

COVER SHEET FOR COMMUNITY PLANNING SUBMITTALS

Name(s) of Submitting Government(s): **City of Brunswick**

RC: **CRC**

Submittal Type: **Comprehensive Plan Update Draft 2**

Preparer: RC Local Government Consultant: Specify

Cover Letter Date: **8/23/23**

Date Submittal Initially Received by RC: **8/23/23**

Explain Unusual Time-lags or Other Anomalies, when present:

Inaccurate/incomplete information, above, and nonconformity with the standards articulated, below, are reportable as performance errors under the terms of the annual DCA/RC contract and may lead to adverse audit findings.

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- **COMBINE ALL INDIVIDUAL IMAGES, DOCUMENTS AND SPREADSHEETS INTO ONE SINGLE, SEARCHABLE PDF (INCLUDING COVER LETTERS, APPENDICES, ETC.), PUT THIS COMPLETED FORM AS THE FIRST PAGE OF THE PDF AND THEN UPLOAD IT.**
- **REVISED SUBMITTALS MUST INCLUDE THE ENTIRE DOCUMENT, NOT ONLY THE REVISED PORTION.**
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CITY OF BRUNSWICK

601 Gloucester Street * Post Office Box 550 * Brunswick * Georgia * 31520-0550 * (912) 267-5500

Cosby H. Johnson, Mayor
Julie T. Martin, Mayor Pro Tem
John A. Cason III, Commissioner
Felicia M. Harris, Commissioner
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City Attorney
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August 3, 2023

Coastal Regional Commission
1181 Coastal Drive, SW
Darien, GA 31305

Re: Comprehensive Plan Update Submittal

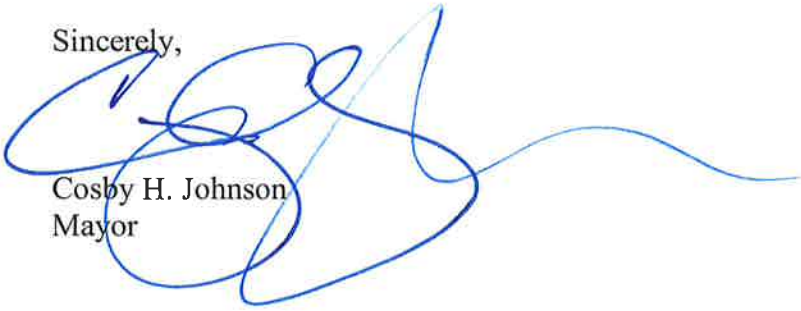
The City of Brunswick has completed an update of its comprehensive plan and is submitting it with this letter for review by the Coastal Regional Commission and the Department of Community Affairs.

I certify that we have held the required public hearings and have involved the public in development of the plan in a manner appropriate to our community's dynamics and resources. Evidence of this has been included with our submittal.

I certify that appropriate staff and decision-makers have reviewed both the Regional Water Plan covering our area and the Rules for Environmental Planning Criteria (O.C.G.A. 12-2-8) and taken them into consideration in formulating our plan.

If you have any questions concerning our submittal, please contact John Hunter, Director of Planning, Development and Codes at 912-267-5527 or jhunter@cityofbrunswick-ga.gov.

Sincerely,


Cosby H. Johnson
Mayor

Enclosures

**CITY OF BRUNSWICK
CITY COMMISSION
BRUNSWICK, GEORGIA**

Resolution 2023-16

**RESOLUTION OF THE CITY OF BRUNSWICK CITY COMMISSION TO ADOPT
THE 2023 COMPREHENSIVE PLAN UPDATE**

WHEREAS, City of Brunswick staff and stakeholders have completed the 2023 Comprehensive Plan Update; and

WHEREAS, this document was prepared according to the Minimum Standards and Procedures for Local Comprehensive Planning, effective March 31, 2014 and established by the Georgia Planning Act of 1989, and the required public hearings were held January 18, 2023 and August 2, 2023; and

WHEREAS, this document was transmitted to the Coastal Regional Commission and the Georgia Department of Community Affairs and was approved by both review entities;

NOW THEREFORE, BE IT RESOLVED, that City Commission of the City of Brunswick does hereby adopt the 2023 Comprehensive Plan Update.

This Resolution will be effective upon adoption.

Adopted the 20th day of September 2023

CITY COMMISSION OF BRUNSWICK

By: _____

COSBY H. JOHNSON, MAYOR

ATTEST:

Naomi D. Atkinson
NAOMI D. ATKINSON, CITY CLERK



FINAL DRAFT 8-2-2023
(For Review by The Ga. Department of Community Affairs)
The City of Brunswick, Georgia
2023 COMPREHENSIVE PLAN
AND
5 – YEAR WORK PROGRAM



Prepared By
The Brunswick, Georgia Department of Planning, Development and Codes

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Chapter 1 – Introduction & Overview

Background

The City of Brunswick is a historic Coastal Georgia city with origins dating back to the pre-Revolutionary period. In recent decades, Brunswick has experienced no growth in its economy, population, or socio-economic profile. However, significant growth has occurred outside the city, particularly on the nearby resort islands to the East and in rapidly developing Glynn County to the North and West of the city. Recently, however, the City of Brunswick is starting to see revitalization, particularly in its historic downtown core. Much of this revitalization is attributable to the successful implementation of the 2018 updated Comprehensive Plan Work Program and it will continue throughout the implementation of this updated 2023 Comprehensive Plan as well.

Demographics

The City of Brunswick population has remained static at around 15,000 for the past 20 years and continues to be a majority (62%) African American resident city. It has a large concentration of low-and low-middle-income families and non-family households (unrelated persons living together). The Median Family Income (MFI) in Brunswick has remained level (factoring inflation) for the past 20 – 30 years and is currently (2021) \$33,500 per year. This compares to the 2021 MFI for Glynn County of just over \$66,000 per year and \$88,000 for The State of Georgia. Within Glynn County, the coastal islands to the east, St. Simons, and Jekyll Islands along with Sea Island, have concentrations of upper income families and retirees well above the County and State MFI.

The economy of the area has and continues to be dominated by the tourist industry on the islands. Over 50% of the labor forces that resides in Brunswick is employed in this industry as opposed to other opportunities such as at the Port of Brunswick, Georgia Pacific's wood fiber plant, the Federal Law Enforcement Training Center, and Gulfstream Aviation to name a few. Wages in these industries are higher than that of the tourist and hospitality industry as well as retail services. Because of lack of education, skills training and public transportation connecting the Brunswick labor force to many higher paying job opportunities, family income has not benefitted from these higher wage opportunities.

Economic issues, which are a priority for the City and its residents, not hold the same priority for the larger and growing Glynn County community. However, much of the city's urban area's labor force and regional services such as the Southeast Georgia Medical Center and the Coastal Georgia College are in Brunswick which helps keep the focus on the city's needs at a regional and expanding urban area level.

Achievements of Goals and Objectives from the 2018 – 2023 Plan and Work Program

- The City of Brunswick, like all cities, was impacted by the outbreak of the COVID virus and the Pandemic that followed. The impact was more severe due to its coastal location and the predominant economic driver for the area being tourism. Nevertheless, Brunswick weathered the period and made considerable progress in achieving its Comprehensive Plan Goals and Objectives expressed in its 5 – Year Work Program. A complete review of that Work Plan is shown in Chapter 13 and here are some of the more notable achievements:
- Completion of a complete revision of its 40+ year old Zoning Ordinance including the creation of two new zoning districts to meet current land use and development objectives as expressed in the 2018 Comprehensive Plan.
- Creation of a City Managed Stormwater Utility supported by a stormwater utility fee and, completion and approval of a 5 – year stormwater and flood prevention plan. Implementation of the plan began in 2022 using SPLOT funding.
- Completion of the Phase II design of historic Mary Ross Park and award of contract for improvements. Work on Phase II is now underway,
- Completion of a Housing Study and Affordable Housing Plan to guide the city in initiating a program of rehabilitating existing housing and revitalizing neighborhoods. Implementation of the plan with a 20-year goal will begin in 2024 with a five-year initial startup. This program will also seek to create opportunities and incentives for the development of new affordable housing on property cleared of dilapidated and vacant buildings under the plan.
- A return to a city managed parks and recreation program to be fully implemented by the Spring of 2024.
- Approval of a recommended public transportation plan by the City Commission and the beginning of efforts to secure the necessary funding and partnerships with the Glynn County and the private sector to enable the system to begin operation by the Spring of 2024.
- Lastly, the completion of several projects to re-purpose vacant commercial buildings in its downtown historic core for residential and commercial uses.

Major Issues for Focus Over the Next 5 - Years in this Plan Update

Addressing some of Brunswick’s continuing physical, and socio-economic needs as a part of this updated Comprehensive Plan has resulted in a focus in many areas previously identified in need and some new issues as well. Following are listed the most pressing needs of the city:

- **Affordable Housing and Neighborhood Revitalization:** Over half of the city’s families are either living in inadequate housing and/or are devoting more than 30 – 35% of their income for housing expense. Over half of the city’s housing stock requires rehabilitation. Revitalization of neighborhoods throughout the city is badly needed and, if improved,

new affordable housing is more likely to be built in the city. Currently, little new housing is being added for sale or rent in the city.

- **Flood Control and Drainage:** As a low-lying Coastal Georgia city, Brunswick faces flooding from increasingly strong storms as well as inadequate and failing stormwater drainage facilities. A recently completed Master Plan for drainage and flood protection system improvements has been funded with passage of a recent SPLOST referendum. The recently created stormwater utility has begun construction of several key projects which will begin to correct serious drainage problems and address flooding. New projects will need to address the impacts of climate change and sea level rise in their design.
- A recently completed **public transportation** plan offered an option for a recommended system could soon offer residents an opportunity to connect with better and higher paying jobs, needed services and education opportunities.
- A newly restored and revitalized **Parks and Recreation Department** and development of a plan for facilities improvements and additions is needed to adequately serve neighborhood families throughout the city. A plan for park facility and program improvements is to be undertaken.
- Continuation of successful efforts to revitalize the city's **downtown commercial core** which has seen several buildings re-purposed for residential uses. A revitalized Economic Development Authority and Urban Redevelopment Agency is now focused on completing long overdue initiatives like the redevelopment of the Oglethorpe Hotel Block.

Purpose of the Plan

This updated Comprehensive Plan (the Plan) will serve as a decision-making tool and guide for the City Commission and staff as well as community leaders going forward to effectively face these and other issues over the next 5 - years. Based on input from the public, City Staff, Stakeholders, and a Steering Committee, the Plan identifies consensus needs and opportunities, goals, and policies. It includes and is accompanied by a Five-Year Work Program to address and implement the key elements of the updated 2023 – 2028 Comprehensive Plan.

Process

The process used to update the Plan follows the guidance and requirements of the Georgia Department of Community Affairs (DCA) Minimum Standards and Procedures for Local Comprehensive Planning, effective 3/1/2014.

Public Involvement

Public Input, Stakeholder & Steering Committee Meetings for this 2023 Update

The process to update the 2018 Comprehensive Plan began with an announcement by the City Commission at a public hearing. The process to update the Plan would stress input from all

areas and interests of the community through a series of community input sessions. A Steering Committee was appointed by the City Commission as well as a Stakeholder Committee to help guide the process. Numerous committee and public gatherings were held to discuss needs, opportunities, goals, and objectives that would influence the Plan content and implementation. Steering and Stakeholder Committee members along with City Staff attended many of these meetings to answer questions and record comments during this process.

Steering Committee members appointed by the City Commission included members of the Planning and Appeals Commission and consisted of the following:

- Lance Sabbe, Chairman
- David Bowers
- Alyssa Bruce
- Anita Collins
- Grace Greene
- Delores Harrison
- William Kitts

Stakeholder Committee members included participants selected by the City Commission who represented constituencies throughout the community and included the following:

- Ashby Worley, The Nature Conservancy
- Daren Pietsch Torras Properties
- Tyler Jones, Historic Brunswick NPA
- Jason Umfress, College of Coastal Georgia
- Jay Jenkins, Citizen
- Lisa Jordan, Downtown Development Authority
- Michael Torras, Torras Properties
- Semona Holmes, Perry Park Community
- Victoria Mackey, Citizen
- Rhonda Waller, Urbana Perry Park NPA
- Tripp Stephens, Southeast Georgia Health System
- Michael Christianson, Citizen
- Mitch Edwards, Citizen

City Staff included:

- Garrow Alberson – City Engineer
- John Hunter – Director, Planning, Development and Codes
- David Bravo – Director of Neighborhood Services
- Russ Marane – Planner
- Roxane George – CDBG DR Project manager

During the six month period of developing this updated Comprehensive Plan, more than 20 committee meetings, public hearings and listening sessions were held.

Records of all Meetings and Public Events: Appendix A

Public Survey

Because affordable housing was identified early in the update process by the City Commission and the Planning and Appeals Commission as THE major issue confronting the city, a Housing Needs Survey was created and publicized on the City's Comprehensive Plan web page, at public events, and on social media. The survey asked participants to identify their current housing needs and preferences regarding type and location. The college and hospital administrations publicized the survey in their employee newsletters and urged them to respond.

From the response of over 360 residents of the city, the following was learned:

1. 46% of respondents were 31 – 50 years old; 6% were 65 years and older.
2. 85 % were women.
3. 88% were heads of households.
4. 68% have children in school.
 - a. 20% in HS
 - b. 22% in MS
 - c. 58% in Elementary.
5. 50% are employed full time; 12% part time; 34% not employed.
6. 59% had monthly incomes below \$2500; 74% below \$3,000; 90% below \$4,000.
7. 57% live in Brunswick.
8. 75% rent their housing.
9. 72% have 4 occupants or less in their household; 34% have 2 occupants.
10. 51% currently have 3 bedrooms; 30% have 2 bedrooms.
11. 62% reported their home in good condition; 9% reported poor conditions needing repairs.
12. 42% are spending less than \$1,000 monthly for housing expense; 25% spend \$1,000 - \$1500; 33% over \$1500,
13. 65% want to improve their housing situation; 48% would like to own; 52% prefer to rent,
14. 44% require 3 bedrooms; 20% 2 bedrooms; 23% 4 bedrooms.
15. 40% can afford up to \$1,000 per month for housing expense; 25% up to \$1500 per month; 35% \$1500 - \$2500 per month.
16. 53% prefer to live in Brunswick.

This data is consistent with the family, household and occupancy data used in this report for the Housing Study (from the American Community Survey based on US Census data).

[A copy of the complete online survey results can be found in Appendix B.](#)

Chapter 2 – Community Goals

General Vision Statement - Updated from 2018 and restated as part of this 2023 Plan Update.

- The City of Brunswick will respect, protect and enhance connections with its natural, historic, and cultural roots through public leadership and engagement with community organizations having the same goals.
- The City of Brunswick will continue to support and incentivize investments in its downtown core area to attract new business and urban living opportunities through the re-purposing of underutilized and vacant structures and development of supporting infrastructure.
- The City of Brunswick will cultivate the growth of its economy and its people, by encouraging entrepreneurship, improving workforce education and development of skills, and connecting its citizens to quality and well-paying jobs through newly developed public transportation services.
- The City of Brunswick recognizing its vulnerability to natural hazards prevalent in coastal areas will continue to apply rigorous and resilient measures and policies to protect its assets and its population. It will implement long range storm drainage and flood protection plan that reflect the issues associated with climate change and sea level rise.
- The City of Brunswick will present a revitalized and rehabilitated image by highlighting its natural and historic beauty and by redeveloping its underutilized areas in a manner keeping with its traditional human scale development characteristics.
- The City of Brunswick will re-vitalize its beautiful neighborhoods through housing rehabilitation and investments in public infrastructure with support from the city, the business community, actively involved citizens and an engaged, well-coordinated community and non-profit organizations. It will also strive to create opportunities for the development of quality new and affordable housing with a priority for creating homeownership.
- By the return of responsibilities for Parks & Recreation, the planning, programming, maintenance and improvement plans will be an emphasis with the goal of expanding access for these facilities and programs throughout the city.

Chapter 3 – Needs and Opportunities – **Updated from 2018 and restated as part of this 2023 Plan update.**

The following list of needs and opportunities result from significant and meaningful personal contact with citizens of the community as well as the priority concerns of Brunswick’s leadership. Needs and opportunities also were identified through planning activities over the past 5 years as well as from Community Input Sessions and feedback at public forums. These needs and opportunities help to create a clear focus for actions and policy to realize the Brunswick vision.

Roots

- Protect the City’s natural resources, including rivers, marshes, and tree cover.
- Increase connections to key natural resources such as the waterfront.
- Keep Brunswick’s small-town charm and friendly character.
- Protect and preserve the City’s historic buildings and character.

Community

- Act to provide a wide variety of affordable housing through a balance of rehabilitation and new construction.
- Maintain a neighborhood focus by placing resources and services in or near neighborhoods and invest in the quality of neighborhood infrastructure.
- Provide adequate and effective public safety and police presence.
- Find new, innovative, and participatory methods for preventing and reducing crime.
- Increase community involvement and capacity in poor and disenfranchised communities including immigrant communities through the city’s Neighborhood Planning Associations.
- Complete the upgrade of internet broadband service throughout the city currently underway.

Growth

- Encourage the creation of greater employment opportunities and entrepreneurship for citizens throughout workforce development and small business development.
- Address the risks associated with coastal flooding through improved drainage and flood protection facilities and encouraging emergency preparedness for its citizens.
- Achieve the long-standing goals of successfully completing the redevelopment of the Oglethorpe Hotel property and take steps to promote and assist in the planning and development of Liberty Harbor.
- Support mobility of all citizens, especially low-income citizens, and senior citizens, by implementing a public transportation plan option.

- Develop and implement a comprehensive network of bicycle and pedestrian pathways throughout the city linking neighborhoods to the city core and area services.
- Strengthen coordination and communication between city and county governmental entities.

Image

- Continue to improve the appearance of the city’s major gateways and program of wayfinding throughout the city.
- Continue to address the City’s large inventory of dilapidated, substandard, and vacant buildings throughout the city. Following removal, incentivize the development of new affordable housing.
- Continue to address existing pollution within the community and promote the clean-up and redevelopment of brownfields.
- Continue to invest in the restoration and improvement of facilities in the City’s squares and parks.
- Ensure new and infill development is compatible in scale and character with existing neighborhoods.

Chapter 4 – Economic Development - Updated based on 2022 CEDS and updated plans for other projects.

The Coastal Regional Commission (CRC) serves as the staff consultant for the Economic Development District (EDD) comprised of the region’s six coastal counties and four inland counties as designated by the U.S. Department of Commerce, Economic Development Administration (EDA). In accordance with EDA, a Comprehensive Economic Development Strategy (CEDS) is updated and submitted every five years. This important document sets the regional economic development planning process for 2022 - 2027. The CEDS brings together public and private sectors to create an economic road map to strengthen Coastal Georgia’s regional economy. **The City of Brunswick is a party to this plan and contributes and supports efforts toward its implementation.**

The CEDS document provides an analysis of the region’s economy which was used as the guide for establishing regional economic goals and objectives, developing, and implementing a plan of action, and identifying investment priorities and funding sources to meet the area’s needs for infrastructure necessary to support desirable economic growth.

Coastal Georgia’s eastern shore stretches almost 100 miles from Savannah at its northern tip to St Mary’s at its southern tip and is home to historic towns, industries, military installations, major ports, and a thriving tourism trade. Equally important, one finds abundant wildlife, beautiful beaches, and over 2300 miles of tributaries and salt marsh vital to the sustainability of its natural environment.

With a hundred miles of coastline, shipping has always been a unique resource for the region's economy. Georgia's accessible ports remain a major advantage for manufacturing and distribution companies located throughout the region. Georgia's ports combine industry innovation with proven flexibility to create new opportunities along the entire global logistics pipeline, while continuing to meet the market demand. The Port of Brunswick is one of the largest "roll on – roll off" automobile and heavy machinery ports in the Nation and is currently expanding its capacity which will make it the largest such facility on the East Coast.

In addition to Georgia's ports, the presence of military installations has proven to be an asset for the region and a major economic driver. The State of Georgia is currently the sixth largest recipient of defense related funding in the Nation. The Federal Law Enforcement Training Center (FLETC) is in Glynn County just north of the City of Brunswick and is a major contributor to the region's economic health.

Tourism which is closely tied to coastal resources through our coastal waterways and the natural, historic, and cultural resources is a major driver of Coastal Georgia's economy and certainly to Brunswick which boasts three islands which attract thousands of tourists which contribute to the region's economy.

Although the Georgia Department of Labor's 2021 profile for the region reports the unemployment rate as significantly lower than the figures during the COVID Pandemic, the Georgia Coast still faces numerous economic challenges. Glynn County, along with the rest of the region, continues to face a loss of working age population in the 35-44- and 45-54-year-old age groups. This can be attributed, in large part, to lower-than-average weekly wages as compared to the rest of the State of Georgia. Recently, the announcement of a new automobile assembly plant to be built in the coastal region should help the labor force retain more workers in these income groups with the prospects of much higher average weekly wages.

Other factors affecting income disparity in the region and specifically Brunswick:

- Education attainment levels in Brunswick are likewise lower than the state and national level despite the presence of a 4 -year state college and two-year technical school.
- Median household income has not kept keep pace with the rise in living costs, particularly housing costs. Finding decent affordable housing is particularly difficult.
- Approximately 22.3 percent of the primary jobs within the region are held by workers commuting from outside the county or community.
- 22.2 percent of employed Coastal Georgia residents leave the region for employment – a high percentage compared to workforce investment areas around the state.
- In Brunswick, nearly 80 percent of its employed labor force works outside the city despite two heavily concentrated employment centers at the Port AND Medical Center.

The startup of a public transportation system is envisioned as playing a major role in connecting the underemployed in Brunswick to job training and higher paying jobs inside and outside the city.

Workforce development issues which threaten quality economic development in the region and include:

- high poverty rate.
- low rates of educational attainment.
- inferior skill levels for high wage; and
- a poor level of occupational *soft skills*.

These factors present the risk of disinvestment among existing companies in the region. These factors also pose difficulty in recruiting new firms to the area. This is an area of attention for not only Brunswick and Glynn County but the region.

As a performance-based strategic plan, the 2022-2027 CEDS serves an important role in the region's efforts to grow the economic base in the face of accelerated growth, economic dislocations, competition, and other events challenging the economic vibrancy of the region.

The Current 2022-2027 Comprehensive Economic Development Strategy (CEDS), Appendix E

Tax Allocation District #1.

The City of Brunswick adopted a Redevelopment Plan outlining the rationale, boundaries, fiscal data, and potential projects that could result from the formation of the Tax Allocation District (TAD) #1: Historic Core. The TAD #1 consists of 687 parcels totaling 481 acres. The TAD area is comprised of properties within the Downtown Historic Core and the surrounding area with redevelopment/ infill potential that are along the commercial corridors coming into downtown and which the City believes have the potential for future redevelopment.

The opportunity for the City of Brunswick is to leverage private reinvestment through targeted public improvements that will:

- Implement the vision set forth in the 2007-2027 Glynn County Joint Comprehensive Plan, adopted by the City of Brunswick in October 2008
- Help to re-activate the City's historic downtown core, its unique waterfront, and the Gloucester, Norwich, and Highway 17 corridors.
- By stimulating investment in the TAD area, offset the decline in property values in the city.

Since the TAD District tax assessment certification in 2021, the district has generated over new tax increment funds to be invested in the district. Consideration is being given to expanding the TAD #1 Boundary and creating a second TAD #2 to help fund housing programs and neighborhood revitalization in other areas of the city.

The Tax Allocation District #1: Historic Core Redevelopment Plan, see Appendix F

Mary Ross Waterfront Park – Downtown Brunswick:

Brunswick's waterfront has served as one of the economic backbones of the City's commerce for more than 200 years. Its deep waterways and shelter from the open sea, have contributed to its success as a thriving seaport. In addition to its international seaport, Brunswick's waterfront was instrumental in World War II as it was a manufacturing facility for the famed Liberty Ships that supplied the U.S. Navy with wartime supplies throughout the war.

Today, the waterfront is predominately industrial with sporadic pockets of private developments and marinas fronting the Brunswick and East Rivers. Mary Ross Waterfront Park resides along the East River and is the terminus for one of Brunswick's prominent streets, Gloucester Street. The waterways surrounding Brunswick are truly one of the environmental gems of the Golden Isles area. Mary Ross Waterfront Park has a front-row seat of this magnificent natural resource but does not currently embrace its full potential as a waterfront destination.

Separated by US341 (Bay Street) and many industrial uses, it has an undeniable disconnect from the hub of activity that is occurring in Downtown Brunswick just blocks away. With its waterfront location and proximity to the downtown core, Mary Ross Waterfront Park stands to be an iconic destination, waterfront gateway to Brunswick, and a much needed physical and cultural connection to downtown. This master plan is the first step in helping the park live up to its full potential. The City of Brunswick was awarded a Coastal Incentive Grant by the Department of Natural Resources which funded this effort.

Mary Ross Waterfront Park should be a regional destination and a local amenity that links downtown Brunswick to the sea at the East River. It should bring the community together and provide places that celebrate the region's history, culture, natural resources, and people.

The Mary Ross Water Park (MRWP) Master Plan looks to the future of the park as a vibrant expression of the region and an asset to the City of Brunswick. A redesigned and upgraded riverfront park will provide both active spaces for entertainment and passive spaces for reflection. It will also become a catalyst for redevelopment in downtown Brunswick.

While there have been various changes and improvements to the park over the years, there has not been a comprehensive master plan to provide direction for the park's future until now.

Phase I of the overall master planning process involved completing a structural study on the major infrastructure within the park to determine their integrity and to establish a preliminary cost for deficient items. The Structural Assessment Report of Mary Ross Waterfront Park was conducted by H+K Engineering Group out of Savannah, Georgia and completed in March of 2014. The report was a separate contract than the MRWP Master Plan but provided a baseline assessment of the park and was referenced through - out the master plan project.

The Mary Ross Waterfront Park Master Plan (Phase II) began months after the completion of Phase I and was the more comprehensive plan of the park. It defined specific uses, developed concepts around those uses, conducted public outreach, established development priorities, and defined costs and potential sources of revenue for a future revitalized park. The resulting master plan is a comprehensive look at the future of the park as it looks to serve Brunswick, the community, and visitors of the Golden Isles for the next several decades.

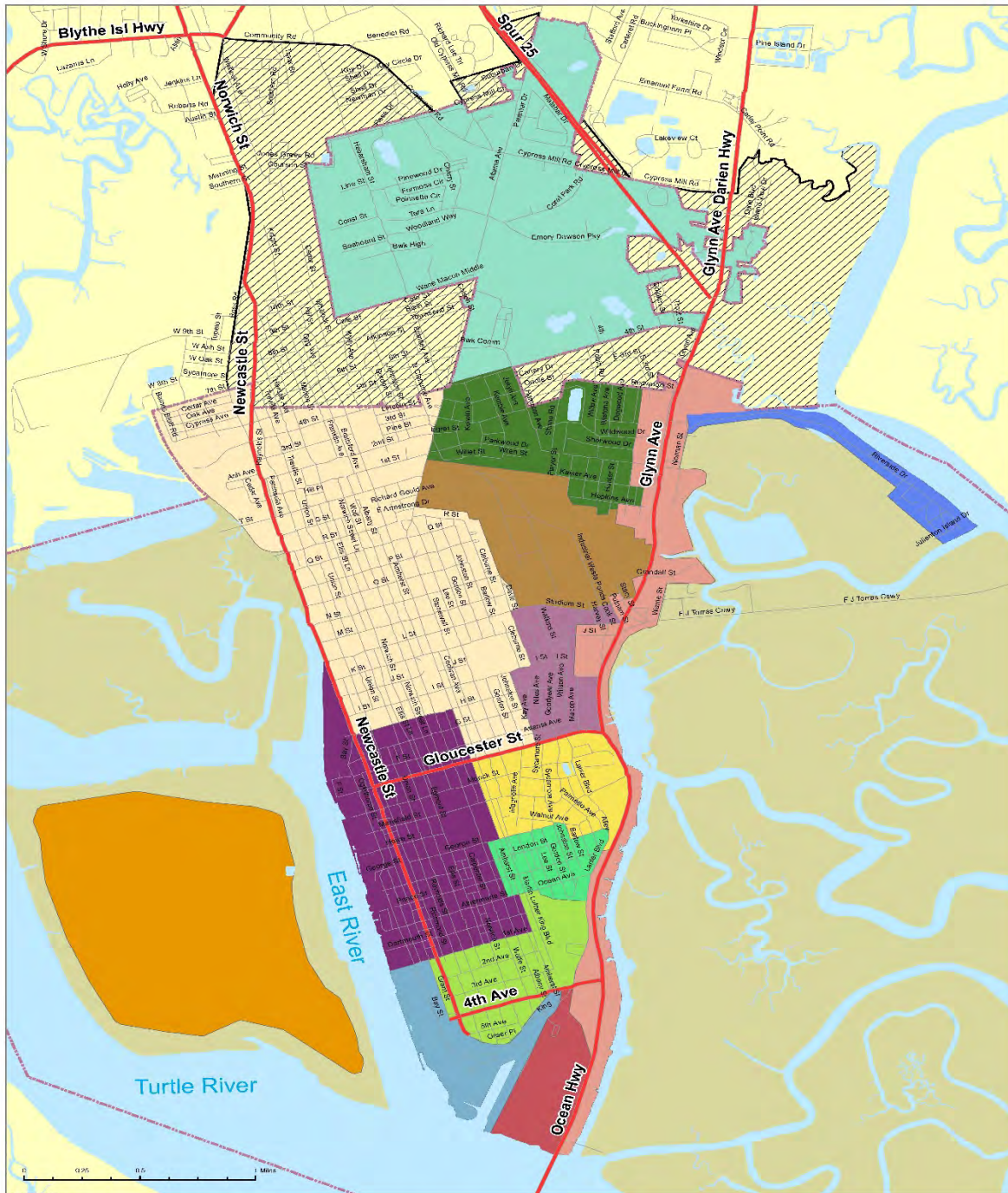
Phase II is now under construction. Subsequent phases of improvements in the Master Plan will be re-evaluated in the 5 – year Work Plan.



Broadband Service – Brunswick

Currently all areas of the city have internet service including portions with fiber optic cable. Installation of new fiber optic cable is currently underway by both a private provider (Live Oak Fiber) and ATT. Currently, fiber optic cable is being installed in Old Town Brunswick. Within 3 – 5 years all areas of Brunswick and Glynn County will have access to upgraded high speed internet service.

Chapter 5 – Land Use Character Area Plan (See Map Below)



LEGEND	
Brunswick Boundary	Industrial Waterfront
Water	Liberty Harbor
Character Areas	New Town/Town Commons
Andrews Island	North Brunswick
Dixville/Habersham Park	Marsh
Hercules Plant	Medical/Parkwood
Potential Annexation	Riverside
	Windsor Park
	South End Brunswick
	Glynn Avenue Corridor
	Urbana/Mayhew

City of Brunswick, Georgia
COMPREHENSIVE PLAN

CHARACTER AREA MAP
AUGUST 2018

NORTH

The Defining Narrative for each Character area follows, and each defines a vision and preferred development pattern for each Character Area in the City. The Defining Narratives are both the basis for land use regulation and for implementation projects that address the specific needs of each area of the community. This method works best for the City of Brunswick because it is a historic and established City that is mostly developed with many areas needing re-development.

Character Areas govern future land use by permitting a variety of land uses and, where appropriate in core areas of the city, promoting a mixed-use approach to planning. Within Character Areas, issues of scale, massing, building placement, architectural style, and performance issues such as traffic volume and waste handling are just as important as permitted land use categories. Character Areas do, however, restrict land use to those on the list of appropriate uses, and some of these uses may be restricted to certain areas within the Character Areas such as parcels along major roadways.

The Character Areas map was originally developed through an interactive process between the planning team and the community first in January 2008. For the Comprehensive Plan Update in 2018, the Character Areas were again discussed and the map and description for each Character Area were further refined through a rigorous community outreach program.

For this 2023 Comprehensive Plan update, similar discussions were held at Stakeholder and Public Meetings to determine if further adjustments in Character Area Boundaries was warranted. Only minor suggested changes in the narratives for several of the Character Areas were suggested. Consideration to modifying the North Brunswick and the Medical Parkwood Character Areas by combining them into an Institutional Character Area. However other factor relating to residential development patterns and large areas being outside the city, were considered and no changes were made.

Character Area: North Brunswick

This northern portion of the city includes an irregularly shaped area primarily centered on Altama Avenue but also with frontage on Community Road/ Cypress Mill Road, and the Spur 25. The development pattern here is very mixed with no one type of development predominating. The campus of the College of Coastal Georgia and Brunswick High School comprise major civic uses in this area. Linear, auto-oriented commercial uses with scattered building sites and large parking areas are found along Altama Avenue, Community Road/ Cypress Mill Road, and the Spur 25.

Two newer residential neighborhoods with curvilinear connected street systems, Magnolia Park, and College Park, are also part of this area. These neighborhoods have well defined boundaries and consistent single-family development patterns but also offer proximity to nearby commercial and institutional services.

Vision

The vision for the North Brunswick area is multi-layered, reflecting its land use diversity. For the single-family neighborhoods of Magnolia Park and College Park, the vision is to continue to preserve the character and boundaries of these suburban, single-family neighborhoods. For Altama and Community Road/Cypress Mill Road corridors, the vision is for new, mixed-use, urban boulevards with active, pedestrian-oriented streetscapes. For Spur 25, the vision is for a continuation of major commercial development. It is also important to the North Brunswick community that it retain its institutional assets – the Coastal Georgia Community College, and Brunswick High School. These institutional assets should be better connected with nearby neighborhoods and knit together with a connected framework of pedestrian and bicycle paths. Commercial redevelopment along Altama is also important to provide goods and services to the college professionals and its students as well as the nearby medical center employing 2700.

Appropriate Land Uses

- Existing single-family residential development within Magnolia Park and College Park
- Community-scale commercial, institutional, multifamily, and mixed-use development along Altama Avenue to support the college, high school, and medical complex and traditional commercial with perhaps some mixed residential use along Community Road/ Cypress Mill Road
- Light Industrial development on the western portions of Habersham

Recommended Development Patterns

- Multi-story mixed-use development along major corridors where appropriate and a new building form can logically be introduced.
- Housing for college students developed in neighborhood patterns along Altama Avenue.
- Clustering high-density development at nodes along major corridors
- Greyfield redevelopment that re-purposes vacant or underutilized commercial strips to mixed-use assets.
- Development that has easy access to nearby transit, shopping, schools, and other areas where residents travel daily.
- Single-family residential areas with strong boundaries and consistent massing, setbacks, and front yards.
- Preservation and enhancement of existing major institutions, the high schools, and the College of Coastal Georgia.

Recommended Transportation Patterns

- New greenways and pedestrian/ bicycle paths to connect residential areas to commercial areas, employment areas and future transit stops.
- Where possible, landscaped buffers between the roadway and pedestrian walkways
- Where possible, landscaped raised medians separating traffic lanes.
- Restrictions on the number and size of signs and billboards
- Landscaping of large parking areas to minimize visual impact.
- Parking lots that incorporate on-site stormwater retention features such as pervious pavements or detention drainage systems.
- Encourage parking at rear or side of buildings to minimize visibility from the street.
- Encourage shared parking arrangements that reduce overall parking.
- Driveway consolidation and inter-parcel connections between parking lots

Recommended Implementation Measures

- Design a new street section for Altama Avenue that includes a wide pedestrian promenade, street trees, lighting, street furniture, bicycle lanes, travel lanes, and, if possible, a landscaped median. Ensure that all modes of transportation are adequately planned per the City's Complete Streets Policy.
- Focus infrastructure improvements on drainage, curb, gutter, sidewalks, and streetlights on major streets.
- Stay actively involved in strategic and master planning for the College of Coastal Georgia
- As land becomes available for purchase, pursue opportunities for purchase of future parks or greenspace in this area.



College of Coastal Georgia Entrance



Rent Assisted Housing in North Brunswick

- Seek to increase recreational opportunities for North Brunswick residents by encouraging public access to middle school and high school recreation facilities.

- Seek consistent zoning along Altama and Community Road/Cypress Mill Road to permit mixed-use development that supports the College and Medical Center.

Altama Avenue Corridor Plan

The Brunswick-Glynn County Archway Partnership identified Planning for Growth as one of the community's top priorities and created a Growth Task Force (GTF). One area identified by the GTF as ripe for revitalization is the neighborhood along Altama Avenue reference as the Altama Community Transformation (ACT) District. In 2012, a Plan was adopted that created a design for the Altama Avenue Corridor and an implementation plan outlining the strategies and actions necessary to implement the design. Research and analysis of previous planning efforts were conducted as well as extensive stakeholder input and engagement to best inform the development of the corridor design and implementation plan.

The Altama Community Transformation District Corridor Plan was updated most recently in 2018, and focuses on:

- Corridor design addressing
 - Zoning and land use issues
 - Streetscape, including street trees, lighting, sense of entry, way-finding signage, sidewalks, and pedestrian crossing.
 - Architectural building design concepts and sample standards (materials, styles, heights, fenestration, etc.)
 - Historic preservation
 - Greenspace and recreation
 - Infill construction (residential and commercial)
 - Right-of-Way design and use (lane layout, access and traffic design, control, and calming alternatives)
 - Alternative transportation including pedestrian accessibility and safety, transit, and bicycles.
- Housing
 - Uses, single family and/or multifamily.
 - Condition issues and solutions
- Economic Development
 - Redevelopment opportunities
 - Businesses best suited for the corridor given the traffic flow, College of Coastal Georgia and Southeast Georgia Health System growth, the Brunswick High School campus, and residential areas.

The ACT District Corridor Plan, see Appendix G:

Character Area: Medical/Parkwood

The center of the Medical/ Parkwood Character Area is the Southeast Georgia Health Systems Brunswick Campus, which is surrounded by related medical uses, particularly east of Hampton Avenue. Located east, west, and south of the hospital are 1960's single-family neighborhoods with regular block patterns and single-story ranch style homes that are well maintained. These residences benefit from their central location within the City of Brunswick, with easy access to the hospital, the community college, and commercial services. There are also some 1970's era townhouses in this neighborhood south of Kaiser Avenue. The Medical/ Parkwood Character Area is bounded by the US Highway 17 Corridor on the east, the Pinova Plant on the south, and Altama Avenue on the west.

Vision

The Medical/Parkwood Character Area should likewise retain its single-family character while allowing the hospital to serve its important public service mission. To balance the competing needs of the neighborhood and the hospital, clear boundaries should be set on the hospital's future expansion to keep it from gradually eroding the stability of surrounding neighborhoods. The city is currently considering establishing an Institutional zone for the area including appropriate use and development regulations.

Appropriate Land Uses

- Single-family and townhouse residential
- Medical related commercial development and parking areas east of Hampton and along parts of Shine Road in the area south of the Hospital and north of Hercules and in the area between the park and the Hospital
- Multifamily development in locations near hospital or college facilities.
- Mixed-use and multifamily development at the intersection of Parkwood Drive and Altama Avenue.



Lakeside Neighborhood East of Hospital



S E Georgia Medical Center – Main Entrance

Recommended Development Patterns

- Single-family houses in residential neighborhoods with off-street parking

- Medical-related commercial development and parking areas east of Hampton and along parts of Shrine Road – in the area south of the Hospital and north of Hercules.
- Existing multifamily developments should be permitted to redevelop into configurations that better support Brunswick’s traditional urban forms and block patterns.
- Mixed-use and multifamily development at the intersection of Parkwood Drive and Altama, an important intersection in this community.
- Single-family residential areas with strong boundaries and consistent massing, setbacks, and front yards
- Clustered high-density development at nodes along major corridors
- Greyfield redevelopment that converts vacant or underutilized commercial strips to mixed-use assets.

Recommended Transportation Patterns

- Shared parking arrangements that reduce overall parking needs
- Location of parking at rear or side of buildings to minimize visibility from the street.
- Parking lots that incorporate on-site storm-water mitigation or retention features such as pervious pavements
- Appropriate connections to hospital and college campuses for bicycles and pedestrians.

Recommended Implementation Measures

- Establish clear boundaries in the character area for the expansion of the medical center uses and parking areas that serve staff, patients, and visitors. Encourage additional medical development to occur along the US 17 or Altama corridors.
- Engage in a comprehensive infrastructure upgrade of all residential streets in a phased and systematic fashion throughout the character area. Focus infrastructure improvements on drainage, curb, gutter, sidewalks, and streetlights on major streets.
- Develop a master plan for pedestrian and bicycle paths connecting the neighborhoods with the Southeast Georgia Health Systems Brunswick Campus, the Coastal College of Georgia, and major commercial corridors.
- Stay actively involved in strategic and master planning for the Southeast Georgia Health Systems Brunswick Campus.
- Consult with the NPAs about the potential need for traffic calming to discourage cut-through traffic.

Character Area: Riverside

The Riverside Character Area is a compact single-family neighborhood located on a peninsula bordered by the Back River and Terry Creek. Most homes here have water views and boat docks for accessing the water. The Riverside Character Area is isolated from other parts of the City of Brunswick and so is less impacted by land use compatibility issues.

Vision

The Riverside Character Area will retain its single-family character and attractive natural surroundings. The Riverside area is distinguished by its location on a peninsula, which provides marsh views and water access to these high-end single-family homes. The goal for this area should be to maintain its current amenities and to protect the character of the existing single-family neighborhood.



Figure 2.5 Single family homes in Riverside display a variety of modern coastal styles

Appropriate Land Uses

- Single-family residential neighborhood

Recommended Development Patterns

- Single-family residential development with off-street parking consistent with existing development.
- Protected marshland and wetlands
- Preserved views of marshlands and river
- New development should minimize disturbance of marshes and wetlands with appropriate setbacks.
- Development that is compliant with FEMA regulations consistent with established LIMWA zone through residential elevation.

Character Area: Glynn Ave Corridor (US Hwy 17)

The Glynn Avenue Corridor is one of the two high - visibility corridors that lead into and out of the city (the other being US 341/Newcastle Street). The Glynn Avenue Corridor serves not just as the gateway to the City of Brunswick, but also as the primary gateway to St. Simons, Sea, Little St. Simons, and Jekyll Islands, combined termed The Golden Isles. The corridor through Brunswick has 6 traffic lanes, plus as many as two turning lanes and deceleration/right turn lanes making the roadway effectively 10 lanes wide in most areas. The developed road cross section is more than 100 feet wide including sidewalks.

The northern portion of the Glynn Avenue Corridor is primarily comprised of low-density, highway-oriented commercial uses including several older motels, while the southern portion, and particularly the East side is characterized by views of open space and marshlands. Many of the commercial areas along Glynn Avenue are deteriorating and suffering from disinvestment, but there has been some new redevelopment activity along the corridor, particularly the northern portion.

A study of the corridor, its characteristics and potential, was initiated by the city in 2018. Guidelines for development within the corridor were recommended following a Design Charette made up of design professionals and stakeholders in November 2018 for consideration by the Brunswick City Commission. As a result, an overlay district was added to the City's zoning code in 2018 to help shape the character of new development within the Corridor with design and planning guidelines. Certain goals, including creating public access to the adjoining marshes and creeks on the Eastern Boundary, will necessitate public investment in infrastructure to access those areas.

Much of the underlying zoning remains Highway Commercial which permits a wide range of commercial uses as well as high density multi-family housing. To date 5 projects have been planned and developed within the Glynn Avenue Corridor covered by the overlay district.

Recommended Land Uses

- Multi-story mixed use development with commercial uses on the first floor
- Multifamily residential development including senior housing.
- Area and highway serving commercial uses and offices.
- Tourism and cultural facilities
- Hotels and resorts
- Protected greenspace, wetland, and wildlife habitats along the eastern border.

Recommended Development Patterns

- Structures located near the street front with parking in rear of buildings, making the corridor more attractive and more pedestrian friendly.

- Vertical, multi-story mixed-use development with retail on the ground floor is encouraged.
- Developments that take advantage of marsh-front views such as housing, restaurants, or hotels
- Clustering high density development at nodes along major corridors
- Developments that have easy access to nearby transit when and if available, shopping, schools, and other areas where residents travel daily.
- Greyfield redevelopment that converts vacant or underutilized large tracts to appropriate land uses.
- Site planning, building design, and landscaping that are sensitive to natural features of the site including topography and views.
- Recognition that FEMA regulations and the LiMWA zone will play a major role in design and use decisions, especially in the area north of the Torras Causeway east of US 17.

Recommended Transportation and Development Patterns

Many of the recommendations contained in the “Design Framework” guidelines for the Overlay District will be challenging to incorporate in new developments within the corridor. The Glynn Avenue Corridor is controlled and maintained by the Ga. Department of Transportation, and it is unlikely that the overall roadway corridor will be altered to provide landscaping, pedestrian separation features and bikeways will occur. Where possible, however, the city will advocate for changes to make the corridor more pedestrian friendly and visually attractive. Some of the guidelines in the Overlay District Design Framework for the overlay district include:

- Location of parking at rear or side of buildings to minimize visibility from the street.
- Shared parking arrangements that reduce overall parking needs
- Landscaping of parking areas to minimize visual impact on adjacent streets and uses.
- Parking lots that incorporate on-site stormwater mitigation or retention features such as pervious pavements
- Pedestrian connections between development on the corridor and residential areas behind the corridor
- New greenways and pedestrian/ bicycle paths to connect residential areas to commercial areas, employment areas, and transit stops.
- Facilities for bicycles including bikeways or bike lanes, frequent storage racks, etc.
- Driveway consolidation and inter-parcel connections between parking lots
- Restrictions on the number and size of signs and billboards

Recommended Implementation Measures

- Continue to work with property owners and developers to implement recommendations in the Glynn Avenue Design Framework Guidelines.
- Examine opportunities for the city to implement TAD#1 funding within the corridor to foster redevelopment and facilitate public access.
- Continue to explore redevelopment opportunities.

The Glynn Avenue Corridor Overlay District in the Zoning Ordinance can be found in Exhibit F along with the “Design Framework” guidance.



Re-purposed auto dealership building for a Striplings General Store on Glynn Ave.



New construction - medical services building on Glynn Avenue

Character Area: Hercules/ Pinova

The Hercules/ Pinova plant, which processes tree stumps into resins and related materials, occupies a large piece of land in the northern sector of the city, highly visible from US Highway 17 and the Torras Causeway. The appearance of the site is typical for a heavy industrial use with large machinery, chain link fences, and a smokestack over the central plant. If the plant closes in the future, environmental constraints may restrict future development on the site. Nearby Brunswick residents complain of air, water, and soil pollution from the Hercules/ Pinova site.

Vision

On June 28, 2023, Pinova announced that it will cease operations immediately and over the next 12 – 18 months take the necessary steps to cease all operations and dismantle the plant facilities and equipment. It is possible that some environmental remediation will be involved.

The city will diligently monitor the plant closure and hopefully be involved in determining the appropriate reuse of this prominent site in the community.

News article regarding plant closure may be found in Exhibit C.

Character Area: New Town/ Town Commons

New Town is the second oldest area of the city. This character area extends northwards from Old Town/F Street up to T Street and east to the Hercules Plant and includes both sides of MLK Boulevard. New Town includes three large public squares that were set aside when it was originally platted. The New Town Character Area is defined by a regular rectangular block pattern which serves to connect diverse land uses in a highly integrated pattern, but also makes it more difficult to identify boundaries between distinct neighborhoods. Land uses in New Town are single-family, though there are many commercial lands uses along Norwich Street and some churches and schools scattered through the area. A high percentage of homes in the area require moderate to significant rehabilitation as noted in the recently completed housing study. In addition, the area has pockets of mostly vacant dilapidated structures that will require demolition.

There are also several large multifamily Brunswick Housing Authority properties in this character area which tend to stand out from their surroundings. Additionally, two modern and attractive privately owned rent assisted housing complexes have recently been built in the area on MLK (Perry Place) and Norwich Commons (4th Street).

There are three major corridors that help define the New Town area. MLK Boulevard runs north-south through the New Town area. The MLK area is somewhat underdeveloped. It has a very wide right-of-way in comparison with its traffic volume, and the corridor contains a large median with a tall utility corridor down its center. The Norwich corridor also runs north-south through the New Town area. Land uses along the Norwich corridor tend to be commercial or institutional in nature with some outdoor storage such as automobile sales, and buildings are situated directly adjacent to the corridor as characteristic of a 'main street.' Along the western edge of New Town is the Newcastle/US 341 corridor, which functions as a main Gateway to Brunswick (along with US 17). Due to the waterfront and the rail line running adjacent to Newcastle, land uses, and architectural styles are quite diverse, with commercial, industrial, institutional, and residential land uses scattered in an incoherent fashion on the corridor.

Vision

The vision for the New Town/Town Commons area is a revitalized, diverse, urban single-family neighborhood with quality infrastructure. The neighborhood can be improved through a variety of infrastructure investments, including drainage improvements, curb and gutters, streetlights, and sidewalks. Neighborhood parks will be improved by additional amenities such as benches, lighting, walking paths, and playgrounds. Dilapidated housing will need to be renovated so that new infill housing will be developed on vacant lots. The neighborhood will continue to be mixed-use with schools and churches as vital part of the neighborhood, and neighborhood-serving commercial development should be encouraged to occur along Norwich Street. Newcastle will become a gateway into the city with new, street-oriented redevelopment and an improved streetscape. The City's waterfront should become more accessible to neighborhood residents through pedestrian and bicycle pathways.

Rise Risley is a project within New Town to transform an abandoned elementary school into a facility that will provide public access to education, improved caregiving, reducing trauma and supporting mechanisms that will help families become economically self-sufficient. Risely Elementary School opened in 1870 as Freedmen’s School in Brunswick for African American residents. Later a high school was built on the Freedmen’s site. Today, the site is surrounded by some of the city’s most dilapidated buildings, poverty, crime, and joblessness. The Rise Risely initiative is dedicated to addressing these issues through the State of Hope Initiative headed by the City’s Community Action Authority with financial support from the community coming from government, philanthropy, and the business community.



Appropriate Land Uses

- Single-family residential development
- Neighborhood scale commercial development along Norwich St, developed in a *Main Street* fashion with the building fronting the streetscape and parking to the rear.
- Community facilities and centers such as schools, parks, museums, and libraries located on the major corridors of Norwich St, MLK Jr Blvd, and Newcastle St
- Multifamily development along the MLK Jr Blvd and Newcastle St corridors
- Townhouse development along the Norwich St and Newcastle St corridors
- Mixed-use development along the Newcastle St corridor south of P Street

Recommended Development Patterns

- Houses located near the street with front porches that encourage interaction with neighbors.
- New residential development that matches the mix of housing types and styles of the community
- Accessory housing units that provide rental opportunities for small households
- Addition of neighborhood commercial centers on appropriate infill sites that serve surrounding neighborhoods.

- Greyfield redevelopment that converts vacant or underutilized commercial strips to mixed-use assets. There is an excess of vacant commercial buildings in the area, particularly along Norwich Street.
- Structures (shopping, offices, etc.) located near street front with parking in rear of buildings, making the corridor more pedestrian friendly.
- Emphasizing and protecting views of the river where possible for development along Newcastle St

Recommended Transportation Patterns

- Improved streetscaping for Norwich St, MLK Jr Blvd, and Newcastle St with the introduction of pedestrian and bicycle facilities and other streetscape amenities
- Restrictions of the number and size of signs and billboards on MLK Jr Blvd, Newcastle St, and Norwich St.

Recommended Implementation Measures

- Design and implement a new streetscape for Norwich entering downtown.
- Design and implement improved street sections for MLK Jr Blvd, Norwich St, and Newcastle St. Include pedestrian and bicycle facilities on all corridors and include transit facilities along MLK Jr Blvd. Include a landscaped median on Newcastle where feasible.
- Conduct an accessory housing study to determine potential configurations for accessory housing units that would leave the neighborhood character intact.
- Ban any new billboards and minimize free standing signs along the Newcastle/ Norwich corridors and negotiate when possible that old billboards be removed as a condition of development/redevelopment permitting when controlled by the applicant.
- Engage the neighborhood in planning charrettes for the public squares in the area.
- Engage in a comprehensive infrastructure upgrade of all streets in a phased fashion throughout the character area, starting with major streets. Focus infrastructure improvements on drainage, curb, gutter, sidewalks, and streetlights.
- Explore the designation of key structures or districts within the New Town Character Area for eligibility for the National Register. Encourage preservation of historic structures where possible.
- Continue to implement the policies and ideas outlined in the Historic Norwich Corridor Development Plan and the Revitalizing Norwich Corridor Study (2018) to foster redevelopment.
- Continue to support the Rise Risely State of Hope Initiative and target the area surrounding the school buildings being re-purposed for housing rehabilitation, removal of blighted structures and improvement of public infrastructure.



Figure 2.10 Single-family houses with porches could provide good infill for New Town



Figure 2.11 Corner stores contribute to a sense of place

Character Area: Urbana/Mayhew

Urbana and Mayhew are post-war subdivisions with single family housing. A large and recent mixed-income, garden apartment development, Whispering Oaks, is a major land use feature of this neighborhood. The Abbott Andrews Public Housing complex is also located in this character area. These neighborhoods are bounded by the US Highway 17 commercial corridor to the east, the Hercules Plant to the north, and the Burroughs-Molette School to the west. Edo Miller Park is on the northern boundary of the neighborhood adjoining the Pinova site.

Vision

The Urbana-Mayhew Character Area should retain its predominantly single-family character. A small neighborhood surrounded by commercial and industrial **uses (although with the closing of the Pinova Plant, the redevelopment of the site, if carefully planned, could become a major asset for the character area)**, it is important to maintain the physical integrity of this neighborhood's boundaries. There is a significant amount of multifamily development in the character area, and while this is currently compatible with the character area, multifamily development should not be permitted to expand significantly in land area or scale. It is important to restore the connectivity of the street grid or to at least restore pedestrian pathways to the east, west, and north where possible. Increasing connections with the US 17 corridor is of value. The neighborhood should continue to benefit from schools and parks that are part of its fabric. As with other Brunswick neighborhoods, there is a crucial need to improve infrastructure, especially drainage infrastructure which is planned for the near future.

Appropriate Land Uses

- Single-family residential development
- Neighborhood scale commercial, institutional, and mixed-use development along Gloucester St, developed in a *Main Street* fashion with buildings fronting the streetscape and parking in the rear.
- Community facilities such as schools, parks, museums, and libraries built to a neighborhood scale.
- Multifamily residential in existing areas of multifamily development – of compatible scale to the single-family areas surrounding and in traditional regional architectural styles.

Recommended Development Patterns

- Houses located near the street with front porches that encourage interaction with neighbors.
- Infill residential development on vacant sites; these sites, with existing infrastructure in place, are to be used for development, matching the character of the surrounding neighborhood.
- Accessory housing units that provide rental opportunities for small households and income generation for homeowners to increase affordability.
- Multifamily developments that face the street, broken into a series of smaller masses that mimic single-family development and preserve the historic street block structure.
- Structures (shopping, offices, etc.) located near the street front with parking in rear of building – making the corridor more attractive and more pedestrian friendly.
- Greyfield redevelopment that converts vacant or underutilized commercial strips into mixed-use assets.

Recommended Transportation Patterns

- Facilities for bicycles including bikeways or bike lanes, frequent storage racks, etc.
- On-street parking to be used for residents' automobiles where lots do not have space for off street parking.
- Maximum size for parking lots in neighborhood commercial areas
- Parking lots that incorporate on-site stormwater mitigation or retention features such as pervious pavement

Recommended Implementation Measures

- Promote affordable infill development and accessory housing units along with housing rehabilitation programs in the area.



Typical single-family residential in Urbana/Mayhew Character Area

- Engage in a comprehensive infrastructure upgrade of all streets in a phased and systematic fashion throughout the character area, starting with major streets. Focus infrastructure improvements on drainage, curb, gutter, sidewalks, and streetlights.

Character Area: Windsor Park

Windsor Park is a 1930's-1940's subdivision developed on the site of a former City golf course. Windsor Park is distinguished from surrounding neighborhoods by its curvilinear street pattern and its circular (as opposed to rectangular) central park. Single-family homes in Windsor Park include a wide variety of architectural styles and larger lot sizes than are found in most of Brunswick's other neighborhoods. The Windsor Park Character Area also includes Howard Coffin Park at its northeast corner. This character area is bounded by Gloucester to the north, US Highway 17 to the east, and Lee Street to the west.

Vision

The Windsor Park Character Area should retain its single-family, low-density character. Howard Coffin Park is a major community amenity, with its swimming pool, gym, tennis courts, and other recreational facilities. The park should continue to respond to evolving community needs and concerns. As with other Brunswick neighborhoods, there is a crucial need to improve infrastructure, such as the addition of sidewalks, streetlights, and especially drainage infrastructure and flood control. Such projects have been included in current Master Plans for Street Improvements and Drainage/Flood Control Projects.

Appropriate Land Uses

- Single-family residential development
- Neighborhood scale commercial, institutional, and mixed-use development along Gloucester Street – developed in a *Main Street* fashion with buildings fronting the streetscape and parking to the rear.
- Community facilities such as parks, museums, and libraries built to a neighborhood scale.

Recommended Development Patterns

- New residential development that matches the mix of housing types and styles of the community
- Open space, environmental protection lands and parks

Recommended Transportation Patterns

- Facilities for bicycles including bikeways or bike lanes, frequent storage racks, etc.
- Landscaped buffers between the roadway and pedestrian walkways
- Garages located to the rear or the side of each residence.

Recommendation Implementation Measures

- Revise the zoning code for Windsor Park to ensure than new single-family development is compatible in scale, massing, and placement with traditional development patterns. The code should ensure that new residences put their ‘face’ to the street, with parking to the side or rear, and that front yards are preserved.



Figure 2.14 Windsor Park, the heart of the neighborhood

Character Area: Dixville/ Habersham Park

These historic neighborhoods date back to the period just after the close of the Civil War. Historic and newer single-family homes are mixed in this character area. The neighborhood is predominantly single-family with small parcel sizes and a wide variety of architectural styles. There are scattered commercial and industrial properties along MLK Boulevard as well as some scattered multifamily development. The area is bounded by US Highway 17 on the east, Albany Street on the west, and includes some industrial land uses on its southern end. The new Glynn Middle School is planned for just south of this area.

The Dixville neighborhood was added to the Georgia Register of Historic Places and the National Register of Historic Places in 2017. It is credited for being a largely residential neighborhood developed primarily from c. 1880-1919 as a cohesive African American community. The district is a good example of a planned residential community for Brunswick’s working-class, African American population, consisting of a variety of early house types typical for Georgia.

Vision

The Dixville/Habersham Park Character Area should retain its single-family character. The Dixville/Habersham Park Character Area will see significant infill development and revitalization, as well as improved neighborhood infrastructure. It should remain a tightly knit community with affordable single-family housing and committed longtime residents. Commercial, industrial, and multifamily areas will be redeveloped into neighborhood commercial and low-density multifamily developments that enhance the character and vitality of the neighborhood.

Appropriate Land Uses

- Single-family residential development
- Community facilities built to a neighborhood scale.
- Select multifamily redevelopment in existing areas of multifamily development – of compatible scale to the single-family areas surrounding and in traditional regional architectural styles.

Recommended Development Patterns

- Infill development on vacant sites closer to the center of the community; these sites with existing infrastructure in place are to be used for new development – matching the character of the surrounding neighborhood.
- Houses located near the street with front porches that encourage interaction with neighbors.
- Accessory housing units that provide rental opportunities for small households and income generation for homeowners to increase affordability.
- Revitalization of existing neighborhood commercial centers to capture more market activity and serve as community focal points.
- Greyfield redevelopment that converts vacant or underutilized commercial strips to mixed-use assets.

Recommended Transportation Patterns

- Garages located to the rear of each property or on-street parking to be used for residents' automobiles.
- Facilities for bicycles including bikeways or bike lanes, frequent storage racks, etc.
- Landscaped buffers between the roadway and pedestrian walkways where possible.
- Improved streetscaping for MLK Jr Blvd with the introduction of pedestrian and bicycle facilities and other streetscape amenities

Recommended Implementation Measures

- Promote affordable infill housing development along with housing rehabilitation programs in the area. Removal of vacant and abandoned structures.
- Engage in a comprehensive infrastructure upgrade of all residential streets in a phased and systematic fashion throughout the character area. Focus infrastructure improvements on drainage, curb, gutter, sidewalks, and streetlights on major streets.
- Revise the zoning code for Dixville/ Habersham to ensure that new single-family development is compatible in scale, massing, and placement with traditional development patterns. The code should ensure that new residences put their ‘face’ to the street, with parking to the side or rear and front yards preserved wherever possible.
- Conduct an accessory housing study to determine potential configurations for accessory housing units that would leave the neighborhood character intact.



Dixville Neighborhood Food Store



Home in Dixville / Habersham Park

Character Area: Old Town

Old Town is the oldest part of the City of Brunswick, planned from before the Revolutionary War. Old Town displays a regular block structure with small blocks. Some of its historic squares are still preserved as open space, while others have been disturbed by private development, institutional development, or intervening streets. The Old Town Character Area exhibits the widest mix of land uses of any part of the city, with civic and governmental structures, retail and business establishments, and a variety of historic and modern single-family homes. The downtown area has seen recent revitalization, with restored historic structures, new streetscapes, and a variety of new businesses opening on Newcastle Street. Most of Old Town is covered by the Old Town Historic District, within which new development and renovations are overseen by the City’s Historic Preservation Board. Parts of the character area, particularly the Newcastle, Gloucester, Norwich, and MLK corridors, are covered by the Downtown Development Authority and are eligible for its programs.

Vision

The Old Town Character area is the historic, civic, and cultural center of the Brunswick community. Although recent years have seen revitalization of both its commercial and residential areas, much work remains to be done. One of the highest priorities is to reconnect the City with its historic waterfront, with improved public access, commercial activities along the waterfront, a publicly accessible pedestrian riverwalk, increased public spaces and parks, and new mixed-use development along the waterfront to capitalize on this high-value property. The Blueprint Brunswick plan provides a detailed urban design strategy for fulfilling this vision for infill development in the waterfront area. In addition, remaining historic squares need to be restored to their original dimensions and filled with community-friendly amenities such as walking paths, lighting, and benches. Neighborhoods in Old Town need to see continued renovation of homes and infill on vacant lots. Glynn Academy needs to be made more pedestrian-friendly, with sidewalk improvements connecting schools with surrounding neighborhoods. Downtown should see a continued revitalization and re-purposing of buildings resulting in a wider variety of activities and entertainment for all ages, but particularly for young adults and community youth.

Appropriate Land Uses

- Community scale residential commercial, institutional, and mixed-use development along Gloucester St and Newcastle St downtown
- Multi-story mixed development or condominium development along the Newcastle St and Bay St corridors and in the waterfront area with publicly accessible boardwalks along the waterfront
- Hotels, resorts, and hospitality developments in the downtown area and along Newcastle and Bay Streets
- Tourism and cultural facilities in the downtown area and along Newcastle, Gloucester, and Bay Streets
- Protected greenspace, parks, wetlands, and wildlife habitats
- Public and private marinas and associated uses

Recommended Development Patterns

- Mixed-use or hospitality developments of human scale with retail on the ground floor to activate the waterfront.
- Commercial structures (shopping, offices, etc.) of human scale located near the street front with parking in the rear of buildings – making the community more attractive and pedestrian friendly.
- Greyfield redevelopment that converts vacant or underutilized commercial areas to mixed-use assets.
- Major institutions, such as government buildings, churches, and schools, particularly along major corridors

- Houses located near the street with front porches that encourage interaction with neighbors.
- Accessory housing units that provide rental opportunities for small households and income generation for homeowners to increase affordability.
- New residential development that matches the mix of housing types and styles in the community
- Redevelopment of existing multi-family developments into configurations that better support Brunswick’s traditional urban form and block patterns.

Recommended Transportation Patterns

- On-street parking in front of retail development on Norwich St, MLK Jr. Blvd, Gloucester St, Newcastle St, and Bay St
- Continued street grid patterns throughout the downtown area
- Facilities for bicycles, including bikeways or bike lanes, frequent storage racks, etc.
- Restrictions on the number and size of signs and billboards on MLK Blvd and Newcastle St within the Historic District and Character Area.
- Establish minimum size parking lots in neighborhood commercial areas.

Recommended Implementation Measures

- Continue Gloucester Street improvements that includes sidewalks, street trees, street furniture, bicycle lanes and travel lanes. Ensure that all modes of transportation are adequately planned for per the City’s Complete Streets policy.
- Ban any new billboards and minimize free standing signs along the Newcastle and Norwich corridors and negotiate those existing billboards be removed as a condition of development/redevelopment permitting where possible.
- Engage in parking management strategies to make the best use of available parking.
- Develop a common long-term plan for the City’s waterfront with the Georgia Ports Authority.
- Plan for a complete network of sidewalks, bicycle lanes, and bicycle paths throughout downtown and connecting to other areas of the city.
- Promote evening entertainment activities for young adults and youth in the Old Town area, such as concerts and movies.



Typical Street in Old Town

Character Area: South End Brunswick

Though the block pattern for South End Brunswick is a continuation of that of Old Town, the residences in this character area are quite different with a predominantly brick ranch style. This area was developed in the post-World War II era. The South End Brunswick area is almost all single-family except for the Glynn Iron metal scrap yard. South End Brunswick is bounded by mostly industrial uses to the east and south.

Vision

The vision for the future of South End Brunswick is a tree-covered, quiet urban neighborhood convenient to downtown and waterfront parks. Much of this vision is currently true today, except for the desired parks along Brunswick's waterfront. This is a stable, single-family neighborhood with little cut-through traffic, and these are characteristics the area would like to maintain.

Appropriate Land Uses

- Single-family residential development
- Open space, environmental protection lands, and parks

Recommended Development Patterns

- Houses located near the street with consistent massing, setbacks, and small front yards.

- New residential development that matches the mix of housing types and styles in the community
- Open space, environmental protection lands, and parks

Recommended Transportation Patterns

- Bicycle paths to connect residential areas to commercial and employment areas.
- Facilities for bicycles, including bikeways or bike lanes, frequent storage racks, etc.
- Landscaped buffers between the roadway and pedestrian walkways where possible.
- Encourage garages located to the rear or the side of each residence.

Recommended Implementation Measures

- Add street trees, street furniture, bus shelters, bicycle lanes, and if possible, a landscaped median. Ensure that all modes of transportation are adequately planned for per the City’s Complete Streets policy.



Figure 2.21 Great neighborhood streets have ample tree cover and good sidewalks



Figure 2.22 Single-family housing typical of South End Brunswick

Character Area: Industrial Waterfront

Industrial land uses adjoin the East River west of Bay Street and south of 4th Avenue. Many of these industrial uses have a lengthy history in the city dating back to when it was a hub for processing timber-related products and seafood. One of the current major industrial operations in this area is King and Prince Seafood, which is a thriving and productive operation. An occasionally active rail line runs parallel to Bay Street and provides access to most of the waterfront industries. Ground transport has access to industry via Bay Street; however, it discontinues at Prince Street forcing truck traffic into the Old Town residential area to serve the

industries to the South of Prince Street resulting in poor access for industry and disruptive traffic in the Old Town neighborhoods.

Vision

While the City of Brunswick encourages viable industrial enterprises to remain in the city along portions of its waterfront, particularly south of 1st Avenue, it would like to arrive at a long-term plan where more of the waterfront north of 1st. Avenue could become public space.

Appropriate Land Uses

- Industrial land uses
- Expanded public access where feasible.

Recommended Development Patterns

- Industrial land uses with rail, road, and waterfront access with sufficient parking areas for employees.
- In cooperation with area stakeholders, develop a long-term plan for more public access.



Industrial Waterfront and pier

Recommended Transportation Patterns

- New greenways and pedestrian/ bicycle connections from residential areas to the waterfront
- Landscaped buffers between the roadway and pedestrian walkways along Bay Street

Recommended Implementation Measures

- Using the Bay Street Corridor Plan as a foundation, re-engage multiple public agencies and stakeholders with interests in Bay Street to develop a long-term plan for improved and more attractive road access for industry and for more expansive and dynamic public spaces and access to the waterfront.

The Bay Street Corridor Plan - see Appendix M for website.

Character Area: Liberty Harbor

Liberty Harbor is a master-planned resort community located on a historically significant site at the southern tip of the city. It was planned to include single-family residences, condominiums, a shopping village, recreational amenities, and a variety of public spaces all connected within a highly walkable community. Residential development was to include single-family homes, up to 20-story condominiums, townhouses and a 200 slip Large Craft Marina and related facilities.

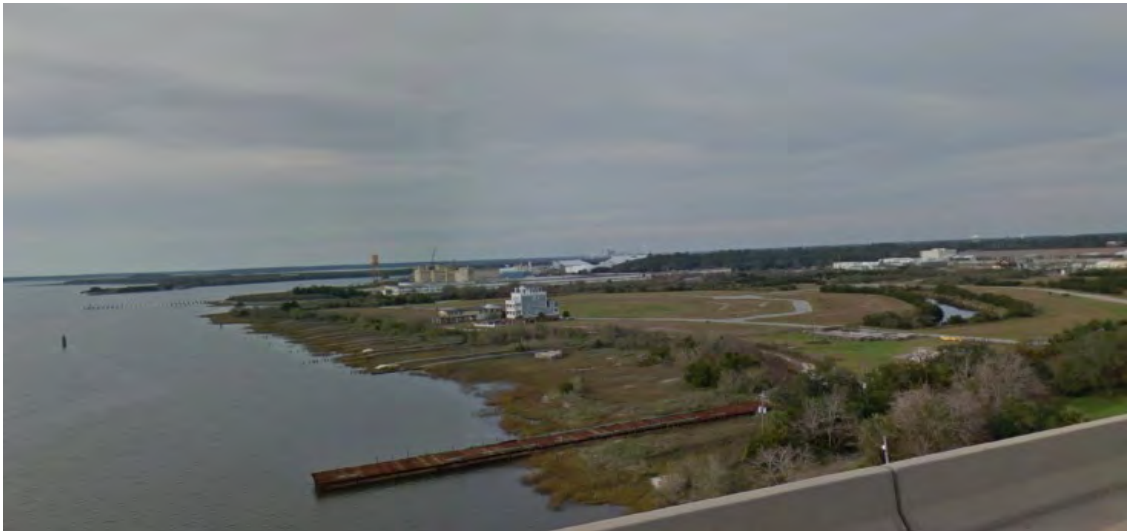
Due to the economic recession which began in 2007, development was halted in 2008 and has not resumed since. Much of the planned infrastructure was completed so the property has the potential to be developed as originally intended. However, despite extensive efforts by the project's lenders to market the sale of the planned community, there have been no successful offers.

The Future

The City should encourage and support its owners to consider alternative development plans for the property working with its professional staff and agencies concerned with economic development within the city. The experience of successful outside real estate developers could also be engaged to assist in that effort, including convening an Urban Land Institute Panel. Additionally, the city should do what it can to help recruit new interest in developing the site including possibly incentivizing the development through various public assistance programs.

Recommended Implementation Measures

- Assist the owners in arriving at an appropriate and marketable plan for the use of the property and assist in attracting a new developer.



Liberty Harbor Site

Character Area: Andrews Island

Andrews Island is in the middle of the East River across from the downtown waterfront. The island is currently used as a collection area for the dredged soils which result from harbor deepening. The Georgia Department of Transportation currently has the island under lease. Andrews Island is currently in public sector ownership, with portions owned by the City of Brunswick, the Brunswick- Glynn County Development Authority, and the Georgia Ports Authority.

Vision

Andrews Island was not much discussed during the comprehensive planning process however various suggestions in past planning efforts included creating a hub for port/ industrial development, protecting the island, and enhancing access as open space, or utilizing the island as a location for new residences. As the City is seeking to reclaim some of its waterfront from other uses, one suggestion was to reclaim certain port uses from the waterfront to Andrews Island. In any of these scenarios, the city would seek to make use of the island and not leave it as a mere receptacle of dredged soils. The city prefers appropriate land uses that take advantage of the island's location in the middle of the East River and are compatible with the City's vision for its downtown waterfront.

Appropriate Land Uses

- To be determined by future planning processes but potentially industrial, transportation, residential, lodging, and open space land uses are appropriate for Andrews Island.



Andrews Island, East River

Character Area: Marsh

The marshes and wetlands surrounding the Brunswick peninsula provide many environmental and economic functions and they are a defining characteristic of our city as well as the region. Without the marshes and wetlands, our area would not be known as the Golden Isles and would certainly be lacking in many elements that make Brunswick significant.

Vision

The marshes and wetlands should be preserved in their natural state to retain as much of their ecological, economic, and storm protection functions as possible. Public views of our marshes and wetlands should be promoted and the connection to our waterways, wetlands, and marshes can be improved without affecting these important resources negatively.

Appropriate Land Uses

Conservation Preservation Districts, as described in the City's Zoning Ordinance, were established and maintained to preserve and/ or control development within certain land, marsh, and/or water areas of the City which serve as wildlife refuges; possess great natural beauty or are of historical significance; area utilized for recreational purposes; provide needed open space for the health and general welfare of the City's inhabitants; or are subject to periodic flooding. Regulations apply within this district designed to reserve such areas and to discourage any encroachment by residential, commercial, industrial, or other uses capable of adversely affecting the undeveloped character of the district.



View of the Marsh and Tidal Creeks adjacent to US 17 and Overlook Park

Core Area Plans

Following are listed other core area plans completed by the city to guide growth and development within its core area. These plans were designed to function over an extended period and are still relevant.

Historic District Parking Plan:

A parking demand assessment for downtown Brunswick was commissioned in 2007. The intent of the study was to assess existing and forecast parking needs within the downtown core. With recently completed projects and an agenda of new development, the downtown is poised to become even more of a vibrant bustling destination for the surrounding area. The primary parking study area is centered along Newcastle Street which is Brunswick's commercial core. A narrow road reflecting the historic nature of the downtown, the low speed of traffic along Newcastle Street contributes to the walkability of the downtown as pedestrians can easily cross the street to destinations on opposite blocks.

The downtown itself is a mixture of financial, retail, office, restaurant, and some public use facilities such as the Glynn County Library and Old City Hall. The building mix is a combination of older historic buildings and new construction. At the time that the Parking Plan was written, and now, the only publicly provided parking supply within the downtown core consists of on-street parking. All off-street parking is privately owned and controlled. Most of the on-street parking is provided along Newcastle St with some along intersecting cross streets and streets or lanes that parallel Newcastle St. The lanes paralleling Newcastle St between Gloucester and Howe Streets are very narrow.

In completing the analysis, the Parking Plan used surveys of downtown business owners and employees plus actual utilization data of the downtown parking. The Parking Plan was able to accurately assess the needs and project future parking demand using anticipated growth projects provided by the city for new development projects.

Sidney Lanier Park Master Plan

A conceptual master plan was created to enhance the Sidney Lanier Park located at the south end of the city. Proposed Park features include:

- pier cover.
- park.
- new parking.
- docks.
- terraced seating.
- interpretive signs; and
- kayak launch.

This preliminary study also gave cost estimates for improving the waterfront park.

[The Sidney Lanier Park Master Plan - See Appendix J for website.](#)

Chapter 6 – Transportation

Updated Brunswick Area Transportation Plan (BATS) 2045

The Brunswick Area Transportation Study (BATS) as designated in MAP-21, is the 20-year plan that identifies the vision, goals and objectives, strategies, and projects that promote mobility within and throughout the region of which Brunswick is a part for both people and goods. This long-range plan, which is required to be updated every five years, is focused on addressing the changing conditions and transportation needs of the Metropolitan planning area to a planning horizon year of 2045.

The BATS contains recommendations for various types of surface transportation including streets and roads, transit routes, and bicycle and pedestrian facilities. It also contains descriptions and assessments of conditions or factors affecting the surface transportation of persons, and the movement of freight.

Another important requirement of the BATS is its ability to demonstrate financial feasibility, by reconciling that anticipated revenues over the designated planning period will be adequate to cover the proposed project costs. The plan is divided into horizon years, or “cost bands,” of either five or ten years. Within each of the cost bands, the project costs and anticipated revenues must be identified by year of expenditure. Cost bands are defined as calendar years, beginning January 1, and ending December 31, and must not be more than 10 years apart. For the BATS 2040 MTP, the cost bands are: 2015 – 2020; 2021 – 2030; and 2031 – 2040.

By conducting a financial analysis, and demonstrating financial feasibility, or fiscal constraint, the BATS plan meets the federal long-range planning standards, and presents a list of proposed projects that can realistically be anticipated over the life of the plan. In addition, those projects for which funding is not anticipated to be available is also captured in an unfunded project list, or Illustrative/Vision Plan.

The Current BATS Report is available for Comment on the Glynn County website and will be published soon.

Public Transportation

After receiving and reviewing a Public Transportation Plan in 2018, The City of Brunswick has received and acted on a recommended Public Transportation Plan Option. The city is currently seeking financial support from Glynn County and the private sectors that will benefit from the implementation of the plan.

The recommended plan links all areas of the city and adjacent Glynn County to Brunswick’s neighborhoods and growth areas in adjoining Glynn County to employment centers on the resort islands and areas where its population can obtain medical and other services.

[The Updated Brunswick Area Public Transportation Study and Recommended Alternatives](#)
[See Appendix K for website:](#)

Complete Streets

In addition to the Transportation Plan, the City of Brunswick is a Complete Streets Community. Adopted by the city in 2017, the Complete Streets Program is designed to reduce congestion, increase the transportation network capability, and increase consumer choice while decreasing consumer transportation costs and improving air quality and community health. The Program also strives to enhance community aesthetics, augment economic growth, and increase community stability by providing accessible and convenient connections between home, school, work, recreation, and retail destinations.

Complete Streets are Rights-of-Way that are planned, designed, constructed, operated, and maintained in such a way as to enable safe, comfortable, and convenient access by users of all ages and abilities. This includes pedestrians, bicyclists, transit riders, motorcyclists, emergency, freight, and vehicle operators.

[The City of Brunswick Complete Streets Ordinance, See Appendix L for website.](#)

Bay Street Corridor Plan

The city, with the assistance of GDOT, completed a corridor study of Bay Street between its intersection with Newcastle in Downtown Brunswick, and 4th Street to the south. One objective was to improve traffic flow at major intersections including installation of round-a- bouts at Newcastle and 4th Streets. Improved pedestrian crossings from downtown to the waterfront area were recommended and two have been stalled.

Implementation of the plan for intersection improvements is to occur in 2024 and 2035 once GDOT approval is obtained.

[Bay Street Corridor Plan- See Appendix M for website.](#)

Glynn Isles Wayfinding Plan

Navigation from place to place is a fundamental and integral part of everyday life. Wayfinding serves the purpose of informing people of the surrounding areas in the unfamiliar built environment. In a tourist-potential coastal city like Brunswick, it is imperative for visitors and locals to be able to navigate easily.

To improve wayfinding in the City and surrounding Glynn County, a field analysis was completed which included a detailed investigation of existing environmental conditions and streetscape plans. The Plan also inventoried and analyzed existing signage and traffic patterns and developed a summary report.

The analyses resulted in the design of a wayfinding sign system and associated elements that will include directional, identity, entry, and functional signage as well as the design of associated features such as logos, fonts, color schemes, and other artwork developed in support of the project.

The Wayfinding Plan continues to be implemented each year through funding in the city's annual budget.

Additionally in late 2017, One Hundred Miles, a local organization whose mission is to preserve, protect, and enhance Georgia's 100-mile coast coordinated a Safe Routes to School Walking Audit in a citywide effort to identify barriers that students encounter when walking and biking to school in Brunswick.

An analysis and subsequent recommendations are expected to provide greater walkability and bike-ability throughout the community.



**Newly installed wayfinding signs
In Downtown Brunswick.**

Trails

The Coastal Georgia Greenway is envisioned as a 155-mile trail system which will connect South Carolina to Florida through Georgia's six coastal counties. This alternative transportation network will link the towns, attractions, recreational sites, historic and cultural sites,

waterways, and natural habitats of the coast. A series of trails suitable for bicyclists, joggers, equestrians, canoeists, kayakers, and other non-motorized users will be built. Including sections within the City on US 17. The city has planned to complete its segments soon.

To be included in the Planning Department's work program is the completion of a study and plan for an urban multi-modal pathway system linking neighborhoods, schools, parks and retail services for families and individuals living in the core area of the city. This is in response to calls for safe and accessible means for walking, cycling, or jogging in the core area.

[Coastal Georgia Greenway Plan - See Appendix N for website:](#)

Chapter 7 – Housing

The city's Department of Planning, Development and Codes was recently tasked with completing and analysis of housing conditions within its neighborhoods as well as the obstacles for the development of affordable housing. Based on the analysis of data collected an Affordable Housing Plan was completed as an element for tis updated Comprehensive Plan. The completed plan is attached as Appendix 4.

The Executive Summary of the Housing Study and Affordable Housing Plan follows:

The issue of affordable housing has never been as prominent as it now is across our Nation, partially due the COVID 19 Pandemic which impacted materials cost and labor supply as well as timing and cost issues relating to transportation. The result has been the cost of housing increasing in most areas of the country by 40 – 50%. Since the pandemic abated a year ago, that increase has dropped but home construction costs remain higher by as much as 25% in most areas and rent increases of about the same percentage.

From the socio-economic and housing data gathered and analyzed for this report, one can easily see that there are real challenges for families living in the City of Brunswick to find affordable housing opportunities. Yet there are also opportunities for the city to address those needs by providing leadership and public investment in programs that will facilitate the development of affordable housing while revitalizing the community's neighborhood and core city areas. The physical and historic character of the city will benefit from both.

Much of City's population of around 15,000 does not have the financial capacity to either rent or purchase adequate and standard condition housing in today's market. The gap between available income capacity and housing costs is as much as \$10,000 per year for many of the city's Median Family Income family and non-family households. Following

are some of the challenges Brunswick's families have in seeking adequate affordable housing:

- As many as 1500 or 45% of the city's family households are currently "housing cost burdened" (spending more than 30% of family income for total housing expense) as well as 1100 non-family households including single elderly persons living alone.
- 64% of all occupied dwelling units are rented and 60% of those units are single family or duplex homes, a high percentage of which require substantial rehabilitation. Few affordable apartment dwellings are available in the city.
- 9% of all single family and duplex housing structures are rated in poor condition requiring substantial rehabilitation or demolition (unfit for human habitation); 40 % are rated in only fair condition indicating a need for modest to major rehabilitation. Another 43 % are rated in only average condition, requiring modest rehabilitation. Only 8% of all single family and duplex housing is in good or excellent condition.
- As many as 2,000 families and individuals are currently living in inadequate, costly, and substandard housing.
- Current sales and rental data indicate that some families and individuals are forced to leave the city because of inadequate housing opportunities. Many are relocating into developing Glynn County or even nearby Brantley or McIntosh Counties.

Most new housing since 1970 has been built outside the city with most of it being multi-family or townhome rental communities. Within the city, only 8 new single family housing units have been added over the past 10 years. In addition, consider the following current market conditions in the City:

- Currently, there are an average of only 35 - 40 homes on the market for sale inside the city with an average list price of \$172,450. These homes normally remain on the market for less than 60 days.
- There are no rental apartments available within the city and those now being developed in the county have rents starting at \$1,250 for a one-bedroom unit and \$1,450 for a two-bedroom unit. Many families and individuals renting these units must devote as much as 40% – 50% of family income for housing expense. 30% - 35% is considered normal.
- New single family "starter homes" are located outside the city now priced at \$175,000 compared to under \$150,000 a few years ago and are beyond the reach of most families.
- Federally subsidized rental housing in the city, including public housing,

Section 8 voucher certificates and other tax incentivized affordable housing have waiting lists of well over 1,000 families and individuals.

From this data, it is easily seen that the City of Brunswick, like many communities facing affordable housing needs, has real challenges to overcome. Yet, there are opportunities for the city to not only begin to address and meet those challenges, but by doing so, begin the transformation of many of its declining neighborhoods through innovative housing programs. Consider these opportunities:

- There is a large supply of older 2- and 3-bedroom homes, in poor condition, which can be rehabilitated and offer opportunities for affordable housing for many families.
- There are numerous incentive programs for development of affordable rental housing using Federal tax incentive programs. Two such projects have been completed in Brunswick during the past 5 years.
- Through aggressive pursuit of tax foreclosed properties using the recently created Land Bank Authority, sites can be made available for both new homeowner single- family, townhome, or duplex housing or for the development of small rental complexes of 8 or more units.
- Expand the use of Federal programs like CDBG, CHIP, and the HOME Program to name a few to help with home repair and rehabilitation as well as the construction of new housing.

By implementing these and other measures, the City of Brunswick can assure that the on-going efforts to revitalize its downtown, historic core area, and its neighborhoods will continue and flourish. From Stakeholders and community input offered throughout the development of the plan, there is probably no higher priority than the implementation of an Affordable Housing Plan.

The city has allocated \$2.5 Million in its FY2024 Budget for the implementation of the Affordable Housing Plan. Because the entire community has a stake in the revitalization of housing and neighborhoods, the city should also look to create partnerships with the non-profit and business community to help sustain and finance the program long-term along with public funding including a future SPLOST allocation.



Homes requiring major rehabilitation.





Homes being rehabilitated in the same area.



[Brunswick's Affordable Housing Plan dated May 25, 2023, can be found in Appendix D.](#) \

Chapter 8 – Resiliency, Stormwater, Flood Control and Hazard Mitigation

Resiliency

Brunswick is a low lying urban coastal community area that is impacted by rainfall, tide changes and storms, including tropical storms and hurricanes. In recent years, the effects of climate change and rising sea levels have compounded the challenges the city faces to plan and implement actions that will mitigate the danger to its citizens and damage to their property.

Over the past five years, the city has taken steps to execute plans that will begin to mitigate these impacts through the formation of a stormwater utility and management program, planning improvements that will provide long term mitigation after completion and continuing to manage and expand its resiliency programs for the long term.

Two recently completed studies; South Atlantic Coastal Study – Glynn County Focus Area (Corps of Engineers 2022) and the Shoreline Assessment and Implementation Resiliency Plan (Glynn County 2022) along with earlier studies help provide guidance to the city in its stormwater and flood control facilities planning and design. Factors such as climate change, projections of sea level rise are consistently monitored and included in project development and design. A useful tool has been developed by National Explorer that has measured tree cover in cities and counties. This tool can be useful in guiding development in various Character Areas that have low scores in tree canopy coverage to help manage carbon sequestration and storm damage.

At the present time Glynn County is in the process of updating the multi-jurisdictional Hazard Mitigation Plan which, when completed will also provide the city with guidance and project development.

Stormwater Management and Flood Control Program

The city presently owns and operates its stormwater management systems and facilities which have been developed over many years. The future usefulness and operational function of the systems and the additions and improvements thereto, rest with the city. To do so, the city must have both a stormwater management program as well as an adequate and stable funding strategy for its stormwater management program operation and drainage-related capital improvement needs.

In 2018, a Stormwater Utility was established which is responsible for stormwater management services throughout the City, and provides for the management, protection, control, regulation, use, and enhancement of the City's stormwater management systems and facilities and stormwater management program services. It will also interface with and consider the Regional Water Plan and all Environmental Planning Criteria established for Coastal Georgia as it implements its work plan.

Soon after creation of the Stormwater Utility, the city prepared and adopted a Stormwater and Flood Control Master Plan to guide the design and construction of projects over a 5 – year period. Funding for implementation of the projects comes from passage of a SPLOST measure passed in 2022. Four highest priority projects are currently underway. Future projects and plan implementation will also be dependent on the passage and availability of SPLOST funds.

As projects are completed, the Master Plan will be updated to provide plans and priorities for the next five years beginning in 2025. In preparing the new Master Plan, the City will be mindful of recommendations to be contained in the 2023 update of the joint Hazard Mitigation Plan (HMP) currently being prepared by Glynn County and including all municipalities and participating entities within the County. Likewise, the city will be mindful of new data relating to climate change and sea level rise that will be included in the HMP 2023 – 2028 as well as guidance by FEMA and other State and Federal Agencies.

The city is currently seeking permits from the Ga. Dept of Natural Resources to improve stormwater discharge into the marsh which borders the Eastern City Limits at seven locations. These discharge improvements will also have flood control devices installed at the discharge point that can prevent rising tides and storm surges from backflowing into the city's stormwater system.

Improvements are also being planned in the Western portion of the city at discharge points in the adjacent rivers and their tributaries.

[Storm Water and Flood Prevention Master Plan can be found in Appendix O](#)

Hazard Mitigation Plan

The City of Brunswick participated in the preparation of the 2018 (2015) Glynn County Hazard Mitigation Plan. Many of the recommendations and Work Plan items contained in the plan for the city were implemented by the creation of the Stormwater Utility and the preparation and adoption of the 5–year Stormwater and Flood Control Master Plan.

The City has begun an acquisition program of properties subject to frequent and recurring flooding. One such property was just recently acquired, and the city has identified other properties which have experienced frequent flooding for similar action. The city has access to a listing of properties that have had repetitive property damage and losses due to flooding. These properties have and will continue to be mapped by GIS and data maintained for other possible property acquisition and/ or areas determined to be too hazardous for development.

Additionally, the City has created a website of information on areas subject to frequent flooding and its building department has started maintaining a file of Certified Flood elevations of property for which they issue permits. These are recorded and mapped by GIS.

The Glynn County Hazard Mitigation Plan update for 2023-2028 is currently underway and is expected to be completed in early Fall. The city will implement the actions contained in the plan indicated a being need to add to the city's resiliency.

[Shoreline Assessment and Implementation Resiliency Plan – See Appendix P for website.](#)
[Corps of Engineers South Atlantic Coastal Study, Glynn County Focus Area – See Appendix Q for website.](#)

[Tree Equity Score Tool by National Explorer – See Appendix R for website.](#)

Chapter 9 – Parks and Recreation (including passive greenspaces)

In 2018, by mutual agreement the city turned over the programming operation, maintenance and improvements of its parks and recreation facilities to Glynn County. In 2022, the city decided to re-take control of its parks and provide the needed programming, operation, maintenance, and capital improvements. Just recently, the city hired a Director of Parks and Recreation to head the Department of Parks and Recreation and by Spring of 2024 will be in complete control of all city parks. The initial focus of the Department is to assume the responsibilities for programming, operations, and maintenance at its parks.

A long-range plan for facilities improvements and expansion will be undertaken beginning in 2024. This study should also address the desire for added neighborhood and core area access by pedestrian and bicycle trails and paths. A useful tool for determining the accessibility of existing parks to neighborhood families has been developed by The Trust for Public Land. This tool will be useful in planning any additional park facilities needed to provide reasonable access neighborhood families in the city. Additionally, the plan should look at the potential for creating preserved greenspace within the community particularly spaces of historic significance like the Altama Canal.

This study and plan will be included in the Community Work Program.

[Signature Squares Program](#)

The core area of Brunswick was initially laid out in a gride pattern with a bounty (15) of public squares to create passive greenspaces throughout the city. Initially through private efforts beginning in the 2000s, a program to restore the parks began and has resulted in 5 squares having been completed with an additional 3 ready to begin with construction plans completed. The program is now a partnership between the city and the Signature Squares Program and efforts continue to complete the restoration of all the historic signature squares as funding is made available.

[Access for TPL Park Location Tool - See Appendix S.](#)

[Access for the Signature Squares Program website – See Appendix T](#)

Chapter 10 – Urban Redevelopment Plans -

The Brunswick Urban Redevelopment Plan adopted by the city in 2018 outlines the best practices that will help Brunswick redevelop those areas of the community that have suffered from blight or are otherwise threatened. It underscores Brunswick’s commitment to protect and preserve those things which have always made Brunswick a unique place; to fulfill responsibilities to the environment; to create upward mobility for citizens and enhance their quality of life; to encourage investment; and to realistically plan for inevitable growth.

Components of the Plan include:

- Boundaries of the redevelopment area
- Evidence that the area overall has not been subject to growth and development through private enterprise and would not be anticipated to be developed soon without approval of the plan.
- Explanation of proposed uses for urban redevelopment purposes and proposed method of financing any construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration, or remodeling of property for such uses and estimated cost thereof
- Description of proposed construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration or remodeling of any public works, public housing, or other public facilities, estimates of cost thereof, and explanation of proposed method of financing same
- Description of proposed construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration, or remodeling of privately owned property, estimates of cost thereof, and explanation of proposed method of financing same
- Description of contracts, agreements and other instruments creating obligations of more than one year which are proposed to be entered into by the City of Brunswick to implement the plan.
- Description of type of relocation payments proposed to be authorized by the plan and estimates of cost thereof.
- Statement of conformity of plan to master plan, zoning ordinances and building codes of the City of Brunswick and exceptions thereto.
- Summary of estimated expenditures from public and private financing sources for each of the first ten years following implementation of this plan
- Historic Property within the redevelopment area that will be sought to be preserved.

Within the structure of city government is the city’s Urban Redevelopment Agency (URA) whose board is appointed by the City Commission. The URA has been tasked by the City Commission to specifically concentrate on the following two redevelopment initiatives that have been on the agenda for many years.

Redevelopment of the Oglethorpe Hotel Block. This property acquired more than 20 years ago was to have become the site of a long-anticipated convention center and hotel. As the result of

expanded similar facilities on the nearby islands, the project lacked economic feasibility and was officially abandoned two years ago.

Numerous proposals for the development of the property were received from developers by the city, however none proved to be viable. The URA has been tasked with determining the appropriate and marketable use(s) for the property and the needed public financial support (if any) for such a development(s) to be successfully completed and become an economic benefit to the city and its downtown core area.

The URA is in the initial stages of selecting professional marketing and development assistance to guide it and prospective developers in successfully developing and marketing the site.

The City of Brunswick Urban Redevelopment Plan - See Appendix I.



The recently completed repurposed Kress Hotel in Downtown Brunswick



The Historic Signature Squares are a Key Part of Downtown Brunswick's Revival

Chapter 11 – Preparation of Future Plans for Specific Short- and Long-Range Projects:

Currently, the Department of Planning, Development and Codes have the following items on their agenda to complete in the coming months and years. These studies and plans cross Character Areas and other initiatives contained in this Comprehensive Plan update,:

1. **Final update of the Zoning Ordinance:** The second phase of the city’s zoning ordinance update and revisions was just recently completed. A complete review of the Official Zoning Map needs to be undertaken to correct property zoning throughout the city that is no longer appropriate. Additionally, a review the city’s Subdivision Code will be undertaken as well as an update of the city’s Property Maintenance Code.
2. **Annexation Study:** There are areas adjacent to the existing City Limits that need to be examined and, working with Glynn County, develop a mutually acceptable annexation of Glynn County property into the city. This is particularly true in the vicinity of the Coastal College of Georgia and the SE Georgia Medical Complex and areas along US 17 south of the GA 25 Spur. This study is particularly important for the successful development of property in the Altama Ave Corridor in uses which can serve the school and hospital facilities and their employees and students in the area.
3. Both the **Coastal College and SEGHS** are in the process of developing **Master Plans** to guide their future development. The city has been invited to review and discuss the implications of their future development of public infrastructure and development needs in the vicinity of the institutions to support their growth.
4. As the city begins to implement the housing and neighborhood revitalization plan within various Character Areas within the city, the Department may need to develop individual **Neighborhood Redevelopment Area Strategy (RAS) Plans** to guide the re-development of areas with dilapidated structures for new housing or other appropriate uses. Neighborhood Planning Assemblies will participate in the preparation of any RAS Plans
5. **A Master Plan for Development of an Urban Trail System** in the City’s core area neighborhoods and downtown for walking, cycling or skating pedestrians, integrating trails into a linear park connecting neighborhoods, schools, and commercial centers. Incorporating greenway corridors as a part of this plan will also be included. Throughout the process, area Neighborhood Planning Assemblies (NPAs) will be consulted and will participate in the planning of these facilities.

This plan will likely be incorporated in the aforementioned Parks and Recreation Master Plan also to be undertaken with the Parks and Recreation Department and NPAs.

Chapter 12 – Report on Status of Work Program for 2018 - 2023

A report of the status of the 2018 Five Year Work Plan is highlighted on the following Charts (1). Those highlighted in GREEN have been completed; those highlighted in Yellow are partially completed; and those highlighted RED have been deferred to the Work Program for 2023 – 2028 in Chapter 13.

Many of the accomplishments of the 2018 Work Program would not have been possible without the passage of a Special Local Option Sales Tax (SPLOST) by the citizens of Brunswick and Glynn County in 2022. Projects funded by the SPLOST measure were guided by the 2018 Comprehensive Plan and are listed below:

2022 Special Local Option Sales Tax Funding Approved for City Projects

1. Storm Drainage and Flood Control based on a Master Plan adopted in 2021 - \$11.5 M
2. Street Resurfacing – Citywide based on a priority needs plan - \$8.0 M
3. Sidewalk Improvements – Citywide including neighborhoods - \$1.1 M
4. Trails and Boardwalks (incl East Coast Greenway connection) - \$3.5 M
5. Public Safety Equipment Upgrades - \$1.65 M
6. Public Works Equipment and Infrastructure Upgrades - \$.90M
7. Parks and Recreation including Phase II of Mary Ross Park (\$4.5 M), building renovations at Lawrence Youth Center and Coffin Center (\$2.7M), Historic Squares, Cemetery Restoration and Other Park Improvements (\$1.1M) TOTAL 8.85M
8. Public Buildings, technology improvements for city operations - \$.550M

Total Potential Available for Projects - \$37.4 Million

Chart No. 1

Progress Report for the 2018 - 2023 Work Program

Completed

Underway

Postponed

Not Accomplished/Cancelled

ID	Project	Start	End	Responsible Entity	Estimated	Funding Sources	NOTES
		Date	Date		Cost		
Economic Development Projects							
1	Develop a strategy for the remediation and redevelopment of brownfield sites assessed from 2008-2013.	2018	2020	Brownsfield Task Force/ Comm. Dev./ Fanning	\$30-100K	EPA, CDBG	Not Accomplished - Unsuccessful with Brownfield Grant Application in 2018/2020
2	Implement selected projects from the Blueprint Brunswick Master Plan to revitalize and redevelop key catalyst sites throughout the City.	2018	2023	Comm. Dev./ Planning/ DDA/ URA	\$100K	Various	Perry School Completed.
3	Promote minority-owned business enterprises through a study of MBE capacity and by initiating business mentoring programs and business incubators.	2018	2019	SBDC/ DDA/ Comm. Dev.	Staff	City	Implemented Financial Navigator Program
4	Aggressively expand downtown development to the Norwich corridor, through tools such as the CNU Legacy Project, marketing studies, increased parks and public facilities, a unifying streetscape design, and promoting housing redevelopment and infill in adjacent neighborhoods.	2018	2023	DDA/ Comm. Dev./ Planning/ URA	\$100K	City	Business Grant program implemented, Housing Study Developed.
5	Recruit a neighborhood grocery to the downtown area.	2018		DDA/ Comm. Dev.	Staff	City	Schroeder Market opened 1/23
6	Leverage opportunity zone to promote economic and community development.	2018	2023	Planning/ Comm. Dev./ County/ DDA/ Chamber	Staff	City	4 projects approved
7	Leverage TAD zone to promote economic and community development as outlined in 2017 TAD plan.	2018	2023	City/Econ. Development/Planning/ URA/DDA/EDA	Staff	City	TAD# 1 re-adopted 2021 to establish assessment baseline. \$800,000
8	Utilize URA to complete the redevelopment of the Perry School Site	2018	2021	URA/Planning/Comm. Development/EDA	Staff	City	Project Completed

Chart No. 1

9	Utilize URA to complete the redevelopment of the Oglethorpe Block for Conference Center and Hotel use	2018	2020	URA/Planning/Comm. Development/EDA	Staff	City	Conference Center project deemed infeasible and abandoned by vote of public. Cancelled.
10	Utilize URA to assist with redevelopment of Glynn Avenue if appropriate.	2018	2023	URA/Planning/Comm. Development/EDA	Staff	City	No redevelopment projects to date. Not accomplished

ID	Project	Date	Date	Responsible Entity	Cost	Funding Sources	NOTES
Cultural & Environmental Projects							
8	Support and assist the African American Historical Commission through development of tourism infrastructure recommended in GDED Tourism Study	2018	2022	City/ County	Staff	private	Refer to GDED Glynn County Tourism Study (Appendix G)
9	Work with Tree Board to continue to develop a tree ordinance for the protection of specimen trees.	2018	2019	Planning/ Comm. Dev./ Park & Tree Board	Staff	City	Public Tree Ord. Completed. Private tree ord. being developed
11	Develop a comprehensive inventory of cultural, archaeological and historic properties and resources, as well as important cultural and historical viewsheds, expanding upon the City's existing historic resource inventory.	2018	2020	Comm. Dev./ DDA/ Historic Board/ Planning/ CRC/ Historic Brunswick Foundation	\$30-100K	City	Postponed. No resources available. Move to 2023 WP
12	Pursue the recognition of New Town as a national historic district.	2018	2020	DDA/ Historic Board/ Planning/ City Manager	<\$30K	DDA	Postponed. No resources available. Move to 2023 WP

ID	Project	Date	Date	Responsible Entity	Est Cost	Funding Sources	NOTES
Housing Projects							
14	Foster partnerships with for-profit and non-profit developers to develop new, affordable infill housing.	2018	2029	Comm. Dev./Housing Non-Profits/Land Bank	\$30-100K	HUD, DCA, BPHA	Plan Completed. Included in 2023 completed Affordable Housing Plan.
15	Promote development of affordable single family housing in strategic neighborhood revitalization areas by expanding financial assistance to homebuyers and providing incentives to for-profit and non-profit developers.	2018	2020	Comm. Dev./ Planning/Land Bank	Using existing City Comm. Dev. funding sources	City, BPHA, HUD	Plan Completed. Included in 2023 completed Affordable Housing Plan.

Chart No. 1

16	Design and implement a Community Housing Assistance Plan.	2018	2021	Comm. Dev. /Planning/CHRAB/BPHA	Staff	City, BPHA	Plan completed. Included in 2023 completed Affordable Housing Plan.
17	Develop a long range plan for addressing the needs of low- income elderly and handicapped persons.	2018	2020	Coast Georgia Area Agency on Aging/Comm. Dev.	\$30-100K	City, BPHA	Plan completed. Included in 2023 completed Affordable Housing Plan.
18	Develop an implementation strategy for elevating rental housing standards throughout the City.	2018	2021	City Commission/ Comm. Dev. / Housing Non-Profits	Staff	City	Plan completed. Included in 2023 completed Affordable Housing Plan.
19	Develop a Senior Citizens Independent Living Housing Plan.	2018	2021	Comm. Dev. / Housing Non-Profits	Staff	HUD/ Donations	Plan completed. Included in 2023 completed Affordable Housing Plan.
20	Utilize County-City Land Bank to clear title and sell tax delinquent and other neglected properties.	2018	2023	Land Bank/Comm. Dev./ Housing Non-Profits	Staff, coordination, legal costs	County, City, BPHA	Land Bank Board appointed and activity initiated for 3 properties
21	Develop a community-wide strategy for addressing chronic homelessness, with improvements to emergency housing and other related services.	2018	2020	Comm. Dev. / Housing Non-Profits/ Faith-Based Providers/ BPHA	\$30-100K	DCA	Public, non-profit and private initiatives underway to provide housing. 2 - tiny home projects started
22	Develop new senior housing project in a transit accessible location, preferably close to other community resources	2018	2022	Comm. Dev. / BPHA / Non-Profits/ DDA/URA	\$100K+	HUD, DCA, LIHTC	Transit plan recommendations in the process of gaining necessary government approvals and funding.
23							

ID	Project	Date	Date	Responsible Entity	Cost	Funding Sources	NOTES
Infrastructure & Parks Projects							
24	Maintain accreditation as a class-2 ISO Fire Department.	2018		Fire	Staff	City	Class 1 achieved 11/22
25	Pursue Level-3 rescue response status as a Georgia search and rescue team.	2018	2021	Fire	Staff	City	Completed
26	Develop design standards for public access along Brunswick's riverfront, including access to the riverfront from public streets.	2018	2022	Comm. Dev. /Planning / DDA	Staff	City	Postponed. No resources available. Move to 2023 WP
27	Increase the availability of downtown parking and engage in parking management strategies to make efficient use of existing parking.	2018	2021	City Commission /DDA /Comm. Dev. /Police	\$600,000	General Funds, Parking Tickets and Revenues	Refer to Downtown Parking Study (Appendix N)

Chart No. 1

28	Implement Sidney Lanier Park phase II.	2018	2020	City Commission/ Engineering	\$1.6 Million	Grant/ General Funds/SPLOST	Completed improvements
29	Develop and maintain a city-wide Drainage Master Plan	2018	2021	City Engineer/ Public Works/ Planning	\$30-100K	Stormwater Utility, MOST	Completed master plan and started implementation with SPLOST Funding.
30	Establish a stormwater utility to fund drainage improvements, starting with a study addressing a drainage needs assessment, the utility's organizational structure, and fee calculation and assessment.	2018	2019	City Manager/ Finance/ Engineer/ Public Works/ Planning	\$100K+	City	Completed
31	Annually update Capital Improvement Program to plan for future capital expenditures and update annually.	2018		City Manager/ Public Works/ Finance	Staff	City	Completed
32	Improve neighborhood infrastructure - drainage, sidewalks, lighting, curb, gutter, etc - as programmed in the Capital Improvement Program.	2018	2023	Comm. Dev./ Engineering/ BPHA/ JWSC/ Non-Profits	\$30-100K	Stormwater Utility/ MOST/ SPLOST/ One Georgia Equity Fund/ CDBG	Repaving and sidewalk improvements underway and continuing.
33	Develop a Comprehensive Parks Plan to manage the City's green spaces and recreational needs.	2018	2021	Planning/ Parks	\$30-100K	City	City has taken over Parks and recreation. A plan will be completed in 2024.
34	Conduct a feasibility study with regard to increasing funding for the City's infrastructure needs with MOST.	2018	2020	City Manager/ Finance/ Engineer/ Public Works	\$100K+	City	Cancelled. MOST not feasible.
35	Implement improvements to Mary Ross Waterfront Park as waterfront catalyst project as outlined in Mary Ross Park Master Plan.	2013	2020	Planning/ Engineer/ Public Works/URA/DDA	\$100K+	City	Phase II contract was awarded and work has commenced.
	Prepare an action plan for the promotion of the deployment of broadband services into underserved areas within the jurisdiction	2019	2021	City Manager/ Planning/ Engineering/ Public Works/ Economic Development		City	2 new service providers have entered the market and lines are under construction

ID	Project	Start	End	Responsible Entity	Estimated	Funding Sources	NOTES
		Date	Date		Cost		
Community Involvement & Planning Projects							
36	Encourage and support the establishment of neighborhood organizations and foster active participation in civic issues.	2018		Comm. Dev./ Neigh. Organizations/ Churches/ Schools	Staff	City	Most NPA's are functioning with the support of the city's Dept of Neighborhood Services.
37	Improve FEMA's Community Rating System's class rating to mitigate flooding risks, increase preparedness for storm flooding events & reduce insurance premiums.	2018		Emerg. Manag./ Engineering/ Public Works/ Planning	\$100K	Stormwater Utility	Improved CRS Score to 5

Chart No. 1

38	Construct approved City gateway features, wayfinding signs, and/ or public art projects at the north and south entrances of US 17 into the City, at the entrance of US 341 into the City, at Gloucester and US 17, at the end of the Torras Causeway, and in other potential locations.	2013	2020	DDA/ Comm. Dev./ Planning/ Golden Isles Arts/ BGIVB	\$100K+	TEA/ General Funds	Installation of wayfinding signage has begun and remains a city priority.
39	Designate the boundaries of a medical district within the Parkwood/Medical Character Area through a neighborhood charrette.	2018	0	Planning/ Comm. Dev./ Hospital/ CCG	Staff	City	Revisions to zoning ordinance and map completed and app'd by CC July 2023
40	Conduct neighborhood-specific charrettes on affordable housing, infill housing design, and needed infrastructure improvements throughout the City. (Potential connection to form-based codes).	2018	2018	Comm. Dev./ Engineering/ Public Works/ BPHA/ JWCS/ Non-Profits/ Planning	\$30-100K	City	Part of recommendation in recently approved Affordable Housing Plan. Appendix D
41	Designate future land use for the Brunswick waterfront as mixed-use development, and include a requirement for providing public space lining the riverfront.	2013		Planning/ Comm. Dev.	Staff	City	Postponed. No resources available. Move to 2023 WP
42	Rework the zoning code to more flexibly permit accessory dwelling units (Potential connection to formbased codes)	2013		Planning/ City Commission	Staff	City	Completed. Revised zoning ordinance approved by CC in July 2023
43	Investigate standards for large-scale developments to require a public charrette process as part of adequate neighborhood review.	2018		Planning/Planning and Appeals Commission	Staff	City	Planned Development section of ZO revised to accommodate objective.

Start ID	End ID	Project	Estimated Date	Date	Responsible Entity	Cost	Funding Sources	NOTES	
Community Involvement & Planning Projects (2nd Page)									
44		Regulate the design standards for automobile dealerships and other outdoor storage land uses. Limit such uses to the Highway Commercial zoning district (Potential connections to form-based codes).	2018	2017	Planning		Staff	City	Included in revise zoning ordinance adopted by CC in July 2023
45		Annexation Plan - Pursue annexation in order to make a more contiguous and 'common-sense' boundary for the City.	2013		City Manager/ City Attorney/ Planning/ City Commission		Staff	City	Postponed. No resources available. Move to 2023 WP

Chart No. 1

46	Rework the zoning code to promote new development that is compatible with the City's historic development patterns. Consider the use of a form-based code instead of traditional land use zoning. Revise lot standards in the zoning code so they fit the most common existing lot sizes in the City.	2013	2023	Planning/ City Commission/ CRC/ Historic Board	\$30-100K	City	New Mixed Use, core Commercial and Historic District Zone created in revised ZO adopted by the CC July 2023.
47	Develop permanent design guidelines for Glynn Avenue gateway.	2013	2019	Planning/ CVB/ County	\$30-100K	City	Completed
48	Develop policies for permitting Bed and Breakfasts in residential areas.	2013	2019	Planning/ Legal/ Historic Board	Staff	City	Included in Rev ZO
49	Revise the zoning ordinance to increase flexibility with respect to neighborhood commercial development (Potential connection with form-based codes)	2013	2023	Planning/ Legal/ City Commission	Staff	City	Included in Revised ZO

ID	Project	Start Date	End Date	Responsible Entity	Estimated Cost	Funding Sources	NOTES
Transportation Projects							
50	Update the Long Range Transportation Plan, and reevaluate the boundaries and projections for future Traffic Analysis Zones (TAZs).	2018		BATS/ Planning/ DDA/ Public Works	\$45,000	GDOT/ County/ City	New BATS Plan issued 2022.
51	In cooperation with Glynn County, establish regular transit service per the Glynn County Urban Transit Implementation Plan, connecting residents to employment, shopping, and health care destinations.	2018		BATS/ County	\$230,000 annually	County/ City/ GDOT/ FTA	Transit Plan Complete and Recommended Plan currently in approval and funding stage.
52	Develop a City-wide Street Schematic Design Plan with designations, functional descriptions, and schematic designs for all streets in the City. Ensure that designs for streets include all modes of transportation. Develop specific cross-sections for US 17, US 341, Bay Street, Altama, and MLK Blvd.	2018		Planning/ Engineering/ Public Works	\$35,000	City	Complete Streets Ord. Adopted
53	Develop a City-wide Bicycle and Pedestrian Master Plan with facilities standards for all street types and a phasing strategy for extending pedestrian and bicycle access to the entire City. Place a particular emphasis on access to public schools from residential areas, i.e. "safe routes to school."	2018	2020	Comm. Dev./ City Manager/ Public Works/ CRC/ Schools/ GDOT	\$45,000	Safe Routes to School, GDOT	MLK Bike Corridor Study Completed. Other areas to be planned in conjunction with Neighborhood Revitalization.
54	US 17 Streetscape - Design and construct new streetscapes, on easements or in the public ROW, including new sidewalks, street trees, lights, benches, and a possible median.	2018		Planning/ Engineering/ GDOT	\$8 million	GDOT/ General Funds	To be negotiated with GDOT in 2023 -2028 Plan period.

Chart No. 1

55	Bay Street Streetscape - Design and construct new streetscapes in the public right-of-way, including new sidewalks, on-street parking, street trees, lights, benches, and a possible median.	2018		Planning/ DDA/ Engineering/ GDOT	\$4 million	GDOT/ General Funds	Corridor Study Completed
56	Gloucester Streetscape - Design and construct new streetscapes in the public right-of-way, including new sidewalks, on-street parking, street trees, lights, benches, and a possible median.	2018		Planning/ DDA/ Engineering/ GDOT	\$4 million	GDOT/ General Funds	Refer to RSVP Plan (Appendix L)
57	Continue to maintain and improve Historic Sidewalks and Streetscape materials in Old Town Historic District as outlined in 1999 study and 2015 update.	2018		Planning/ DDA/ Engineering/Public Works	\$100k+	SPLOST/ General Funds	Public Works Continues to implement

Start End

ID	Project	Date	Date	Responsible Entity			NOTES
Supplemental Plans - Plans that inform the Comprehensive Plan and provide guidance and detail for work tasks and responsibilities for City Staff and Boards							
58	2017 Downtown RSVP			DDA			Appendix L
59	2023 Brunswick Area Transportation Study			BATS/ County			Appendix P
60	2018 Urban Redevelopment Plan Update			URA			Appendix M
61	2018 TAD Plan			Comm. Dev./ City Manager/ Planning/DDA/URA			Appendix H
62	Complete Streets Ordinance			Planning/ Engineering/ GDOT/ Public Works			Appendix D
63	Altama Community Transformation District Plan (2018 Update)			Planning/ DDA/ Engineering/ Economic Development			Appendix J
64	Historic Norwich Corridor Development Plan			DDA/Planning/Economic Dev.			Appendix K
65	CNU Legacy Project: Norwich Corridor Plan			DDA/Planning/Economic Dev.			Appendix K
66	Mary Ross Waterfront Park Master Plan			URA/DDA/Planning/Public Works/Engineering			Appendix I

Chart No. 1

67	Sidney Lanier Park Master Plan			Engineering/Public Works/Planning			Appendix O
68	Historic Sidewalk Master Plan and Priority List 2015			Planning/ Engineering/ GDOT/ Public Works/HPB			Appendix Q
69	Glynn County Tourism Resource Team Report 2017 - African- American Tourism			Planning/ DDA/ Economic Development/HPB			Appendix G

Chapter 13 – 2023 – 2028 Work Program

This element of the Comprehensive Plan lays out the specific activities the City of Brunswick plans to undertake during the next five years to address the priority Needs and Opportunities as well as taking steps toward the Community Goals. The Work Program that follows also includes items from the previous 5 – year Work Program that were deferred (highlighted) in YELLOW).

As can easily be seen in a review of the Work Program, there is much to be achieved over the next five years if community goals and objectives are to be met. The city should strive to broaden and expand its efforts and resources by engaging the community, particularly its NPAs, wherever possible to assist it in achieving this work program.

Partnerships between cities and their citizens and neighborhood organizations, non-profit and civic institutions as well as the business community will bring expanded experience, efforts, and resources to help solve major problems like affordable housing and neighborhood revitalization, without question one of the city’s most pressing need. City leadership should attempt to tap those resources as it begins to implement this Work Plan.

The Work Program reflects the city’s ambitious and focused priorities as stated in the introduction to this Comprehensive Plan Update, namely: Affordable Housing and Neighborhood Revitalization; Stormwater Infrastructure and Flood Control Improvements including resiliency improvement measures; Implementation of a Recommended Public Transportation Plan: Development of Parks and Recreation Plans; and their implementation; Development of the Oglethorpe Hotel Block and completion of a new development strategy for Liberty Harbor, and continued redevelopment in the downtown core area of the city.

The 2023 – 2028 Work Plan follows on Chart 2 that follows:

Chart 2
Community Work Program - 2023 - 2028

ID	Project	Date	End Date	Responsible Entity	Est. Cost	Funding Source	Notes
Affordable Housing Rehabilitation, Development and Neighborhood Revitalization							
1	Prepare a Management Plan for implementing the Affordable Housing Plan.	9/1/2023	1/1/2024	DHNR, DPDC, CDBG - DR	\$25,000	DHNR and Consultant	
2	Prepare Policies and Procedures and a Relocation Plan. Initiate preliminary home inspections.	1/1/2024	3/1/2024	DHNR	Staff	DHNR	
3	Identify at least 3 target areas for concentrated housing inspections. Solicit applications from homeowners. Initiate and complete initial home inspection.	3/1/2024	6/1/2024	DHNR, DPDC, CDBG - DR	Staff	City of Brunswick	
4	Select first "package of 3 - 6 homes for rehabilitation. Complete work write up and bid packages. Award bid(s).	6/1/2024	9/1/2024	DHNR	\$180,000 - 360,000	City of Brunswick and CDBG	
5	Continue Housing Repair Program City Wide			DHNR	\$200,000	City and CDBG	
6	Begin second and succeeding years of program	9/1/2024	9/1/2028	DHNR, CDBG-DR, DPDC	\$7 Million	City, CDBG, CHIP, SPLOST	
7	Start and complete neighborhood infrastructure evaluation and improvement plan.	9/1/2024	1/1/2025	DPW, DPDC	\$25,000	City and Consultant	
8	Begin implementation of neighborhood revitalization plan.	1/1/2025	9/1/2025	DPW, DPDC	\$250,000	City and Consultant	
9	File HOME - CHIP Application with DCA for New Affordable Housing Construction. \$600,000	1/1/2024	3/1/2024	DHNR	Staff	City	
10	Re-constitute GHIC Committee	1/1/2024	4/1/2024	City	Staff	City	

Chart 2
Community Work Program - 2023 - 2028

ID	Project	Start Date	End Date	Responsible Entity	Est. Cost	Funding Source	Notes
Resiliency, Stormwater, Flood Control and Infrastructure Improvements							
10	Complete first 4 Master Plan stormwater and flood control projects.	Underway	12/1/2024	DPW	\$2 Million	SPLOST	
11	Update Stormwater and Flood Control Master Plan	6/1/2024	12/1/2024	DRW	\$50,000	City	
12	Continue priority street repaving program	Underway	10/1/2028	DPW	\$1,000,000 annually	City / SPLOST	
13	Assist DHNR with neighborhood revitalization planning and infrastructure improvements	1/1/2025	10/1/2028	DPW, City Engineer, DPDC	Staff	City	
14	Participate in Park Improvements Planning	1/1/2024	12/1/2024	City Engineer and DPDC and Consultant	\$50,000	City and Grant	
15	Complete Master Plan Improvements for Mary Ross Park	6/1/2024	12/1/2024	City Engineer	\$25.00	City and Consultant	
16	Complete NCRF Project Study	Underway	6/1/2024	City Engineer	Grant	NFWF	
Transportation							
17	Secure funding from public and private sources and Implement recommended public transportation alternative in phases	Underway	6/1/2024	City Manager, City Engineer	\$800,000	City, County. GDOT, Private sources	
18	Develop pedestrian and cycling connection plans from revitalized neighborhoods as Affordable Housing Plan is being carried out	1/1/2024	10/1/2028	DHNR, DPDC, PW	Staff	City	
19	Continue Historic District sidewalk and streetscape maintenance and development	11/1/2023	10/1/2028	SPDC, PW	\$100,000	Annual City Budget	

Chart 2
Community Work Program - 2023 - 2028

ID	Project	Start Date	End Date	Responsible Entity	Est. Cost	Funding Source	Notes
20	Implement intersection and pedestrian crossings in the Bay Street Corridor Plan.	1/1/2024	12/1/2025	DPW, GDOT	\$100,000	City, GDOT	
Cultural and Environmental Projects							
21	Continue to assist the African American Historical Commission to develop tourism infrastructure in the city	Continued	10/1/2028	City/County AAHC/Forward Brunswick	Staff	Foundation and Private Contributions	
22	Continue to advocate for a city-wide tree ordinance for all property to protect legacy tree species	Continued	10/1/2028	DPDC	Staff	City	
23	Pursue recognition of New Town as a National Historic District	Continued	12/1/2025	DPDC	\$30,000	City	
24	Develop an inventory of cultural, historic and archaeological resources as well as cultural and historic viewsheds.	Continued	12/1/2026	City, CRC, Historic Board, Tourism Board	\$100,000	Grant	
Economic Development Initiatives							
25	Consider amending the boundary of TAD #1 to include areas on US 17 and the Norwich and MLK corridors.	1/1/2024	12/1/2024	DPDC	Staff	City	
26	Consider creating TAD # 2 centered around the Medical / College Complex and including several declining neighborhoods	1/1/2024	12/1/2024	DPDC	Staff	City	
27	Consider creating a small business incubator program in downtown Brunswick	7/1/2024	6/30/2025	DPDC and Coastal College	Staff	City/College	
28	Consider a building trades apprenticeship program	7/1/2024	10/1/2028	City/GC Schools, Coastal Tech School	Staff	City/GCSS/ Technical College	

Chart 2
Community Work Program - 2023 - 2028

ID	Project	Start Date	End Date	Responsible Entity	Est. Cost	Funding Source	Notes
Short and Long Range Planning							
29	Re-visit the Altama Corridor Plan and develop a strategy for implementation along with Annexation of key areas.	1/1/2024	12/1/2026	DPDC/Glynn County PD	Staff	City/County	
30	Update Urban Redevelopment Plan to add focus in target housing and neighborhood revitalization areas	1/1/2024	7/1/2025	DPDC, DHNR, URA	Staff	City	
31	Consider a re-use plan for Liberty Harbor using ULI/UGA and other outside resources	7/1/2024	7/1/2025	DPDC, URA	Staff	City	
32	Re-visit US 17 Overlay District and consider modifications	1/1/2024	12/1/2024	DPDC	Staff	City	
33	Complete review of all city codes dealing with development, land use and code enforcement	7/1/2024	7/1/2025	DPDC	Staff	City	
34	Complete a short and long range annexation program	1/1/2024	12/1/2025	DPDC	Staff	City	
35	Combine the Master Plans for College of Coastal Georgia and SEGMC for long range land use plan for new Institutional Zone	7/1/2024	7/1/2026	DPDC	Staff	City	
Parks, Recreation and Greenspace							
36	Prepare a Master Plan for Park and Recreation Program Improvements	7/1/2024	7/1/2025	DPR, DPDC, Consultant	\$50,000	City and Grants	
37	Continue Signature Squares Restoration program	7/1/2025	7/1/2028	Signature Squares, City, consultants	\$500,000	City, Private Contributions and Grants	
38	Complete Final Phase of Mary Ross Park	7/1/2025	7/1/2035	DPR, DPDC, Consultant	\$1,000,000	City and Grants	

APPENDICIES

Appendices may be accessed from the Comprehensive Plan website by clicking control and the website address below (control+ click):

<https://www.brunswickga.org/planning/page/comprehensive-plan-2023-update>

Each appendix listed below may be accessed from their individual website locations (control + click).

Supporting Documents

-  [DRAFT Comprehensive Plan 7.20.23](#) (11 MB)
-  [Appendix A: Summary of Public Meetings](#) (2 MB)
-  [Appendix B: Community-Wide Housing Survey](#) (653 KB)
-  [Appendix C: Brunswick News Article - Pinova](#) (413 KB)
-  [Appendix D: Affordable Housing Plan](#) (13 MB)
-  [Appendix E: CRC CEDS Report 2022](#) (26 MB)
-  [Appendix F: TAD District #1 Report](#) (5 MB)
-  [Appendix G: Altama Community Transformation Plan](#) (68 MB)
-  [Appendix H: Glynn Avenue Design Guidelines](#) (25 MB)
-  [Appendix I: Urban Redevelopment Plan](#) (2 MB)
-  [Appendix J: Sidney Lanier Park Plan](#) (3 MB)
-  [Appendix K: Brunswick Transit Service Plan](#) (3 MB)
-  [Appendix L: Complete Streets Ordinance](#) (601 KB)
-  [Appendix M: Bay Street Corridor Plan](#) (8 MB)
-  [Appendix N: CGG Plan](#) (6 MB)
-  [Appendix O: 2018 Stormwater Master Plan](#) (6 MB)
-  [Appendix P: Shoreline Assessment and Resiliency Implementation Plan](#) (16 MB)
-  [Appendix Q: COE South Atlantic Coastal Study, Glynn County](#) (46 MB)
-  [Appendix R: Tree Equity Score](#) (5 MB)
-  [Appendix S: Park Access Score \(Trust for Public Land\)](#) (1 MB)
- Appendix T: [Signature Squares of Brunswick](#)

Appendix A

Public Hearings and Meetings

Brunswick City Commission Public Hearing Announcing Comprehensive Plan Update January 18, 2023

Meeting Summary: The Brunswick City Commission held a public hearing to announce the process that would lead to their consideration of an updated Comprehensive Plan in September. They also announced that the Planning and Advisory Commission (PAC) would serve as the Steering Committee and recommend a panel of Stakeholders to work with staff to generate public input for preparation of the updated Plan.

There were no public comments made when the hearing was opened.

Notice of the meeting is attached.

Steering Committee Meeting Wednesday, February 8, 2023

The Planning and Appeals Commission, serving as the Comprehensive Plan Update Steering Committee, met in regular session on February 8. In addition to regular business on the agenda, the Commission reviewed a schedule for the updating of the 2018 Comprehensive Plan. Commission Members were asked to make recommendations for the Stakeholders Committee by their next meeting.

Steering Committee Meeting Wednesday, March 8, 2023

The PAC, meeting in regular session received a report of progress made in updating the Comprehensive Plan as well as briefing on progress completing a Housing Study and Affordable Housing Plan.

Stakeholder Meeting 3/30/2023

Meeting Summary: A Stakeholder Committee recommended by the PAC and approved by the City Commission met for an introduction to the Comprehensive Plan update process that would be followed. Also discussed were a number of issues the City Commission wanted the plan to address; Housing, Neighborhood Revitalization, Public Transportation and Flooding within the core city area. The group spent considerable time discussing these and other issues but affordable housing was clearly a top priority

A summary of the Meeting and sign in are attached.

Steering Committee Meeting Wednesday, April 12, 2023

The PAC, meeting in regular session received a report of progress made in updating the Comprehensive Plan as well as briefing on progress completing a Housing Study and Affordable Housing Plan.

Steering Committee Meeting Wednesday May 10, 2023

The PAC, meeting in regular session received a report of progress made in updating the Comprehensive Plan as well as briefing on the May 5 Open House during First Friday,

Community Input Session: Monthly First Friday Downtown Event, Friday, 5/5/2023

Summary: An advertised public drop in to discuss issues and review materials developed so far for the plan update was held at the downtown public library. Exhibits presenting a summary of the current Comprehensive Plan 2028 - 2023, Housing Conditions, Public Transportation Plan, Drainage, Flood Control and Street Paving Programs and updated socio-economic data were available for attendees which totaled over 25 during the hour and a half session. The First Friday Community Input Session summary can be found in Appendix ____.

Stakeholder's Meeting: May 25, 2023

Meeting Summary: The second meeting of the Stakeholders Committee was held at City Hall. Topics discussed included:

1. Implementation of the city's 5 – year Stormwater and Flood Control Plan presented by Garrow Anderson, the City Engineer. The background of the how the plan was developed, and projects prioritized were discussed and the committee was given a copy of the Project Listing, Costs and a map showing the location for each project listed.
2. The current recommended Public Transportation Plan was presented by John Hunter, City Planning, Development and Codes Director. Each member was given a copy of the plan along with a map showing the routes the public transportation would take and the types of equipment that would be used.
3. A recently completed Housing Study and Affordable Housing Plan was presented by Russ Marane, a Planner with the Department of Planning, Development and Codes. Issues relating to socio economic conditions of families and households in Brunswick, current condition of housing and the housing market were laid out and a discussion followed. Materials from the Housing Study were distributed to the Stakeholders at the meeting.
4. John reviewed suggested modifications to Goals, Objectives Needs and Opportunities as currently stated in the Comp Plan.

All members were invited to call, email or stop by John or Russ's office to discuss issues of interest or concern to them.

Minutes of the meeting can be found in Appendix _____.

Steering Committee Meeting Wednesday June 14, 2023 (PACMeeting)

The PAC, meeting in regular session received a report of progress made in updating the Comprehensive Plan. The Public Transit Plan and Stormwater and Flood Control Master Plans were reviewed and discussed.

Urbana Perry Park NPA June 27, 2023

At the invitation of the NPA chair, the Planning Department staff attended the meeting of 35 - 40 members of the NPA and reviewed the work completed to date on updating the Comprehensive Plan. Of particular interest and concern to the members was flood control and affordable housing. Also mentioned frequently were the large number of abandoned and boarded up houses in the City.

Members were invited to the public meeting to review the draft of the Comp Plan update on July 12.

Public Open House July 12, 2023

Following the meeting of the Planning and Appeals Commission, which serves as the Steering Committee for the Comprehensive Plan update, an open meeting to discuss the First Draft of the Plan was held. John Turner made a presentation of the major issues being addressed in the plan and the Goals and Objectives, Needs and Opportunities and background studies that were used to develop the recommendations for Community Work Items over the next 5 – Years.

Of particular interest to those attending were the goals for an affordable housing program, the public transportation system currently being planned to begin service in the Spring of 2024 and storm drainage and flood control. One suggestion was made to begin to connect the core area neighborhoods with bicycle and pedestrian trails.

Participants were informed of upcoming work shop meetings with the City Commission on July 19 and a public hearing on August 2 to approve the Draft Comp Plan for review by the Department of Community Affairs.

Approximately 25 people attended the Open Meeting which lasted 1.5 hours. Sign In sheet attached.

City Commission Work Shop, July 17.

Draft Submitted to the City Commission following the PAC meeting for Review and Resolution Submitting the Updated 2023 Comprehensive Plan to the CRC and DCA at their August 4 Meeting.

City Commission Public Hearing – Final Draft – August 2, 2023

The City Commission approved the August 2, 2023 draft of the Comprehensive Plan update and a Resolution submitting the Draft to the Ga. Department of Community Affairs and the Coastal Georgia CRC.

Meeting Notices, Sign Ins and Handouts Follow.

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**CITY OF
BRUNSWICK
BOARD OF
COMMISSIONERS
NOTICE OF FIRST
PUBLIC HEARING -
COMPREHENSIVE
PLAN UPDATE**

The community is invited to participate in the upcoming comprehensive planning process for the future of the City of Brunswick. This planning process is meant to develop strategies for sustainable growth and prioritize appropriate expenditures of funds to coordinate future development efforts. This plan will focus on issues of population, economic development, housing, natural and cultural resources, community facilities, land use, inter-governmental coordination, and transportation. It is anticipated that a draft will be available for public comment in August of 2023. This will be an opportunity for any and all in the community to share ideas, voice concerns, and impress their vision regarding the direction of the City of Brunswick over the near future. In addition to this, the City of Brunswick Planning Staff will be present to lay out the planning process and highlight main areas of focus. The City of Brunswick encourages all interested persons and parties to take part in this once per five-year process. The City Commission will conduct a Public Hearing for the comprehensive plan update on: **Wednesday, January 18, 2023, 6:00 PM** at Old City Hall, 1223 Newcastle Street, Second Floor Commission Chambers. For further information on this public hearing, contact the City of Brunswick Planning Department at 912-257-5527 or planning@cityofbrunswick-ga.gov.

**PUBLIC BRIEFING
FIVE – YEAR UPDATE OF THE BRUNSWICK COMPREHENSIVE PLAN**

The current Comprehensive Plan was prepared in 2018 and approved by the Brunswick City Commission in October 2018.

Under Georgia Law, for a municipality or county in Georgia to receive and remain eligible for certain state funding and permitting programs, it must initially adopt and update its Comprehensive Plan every five years. The Georgia Department of Community Affairs (DCA) has established guidelines and procedures municipalities and counties must follow in preparing and/or updating their Comprehensive Plan. The deadline for completing and submitting a draft of the Brunswick Comp Plan update for DCA and Coastal Regional Commission reviews is August 30, 2023. The Plan must be formally adopted by the City by October 30, 2023 to meet the State and DCA requirements.

The City of Brunswick Planning, Development and Codes staff will begin the process of updating its Comprehensive Plan following an initial Public Hearing by the City Commission on January 17, 2023. At that meeting a Steering Committee will be named by the City Commission to be made up of members of the Planning and Appeals Commission. The Committee will be charged with the responsibility of guiding the preparation of the plan update and will recommend a STAKEHOLDERS Committee to the City Commission which will provide input during the preparation process.

The process that will be followed, as prescribed by the DCA, will include multiple and significant opportunities for citizens of Brunswick to provide input into the establishment of goals, needs and opportunities to be addressed by the plan as well as alternative solutions and proposals to be included in the plan. These will include, among others:

- A. Future land use development,
- B. Community infrastructure needs and improvements (streets, drainage, sidewalks, etc.)
- C. Neighborhood revitalization (removal of vacant and dilapidated housing, rehabilitation of other housing as needed),
- D. Affordable housing programs including adoption of policies that can facilitate new housing development.
- E. Economic development,
- F. Transportation needs,
- G. And other issues identified in the plan development and citizen input process.

The final element of the Comprehensive Plan update will be a five-year work program that will specifically address the efforts and timelines that will be made to implement the plan proposals.

Opportunities for citizen review and comment will include:

- A. Public forums,
- B. Open house sessions to receive and discuss issues and plans in small groups or one-on-one,
- C. Access to on-line surveys and forums for submitting comments electronically,
- D. On-line posting of plan elements as they are developed and proposed for comment responses, And, a final Public Hearing before the Updated 2023 Comprehensive Plan is adopted by the City Commission

AGENDA

PLANNING & APPEALS COMMISSION

February 8, 2023

5:15PM

Call to Order: Chairman Lance Sabbe

Items of Business:

- Approval of January 11, 2023 Minutes

Staff Items

- Review of Zoning Ordinance Revisions and Synopsis
- Comprehensive Plan: Discussion of Plan and Stakeholder Committee Recommendations

Chairman Items:

Adjournment

AGENDA

PLANNING & APPEALS COMMISSION

March 8, 2023

5:15PM

Call to Order: Chairman Lance Sabbe

Items of Business:

- Approval of February 8, 2023 Minutes

Zoning Applications:

- VP 23-01: 3302 Glynn Ave – Reduce minimum parking requirement **(Withdrawn)**

Staff Items

- Comprehensive Plan:

Chairman Items:

Adjournment

2023 Comprehensive Plan – Stakeholder Meeting
March 30, 2023 6:00 PM Old City Hall Conference Room

Attendees:

Tyler Jones – Historic Brunswick NPA
Lisa Jordan – Downtown Development Authority
Tripp Stevens – Southeast Ga. Health System
Rhonda Walker – Urbana Perry Park NPA
Gisha Dudley – Urbana Perry Park NPA
Mitch Edwards – MECA Consulting
Jay Jenkins –
Jason Umfress – Coastal College of Georgia
Michael Torras - Torras Properties
Ron Slade – Slade Design
Daren Pigtsch – Torras Properties

City of Brunswick

John Hunter – Director of Planning, Development and Codes
Russ Marane - Planner

Meeting Summary:

John Hunter opened the meeting with introductions and welcomed everyone to the first meeting of the Comprehensive Plan Update Stakeholder Committee.

1. John explained the purpose of the update and the process that would be followed for the next 3 – 4 months before completing a 5 year update of the current 2018 Comprehensive Plan. He explained that there would likely be two additional meeting of the Stakeholder Committee to review work completed for the update and to seek their input and guidance along with that of the Steering Committee.
2. John presented a Power Point Presentation (attached) of the Needs and Opportunities, Goals and Objectives and Recommendations for Action contained in the 2018 Plan and indicated the progress made by the City following their adoption of the 2018 Plan and Short Term Work Program.
3. A discussion of Major Issues and Challenges facing the City followed and included
 - a. Storm Water Facility needs
 - b. Affordable Housing
 - c. Public Transportation
 - d. Development of the Oglethorpe Block
 - e. A plan for the Bay Street Corridor
 - f. And others included in the Power Point
4. Russ Marane presented a written data summary of work completed on an Affordable Housing Plan (attached). Considerable discussion followed as the data was presented outlining the needs for affordable housing, the availability of affordable housing and the

current housing market in Brunswick and Glynn County (excluding the islands). These major points were discussed

- a. Low Median Family Income (\$32,000 annually) and high family poverty levels (above 30%) compound the ability of families to secure affordable housing.
- b. Most housing in Brunswick, over 60 percent are single family rentals with high percentage (over 60 %) requiring moderate to major rehabilitation.
- c. Since 2000, less than 10% of the housing units were developed in the City. Over 50% of the housing units were built before 1950.
- d. There is a pressing need to remove vacant and dilapidated housing (estimated at 300 units) and rehabilitate as many as 2,000 single family homes to improve the supply of adequate affordable housing. Programs to develop new housing, both rental and for homeownership will require outside funding to close the gap between the amount most families can afford and their cost to acquire or rent.
- e. The current market is producing housing for rent in the \$1400 – 1700 per month range (mostly well outside the City) and “starter homes” in the \$175,000 range. Typical Brunswick families can only afford rental rates of \$750 - \$900 per month or mortgage and other housing expenses to purchase a home at around \$100,000 - \$125,000.

As additional work is completed, the Steering Committee will be briefed and input sought.

5. Other Challenges including Public Transportation, waterfront development , continuing the revitalization of Downtown Brunswick and the future of Liberty Harbor project were discussed.

The meeting adjourned at 7:45 PM.

AGENDA
PLANNING & APPEALS COMMISSION
April 12, 2023
5:15PM

Call to Order: Chairman Lance Sabbe

Items of Business:

- Approval of March 8, 2023 & March 24, 2023 Minutes

Zoning Applications:

- SD 23-02: Recombination Plat of Lot 413 and Portions of Lots 412, 414 & 415 of Old Town

Planning Applications:

- Site Plan Review: 3302 Glynn Avenue 90% Plan

Staff Items

- Comprehensive Plan Update

Chairman Items:

Adjournment

City seeks residents' input on new plan

By **TAYLOR COOPER**

tcooper@thebrunswicknews.com

The city of Brunswick is asking residents for input on the city's comprehensive plan, a document that is intended to serve as a guiding influence on growth and development.

An open house is scheduled for 5-7 p.m. Friday in the Brunswick-Glynn County Library.

"We're going to have some materials and maps so people can begin to see and discuss preferences in

Please see **CITY, 3A**

City

Continued from page 1A

the direction the city may be heading,” said Russ Marane, a consultant working with the city’s Planning, Development and Codes Department on the comprehensive plan.

“There’s a lot of issues that the comp plan will have to deal with, and we want to get them on the table, have the public understand what they are and get their feedback.”

Marane said citizens will be able to view data on a variety of topics, such as housing, transportation and stormwater drainage. The city will provide the materials to take notes and write down feedback, if desired.

“People can drop in and chat with us. There will be several people from the city who can chat about anything they want to talk about,” Marane said. “One of the top items on the agenda is affordable housing. We had a stakeholder meeting a few weeks ago and that was all

they wanted to talk about.”

The planning department already has some strong recommendations on that front, but Marane said he welcomes input from residents on the city’s housing supply.

“The condition of housing in the city is a huge issue and we’ve got a lot of information we’ve pulled together on that,” Marane said. “It’s just not available. People that want decent housing are having to move out of the city and into the county into the newly developed areas. Not that they want to, but that’s where the housing is being built.”

Housing isn’t the only subject. Marane said the city hopes to make sure the comprehensive plan places emphasis on correcting storm drainage issues and flooding and controlling tidal effects on the city. Both the city’s master plan and capital improvements plan include several such projects, and both will be available at the open house.

The last time the city updated its comprehensive plan

was in 2018. To see that plan, visit brunswickga.org/planning/page/2018-comprehensive-plan.

After the open house, feedback from residents will be taken to a committee of stakeholders, Marane said. The committee includes representatives from each of the city’s neighborhood planning assemblies, the College of Coastal Georgia, Southeast Georgia Health System, and local businesses, among others.

Once revisions to the 2018 plan are finalized, he said citizens will get a chance to view the final documents and make further suggestions at a public hearing before it’s sent to the state Department of Community Affairs for final approval.

It’s not available yet, but Marane said all relevant documentation will be available soon on the city’s website.

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PROGRESS REPORT FOR STEERING COMMITTEE (PAC) COMPREHENSIVE PLAN UPDATE

Comp Plan Update Progress

1. Background data for the plan update is continuing to be gathered.
2. First Stakeholder Meeting held March 30 with all but two present. Major items of interest for discussion:
 - a. Affordable Housing: Clearly on the minds on many and a genuine concern on how best to address the issue. We reviewed the current status of the Affordable Housing Plan being prepared as a major element of the Comp Plan Update.
 - b. Transportation: The committee felt a transit system of some sort could be the answer of addressing access to better paying jobs and access to education and training opportunities.
 - c. There was a lot of interest in the socio-economic data summary presented to the committee.
 - d. **Summary of meeting attached.**
3. Open House held on First Friday May 5 at the Downtown Library. It was attended by around 25. Lots of interest shown in:
 - a. Housing Study Maps depicting Age and Condition of Housing.
 - b. Transportation Study and Transit Plan Options
 - c. Storm Drainage and Flood Protection.
 - d. Creation of Institutional and MUCCH Zones.
4. The Affordable Housing Plan Report is now in Final Draft form and is attached. It will likely be a major part of the Comp Plan Update. **Copy of Final Draft Attached**
5. A Stakeholder Meeting will likely be held later this month to review progress.
6. Another public drop in will likely be held in June as elements of the plan will likely be ready for public review.

**Brunswick Comprehensive Plan Update
Stakeholder Meeting
May 25, 2023
6:00 PM – 7:00 PM
Old City Hall**

- A. Review Comp Plan Goals, Needs and Objectives – John Hunter, Director Planning, Development and Codes.**
- B. Review and Discussion of Storm Drainage, Flood Prevention and Street Improvement Priorities – Garrow Alberson City Engineer**
- C. Review and Discussion of Transportation Plan Alternatives - John Hunter, Planning, Development and Codes**
- D. Review and Discussion of Affordable Housing Plan - Russ Marane Planner**
- E. Review and Discussion of Zone Changes Involving Creation of Institutional and MUCCH Zones – Russ Marane - Planner**
- F. Next Public Meeting – Discussion John Hunter**

SIGN IN SHEET

STAKEHOLDER MEETING MAY 25, 2023

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Victoria Mackey	1804 Niles Ave	VictoriaMackey@gmail.com	912 399 6331
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Hanny Inonley	713 Carpenter St	hanny.inonley@TWC.org	912-399-2996
Grace Greene	1000 Wolf St	sgreede@gmail.com	912-548-9826
Paul Brewer	526 Newcastle	PaulBrewer51@gmail.com	571 375 6013
JAY JENKINS	644 CHAMPNEY SQE	INFORMATION@jmc.com	603-762-7115
Michael Tomas	105 Meadow Bay SSI	michael@tomasperties.com	912-230-7519
JASON CLARKE	1158 CANTON ST, BUK	inimfsg@gmail.com	843 801 3377
Rhonda Waller	1701 Wilson Ave	RhondaWaller@gmail.com	240 391 8218
Kasey McClary	2419 Reynolds St	mcclarykb@cloud.com	404 545 8960
Russ MARINE			
Dotter-Hunter			
Carrie Albarr			

City of Gainesville Staff

May 5, 2023

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Matthew Stinar	241 Townsend	mafhew@stinar.net

AGENDA
PLANNING & APPEALS COMMISSION
April 12, 2023
5:15PM

Call to Order: Chairman Lance Sabbe

Items of Business:

- Approval of March 8, 2023 & March 24, 2023 Minutes

Zoning Applications:

- SD 23-02: Recombination Plat of Lot 413 and Portions of Lots 412, 414 & 415 of Old Town

Planning Applications:

- Site Plan Review: 3302 Glynn Avenue 90% Plan

Staff Items

- Comprehensive Plan Update

Chairman Items:

Adjournment

AGENDA
PLANNING & APPEALS COMMISSION May 10, 2023
5:15PM

Call to Order: Chairman Lance Sabbe

Approval of the Agenda

Approval of Minutes

- April 12, 2023 Minutes
- April 27, 2023 Minutes

Planning Applications:

- CU 23-01: 2802 Hunter Street: Multi-Family Dwelling

Zoning Applications: N/A

Staff Items:

- Comprehensive Plan Update – Russ Marane

Chairman Items:

Adjournment

PROGRESS REPORT FOR STEERING COMMITTEE (PAC) COMPREHENSIVE PLAN UPDATE

Comp Plan Update Progress

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2. First Stakeholder Meeting held March 30 with all but two present. Major items of interest for discussion:
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 - b. Transportation: The committee felt a transit system of some sort could be the answer of addressing access to better paying jobs and access to education and training opportunities.
 - c. There was a lot of interest in the socio-economic data summary presented to the committee.
 - d. Summary of meeting attached.**
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 - b. Transportation Study and Transit Plan Options
 - c. Storm Drainage and Flood Protection.
 - d. Creation of Institutional and MUCCH Zones.
4. The Affordable Housing Plan Report is now in Final Draft form and is attached. It will likely be a major part of the Comp Plan Update. **Copy of Final Draft Attached**
5. A Stakeholder Meeting will likely be held later this month to review progress.

Another public drop in will likely be held in June as elements of the plan will likely be ready for public review.

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Matthew Stina	2641 Townsend	mafhew@stina.net

house conditions map

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Bobby Mengel 143 buaybobe

Josiah Watts 'Jazz' 7614 Avenue jos @ undredmiles.org
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**Brunswick Comprehensive Plan Update
Stakeholder Meeting**

May 25, 2023

6:00 PM – 7:00 PM

Old City Hall

- A. Review Comp Plan Goals, Needs and Objectives – John Hunter, Director Planning, Development and Codes.**
- B. Review and Discussion of Storm Drainage, Flood Prevention and Street Improvement Priorities – Garrow Alberson City Engineer**
- C. Review and Discussion of Transportation Plan Alternatives - John Hunter, Planning, Development and Codes**
- D. Review and Discussion of Affordable Housing Plan - Russ Marane Planner**
- E. Review and Discussion of Zone Changes Involving Creation of Institutional and MUCCH Zones – Russ Marane - Planner**
- F. Next Public Meeting – Discussion John Hunter**

City Hall invites public to discuss major local issues

By **TAYLOR COOPER**

tcooper@thebrunswicknews.com

City Hall wants to hear from Brunswick residents about local issues that are important to them at a public meeting on Wednesday.

The meeting on the city's comprehensive plan is scheduled for 6 p.m. in Old City Hall, 1229 Newcastle St.

For the past three months, the city's Planning, Development and Codes Department has been gathering data and ideas to update a comprehensive plan and five-year work plan. The comp plan, a five-year agenda for the municipal government, outlines goals and projects to improve housing, public transportation, roads, storm drainage and flood control, parks, recreation programs and neighborhood revitalization, among

other things.

Among the most important items is housing. A report developed by the city suggests close to 85% of Brunswick's total housing stock, 4,800 dwelling units, was built before 1970. Twenty percent of houses are "almost uninhabitable," per city consultant Russ Marane. Half of that, around 130 houses, is unsalvageable and slated for demolition.

Sixty percent of the housing stock, 2,500 units, requires moderate to major rehabilitation, Marane said, which is classified as starting at \$50,000.

Even when it comes to new construction, five years ago a starter home would cost \$125,000 to \$150,000, but now it's closer to \$175,000 to \$200,000. Less than 32% of homes are owner-occupied in the city, a very low homeown-

ership rate, Marane said.

Apartments aren't much better. A new basic two-bedroom apartment in the Golden Isles would cost \$850 to \$1,100 five years ago, but now would exceed \$1,400, plus utilities and amenities — well exceeding affordability for the city's median family income of \$33,000.

Information on the plan, as well as documentation of major issues like the housing study, is available online at brunswickga.org/planning/page/comprehensive-plan-2023-update. On the website is also a survey regarding the housing needs and preferences of the public.

If all goes well, the comp plan should go before the state Department of Community Affairs in August and receive final approval from the City Commission in October.

Brunswick News
7/8/2023

Nov 13 2023
May 5 2023

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+ 4 new signers
25 total

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Craig Watkins	1312 Newcastle #200	
SEMORA Holmes	1819 Beacon Ave	
Hannah Hollington	300 Union Street / 101 First St.	trondproject@sevees.com
Commissioner Felicia Harris	904 Bayview St, Bldg 68A	felicia@sevees.com
Don + Susan Myers	1078 Bealwood Dr. SSt	dandamyers@sevees.com
POU SLADE	509 MAGNOLIA ST. 551	PSLADE777@SMA11.com
Anita D Collins		
William Kitts		
Laura Morse	1316 Newcastle #201 Bldg	lmorse@coastalgeorgiastandards.org
Kasey McClary	2119 Reynolds Street Brunswick	mcclaryk3@icloud.com
Hannah Mendillo		hannah@sevees.com
Alice M. Keyes	1210 Magnolia Ave	alice@sevees.com

July 12, 2023
May 5, 2023

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John Mark	1728 1/2 1st St	
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**CITY OF
BRUNSWICK
BOARD OF
COMMISSIONERS**

NOTICE OF SECOND
PUBLIC HEARING -
COMPREHENSIVE
PLAN UPDATE

The community is invited to participate in the upcoming comprehensive planning process for the future of the City of Brunswick. This planning process is meant to develop strategies for sustainable growth and prioritize appropriate expenditures of funds to coordinate future development efforts. This plan will focus on issues of population, economic development, housing, natural and cultural resources, community facilities, land use, intergovernmental coordination, and transportation.

The Comprehensive Plan Draft is available on the City of Brunswick website for review at www.brunswickga.org.

The City Commission will conduct a Public Hearing for the comprehensive plan update on:

Wednesday, August 2, 2023, 6:00 PM at Old City Hall, 1229 Newcastle Street, Second Floor Commission Chambers.

For further information on this public hearing, contact the City of Brunswick Planning Department at 912-267-5527 or

Appendix B

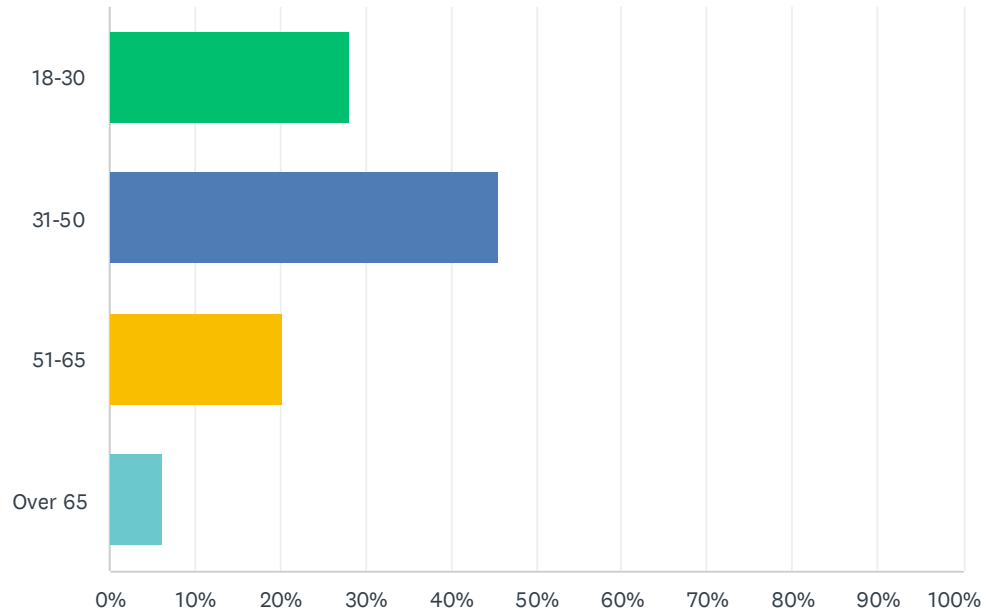
ONLINE AFFORDABLE HOUSING SURVEY – SUMMARY

Total Responses 361

- 1. 46% OF RESPONDENTS WERE 31 – 50 YEARS OLD; 6% 65 YEARS AND OLDER.**
- 2. 85 % WERE WOMEN**
- 3. 88% WERE HEADS OF HOUSEHOLDS**
- 4. 68% HAVE CHILDREN IN SCHOOL**
 - a. 20% IN HS**
 - b. 22% IN MS**
 - c. 58% IN ELEM**
- 5. 50% EMPLOYED FULLTIME; 12% PART TIME; 34% NOT EMPLOYED**
- 6. 59% HAD MONTHLY INCOME BELOW \$2500; 74% BELOW \$3,000; 90% BELOW \$4,000**
- 7. 57% LIVE IN BRUNSWICK**
- 8. 75% RENT THEIR HOUSING**
- 9. 72% HAVE 4 OCCUPANTS OR LESS; 34% HAVE 2 OCCUPANTS**
- 10. 51% HAVE 3 BEDROOMS; 30% HAVE 2 BEDROOMS**
- 11. 62% REPORTED THEIR HOME IN GOOD CONDITION; 9% POOR NEEDING REPAIRS.**
- 12. 42% SPEND LESS THAN \$1,000 MONTHLY FOR HOUSING EXPENSE; 25% SPEND \$1,000 - \$1500; 33% OVER \$1500,**
- 13. 65% WANT TO IMPROVE THEIR HOUSING SITUATION; 48% WOULD LIKE TO OWN; 52% PREFER TO RENT,**
- 14. 44% REQUIRE 3 BEDROOMS; 20% 2 BEDROOMS; 23% 4 BEDROOMS.**
- 15. 40% CAN AFFORD UP TO \$1,000 PER MONTH; 25% UP TO \$1500 PER MONTH; 35% \$1500 - \$2500 PER MONTH.**
- 16. 53% WOULD PREFER TO LIVE IN BRUNSWICK**

Q1 Your Age

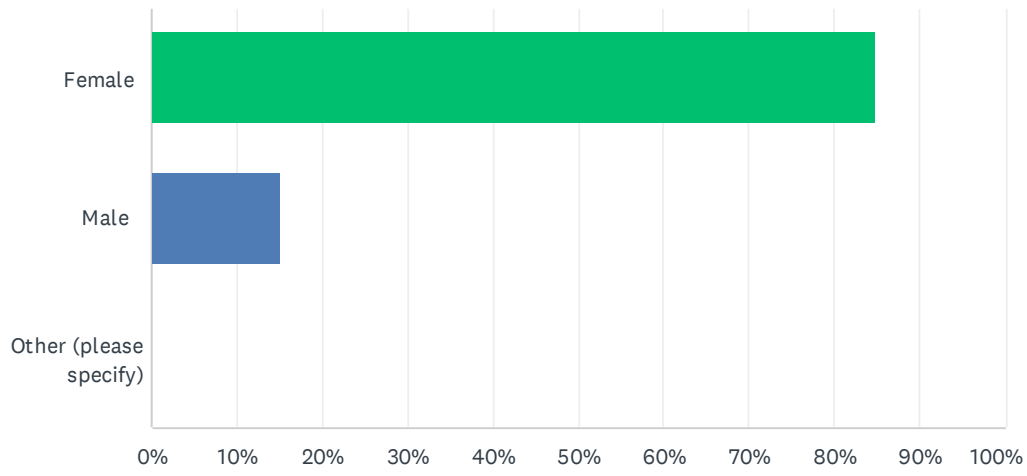
Answered: 228 Skipped: 0



ANSWER CHOICES	RESPONSES	
18-30	28.07%	64
31-50	45.61%	104
51-65	20.18%	46
Over 65	6.14%	14
TOTAL		228

Q2 Are you

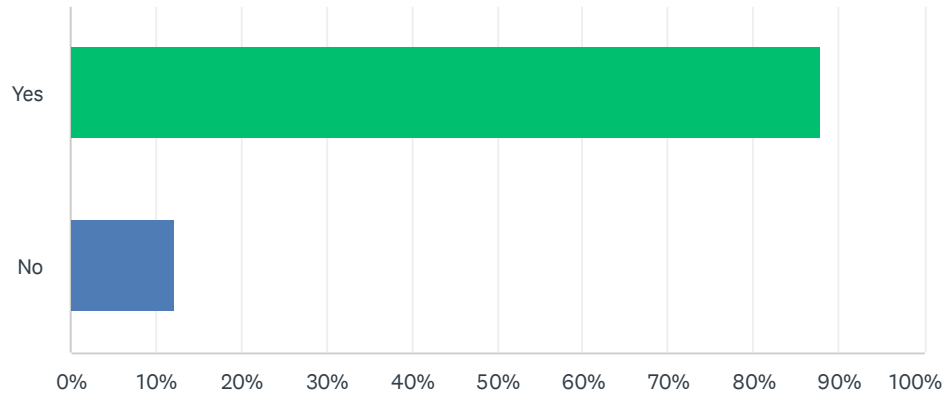
Answered: 226 Skipped: 2



ANSWER CHOICES	RESPONSES	
Female	84.96%	192
Male	15.04%	34
Other (please specify)	0.00%	0
TOTAL		226

Q3 Are you the head of your family household?

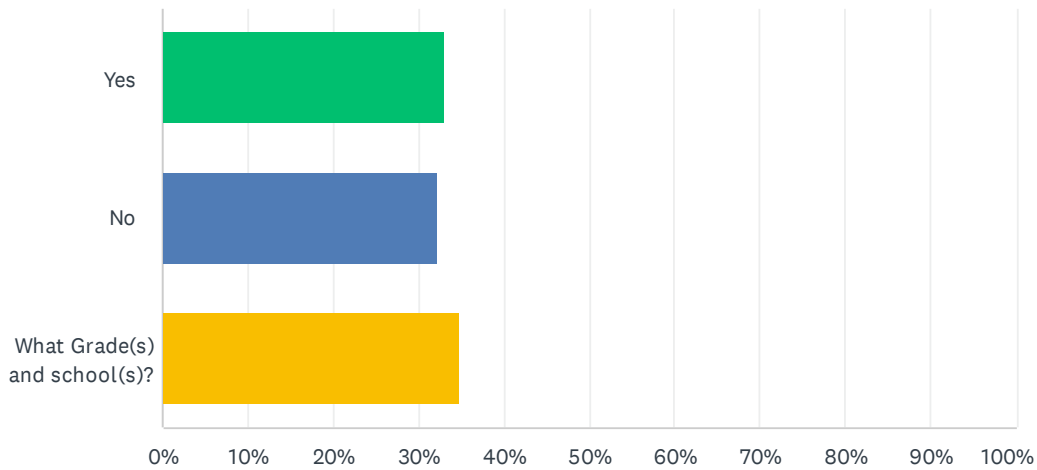
Answered: 224 Skipped: 4



ANSWER CHOICES	RESPONSES	
Yes	87.95%	197
No	12.05%	27
TOTAL		224

Q4 Do you have children in school?

Answered: 224 Skipped: 4



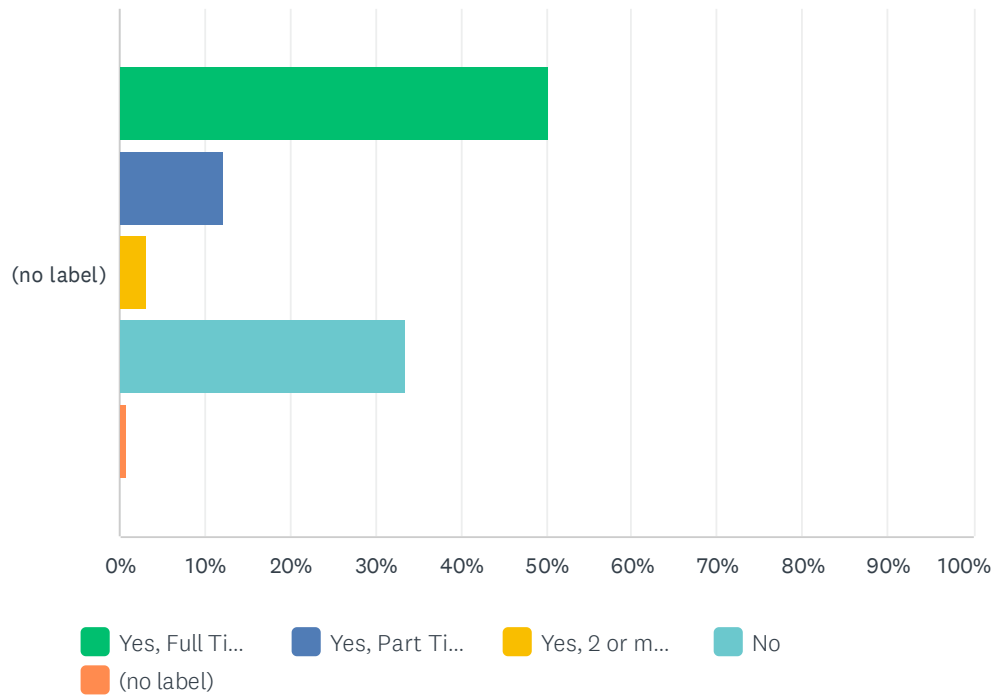
ANSWER CHOICES	RESPONSES	
Yes	33.04%	74
No	32.14%	72
What Grade(s) and school(s)?	34.82%	78
TOTAL		224

Schools Listed in Limited Responses

1. Brunswick High School - 10
2. Burroughs Molette Elementary - 8
3. Goodyear Elementary - 6
4. Needlewood Middle School - 5
5. Glynn Middle School - 5
6. Altama Elementary School - 4
7. Golden Isles Elementary School - 3
8. St. Simons Elementary School - 3
9. Jane Macon Middle School - 2
10. Oglethorpe Point Elementary School - 1
11. Greer Elementary School - 1
12. Glynn Academy High School - 1
13. Risley Elementary School - 1

Q5 Are you employed?

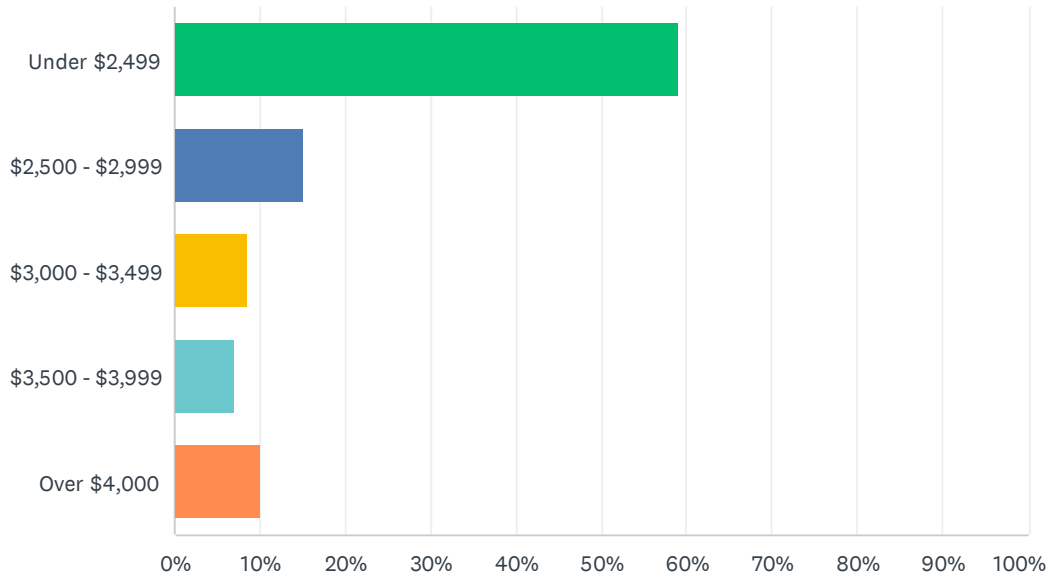
Answered: 215 Skipped: 13



	YES, FULL TIME	YES, PART TIME	YES, 2 OR MORE JOBS	NO	(NO LABEL)	TOTAL	WEIGHTED AVERAGE
(no label)	50.23% 108	12.09% 26	3.26% 7	33.49% 72	0.93% 2	215	2.23

Q6 What is your monthly income?

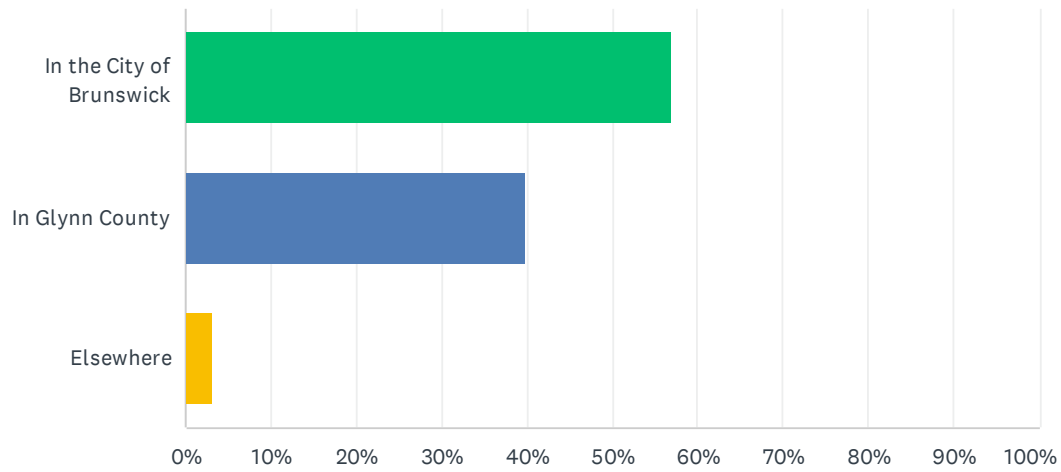
Answered: 198 Skipped: 30



ANSWER CHOICES	RESPONSES	
Under \$2,499	59.09%	117
\$2,500 - \$2,999	15.15%	30
\$3,000 - \$3,499	8.59%	17
\$3,500 - \$3,999	7.07%	14
Over \$4,000	10.10%	20
TOTAL		198

Q7 I currently Live:

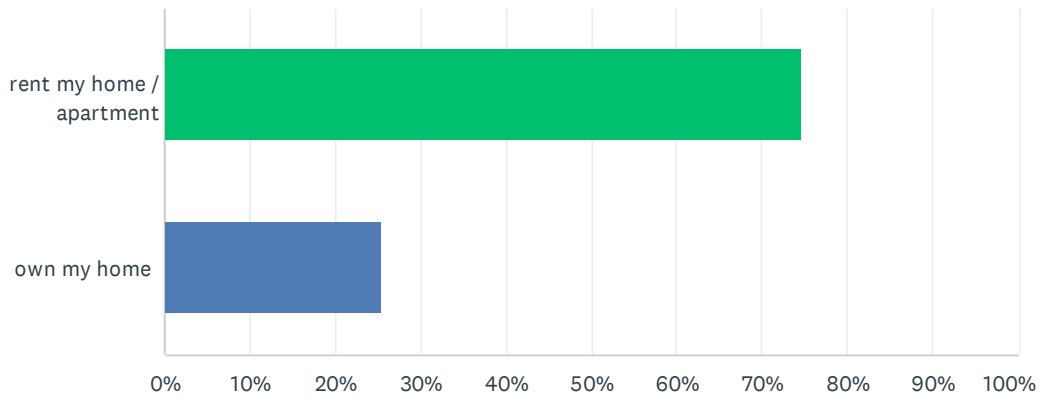
Answered: 221 Skipped: 7



ANSWER CHOICES	RESPONSES	
In the City of Brunswick	57.01%	126
In Glynn County	39.82%	88
Elsewhere	3.17%	7
TOTAL		221

Q8 I currently

Answered: 212 Skipped: 16



ANSWER CHOICES	RESPONSES	
rent my home / apartment	74.53%	158
own my home	25.47%	54
TOTAL		212

Q9 The number of people living in my current home is:

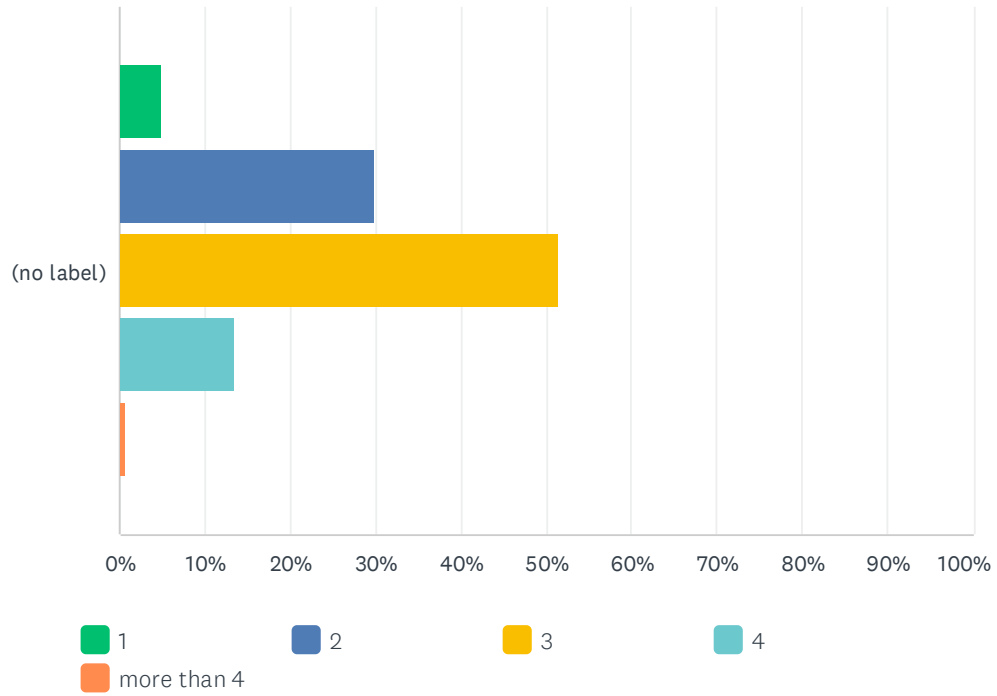
Answered: 211 Skipped: 17

Number of Occupants in Current Home - Limited Responses

1 Occupant	18	10%
2 Occupants	41	24%
3 Occupants	27	21%
4 Occupants	30	17%
5 Occupants	31	17%
6 Occupants	11	6%
7 or More Occupants	5	3%

Q10 The number of bedrooms is

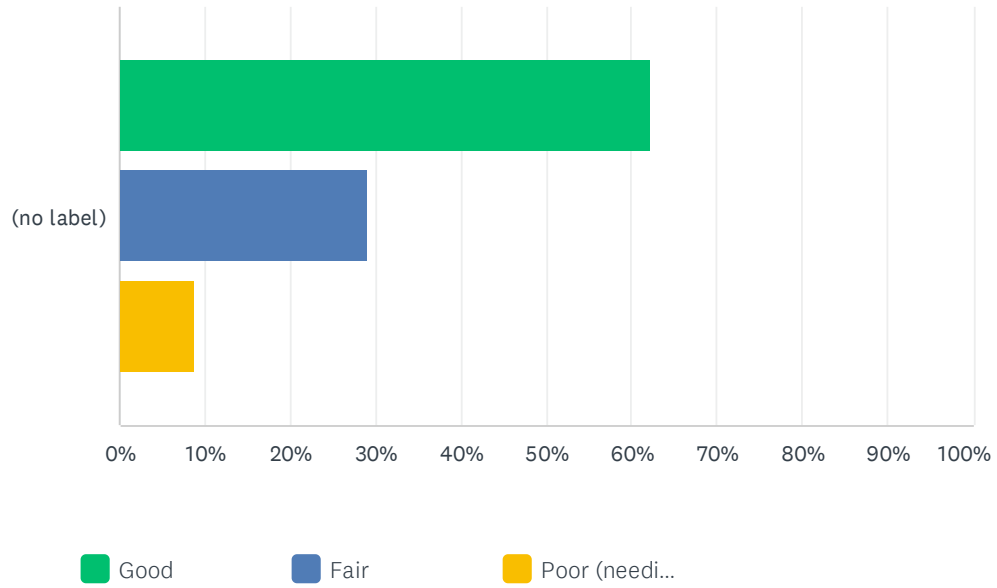
Answered: 187 Skipped: 41



	1	2	3	4	MORE THAN 4	TOTAL	WEIGHTED AVERAGE
(no label)	4.81%	29.95%	51.34%	13.37%	0.53%	187	2.75
	9	56	96	25	1		

Q11 My homes condition is:

Answered: 220 Skipped: 8



	GOOD	FAIR	POOR (NEEDING MAJOR REPAIRS)	TOTAL	WEIGHTED AVERAGE
(no label)	62.27% 137	29.09% 64	8.64% 19	220	1.46

Q12 My current rent or mortgage expense plus utilities is

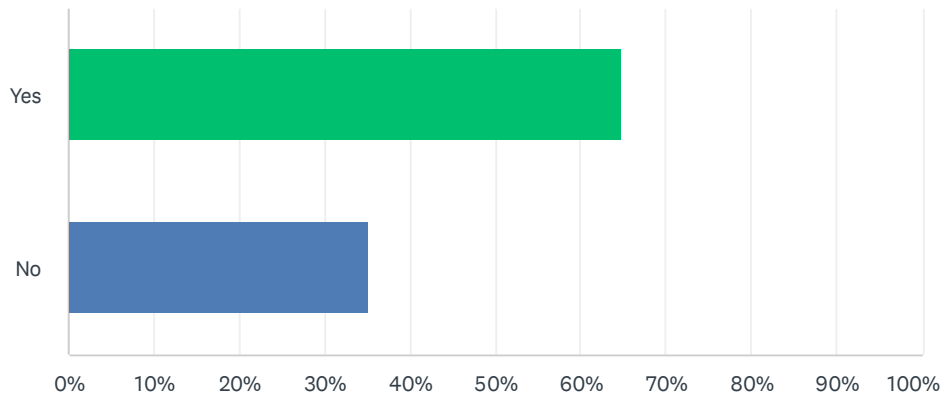
Answered: 188 Skipped: 40

Limited Responses - 178 Total

Less than \$1,000/month	75	42%
\$1,000 - \$1500	45	25%
\$1500 - \$2,000	23	21%
Over \$2,000	10	12%

Q13 I would like to improve my current housing and living condition

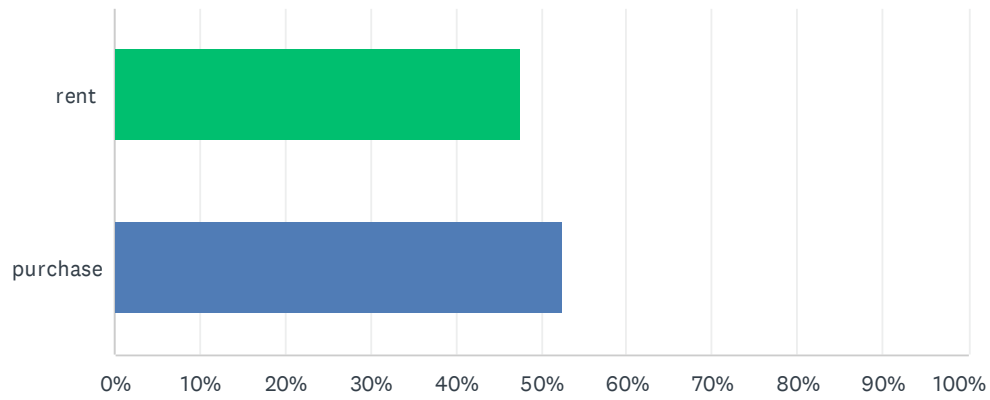
Answered: 219 Skipped: 9



ANSWER CHOICES	RESPONSES	
Yes	64.84%	142
No	35.16%	77
TOTAL		219

Q14 I would like to rent or purchase another home or apartment

Answered: 183 Skipped: 45



ANSWER CHOICES	RESPONSES	
rent	47.54%	87
purchase	52.46%	96
TOTAL		183

Q15 Number of bedrooms needed

Answered: 172 Skipped: 56

Limited Responses:

1 Bedroom	9	6%
2 Bedrooms	30	20%
3 Bedrooms	66	44%
4 Bedrooms	35	23%
5 or More	11	7%

Q16 I would like my total housing expense not to exceed

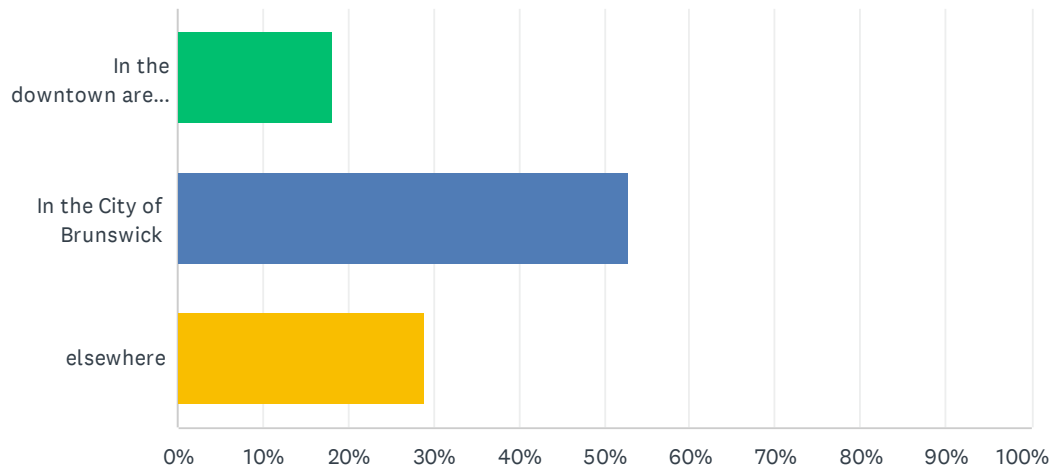
Answered: 131 Skipped: 97

Limited Responses

Less than \$500/month	23	17%
\$500 - \$1000/Month	31	23%
\$1,000 - \$1200/Month	16	12%
\$1200 - \$1500/Month	19	13%
\$1500 - \$2,000/Month	16	12%
\$2,000 - \$2,500/Month	21	16%
\$Over \$2,500/Month	11	7%

Q17 I would like to live

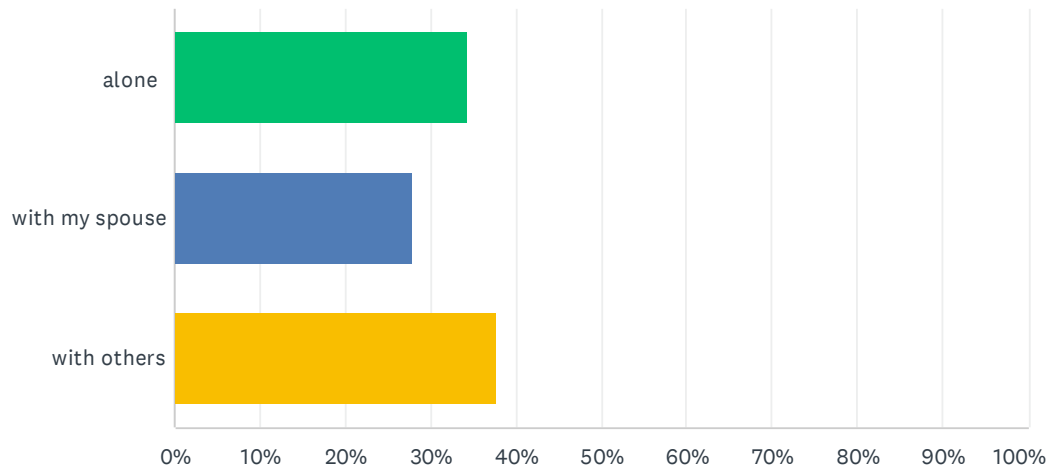
Answered: 176 Skipped: 52



ANSWER CHOICES	RESPONSES	
In the downtown area of Brunswick	18.18%	32
In the City of Brunswick	52.84%	93
elsewhere	28.98%	51
TOTAL		176

Q18 I am over 65 and live

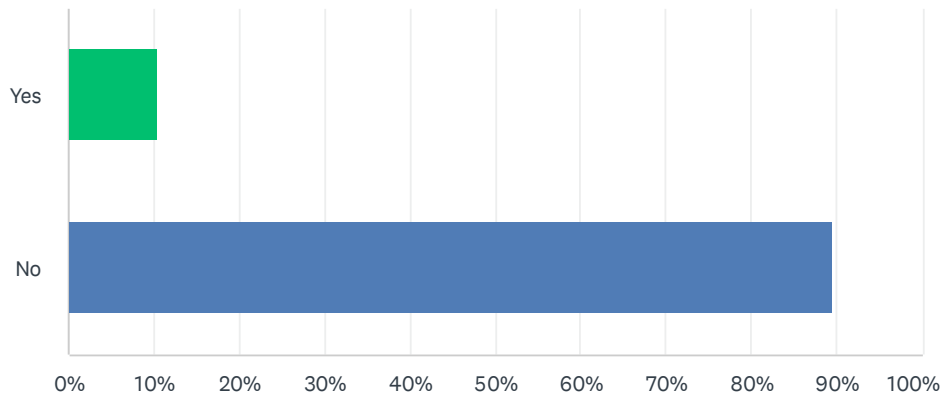
Answered: 61 Skipped: 167



ANSWER CHOICES	RESPONSES	
alone	34.43%	21
with my spouse	27.87%	17
with others	37.70%	23
TOTAL		61

Q19 I am handicapped and have special needs in my home

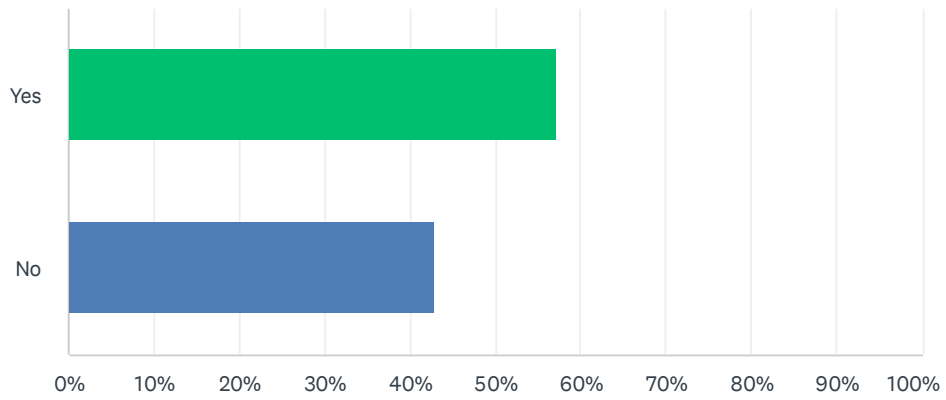
Answered: 181 Skipped: 47



ANSWER CHOICES	RESPONSES	
Yes	10.50%	19
No	89.50%	162
TOTAL		181

Q20 I would like to be close to my work

Answered: 159 Skipped: 69



ANSWER CHOICES	RESPONSES	
Yes	57.23%	91
No	42.77%	68
TOTAL		159

https://thebrunswicknews.com/news/local_news/end-of-an-era-pinova-plant-to-close-permanently/article_68787102-1740-5dda-a336-c9c33784249e.html

End of an era: Pinova plant to close permanently

By MICHAEL HALL mhall@thebrunswicknews.com

Jun 29, 2023

1 of 3



A few months after a fire caused significant damage, Pinova announced Wednesday it was shutting down its Brunswick plant.

JM714

Steam and smoke will no longer pump out of the industrial operation that greets motorists at the mainland entrance to the F.J. Torras Causeway.

Pinova Solutions is closing its doors permanently, a statement from the company said Wednesday.

The facility, which has operated for more than 110 years in Brunswick, will not reopen in the aftermath of a massive April 15 fire at the wood rosin plant that destroyed core production assets and infrastructure, a statement from the company said. Opening the facility again would require “substantial demolition, reconstruction, costs and time,” the statement said.



“This is a difficult decision, considering all our talented employees and the long history of the site in Brunswick, but one made after careful review,” Ron Kurtz, director of operations at Pinova, said in the statement. “We are committed to treating employees with respect and fairness and to close the site in line with our values. Pinova appreciates the value that employees have brought to the company.”

The plant ceased operations after the fire and has not operated fully since.

Employees were notified of the closing Wednesday morning. Layoffs will occur in phases as the plant is decommissioned and closed according to regulatory standards, the statement said.

“Wind down activities, including emptying tanks and disassembling equipment, will begin soon, although full shutdown is expected to take 18 months,” the statement said.

The Golden Isles Development Authority’s most recent count of employees at Pinova shows 220 people work at the plant. There are likely more than double that number of jobs indirectly connected to the plant, according to a multiplier used by economic developers.

“Pinova is committed to supporting those employees, in line with the company’s values, and will provide severance, career counseling and support transitioning to future employment,” the statement said. “Pinova is committed to working with its valued clients to look for internal and other alternatives,

“Knowing that this is a lengthy process, it is important to prepare our city to ensure that proper environmental study is done on the footprint so that we can properly assess the impact to our people and ecosystem,” he said.

Environmental cleanup efforts at the Terry Creek outfall ditch, which is across U.S. 17 from the facility, will continue under the supervision of the federal Environmental Protection Agency. Cleanup efforts there are to eliminate exposure to remaining levels of residual toxaphene in the surrounding marsh and creeks.

Environmental remediation of Hercules’ legacy will also continue at the Pinova site under the supervision of the state Environmental Protection Division. Hercules and Pinova are listed as co-permittees with the state on the corrective action plan that seeks to remediate chromium in the soil and groundwater.

Pinova purchased the operational portions of the facility from Hercules in 2010. Pinova produced a terpene resin from pine stumps that are used in numerous applications, including fragrances and food products like chewing gum, sports drinks and makeup. It also is used in tapes and road-paving materials, according to the company’s website.

Pinova is owned by DRT America, a U.S. subsidiary of French-based DRT. DRT is owned by Fermentich International SA, a Switzerland-based company that specializes in fragrances and flavors.

Taylor Cooper and Gordon Jackson contributed to this report.



Michael Hall

as multiple other agencies from around the region. A firefighting foam was deployed on the ground and by air that eventually extinguished the blaze at around 10 p.m. that night.

The fire prompted shelter-in-place orders for areas surrounding the facility and on St. Simons Island where the smoke blew. An evacuation order was also ordered that evening for the area around the plant.

Plant officials said at a town hall meeting in the weeks following the fire that the alpha-pinene that burned is a byproduct of the wood-pulping process. Alpha-pinene is highly flammable and has a low flashpoint of 91 degrees, according to the National Library of Medicine's National Center for Biotechnology Information.

Brunswick Fire Chief Tim White said Wednesday that the department continues to monitor the site of the fire and is still working with the State Fire Marshal's Office to investigate its cause.

HISTORY, FUTURE AND THE ENVIRONMENT

The closing leaves an uncertain future for the 152-acre facility. Moore said that after first working with employees through the transition, the development authority and its community partners will begin looking at what happens with the property as it shuts down over the next 18 months.

There are currently no clear plans for what comes next.

"It will be a much larger conversation about the future of the property," Moore said.

The facility opened in 1911 as a naval stores plant that used a then-new method for extracting rosin from pine tree stumps. Nine years later, in 1920, Hercules began operating at the facility producing rosin and turpentine from pine stumps.

Hercules operated the facility for nearly 100 years, producing numerous different products over the decades that included smokeless powder during World War I, munitions during World War II, and later an insecticide called toxaphene, among other things.

Production of toxaphene and other substances left an environmental legacy that is still being remediated today.

Mayor Johnson said environmental mitigation at the site must be the focus of Pinova, its parent company and regulatory agencies.

He now wonders what the future holds for the 152-acre site.

U.S. Rep. Buddy Carter, the Pooler Republican whose district includes Georgia's coastal counties, lamented the loss.

"I'm sad to hear that the Pinova plant in Brunswick, a longstanding community partner, is closing its doors," Carter said. "Companies like these are the bedrock of our local economy, employing hundreds of our friends and neighbors, and all of Glynn County will feel this loss.

"I'd also like to reiterate my gratitude for the first responders who quickly contained the fire earlier this year and protected their community from further irreparable damage."

THE FIRE

Johnson and Booker have both expressed frustration with the pace at which answers about the fire are emerging. No report so far has been released about the cause of the fire by company-hired investigators, the State Fire Marshall's Office or federal officials.

The company's headquarters are in France, Booker noted, making it hard to communicate directly with leadership. Local representatives are responsive, but he said local authorities have long wanted to open direct lines of communication with Pinova.

"I know they were having an inspection, but we still don't know the cause of the fire or if that's the reason why they're deciding to close," Booker said.

Johnson said that moving forward he will look closely at what state and federal agencies will conclude in their reports on the fire.

"Their insight will help lead further action by my administration," Johnson said.

Two fires occurred April 15 at the plant. The first ignited early in the morning and was quickly put down by the Brunswick Fire Department.

The fire ignited again around 2 p.m. and burned for more than six hours, sending a thick black plume of smoke into the air that blew across the marshes and over St. Simons Island. The Brunswick Fire Department was aided in the firefight by the Glynn County and Jekyll Island fire departments as well

"It's sure a shot across the bow to this community," Cason said. "If we don't have something called manufacturing, it's not a good, positive thing for this community."

Brunswick was home to many industrial businesses in the not-to-distant past that paid well and supported local families, he said. Most are now closed, he noted.

"I know what the loss of a job is. It's absolutely devastating," Cason said.

Glynn County Commissioner Allen Booker, whose district includes most of the city, said he was "taken aback" by the seemingly sudden decision.

"Neighbors come together and find ways to solve problems, and this is not a solution," Booker said. "This is not what is best for anyone."

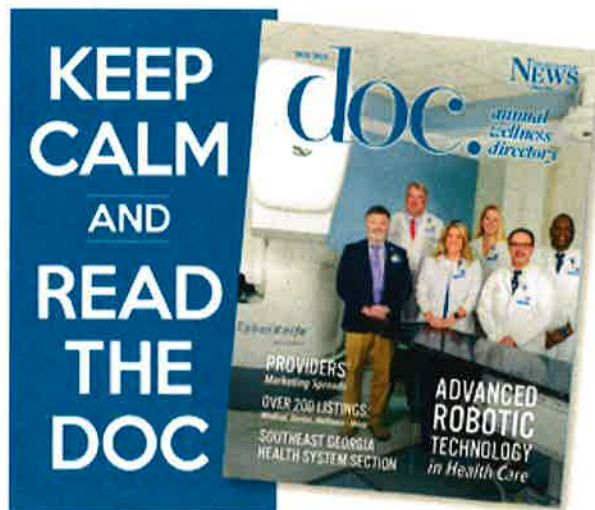
Glynn County Commission Chairman Wayne Neal said he learned about the plant closure Wednesday morning when he received a phone call from a Pinova lawyer.

Before the announcement, Neal said he was "fearful" the plant would never reopen after the fire.

"It's a loss to our county," he said. "We hate it."

Neal said county officials plan to do everything possible to help the displaced workers.

At-large County Commissioner Walter Rafolski said he was surprised to hear about the closing.



"I think it's a big loss to the county," he said. "I was stunned when I learned about it."

as available.”

Ryan Moore, president and CEO of the Golden Isles Development Authority, said authority staff is meeting with company officials and a state task force that oversees large-scale closings and layoffs to ensure employees can access opportunities for new jobs.

“We are focused at this time on the employees who are now looking for jobs,” Moore said. “We are making sure that we as a community are coordinated to give them as many opportunities as possible.”

Pinova qualifies under the Worker Adjustment and Retraining Notification Act, WARN, which requires employers with more than 100 employees who are laying off at least 50 people to provide at least 60 days’ notice with pay before they are out of a job.

Employees will be on paid leave until July 10 and employed through Sept. 15, company officials said.

Pinova officials said Wednesday that some employees will continue working with the company during the 18 months the plant is shutting down. That number has not been determined.

Employees can also apply for positions at DRT America, Pinova’s parent company, which operates a facility in Rincon, officials said. A list of job opportunities with the company was provided to employees.

The severance package has been presented to non-union employees and will be negotiated in good faith with the union, the company said.

REACTIONS FROM OFFICIALS

Brunswick Mayor Cosby Johnson said his administration’s immediate focus is on Pinova’s employees.

“We are working with larger businesses in the area as well as major job centers to ensure we are providing a robust municipal response for any individual who lost their job as a result of the economic decision of Pinova,” Johnson said. “The employees’ skills and determination has defined a generation of hard workers in Brunswick and throughout our region.”

City Commissioner Johnny Cason, who represents the city’s north ward where Pinova is located, said the closing is a major blow to the city in terms of employment and economic development.

APPENDIX D

Affordable Housing Plan For The City of Brunswick, Georgia Challenges and Opportunities



**Prepared by
City of Brunswick
Department of
Planning, Community Development and Codes
May 25, 2023**

What is Affordable Housing: *Housing is considered affordable if total housing expense, including rent or mortgage plus other housing expenses (utilities, insurance, etc.) paid by the occupant, does not exceed 30 – 35% of a family’s gross income (Department of Housing and Urban Development (HUD) standard).*

The Median Family Income of families in Brunswick in 2021 was just slightly under \$33,500 per year, significantly lower than families in Georgia and Glynn County. The number of Brunswick families living below the poverty level of \$27,500 per year hovered at around 34% in 2021; nearly three times as high as all of Glynn County at 12%.

The HUD affordable housing standard of 30 – 35% presents a serious challenge for City of Brunswick residents to secure affordable decent. Safe and sanitary housing within the Brunswick housing market.

EXECUTIVE SUMMARY

The issue of affordable housing has never been as prominent as it now is across our Nation, partially due the COVID 19 Pandemic which impacted materials cost and labor supply as well as timing and cost issues relating to transportation. The result has been the cost of housing increasing in most areas of the country by 40 – 50%. Since the pandemic abated a year ago, that increase has dropped somewhat but home construction costs remain higher by as much as 25% in most areas and rent increases of about the same percentage.

From the socio-economic and housing data gathered and analyzed for this report, one can easily see that there are real challenges for families living in the City of Brunswick to find affordable housing opportunities. Yet there are also opportunities for the city to address those needs by providing leadership and public investment in programs that will facilitate the development of affordable housing while revitalizing the community's neighborhood and core city areas. The physical and historic character of the city will benefit from both.

Much of City's population of around 15,000 does not have the financial capacity to either rent or purchase adequate and standard condition housing in today's market. The gap between available income capacity and housing costs is as much as \$10,000 per year for many of the city's Median Family Income family and non-family households. Following are some of the challenges Brunswick's families have in seeking adequate affordable housing:

- As many as 1500 or 45% of the city's family households are currently "housing cost burdened" (spending more than 30% of family income for total housing expense) as well as 1100 non-family households including single elderly persons living alone.
- 64% of all occupied dwelling units are rented and 60% of those units are single family or duplex homes, a high percentage of which require substantial rehabilitation. Few affordable apartment dwellings are available in the city.
- 9% of all single family and duplex housing structures are rated in poor condition requiring substantial rehabilitation or demolition (unfit for human habitation); 40 % are rated in only fair condition indicating a need for modest to major rehabilitation. Another 43 % are rated in only average condition, requiring modest rehabilitation. Only 8% of all single family and duplex housing is considered to be in good or excellent condition.
- As many as 2,000 families and individuals are currently living in inadequate, costly and substandard housing.
- Current sales and rental data indicate that some families and individuals are forced to leave the city because of inadequate housing opportunities. Many are relocating into developing Glynn County or even nearby Brantley or McIntosh Counties.

Most new housing since 1970 has been built outside the city with most of it being multi-family or townhome rental communities. Within the city, only 85 new single family housing units have been added over the past 10 years. In addition, consider the following current market conditions in the City:

- Currently, there are an average of only 35 - 40 homes on the market for sale inside the city with an average list price of \$172,450. These homes normally remain on the market for less than 60 days.
- There are virtually no rental apartments available within the city and those not being developed in the county have rents starting at \$1,250 for a one-bedroom unit and \$1,450 for a two-bedroom unit. Many families and individuals renting these units must devote as much as 40% – 50% of family income for housing expense. 30% - 35% is considered normal.
- New single family “starter homes” are located outside the city now priced at \$175,000 compared to under \$150,000 a few years ago and are beyond the reach of most families.
- Federally subsidized rental housing in the city, including public housing, Section 8 voucher certificates and other tax incentivized affordable housing have waiting lists of well over 1,000 families and individuals.

From this summarized data, it is easily seen that the City of Brunswick, like many communities facing affordable housing needs, has real challenges to overcome.

Yet, there are opportunities for the city to not only begin to address and meet those challenges, but by doing so, begin the transformation of many of its declining neighborhoods through innovative housing programs. Consider these opportunities:

- There is a large supply of older 2- and 3-bedroom homes, in poor condition, which can be rehabilitated and offer opportunities for affordable housing for many families.
- There are numerous incentive programs for development of affordable rental housing using Federal tax incentive programs. Two such projects have been completed in Brunswick during the past 5 years.
- Through aggressive pursuit of tax foreclosed properties using the recently created Land Bank Authority, sites can be made available for both new homeowner single-family, townhome or duplex housing or for the development of small rental complexes of 8 or more units.
- Expand the use of Federal programs like CDBG, CHIP, and the HOME Program to name a few to help with home repair and rehabilitation as well as the construction of new housing.

By implementing these and other measures, the City of Brunswick can assure that the on-going efforts to revitalize its downtown, historic core area, and its neighborhoods will continue and flourish.

An Affordable Housing Plan which, adopted and implemented, can help assure the success of a revitalized city.

INTRODUCTION

Affordable Housing has become one of the Nation's top domestic issues. Since the outbreak of the COVID 19 Virus in early 2020, we have seen the housing market nationally and locally dramatically change. Consider these current housing market conditions that evolved during the Pandemic; many of which are still continuing and affecting the market:

- Dramatic increases in the cost of building materials, in some instances as much as 40%. Even though increases have abated somewhat, builders in the area indicate that, on average, building materials are 15% - 20% higher than two years ago. Coupled with increases in labor cost, the overall cost of housing has risen around 25%.
- Shortages of construction materials and components as supply chain issues have improved but still persist for some items.
- Shortages of construction trades labor and substantial increases in labor costs. This has limited the return of many homebuilders into the market, particularly for single-family homes.
- Inventories of new and existing housing units for sale have decreased to levels not seen in many years resulting in substantial rises in sales prices. Although inventories have increased somewhat in recent months, it is still a "seller's market" because of limited supply.
- Starter homes were generally available prior to the pandemic in the \$150,000 range are now priced at \$175,000 to \$200,000 and above in most areas.
- Mortgage rates have increased from the mid 3% level to 6% or higher.

These changes in the housing market have resulted in families forced to use a higher percentage of their income for housing expense or it has forced them to share housing with other family members or friends. Those families who have chosen to rent, have seen rental rates for single family homes and apartments rise as much as 20% in some markets. Home ownership has slipped into the mid 30% range in many cities, including Brunswick.

In the State of Georgia, the affordable housing issue is considered so serious that the Governor has called attention to the negative impact it is currently having on economic development in the state. He has called on state and local government to seek solutions including removal of regulatory measures which unduly inhibit the construction and cost of housing.

The housing market in the City of Brunswick, and particularly throughout Glynn County, is no different; perhaps even worse. Coupled with the described dynamics of the national and state housing market, is a city population whose residents have a Median Family income of \$33,500 which is substantially less than what is required to obtain affordable decent and adequate housing. The city's family poverty rate still hovers at over 32%. These and other conditions, including a lack of newly constructed affordable housing either for sale or for rent, compound the challenge for Brunswick to meet the housing needs of its population. This is not a new challenge for Brunswick as it has persisted for many years.

The purpose of this Affordable Housing Plan is to quantify the challenge facing families and individuals seeking affordable housing and to recommend specific actions, policies and initiatives that can be undertaken by to meet that challenge. By adopting a plan, the City of Brunswick will acknowledge the extent of the need, establish policies, and initiate programs to meet that need.

BACKGROUND – POPULATION AND SOCIO-ECONOMIC PROFILES

Brunswick is a historic coastal city with a central core area of beautiful homes, churches, schools, and commercial structures amidst beautiful 100-year-old plus live oak and other “Heritage” trees. Today it boasts a thriving port which moves import and export vehicles and construction machinery through it daily as well as a thriving tourist industry due to its historic past and proximity to coastal beach areas.

Its economic past is linked to the timber and timber products industry and, during World War II, to the building of Liberty Ships for the war effort and hosting a Navy Base for sub searching blimps. It was during those years when Brunswick saw significant population growth which reached over 20,000 by early 1960s. Its urban and metropolitan areas also began to grow and develop during that period. Nearly 70% of all homes in Brunswick were built prior to 1970. The timber industry remains an important part of the area’s economy.

Table 1 presents US Census 2021 ACS projections of key population and socio-economic data for the city, its urban area (excluding St. Simons and Jekyll Islands and Sea Island) and all of Glynn County including the island population. It should be pointed out, that population, socio-economic and housing data available for this report vary considerably by data source. The margin of error for much of the US Census data is often high due to the low percentage of responses in 2020 due largely to the COVID 19 Pandemic. Every effort has been made to compare data and choose that which was felt to be most accurate including comparing data to actual counts.

- The city, and its urban area population has remained more or less static since 2000 at around 15,000 and 33,000 respectively, while all of Glynn County has increased about 25% from 67,500 in 2000 to 84,740 in 2021.
- The City’s population is 60% African American compared to 40% for the urban area and 24% for Glynn County.
- Median Family Income (MFI) among city residents is \$33,357 compared to \$45,561 for the Urban Area and \$66,537 for all Glynn County residents. Income in all these areas falls below the State level of over \$80,000. The City’s MFI has remained essentially the same since 2000 factoring in inflation.
- Median Family Income in Glynn County is heavily influenced by the population living on St. Simons Island where the MFI is estimated at \$120,000. Data for Sea Island and Jekyll Island is not estimated by the US Census because of the small number of full- time resident homeowners.

**Table 1
Population Profile**

<u>Data</u>	<u>City of Brunswick</u>	<u>Brunswick Urban Area</u>	<u>Glynn County</u>
Total Population - 2021	14,774	33,427	84,739
Total Population - 2010	15,383	33,555	79,816
Total Population - 2000	15,600	31,588	67,568
Racial Composition			
African American	60%	40%	24%
White	34%	44%	62%
Other	6%	16%	14%
AGE			
Median Age	36	35	41
% over 65	17%	15%	15%
% under 18	23%	25%	21%
Median Household Income	\$ 29,362.00	\$ 36,223.00	\$ 61,984.00
Median Family Income	\$ 33,357.00	\$ 45,561.00	\$ 66,537.00
Families Below Median Income	53%	54%	45%
Families Below Poverty Level	34%	30%	12%
Employment			
% of Labor Force Employed	93%	95%	96%
Employed where Live	21%	67%	67%
Employed Elsewhere	79%	33%	33%
Average Commute Time	19 min	22 min	23 min
Occupations			
a. Retail Trade	13%	17%	13%
b. Professional/ Management	8%	12%	12%
c. Education, Health Care	26%	21%	22%
d. Accommodations, food serv.	18%	17%	18%
e. Government	13%	11%	7%
f, All other	22%	22%	28%
Education Attainment			
a. Less than a HS Degree	14%	16%	12%
b. HS Graduate	35%	35%	28%
c. Some college / 2 yr degree	32%	33%	31%
d. College degree	19%	16%	29%

Source: US Census ACS 2021 Projections

AREA WORKFORCE AND ECONOMY

Much of the economic and job growth has occurred outside the City in recent years, particularly on the islands (St. Simons and Jekyll) fueled by tourism which continues to be a leading economic driver for the area. The Port of Brunswick, located to the Southwest of the City continues to grow and expand, and is currently one of the largest automobile and construction vehicle import and export shipping and processing facilities in the US.

Total employment in Glynn County stands at around 30,000 jobs; 8,687 jobs are within the City of Brunswick. Of the total jobs within the city, only 973 jobs (11%) are filled by the city's employed labor force living within the city. This data was collected and analyzed as a part of a public transit study for the city and also concluded:

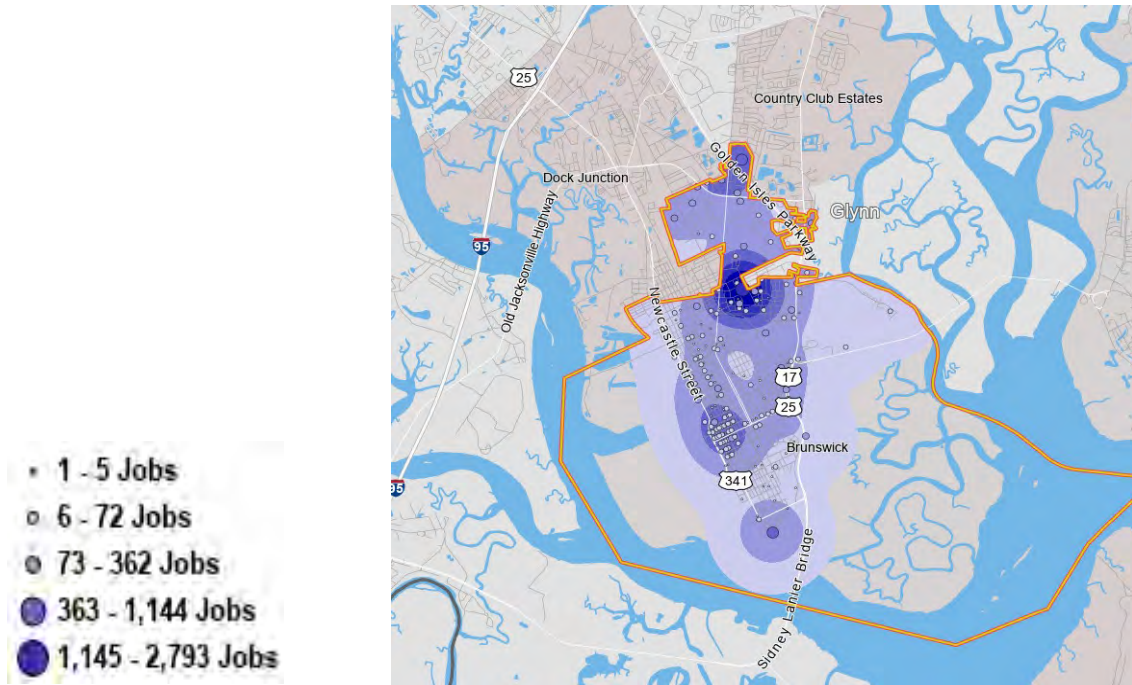
- Only 21% of the city's labor force work within the city and fill only 11% of available jobs. Approximately 24% of the city's labor force are employed on St. Simons and Jekyll Islands. The remaining 55% are employed either inside or outside Glynn County.



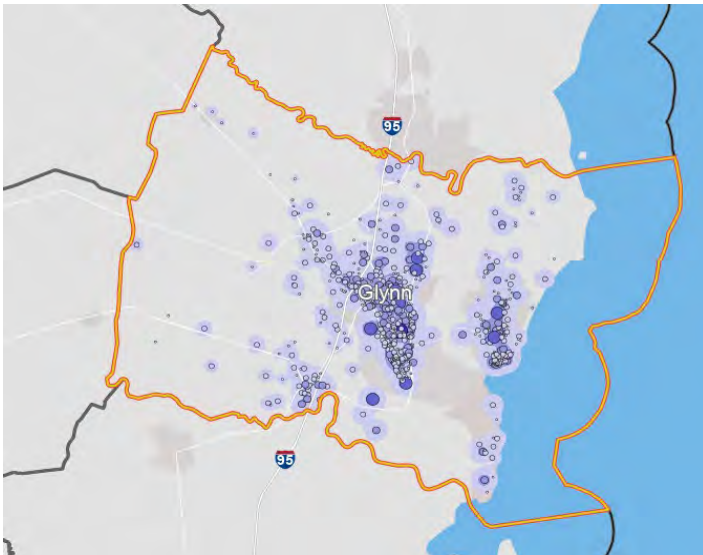
- Jobs being filled inside the City are from St. Simons (10%), Glynn County (45%) and outside Glynn County ((35%)
- The largest percentage of privately employed workers are full time in health care, education, accommodations, retail, and food service. The latter three are fueled by the tourist market in the city and on the islands. These three make up the lower paying sectors of the area job market.
- Full time earnings show that 1/3rd of city workers are earning only \$1,250 per month with 46% earning between \$1,250 and \$3,333 per month. This helps explain the low Median Family Income of under \$33,000 per year.

- The largest concentration of jobs in the city are in the Coastal College and Southeast GA Hospital complexes and in Downtown Brunswick as can be seen on the map below. Countywide, jobs are concentrated in the City of Brunswick, St. Simons and Jekyll Islands and at major interchanges along I-95 West of the City.

Brunswick Job Concentrations



Glynn County Job Concentrations



HOUSEHOLD OCCUPANCY CHARACTERISTICS DATA

The characteristics of households renting or owning their homes in Brunswick, provides an even clearer picture of the challenge for families to find affordable decent safe and sanitary housing. Following is a summary of housing occupancy data for the city, its Urban Area and Glynn County.

Table 2
Household Occupancy Characteristics

<u>Data</u>	<u>Brunswick City</u>	<u>Brunswick Urban</u>	<u>Glynn County</u>
TOTAL HOUSEHOLDS	5,616	13,234	33,401
AVERAGE HOUSEHOLD SIZE	2.54	2.47	2.5
Owner Household Av. Size	2.92	2.63	2.50
Rental Household Av. Size	2.32	2.5	2.5
TOTAL FAMILY HOUSEHOLDS	3,226	7,397	21,846
Av. Family Size	3.27	3.23	3.04
a. Married Couple Family	1,219	3,465	15,027
b. Male Head of Household	338	1,076	1,564
c. Female Head of Household	1,669	2,856	5,255
d. Non-family Households*	2,390 (43%)	5,837 (44%)	11,555 (35%)
Household Size - Occupied			
a. 1-Person	37%	39%	30%
b. 2 - Person	28%	28%	37%
c. 3 - Person	21%	15%	15%
d. 4 - Person	14%	18%	18%
Mo. Housing Costs - Owner Occ.			
a. \$0 - \$499/mo.	25%	43%	26%
b. \$500 - \$999	45%	29%	22%
c. \$1,000 +	30%	28%	52%
d. Median Monthly Cost	\$1,016	\$1,015	\$1,471
Mo. Housing Cost - Rented Occ.			
a. \$0 - \$499/mo.	18%	12%	10%
b. \$500 - \$999	49%	48%	40%
c. \$1,000 +	33%	40%	50%
Median Monthly Cost	\$785	\$874	\$960
H H PAYING +30% FOR HOUSING	45%	41%	37%
*Household made up of unrelated individuals			

Source: US Census ACS 2021 Projections / Glynn County Tax Assessor

In summary, this data shows:

- A large percentage of households in the city (43%) are non-family households, defined as unrelated persons are sharing housing. This category also includes elderly individuals living alone.
- Of the 3226 family households in Brunswick, 1,669 (52%) have a female head of household, a significant increase of about 11% over the last 20 years. 38% of all family household heads are married couples a decrease of about 10% over the past 20 years.
- The numbers are quite different in Glynn County as a whole. Married family heads of households make up 69% of all family households, significantly higher than the city. Non-family households make up 35% of all households, much lower than the city.
- Household makeup within the Brunswick Urban area mirrors that of the city.
- The average size for city households is 2.54 persons, slightly larger for household owners and lower for household renters. These percentages are similar for Urban Area and Glynn County households as well.
- The size of households is similar in the city, Urban Area and Glynn County Area at around 2.5 persons

CURRENT HOUSING EXPENSE FOR FAMILIES

Total housing expense including utilities, plus insurance and maintenance for housing if owned should not exceed 30 – 35% of family income. Following are the highlights of US Census 2021 estimates of monthly family housing expense for Brunswick, its Urban Area and Glynn County (See also Table 3).

- Total average monthly housing rental expense exceeds 30% of family income for 48% of families renting and 42% of families owning their homes in the City of Brunswick. Those households are paying an average \$1016 monthly for homeowner housing expense, excluding utilities, and \$785 monthly for rental expense, excluding utilities. The percentage of these housing expenses for families in the Urban Area and Glynn County average 35%
- Total average monthly rent expense of \$785 in the city exceeds 30% of MFI for 48% of families renting. In the Urban Area and Glynn County it exceeds 30% for an average 45% of families renting; essentially the same.
- While monthly housing costs are somewhat lower in the City than its Urban Area and Glynn County, housing choices are limited by supply and the condition of housing is poorer.

Table 3
Profile of Existing Housing Characteristics and Cost
City of Brunswick, its Urban Area and Glynn County

	<u>Brunswick City</u>	<u>Brunswick Urban</u>	<u>Glynn County</u>
TOTAL NUMBER OF HOUSING UNITS	6,884	15,536	42,091
Occupied	82%	85%	79%
Vacant	18%	15%	21%
Renter Occupied	64%	57%	33%
Owner Occupied	36%	43%	67%
 HOUSING TYPE			
Single Family	70%	65%	69%
Duplex	7%	7%	5%
Multi Family	21%	19%	17%
Mobile Home	2%	9%	9%
 SF HOUSING SIZE			
1 Bedroom (incl 0 Bedrooms)	19%	12%	9%
2 Bedroom	30%	29%	21%
3 Bedroom	40%	47%	50%
4+ Bedrooms	11%	12%	20%
 SF HOUSING AGE			
Built Pre 1970	65%	49%	28%
Built 1979 - 1999	25%	38%	46%
Built After 1999	10%	13%	26%
 SF HOUSING VALUE			
Median value	\$ 105,800	\$ 111,600	\$ 204,900
Homes with Mortgage	48%	52%	62%
 OWNER AND RENTER HOUSING COST			
Owner w/ Mortgage - Median/Month	\$ 1,016	\$ 1,015	\$ 1,471
Owner Paying More than 30% of Income	42%	37%	30%
Media Rent Paid by Tenants/Month	\$ 785	\$ 874	\$ 960
Renter Paying More Than 30% of Income	48%	46%	44%

Source: US Census ACS 2021 Projections

PROFILE OF EXISTING HOUSING IN THE BRUNSWICK MARKET AREAS

Existing housing in the City of Brunswick can generally be described as older, in only average or fair condition with pockets of severely dilapidated and vacant housing in many of its neighborhoods. The Historic District in the city's core area boasts a significant number of beautifully restored homes and the neighborhoods adjoining the district are showing signs of revival. Within its urban area, the housing profile is only somewhat improved in terms of home ownership, makeup and age. Housing conditions and choices are significantly better in the newly developing portions of Glynn County where most new housing has been developed over the past 20 years.

Following is a summary of housing data presented in the preceding Table 3 based upon the US Census 2021 Projections for the City of Brunswick, its Urban Area and Glynn County:

- Within Glynn County, approximately 16% of all housing units are located in the City of Brunswick.
- Owner occupied housing in Brunswick is 36% of all occupied units compared to 67% within Glynn County and 43% within the Brunswick Urban Area.
- 64% of all housing in Brunswick is rented, compared to only 33% for all of Glynn County. Over 60% of rental housing in Brunswick are single family residences.
- In Brunswick, 70% of all housing units are single family dwellings compared to 65% in all of Glynn County. Mobile homes make up only 2% of all housing units in Brunswick but 9% within Glynn County,
- Housing units have fewer bedrooms in Brunswick with 49% having only 1 or 2 bedrooms. Three- and four- bedroom homes make up 60% of all housing in the Urban Area and 70% in Glynn County.
- 65% of all housing units (mostly single family) in Brunswick were built prior to 1970; New housing built since 2000 makes up 26% of all housing in Glynn County but only 10% in the City of Brunswick.
- The median value of all owned homes in Brunswick is \$105,800; \$111,600 in the Urban Area; \$204,900 in all of Glynn County.

HOUSING CONDITIONS IN THE CITY OF BRUNSWICK

Existing housing conditions within the City of Brunswick are generally average to fair as characterized by the Tax Assessor's periodic assessment. Following is a summary of housing condition data taken from the Glynn County Tax Assessor's records. (See APPENDICIES 1 AND 2 and Maps 1 and 2 which depict that data):

Of a total 4,663 single family residences in the City of Brunswick.

- 40% were rated in only **Fair** condition, requiring extensive rehabilitation.

- 9% of all homes were rated in **Poor** condition, possibly requiring demolition.
- 43% were considered to be in **Average** condition, requiring moderate to light rehabilitation or minor repairs..
- Only 8% of all homes were rated in **Good or Excellent** condition.

This indicates that over half of all housing units in the City require substantial rehabilitation with 10 – 15 % of those units likely requiring demolition. Another 43 percent, ranked Average, require some rehabilitation or moderate repairs. **It is most likely that at least 2/3rds of those single-family homes requiring rehabilitation are rental units.**

The heaviest concentration of single- family homes in **fair or poor** condition were located in the following Comprehensive Plan Character Areas and Neighborhoods. This data is graphically shown on Map No. 1:

- South End Brunswick – 44% particularly in the South and Southeast Brunswick Neighborhoods.
- Dixville / Habersham Park – 71% throughout the area.
- Urbana / Mayhue – 61% throughout the area
- Old Town, particularly the TAD #1 District with 81% and Grant Street with 61%
- New Town / New Town Commons – 71% throughout the entire area.

There are virtually no areas of the city that are not impacted by poor housing conditions and declining homeownership.

The city's code enforcement department has conducted surveys of much of the City's housing as a part of their enforcement program and reports the following:

- There are currently 186 homes that are determined to be dilapidated mostly single-family homes, that will likely require substantial rehabilitation. These are predominantly located in the core city neighborhoods.
- 109 residential structures are considered uninhabitable and requiring demolition. These structures are likewise located in core city neighborhoods, particularly along MLK and Norwich Streets.
- Since 2007, property owners or the City's Code Enforcement Program has taken action to have over 323 uninhabitable homes demolished: 143 in the past 10 years.

THE CITY OF BRUNSWICK HOUSING PROGRAMS

The City's housing policies and programs have received increasing attention by the City Commission in recent years. Code enforcement and home repair programs have been guided by its Five-Year Consolidated Plan. This Plan is prepared and updated every 5 years for submission to The Department of Housing and Urban Development to support the use of their

entitlement CDBG Funds for its Housing Programs. The most recent Consolidated Plan was approved by the City in September 2020. This Plan calls for the following Goals and actions to be undertaken between 2000 and the end of 2024.

<u>GOAL</u>	<u>FUNDING</u>	<u>PROJECTED GOAL OUTCOME</u>
Housing Rehabilitation	CDBG	6 Homes Annually
Services to Homeless	CDBG	50 Persons Annually
Infrastructure Improvements	CDBG	1,000 Homes Benefitted Annually
Public Services	CDBG	131 Persons Annually
Spot Demolition	CDBG	3 Annually

Some of the housing issues identified in the current Consolidated Plan include:

- Although many of the existing homes are “affordable” for acquisition or rental, they require rehabilitation which adds to the cost to acquire or rent making them not “affordable”.
- Because such a large % of the existing housing stock was constructed before 1970, it is not hurricane wind resistant adding considerable cost to home rehabilitation.
- Many existing homes are not handicapped accessible and require alterations to access, room entry and bathroom facilities safe access.
- The incidences of overcrowding and lack of multiple facilities in homes (plumbing, adequate heat and ventilation, functioning doors and windows, etc.) is disproportionately higher among lower income and minority families.
- While Median Family Incomes are flat or decreasing, the cost of housing is increasing thus widening the affordability gap.

AFFORDABLE AND FEDERALLY SUBSIDIZED RENTAL HOUSING

There are a total of 21 affordable rental apartment properties in Brunswick ranging in size from 8 units to over 100 units including:

- 589 Public Housing Units and 46 managed private units of below market rate rents ranging in size from 1 bedroom to 5 bedrooms. Public Housing Tenants pay no more than 30% of their household income for rent and utilities.
- 386 families currently holding Section 8 Housing Choice Vouchers occupying approved apartment units at reduced rents. The Section 8 Home Choice Program is administered by the Brunswick Housing Authority and targets low - income families earning 30% - 80% of Median Area (Metropolitan) Income of \$75,000.

- 277 apartment units developed with Low Income Housing Tax Credits that offer reduced levels of rent to low- income families earning as little as 20% of Area Median Income.

Area median Income is established by HUD for Metropolitan Areas. The Brunswick SMSA includes all of Glynn County (including the Islands where incomes are significantly higher than the mainland) as well as McIntosh and Brantley County. The Median Family Income for just the City of Brunswick is \$33,357, less than half the Metropolitan Area Median Income of \$75,000.

These affordable rental units total approximately 1382 or 30% of all occupied rental housing in Brunswick. They are located primarily in the core and northern areas of the city. The Median Household Income of those occupying rent assisted housing is just over \$26,000 per year and the average household size is 2.47. The median rent and utility expense paid for these assisted housing units is currently \$700 per month. This compares to a median market rate rent and utility expense of almost \$800 per month for the entire city market and over \$1,000 per month for the entire Brunswick urban area including most of Glynn County.

Currently, the Housing Authority has a waiting list of over 1400 family and individual applicants for public housing units and 623 on the waiting list for Section 8 housing vouchers. These extensive wait lists illustrate the lack of available decent, safe and sanitary affordable housing in Brunswick. Currently nearly HALF of all Brunswick families are severely housing expense burdened and around 30% are estimated to be renting substandard housing.

Around 110 federally subsidized housing units have their affordability restrictions expiring by 2030 and another 230 units are scheduled to expire after that date. **The city should encourage owners to extend their affordability contracts.**

THE CURRENT HOUSING SALES MARKET IN BRUNSWICK AND GLYNN COUNTY.

Housing Market Trends 2018 – 2023

Like most residential real estate markets over the past 5 years, Brunswick and Glynn County have experienced their ups and downs. Following is a summary of sales history over the past 5 years for both markets.

	Jan. 2018	Jan.2019	Jan 2020	Jan 2021	Jan. 2022
Glynn County					
Sales Inventory	904	1040	941	574	315
Median Sales Values	\$250,000	\$262,000	\$258,100	\$246,000	\$270,000
High Value	\$392,000	\$282,000	\$366,000	\$424,000	\$435,000
Low Value	\$250,000	\$262,000	\$168,500	\$179,300	\$182,900
Median Sales Price for Single Family Homes					\$285,000
Median Sales Price for Townhomes					\$302,000

BRUNSWICK - City Core Area

Median Listing Price	\$89,000	\$131,450	\$100,750	\$164,900	\$129,000
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Current Market Supply – January 2023

Zip 31520	\$172,450	29 Active Listings	Brunswick Core Area
Zip 31523	\$288,250	49 Active Listings	Brunswick Urban Area
Zip 31525	\$341,700	100 Active Listings	Brunswick Urban and Suburban Area
Glynn County	\$444,100	313 Active Listings	Includes the Islands

The Median Sales Price for housing within the entire Glynn County Market currently is averaging \$347,000. This has increased substantially since 2018 when the median sales price was below \$250,000 and prices for “starter homes” just below \$150,000. Currently, the asking price for a “starter home” begins at \$175,000 - \$250,000.

The US Census of Housing Construction has reported the following data relating to the issuance of residential building permits for the years 2019 – February 2023 for all of Glynn County:

Building Permits Issued in Glynn County – 2019 - 2022

YEAR	Total Units	SF	Duplex	3 – 4 Units	(5+ Units - No. Bldgs)
2019	460	437	10	0	13
2020	542	457	36	3	46
2021	723	691	12	0	20
2022	1567	879	88	68	537
2023 (MAR)	82		76	0	0

During the same years in the table above, the City’s Building Department reports issuing 44 permits for new housing construction. Only 30 of these were issued for newly constructed single-family homes. Four permits for multi-family apartment projects totaling 170 units were issued as well as a permit for 60 “tiny homes” for the homeless. The remainder were issued for 7 substantially rehabilitated homes.

Currently, as reported by the MLS, there are only 35 -40 homes listed for sale in the City of Brunswick averaging \$172,450 or \$118/ SF. Within Glynn County, there are currently reporting 313 listings averaging \$444,000 or \$237 per SF. This area includes St. Simons, Sea Island, and Jekyll Island which increases the average listing and sales prices for the area substantially. The current supply of homes for purchase, particularly new homes, has not yet recovered from the construction slow-down and shortage of building materials. This has resulted in a “seller’s market” environment adding to the cost pressures of higher construction costs and profits being sought by builders and their suppliers.

Home sales within the city are typically for older homes as few new single family or multifamily ownership units are being developed. The Median Sales Price for housing in the City’s core area is currently around \$160,000, with homes selling in around 36 days after being placed on the market. Some homes in the core area and adjacent neighborhoods sell for under \$80,000 but require rehabilitation. Housing needs for the City of Brunswick are primarily being met within its Urban Area to the North and West and beyond to the developing Metropolitan Area. For the past 20 or more years, most new housing, both rental and ownership, has been built outside the city.

A home purchased in the city at the median sales price \$160,000 and financed at a current interest rate after a 10% down payment, would require a mortgage payment of \$950 per month. After including taxes, insurance and monthly utility costs, that amount increases to \$1300 per month. **For a family not to be cost burdened by housing expense, such a purchase would require an annual income of \$50,000 to \$55,000; 70% above the current Median Family Income for City of Brunswick families of 4.**

For the same family to purchase a new home in the Urban Areas at \$175,000 or more, raises the annual income level needed to avoid being cost burdened to \$60,000 or more; 100% higher than the Median Family Income level for City residents.

An additional market factor adds to the dilemma of families seeking home ownership. New and existing homes are being acquired by investors offering no contingency and all cash offers (not dependent upon financing). These homes are then offered for rent with the expectation that they will increase in value over the ensuing 5–10-year period and then be sold offering the investor(s) an attractive return.

Lastly, while there are opportunities for housing developers to purchase existing housing units needing modest to extensive repairs at much lower square foot costs, that opportunity has not yet resulted in any significant increase in the supply of housing at affordable cost or even higher.

NOTE: Data on listings and sales was obtained from The Glynn Multiple Listing Service and from Redfin Real Estate Services a Nation Real Estate Management Firm. New housing construction data was sourced from the

CITY OF BRUNSWICK HOUSING MARKET DEMAND AND SUPPLY

A housing market study completed in 2019 for the Downtown and In–Town Brunswick Neighborhoods indicated **a fairly strong market for households preferring to live within an urban core area and in walkable urban styled neighborhoods.** The potential overall housing market for the Brunswick Urban Area identified in the report was for 1,425 households seeking urban style housing and neighborhoods each year for the next 5 years and that the core area of Brunswick could capture as many as 500 of that market annually.

Additionally, the market study identified that roughly half of that market demand potential was from younger singles and couples, empty nesters and small families seeking new and existing housing of almost every possible type. This market segment is primarily looking for rental opportunities (65%) with the remaining 35% seeking homeownership. Those seeking rental housing do so because of affordability issues.

With advent of the COVID pandemic in late 2020 and lasting into early 2022, many of the demand assumptions for housing have been altered. Equally important, the development of new affordable housing to meet this market demand has likewise altered due to increased costs of construction. In other words, much of the market dynamics that existed just a few years ago has now changed. Add the improved housing demand of hundreds, even thousands, of households and families currently living in Brunswick or its outlying urban areas for new and existing rental and ownership opportunities and you have potentially an even larger overall market demand.

To meet this demand, will require that many of the substandard single-family homes now being rented be rehabilitated through incentive programs and sold to existing families seeking homeownership. **Rehabilitation of existing homes is likely the best lower cost alternative for increasing the supply of affordable homes for first-time purchasers and increasing the supply of desirable single family home rentals.**

Such a program, coupled with the construction of new urban styled homes on available revitalized neighborhood lots should have an impact of meeting the demand for affordable housing in the City of Brunswick and, equally important, the revitalization of its neighborhoods.

Without question, much of the market demand for better housing among residents of Brunswick and even those seeking to live in an urban area is for rental housing. With over 60% of households now living in rental housing, it is not likely to see much of a shift to purchase of homes.

The development of new rental housing in Brunswick will require some Federal subsidy

coupled with city incentives for its development such as land assembly, infrastructure development and certainly improvement of neighborhood environment. The rehabilitation of many single-family homes now in the rental inventory of housing will also be necessary to meet demand. Without an affordable housing program backed by strong policy and financial incentives, the city will not be able to maintain the revitalization momentum it has developed over the past 5 years.

RENTAL AND HOMEOWNERSHIP HOUSING SUPPLY AND DEMAND CONCLUSIONS:

- Most new housing opportunities will continue to be developed outside the City of Brunswick in its urban and metropolitan area for the foreseeable future, unless the city acts immediately to incentivize the construction of new housing, remove blight and blighting influences from its neighborhoods and undertakes a long - range program to rehabilitate much of its existing housing stock. **There are as many as 2,000 housing units in need of moderate to extensive rehabilitation.**
- The cost of newly constructed rental or ownership housing will likely continue to exceed the financial capacity of a high percentage of City households and families burdened by housing costs exceeding 30 – 35% of family income.
- The availability of housing, existing or newly constructed, is likely to remain competitive for at least another 3 – 5 years resulting in higher sales prices and rents. **The demand for rental and purchase housing is in excess of 500 units annually.**
- For City of Brunswick families and households with median annual income levels or less to obtain rental housing will require financial subsidies through Federal or State tax incentive programs. The city must exert leadership to assure that these resources are available. **These families will likely have the best opportunity to obtain better housing by renting.**
- Given the large number of homes in the city that are in only fair or poor condition, it is very likely that there are a substantial number of families living in substandard housing units. These families will require new housing opportunities in newly built or rehabilitated housing. **This demand is likely in excess of 1,000 housing units.**
- **Creating an environment and locations for new and varied housing opportunities in Brunswick is essential for the city's economic base and livability.**

DEFINING THE GAP BETWEEN AFFORDABLE HOUSING NEEDS AND SUPPLY

Focusing only on the needs of families and households within the City of Brunswick, it is

obvious from the data and analysis in this report that there is:

- An exceptionally large gap between the number of available decent safe and sanitary housing units for either purchase or rent, and the number of families needing this housing.
- Equally obvious from the data is that few families needing decent safe and sanitary housing can afford it even if it were available.
- It is also obvious that many families and households that can afford adequate housing are leaving the city to find it elsewhere. This is a likely factor has likely caused the population of the city to remain essentially the same for the past 20 or more years and for the socio-economic conditions of its residents to either remain static or decline over the same period.

GAP FOR HOME PURCHASE

If a family living in Brunswick wants to purchase a home in good condition or newly constructed, they are not likely to be able to find it within the city. Few new homes have been built inside the city according to building permit records. Most existing homes being sold inside the city are older homes with most requiring repairs or upgrades to make them attractive to purchasers. Such homes are typically offered in the \$80,000 - \$100,000 range and would require an additional \$75,000 to \$100,000 for such repairs or upgrades.

Most newly built homes are located outside the city in Glynn County in newly developed subdivisions and are priced at \$175,000 or more. To purchase and finance the home with a loan after a 10% down payment, a family must devote at least \$1,300 per month for mortgage and other homeowner expenses. This would require an annual income of \$55,000-\$60,000 annually. As seen in the following Table 6, only about 40% of all families in Brunswick have an income at that level.

Table 6
Family Income Ranges Brunswick City, Urban and Metro Areas

Family Income - \$	Brunswick City	Brunswick Urban	Glynn County
Less than \$10,000	13%	8%	5%
\$10,000 - \$14,999	13%	10%	4%
\$15,000 - \$4,999	12%	9%	8%
\$25,000 - \$34,999	14%	12%	7%
MFI - \$33,357	52%		
\$35,000 - \$49,999	9%	14%	11%
MFI - \$45,561		49%	
\$50,000 - \$74,999	15%	20%	19%
MFI - \$70,157			52%
\$75,000 - \$99,999	9%	10%	14%
\$100,000 - \$149,999	8%	10%	18%
\$150,000+	6%	7%	14%

Source: US Census ACS Estimate for 2021

For most families with incomes at 80% - 120% of the city's Median Family Income level, a home priced at \$125,000 to \$150,000 would be within their range. Such a home would require some form of subsidy or cost reduction program to meet their improved housing needs. The number of families desiring to purchase housing in this range is estimated at 250 families.

Another gap in supply and demand, is upper tier priced housing for young professionals and families seeking to live in an a more urban environment. These potential home purchasers are looking for smaller 2- or 3-bedroom units in townhomes or condominiums priced in the \$250,000 - \$350,000 range. Earlier market studies noted in this report estimate that demand at about 25 - 30 units per year. Only a very small number of these units are being developed each year; primarily in re-purposed commercial or mixed use buildings in the core city area.

It is assumed that with a more aggressive publicly assisted housing and neighborhood rehabilitation programs, that the needs of a significant number of homebuyers could be met over the next 5 years.

**The five-year need for purchase housing is 20 upper tier units/year.
And 50 units of median income tier housing/year FOR A TOTAL OF 350 UNITS**

GAP FOR RENTAL HOUSING

Single family and duplex housing units in the city total 5300 units and make up 77% of all housing units in Brunswick. Over 60% or 3200 of the existing single family and duplex housing in Brunswick is rented. Over 65% of these housing units were built before 1970, 90% before 2000. The age of this housing is reflected in its condition with nearly 2,500 units (46%) either in poor or only fair condition as rated by the Glynn County Tax Assessor's office.

A total 589 public housing units are managed by the Brunswick Housing Authority which currently has a waiting list of over 1000 seeking affordable income based rental housing. There are an additional 600 "affordable" apartment units available in the city which rent for between \$700 (1 bedroom) and \$1200 (2 or 3 bedrooms) including utilities. Other apartments, mostly one-bedroom units in small groupings, rent for as little as \$500 per month unit and their condition is considered to be only average.

While mobile homes make up only 2% of existing housing units, most are rented at less than \$500 per month.

Families with median incomes or less can most likely only afford to rent housing at rates of no more than \$800 per month including utilities. The rental housing that is available in

this range, other than those with subsidized rent, is difficult to find in acceptable living condition. Families and households with incomes at 80% or less of median Family Income, can only afford public housing or some form of assisted rental housing. Unfortunately, with a limited supply of such housing, many families must resort to renting substandard housing.

A limited number of upper market rental and sales housing has been developing in downtown Brunswick in converted commercial buildings. These units are attractive to young professionals or couples whose income is above \$75,000. Over the past 3 years approximately 50 such units have been developed and it is expected that this type of housing will continue to develop at that pace over the next 5 years.

The GAP between affordability and supply of sound quality rental housing is affecting as many as 2500 families in Brunswick who are currently living in substandard rental housing. Likewise, there is a gap between those families seeking upper tier rental units which is estimated at around 25 per year.

The estimated **5 Year** demand for rental housing, based on estimates of the number of units that can reasonably be expected to be developed in the city is as follows:

**Median Income Level Tier Apartments – Rents @ \$800 - \$1150/month incl. utilities: Small Efficiency or 1 Bedroom Units and 2- and 3-Bedroom Units
Demand Estimated at 50 units per year for families with incomes of 80% - 120% MFI Metro Area**

Upper Tier Income Single Family Homes and Townhomes - New Construction with Rents @ \$1500 – \$1900/month incl. utilities

Demand Estimated at 25 Units/year for 120% – 160% MFI

**Median Income Level Tier Single Family Rehabilitated Rental Housing
\$ 800 - \$1,200/month + Utilities 2 and 3 Bedroom**

Demand estimated at 25 units per year for families earning 80% - 120% of Brunswick MFI.

Lower Income Tier Rent Assisted Housing - \$500 – 750/month.

2 and 3- bedroom

Demand Estimated at 50 units/year All rent income based – 50 – 80% % of Brunswick MFI.

Total 5 year goal for additional rental housing units – 150 units/year FOR A TOTAL OF 750 ADDITIONAL RENTAL UNITS.

THE CHALLENGE

From the data gathered for this study of housing supply and demand needs for Brunswick,

there are the following facts which help define the approach that need to be taken to create affordable housing opportunities for current and future residents of the city.

- With a Median Family Income of \$33,357, a Brunswick's family's housing choices are extremely limited. Current housing expenses for rentals or purchase housing require a family income of \$40,000 - \$50,000 to cover all housing expenses. This far exceeds the capacity of at least half of the city's population.
- Little new affordable housing is being added to the inventory within the city. The average number of new units added over the last 4 years is approximately 50 units per year for a total of 200 units (30 SF and 170 MF).
- The existing housing stock within the city consists of 6,884 units. 70 % or 4,663 are single-family residences 60% of which are rented. Nearly half of these single- family residences are in either poor or only fair condition most requiring major rehabilitation and approximately 10% considered to be uninhabitable requiring demolition. **To meet much of the affordable housing needs of its market, the city must begin an aggressive program of rehabilitating its existing housing stock coupled with removing blight and blighting influences to restore the once quality neighborhoods within the city.**
- There is a also a demand for new affordable and market rate housing in Brunswick. That market is made up of families living outside the city looking for a more desirable housing environment in an urban neighborhood setting, those relocating to the area seeking the same thing, and families currently living in the city who wish to have better quality and more suitable housing that meets their needs.

A 20 YEAR AFFORDABLE HOUSING PLAN FOR BRUNSWICK (2023 – 2043)

To meet this challenge, it is recommended that the city embark on a 20 – year program to: rehabilitate at least 50 percent of it deteriorated housing stock, facilitate the development of the creation of at least 500 new housing units for sale and/or rental, and complete the revitalization of at least four of the most deteriorated Character Area neighborhoods in the city.

Such a plan should focus on:

1. Rehabilitation of its aging housing stock which has fallen into disrepair. **A 20-year goal of 50 units per year would see the rehabilitation of at least 1000 single family housing units.**
2. Selected Character Area neighborhoods and sub-areas within neighborhoods, should be revitalized through improvements to neighborhood infrastructure and improved pedestrian access within the neighborhoods and connectivity to the city's core area.

3. Continuation of efforts to remove blighted and vacant residential structures throughout the city through its existing code enforcement program and make reclaimed lots available for new housing development. Coordination of these efforts with the Land Bank Authority for properties with tax liens or title issues.
4. Continuation and added effort for the home repair program to make housing safe, accessible and livable. **At least 25 homes per year should be improved** including some that will require additional rehabilitation to correct home deficiencies.
5. Because rental housing is likely the only answer for many families whose income is below MFI, take steps to assemble property that will facilitate the development of affordable small to medium sized rental housing communities. **There is a need for at least an average of 50 new subsidized rental housing units to be added to the inventory each year.**
6. Re-energize the Public Housing Program to become active in promoting the creation of affordable housing through partnerships with developers. The Housing Authority could become the resource for temporary rehousing of families displaced from dilapidated housing.
7. Focus attention on all segments of the housing market: rent subsidies for lower income families, opportunities for first time homebuyers to purchase affordable rehabilitated or newly construct single family housing options, opportunities for development of upper market rate housing which will add diversity and opportunities for new families to live in a vibrant and active city. **The re-purposing of existing commercial properties for rental and purchased market rate housing that has seen success in the core area should spread to other areas of the city. This should lead to the construction of market driven upper tier housing opportunities for those seeking an urban environment.**
8. Creating partnerships and collaboratives with other city and public agencies to assist in meeting a 20-year plan goal and establish a financial support program from within the corporate and business community through the efforts of a housing program companion non-profit organization.

Suggested Steps for the Creation of a Housing Program and 5 year Start Up Plan:

It is recommended that the City of Brunswick adopt a 20-year housing and neighborhood revitalization program by launching a 5 – year intensive housing rehabilitation and neighborhood revitalization program managed by a reorganized and purposed Department of Housing and Neighborhood Revitalization and Resident Services.

To effectively launch such a program, there are steps that should be taken to assure that the program can be successful. Those steps include:

Step No. 1: Select One or More Character Area) for the initial program focus to address current housing and neighborhood conditions. One of the Character Areas, New Town (NTCAS), could be an appropriate initial selection due to pockets of severe housing deterioration. There already exists several sub- areas in the New Town Character Area including TAD District #1, the Norwich Corridor Plan, the Rise Risley 8 block redevelopment area, and the 40 unit Veterans Tiny Home Complex to name a few. Sub areas within the Character Area could be designated for concentrated efforts to remove blight, rehabilitate existing homes and use cleared property for new housing development.

Step No. 2: Establish a Department of Housing and Neighborhood Revitalization possibly incorporating those functions in the current Department of Neighborhood Services.

- Initially staff the Department with a Program Director, 2 Housing Inspectors, a Contract Officer and support clerical and legal staff.
- Create a Housing Rehabilitation Policies and Procedures Guidance Manual, approved by the City Commission.
- Develop eligibility criteria for a program of financial assistance of loans and grants to eligible homeowners and create a program of loans and tax incentives for investor owners. This document will include criteria for evaluating property owner participation in the program and requirements for maintaining affordability levels for specific time periods.

The likely cost of program administration and execution is \$300,000 annually.

Step No. 3: Adopt the International Housing Code to strengthen the ability of Code Enforcement Officers to make cursory and preliminary inspections of housing where there is evidence of neglect or badly needed repairs. Such inspections would be used to determine whether to proceed with a detailed evaluation of the property for rehabilitation.

Step No. 4: After evaluation of the initial Housing Code Inspections;

- Offer an opportunity for homeowners or investor owners, to apply for rehabilitation financial assistance (loans, grants and/or both).
- Based on owner response, define and establish the first focused Multi - Block Areas where housing rehabilitation can be initiated, dilapidated and vacant structures can be removed and neighborhood physical and family socio-economic revitalization can begin.

The initial goal should be to rehabilitate at least 40 units per year at an average cost of \$60,000 each, or \$2.4 Million annually. Over a 20-year period that level should be increased to reach a goal of 1,000 rehabilitated affordable homes.

Step No. 5: Initiate and complete needed or deficient neighborhood infrastructure improvements funded by the city's capital budget. The City Engineer should evaluate target area needs and coordinate needed repairs and improvements. The Planning, Development and Codes Department will look at opportunities to create greenspace and pedestrian connections to the city's core area via sidewalk improvements or trails.

Step No. 6: As progress is made within a Target Sub-Area and the goal is within reach, move the program to a second Target Area having potential for neighborhood revitalization.

Step No. 7: Initiate a program to bring job training and economic development programs to neighborhood commercial areas that will offer new employment and business opportunities for target area residents.

Step No. 8: Create a plan to market opportunities for development of affordable rental and ownership housing within the target area including incentives such as:

- Offering low-cost sites for homes and apartments
- Property tax abatement (5 – 15 years depending on investment)
- Home purchase loan financing programs in partnership with local banks (loan guarantees, downpayment assistance).

Step No. 9: Soon after the program is underway and Target Areas are defined within the larger Character Areas, the City should begin to develop collaborative partnerships with other agencies and entities who share common goals and objectives. Those should include:

- **The Glynn County / City of Brunswick Land Bank Authority.** This entity can provide timely assistance in capturing tax foreclosed properties within focus areas that can be used for public purposes or, added to other properties, create an opportunity for new housing development. Maintaining Focus Area Plan

objectives will be important to maximize the benefits the Land Bank can offer.

- **The Brunswick Housing Authority:** It is important for the Housing Authority to provide relocation housing for tenants and owners displaced from dilapidated and uninhabitable resulting from code enforcement.
- Initiate discussions with **non-profit organizations who have an interest and focus on housing and neighborhood revitalization** within the core city area. The purpose would be to solicit their help in raising non-public funding to assist the city in implementing its 20 – year plan.

To launch a successful and worthwhile program, the City will need to make a 5 – year financial commitment for the 5 - year start- up of the 20-year Affordable Housing Plan. By making such a commitment and demonstrating how that the program can be successful in addressing the housing conditions and needed neighborhood revitalization will help generate private financial support for the long-term success of the program. That support will be necessary for the program to reach its 20-year goal; improving of at least 50 % of its existing housing stock, the creation of at least 500 units of new affordable rental and ownership housing, increase homeownership and the revitalize the New Town Character Area and other Character Areas in Brunswick.

Following is an outline of likely program costs based on the recommended 5–year initial plan goals and steps.

ESTIMATED ANNUAL BUDGET:

Home Repair - Envelope Program (currently in effect)	
25@ Av. \$10,000/ home	\$ 250,000
New Home Rehabilitation Program –	
40 Homes @ \$60,000 Av, Each	\$2,400,000
Incentives for New SF Home Construction:	\$ 250,000
Neighborhood Revitalization Investments	<u>\$ 500,000</u>
Estimated Annual Budget	\$3,400,000
TOTAL 5 – YEAR PROGRAM INVESTMENT	\$17,000,000
By The City of Brunswick	\$10 MILLION
By Non-Profits and Public Support	\$7 MILLION

Potential Sources of Funds:

1. TAD #1 Bonds could provide up to \$ 400,000/year for home rehabilitation and neighborhood revitalization projects. Current TAD# Fund Balance - \$400,000.
2. Create a new TAD # 2 District encompassing the entirety of the New Town corridors and incorporate the Institutional District. Potentially, such a district could create a similar amount annually possibly beginning in Year 6 for the same purposes.

3. Brunswick does not qualify to be a “Participating Entity) under the HUD HOME Investment Partnership Program. However, it should qualify to obtain funding through the State of Georgia’s Dept. of Community Affairs HOME CHIP program. Chip could fund up to \$400,000 for home rehabilitation or \$600,000 for affordable housing construction or reconstruction of existing dilapidated housing for homeownership. This is a competitive grant program for communities who have yet to qualify under the HUD HOME program.
4. Include housing rehabilitation and neighborhood revitalization in the New Town Character Area in a future SPLOST, \$5 Million, perhaps in 5 - years.
5. Increase the allocation of CDBG entitlement funds from \$100,000 to \$250,000 annually. Consider a Section 208 Loan to be repaid from pledged CDBG Entitlement funds which could advance future CDBG funds to aid in the start-up of the program.
6. City of Brunswick allocating program funding Annually from its budget to maintain the program at goals set.

These additional dedicated sources of funding could total as much as \$10 Million over the next 5 - years.

The additional \$7 Million needed should be sought from area non-profit and business philanthropic institutions as well as seeking any special funding opportunities available from the DHUG or State of Georgia DCA. The city should establish a working partnership with a local non-profit to assist in raising the funding necessary to meet both the 5 – year short term goal and the ultimate 20-year goal.

OTHER TOOLS AND AGENCIES THAT CAN ASSIST THE CITY OF BRUNSWICK

- 1. Brunswick Housing Authority should be revitalized and become a partner in this effort.**
- 2. Housing Choice Voucher Program (Section 8)**
- 3. Create a CHDO partnership with an eligible non-profit with housing development capabilities.**
- 4. Federal Tax Credit Program for developing affordable rental housing.**
- 5. Habitat for Humanity – Partnership to assist in developing new homeownership.**
- 6. GICH Committee – Re-establish the committee to assist in securing other sources of funding that may become available through the Georgia Department of Community Affairs.**

REPORT APPENDIX

- A. Appendix 1 - HOUSING CONDITION TABLE – BY NEIGHBORHOOD**
- B. Appendix 2 - HOUSING CONDITION TABLE – BY CHARACTER AREA**
- C. Appendix 3. MAP – SINGLE FAMILY HOUSING CONDITIONS**
- D. Appendix 4 -MAP - AGE OF SINGLE- FAMILY HOUSING**

**SINGLE FAMILY HOUSING CONDITIONS
CITY OF BRUNSWICK NEIGHBORHOODS**

<u>Neighborhood Name</u>	<u>Number of SF Residences</u>	<u>Average Market Value</u>	<u>Housing Condition - Number of Homes</u>					<u>Total</u>
			<u>A - Excellent</u>	<u>B - Good</u>	<u>C - Average</u>	<u>D - Fair</u>	<u>E - Poor</u>	
Union Street	167	\$ 283,795.38	21	61	56	24	5	167
Victorian	51	\$ 161,581.86	5	15	20	6	5	51
Goodyear Park	79	\$ 101,943.62	0	0	69	10	0	79
South Union	161	\$ 181,201.08	4	8	131	18	0	161
Habersham Park	77	\$ 76,395.26	0	3	26	47	1	77
Riverside	27	\$ 375,852.99	6	19	2	0	0	27
Riverside Waterfront	46	\$ 640,598.62	8	35	3	0	0	46
Riverside Marsh	23	\$ 348,237.55	2	12	9	0	0	23
Dixville	151	\$ 23,755.00	0	0	37	88	26	151
Suburban Estates	16	\$ 106,587.50	0	0	16	0	0	16
Northside Estates / Lakeside	94	\$ 184,974.00	0	0	94	0	0	94
College Park	111	\$ 89,819.82	0	0	111	0	0	111
Windsor Park	190	\$ 184,679.26	0	4	174	10	2	190
SE Brunswick	141	\$ 115,028.21	1	4	29	79	28	141
Magnolia Park	263	\$ 67,323.59	0	0	258	5	0	263
E. Goodyear Park / Eastview	104	\$ 142,508.74	0	0	103	1	0	104
Grant Street	113	\$ 95,313.30	2	6	36	66	3	113
Central South Brunswick	223	\$ 118,440.00	4	17	98	100	4	223
SE Gloucester	49	\$ 37,412.24	0	0	4	36	9	49
Norwich Street Residential	45	\$ 57,261.36	0	0	12	32	1	45
Peninsula Park	246	\$ 65,223.08	0	0	45	196	5	246
New Town A	200	\$ 53,909.00	0	1	33	136	30	200
New Town B	178	\$ 70,498.00	2	6	32	95	43	178
Town Commons	239	\$ 60,404.94	0	0	43	111	85	239
2700 - 3000 NT	114	\$ 48,871.00	0	5	61	37	11	114
Lawrenceville	100	\$ 42,946.45	0	1	33	56	10	100
1600 - 1200 NT	97	\$ 17,231.00	0	0	4	52	41	97
Town Common East	382	\$ 48,364.68	0	1	66	256	59	382
Washington Heights	83	\$ 31,489.38	0	0	18	53	12	83
Urbana	270	\$ 71,880.27	0	3	101	163	3	270
Highland Manor	16	\$ 70,308.75	0	0	6	10	0	16
Homesite	57	\$ 95,025.00	0	0	51	6	0	57
Perry Park	109	\$ 63,723.46	0	0	101	8	0	109
Perry Park East	33	\$ 45,617.58	0	0	28	4	1	33
NW Goodyear Park	48	\$ 75,009.00	0	0	25	23	0	48
Montpelier	18	\$ 30,000.00	0	0	6	11	1	18
NBHD TAD#1	170	\$ 49,572.00	0	7	25	104	34	170
Union St Victorian	172	\$ 280,736.00	29	60	55	23	5	172
	4663	\$ 121,408.39	84	268	2021	1866	424	4663
			2%	6%	43%	40%	9%	

**APPENDIX 2
SINGLE FAMILY HOUSING CONDITIONS SUMMARY
BY CHARACTER AREAS 2023**

<u>CHARACTER AREA</u>	<u>SF Homes</u>	<u>CONDITION</u>					<u>Av. Value</u>	<u>YEAR BUILT</u>		
		<u>A - Excel.</u>	<u>B - Good</u>	<u>C - Av.</u>	<u>D - Fair</u>	<u>E - Poor</u>		<u>Pre 1950</u>	<u>1950-1970</u>	<u>After 1970</u>
SOUTH END BRUNSWICK										
a. South Union	161	4	8	131	18	0	\$ 181,201.00	35	118	8
b. Central S Brunswick	85	1	5	32	45	2	\$ 120,902.00	54	29	2
c. SE Brunswick	141	1	4	29	79	28	\$ 115,028.00	95	<u>27</u>	19
TOTALS	387	6	17	192	142	30		184	174	29
		2%	4%	50%	37%	8%		48%	45%	7%
DIXVILLE / HABERSHGAM PARK										
a. Habersham Park	77	0	3	26	47	1	\$ 76,395.00	12	60	5
b. Dixville	<u>151</u>	<u>0</u>	<u>0</u>	<u>37</u>	<u>88</u>	<u>26</u>	\$ 23,755.00	<u>100</u>	<u>32</u>	<u>19</u>
TOTALS	228	0	3	63	135	27		112	92	24
		0%	1%	28%	59%	12%		49%	40%	11%
WINDSOR PARK										
a. Windsor Park	190	0	4	174	10	2	\$ 184,679.00	154	31	5
b. SE Gloucester	<u>49</u>	<u>0</u>	<u>0</u>	<u>4</u>	<u>36</u>	<u>9</u>	\$ 37,412.00	<u>49</u>	0	<u>0</u>
TOTALS	239	0	4	178	46	11		203	31	5
		0%	2%	74%	19%	5%		85%	13%	2%
URBANA / MAYHUE										
a. Urbana	270	0	3	101	163	3	\$ 71,880.00	169	64	37
OLD TOWN (First Ave - H Street)										
a. Victorian	51	5	15	20	6	5	\$ 161,582.00	46	4	1
b. Union Street	167	21	61	56	24	5	\$ 283,795.00	157	8	12
c. Central South BWK	138	3	12	66	55	2	\$ 142,376.00	92	31	15
d. Union Street Victorian	172	29	60	55	23	5	\$ 280,736.00	144	7	21
e. TAD Dist #1	170	0	7	25	104	34	\$ 49,572.00	54	109	7
b. Grant Street	113	2	6	36	66	3	\$ 95,313.00	55	57	1
TOTALS	811	60	161	258	278	54	NA	548	216	57

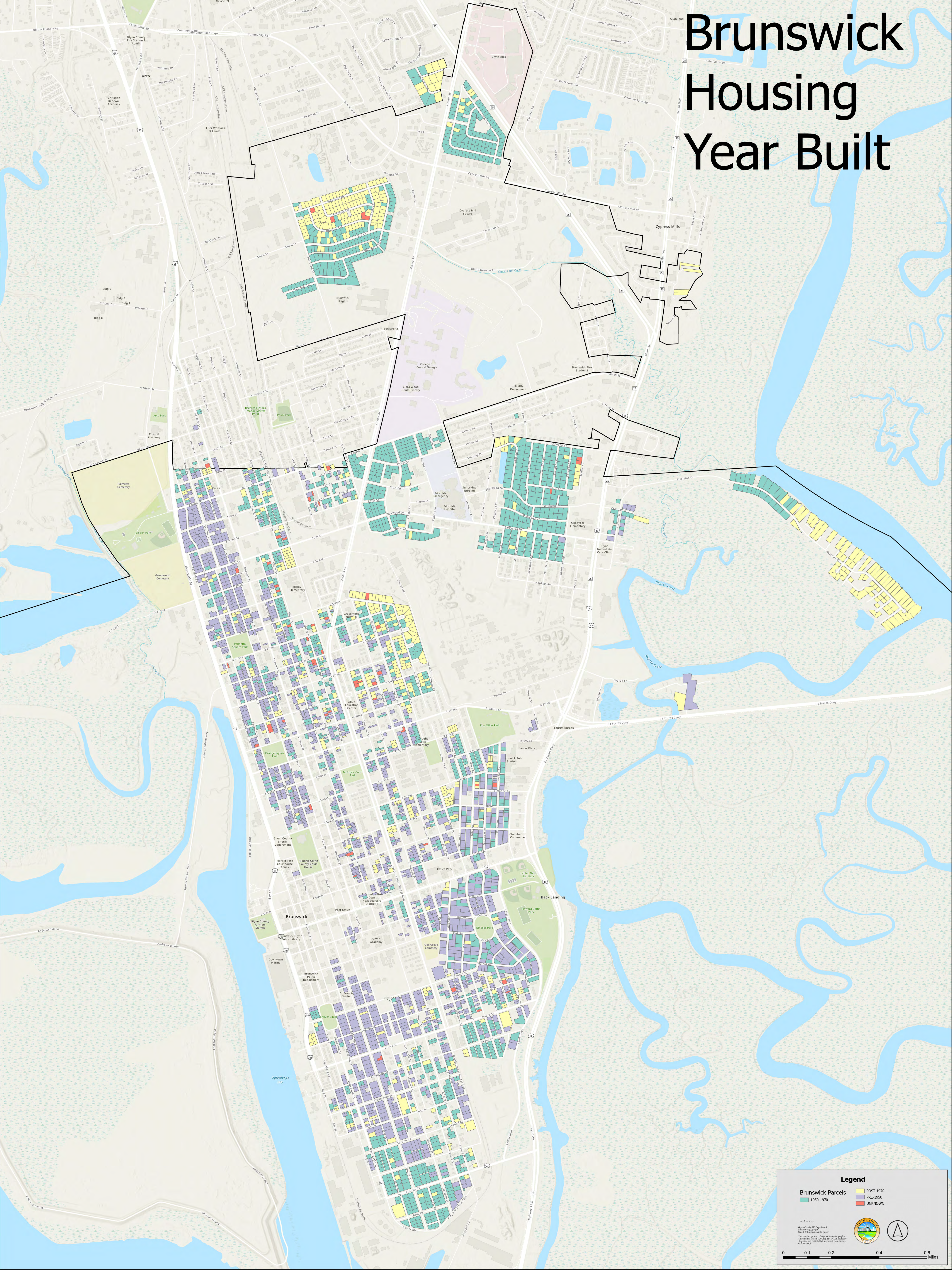
**APPENDIX 2
SINGLE FAMILY HOUSING CONDITIONS SUMMARY
BY CHARACTER AREAS 2023**

<u>CHARACTER AREA</u>	<u>SF Homes</u>	<u>CONDITION</u>					<u>Av. Value</u>	<u>BUILT</u>		
		<u>A - Excel.</u>	<u>B - Good</u>	<u>C - Av.</u>	<u>D - Fair</u>	<u>E - Poor</u>		<u>Pre 1950</u>	<u>1950-1970</u>	<u>After 1970</u>
NEW TOWN / NEW TOWN COMMONS										
a. Town Commons	239	0	0	43	111	85	\$ 60,405.00	104	95	40
c. Penninsula Park	246	0	0	45	196	5	\$ 65,223.00	184	46	16
d. Town Commons East	382	0	1	66	256	59	\$ 48,365.00	208	117	57
e. Lawrenceville	100	0	1	33	56	10	\$ 42,946.00	14	40	46
f. Washington Heights	83	0	0	18	53	12	\$ 31,489.00	21	51	11
g. Norwich Street	45	0	0	12	32	1	\$ 57,261.00	27	12	6
h. NT A (1700 - 3000)	114	0	5	61	37	11	\$ 48,871.00	79	24	11
i. NT B (1200 - 1600))	97	0	0	4	52	41	\$ 17,231.00	34	36	27
j. Perry Park	109	0	0	101	8	0	\$ 63,724.00	4	86	19
k. Perry Park East	33	0	0	28	4	1	\$ 45,618.00	0	23	10
l. New Twon A	200	0	1	33	136	30	\$ 53,909.00	140	34	26
m. New Town B	178	2	6	32	95	43	\$ 70,498.00	136	30	26
TOTALS	1826	2	14	476	1036	298	NA	951	594	295
MEDICAL PARKWOOD										
a. Goodyear Park	79	0	0	69	10	0	\$ 101,944.00	0	76	3
b. E. Goodyear Park / Eastview	104	0	0	103	1	0	\$ 142,141.00	0	97	7
c. NW Goodyear Park	48	0	0	25	23	0	\$ 75,009.00	0	48	0
d. Northside Estates / Eastview	94	0	0	94	0	0	\$ 184,974.00	0	89	5
e. Homesite	57	0	0	51	6	0	\$ 95,025.00	1	53	3
f. Montpelier	18	0	0	6	11	1	\$ 30,000.00	4	12	2
TOTALS	400	0	0	348	51	1	NA	5	375	20
RIVERSIDE										
a. Riverside	27	6	19	2	0	0	\$ 375,853.00	0	0	27
b. Riverside Waterfront	46	8	35	3	0	0	\$ 640,599.00	0	10	36
c. Riverside Marsh	23	2	12	9	0	0	\$ 348,238.00	0	12	11
TOTALS	96	16	66	14	0	0		0	22	74

**APPENDIX 2
SINGLE FAMILY HOUSING CONDITIONS SUMMARY
BY CHARACTER AREAS 2023**

<u>CHARACTER AREA</u>	<u>CONDITION</u>						<u>Av. Value</u>	<u>BUILT</u>		
	<u>SF Homes</u>	<u>A - Excel.</u>	<u>B - Good</u>	<u>C - Av.</u>	<u>D - Fair</u>	<u>E - Poor</u>		<u>Pre 1950</u>	<u>1950-1970</u>	<u>After 1970</u>
NORTH BRUNSWICK										
a. Magnolia Park	263	0	0	258	5	0 \$	67,324.00	0	131	132
b. College Park	111	0	0	111	0	0 \$	89,820.00	0	106	5
c. Highland Manor	16	0	0	6	10	0 \$	70,309.00	0	16	0
d. Suburban Estates	16	0	0	16	0	0 \$	106,588.00	0	2	11
TOTALS	406	0	0	391	15	0		0	255	148
CITY TOTALS	4663	84	268	2021	1866	424	4663	2172	1823	689
		2%	6%	43%	40%	9%		47%	39%	14%
								4684		

Brunswick Housing Year Built





Legend

Brunswick Parcels

- POST 1970
- 1950-1970
- PRE-1950
- UNKNOWN

April 11, 2014
Glynn County GIS Department
Phone: 912.263.7400
Email: GIS@glynncounty.ga.gov
This map is a public utility. Glynn County is not responsible for any errors or omissions that may result from the use of this map.



0 0.1 0.2 0.4 0.6 Miles

APPENDIX E

2022-2027

Comprehensive Economic Development Strategy



Resolution

Resolution

Whereas, the purpose of a Comprehensive Economic Development Strategy (CEDS) is to sustain a regional planning process by which jobs are created, more stable and diversified economies are fostered, and living conditions are improved; and

Whereas, the Coastal Regional Commission (CRC) is the Economic Development District for Coastal Georgia as designated by the Economic Development Administration (EDA); and

Whereas, the U.S. Department of Commerce, Economic Development Administration (EDA) requires the preparation and adoption of a CEDS by a local review committee for initiatives and projects in the Coastal Georgia region; and

Whereas, the CRC Council appointed a review subcommittee to lead the effort in the development of the CEDS Plan; and

Whereas, the CEDS Review Committee and CRC staff began preparation of the CEDS in January 2022; and

Whereas, the CEDS has been prepared and updated to meet the requirements for designation as an Economic Development District and to qualify for assistance under the public works, economic adjustment, and planning programs of the U.S. Department of Commerce, EDA; and

Whereas, said action also directed the CEDS document be submitted to the CRC Council for their review and input; and

Now Therefore, Be It Resolved, that the Coastal Regional Commission Council hereby approves the submittal of the Comprehensive Economic Development Strategy to the US Department of Commerce, EDA to remain in good standing as the Economic Development District for Coastal Georgia.

Adopted this 12th day of October, 2022.



By: 
Jason Coley, Chairman

Attest


Ken Lee, Secretary

Acknowledgements



The 2022-2027 Comprehensive Economic Development Strategy (CEDS) is funded by the United States Department of Commerce, Economic Development Administration (EDA). The CEDS was produced under the leadership of the Coastal Regional Commission (CRC) Council with participation from the region's stakeholders, support from partners and collaboration with other regional leaders. Thank you for your invaluable role making and maintaining Coastal Georgia as a unique place to invest, to work, to live, and to play.

Coastal Regional Commission Council

Bryan County

Chairman Carter Infinger - County • Steven Asplund - Non-Public • Steve Scholar - City of Richmond Hill

Bulloch County

Commissioner Walter Gibson - County • Mayor Jonathan McCollar - City of Statesboro • Allen Amason - Non-Public

Camden County

Commissioner Lannie Brant - County • Kristy Chance - City of Kingsland • Craig Root - Non-Public

Chatham County

Mayor Van Johnson II - City of Savannah • Chairman Chester Ellis - County • Chris Blaine - Non-Public • Sabrina Kent - Non-Public • Tanet Myers - Non-Public

Effingham County

Commissioner Reggie Loper - County • Mayor Ken Lee - City of Rincon • Herb Jones - Non-Public

Glynn County

Chairman David O'Quinn - County • Mayor Pro Tem Julie Martin - City of Brunswick • Paul Christian - Non-Public • Shaw McVeigh - Non-Public

Liberty County

Chairman Donald Lovette - County • Mayor Allen Brown - City of Hinesville • Richard Hayes - Non-Public • Shirley Frasier - Non-Public

Long County

Chairman Robert Parker - County • Councilwoman Mary Hamilton - City of Ludowici • Tammy Goober - Non-Public

McIntosh County

Commissioner Kate Karwacki • Mayor Hugh Hodge - City of Darien • Jordy Evans - Non-Public

Screven County

Mayor Preston Dees - City of Sylvania • Commissioner Rosa Romeo • Richard Freeman - Non-Public

State Appointed

Tom Ratcliffe - Non-Public • Dan Coty - Non-Public • Chap Bennett - Non-Public • Jason Coley - Non-Public, CRC Vice-Chair • Vacant - Non-Public

Ex-Officio

Dina McKain • Dorothy Glisson • Chris Fletcher

CRC CEDS Committee

The CRC Comprehensive Economic Development Strategy (CEDS) Committee is responsible for developing, implementing, and revising the Comprehensive Economic Development Strategy with the assistance of CRC staff. The Strategy Committee is also responsible for outlining the methodology for cooperating and integrating the CEDS with the State of Georgia's economic priorities, incorporating relevant material from other government sponsored plans, and ensuring consistency with applicable State and local workforce investment strategies. The CRC Strategy Committee represents the main economic interests of the region and includes private sector representatives as much of its membership.

Mr. Jason Coley, *Community and Economic Development Manager, Coastal Region, Georgia Power*

Mr. Christopher Fletcher, *Director, Public Affairs, USAG Fort Stewart*

Ms. Sabrina Newby, *CEO, Coastal Georgia Minority Chamber of Commerce*

Ms. Alicia Johnson, *Executive Director, Step Up Savannah*

Mr. R. Bradley Day, *Executive Director, Development Authority of Long County*

Dr. Dominique Halaby, *Associate Provost for Innovation and Commercialization and Founding Director of the Business Innovation Group, Georgia Southern University*

Mr. Mark Bennett, *Public Affairs and Community Investment, Gulfstream Aerospace*

Mr. Glenn Gann, *Vice President and Administrator, Southeast Georgia Health System - Camden Campus*

Dr. Patrick Holladay, *President, Georgia Grown Trail 17 and Associate Professor of Tourism Management, Troy University - Brunswick*

Mr. David Goodell, *CEO, Debellation Brewing Company*

Mr. Steve Howard, *Project Lead, Spaceport Camden and County Administrator, Camden County*

CRC Project Team

Allen Burns, Executive Director

Dionne Lovett, Assistant Executive Director

Planning and Government Services

Aaron Carpenter, Director Planning & Government Services

Hannah Mendillo, Regional Planner

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Purpose

The Coastal Regional Commission (CRC) serves as the Economic Development District (EDD) for the region's six coastal counties and four inland counties as designated by the U.S. Department of Commerce, Economic Development Administration (EDA).

In accordance with EDA, a Comprehensive Economic Development Strategy (CEDS) is updated and submitted every five years. This important document sets the regional economic development planning process for 2022-2027. The CEDS brings together public and private sectors to create a road map to strengthen Coastal Georgia's regional economy.

The CEDS documents provides an analysis of the region's economy which was used as the guide for establishing regional goals and objectives, developing and implementing a plan of action; and identifying investment priorities and funding sources. By implementing this strategy, the region remains eligible for economic development assistance investment from EDA. This investment can help fund local infrastructure projects, technology-led economic development projects, and strategies to respond to sudden and severe economic situations.



Executive Summary

Coastal Georgia is home to historic towns, industries, military installations, major ports, and a thriving tourism trade, each driving some part of the region's economic engine. The region boasts abundant wildlife, beautiful beaches and over 2300 miles of tributaries and salt marshes. Coastal Georgia's eastern shore stretches almost 100 miles from Savannah in the north to St. Marys in the south.

Due to its coastal geography, shipping is a unique resource for the region's economy. Georgia's ports remain a major advantage for manufacturing and distribution companies located throughout the region. Georgia's ports combine industry innovation with proven flexibility to create new opportunities along the entire global logistics pipeline, while continuing to meet the market demands.

In addition to Georgia's ports, the region is also home to military installations which act as an asset to the region and an economic driver. Two bases provide the backbone of coastal Georgia's defense-related employment, Fort Stewart/Hunter Army Airfield and the U.S. Naval Submarine Base Kings Bay. The Federal Law Enforcement Training Center (FLETC) contributes to the region's economic health.

Coastal Georgia contains some of the most significant heritage assets in the State, high biodiversity, ecosystem services, natural productivity, and most significant habitats which are important elements of tourism development. Economic development via tourism is closely tied to coastal resources through our coastal waterways and the natural, historic, and cultural resources which drive industry. Tourism contributes to the region's economic development as one of the most significant revenue generators for the coast.

Additionally, Coastal Georgia has a vast area of land used for commercial forests. Of the region's inland four counties including Bulloch, Effingham, Long and Screven, the total land area, over half, (~2,000 square miles of land) is forested. Although forestry itself is a relatively small employer in the region, manufacture of paper and other forestry products is a major enterprise, employing workers in plants scattered along the region.

The 2020 census reported a population of 731,630 for the region. This is a 11.51% increase since 2010, and a 31.03% increase since the 2000 census. The region is getting gradually older with the median age at 35.5 and expected to increase to 36.4 by 2026. The Coastal Region has seen a 3.7% decline in poverty since 2014. The median household income cannot keep up with the rise of median housing values. Professional and Business Services and Trade, Transportation, and Utility industries have been identified as developing. Education, health services, Natural Resources, Mining, Agriculture, Financial activities, and information industries have been identified as declining. The local per capita personal income (PCPI) in 2020 was \$42,066, about 18.76% less than Georgia's PCPI and 29.31% smaller than the United States as a whole.

One of the goals of the CEDS is to develop effective strategies to nurture economic growth and development in the region. As a performance-based strategic plan, this CEDS serves an important role in the region's efforts to grow our economy in the face of challenges to the economic vibrancy of the region.



Summary Background

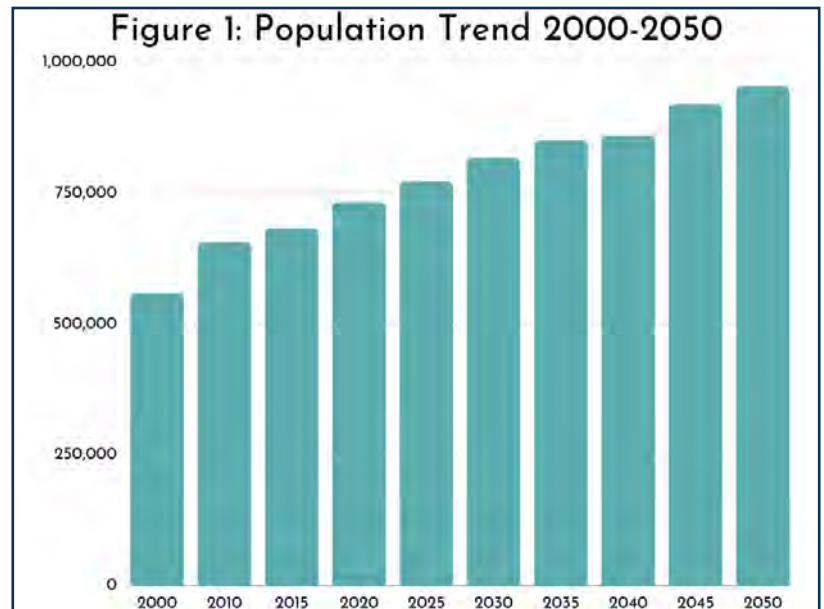
1. Demographics and Social Economics
2. Economic Conditions
3. Business Environment
4. Resources and Environment
5. COVID-19

1. Demographics and Social Economics

1.1 Total Population

The total population of the region recorded in the 2020 Census was 731,630 people. Figure 1 shows the estimated population trends until 2050. According to Environmental Systems Research Institute (ESRI) Business Analyst Online (BAO), the latest estimated number in the 2019 Census was 708,061.

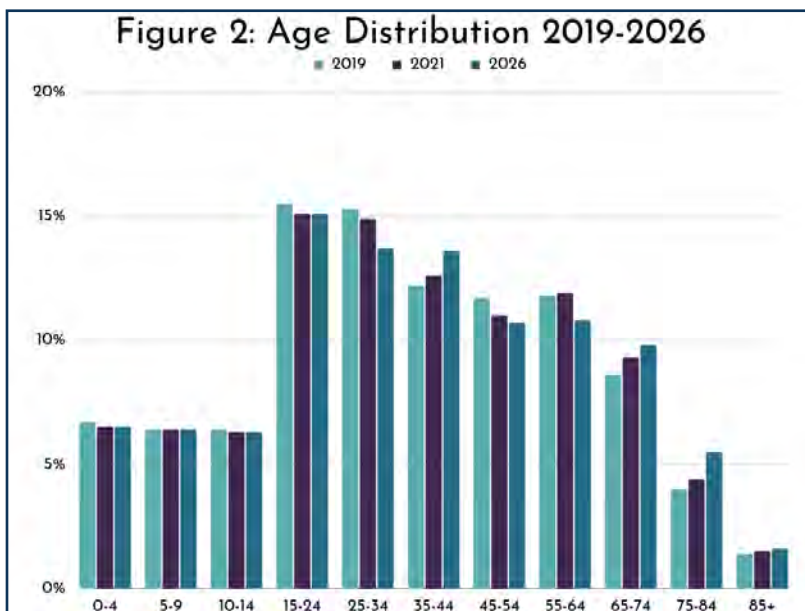
Leaders in the Coastal Region suggest that the total population may have been significantly undercounted. This may be further exacerbated by the Census's inability to count some military personnel. Seasonal residents play a role in total population as the numbers in coastal vacation areas fluctuate throughout the year.



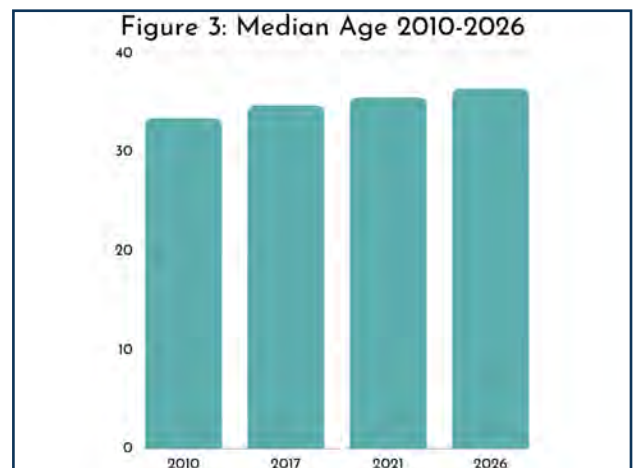
Source: US ACS and Georgia Office of Planning and Budget

1.2 Age Distribution

Figure 2 shows the predicted age distribution for 2026. Figure 3 indicates the median age in Coastal Georgia increased from 34.7 in 2017 to 35.5 in 2021 and is estimated to be 36.4 in 2026.



Source: ESRI



Source: ESRI

1. Demographics and Social Economics

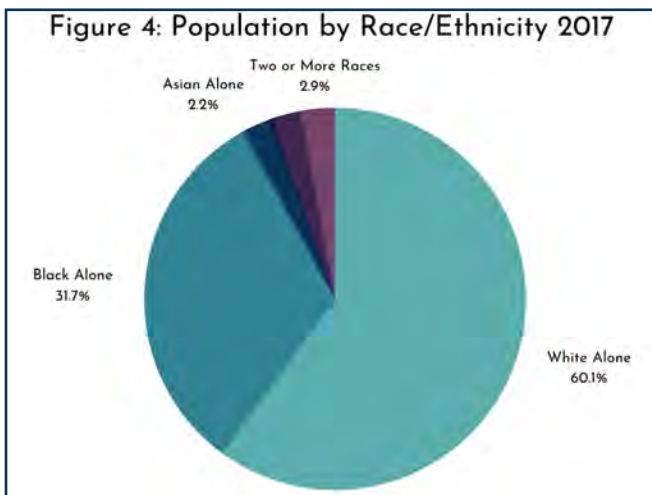
1.3 Race and Ethnicity

Coastal Georgia's majority population is White as demonstrated by the racial breakdown in Figure 5, although data shows that the White population is gradually decreasing, going from 61.3% in 2010, and to 60.0% in 2017, and 59.1% in 2021.

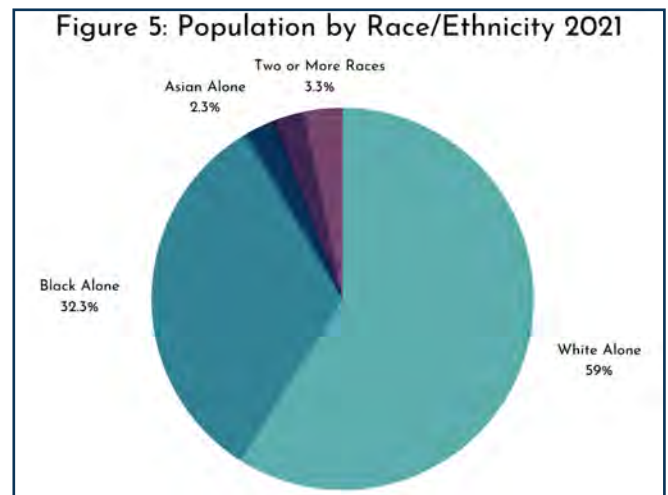
The Black population from 2017 to 2021 has increased from 31.7% to 32.4%. Other groups increasing in percentage include Asian Alone, and Two or More Races. Pacific Islander, Some Other Race Alone, and American Indian Alone have all maintained their numbers.

The Hispanic Origin population increased from 6.8% to 7.20 from 2017 to 2021 and is expected to reach 8.1% by 2026.

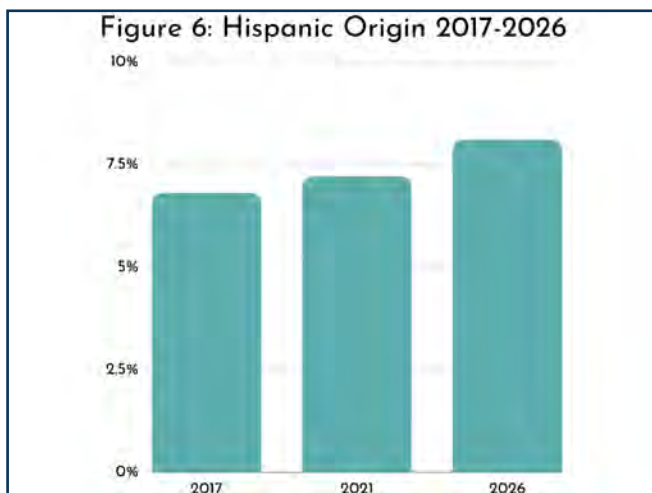
The diversity index shows the likelihood that two people, chosen at random from the Coastal Region, belong to different races or ethnic groups. The index ranges from 0, meaning no diversity, to 100, meaning complete diversity. The racial diversity index in the Coastal Region has continued to rise and is expected to increase to 62.3 by 2026.



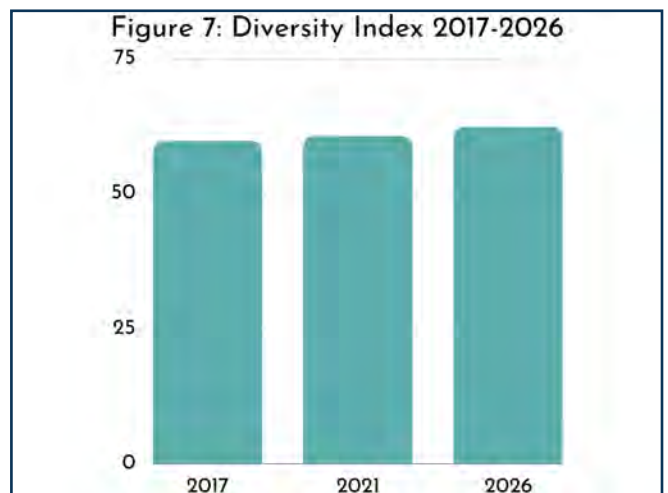
Source: ESRI



Source: ESRI



Source: ESRI



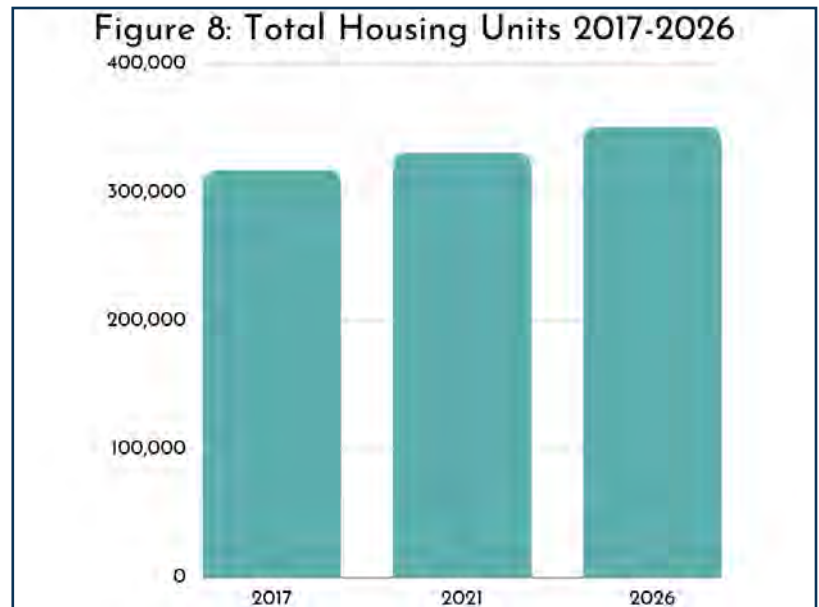
Source: ESRI

1. Demographics and Social Economics

1.4 Housing

According to ESRI Business Analyst Online (BAO), the housing inventory in Coastal Georgia from 2017-2021 increased by 4.4% from 316,754 units to 330,587 units. It is estimated that housing units will increase to 350,774 in 2022.

Of the housing types reported between 2015 and 2019, 67.8% were single-family and 20.8% were multi-family. An estimated 15% of housing units were unoccupied in the coastal region.



Source: 2019 ACS 5-Year Estimates Table B25001

Table 1: Housing Types 2015-2019

	Number	Percentage
Total	309,999	100%
Occupied	263,940	85%
Unoccupied	46,059	15%
Single Family		
Single Family Detached	169,193	64.1%
Single Family Attached	9,776	3.7%
Subtotal	178,969	67.8%
Multi Family		
2 Units in Structure	8,952	3.4%
3-4 Units in Structure	12,967	4.9%
5-9 Units in Structure	12,947	4.9%
10+ Units in Structure	19,951	7.6%
Subtotal	54,817	20.8%
Other		
Mobile Homes, Boats, etc.	30,154	11.4%

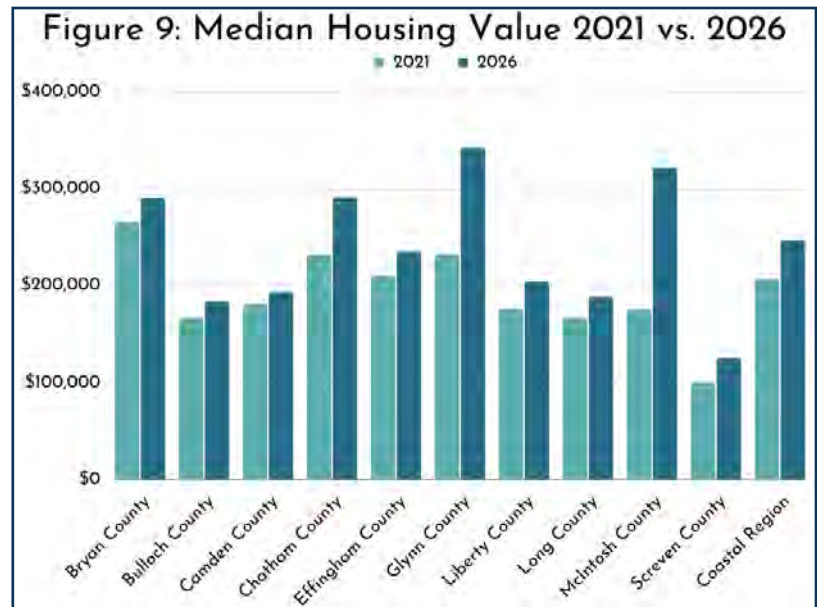
Source: 2019 ACS 5-Year Estimates Table B25001

1. Demographics and Social Economics

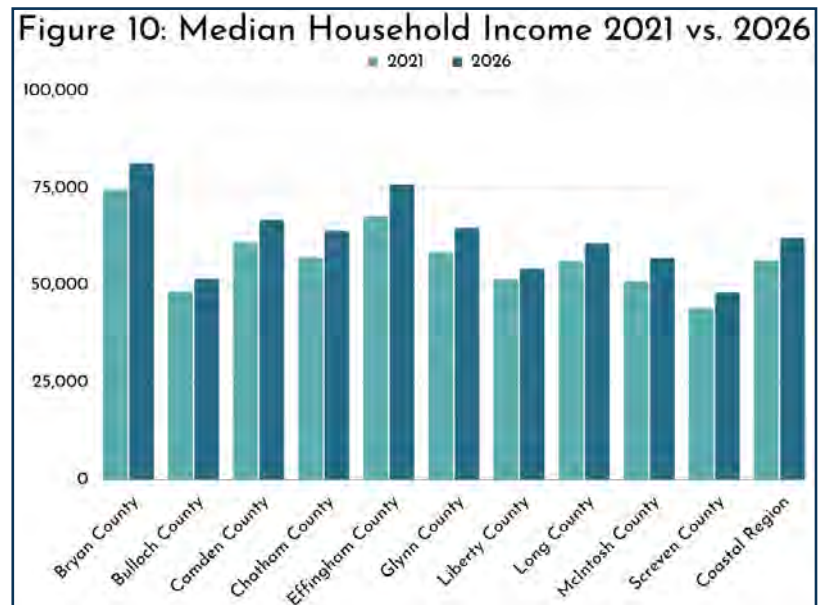
The median household income for the coastal region is expected to increase by 10.1% from 2021 to 2026. In the same period, the growth rate for median house value is estimated to increase by 19.3%. Median household income is unable to keep pace with the rise of median housing values.

2.1 Income and Wage

Per Capital Personal Income measure average income earned per person in a given region in a specified year. It is calculated by dividing the area's total income by its total population as a measure of prosperity. Per Capita Personal Income (PCPI) in Coastal Georgia increased by 15.5% between 2015 and 2020. The 2020 regional PCPI was \$42,066, about 18.76% smaller than Georgia's PCPI and 29.31% smaller than the United States as a whole.

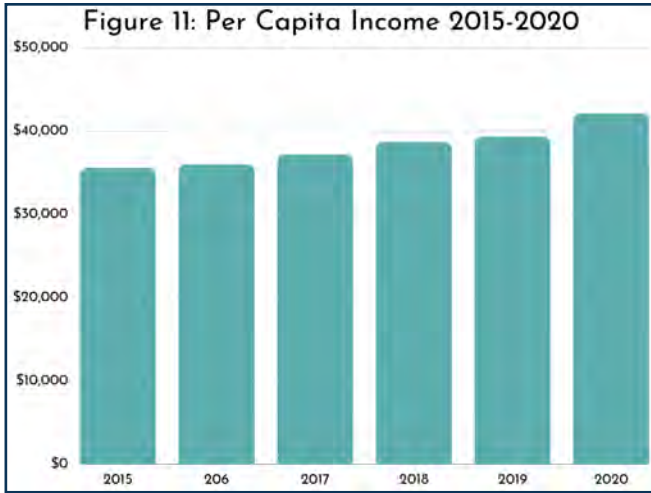


Source: ESRI

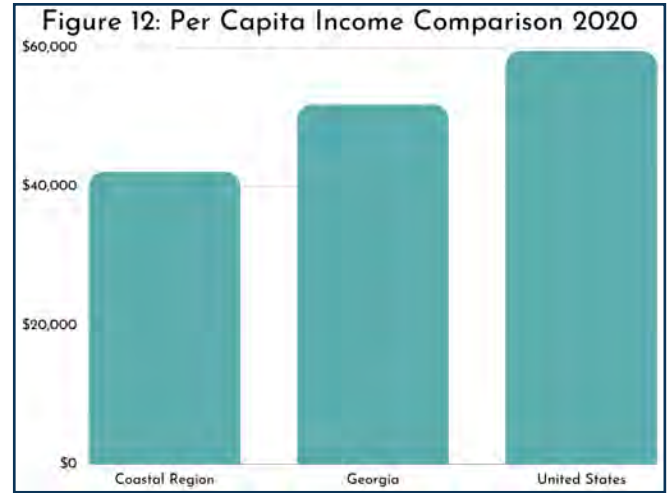


Source: ESRI

2. Economic Conditions



Source: Bureau of Economic Statistics

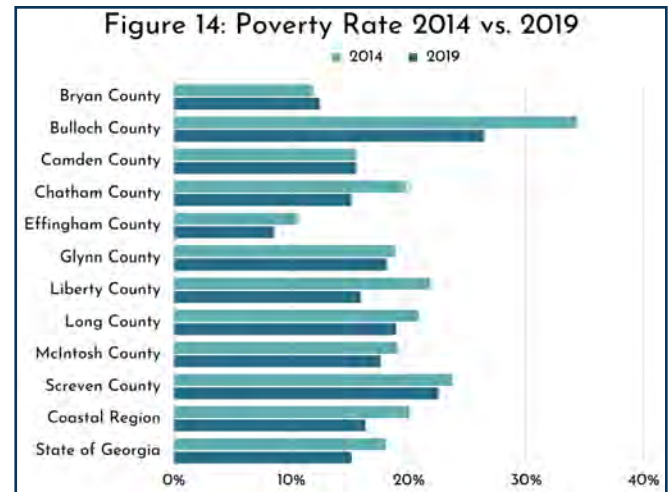


Source: Bureau of Economic Statistics

For all industries in the ten-county coastal region, the 2020 average weekly wage was \$799, which is a decrease of 2.56% since 2016 when the average weekly wage was \$820. The 2020 average weekly wage for Coastal Georgia is about 70.59% of the State of Georgia's average weekly wage, and approximately 64.91% of the United States average weekly wage.



Source: Bureau of Economic Statistics



Source: 2019 ACS 5-Year Estimates Table S1701

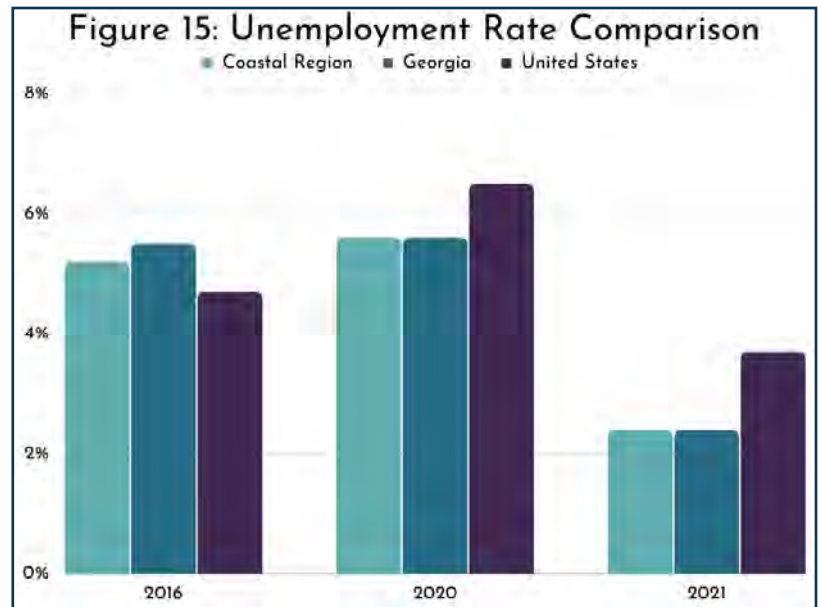
2. Economic Conditions

2.2 Unemployment

Figure 15 shows the unemployment rates for 2016, 2020, and 2021 for the Coastal Region, Georgia, and the United States. Unemployment rates saw an incline in 2020, likely due to the COVID-19 pandemic. In 2021, unemployment has recovered from the 2020 increase, and is now lower than pre-pandemic numbers.

2.3 Public Safety

ESRI BAO defines the crime index values for the U.S. level are 100, representing average crime for the country. A value of more than 100 represents a higher crime rate than the national average, and a value of less than 100 represents a lower crime than the national average. For example, an index of 155 implies that crime in the area is 55 percent higher than the U.S. average; and an index of 47 implies that crime is 53 percent lower than the U.S. average.



Source: 2019 ACS 5-Year Estimates Table S1701

In 2021, the Total Crime Index varied from 50 to 136 and the Personal Crime Index varied from 33 to 114. Bryan, Effingham, and Long Counties ranked the top three in safety Coastal Georgia.

Table 2: Crime Indices 2021

	Total Crime	Property Crime	Personal Crime
Bryan County	53	56	33
Bulloch County	90	94	63
Camden County	92	94	79
Chatham County	130	133	114
Effingham County	64	67	46
Glynn County	136	141	107
Liberty County	124	128	102
Long County	50	50	49
McIntosh County	90	92	79
Screven County	73	70	93
Coastal Region	90.2	92.5	90

Source: ESRI Business Analyst Online

2. Economic Conditions

2.4 Health Outcomes

According to A. Robert Wood Johnson Foundation Program, County's Health Outcomes are based on length of life, and quality of life. County Health Factors include health behavior, clinical care, social and economic factors, and physical environment. Table 3 and Table 4 show the change of rankings from 2017 to 2021 for County Health Outcomes and Health Factors. The Health Outcome Rank varies from 13 to 93; and the Health Factor Rank varies from 14 to 127 out of 159 counties in Georgia. For both categories, Bryan County ranks the best in Coastal Georgia.

Table 3: Health Outcome Rank in Georgia 2017-2021

	2017	2021
Bryan County	20	13
Bulloch County	57	49
Camden County	16	22
Chatham County	41	42
Effingham County	26	30
Glynn County	48	60
Liberty County	47	61
Long County	33	26
McIntosh County	56	97
Screven County	118	93
Coastal Region	46.2	49.3

Source: County Health Rankings

Table 4: Health Factor Rank in Georgia 2017-2021

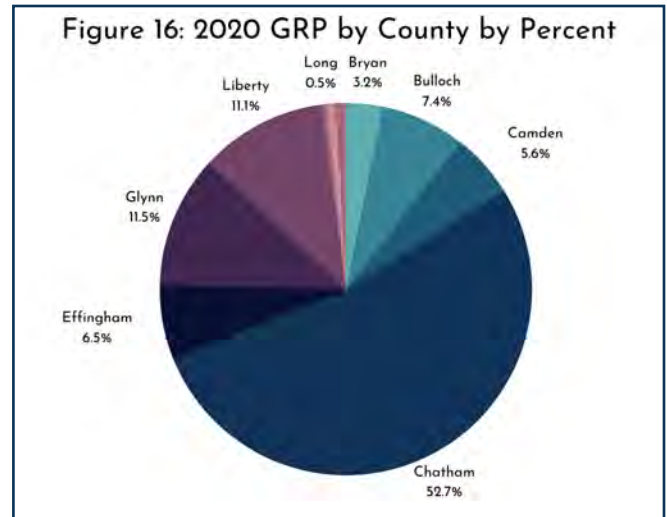
	2017	2021
Bryan County	9	14
Bulloch County	78	45
Camden County	17	34
Chatham County	34	22
Effingham County	25	23
Glynn County	32	40
Liberty County	49	48
Long County	55	59
McIntosh County	51	57
Screven County	135	127
Coastal Region	48.5	46.9

Source: County Health Rankings

3. Business Environment

3.1 Gross Regional Product

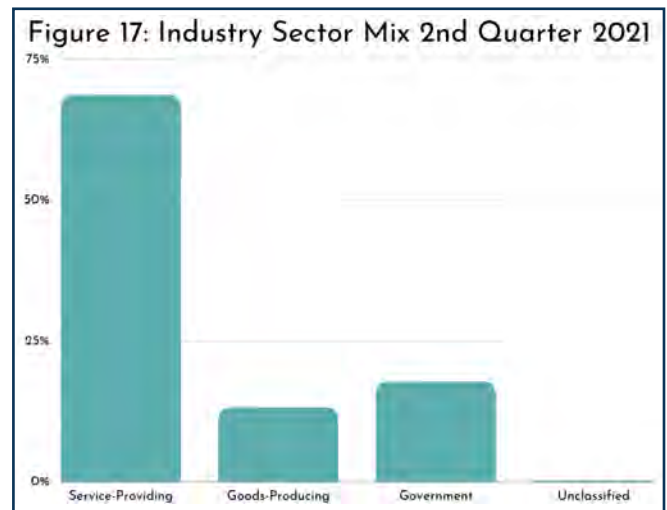
Gross Regional Product (GRP) is defined as the market value of all final goods and services produced within the metropolitan area within a given period. EMSI, an Economic modeling company, shows the latest economic overview in 2020 Coastal Georgia's Gross Domestic Product was \$29.6 billion. Among the ten counties, Chatham has the highest percentage, at 52.7 percent. Nearly thirty Fortune 500 companies are in Chatham County according to Coastal Workforce Development Board (CWDB). Figure 16 demonstrates the percentages of each county.



Source: Bureau of Economic Analysis

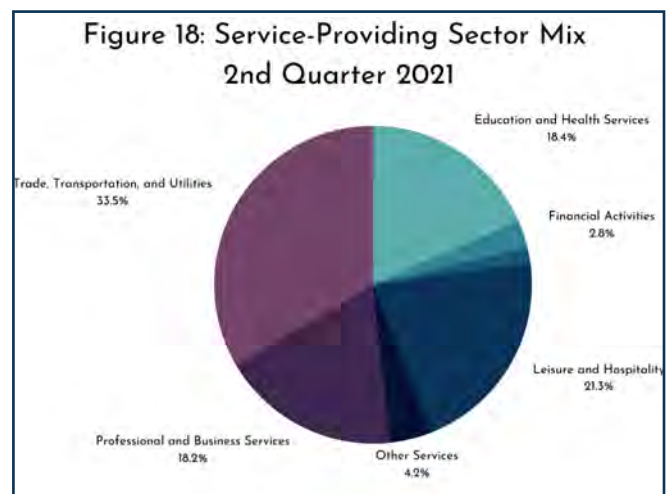
3.2 Industry

Figure 17 shows that service-providing industries lead at 68.7 percent followed by the government sector at 17.8 percent, and goods-producing at 13.2 percent.



Source: Georgia Department of Labor

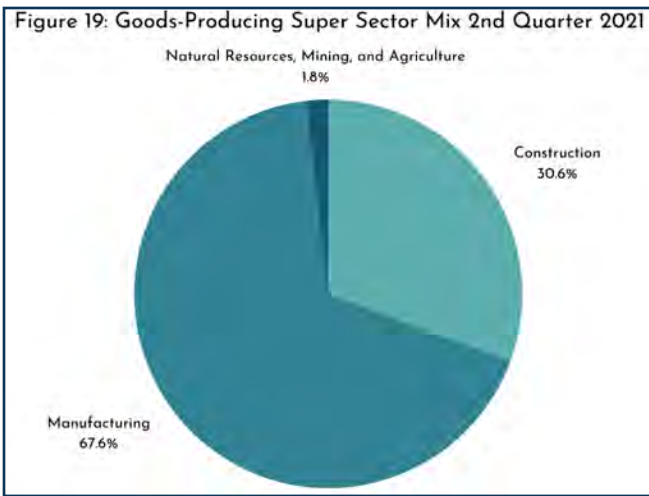
Figures 18, 19, and 20 break down service-providing, good producing, and government super sectors. Figure 18 results show trade, transportation and utilities as the dominant industry in the coastal region, at 33.5 percent. Leisure and Hospitality and Education and Health Services, follow at 21.3 percent and 18.4 percent respectively.



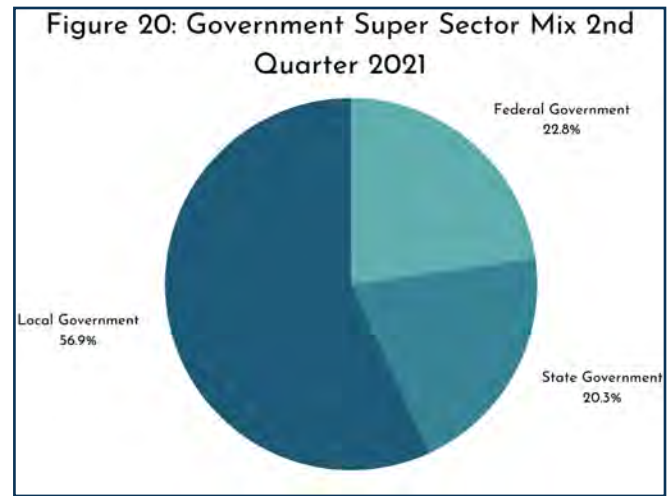
Source: Georgia Department of Labor

Examining the 10 counties together from 2016 to 2020, the industries in terms of absolute number of jobs created as well as the growth rate of employment were professional and business services which grew by 15.9%. Construction had the largest percent increase at 18.5%.

3. Business Environment



Source: Georgia Department of Labor



Source: Georgia Department of Labor

Location Quotient (LQ) measures how concentrated an industry is in a region compared to a national level. If an LQ is equal to 1, then the industry has the same share of its area employment as it does in the reference area. An LQ greater than 1 indicates an industry with a greater share of the local area employment than the reference area.

Table 5: Super Sector Employment and Location Quotient Change 2016-2020

Super Sector	2016 Employment	2020 Employment	Employment Change	Percent Change	2016 LQ	2020 LQ	LQ Percent Change
Construction	9880	11703	1823	18.5%	0.77	0.9	16.9%
Natural Resources	882	693	-189	-21.4%	1.3	0.7	-46.2%
Manufacturing	24124	24708	584	2.4%	1.2	1.3	8.3%
Education	35830	35662	-168	-0.5%	0.57	0.5	-12.3%
Financial	9409	9392	-17	-0.2%	0.56	0.6	7.1%
Information	2370	2264	-106	-4.5%	0.37	0.3	-18.9%
Leisure	42386	37339	-5047	-11.9%	1.41	1.5	6.4%
Professional	25019	29008	3989	15.9%	0.47	0.5	6.4%
Trade	58223	60342	2119	3.6%	0.94	0.9	-4.3%
Unclassified	736	459	-277	-37.6%	1.26	1.5	19.0%
Other	7500	7489	-11	-0.1%	0.97	1.1	13.4%

Source: Bureau of Labor Statistics

3. Business Environment

Normally, industries with increasing LQ and job numbers form a region’s economic base. The industries with increasing LQ but with decreasing jobs means they are emerging. The industries decreasing LQ but with growing employment indicates they are developing. The industries with decreasing LQ and decreasing employment suggest they are weak. Table 6 shows each of the super sectors and their designations based on LQ and employment statistics.

3.3 Clusters

Clusters are the “building blocks” of a region’s economy. They drive economic performance in many ways including job creation, wages, and innovation. Companies see clusters as opportunities for investment and site selection (US Cluster Mapping Project).

A traded cluster is composed of traded industries which are concentrated in a subset of geographic areas and sell to other regions while a local cluster serves the region it originates in.

Relatively low LQ with growing employment	Relatively high LQ with growing employment
<i>Developing</i>	<i>Strong</i>
Professional and Business Services Trade, Transportation, and Utilities	Manufacturing Construction
Education and health services Natural Resources, Mining, and Agriculture Financial Activities Information	Unclassified Other Leisure and Hospitality
<i>Declining</i>	<i>Emerging</i>
Decreasing LQ with decreasing employment	Relatively high LQ with decreasing employment



Source: US Cluster Mapping Project

3. Business Environment

Figures 22 and 23 show the top traded and local clusters by employment in Coastal Georgia for 2016.

In 2016, the top traded clusters by employment were:

1. Business Services
2. Distribution and Electronic Commerce
3. Hospitality and Tourism

The top local clusters by employment were:

1. Local Hospitality Establishments
2. Local Health Services
3. Local Real Estate, Construction, and Development



Source: US Cluster Mapping Project



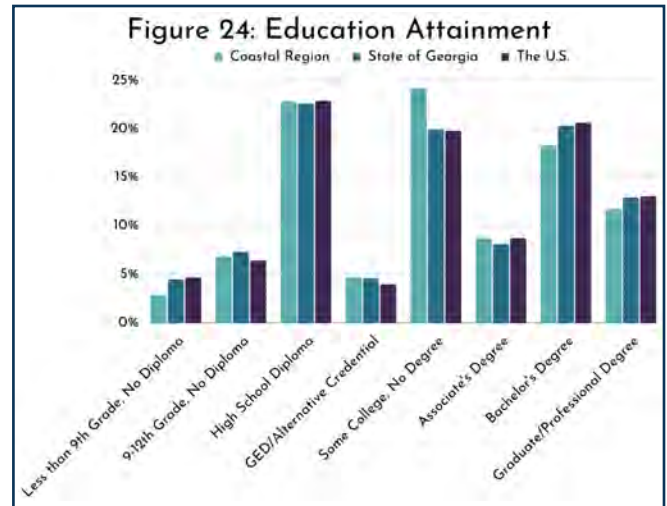
Source: US Cluster Mapping Project

3. Business Environment

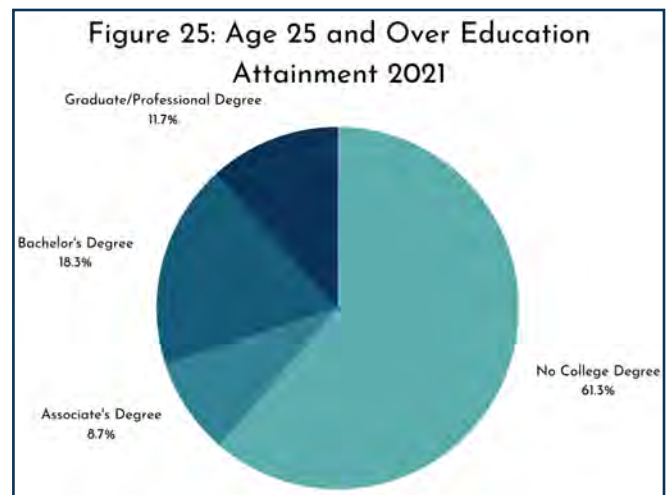
3.4 Educational Attainment

Figure 24 demonstrates that the educational attainment of Coastal Georgia is improving. In 2021, the percentage of educational attainment equal to less than 9th grade, no diploma, and 9th through 12th grade, no diploma is lower than the State of Georgia. 61.3% of the population over the age of 25 have no college degree.

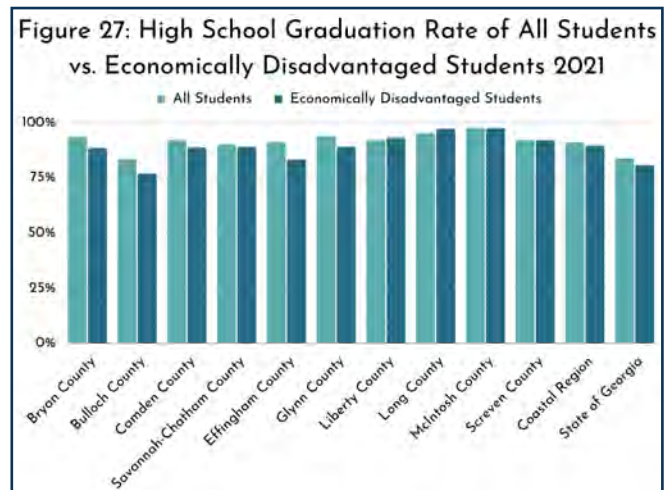
Figure 27 shows the high school graduation rate for 2021 by county. Bulloch County has the lowest graduation rate at 83.4% and McIntosh County has the highest graduation rate at 97.5%. The average graduation rate for the region is 91% and the average graduation rate for the State of Georgia is 83.8%. Figure 27 also shows the comparison between the high school graduation rate for all students and for economically disadvantaged students in the region.



Source: ESRI



Source: ESRI



Source: Georgia Department of Education

3. Business Environment

3.5 Workforce Development

The CWDB created a Workforce Development Area 19 Local/Regional Plan for 2020-2023 that is the basis for the workforce analysis in this CEDS.

The Coastal Workforce Development Board (CWDB) has determined the five industry sectors:

- Logistics and Warehousing
- Healthcare
- Manufacturing
- Hospitality
- Construction

CWDB identifies the region’s greatest strength to be its opportunity for workforce development through personal growth, education, and employment success. However, the region struggles to retain members of the workforce who take advantage of the programs and resources available. There has been growth in the high-demand target sectors, but there is a need for high wages and effective marketing to encourage a workforce that will stay in the region. In the past the CWDB recommended collaboration between stakeholders to bolster the economy and address the needs of the workforce. These efforts have been made, but the commitment to workforce development will need to continue to be a top priority for the region.

Technical schools represent an important stakeholder in the development of the workforce. The Coastal Region is home to three technical colleges, all of which continue to increase their In-Field Place Rates.

Table 7: Georgia Technical College Achievements 2019-2021

Year	Total Graduates		In-Field Placement Rate		Customized Contract Companies		Customized Contract Hours	
	2019	2021	2019	2021	2019	2021	2019	2021
Coastal Pines	1582	1395	96.3%	97.8%	95	114	14265	5018
Ogeechee	1059	880	92.3%	94.4%	29	23	18080	44830
Savannah	1752	1762	93.7%	95.0%	385	563	56516	67444
Source: TCSG								

4. Resources and Environment

4.1 Georgia Ports Authority

Georgia's accessible ports are a major advantage for manufacturing and distribution companies located throughout the region. The Georgia Ports Authority is a leader in the operation of modern terminals and in meeting the demands of international business.

The Port of Savannah, home to the largest single-terminal container facility of its kind in North America, is comprised of two modern, deep-water terminals: Garden City Terminal and Ocean Terminal. Together, these facilities exemplify the GPA's exacting standards of efficiency and productivity. Garden City Terminal is the fourth busiest container handling facilities in the United States, encompassing more than 1,200 acres and moving millions of tons of containerized cargo annually.

Ocean Terminal, Savannah's dedicated breakbulk and Roll-on / Roll-off facility, covers 200.4 acres and provides customers with more than 1.4 million square feet of covered, versatile storage.

The Port of Brunswick is comprised of three GPA-owned deep-water terminals, two of which are directly operated by the GPA. The port's well-earned reputation for productivity and efficiency is heightened by its position as one of the fastest growing auto and heavy machinery ports in North America. Today, more than 12 major auto manufacturers, supported by three auto processors, utilize the Colonel's Island Terminal. The terminal is also home to the South Atlantic's fastest growing bulk export / import operation. Agri-Products from Georgia and the rich U.S. grain belt, as well as import products, flow smoothly across the Colonel's Island docks.

Brunswick's Mayor's Point Terminal facilitates the export of Georgia's valuable forest products, while Marine Port Terminals, operated by Logistec U.S.A., specializes in the handling of breakbulk and bulk commodities.



4. Resources and Environment

4.2 Military Bases

Fort Stewart-Hunter Army Airfield is the Army's Premier Power Projection Platform on the East Coast. Fort Stewart-Hunter Army Airfield is responsible for training, equipping, deploying and redeploying, active and reserve component Army units, and home of the historic 3rd Infantry Division.

Fort Stewart's 285,000 acres provides unequaled joint training opportunities along the eastern seaboard, serving a wide array of customers, the biggest being the 3rd Infantry Division. The Air Force, the Marine Corps, the Navy, Coast Guard, and other Army units are also served. Seven major drop zones, multiple tank and armored fighting vehicle gunnery ranges, helicopter gunnery ranges, small arms ranges and three live-fire maneuver areas contribute to the Department of Defense' ability to train joint forces on the East Coast. Hunter Army Airfield's location in Savannah/Chatham County plays a critical role in the post's deployment capabilities. The largest military aircraft can land at Hunter Army Airfield, load the biggest equipment in the Army inventory and deploy both equipment and soldiers within an 18-hour wheel to air timeline to contingency operations anywhere in the world.

Fort Stewart and Hunter Army Airfield combined economic impact of \$4.9 billion in Coastal Georgia serves as a major economic driver. The daily working population of Stewart-Hunter is approximately 28,615. Businesses that support operations related to Stewart-Hunter employ 10,678 people. It brings in \$71 million in local tax revenues.

Kings Bay Naval Submarine Base in Camden County houses several U.S. Navy Trident nuclear submarines on the 16,000-acre installation. According to the Bureau of Research Economic Development (BRED), the Navy employs approximately 9,900 workers (military, civilian, and contractors) at the base. The economic impact of Kings Bay payroll in 2016 was estimated to be \$855 million, with additional economic benefits imparted through goods, services, and retirees.

4. Resources and Environment

4.3 Prime Agricultural Lands

The conversion of prime farmland to urban uses represents a loss to the region's landscape. Wise use and protection of basic soil and water resources helps to achieve practical water quality goals and maintain viable agriculture. Viable agriculture is the backbone of maintaining a functioning network of working farmland, open space, and natural areas, and a range of strategies should be used to ensure the value of these areas within Bulloch, Screven, Long, and portions of northwestern Effingham counties.

4.4 Forest Lands

Coastal Georgia has an enormous area of land used for commercial forests. Of the region's total land area, about 3,300 square miles, is forested. In addition to this commercial forest, another 17 percent of the land area in the region is held by local, state, or federal government entities, and much of this land is also forested. Although forestry itself is a relatively small employer in the region, manufacture of paper and other forestry products is a major enterprise, employing workers in plants scattered throughout the region.

4.5 Climate

The coastal region is classified as subtropical, with both latitude and proximity to the Atlantic Ocean resulting in moderate temperatures. The average winter temperature is about 45 degrees, and the average summer temperature is near 80 degrees. Temperature exceeds 90 degrees from 75 days (coastal) to 80 days (inland) a year. Freezing temperatures in winter are infrequent (averaging 12 days a year on the coast, 25 days a year inland) and seldom last longer than half a day at a time. Humidity is high, averaging between 60 percent and 75 percent. Annual rainfall ranges between 49 and 54 inches, with slightly higher levels just inland from the coast.

4.6 Wetlands

Under the Georgia Coastal Marshlands Protection Act (O.C.G.A. 12-5-280 et seq.) of 1970, the State recognizes that "the coastal marshlands of Georgia comprise a vital natural resource system. The estuarine area is the habitat of many species of marine life and wildlife and..., the estuarine marshlands of coastal Georgia are among the richest providers of nutrients in the world. Such marshlands provide a nursery for commercially and recreationally important species of shellfish and..., provide a great buffer against flooding and erosion, and help control and disseminate pollutants. The coastal marshlands provide a natural recreation resource which is vitally linked to the economy of Georgia's coast and to that of the entire state. This...system is costly, if not impossible, to reconstruct or rehabilitate once adversely affected..."

4. Resources and Environment

4.7 River Basins and Floodplains

There are five river basins in the coastal region including the Savannah, the Ogeechee, the Altamaha, the Satilla, and the St. Marys. Satilla, St. Marys and Suwannee River basins lie entirely within the Coastal Plain physiographic province, which extends throughout the southeastern margin of the United States. The Satilla River basin lies entirely within the Bacon Terraces and Barrier Island Sequence districts. The St. Marys River basin lies entirely within the Okefenokee Basin and Barrier Island Sequence districts.

The Altamaha River Basin is the third largest river basin in the United States. The entire Altamaha River Basin consists of waters from the Ocmulgee, Oconee, as well as the Altamaha River. The shrimp and fishing industries make up a large part of the Basin's economy. Vast numbers of pine timber forest are harvested to aid in the production of paper and other wood products within the Altamaha basin. The kaolin industry, located in the northern portion of the basin, supplies inputs for making paper, bathtubs, bricks, fine china, and a myriad of other products. All along the river one finds a multitude of agricultural products under cultivation. The basin also affords wildlife viewing areas and habitats, especially for rare native bird species as well as many migratory birds.

The Ogeechee River originates in Green County and then flows through several of the basin's 22 counties before reaching the coast. The river passes through the eastern boundary of Fort Stewart Army Base. Georgia Southern University, in Statesboro also falls within the Basin. The timber and poultry industries are strong in the area. The basin enjoys diverse agricultural production.

The Savannah River Basin extends down the entire length of Georgia's eastern border and contains a diverse array of industries and attractions. The Satilla River Basin is predominantly agricultural. However, forestry and timber production is found in the also prevalent in the basin.

The St. Marys is the smallest of the river basins in the Coastal region. The Okefenokee National Wildlife Refuge, located on the western side of the basin, provides habitat to many rare wildlife and plant species. Kings Bay Naval Base calls the St. Marys Basin home. Moreover, timber is a major industry within the area.



4. Resources and Environment

4.8 Barrier Islands

All 100 miles of Georgia's ocean beaches are on the seaward face of barrier islands. Ten of the 18 major barrier islands along Georgia's coast are in public ownership.

Tybee Island is the farthest north of Georgia's barrier islands. It is approximately four miles long and one mile wide. Tybee is Georgia's most developed barrier island. The commercialism on Tybee consists of hotels, year-round private residences, summer cottages, condominiums, and tourist facilities such as public beaches, fishing piers, marinas, and public campgrounds.

Little Tybee, once privately owned, was acquired by the State of Georgia, with a conservation access allowed to the Nature Conservancy. The only access to the island is by private boat.

Williamson Island is known as Georgia's newest island first detected around 1971 and claimed by the State of Georgia. The island was named for Mr. Jimmy Williamson, a former Mayor of the City of Darien, Georgia.

Wassaw Island is seven miles long and the most primitive and undeveloped of Georgia's barrier islands. In 1969, the Nature Conservancy deeded Wassaw to the federal government as a National Wildlife Refuge. Hundreds of gulls, herons, egrets, migratory songbirds, and shorebirds use the beaches, marshes and freshwater ponds as breeding and nesting grounds.

Ossabaw Island is 10 miles long and two miles wide. In 1978, the island was sold to the State of Georgia as a Natural Wildlife Refuge and in May of that year Ossabaw became Georgia's first Heritage Preserve under the Heritage Trust Act of 1975. As a Heritage Preserve, Ossabaw can be used only for natural, scientific and cultural purposes.

St. Catherine's is a 23-square-mile island with a total acreage of 14,640 acres and 11 miles of natural beaches. Button Gwinnett, one of the signers of the Declaration of Independence, bought the island in 1765 and lived there until 1771. His 19th century family home still stands.

Blackbeard Island's total acreage is 5,618 acres, 9 miles of beach and two and one-half wide at its widest point. In the early 1700's Edward Teach, the famous English pirate popularly known as "Blackbeard," was thought to have buried treasure on the island.

Sapelo Island is about 12 miles long and two to four miles wide with a total area of 17,950 acres, making it the fourth largest of Georgia's barrier islands. Sapelo has five and one-half miles of undeveloped beaches. Sapelo's beach is noted for having the most extensive undisturbed natural beach dunes of any of Georgia's barrier islands. Sapelo Island is jointly owned by the State of Georgia, the R.J. Reynolds Foundation, and the residents of the Hog Hammock Community. Sapelo is a National Estuarine Research Reserve and Wildlife Refuge. Primitive camping and short-term lodgings are offered through the residents of Hog Hammock and the Department of Natural Resources (DNR).

4. Resources and Environment

Wolf Island is located just south of Sapelo at the mouth of the Altamaha River. It has a total of 5,126 acres, of which only 250 acres are high ground including beach and dunes. Access to the island is by boat and only limited public recreation activities are allowed.

Little St. Simons Island is the last family-owned island on Georgia's coast. It was purchased in 1908 by Philip Berlzheimer. His descendants still own the island and operate a retreat where guests are invited to fish, hunt, horseback ride, and take nature tours. The island has a total of 8,840 acres, of which 2,300 acres are uplands, and six and one-half miles of beaches.

Sea Island is connected by causeway to St. Simons Island and is a privately owned beach resort with hotels and private cottages and residences. Development of Sea Island began in 1926 when Howard Coffin bought five miles of beach front and established the Sea Island Company to develop a resort. The Cloister Hotel opened in October 1928 and is today a five-star hotel.

St. Simons is Georgia's only larger barrier island that has never been privately owned. St. Simons consists of 27,300 total acres including marsh. It has 12,300 acres of upland and three miles of beach. The St. Simons Lighthouse, first constructed in 1810 and rebuilt in 1871, is one of the nation's oldest continuously working lighthouses. Most of the island is privately owned residential homes and low-key commercial hotels and condominiums.

Jekyll Island, the smallest of Georgia's major barrier islands, is 10 miles long and one and one-half milewide at its widest point. It has 5,700 total acres, 4,400 of which are uplands. It has eight miles of beach. In 1886, Jekyll was purchased by a group of northern millionaires including Rockefeller, Morgan, Pulitzer, Vanderbilt, Gould, McCormick, Goodyear, Aston, Baker, Biddle, Whitney, Armour, Crane, Macy, and Bliss families for use as a winter resort. In 1947, the state of Georgia bought Jekyll for use as state park. The causeway and bridge were built in 1954, allowing easy access for the public to enjoy year-round recreational activities.

Little Cumberland Island is owned by a private homeowner's association. The island has two and a half miles of beach and 2,400 total acres, 1,600 of which are uplands.

Cumberland Island is the southernmost and longest of Georgia's barrier islands. It has a total of 23,000 acres, 15,000 of which are uplands. The island is one and a half to three miles wide and has 17.5 miles of beach. Thomas Carnegie purchased a portion of the island and rebuilt the Dungeness mansion in 1880. Around 1900, W.P. Bunkly built the Hotel Cumberland. The property later became the property of the Candler family of Atlanta.

Portions of Cumberland were donated to the National Parks Service in 1970 and by an Act of Congress in 1972 it became a National Seashore. In 1982, the northern half of the island was added to the National Wilderness Preservation System. Today the island is managed by the National Parks Service and day trips and short-term camping are available. There are still several private residences on the island and the Grey Field Inn, a private facility, offers overnight accommodation.

4. Resources and Environment

4.9 Interstate

Interstate 95 (I-95) bisects the region from the South Carolina border in the north to the Florida border in the south. This interstate is the primary north/south corridor between the states of New York and Florida. Interstate 16 (I-16) is the primary east/west connector for central Georgia, connecting Savannah in the east with Macon, and providing access to Interstate 75 (access to Atlanta) in the west. I-16 crosses I-95 near Savannah. The interstate access, as well as air and rail facilities make the region a prime location for industrial development dependent upon access to multi-modal transportation and infrastructure.

The Savannah/Hilton Head International Airport provides the region with access to international passenger and cargo air service. The airport is located strategically near the junction of I-95, I-16, and the Savannah Ports, and only minutes from historic downtown Savannah tourism destinations. The region is also home to the Brunswick Golden Isles Airport, a commercial passenger airport, similarly located with convenient access to the Port of Brunswick, I-95 and tourist attractions in the southern portion of the region.

4.10 Broadband

Access to broadband has the potential to boost local economic development. Businesses are more likely to locate or relocate to areas with reliable and fast internet access. Access to broadband allows for industries located in rural areas to compete on a global scale. The Internet is needed for the job-seeking and employment process as more companies conduct hiring practices online, especially in a post-pandemic economy. Businesses with broadband access can reach more candidates that they otherwise couldn't have, enticing more members of the workforce to move to the region. Telecommuting and teleworking have also increased in popularity in recent years and have become a standard for many competitive industries. Without access to broadband these opportunities are missed by local jobseekers.

5. COVID-19

5.1 National Impacts

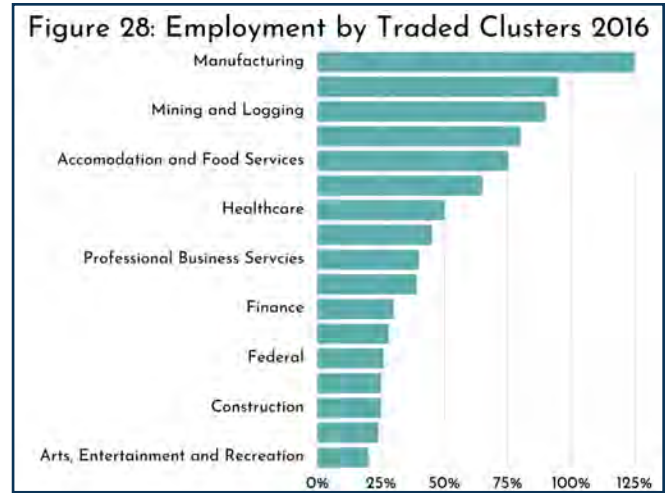
The Wall Street Journal reported on the economic impacts the COVID-19 pandemic had on that nation. Figure 28 shows the national job growth since the start of the pandemic. Manufacturing jobs have seen the most growth with a 125% increase.

Figure 29 demonstrates the monthly number of employee quitting as a percentage of total employment from 2018 to 2022. There is a significant dip in the second quarter of 2020 to 0% quits. After this quarter the quits percentage begins to rise higher than pre-pandemic numbers to 3.10% in the first quarter of 2022.

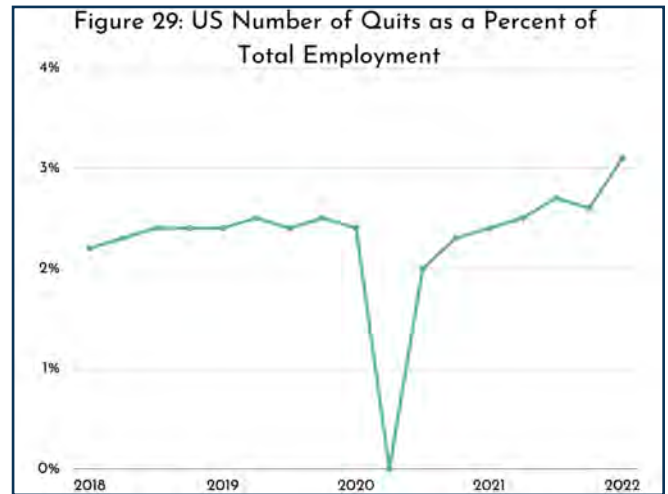
Figure 30 compares the national median hourly wage change from 2018 to 2022. Lowest-earning workers saw the biggest increase in wages overtime and highest-earning workers saw the least change.

5.2 Stimulus

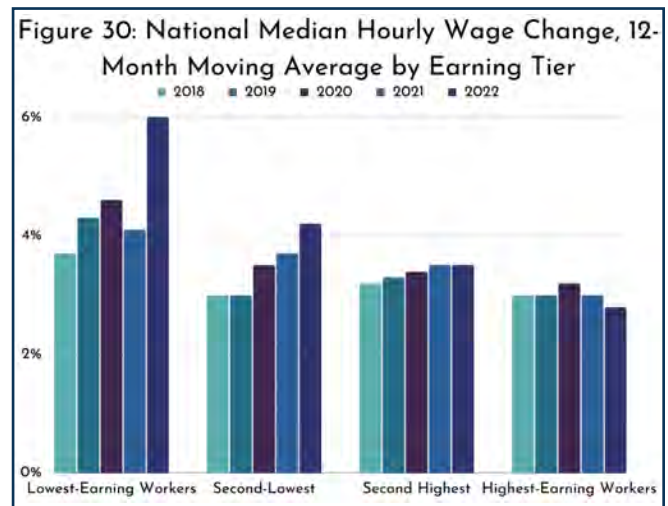
During the pandemic, the federal government provided funds in order to stimulate local economies and personal spending. \$850 billion in funding was allotted to distressed and small business through the CARES Act. \$3 billion in economic development assistance and \$362 billion in state and local fiscal recovery from the ARPA were also designated. 75% of households in the nation spent their first stimulus checks whereas 50% used the second and third checks to pay off debt or add to savings.



Source: Wall Street Journal



Source: Wall Street Journal



Source: Wall Street Journal



Community Analysis

1. Preparation
2. Strengths, Weaknesses, Opportunities, and Threats
3. Needs Assessment
4. Economic Resilience

1. Preparation



During the planning process for this Comprehensive Economic Development Strategy, CRC staff participated in webinars, invited key speakers to address the steering committee, and hosted engagement meetings. Outreach efforts for the CEDS were combined with efforts for the 2022 Regional Plan Update. Both planning processes had overlapping timelines and goals.

2. SWOT

Strengths

- Natural coastal assets
- Ports
- Community
- Good place to live
- Desirable for new residents and businesses
- Transportation network
- History
- Tourism
- Educational Institutions
- Military Bases

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Weaknesses

- Lack of high paying jobs
- Lack of economic diversification
- Lack of employment and training opportunities
- Traffic congestion and road wear from heavy freight traffic
- Lack of public transportation
- Low walkability
- Lack of affordable housing
- Crime
- Unplanned growth
- Poverty
- Lack of healthcare access
- Low public participation
- Lack of recreation options
- Homelessness

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Opportunities

- "Smart growth"
- Attracting high paying employers
- Development of marine industry
- Good time and place for economic development
- Infill development
- Improving bike and pedestrian connections
- Reversing brain drain by attracting jobs and building livable communities
- Encouraging talented people to live here
- Regional coordination on stormwater runoff
- Promoting eco-tourism

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Threats

- Loss of natural resources and coastal assets
- Public service capacity strained by sprawl
- Sea level rise
- Natural disasters
- Septic tank failure
- Aging infrastructure
- Competition for workforce
- Depleting water supply
- Failure to engage rural residents
- Loss of dunes and buffers
- Aging workforce approaching retirement
- Property blight
- Decline of seafood industries

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3. Needs Assessment

Needs

- Shift from lower paying service jobs to higher paying manufacturing jobs
- Sufficient jobs and economic opportunities for rural residents
- Economic diversification
- Labor skills and education to support a diverse group of industries
- Protect locally owned retail stores in downtown areas from regional shopping centers
- Support programs for entrepreneurs and minority-owned businesses
- Promote expansion of existing businesses and new industry
- Redevelopment opportunities
- Support in coastal commercial fisheries industry
- Preserve the traditional silviculture industry in Coastal Georgia
- Brownfield prevention and rehabilitation
- Promote growth and development through amending wastewater processing and water consumption limitations
- Communication between governments, authorities, businesses, and citizens in planning and implementing economic development plans

Opportunities

- Market existing industrial parks with the infrastructure in place
- Promote more high value, environmentally sound industries
- Promote proximity to ports and regional transportation
- Support the quality K-12 educational systems already in place and improve others
- Take advantage of the numerous options for advanced education and workforce development
- Promote strong healthcare and engineering educational opportunities in the region
- Tap into the supply of professional, technical information, and expertise available in the region
- Support existing local chambers of commerce and development authorities in their promotion of the area's towns, counties, and local businesses
- Attract businesses with airports, transit systems, and other regional transportation initiatives
- Promote available commercial property and infill properties in the already-populated areas of the region
- Encourage private and public partnerships to redevelop neglected areas under Georgia's Urban Redevelopment Act
- Support the viable coastal fisheries industry through state and local programs
- Maintain undeveloped land in the region that is best suited for forestry and agricultural purposes.
- Recruit growth industries that can use the skills of workers in declining industries
- Develop or enhance collaboration between local economic development agencies and community-based organizations
- Begin international outreach by tapping into Georgia Department of Economic Development job training programs.
- Incentivize and support developments that rehabilitate existing brownfield sites

4. Economic Resilience

The EDA defines economic resilience as “the ability of a region or community to anticipate, withstand, and bounce back from shocks and disruptions, which includes both natural and human disasters”. All communities must be able and willing to recognize their vulnerabilities and develop strategies that lead to mitigation and long-term recovery. A resilient region minimizes disruption to everyday life and economies. Economic resilience is mentioned throughout this plan.

Preparing for possible disruptions is integral to creating resilience in the region. Having up-to-date hazard mitigation plans, emergency operation plans, and climate action plans means the community is aware of their vulnerabilities and has identified the path needed to mitigate risk or respond to shocks. Some communities in the region have struggled with maintaining up-to-date plans, furthering the risk to the communities they are meant to serve. Businesses can also help themselves resist shock by implementing emergency action plans with their employees.

Communities with unequal distribution of wealth are less resistant to economic shock, making recovery efforts more difficult. The Gini index captures the level of inequality. A coefficient of zero is considered perfect equality and one is considered extreme inequality. A higher Gini coefficient means that less people receive more of the income in the region. The counties in the coastal region all have a significant income gap.

Identified Threats to Economic Resilience:

- Income Inequality
- Gaps in Resilience Planning
- Lack of Transportation within Lower Income Families
- Lack of Business Continuity Plans
- Threats to Coastal Ecosystem
- Access to public services
- Aging Infrastructure
- Lack of economic diversity

Table 12: Distribution of Wealth Comparison 2020

	Gini Index	Margin of Error
United States	0.4817	±0.0004
Georgia	0.4814	±0.0019
Bryan	0.4058	±0.0188
Bulloch	0.4863	±0.0468
Camden	0.4276	±0.0280
Chatham	0.482	±0.0118
Effingham	0.4332	±0.0469
Glynn	0.4848	±0.0222
Liberty	0.3991	±0.0145
Long	0.4206	±0.0318
McIntosh	0.4203	±0.0285
Screven	0.4656	±0.0255
Source: B19083 ACS 2020 5 Year-Estimates		



Strategy Action Plan

1. Vision
2. Goals and Objectives
3. Resources, Tools, and Financing for Implementation

1. Vision

The region seeks to be economically resilient by investing in workforce training, innovative development plans, regional marketing efforts, quality of life, and economic diversification.

2. Goals and Objectives

The Coastal Regional Commission, through a process of surveys, meetings, and briefings, offers the following goals and objectives as the course of proposed activities that will improve the economic vitality of the ten-county region.

1. Infrastructure and Development

Develop long-term plans to encourage resilient infrastructure and sustainable development that serves the needs of the region.

2. Workforce

Develop opportunities for workforce development and education to sustain a competitive workforce.

3. Global Competitiveness

Market the region on a national and global scale to encourage economic growth.

4. Local Investment

Encourage local participation and investment in the community.

5. Resilience

Reduce vulnerabilities and strengthen the resilience of the region through both steady-state and responsive initiatives.

3. Financing for Implementation

The Georgia Department of Community Affairs publishes an “Economic Development Financing Packet” which is an excellent inclusive listing of various financing resources. These Incentives vary from local initiatives to statewide initiatives. Business Development Funds are various federal, state, and local financing programs which help provide business and industry with needed capital to make their projects happen. The following overview is not all inclusive but merely a listing of the most used or best-known programs in the area. There are four primary sources of grant funds available for economic development: Georgia Department of Community Affairs, the OneGeorgia Authority, the Economic Development Administration, and the United States Department of Agriculture-Rural Development. The Small Business Development Center (SBDC) at the University of Georgia has a proven track record in new business creation and providing access to monies. This section also includes the programs listed under the Bipartisan Infrastructure Law that went into effect in 2022.

3.1 Small Business Development Center University of Georgia

The Small Business Development Center’s (SBDC) goal is to enhance the economic well-being of Georgians by providing a wide range of educational services for small business owners and aspiring entrepreneurs. New business creation is the lifeblood of our economy, and the infusion of capital enables firms to finance future growth.

SBDC assists clients with access to money through loans and equity financing. The SBDC helps navigate through obstacles that come with stages of the business cycle. Over the past years clients of the SBDC added approximately 11,785 new jobs to the economy.

3.2 Georgia Department of Community Affairs

Community Development Block Grant

The primary objective of the economic development (ED) component of the CDBG program is the expansion of economic opportunities in cities and counties, principally for persons of low-and-moderate income. This is accomplished by funding viable projects which cannot take place without CDBG assistance. Applicants should note that any project must create or retain jobs for low- and moderate-income people.

CDBG annual competition grants may be loaned to businesses or used to build public infrastructure that make business projects possible and create employment for low- and moderate-income persons. Generally eligible are:

1. Projects carried out by public or private nonprofit entities including:
 - a. Acquisition of real property;
 - b. Acquisition, construction or rehabilitation of public facilities, site improvements and utilities.
2. Loans to private businesses for fixed asset financing when assistance is necessary and appropriate to carry out an economic development project.

3. Financing for Implementation

Loans are usually made at below-market rates with favorable terms (but no more favorable than the minimum necessary to make the project feasible). Payback is not required where CDBG funds are used for public infrastructure projects

Employee Incentive Program

The Employment Incentive Program (EIP) is a financing program capitalized with State CDBG funds that may be used by private businesses along with conventional private financing to carry out economic-development projects which will result in employment of low- and moderate-income persons. Eligible EIP activities encompass three broad areas:

1. Grants to local governments for the installation of public infrastructure which supports an eligible economic development project. Eligible projects include public water and sewer systems, distribution and/or collection lines, wastewater treatment projects, rail spurs, and various other types of public facilities;
2. Grants to local governments who then loan the EIP proceeds to a sub-recipient business to finance various fixed assets used in an eligible economic development project. Eligible uses for EIP loan funds include financing for fixed assets: land, new facilities, rehabilitation of existing facilities, machinery and equipment, and some types of privately owned infrastructure.
3. Grants to local governments for assistance to local development entities and other local non-profit corporations to fund facilities which assist low- and moderate-income persons to acquire employment, the employment skills and/or basic educational training to become more effective participants in the local economy. Eligibility for such activities will be limited to "new" activities which have not previously been undertaken by the unit of local government or local development entity. EIP projects must always create or retain employment principally for low- and moderate-income people.

Job Tax Credit

A Job Tax Credit program is designed to encourage businesses to locate and to expand in the state by providing tax credits for certain businesses that create new jobs. The state is divided into four tiers based on demographic calculation of need and the more needy counties are provided a higher tax credit.

3. Financing for Implementation

Opportunity/Enterprise Zones

The Enterprise Zone Employment Act recognizes the need for revitalization in areas of Georgia. The State Enterprise Zone program intends to improve geographic areas that suffer from disinvestment, underdevelopment, and economic decline while encouraging private businesses to reinvest and rehabilitate these places.

The Enterprise Zone area must meet three of the following five criteria:

1. Pervasive poverty established by U.S. Census data in that each block group must have at least a 20 percent poverty level,
2. Unemployment Rate at least 10 percent higher than the State, or significant job dislocation.
3. Underdevelopment evidenced by lack of building permits, licenses, land disturbance permits, etc. and lower development activity than within the local body's jurisdiction.
4. General distress and adverse conditions (population decline, health and safety issues, etc.)
5. The presence of general blight is evidenced by the inclusion of any portion of the nominated area in an urban redevelopment area.

Opportunity Zone Tax Credit Program

Opportunity Zone Tax Credit program is a designation of a "less developed area" that is within two or more census block groups with 15 percent or greater poverty, within an enterprise zone, and where an urban redevelopment plan exists. Opportunity Zones are intended to encourage development and redevelopment in smaller geographic areas than are served by existing economic development programs. State resources are directed towards these "pockets of poverty" in a way that can be supplemented by federal programs.

3.3 OneGeorgia Equity Fund

OneGeorgia Equity Fund is a community and economic development tool providing financial assistance through grants and loans to promote development and retention of employment opportunities and enhancement of various infrastructures.

Eligible recipients include local governments, local government authorities, and joint or multi-county development authorities in rural counties with high poverty rates. Equity funds may be used for a multitude of economic development activities designed to increase employment opportunities.

OneGeorgia Economic Development Growth & Enterprise (EDGE) program, is a specialized economic development tool used to enhance Georgia's competitiveness in attracting significant economic development projects. EDGE funds are targeted for competitive projects in rural counties suffering from high poverty. All of the Coastal Region's counties are either conditionally eligible, or eligible to receive OneGeorgia Equity Funds.

3. Financing for Implementation

3.4 Economic Development Administration (EDA)

EDA provides grant funds to help build or expand public facilities essential to industrial and commercial growth such as industrial parks. Over the past forty years, EDA funds have been used in almost every county in the region. EDA also provides grants to designated economic development districts for planning and economic development technical assistance.

3.5 USDA Rural Development

USDA Rural Development financial programs support essential public facilities and services including water and sewer systems, housing, health clinics, emergency service facilities, electric, and telephone service. The program promotes economic development by supporting loans to businesses through banks and community-managed lending pools.

The program offers technical assistance and information to help agricultural and other cooperatives get started and improve the effectiveness of their member services. Rural Development achieves its mission by helping rural individuals, communities, and businesses obtain financial and technical assistance needed to address their diverse and unique needs. Rural Development works to make sure that rural citizens can participate fully in the global economy.

3.6 Small Business Administration

SBA offers programs which have been used in the coastal Georgia region, including the SBA 7a and SBA 504 loan programs. The SBA 7a program is a conventional bank loan with SBA providing a guarantee to the local financial institutions. The SBA 504 provides direct financing for 40 percent of the fixed assets needed by the new or expanding business. The SBA takes a second lien position behind a conventional bank lender who provides 50 percent of the project financing. The business is only required to inject 10 percent of the project. The 90 percent long-term financing offered by this program has been very beneficial to the economic development of the region.

3.7 Georgia Environmental Finance Authority (GEFA)

The Georgia Environmental Finance Authority provides loans for water, sewer, and solid waste infrastructure; manages energy efficiency and renewable energy programs; oversees land conservation projects; and manages and monitors state-owned fuel storage tanks. These programs improve Georgia's environment, protect its natural resources and promote economic development (Georgia.gov).

3. Financing for Implementation

3.8 Georgia Department of Transportation (GDOT)

The Local Maintenance & Improvement Grant (LMIG) program is designed to help local governments achieve much-needed improvements to the state's roadway network. The LMIG program allows local governments greater flexibility and quicker project delivery while allowing administering the program with a reduced workforce and new funding match requirements.

3.9 General Fund and Bond Proceeds

General Fund and Bond Proceeds is funding that can be used to help local governments or communities underwrite expenditures for economic development. Some governments set aside fund balance as well for use in economic development. They are utilized for public property of the state.

3.10 Special Purpose Local Option Sales Tax (SPLOST)

A special-purpose local-option sales tax (SPLOST) is a financing method for funding capital outlay projects in Georgia. It is an optional 1% sales tax levied by any county for the purpose of funding the construction of parks, schools, roads, and other public facilities. The revenue generated cannot be used towards operating expenses or most maintenance projects.

3.11 Bipartisan Infrastructure Law

The Bipartisan Infrastructure Law includes competitive funding available to local governments for investing in community infrastructure. The funding is broken down into 25 opportunities for states or local governments to apply for and coordinate efforts.

Rebuilding American Infrastructure Sustainably and Equitably (RAISE) Grants

A previously existing grant program at DOT, RAISE provides funding for road, rail, transit, and other surface transportation of local or regional significance. Selection for funding is based on safety, sustainability, equity, economic competitiveness, mobility, and community connectivity.

Port Infrastructure Development Program Grants

From DOT, this program funds investment for the modernization and expansion of US ports. Funds can be used to remove bottlenecks, ensure long-term competitiveness, movement improvements, port electrification, idling reduction, worker training, resilience, and sustainability while reducing impacts to the environment and neighboring communities.

Bus & Bus Facilities Competitive Grants

This DOT program provides capital funding for the replacement, rehabilitation, purchase, or lease of buses, bus related equipment, and bus-related facilities. It also provides funding for low or no emissions bus projects. or national significance. Eligibly includes large projects that are unachievable without financial assistance.

3. Financing for Implementation

National Infrastructure Project Assistance (Also known as "Megaprojects" or MEGA)

This grant program supports multi-modal and multi-jurisdictional projects that are of regional or national significance. Eligibly includes large projects that are unachievable without financial assistance.

Infrastructure for Rebuilding America (INFRA) Grants

DOT program that supports highway and rail projects of regional and economic significance.

Safe Streets and Roads for All

A grant program with DOT that provides funding directly to local governments to support efforts for vision zero and complete streets plans to reduce cyclist and pedestrian crashes.

Charging and Fueling Infrastructure Grants

A grant from DOT to fund the strategic deployment of public access electric vehicle charging infrastructure, and hydrogen, propane, and natural gas fueling infrastructure.

Clean School Bus Program

A new grant program from the EPA provides funding to replace school buses with low or zero emission school buses.

Reconnecting Communities

A new program at DOT that aims to connect communities divided by transportation infrastructure, particularly historically disadvantaged communities. Provides funding to states, local governments, MPOs, and tribal governments for planning, design, demolition, and reconstruction of street grids, parks, or other infrastructure.

Rural Surface Transportation Grant

A new grant program at DOT to improve and expand surface transportation and infrastructure in rural areas, increasing connectivity, improving safety and reliability of the movement of people and freight, and generate regional economic growth.

Building Resilient Infrastructure and Communities Program

A program out of FEMA that distributes funds to support communities with hazard mitigation projects to reduce risk.

Flood Mitigation Assistance

A program out of FEMA that provides funding for projects to reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.

Brownfields Remediation Program

An EPA program that provides grant funding and technical assistants to communities to assess and clean-up contaminated properties and offer job training programs.

3. Financing for Implementation

Energy Efficiency and Conservation Block Grants

A Department of Energy block grant program that provides funds to states, local governments, and tribes for projects aimed at reducing energy use, increasing energy efficiency, and cutting pollution.

Grants for Energy Efficiency and Renewable Energy Improvements in Schools

This program from the Department of Energy provides funds for local government education agencies and nonprofits to make energy efficiency, renewable energy, and clean vehicle upgrades and improvements at public schools.

Energy Improvement in Rural or Remote Areas

This Department of Energy program provides funds to entities in rural or remote areas to increase environmental protection from the impacts of energy use and improve resilience, reliability, safety, and availability of energy.

Grants for Energy Efficiency and Resilience Code Adoption

This Department of Energy program provides funds to state energy agencies to enable sustained, cost-effective implementation of updated building energy codes to save customers money on energy bills.

Regional Clean Hydrogen Hubs

This program from the Department of Energy provides funds to support the development of at least four regional clean hydrogen hubs to improve clean hydrogen production, processing, delivery storage, and end use.

Community Wildfire Defense Grant Program

This program out of the Department of Agriculture provides grants to communities at risk of wildfire to develop or update their community wildfire protection plans and carry out plan implementation.

ReConnect Program

This Department of Agriculture program provides funds in loans and grants for projects that provide broadband to rural areas.

Middle Mile Grants Program

This program from the Department of Commerce provides grants for the conservation, improvement, or acquisition of middle mile broadband infrastructure.

3. Financing for Implementation

State and Local Cybersecurity Grant Program

This program out of the Department of Homeland Security provides funding to state, local, and tribal governments to address cybersecurity risks and cybersecurity threats to information systems.

Smart Grid Investment Grant Program and Energy Sector Operational Support For Cyber Resilience Program

These Department of Energy programs provide funds for electric utilities to modernize the electricity grid and increase resilience to cybersecurity threats.

Water & Groundwater Storage and Conveyance

This program from the Department of the Interior provides funds for water storage projects.

Emergency Watershed Protection Program

This program from the Department of Agriculture provides technical and financial assistance to project sponsors for the design and construction of measures to help repair damages from a recent disaster.



Evaluation and Implementation

1. Evaluation
2. Implementation

1. Evaluation

For this economic development plan to be achievable, there must be ways to measure the success of each goal from approval to horizon year. Economic conditions are always changing, making review of the CEDS goals and objectives necessary. Through annual reports the CRC can determine the areas of success within the CEDS are reevaluated for any problem areas. The annual report of accomplishments is an evaluation tool used to maintain the desired vision of the region. This document is maintained by CRC staff under the guidance of the CRC councils.



2. Implementation

1. Infrastructure and Development

Develop long-term plans to encourage resilient infrastructure and sustainable development that serves the needs of the region.

Objective	Action Item	Performance Evaluation Schedule					Responsible Party	Time Frame
		2023	2024	2025	2026	2027		
Encourage new developments in infill areas and clusters in accordance with smart growth practices.	Identify potential sites for new development that fits within smart growth practices.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long
	Work with regional partners to create and market more incubators/ makerspaces.	x	x	x	x	x	CRC, regional stakeholders, local governments	Mid
Support and assist local governments on redevelopment and rehabilitation projects for dilapidated structures.	Identify structures that are in need of rehabilitation using crowdsourcing methods.	x	x	x	x	x	CRC, regional stakeholders, local governments	Mid
	Make abandoned structures more appealing for redevelopment by the private sector.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long
Support and assist local governments on development or refurbishment of needed infrastructure.	Create an online form for residents to report needed infrastructure improvements.	x	x	x			CRC	Short
	Continue to conduct an inventory of assets and needs across the region.	x	x	x	x	x	CRC, regional stakeholders, local governments	Mid

2. Implementation

2. Workforce

Develop opportunities for workforce development and education to sustain a competitive workforce.

Objective	Action Item	Performance Evaluation Schedule					Responsible Party	Time Frame
		2023	2024	2025	2026	2027		
Collaborate with CWDB and other organizations and agencies to initiate equitable access to education, training, and employment access.	Explore opportunities to increase the level of educational attainment.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long
	Offer technical support and feedback on draft grant applications, development, monitoring, and administration.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long
	Survey stakeholders to identify training needs among the workforce.	x	x				CRC, regional stakeholders, local governments	Short
Support an aging workforce through continued education and quality of life investments.	Identify opportunities for adult education funding.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long
Market the educational opportunities in the region to expand workforce.	Analyze and report on annual workforce trends.	x	x	x	x	x	CRC, regional stakeholders	Long

2. Implementation

3. Global Competitiveness

Market the region on a national and global scale to encourage economic growth.

Objective	Action Item	Performance Evaluation Schedule					Responsible Party	Time Frame
		2023	2024	2025	2026	2027		
Assist counties with identifying and addressing broadband deployment gaps.	Survey region for gaps in broadband access and identify underserved and unserved areas.	x	x				CRC, regional stakeholders, local governments, GIS, DCA	Short
Coordinate the county development efforts, the industry clusters, and the location incentives to overseas markets and investors via DEcD foreign offices.	Collaborate with county economic development authorities to establish industrial marketing efforts of the region with special emphasis on local fishing industries.	x	x	x	x	x	CRC, regional stakeholders, local governments	Mid
	Collaborate with tourism bureaus, chambers, downtown development authorities, environmental groups, and economic development organizations to effectively market the region.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long

2. Implementation

4. Local Investment

Encourage local participation and investment in the community.

Objective	Action Item	Performance Evaluation Schedule					Responsible Party	Time Frame
		2023	2024	2025	2026	2027		
Develop a strong sense of place throughout the region.	Maintain a network of cultural and environmental resources in the region.	x	x	x	x	x	CRC	Long
	Promote the preservation of historic sites and structures to enhance opportunities for tourism and economic development that maintains the region's heritage and character.	x	x	x	x	x	CRC, regional stakeholders, local governments	Mid
	Promote downtown revitalization efforts to enhance job creation and centralize businesses and offices.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long
	Identify locations for wayfinding to promote the cultural and geographic resources of the region.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long
Promote or develop resources that would aid in improving quality of life.	Continue to work with local governments to improve affordable housing.	x	x	x	x	x	CRC, regional stakeholders, local governments	Long
	Support and promote financing programs available via CADD, county RLFs, regional CDFIs as well as appropriate state and federal programs, with special emphasis on local businesses.	x	x	x	x	x	CRC, regional stakeholders, local governments, DCA, EDA	Long

2. Implementation

5. Resilience

Reduce vulnerabilities and strengthen the resilience of the region through both steady-state and responsive initiatives.

Objective	Action Item	Performance Evaluation Schedule					Responsible Party	Time Frame
		2023	2024	2025	2026	2027		
Engage in comprehensive planning efforts that promote a community vision of resilience through associated planning efforts such as HMPs and climate action strategies.	Identify gaps in local government resilience planning.	x	x				CRC	Short
	Assist in local government resilience planning where necessary.	x	x	x	x	x	CRC, local governments	Long
Create and maintain a resilience network of regional stakeholders to collaborate and advise on existing economic vulnerabilities in the region.	Identify economic resilience stakeholders in the region.	x	x	x			CRC, regional stakeholders, local governments	Short
Encourage a more economically diverse region.	Identify policies and programs to promote economic diversity in the region and reflect the changing economy and society.	x	x	x	x	x	CRC	Mid



Appendix

- A. Housing
- B. COVID-19
- C. Commuting

A. Housing

Average Household Size 2017-2026			
	2017	2021	2026
Bryan County	2.83	2.81	2.81
Bulloch County	2.56	2.55	2.55
Camden County	2.67	2.65	2.64
Chatham County	2.47	2.45	2.46
Effingham County	2.87	2.84	2.84
Glynn County	2.47	2.44	2.43
Liberty County	2.72	2.7	2.69
Long County	2.81	2.79	2.78
McIntosh County	2.37	2.36	2.36
Screven County	2.52	2.51	2.5
Coastal Region	2.57	2.56	2.56
Georgia	2.64	2.63	2.63

Source: ESRI Business Analyst Online

Cost-Burdened Housing Owner Occupied Units with a Mortgage		
	2016	2019
Bryan County	23.50%	29.80%
Bulloch County	26.60%	24.00%
Camden County	36.30%	26.00%
Chatham County	36.00%	32.70%
Effingham County	25.80%	24.20%
Glynn County	34.80%	29.80%
Liberty County	38.10%	29.50%
Long County	25.60%	23.00%
McIntosh County	39.90%	36.00%
Screven County	37.30%	26.80%
Coastal Region	35.70%	29.60%

Source: U.S. Census

Housing Move-In Years 2015-2019		
	Estimated Occupied Housing Units	Percent
Moved in 2017 or later	35042	13.30%
Moved in 2015 to 2016	50591	19.20%
Moved in 2010 to 2014	64193	24.30%
Moved in 2000 to 2009	58896	22.30%
Moved in 1990 to 1999	28713	10.90%
Moved in 1989 or earlier	26505	10.00%
Total	263940	100%

Source: U.S. Census

Age of Housing 2015-2019		
	Estimated Housing Units	Percent
2014 or later	10017	3.80%
2010 to 2013	12108	4.60%
2000 to 2009	55725	21.10%
1980 to 1999	92592	35.10%
1960 to 1979	53322	20.20%
1940 to 1959	26522	10.00%
1939 or earlier	13654	5.20%
Total	263940	100%

Source: U.S. Census

A. Housing

Cost-Burdened Housing Renter Occupied Units		
	2016	2019
Bryan County	48.50%	48.30%
Bulloch County	62.70%	48.60%
Camden County	43.70%	43.50%
Chatham County	54.60%	45.50%
Effingham County	42.00%	42.10%
Glynn County	49.00%	43.50%
Liberty County	52.00%	46.50%
Long County	47.50%	51.70%
McIntosh County	49.30%	44.10%
Screven County	49.20%	34.00%
Coastal Region	53.90%	45.50%
Source: U.S. Census		

Renter Occupied Housing Expenditures		
	Average Amount Spent	Percent
Rented Housings	\$4,515.08	100%
Rent	\$4,407.67	97.60%
Renters Insurance	\$31.09	0.70%
Maintenance and Repair Services	\$50.11	1.10%
Maintenance and Repair Materials	\$26.21	0.60%
Source: ESRI Business Analyst Online		

Owner Occupied Housing Expenditures		
	Average Amount Spent	Percent
Owned Housings	\$11,309.70	100%
Mortgage Interest	\$2,695.75	23.80%
Mortgage Principal	\$1,926.34	17.00%
Property Taxes	\$1,993.51	17.60%
Homeowners Insurance	\$513.01	4.50%
Ground Rent	\$59.76	0.50%
Maintenance and Remodeling Services	\$2,296.16	20.30%
Maintenance and Remodeling Materials	\$521.45	4.60%
Property Management and Security	\$94.81	0.80%
Source: ESRI Business Analyst Online		

B. COVID-19

Manufacturing (31-33) Gross Domestic Product in Millions					
Area	2016	2017	2018	2019	2020
Coastal Region	4885.7	5287.5	5962.6	5874.2	5363.9
Georgia	58691.8	60150.9	62375.3	61608.7	59534.9

Source: JobsEQ by Chmura Economics

Manufacturing (31-33) Total Wages in Millions									
Area	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1
Coastal Region	\$574.7	\$509.7	\$493.4	\$527.7	\$550.9	\$455.5	\$436.6	\$498.7	\$512.5
Georgia	\$6133.4	\$5738.1	\$5679.8	\$5991.3	\$6221.0	\$5127.7	\$5448.8	6270.0	6258.7

Source: JobsEQ by Chmura Economics

Manufacturing (31-33) Establishments					
Area	2016	2017	2018	2019	2020
Coastal Region	480	456	473	481	484
Georgia	10097	9747	9887	10069	10658

Source: JobsEQ by Chmura Economics

Manufacturing (31-33) Employment									
Area	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1
Coastal Region	27,112	27,132	27,190	27,066	26,720	24,868	24,277	24,439	24,867
Georgia	412,864	413,149	411,934	410,645	410,247	375,344	387,506	390,930	395,533

Source: JobsEQ by Chmura Economics

C. Commuting

2019 Inflow/Outflow Report		
	Count	Share
Employed in the Coastal Region	215509	100%
Employed in the Coastal Region but Living Outside (Inflow)	49264	22.90%
Employed and Living in the Coastal Region	166245	77.10%
Living in the Coastal Region	218245	100.00%
Living in the Coastal Region but Employed Outside (Outflow)	52000	23.80%
Employed and Living in the Coastal Region	166245	76.20%
Source: U.S. Census Onthemap		

2019 Commute Distance Home Census Block to Work Census Block		
	Count	Share
Total Private Primary Jobs	218,245	100.00%
Less than 10 miles	100,708	46.10%
10 to 24 miles	46,462	21.30%
25 to 50 miles	22,119	10.10%
Greater than 50 miles	48,956	22.40%
Source: U.S. Census Onthemap		

APPENDIX F

CITY OF BRUNSWICK TAX ALLOCATION DISTRICT #1: HISTORIC CORE REDEVELOPMENT PLAN



October 6, 2017

Prepared for:

City of Brunswick, Georgia

Prepared by:



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1. TAD # 1: Historic Core Redevelopment Plan Summary

This section presents an executive summary of the key elements of the redevelopment plan for the City of Brunswick Tax Allocation District #1: Historic District.

The City of Brunswick presents this plan outlining the rationale, boundaries, fiscal data and potential projects that could result from the formation of the City of Brunswick Tax Allocation District #1: Historic Core. This Redevelopment Plan was prepared in conformance with the provisions of Georgia's Redevelopment Powers Law (O.C.G.A. Title 36 Chapter 44) that governs the creation and operation of tax allocation districts (TADs) in the state.

1.1. The Opportunity

The opportunity for the City of Brunswick is to leverage private reinvestment through targeted public improvements that will:

1. Implement the vision set forth in the 2007-2027 Glynn County Joint Comprehensive Plan, adopted by the City of Brunswick in October 2008.
2. Help to re-activate the City's historic downtown core, its unique waterfront, and the Gloucester, Norwich and Highway 17 corridors.
3. By stimulating investment in the TAD area, offset the decline in property values in the city. Since the Great Recession in 2009, property values in the City of Brunswick have declined by 24%.

1.2. Overview and Geographic Boundary

The proposed City of Brunswick Tax Allocation District #1 includes the properties within the boundaries shown on the following map. The TAD area consists of 687 parcels totaling 481 acres. The proposed TAD area contains properties in the Downtown Historic Core, along the city's waterfront, along the Gloucester Street Corridor, and the Highway 17 corridor running northward from the Downtown area, including the intersection with Torras Causeway northward to the city boundary. The 2016 taxable value of property in the TAD is \$28.8 million, which represents 8.95% of the city's property tax digest of \$321,612,543 million—which is under the 10% limit on the amount of a city's tax digest that can be included in its TAD districts collectively.

City of Brunswick Proposed TAD #1 Summary

Brunswick TAD #1 - Proposed TAD Summary	
Parcels	687
Acreage	481
2016 Taxable Value	\$ 28,798,842
2016 Brunswick Tax Digest	\$ 321,612,543
TAD as % of Brunswick Taxable Digest	8.95%
2016 Glynn County Tax Digest	\$ 4,336,227,431
TAD as % of Glynn Taxable Digest	0.66%
2016 Glynn Schools Tax Digest	\$ 4,171,747,696
TAD as % of Glynn Schools Taxable Digest	0.69%

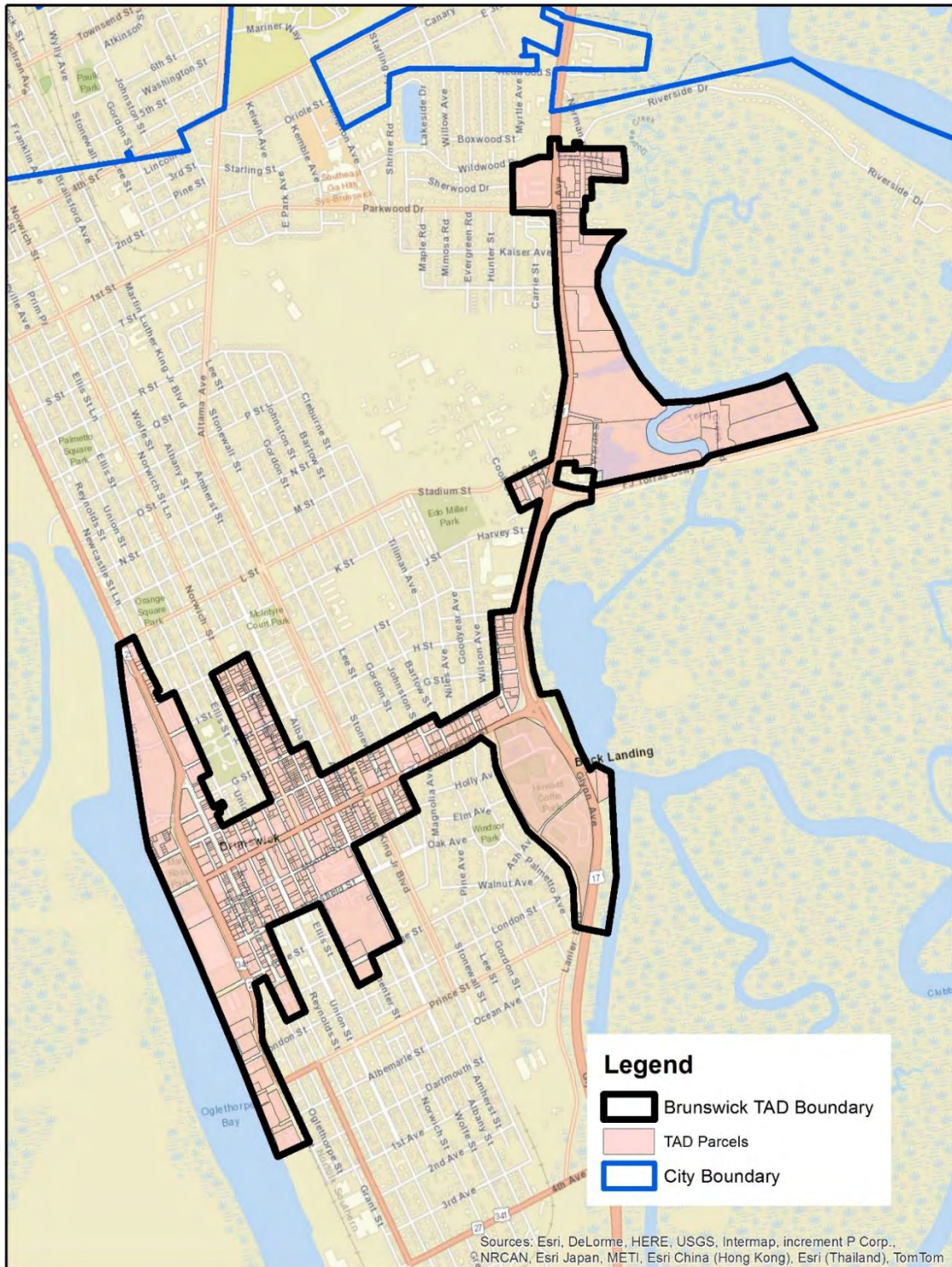
Source: BAG, Glynn County GIS, Georgia Department of Revenue

Appraised Value is a parcel's fair market value (includes tax exempt property).

Assessed Value is 40% of the appraised value, taxable value is the appraised value of all non-tax-exempt properties.

The TAD is comprised of properties within the Downtown Historic Core and the surrounding area with redevelopment/infill potential that are along the commercial corridors coming into Downtown and which the city believes have the potential for future redevelopment. All of the designated TAD parcels are contiguous or connected by a public right-of-way into the TAD #1 area. Tax parcel identification numbers for properties included within TAD #1 are listed in Appendix B.

City of Brunswick TAD #1 District Boundary Map



1.3. Why City of Brunswick TAD #1 Qualifies as a TAD

The City of Brunswick has the authority to exercise all redevelopment and other powers authorized or granted municipalities pursuant to the Redevelopment Powers Law (Chapter 44 of Title 36 of the O.C.G.A.), as approved by referendum on November 3, 2015.

Specifically, the City of Brunswick TAD #1 redevelopment area complies with the O.C.G.A. definition as a distressed area due to four factors:

1. The presence of high incidents of crime
2. The presence of pervasive poverty
3. High unemployment
4. The presence of vacant and deteriorated structures
5. The presence of a high number of older structures with low values

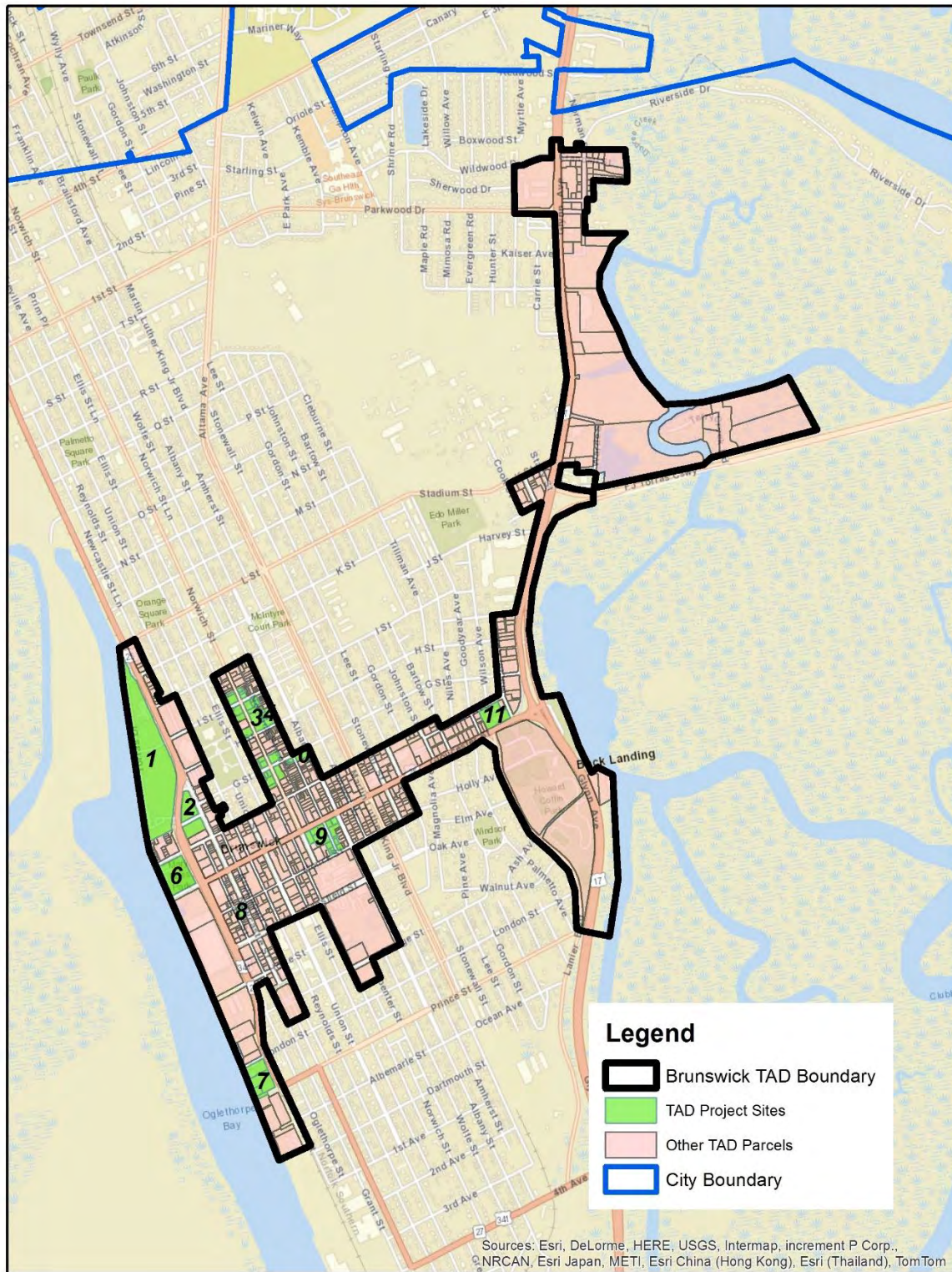
These factors are consistent with the requirements for definition of a redevelopment area in Section A, Chapter 44 of Title 36 of the O.C.G.A. as will be discussed in greater detail in later sections of this redevelopment plan.

1.4. The Redevelopment Plan

This Redevelopment Plan envisions nine potential catalyst redevelopment projects within the TAD area that reflect community objectives identified in the City of Brunswick portion of the 2007-2027 Glynn County Joint Comprehensive Plan. These potential redevelopment projects illustrate the scope of feasible redevelopment in the TAD area.

Based on the development of these hypothetical projects, It is estimated that there is the potential for \$168 million of new market value to be created in the TAD at build-out, based on information on comparable developments in the area and consultant prepared estimates. Should all of this new development occur, it will lead to an estimated \$63.4 million increase in taxable value in TAD #1. This would represent a 20% growth in City's overall Tax Digest. This incremental increase in TAD #1 taxable value would have the potential to support up to \$16.6 million in net TAD bond proceeds to support new development.

TAD #1: Potential Redevelopment Locations in TAD #1 (shown in green)



Potential Brunswick TAD Redevelopment Projects and Potential Values

Catalyst Project Site	1: Hotel Conference Center (Bay & Newcastle	2: Marina Mixed-Use	3: London St. Waterfront Residential	4: Gloucester & Macon Residential	5: Norwich Mixed-Use	6: Norwich Infill Residential	7: Gloucester Mixed Use	8: Newcastle Hotel	9: Mary Ross Park Condo Conversion	Total
Existing Property Values										
Parcels	2	1	3	1	18	17	13	1	1	57.0
Acres of New Development	3.0	14.0	3.2	2.4	2.5	1.6	3.4	0.3	4.6	34.9
Exstiing Market Value	\$ 234,300	\$ 3,709,300	\$ 1,742,600	\$ 179,400	\$ 1,324,300	\$ 966,700	\$ 913,300	\$ 40,900	\$ 1,396,100	\$ 10,506,900
Assessed Value	\$ 93,720	\$ 1,483,720	\$ 697,040	\$ 71,760	\$ 529,720	\$ 386,680	\$ 365,320	\$ 16,360	\$ 558,440	\$ 4,202,760
Tax Value	\$ 42,040	\$ 1,483,720	\$ 697,040	\$ -	\$ 453,560	\$ 386,680	\$ 113,640	\$ 16,360	\$ 558,440	\$ 3,751,480
New Predevelopment Project Values										
New Residential Development										
Townhomes	-	34	-	19	-	-	-	-	-	53
Single-Family Homes	-	-	-	-	-	20	-	-	-	20
MultiFamily Rental Units	-	-	-	-	-	-	54	-	-	54
Condo Units	-	293	112	-	-	-	-	-	20	425
Senior Housing Units	-	-	-	-	45	-	-	-	-	45
Total Housing units	-	327	112	19	-	20	54	-	20	597
New Commercial Development										
Retail SF	5,000	16,754	-	-	2,980	-	8,079	5,000	-	37,812
Convention SF	10,000	-	-	-	-	-	-	-	-	10,000
Hotel Rooms	120	-	-	-	-	-	-	80	-	200
TAD Increment										-
Total Market Value of New Development	\$ 17,625,000	\$ 91,935,849	\$ 25,148,345	\$ 4,677,268	\$ 4,394,792	\$ 2,600,000	\$ 5,857,437	\$ 10,625,000	\$ 5,500,000	\$ 168,363,691
Total Assessed Value (40%)	\$ 7,050,000	\$ 36,707,325	\$ 10,059,338	\$ 1,831,930	\$ 1,757,917	\$ 1,000,000	\$ 2,342,975	\$ 4,250,000	\$ 2,200,000	\$ 67,199,484
Total Taxable Value	\$ 7,050,000	\$ 36,707,325	\$ 10,059,338	\$ 1,831,930	\$ 1,757,917	\$ 1,000,000	\$ 2,342,975	\$ 4,250,000	\$ 2,200,000	\$ 67,199,484
Less Existing Taxable Value	\$ (42,040)	\$ (1,483,720)	\$ (697,040)	\$ -	\$ (453,560)	\$ (386,680)	\$ (113,640)	\$ (16,360)	\$ (558,440)	\$ (3,751,480)
Net Increase in Taxable Value (Increment)	\$ 7,007,960	\$ 35,223,605	\$ 9,362,298	\$ 1,831,930	\$ 1,304,357	\$ 613,320	\$ 2,229,335	\$ 4,233,640	\$ 1,641,560	\$ 63,448,004

1.5. Proposed Public Investments

The City is seeking to create TAD#1 to help fund the infrastructure, public improvements, and eligible redevelopment costs necessary to attract high-quality redevelopment in the historic core consistent with the shared community vision for this area of the City while expanding the City’s tax base and growing its economy.

The potential of TAD #1 to fund public improvements, infrastructure and redevelopment costs is currently estimated at \$16.6 million, which the City intends to fund through the tax allocation district for qualified projects. The initial funding priorities of the City of Brunswick for use of potential TAD funds is summarized in the chart below. (These expenditures are for illustrative purposes to reflect current City priorities but will be subject to change based on the City’s review of actual projects which request TAD funding in the future.)

Potential Allocation of TAD Funds by Brunswick TAD #1 to Support Projects

Potential Use of TAD Funds by Brunswick TAD #1: Historic District		
	TAD #1 Share	Allocation
Transportation and mobility enhancements	10%	\$ 1,660,000
Site-specific development activities	30%	\$ 4,980,000
Infrastructure improvements	10%	\$ 1,660,000
Public space, landscaping, lighting, and other improvements	20%	\$ 3,320,000
Other redevelopment initiatives	30%	\$ 4,980,000
Total	100%	\$ 16,600,000

Categories and cost allocations are estimates for potential projects as of 2017 and are subject to revision as the Redevelopment Plan is implemented. As priorities are identified or addressed, specific project amounts, allocations and priorities are subject to change.

1.6. Brunswick TAD Benefits

TAD#1 gives the City of Brunswick the ability to leverage substantial levels of new private investment in the City. Using TAD financing to fund construction of infrastructure, public improvements and qualified redevelopment costs will enable the City to leverage approximately \$17 million in TAD funding to attract \$168 million in private investment, a leverage ratio of nearly \$9.12 in private dollars invested for every \$1 of TAD investment by the City.

The creation of the City of Brunswick TAD #1, could increase the City’s overall taxable value from \$312 million to \$375 million an increase in the Digest of over 20.5%. This would result in approximately \$63 million in new taxable valuation that would support TAD funding for up to \$17 million in needed infrastructure, public improvements and redevelopment support om TAD #1.

Summary of Brunswick TAD #1: Brunswick Historic Core Benefits

Brunswick TAD #1 - Summary of TAD Benefits	
Market value of new private investment	\$ 168,363,691
Taxable incremental value at full build out	\$ 63,448,004
Potential project funding that would be supported by TAD	\$ 16,600,000

The benefits of the TAD to the City of Brunswick will include:

- A substantial increase in the City's Tax Digest, likely beyond the level that would have occurred without the TAD. The increase is estimated to be \$63 million in new incremental assessed property value at buildout, a substantial increase over the base assessed value of the property within the TAD – currently \$28.8 million.
- The TAD will support the redevelopment of the Downtown Historic Core and will create a more livable and attractive environment for residents, visitors and businesses in the City.
- Additional commercial and industrial development both in the core of Downtown and along key commercial corridors, like Gloucester and Norwich Streets and Highway 17, will further diversify the City's tax base. Vacant properties and underutilized land will be put back into productive use that will help to employ local residents and attract new visitors.
- The TAD will leverage substantial private investment. Using TAD financing to fund construction of infrastructure will enable the City to attract over \$168 million in private investment from an investment of \$17 million in TAD funds, a leverage ratio of nearly \$9.12 in private dollars invested for every \$1 of TAD investment.
- Development will create substantial growth in property and sales tax revenues for the City, County and School District. Once all TAD obligations of the district are retired, the City will receive the full property tax increment from the new development created. The City, County and School District will begin receiving the benefit of increased sales tax revenues as soon as development occurs and attracts additional demand to the area.
- The creation of this new economic activity in the Historic District should stimulate the "halo effect" noted in many other communities where new investment in the TAD attracts additional development to adjacent areas around the TAD.

1.7. Brunswick TAD Liability

Tax allocation bonds or loans that may be authorized by the City of Brunswick would be secured by the property tax increment revenue generated from within TAD #1. Such revenue bonds or loans would not constitute a general obligation of the City and would not involve a pledge of the full faith and credit of the City of Brunswick.

City of Brunswick Tax Allocation District #1:

Brunswick Historic Core

2. Introduction

The City of Brunswick presents this plan outlining the rationale, boundaries, fiscal data and potential projects that could result from the formation of the **City of Brunswick Tax Allocation District #1: Brunswick Historic Core**.

The City of Brunswick has the authority to exercise all redevelopment and other powers authorized or granted municipalities pursuant to the Redevelopment Powers Law (Chapter 44 of Title 36 of the O.C.G.A.), as approved by Brunswick voters on November 3, 2015.

Brunswick will have the opportunity to leverage private reinvestment through targeted public improvements, enhanced infrastructure and critical investments in redevelopment that will help implement the vision set forth in the 2008 City of Brunswick Community Agenda, part of the City of Brunswick 2030 Vision presented in the City's 2008 Comprehensive Plan.

According to the Community Agenda:

The City of Brunswick will grow into its future like a glorious Live Oak, with strong roots, quality communities, economic growth and revitalized image. [...] And the City ... will present a revitalized and rehabilitated image by showcasing its natural and historic beauty and by redeveloping its underutilized areas in a manner in keeping with its traditional, human-scaled development pattern. Polluted, contaminated, and dilapidated areas will be vigorously rehabilitated and made available for reuse.

The city of Brunswick also prepared a fourth amendment of the City of Brunswick Urban redevelopment Plan in 2016, addressing many of the areas and redevelopment sites identified in this TAD plan. Among the identified goals and objectives of that plan were:

- *Use appropriate tools to buy and assemble property for revitalization and resale*
- *Encourage private enterprise/public-private partnerships to redevelop neglected areas of the community*
- *Use tax exempt bonds, secured by loans or grants, for redevelopment purposes*
- *Guide City investments in infrastructure to support redevelopment*
- *To utilize the development of public facilities within the Urban Redevelopment Area as catalyst for the creation of new desired private development, consistent with this plan*

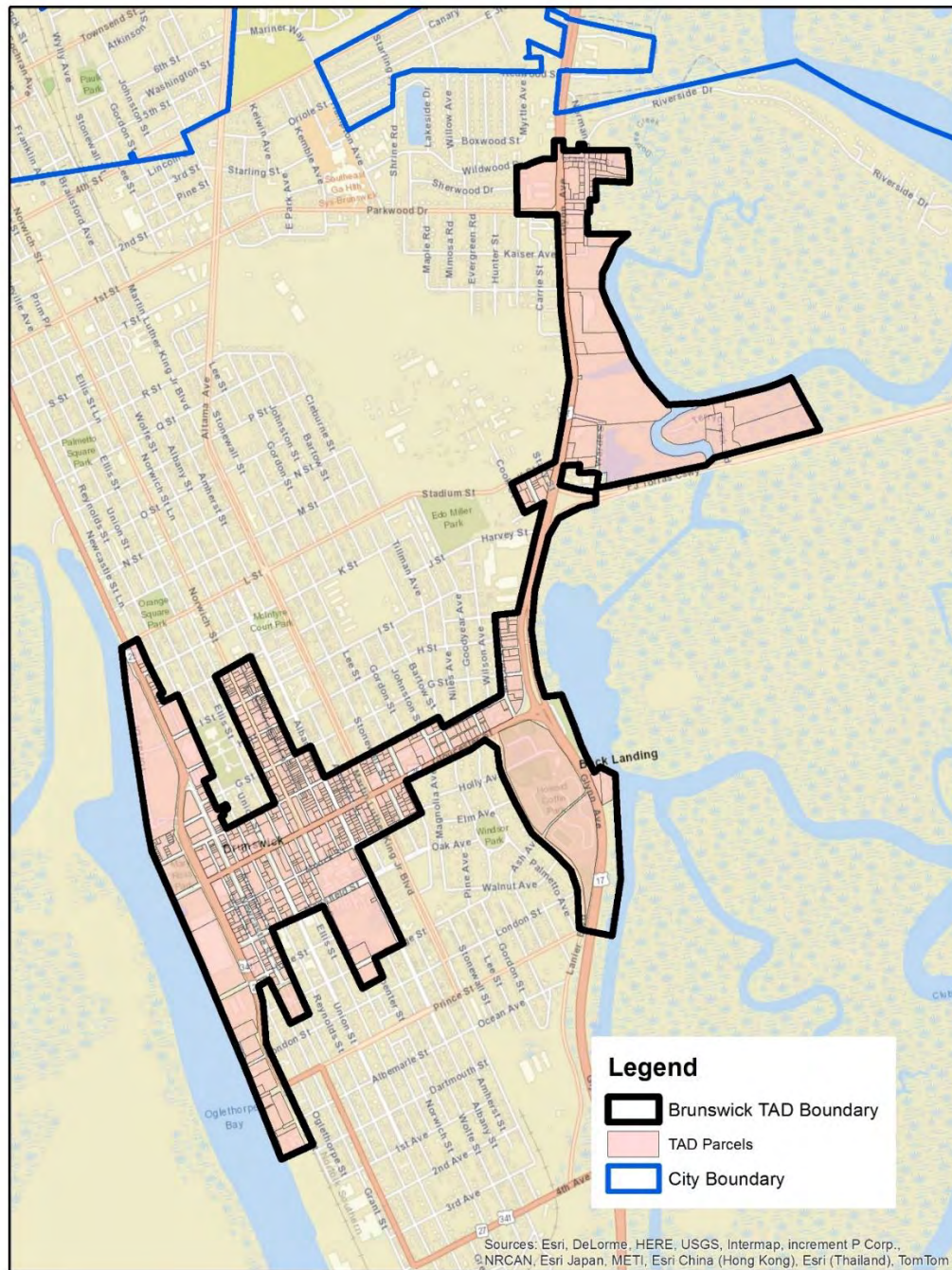
The City of Brunswick Tax Allocation District #1: Brunswick Historic Core will create an essential tool for the City to reach its development goals. Specifically, the TAD will help to spur investment in the historic core district with enhancements to further economic development and sustainable growth. Specifically, the TAD will help to re-activate the historic core of Downtown, the Norwich corridor and Highway 17

corridor. By stimulating investment in the TAD area, offset declining and stagnating property values, fill empty storefronts and increase economic activity in the City for the benefit of all its citizens.

2.1. Geographic Boundaries

This plan calls for the creation of the City of Brunswick Tax Allocation District #1: Brunswick Historic Core, whose redevelopment area includes the parcels outlined and shaded in the boundary shown on the map below. Tax parcel identification numbers for properties included within the TAD are listed in Appendix B.

City of Brunswick TAD Boundary Map



2.2. Benefits to Brunswick Residents

The benefits to Brunswick residents from future projects in the TAD district include the following:

- A revitalized commercial core to stabilize and expand economic activity the historic downtown.
- Improvements to key public infrastructure enhancing the city's quality of life.
- An expanded job base in the commercial and hospitality sectors.
- Increased personal incomes and new local businesses which will generate expanded economic activity
- New private investment potentially valued at over \$168 million creating new employment options, a revitalized historic commercial center, and reuse of many acres of underutilized waterfront and commercial land in the heart of the City.
- Substantial new annual tax revenues from property taxes, sales taxes and business licenses.
- Overall commercial growth and increased infrastructure utilization within Brunswick.

2.3. Tax Allocation Districts Overview

Tax allocation districts (TADs) are Georgia's version of tax increment financing. Tax increment financing is a redevelopment funding mechanism that reinvests the future taxes from real estate development back into a project and surrounding infrastructure as an incentive to attract new private investment into an area, that "but for" the incentive would not have occurred. As described by the Council of Development Finance Agencies. (www.cdfa.net), tax increment financing was created and first used in California in 1952. Hundreds of TIF districts have helped spur urban redevelopment in cities across the country. Today, 49 states and the District of Columbia use some form of tax increment financing.

In 1985, the Georgia General Assembly authorized formation of Georgia's form of tax increment financing called Tax Allocation Districts (TAD) through the creation of the Redevelopment Powers Act. The purpose of a Georgia tax allocation district is consistent with tax increment financing in other states. It uses the increased property taxes generated by new development in a designated redevelopment area to finance costs related to the development such as public infrastructure, land acquisition, relocation, demolition, utilities, debt service and planning costs.

Other costs funded by TAD might include:

- Sewer expansion and repair
- Storm drainage
- Street construction & expansion
- Environmental clean-up
- Park improvements
- Streetscape improvements
- Bridge construction and repair
- Curb and sidewalk work
- Grading and earthwork/site preparation
- Traffic control/access enhancements
- Multi-use paths/bike trails
- Public parking/parking decks

Cities and counties throughout Georgia have created TADs to stimulate major new construction and renovation or rehabilitation in underdeveloped or blighted areas. For example, ten TADs have been created in Atlanta, six in Columbus, and additional TADs have been created in Marietta, Smyrna, Acworth, Woodstock, Holly Springs, East Point, Clayton County and DeKalb County. Over 70 Georgia cities and counties either have approved the use of redevelopment powers in their communities.

A TAD offers local governments the opportunity to promote redevelopment projects in areas that otherwise are not attracting investment. The creation of the City of Brunswick TAD #1 will enhance the private development community's interest in investing in major redevelopment projects in the City of Brunswick.

A TAD will bring the City of Brunswick and Glynn County additional economic advantages as well. Other Georgia tax allocation districts, such as Atlantic Station in Midtown Atlanta and Camp Creek Marketplace in East Point, have demonstrated the benefits of TAD, including:

- **A stronger economic base** – Private development that would not have occurred without the TAD designation can be attracted by this incentive.
- **The “halo effect”** – Several Georgia TADs have generated significant new investment in areas surrounding the TAD as well as within the tax allocation districts, further expanding the positive economic impact.
- **No impact on current tax revenues** – Redevelopment is effectively promoted without tapping into existing general governmental revenues or levying special assessments on property owners.
- **Expanded local tax base** – By stimulating economic activity TAD's expand the local tax digest, and can generate additional retail sales, and as a result, increased SPLOST and ESPLOST revenues.
- **It is self-financing** – TADs are self-financing, since they are funded by the increased tax revenues from new development within the district.
- **High leverage** – Typically TAD funds can represent between 5-15% of project costs, leveraging 7 to 20 times their value in private investment.

In summary, the creation of a tax allocation district supports the infrastructure necessary to make an underutilized area attractive to private development, at no additional cost to the taxpayer. It does not create a tax increase for the community, nor does it reduce current tax revenues the community currently receives from the district.

The creation of the City of Brunswick Tax Allocation District #1 is designed to provide the financial incentive to support the creation of the vision set forth in the Joint Comprehensive Plan. As such, it is a highly appropriate and consistent use of this financing technique as authorized in Georgia's Redevelopment Powers Law.

3. Proposal

Through the creation of the City of Brunswick TAD #1: Brunswick Historic Core, the City is positioning the area for new opportunities for reinvestment and revitalization through the implementation of the vision for the community set forth in the Joint Comprehensive Plan.

3.1. Grounds for Exercise of Redevelopment Powers

Tax Allocation Districts (TADs) are authorized in Georgia under the Redevelopment Powers Law, O.C.G.A. Title 36, Chapter 44. In 2009, the Redevelopment Powers Law was amended with the following definition of a “redevelopment area”:

'Redevelopment area' means an urbanized area as determined by current data from the US Bureau of the Census or an area presently served by sewer that qualifies as a 'blighted or distressed area, a 'deteriorating area,' or an 'area with inadequate infrastructure' as follows:

(A) A 'blighted or distressed area' is an area that is experiencing one of more conditions of blight as evidenced by:

- (i) The presence of structures, buildings, or improvements that by reason of dilapidation; deterioration; age; obsolescence; inadequate provision for ventilation, light, air, sanitation, or open space; overcrowding; conditions which endanger life or property by fire or other causes; or any combination of such factors, are conducive to ill health, transmission of disease, infant mortality, high unemployment, juvenile delinquency, or crime and are detrimental to the public health, safety, morals, or welfare;*
- (ii) The presence of a predominant number of substandard, vacant, deteriorated, or deteriorating structures, the predominance of a defective or inadequate street layout, or transportation facilities; or faulty lot layout in relation to size, accessibility, or usefulness;*
- (iii) Evidence of pervasive poverty, defined as being greater than 10 percent of the population in the area as determined by current data from the U.S. Bureau of the Census, and an unemployment rate that is 10 percent higher than the state average;*
- (iv) Adverse effects of airport or transportation related noise or environmental contamination or degradation or other adverse environmental factors that the political subdivision has determined to be impairing the redevelopment of the area; or*
- (v) The existence of conditions through any combination of the foregoing that substantially impair the sound growth of the community and retard the provision of housing accommodations or employment opportunities;*

(B) A 'deteriorating area' is an area that is experiencing physical or economic decline or stagnation as evidenced by two or more of the following:

- (i) The presence of a substantial number of structures or buildings that are 40 years old or older and have no historic significance;*
- (ii) High commercial or residential vacancies compared to the political subdivision as a whole;*
- (iii) The predominance of structures or buildings of relatively low value compared to the value of structures or buildings in the surrounding vicinity or significantly slower growth in the property tax digest than is occurring in the political subdivision as a whole;*
- (iv) Declining or stagnant rents or sales prices compared to the political subdivision as a whole;*
- (v) In areas where housing exists at present or is determined by the political subdivision to be appropriate after redevelopment, there exists a shortage of safe, decent housing that is not substandard and that is affordable for persons of low and moderate income;*
- (vi) Deteriorating or inadequate utility, transportation, or transit infrastructure; and*

(C) An 'area with inadequate infrastructure' means an area characterized by:

- (i) Deteriorating or inadequate parking, roadways, bridges, pedestrian access, or public transportation or transit facilities incapable of handling the volume of traffic into or through the area, either at present or following redevelopment; or*
- (ii) Deteriorating or inadequate utility infrastructure either at present or following redevelopment.*

3.2. Why the City of Brunswick TAD #1 Qualifies as a Redevelopment Area

The City of Brunswick has the authority to exercise all redevelopment and other powers authorized or granted municipalities pursuant to the Redevelopment Powers Law (Chapter 44 of Title 36 of the O.C.G.A.), as approved by Brunswick voters by referendum on November 3, 2015.

Specifically, the City of Brunswick TAD #1 redevelopment area complies with the O.C.G.A. definition for a redevelopment area Section 36-44-3 7-A as a “blighted or distressed area” due to the evidence of pervasive poverty, chronic decline in property values, and environmental contamination and degradation, consistent with Chapter 44 of Title 36 Section 7-A of the O.C.G.A.

(A) (1) Presence of High Crime

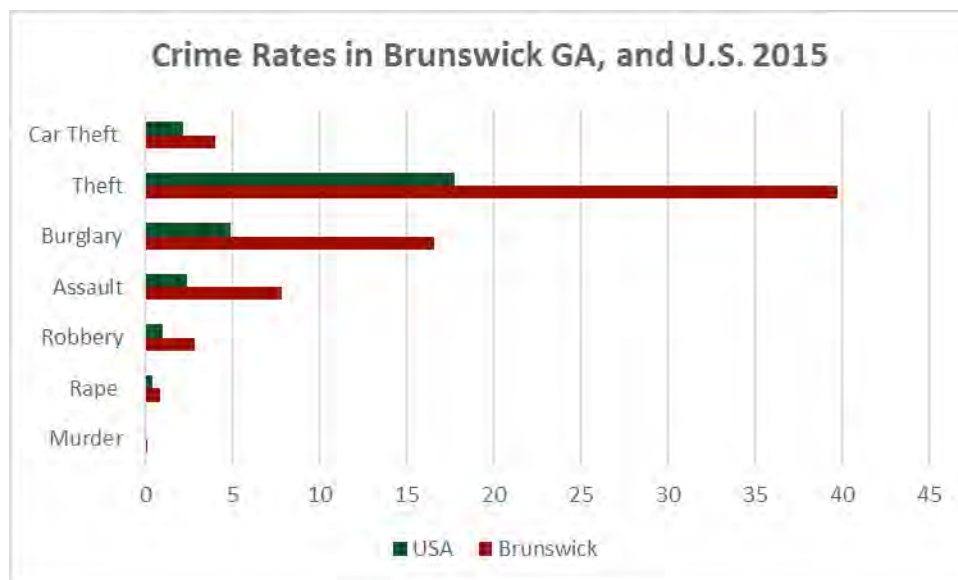
As shown on the following table, the City of Brunswick suffers from a high level of both violent and property crime. The exhibit below shows the incidents of reported crimes in seven categories as tracked by Neighborhood Scout using data from the FBI Uniform Crime Reports.

Crime Rates in Brunswick Versus National Average by Type 2015							
	Murder	Rape	Robbery	Assault	Burglary	Theft	Car Theft
Brunswick	0.12	0.87	2.85	7.8	16.59	39.74	4.02
USA	0.05	0.39	1.02	2.38	4.91	17.75	2.2

* Crime rates per 1,000 residents

Source: NeighborhoodScout/FBI Uniform Crime Reports, 2016

Residents of Brunswick are two or more times more likely to experience each of the seven types of violent or property crime based on 2015 statistics. These high rates of crime are consistent across all seven of the crime types reported. The high rates of various crimes on Brunswick is shown graphically below.



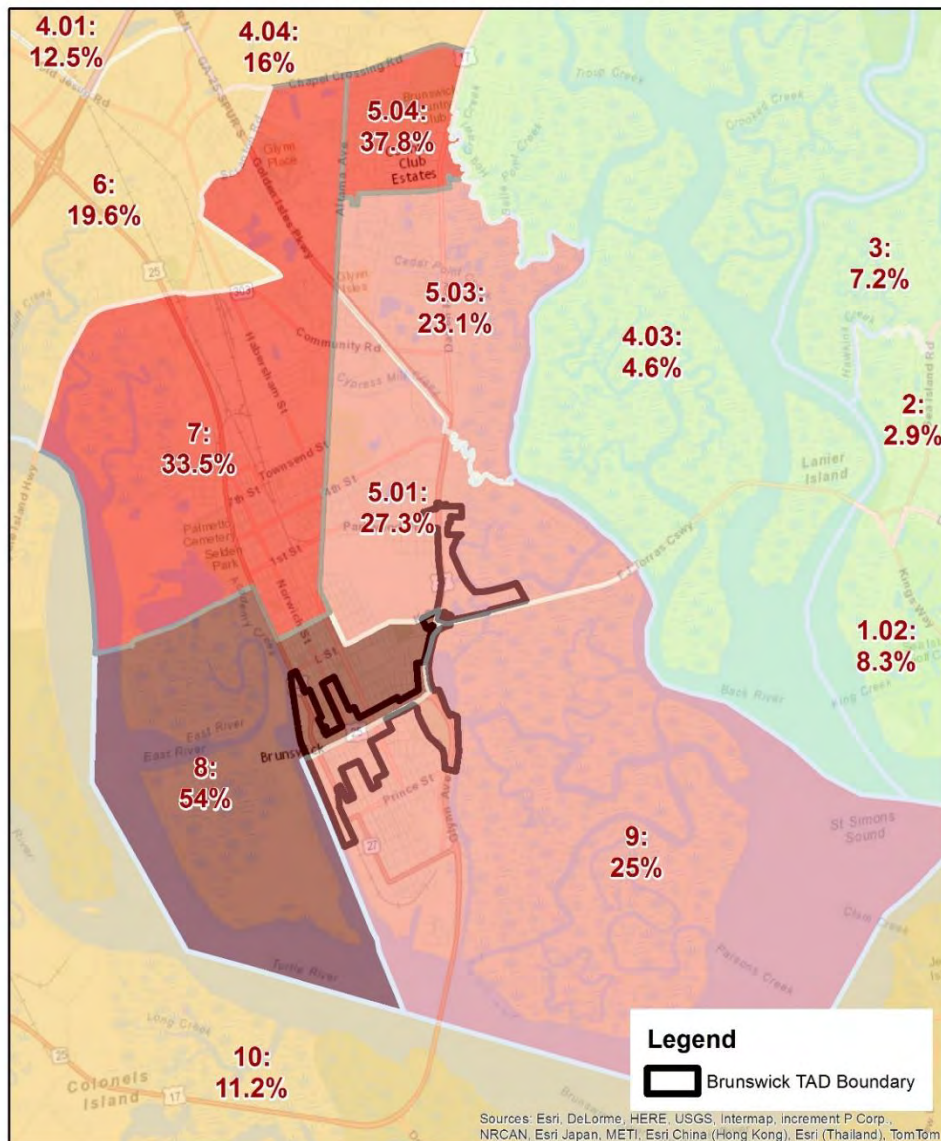
(A) (iii) Presence of Pervasive Poverty

The City of Brunswick TAD #1 redevelopment area exhibits evidence of pervasive poverty.

Shown on the map below is the percentage of the population whose income is below the poverty level by census tract for the City of Brunswick. The proposed boundary of TAD #1 is superimposed on the maps for reference. As shown, a substantial portion of TAD #1 is in Tract 8 where 54% of residents have incomes below the poverty level. Census tracts 5.01 and 9 also exhibit high levels of poverty among its residents at 27.3% and 25% respectively. Thus, TAD #1 significantly exceeds the threshold level of pervasive poverty of 10% of all residents established in the Redevelopment Powers Law.

Brunswick TAD #1: Households below Poverty, 2015

Source: US Census American Community Survey 2015, 5-Year estimates

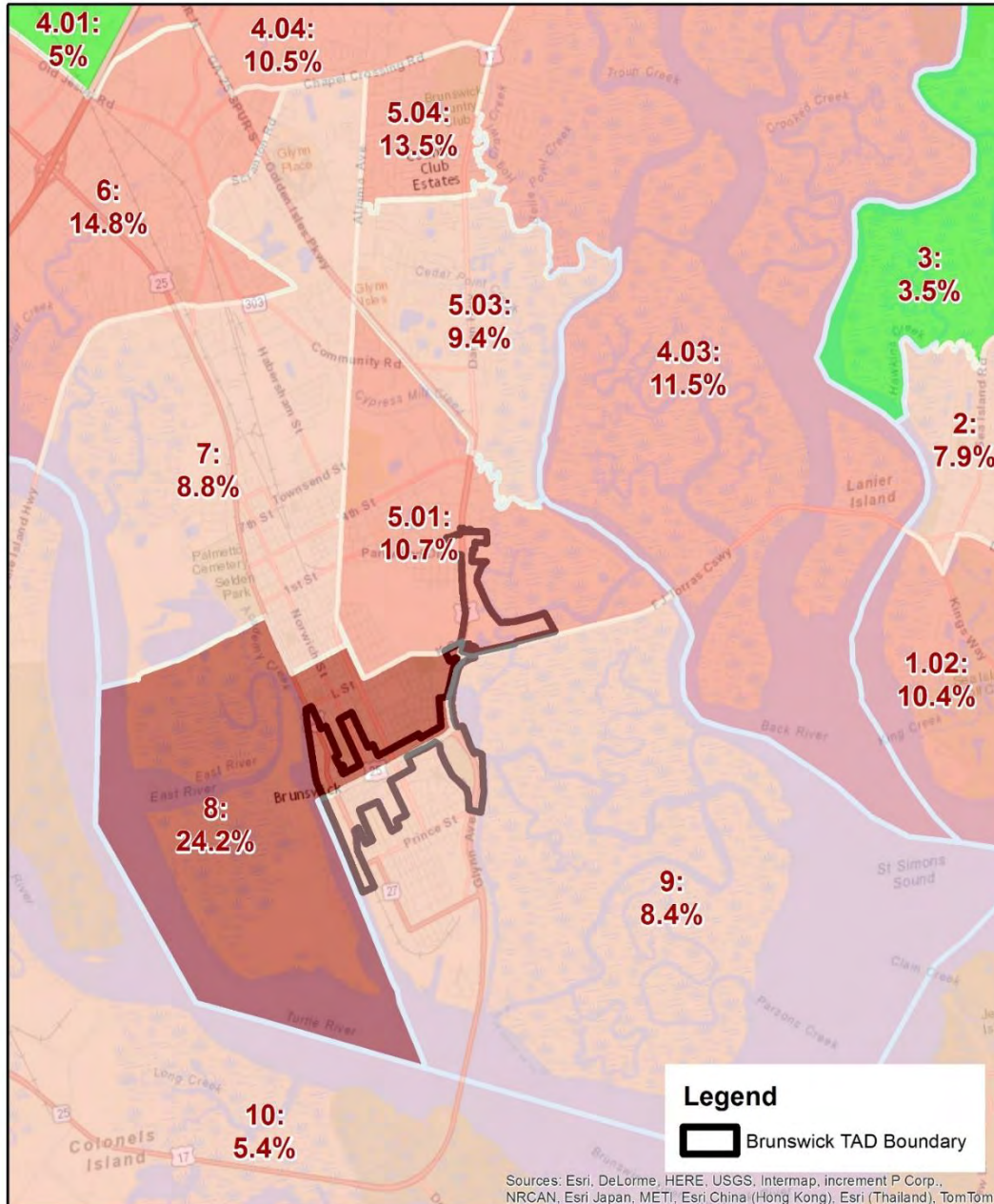


Unemployment --In terms of unemployment, the proposed TAD #1 is experiencing a high unemployment rate relative to statewide averages. In 2015 the state’s unemployment rate was 5.6%. As shown on the follow map, the unemployment rate Brunswick ranged from a low of 8.4% to a high of 24.2% in census

tract 8, significantly more than 10% higher than the statewide rate of 5.6% which is the legislative standard for determining high unemployment.

Brunswick TAD #1: Unemployment by Census Tract, 2015

Source: US Census American Community Survey 2015, 5-Year estimates



(A) (ii) Presence of Vacant, Deteriorating Structures**(B) (i) (ii) Presence of High Number of Older Structures, with Low Values**

As shown in the table below, the City of Brunswick has an older housing stock which contains a significant number of vacant structures and the owner-occupied units have a low median value.

City of Brunswick Housing Characteristics 2015				
	Brunswick	Glynn County	Georgia	Brunswick As % of GA
Total Housing Units	7,226	41,471	4,133,065	
% Renter Occupied Units	61.8%	39.0%	36.7%	168%
Vacant Housing Units %	15.3%	22.1	13.5%	113%
% of Units Built Prior to 1960	41.9%	16.5%	13.6%	308%
Median Home Values	\$ 91,800	\$ 159,200	\$ 148,100	62%
Median Rent	\$ 708	\$ 826	\$ 879	81%
% of HH's Spending 35+% on Housing	45.7%	41.9%	43.3%	106%

Source: 2015 American Community Survey

The City's housing stock is predominantly renter occupied at 61.8% which is significantly more renter oriented than in Glynn County or the State of Georgia. Vacant units account for 15.3% of the inventory, even after a long-standing City program to remove long term vacant units from the inventory. The housing is old, with 41.9% of the inventory built before 1960 versus 13.6% statewide. Home values are very low at \$91,800 which is only 62% of the statewide average of \$148,100. Median rents are also low at \$708 per month, only 81% of the statewide average. A high percentage of Brunswick households, 45.7% are spending more than 35% of their incomes on housing. These are considered housing cost burdened households since the national norm is to spend 30% or less on housing costs.

According to Brunswick city officials, since 2009 the City has had a long-standing program to demolish dilapidated structures in the city. Through early 2016 a total of 200 properties have been demolished and 144 of the properties are still vacant lots. The City estimates there are another 140 dilapidated properties which will require demolition in the future.

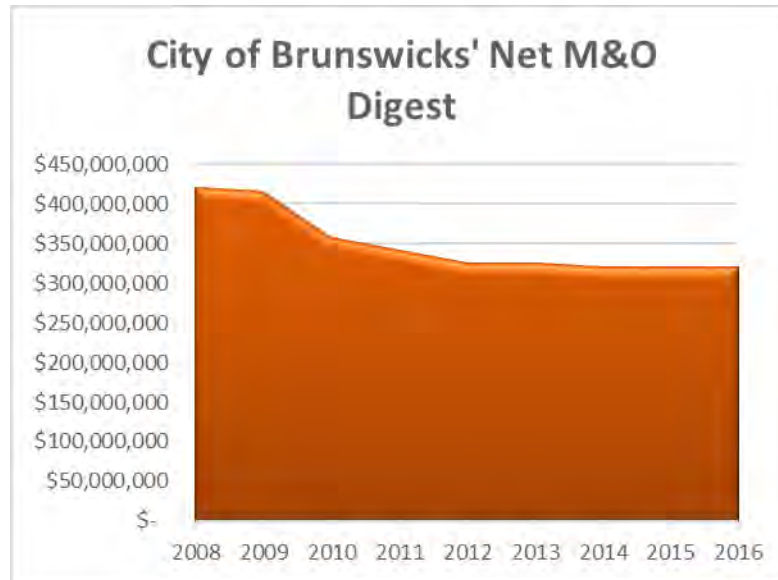
Thus, Brunswick meets the requirements for TAD eligibility due to these challenging housing condition measures in the city.

(A) (v) Conditions that Impair the Sound Growth of the Community

The City of Brunswick was hit very hard by the Great Recession in 2009 and its economy and tax base have not yet recovered from its after-effects. As shown below, the City's tax digest has declined by 24% over the past decade, from a high of \$512 million in 2008 just as the Great Recession was starting, it dropped to \$325 million by 2012 and has been essentially flat since that time. Property taxes needed to support city functions have also dropped substantially. Today, total City property taxes are down 17% from their peak in 2008. The City is seeking to benefit from use of a TAD to stimulate new investment in the City and as a result recapture some of the decline in its Tax Digest.

City of Brunswick's Change in Tax Digest 2008-2016										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	Change
Net M&O Digest	\$ 420,583,188	\$ 415,723,223	\$ 357,846,537	\$ 341,891,420	\$ 325,448,766	\$ 325,786,801	\$ 320,666,072	\$ 321,528,566	\$ 321,612,543	\$ (742,195,731)
% Change		-1%	-14%	-4%	-5%	0%	-2%	0%	0%	-24%
Taxes Levied	\$ 5,152,144	\$ 5,092,609	\$ 4,383,620	\$ 4,348,516	\$ 4,139,382	\$ 4,143,682	\$ 4,238,884	\$ 4,250,286	\$ 4,251,396	-17%

Source: Georgia Department of Revenue



4. Plan Vision and Goal

The goal of the City of Brunswick Tax Allocation District #1: Brunswick Historic Core is to encourage the private redevelopment and reinvestment through targeted public improvements, improved infrastructure and strategic investment in redevelopment initiatives that will help implement the future development and economic vision of the City of Brunswick, Georgia.

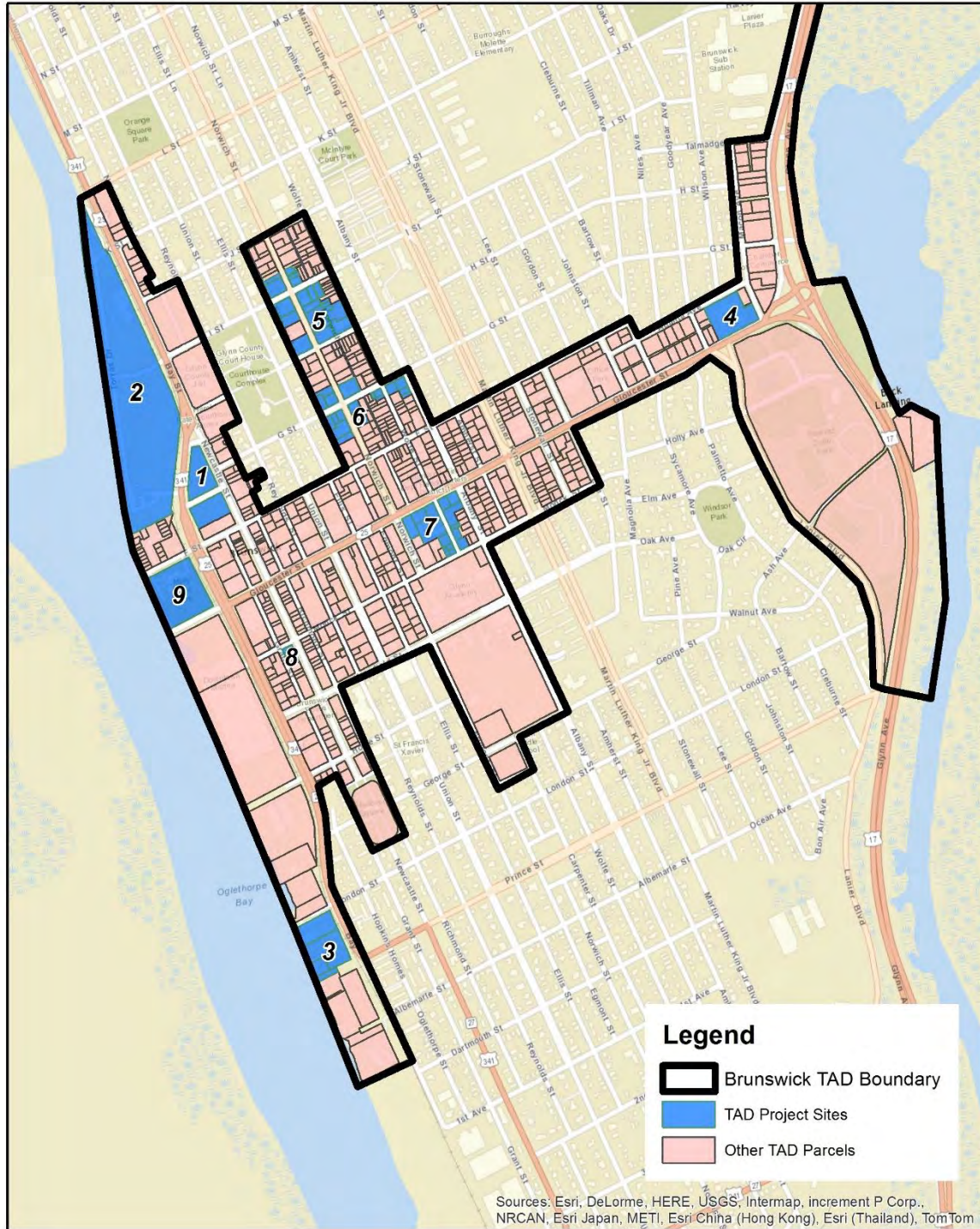
4.1. Proposed Land Uses after Redevelopment

This Redevelopment Plan envisions nine potential catalyst redevelopment projects within the TAD area that reflect community objectives identified in the 2007-2027 Glynn County Joint Comprehensive Plan. The redevelopment projects illustrate the scope of feasible potential redevelopment in the TAD area. These projects should be seen as illustrative for the purposes of modeling feasible redevelopment potential within the TAD boundaries. These plans do not reflect an endorsement or recommendation of any specific redevelopment project, site, or concept. These projects could be developed over the next 5 to 15 years.

These potential development programs are based on discussions of land use and density with City staff, maximum zoning allowances, and the available acreages of the redevelopment parcels and other typical developments in the greater Brunswick/coastal Georgia areas.

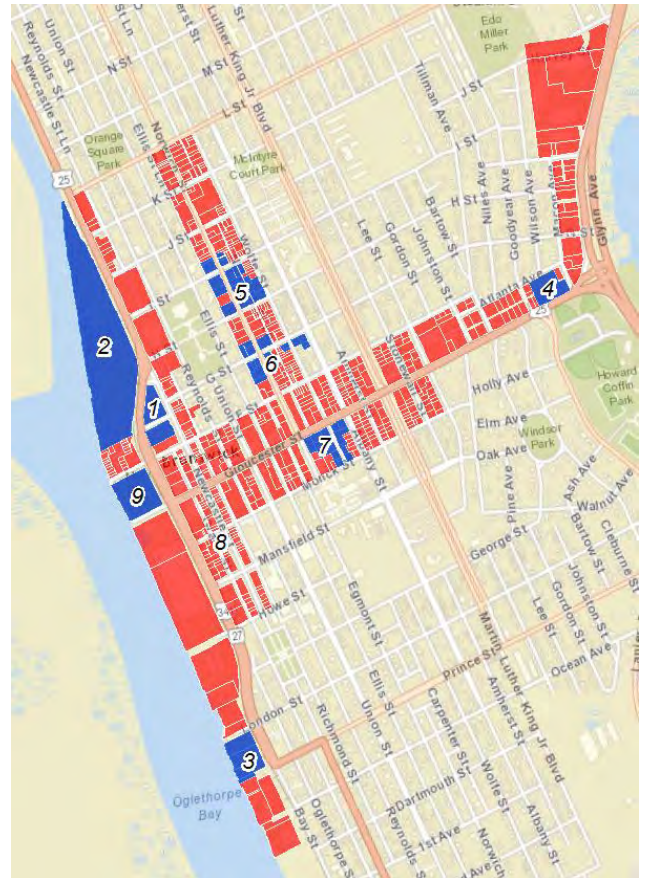
TAD #1: Potential / Planned Redevelopment Locations (shown in blue)

Brunswick TAD #1: Redevelopment Project Sites



As shown on the accompanying map, nine hypothetical redevelopment projects that could occur on parcels within the TAD District boundary were identified. Estimates of the type and scope of development that could occur in each of these parcels, as well as the estimated total value of those redevelopment projects were derived. The nine hypothetical redevelopment projects are:

Map3: Potential Redevelopment Projects



1. **Hotel and Conference Center (Bay & Newcastle):** A 120-room hotel with conference space and limited ground floor retail.
2. **Marina Residential Mixed-Use:** 327 units of condos and townhomes on 14 acres adjacent to the Marina.
3. **London St. Waterfront Residential:** 112 condominium units on this key riverfront site.
4. **Gloucester & Macon Townhomes:** 19 townhomes on a vacant auto-sales lot.
5. **Norwich Mixed-Use:** Neighborhood infill redevelopment with 45 senior-housing units and ground floor retail.
6. **Norwich Infill Residential:** Neighborhood infill redevelopment of 20 small-lot single-family homes.
7. **Gloucester Mixed Use:** Neighborhood infill redevelopment with 54 multifamily rental units and ground-floor retail.
8. **Newcastle Hotel:** An 80-room hotel with ground floor retail.
9. **Mary Ross Park Residential Conversion:** Conversion of an existing office space into 20 waterfront condominium units.

The hypothetical development projects details and valuation estimates are shown on the next page. These projects serve as the basis for evaluating the financing of potential of redevelopment projects within the TAD district. We estimated total market value of each project based on reasonable density estimates and unit values derived from similar, recently-built developments in and around Brunswick.

The nine potential redevelopment projects would have a dramatic impact on the historic core of Brunswick, from major investments along the city's historic waterfront, creation of new hotel and conference space, expanded residential inventory for current and future residents and additional retail offerings for residents and visitors the City to enjoy and patronize. Combined, the nine potential developments would add--

- 597 new housing units including single family, townhomes and stacked flat condominiums and rental apartments, along with senior housing
- 200 new hotel rooms and 10,000 SF of convention/conference meeting space
- 38,000 SF of additional retail and restaurant space

If all nine potential redevelopment projects were implemented, they would have a current total market value of \$168 million, with a taxable value of \$67.2 million. This would increase the taxable value of the Historic Core TAD district from \$27.1 million to \$90.5 million in taxable value or \$63.4 million in net new taxable value--a 234% increase in today's value of the district.

Potential Brunswick TAD Redevelopment Projects and Potential Values

Catalyst Project Site	1: Hotel		3: London St.		4: Gloucester		6: Norwich		9: Mary Ross		Total
	Conference Center (Bay & Newcastle)	2: Marina Mixed-Use	Waterfront Residential	& Macon Residential	5: Norwich Mixed-Use	Infill Residential	7: Gloucester Mixed Use	8: Newcastle Hotel	Park Condo Conversion		
Existing Property Values											
Parcels	2	1	3	1	18	17	13	1	1		57.0
Acres of New Development	3.0	14.0	3.2	2.4	2.5	1.6	3.4	0.3	4.6		34.9
Existing Market Value	\$ 234,300	\$ 3,709,300	\$ 1,742,600	\$ 179,400	\$ 1,324,300	\$ 966,700	\$ 913,300	\$ 40,900	\$ 1,396,100		\$ 10,506,900
Assessed Value	\$ 93,720	\$ 1,483,720	\$ 697,040	\$ 71,760	\$ 529,720	\$ 386,680	\$ 365,320	\$ 16,360	\$ 558,440		\$ 4,202,760
Tax Value	\$ 42,040	\$ 1,483,720	\$ 697,040	\$ -	\$ 453,560	\$ 386,680	\$ 113,640	\$ 16,360	\$ 558,440		\$ 3,751,480
New Predevelopment Project Values											
New Residential Development											
Townhomes	-	34	-	19	-	-	-	-	-		53
Single-Family Homes	-	-	-	-	-	20	-	-	-		20
MultiFamily Rental Units	-	-	-	-	-	-	54	-	-		54
Condo Units	-	293	112	-	-	-	-	-	20		425
Senior Housing Units	-	-	-	-	45	-	-	-	-		45
Total Housing units	-	327	112	19	-	20	54	-	20		597
New Commercial Development											
Retail SF	5,000	16,754	-	-	2,980	-	8,079	5,000	-		37,812
Convention SF	10,000	-	-	-	-	-	-	-	-		10,000
Hotel Rooms	120	-	-	-	-	-	-	80	-		200
TAD Increment											
Total Market Value of New Development	\$ 17,625,000	\$ 91,935,849	\$ 25,148,345	\$ 4,677,268	\$ 4,394,792	\$ 2,600,000	\$ 5,857,437	\$ 10,625,000	\$ 5,500,000		\$ 168,363,691
Total Assessed Value (40%)	\$ 7,050,000	\$ 36,707,325	\$ 10,059,338	\$ 1,831,930	\$ 1,757,917	\$ 1,000,000	\$ 2,342,975	\$ 4,250,000	\$ 2,200,000		\$ 67,199,484
Total Taxable Value	\$ 7,050,000	\$ 36,707,325	\$ 10,059,338	\$ 1,831,930	\$ 1,757,917	\$ 1,000,000	\$ 2,342,975	\$ 4,250,000	\$ 2,200,000		\$ 67,199,484
Less Existing Taxable Value	\$ (42,040)	\$ (1,483,720)	\$ (697,040)	\$ -	\$ (453,560)	\$ (386,680)	\$ (113,640)	\$ (16,360)	\$ (558,440)		\$ (3,751,480)
Net Increase in Taxable Value (Increment)	\$ 7,007,960	\$ 35,223,605	\$ 9,362,298	\$ 1,831,930	\$ 1,304,357	\$ 613,320	\$ 2,229,335	\$ 4,233,640	\$ 1,641,560		\$ 63,448,004

Source: BAG

5. Contractual Relationships

Pursuant to O.C.G.A. §36-44-3(a), the Brunswick City Council will act as the redevelopment agent and will exercise redevelopment powers as needed to implement this plan. In doing so, the Council, either directly or through its designee, may conduct the following activities and enter into the following contracts:

1. Coordinate implementation activities with other major participants in the redevelopment plan and their respective development and planning entities involved in implementing this redevelopment plan.
2. Enter into development agreements with private developers to construct infrastructure and vertical developments to implement the redevelopment plan.
3. Negotiate and enter into commercial financing agreements and intergovernmental agreements as needed.
4. Coordinate public improvement planning, design and construction among City, County and State agencies and departments.
5. Prepare (either directly or through subcontract to other appropriate entities) economic and financial analyses, project specific feasibility studies and assessments of tax base increments in support of the issuance of tax allocation bonds or other forms of financing by the City.
6. The City will enter into contractual relationships with qualified vendors for the provision of professional and other services required in qualifying and issuing the bonds or other forms of financing including but not limited to, legal, underwriting, financial analysis and other related services.
7. The City will perform other duties as necessary to implement the redevelopment plan.

6. Relocation Plans

As is currently foreseen, no relocation of tenants, or residents from private homes, is anticipated within the proposed City of Brunswick TAD #1. In the future, should the relocation of existing homes or businesses be required, such relocation expenses may be provided for under all applicable federal, state and local guidelines if public funds are used for property acquisition. If such funding sources require relocation, benefits would be offered to tenants and users for relocation.

7. Zoning & Land Use Compatibility

The land parcels within the TAD area have a mix of land use designations. Of the 687 parcels within the TAD boundary, 272 parcels, representing 43 acres or 12% of the TAD area's land area, are designated as residential. A total of 400 parcels, representing 304 acres or 63% of the land area, are zoned for commercial use. Two parcels, representing 98 acres or 20% of the land area are zoned for industrial use, however the bulk of this land is currently used as park space.

Land Use Category	Parcels	%	Acres	%
Residential (SF)	270	39%	43.2	9%
Residential (MF)	2	0%	13.9	3%
Commercial	400	58%	304.2	63%
Industrial	2	0.3%	98.5	20%
Other	13	2%	21.1	4%
	687	100%	481	100%

As part of the 2008 Comprehensive Plan, the City of Brunswick adopted a Future Development Narrative outlining and defining with the City’s stated vision for the future.

The following future development narratives define a vision and preferred development patterns for each character area in the city. The future development narratives are both the basis for land use regulation and for implementation projects that address the specific needs of each area of the community.

Most of the parcels proposed TAD area are classified in the future development plan as one of four character areas:

- US 17 Commercial Corridor:** *The US Highway 17 Corridor should be a true gateway to the City of Brunswick and the Golden Isles region. [...] Development on the corridor should be multi-story, street-oriented, and predominantly mixed-use, with parking and service areas to the rear so that the architecture, the median landscaping, and the marsh form the dominant features of the corridor. Redevelopment along the northern portion of the corridor can help to reshape US 17 from a regional throughway into a new center of activity for the community.*
- Urbana/Mayhew** *Neighborhood scale commercial, institutional, and mixed-use development along Gloucester, developed in a “Main Street” fashion with the building fronting the streetscape and parking to the rear [...]Multifamily redevelopment in existing areas of multifamily development, of compatible scale to the single-family areas surrounding and in traditional regional architectural styles*
- Windsor Park** *Appropriate Land Uses: Single-family residential development. Neighborhood scale commercial, institutional, and mixed-use development along Gloucester, developed in a “Main Street” fashion with the building fronting the streetscape and parking to the rear. Community facilities such as parks, museums, and libraries, built to a neighborhood scale.*
- Old Town** *Neighborhoods in Old Town need to see continued renovation of homes and infill on vacant lots. Glynn Academy needs to be made more pedestrian-friendly, with sidewalk improvements connecting the school with surrounding neighborhoods. Downtown should see a continued revitalization and a wider variety of activities and entertainment for all ages, but particularly for young adults and community youth. Appropriate Land Uses. Single-family residential development. Multifamily development in existing locations of multifamily. Community-scale commercial, institutional, and mixed-use development along Gloucester and Newcastle downtown. Multi-story, mixed-use or condominium development along the Newcastle and Bay Street corridors and in the waterfront area with publicly accessible boardwalks along the waterfront*

The model redevelopment projects presented in this TAD Redevelopment Plan are all compatible with these future land use character areas, and any development proposals arising in this area will be subject to all applicable local zoning and land use regulations and design guidelines.

8. Method of Financing / Proposed Public Investments

8.1. City of Brunswick Tax Allocation District TAD Potential

The following estimates of the bond revenues from the nine potential redevelopment projects in the City of Brunswick TAD #1: Brunswick Historic Core assume that both Glynn County and the Glynn County School Board pledge their M&O millage to the TAD redevelopment effort.

It is estimated that as a result of \$168 million of new investment, and the City were to issue bonds based on the projected increment, the incremental taxable value of \$63.4 million could support total potential TAD bond proceeds of up to \$16.6 million. Details of these forecasts are shown in the table below.

Brunswick TAD Bonding Potential Forecast

Brunswick TAD #1 - Estimate of TAD Increment	
Total Market Value of New Development	\$ 168,363,691
Taxable Value of New Development	\$ 67,199,484
Less Existing Taxable Value of TAD	-\$3,751,480
Net Increase in Taxable Value (Increment)	\$ 63,448,004
Brunswick TAD #1 - Potential TAD Bond Proceeds	
2016 Taxable Value of TAD Area	\$ 28,798,842
Total TAD Taxable Value after Build-out	\$ 92,246,846
Net New Taxable Value (Increment)	\$ 63,448,004
2016 Millage Rates	
City of Brunswick M& O Millage	13.219
Glynn County M&O Millage	5.673
Glynn Schools M&O Millage	16.157
Total Millage Rate	35.049
New Property Taxes*	\$ 2,223,789
TAD Bond Incremental Amount Estimate	
Property Taxes for Debt Service (95%)	\$ 2,112,600
Debt Coverage Ratio	125%
Bondable Property Tax	\$ 1,690,080
Interest Rate	6.0%
Bond Term (years)	25
Estimated Bond Amount	\$ 21,742,676
Issuance Costs (3%)	-\$ 652,280
Capitalized Interest (24 months)	-\$ 2,609,121
Debt Reserve (10%)	-\$ 1,859,088
Net Bond Proceeds	\$ 16,622,187

8.2. Proposed Public Investments

City of Brunswick intends to use TAD#1 as a key incentive to attract new development and investment into the Historic Core. While the specific uses of the TAD will be determined at the time individual projects are submitted for approval and funding, the city has established a set of initial funding criteria for the use of the TAD to guide future deliberations. Having a TAD in place will help fund a range of public investments which are all designed to achieve the future vision for the Historic Core of the City.

The purposes for future funding by the TAD would be:

- **Transportation and Mobility Enhancements**--To make transportation and mobility improvements to support future investment such as entrance and egress improvements, signalization enhancements, deceleration lanes, etc.
- **Site Specific Development Activities**—these will be case specific request for assistance in future redevelopment which could include parking decks, parking enhancements, etc.
- **Infrastructure Improvements**—this could be sewer and water related, detention facilities, underground utilities, etc.
- **Public Space Improvements**-- such as streetscapes, curb and sidewalk improvements, parks and pocket parks and other public spaces to improve the experience of shoppers, residents and visitors in the historic core.
- **Other Redevelopment Initiatives**--To provide funds to support site-specific development activities, including site preparation, demolition and clearance, utility improvements and environmental remediation, etc.

Shown below, for illustrative purposes, is an initial allocation of how potential funding from TAD#1 could be used for these various TAD-eligible activities.

Potential Allocation of TAD Funds by Brunswick TAD #1 to Support Projects

Potential Use of TAD Funds by Brunswick TAD #1: Historic District		
	TAD #1 Share	Allocation
Transportation and mobility enhancements	10%	\$ 1,660,000
Site-specific development activities	30%	\$ 4,980,000
Infrastructure improvements	10%	\$ 1,660,000
Public space, landscaping, lighting, and other improvements	20%	\$ 3,320,000
Other redevelopment initiatives	30%	\$ 4,980,000
Total	100%	\$ 16,600,000

Categories and cost allocations are estimates for potential projects as of 2017 and are subject to revision as the Redevelopment Plan is implemented. As priorities are identified or addressed, specific project amounts, allocations and priorities are subject to change

8.3. The Benefits of the Brunswick TAD #1 to the City

The benefits of the TAD to the City of Brunswick will include:

- A substantial increase in the City’s Tax Digest that would not have occurred without the TAD. The increase is estimated to be \$63.4 million in new incremental taxable property value at build-out,

would be a 220% increase over the base taxable value of the property within the TAD – currently \$28.8 million.

- The TAD will expand the City’s redevelopment of the Downtown Historic District, along the Norwich and Highway 17 commercial corridors and will create a better environment for residents and visitors, including a potential for growth in the local tourism industry.
- Additional residential and commercial development will further diversify the tax base. Vacant properties will be replaced with new infill projects that will help to employ local residents and attract new visitors.
- The TAD will leverage substantial new private investment. Using TAD financing to fund construction of infrastructure will enable the City to attract over \$168 million in private investment for its investment of \$16.6 million in infrastructure, a leverage ratio of nearly \$9.12 private dollars invested for every \$1 of TAD investment.
- The development with TAD#1 should create substantial growth in property and sales tax revenues. Once all TAD obligations of the district are retired, the City, Glynn County and Glynn County School District will receive the full property tax increment from the new development created and throughout the period, the proposed redevelopment will generate additional retail sales with the result of increasing SPLOST and ESPLOST revenues to all three entities.

9. Assessed Valuation for TAD

The redevelopment area for the City of Brunswick Tax Allocation District #1: Brunswick Historic Core as defined in this Redevelopment Plan has a current fair market value of \$118,986,307 and an assessed value of \$28,798,842.

Pursuant to the Redevelopment Powers Law, upon adoption of the Redevelopment Plan and the creation of the tax allocation district, the City will request that the Commissioner of Revenue of the State of Georgia certify the tax base for 2017, the base year for the proposed tax allocation district.

The tax base will increase in the future through the private investment stimulated by the implementation of the redevelopment plan and the issuance of tax allocation bonds or loans or using a Pay-As-You-Go approach. In addition, this redevelopment is intended to stimulate other development in the district and lead to a substantial increase in property values as the redevelopment plan is implemented.

Upon completion of the redevelopment of the Brunswick Tax Allocation District #1 area as presented in this plan, this tax allocation district is projected to have a taxable value of \$92,246,846.

10. Historic Property within Boundaries of TAD

Brunswick is one of two port cities in coastal Georgia, along with Savannah, with a long historical presence dating back to General Oglethorpe’s initial plan for the city. The Old Town Brunswick Historic District was listed on the National Register of Historic Places in 1979. The City maintains and administers a vibrant and active National Register Historic District via the Brunswick Historic Preservation Board and related ordinance. The boundary of the District is roughly 1st Street, Bay and New Bay Street, H Street and MLK Jr. Drive in downtown Brunswick, which overlaps with much of the boundary of TAD #1. The district

contains many historic structures, including civic, commercial and residential structures spanning the long history of the City from the colonial period to the 1960s.

Any redevelopment or development activity within the TAD Redevelopment Area will be subject to all federal, state and local laws pertaining to historic structures and districts. No historic structures or districts in the TAD area will be substantially altered in any way inconsistent with technical standards for rehabilitation; or demolished unless feasibility for reuse has been evaluated based on technical standards for the review of historic preservation projects, which technical standards for rehabilitation and review shall be those used by the state historic preservation officer.

11. Creation & Termination Dates for TAD

The City of Brunswick Tax Allocation District #1: Brunswick Historic Core will be created effective December 31, 2017. The Redevelopment Powers Law provides that the district will be in existence until all redevelopment costs, including debt service, are paid in full.

12. Tax Allocation Increment Base

On or before December 30, 2017, the City of Brunswick, acting as the redevelopment agent, will apply to the State Revenue Commissioner for a certification of the tax allocation increment base of the proposed tax allocation district. The base is estimated as follows:

City of Brunswick Proposed TAD Summary

Brunswick TAD #1 - Last Known Assessed Valuation	
Parcels	687
Acres	481
TAD Base 2016 Market Value	\$ 118,986,307
TAD Base 2016 Taxable Value	\$ 28,798,842
New Development At Build-Out Market Value	\$ 168,363,691
New Development At Build-Out- Taxable Value	\$ 67,199,484
Less Existing Taxable Value of Redev. Areas	-\$ 3,751,480
Net Increase in Taxable Value (Increment)	\$ 63,448,004
Total TAD Market Value After Build-Out	\$ 115,234,827
Total TAD Taxable Value after Build-out	\$ 92,246,846
Increment (Net Increase in Taxable value)	\$ 63,448,004

Source: BAG, Glynn County GIS, Georgia Department of Revenue
 Appraised Value is a parcel's fair market value for tax purposes.
 Assessed Value is 40% of appraised value, taxable value is the assessed value of all properties that are not tax-exempt.

13. Property Taxes for Computing Tax Allocation Increments

As provided in the Redevelopment Powers Law, the taxes that will be included in the tax increment base for the tax allocation district are based on the authorized millage rates in 2016 as shown in the chart below.

Property Taxes Collected Within Tax District to Serve as Base

Valuation		
TAD Base 2016 Market Value	\$118,986,307	
TAD Base 2016 Taxable Value	\$28,798,842	
Property Taxes		
<i>Ad Valorem Tax Rates (M&O Only)</i>	<i>Millage Rate</i>	<i>Taxes</i>
City of Brunswick Millage	13.219	\$ 380,692
Glynn County M&O Millage	5.673	\$ 163,376
Glynn Schools M&O Millage	16.16	\$ 465,303
Total Property Taxes, City, Schools, County	35.049	\$ 1,009,371

Source: BAG, Glynn County, Georgia Department of Revenue

The 2016 assessed value of real property in TAD #1 is \$28,798,842. This taxable value generates a total of \$1,009,371 in City, School and County (M&O) property taxes and serves as the base amount of taxes for the City of Brunswick Tax Allocation District #1: Historic Core. Millage rates for the Joint Development Authority (1.0) are not included in this estimate or are committed to TAD#1.

14. Tax Allocation Bond Issues

14.1. Amount of Bond Issue

Upon adoption of this redevelopment Plan, the City proposes to issue tax allocation bonds, notes or other financing approaches, in one or more bond issues in amounts to range from \$1.0 million to \$16.6 million.

14.2. Term of the Bond Issue or Issues

The City proposes to issue tax allocation bonds for a term no longer than 25 years.

14.3. Rate of Bond Issue

The City may issue fixed-rate tax exempt bonds in accordance with TAD #1. The actual rate on any potential bond issue will be determined at the time of issuance based upon general market conditions, anticipated development within the redevelopment area, assessed taxable property values, and federal tax law considerations. The City reserves the option to either operate the district on a pay-as-you-go basis or consider other potential financing options, including securing a loan from a lending institution, or other commercial financing to support future projects, as appropriate.

14.4. Positive Tax Allocation Increments

The positive tax allocation increment for the period covered by the term of the bonds is estimated to range from \$1 million to \$4 million annually after the redevelopment and build out is complete. The actual amount will depend upon the pace at which the Redevelopment Plan is implemented and the impact of the redevelopment activities and other economic factors on the tax base in the district as a whole.

14.5. Property Pledged for Payment of the Bonds

The bonds will be secured by the positive tax allocation increment from eligible ad valorem taxes levied by the City, and with their concurrence, Glynn County and Glynn County School District, on real property for these purposes.

14.6. Brunswick Liability

Tax allocation bonds that may be authorized by the City of Brunswick would be secured by the property tax increment revenue generated from within TAD #1. Such revenue bonds would not constitute a general obligation of the City and would not involve a pledge of the full faith and credit of the City of Brunswick.

From the projected tax allocation increments, it is possible that the City could be asked to rebate a portion of county or school TAD increments back to those jurisdictions as payments in lieu of taxes (PILOT payments), effectively lowering the net millage rate contributed by those jurisdictions to the TAD. This plan makes no specific assumptions in that regard. To the extent that rebates are requested from initial TAD proceeds, rather than later year proceeds after redevelopment has occurred, the amount of financing that could be leveraged by the TAD is reduced accordingly.

15. School System Impact Analysis

Georgia’s Redevelopment Powers Law governs the operation of tax allocation districts (TAD’s) in the State. The Law was amended during the 2009 legislative session to include a new provision under section 36-44-3(9)(R) for preparation of a “School System Impact Analysis”. This section presents the school impacts of the City of Brunswick Tax Allocation District #1.

15.1. The Current Value of Brunswick TAD vs. the Glynn Schools Tax Digest

The current taxable value for the City of Brunswick TAD #1 is \$28,798,842. According to the Georgia Department of Revenue, the 2016 taxable value of the Glynn County School District was \$4,171,747,696. Thus, the City of Brunswick TAD #1 represents approximately 0.7% of the school district’s total tax digest. The amount of ad valorem school taxes collected from the properties in the designated City of Brunswick TAD #1, as determined by the tax assessor on December 31, 2017, will continue to flow to Glynn County Schools throughout the operation of the TAD. The City of Brunswick TAD #1 will receive any additional property taxes collected above the 2017 base amount for use to attract redevelopment to this portion of the city.

TAD Portion of Glynn County Schools Tax Digest

Area	Net M&O Digest
TAD# 1 Base Value	\$ 28,798,842
Glynn Schools Digest	\$ 4,171,747,696
TAD % of Schools Digest	0.69%

Source: BAG, Glynn County, Georgia Department of Revenue

15.2. Proposed Redevelopment in Brunswick TAD

As detailed earlier in this plan, there are nine potential redevelopment projects located on 35 acres of the City of Brunswick TAD #1. The redevelopment plan calls for a mix of uses including residential units, retail space, convention space and hotel rooms. The nine proposed projects, which would be built out over the next 5 to 15 years, could include:

TAD #1 Proposed Developments	
Land Use	SF/Units/Rooms
Housing	
Townhomes	53
Single Family	20
Multifamily rental	54
Condominiums	425
Senior housing	45
Total housing units	597
Retail	38,000
Convention Space	10,000
Hotel Rooms	200

These potential projects could have a total taxable value of \$67 million, which would represent a net potential increase, over current values of the parcels where they are developed of \$63.4 million in taxable value for the City of Brunswick within TAD #1.

15.3. Estimated Number of Public School Students from Brunswick TAD

Based on the proposed development plan for TAD #1, there are plans to add an additional 597 residential units over the first fifteen years of the TAD. Presented below is an estimate of the number of new residents and school aged children that would result from this future development. These estimates are based on several factors:

- A detailed analysis of resident and school aged children per residential unit in the state of Georgia prepared by Rutgers University in 2006.
- Anticipating that the prices and orientation of the rental apartments, senior housing and condominium development will appeal to a combination of singles and childless couples either empty nesters, retirees and seniors based on the experience of other similar projects in Georgia.
- That a portion of the units, as much as 25%, are assumed to appeal to existing residents in the greater Brunswick area and as a result, will have no net new impact on the schools since any children from these households would already be in the system.

Therefore, the nine proposed development projects in the TAD area will increase total enrollment in the Glynn County Schools by an estimated 68-90 students over the fifteen-year development period, or an average of 5-6 new students per year, as a result of new development in TAD #1.

Glynn County Schools had a total enrollment of 13,187 in March 2017, according to the Georgia Department of Education. The increased school enrollment from new development in TAD #1 would represent an addition of 0.7% to total enrollment in Glynn County Schools.

TAD #1: POPULATION AND SCHOOL AGED CHILDREN FROM HYPOTHETICAL DEVELOPMENT					
Unit Type	Units At Build-Out	Population Multiplier	Estimated Population	School Aged Children Multiplier	Estimated School Aged Children
Single	20				
3-bedroom	10	2.79	28	0.56	6
4-bedroom	10	3.34	33	0.88	9
Townhouse	53				
2-bedroom	27	1.88	51	0.22	6
3-bedroom	26	2.41	63	0.43	11
Senior	45				
1 bedroom	45	1.2	54	0.00	0
Condominium	425				
1-bedroom	225	1.39	313	0.07	16
2-bedroom	200	1.66	332	0.17	34
Rental	54				
1- bedroom	27	1.49	40	0.08	2
2-bedroom	27	2.11	57	0.26	7
Total Pop/Children	597		971		90
Total Net New Pop/Children			728		68

Source: CUPR, Rutgers University, "Residential Demographic Multipliers for Georgia, 2006" Fannie Mae Foundation/BAG

15.4. Location of School Facilities within the Redevelopment Area

There are three school facilities located within TAD # 1:

- Glynn Board of Education Offices at 1313 Egmont Avenue
- Glynn Academy at 1001 Mansfield Street
- Goodyear Elementary at 3000 Roxboro Road

15.5. School Impact Conclusions

TAD #1 will help the City of Brunswick leverage substantial private investment. Over the next fifteen years the taxable value in the TAD has the potential to increase by \$63.4 million. The portion of ad valorem property taxes generated for Glynn County Schools from this new investment will exceed \$1 million annually once all TAD financing is paid. In addition, Glynn County Schools will receive any property taxes

from increases in personal property value as they occur, since property taxes from personal property is not committed to the TAD.

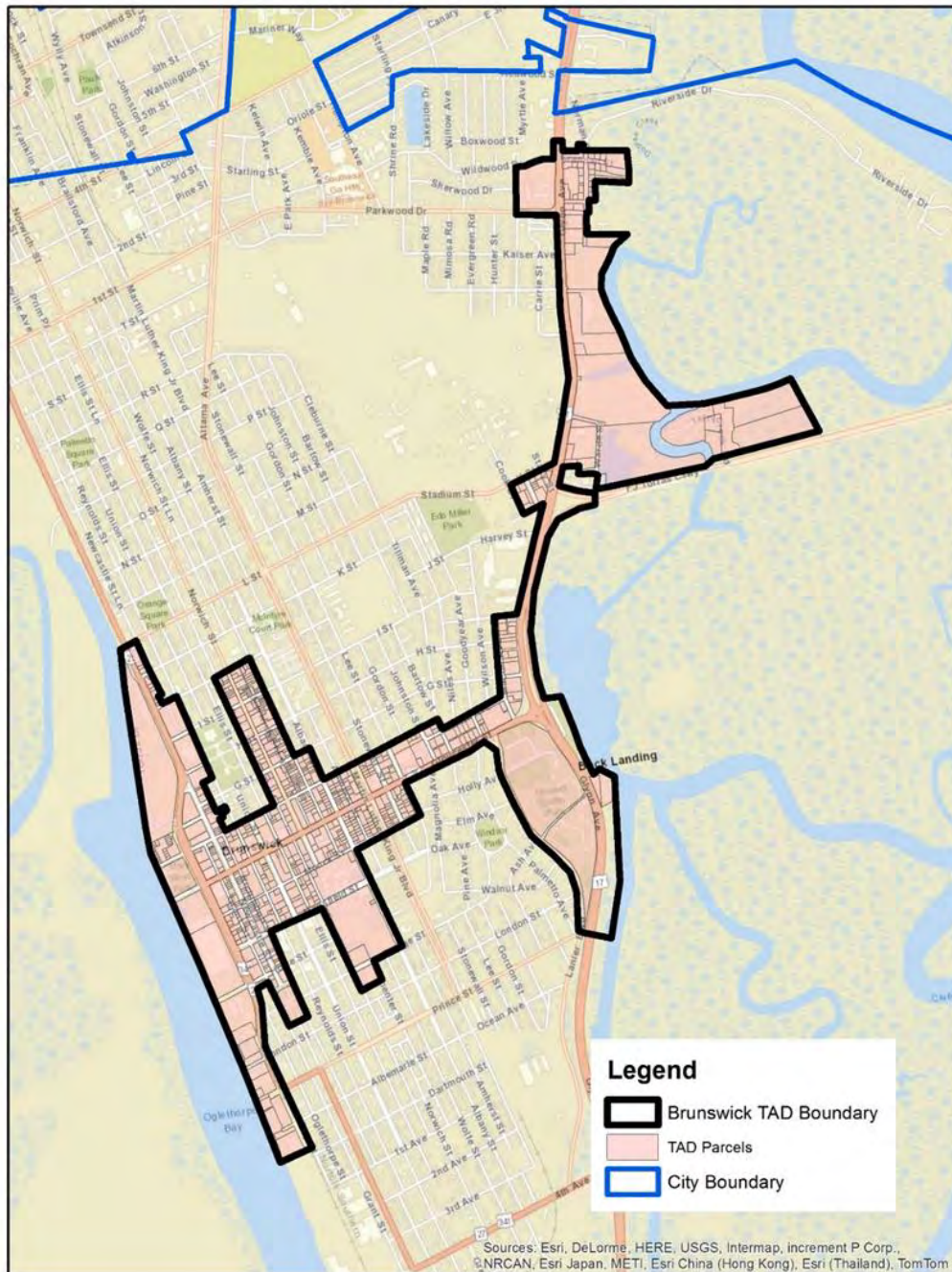
- Glynn County schools will continue to receive the estimated \$465,000 in property taxes it currently receives from properties in TAD #1 each year for the life of the TAD.
- Over the next fifteen years, there are plans to potentially create 597 new residential units which will result in an estimated 68-90 new students for the school system, this averages approximately 6 additional students per year over the next fifteen years, resulting in a minimal impact to the School District.
- The three School District facilities located in TAD #1, it can potentially benefit from the TAD.

Based on consideration of all these factors, we believe the participation by the Glynn County School District in the TAD#1 would have a substantial net positive impact on the District by expanding its revenue base, minimizing the demand for new educational services, while continuing to receive the current property taxes collected in the TAD to the School District.

Appendices

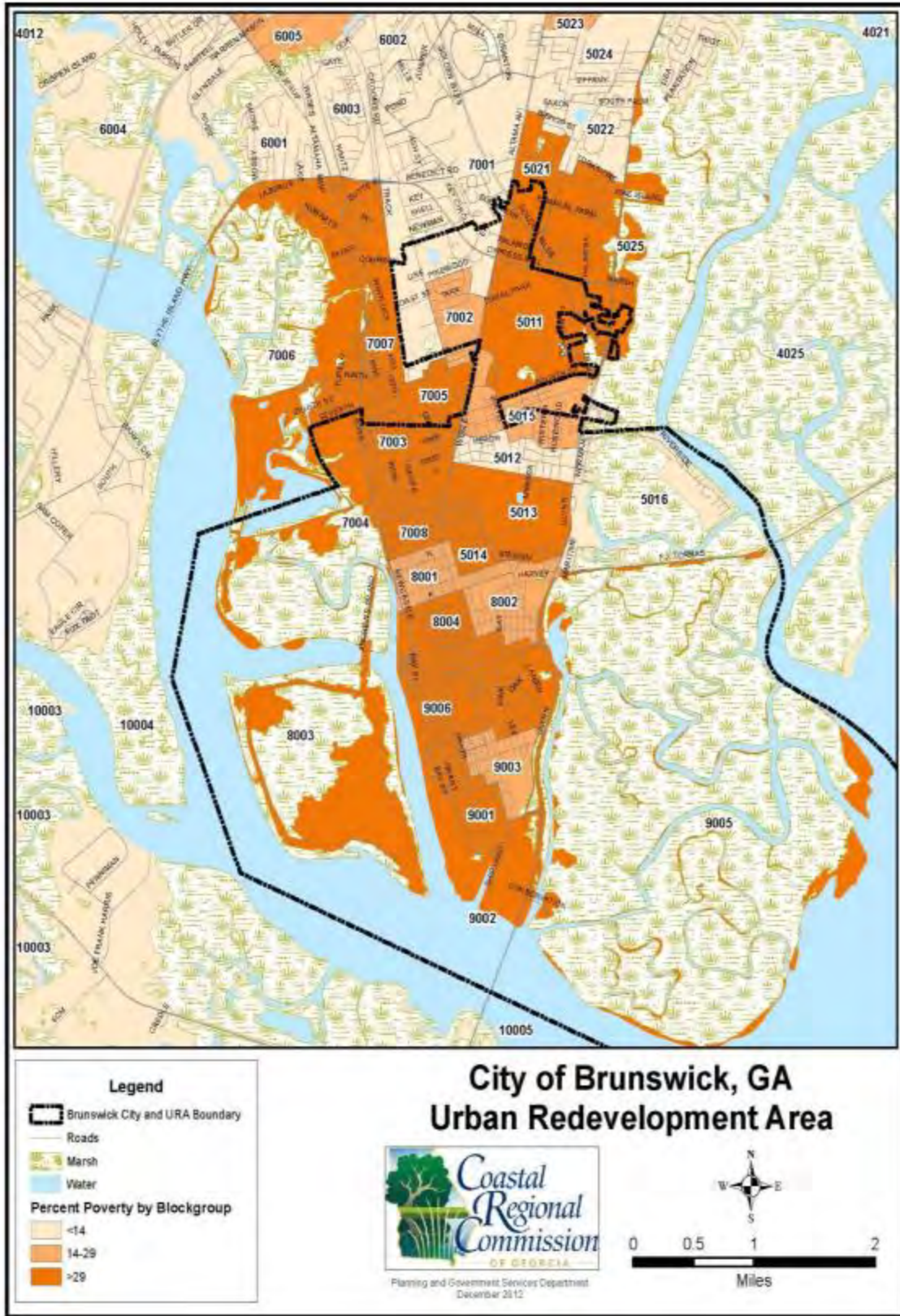
Appendix A. Maps & Drawings

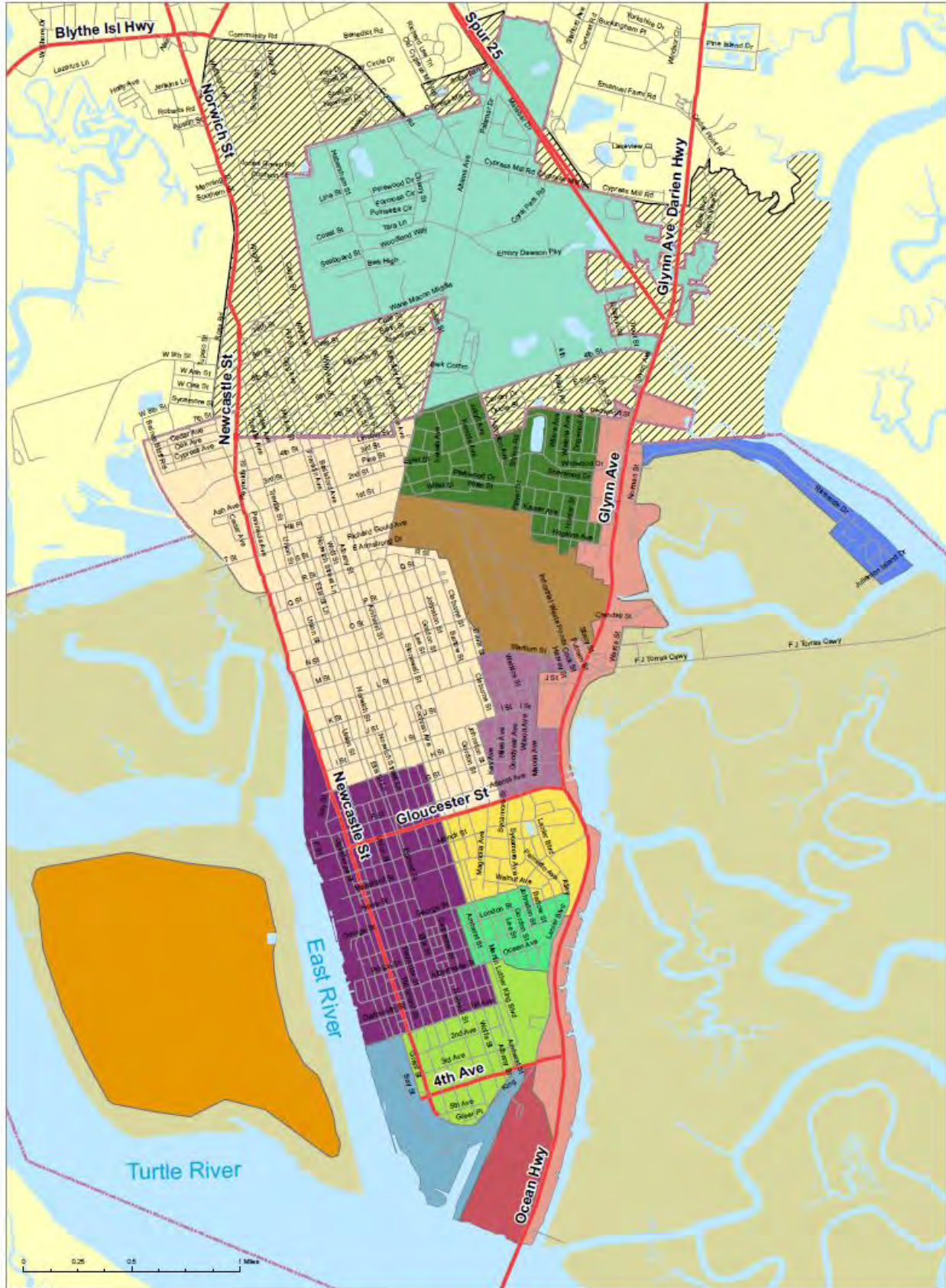
City of Brunswick TAD Boundary Map



Attachment 10 -

Urban Redevelopment Area





LEGEND

- | | | | | | |
|--------------------|-------------------------|-----------------------|-----------------------|---------------------|---------------------------|
| Brunswick Boundary | Character Areas | Industrial Waterfront | New Town/Town Commons | Riverside | Windsor Park |
| Hydrography | Andrews Island | Liberty Harbor | North Brunswick | South End Brunswick | US 17 Commercial Corridor |
| | Dixville/Habersham Park | Marsh | Old Town | Urbana/Mayhew | |
| | Hercules Plant | Medical/Parkwood | Potential Annexation | | |



Appendix B. Figures & Descriptions

City of Brunswick Tax Allocation District #1: Tax Parcel ID Numbers of Properties within the TAD

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-00143	6200000001	100 HAROLD J FRIEDMAN DR	000-001	0062-00	\$563,500	\$225,400	\$225,400
01-00154	6300000002	0 TERRY CREEK RD	000-002	0063-00	\$600	\$240	\$240
01-00155	6300000003	1200 GLYNN AV #7	000-003	0063-00	\$200,000	\$80,000	\$0
01-00158	6300000007	1240 GLYNN AV	000-007	0063-00	\$150,000	\$60,000	\$0
01-00159	6300000008	8 TERRY CREEK RD	000-008	0063-00	\$489,800	\$195,920	\$195,920
01-00518	B00707053001	821 BAY ST	053-001	B007-07	\$180,000	\$72,000	\$0
01-00519	B00707053002	827 BAY ST #2	053-002	B007-07	\$291,900	\$116,760	\$116,760
01-00521	B00707053005	10 ALBEMARLE ST	053-005	B007-07	\$921,800	\$368,720	\$368,720
01-00658	B00707083003	715 BAY ST	083-003	B007-07	\$1,308,500	\$523,400	\$0
01-00659	B00707083004	729 BAY ST	083-004	B007-07	\$50,200	\$20,080	\$20,080
01-00951	B00907016001	1120 NEWCASTLE ST	016-001	B009-07	\$284,000	\$113,600	\$0
01-00952	B00907017001	1129 NEWCASTLE ST	017-001	B009-07	\$18,300	\$7,320	\$0
01-00953	B00907017002	1125 NEWCASTLE ST	017-002	B009-07	\$750,800	\$300,320	\$0
01-00954	B00907018001	1128 BAY ST	018-001	B009-07	\$6,700	\$2,680	\$0
01-00955	B00907018002	1126 BAY ST	018-002	B009-07	\$6,700	\$2,680	\$0
01-00969	B00907018016	1129 GRANT ST	018-016	B009-07	\$9,700	\$3,880	\$0
01-00970	B00907018017	206 HOWE ST	018-017	B009-07	\$10,500	\$4,200	\$0
01-00984	B00907020003	1025 BAY ST	020-003	B009-07	\$743,300	\$297,320	\$297,320
01-00985	B00907020004	1001 BAY ST	020-004	B009-07	\$220,300	\$88,120	\$88,120
01-00986	B00907020005	1029 BAY ST	020-005	B009-07	\$425,000	\$170,000	\$170,000
01-01014	B00907025001	1100 GRANT ST #13000	025-001	B009-07	\$118,700	\$47,480	\$0
01-01042	B00907030001	900 GEORGE ST	030-001	B009-07	\$151,900	\$60,760	\$0
01-01137	B00907052001	829 BAY ST	052-001	B009-07	\$1,028,200	\$411,280	\$411,280
01-01461	B01106001001	1116 LANIER BLVD #13000	001-001	B011-06	\$756,000	\$302,400	\$0
01-01462	B01201023001	1200 GLOUCESTER ST	023-001	B012-01	\$72,700	\$29,080	\$29,080
01-01463	B01201023002	1420 WOLFE ST	023-002	B012-01	\$35,200	\$14,080	\$14,080
01-01464	B01201023003	1412 WOLFE ST	023-003	B012-01	\$4,700	\$1,880	\$1,880
01-01465	B01201023004	1410 WOLFE ST	023-004	B012-01	\$8,900	\$3,560	\$3,560
01-01466	B01201023005	1207 MONCK ST	023-005	B012-01	\$14,000	\$5,600	\$5,600
01-01467	B01201023006	1209 MONCK ST	023-006	B012-01	\$19,500	\$7,800	\$7,800
01-01468	B01201023007	1403 ALBANY ST	023-007	B012-01	\$49,200	\$19,680	\$0
01-01469	B01201023008	1407 ALBANY ST	023-008	B012-01	\$25,800	\$10,320	\$10,320
01-01470	B01201023009	1409 ALBANY ST	023-009	B012-01	\$28,000	\$11,200	\$11,200
01-01471	B01201023010	1411 ALBANY ST	023-010	B012-01	\$37,000	\$14,800	\$14,800
01-01472	B01201023011	1417 ALBANY ST	023-011	B012-01	\$39,900	\$15,960	\$15,960
01-01473	B01201023012	1419 ALBANY ST	023-012	B012-01	\$5,900	\$2,360	\$2,360
01-01474	B01201023013	1208 GLOUCESTER ST	023-013	B012-01	\$122,300	\$48,920	\$48,920
01-01475	B01201024001	1100 GLOUCESTER ST	024-001	B012-01	\$150,200	\$60,080	\$0
01-01476	B01201024002	1421 WOLFE ST	024-002	B012-01	\$38,000	\$15,200	\$0
01-01477	B01201024003	1103 MONCK ST	024-003	B012-01	\$13,400	\$5,360	\$5,360
01-01478	B01201024004	1105 MONCK ST	024-004	B012-01	\$5,300	\$2,120	\$2,120
01-01479	B01201024005	1107 MONCK ST	024-005	B012-01	\$5,500	\$2,200	\$2,200
01-01480	B01201024006	1109 MONCK ST	024-006	B012-01	\$4,300	\$1,720	\$1,720
01-01481	B01201024007	1405 WOLFE ST	024-007	B012-01	\$5,300	\$2,120	\$2,120
01-01482	B01201024008	1409 WOLFE ST	024-008	B012-01	\$11,200	\$4,480	\$4,480
01-01483	B01201025001	1002 GLOUCESTER ST	025-001	B012-01	\$441,000	\$176,400	\$0
01-01484	B01201025002	1414 NORWICH ST	025-002	B012-01	\$14,000	\$5,600	\$0
01-01485	B01201025003	1400 NORWICH ST	025-003	B012-01	\$279,200	\$111,680	\$0
01-01486	B01201026001	900 GLOUCESTER ST	026-001	B012-01	\$921,400	\$368,560	\$0
01-01487	B01201026002	1411 NORWICH ST	026-002	B012-01	\$44,900	\$17,960	\$0

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-01489	B01201026004	903 MONCK ST	026-004	B012-01	\$116,700	\$46,680	\$46,680
01-01490	B01201027001	800 GLOUCESTER ST			\$0	\$0	\$0
01-01491	B01201027002	1410 ELLIS ST	027-002	B012-01	\$5,600	\$2,240	\$2,240
01-01492	B01201027003	1408 ELLIS ST	027-003	B012-01	\$5,760	\$2,304	\$2,304
01-01493	B01201027004	801 MONCK ST	027-004	B012-01	\$140,800	\$56,320	\$56,320
01-01494	B01201027005	805 MONCK ST	027-005	B012-01	\$34,000	\$13,600	\$13,600
01-01495	B01201027006	1409 EGMONT ST	027-006	B012-01	\$170,700	\$68,280	\$68,280
01-01496	B01201027007	1415 EGMONT ST	027-007	B012-01	\$56,500	\$22,600	\$22,600
01-01497	B01201027008	1421 EGMONT ST			\$0	\$0	\$0
01-01498	B01201027009	808 GLOUCESTER ST			\$0	\$0	\$0
01-01499	B01201027010	1414 ELLIS ST	027-010	B012-01	\$75,000	\$30,000	\$0
01-01500	B01201028001	700 GLOUCESTER ST #202	028-001	B012-01	\$1,100,000	\$440,000	\$440,000
01-01502	B01201028003	710 GLOUCESTER ST	028-003	B012-01	\$936,600	\$374,640	\$374,640
01-01503	B01201029001	600 GLOUCESTER ST	029-001	B012-01	\$107,000	\$42,800	\$42,800
01-01504	B01201029004	1416 REYNOLDS ST	029-004	B012-01	\$118,800	\$47,520	\$47,520
01-01505	B01201029005	1406 REYNOLDS ST	029-005	B012-01	\$25,500	\$10,200	\$10,200
01-01506	B01201029006	1402 REYNOLDS ST	029-006	B012-01	\$79,500	\$31,800	\$31,800
01-01507	B01201029007	1401 UNION ST	029-007	B012-01	\$180,200	\$72,080	\$72,080
01-01508	B01201029008	1407 UNION ST	029-008	B012-01	\$116,100	\$46,440	\$46,440
01-01510	B01201029010	1415 UNION ST	029-010	B012-01	\$10,300	\$4,120	\$4,120
01-01511	B01201029012	1425 UNION ST	029-012	B012-01	\$9,900	\$3,960	\$3,960
01-01512	B01201029013	606 GLOUCESTER ST	029-013	B012-01	\$252,700	\$101,080	\$101,080
01-01513	B01201029014	1423 UNION ST	029-014	B012-01	\$7,600	\$3,040	\$3,040
01-01514	B01201030001	500 GLOUCESTER ST	030-001	B012-01	\$425,000	\$170,000	\$170,000
01-01516	B01201030003	510 GLOUCESTER ST	030-003	B012-01	\$2,388,200	\$955,280	\$955,280
01-01518	B01201031001	1426 NEWCASTLE ST	031-001	B012-01	\$0	\$0	\$0
01-01519	B01201031002	1424 NEWCASTLE ST	031-002	B012-01	\$48,600	\$19,440	\$19,440
01-01520	B01201031003	1422 NEWCASTLE ST	031-003	B012-01	\$75,200	\$30,080	\$30,080
01-01521	B01201031004	1418 NEWCASTLE ST	031-004	B012-01	\$72,800	\$29,120	\$29,120
01-01522	B01201031005	1416 NEWCASTLE ST	031-005	B012-01	\$40,400	\$16,160	\$0
01-01523	B01201031006	1414 NEWCASTLE ST	031-006	B012-01	\$82,500	\$33,000	\$33,000
01-01524	B01201031007	1412 NEWCASTLE ST	031-007	B012-01	\$90,000	\$36,000	\$36,000
01-01525	B01201031008	1404 NEWCASTLE ST	031-008	B012-01	\$85,000	\$34,000	\$34,000
01-01526	B01201031009	1402 NEWCASTLE ST	031-009	B012-01	\$98,200	\$39,280	\$39,280
01-01527	B01201031010	1400 NEWCASTLE ST	031-010	B012-01	\$117,700	\$47,080	\$47,080
01-01528	B01201031011	1430 NEWCASTLE ST	031-011	B012-01	\$247,500	\$99,000	\$99,000
01-01529	B01201032001	304 GLOUCESTER ST #201	032-001	B012-01	\$359,300	\$143,720	\$143,720
01-01530	B01201032002	1429 NEWCASTLE ST	032-002	B012-01	\$182,900	\$73,160	\$73,160
01-01531	B01201032003	1423 NEWCASTLE ST	032-003	B012-01	\$289,900	\$115,960	\$115,960
01-01532	B01201032004	1421 NEWCASTLE ST	032-004	B012-01	\$48,600	\$19,440	\$19,440
01-01533	B01201032005	1415 NEWCASTLE ST	032-005	B012-01	\$40,400	\$16,160	\$0
01-01534	B01201032006	1413 NEWCASTLE ST	032-006	B012-01	\$61,700	\$24,680	\$24,680
01-01538	B01201032010	1405 NEWCASTLE ST	032-010	B012-01	\$205,900	\$82,360	\$82,360
01-01539	B01201032011	1403 NEWCASTLE ST	032-011	B012-01	\$46,800	\$18,720	\$18,720
01-01540	B01201032012	1401 NEWCASTLE ST	032-012	B012-01	\$381,200	\$152,480	\$152,480
01-01541	B01201032013	1419 NEWCASTLE ST	032-013	B012-01	\$62,600	\$25,040	\$25,040
01-01542	B01201033001	208 GLOUCESTER ST	033-001	B012-01	\$504,000	\$201,600	\$0
01-01544	B01201033006	205 MONCK ST	033-006	B012-01	\$86,800	\$34,720	\$34,720
01-01545	B01201033007	211 MONCK ST	033-007	B012-01	\$300,700	\$120,280	\$120,280
01-01561	B01201035002	102 GLOUCESTER ST	035-002	B012-01	\$4,884,000	\$1,953,600	\$0
01-01565	B01201036002	1299 BAY ST #17000	036-002	B012-01	\$1,356,000	\$542,400	\$0
01-01574	B01201038001	1320 BAY ST	038-001	B012-01	\$8,400	\$3,360	\$3,360
01-01575	B01201038002	1318 BAY ST	038-002	B012-01	\$3,700	\$1,480	\$1,480
01-01576	B01201038003	1308 BAY ST	038-003	B012-01	\$7,500	\$3,000	\$3,000
01-01577	B01201038004	1304 BAY ST	038-004	B012-01	\$46,200	\$18,480	\$18,480
01-01578	B01201038005	211 MANSFIELD ST	038-005	B012-01	\$107,500	\$43,000	\$43,000
01-01579	B01201038006	1307 GRANT ST	038-006	B012-01	\$159,600	\$63,840	\$63,840
01-01580	B01201038007	1309 GRANT ST	038-007	B012-01	\$5,900	\$2,360	\$2,360
01-01581	B01201038008	1311 GRANT ST	038-008	B012-01	\$5,900	\$2,360	\$2,360

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-01582	B01201038009	1314 BAY ST	038-009	B012-01	\$261,800	\$104,720	\$104,720
01-01585	B01201038012	212 MONCK ST	038-012	B012-01	\$22,400	\$8,960	\$8,960
01-01586	B01201038013	208 MONCK ST	038-013	B012-01	\$22,800	\$9,120	\$9,120
01-01587	B01201039001	1317 NEWCASTLE ST	039-001	B012-01	\$40,900	\$16,360	\$16,360
01-01587	B01201039001	1317 NEWCASTLE ST	039-001	B012-01	\$40,900	\$16,360	\$16,360
01-01588	B01201039002	1313 NEWCASTLE ST	039-002	B012-01	\$351,800	\$140,720	\$140,720
01-01589	B01201039003	1301 NEWCASTLE ST	039-003	B012-01	\$63,200	\$25,280	\$0
01-01590	B01201040001	1330 NEWCASTLE ST	040-001	B012-01	\$96,100	\$38,440	\$38,440
01-01591	B01201040002	1328 NEWCASTLE ST	040-002	B012-01	\$26,100	\$10,440	\$10,440
01-01592	B01201040003	1326 NEWCASTLE ST	040-003	B012-01	\$41,600	\$16,640	\$16,640
01-01593	B01201040004	1322 NEWCASTLE ST	040-004	B012-01	\$41,600	\$16,640	\$16,640
01-01594	B01201040005	1320 NEWCASTLE ST	040-005	B012-01	\$81,600	\$32,640	\$32,640
01-01596	B01201040007	1316 NEWCASTLE ST	040-007	B012-01	\$364,900	\$145,960	\$145,960
01-01597	B01201040008	1314 NEWCASTLE ST #200	040-008	B012-01	\$228,000	\$91,200	\$91,200
01-01598	B01201040009	1312 NEWCASTLE ST #100	040-009	B012-01	\$417,300	\$166,920	\$166,920
01-01599	B01201040010	1300 NEWCASTLE ST	040-010	B012-01	\$63,200	\$25,280	\$0
01-01600	B01201041001	1328 RICHMOND ST	041-001	B012-01	\$142,400	\$56,960	\$56,960
01-01602	B01201041003	1310 RICHMOND ST	041-003	B012-01	\$66,300	\$26,520	\$26,520
01-01603	B01201041004	503 MANSFIELD ST	041-004	B012-01	\$163,100	\$65,240	\$65,240
01-01604	B01201041005	1301 REYNOLDS ST	041-005	B012-01	\$41,500	\$16,600	\$16,600
01-01605	B01201041006	1313 REYNOLDS ST	041-006	B012-01	\$9,100	\$3,640	\$3,640
01-01606	B01201041007	512 MONCK ST	041-007	B012-01	\$80,900	\$32,360	\$32,360
01-01607	B01201041008	506 MONCK ST	041-008	B012-01	\$110,200	\$44,080	\$44,080
01-01618	B01201043001	1230 NEWCASTLE ST	043-001	B012-01	\$16,300	\$6,520	\$0
01-01619	B01201043002	1214 NEWCASTLE ST	043-002	B012-01	\$146,600	\$58,640	\$58,640
01-01620	B01201043003	1206 NEWCASTLE ST	043-003	B012-01	\$135,500	\$54,200	\$54,200
01-01621	B01201043004	1202 NEWCASTLE ST	043-004	B012-01	\$42,100	\$16,840	\$16,840
01-01622	B01201043005	405 HOWE ST	043-005	B012-01	\$129,800	\$51,920	\$51,920
01-01623	B01201044001	1229 NEWCASTLE ST #13000	044-001	B012-01	\$464,300	\$185,720	\$0
01-01624	B01201044002	1217 NEWCASTLE ST	044-002	B012-01	\$145,100	\$58,040	\$58,040
01-01625	B01201044003	1215 NEWCASTLE ST	044-003	B012-01	\$87,600	\$35,040	\$35,040
01-01626	B01201044004	1213 NEWCASTLE ST	044-004	B012-01	\$162,800	\$65,120	\$65,120
01-01627	B01201044005	1205 NEWCASTLE ST	044-005	B012-01	\$180,400	\$72,160	\$72,160
01-01628	B01201045001	206 MANSFIELD ST	045-001	B012-01	\$922,500	\$369,000	\$0
01-01631	B01201045004	1204 BAY ST	045-004	B012-01	\$212,400	\$84,960	\$84,960
01-01638	B01207003001	1326 EGMONT ST	003-001	B012-07	\$523,200	\$209,280	\$0
01-01639	B01207003002	1328 NORWICH ST	003-002	B012-07	\$3,550,000	\$1,420,000	\$0
01-01640	B01207003003	1321 ALBANY ST	003-003	B012-07	\$111,100	\$44,440	\$44,440
01-01641	B01207004001	800 MONCK ST	004-001	B012-07	\$121,300	\$48,520	\$0
01-01642	B01207004002	804 MONCK ST	004-002	B012-07	\$90,100	\$36,040	\$0
01-01643	B01207004003	1320 ELLIS ST	004-003	B012-07	\$9,000	\$3,600	\$3,600
01-01644	B01207004004	1314 ELLIS ST	004-004	B012-07	\$158,500	\$63,400	\$0
01-01645	B01207004005	1310 ELLIS ST	004-005	B012-07	\$5,500	\$2,200	\$0
01-01646	B01207004006	801 MANSFIELD ST	004-006	B012-07	\$109,900	\$43,960	\$0
01-01647	B01207004007	811 MANSFIELD ST	004-007	B012-07	\$10,600	\$4,240	\$0
01-01648	B01207004008	1309 EGMONT ST	004-008	B012-07	\$13,100	\$5,240	\$0
01-01649	B01207004009	1313 EGMONT ST	004-009	B012-07	\$13,100	\$5,240	\$0
01-01650	B01207004010	1317 EGMONT ST	004-010	B012-07	\$23,400	\$9,360	\$0
01-01651	B01207004011	1321 EGMONT ST	004-011	B012-07	\$49,200	\$19,680	\$19,680
01-01652	B01207004012	808 MONCK ST	004-012	B012-07	\$155,500	\$62,200	\$62,200
01-01653	B01207005001	1328 UNION ST	005-001	B012-07	\$175,000	\$70,000	\$0
01-01654	B01207005002	1320 UNION ST	005-002	B012-07	\$42,100	\$16,840	\$0
01-01655	B01207005003	1314 UNION ST	005-003	B012-07	\$12,200	\$4,880	\$0
01-01656	B01207005004	1310 UNION ST	005-004	B012-07	\$827,800	\$331,120	\$0
01-01658	B01207005006	707 MANSFIELD ST	005-006	B012-07	\$24,300	\$9,720	\$0
01-01660	B01207006002	1315 UNION ST	006-002	B012-07	\$60,000	\$24,000	\$24,000
01-01661	B01207006003	1311 UNION ST	006-003	B012-07	\$412,000	\$164,800	\$0
01-01662	B01207006004	603 MANSFIELD ST #B	006-004	B012-07	\$115,600	\$46,240	\$46,240
01-01663	B01207006005	1303 UNION ST	006-005	B012-07	\$133,300	\$53,320	\$53,320

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-01664	B01207006006	1312 REYNOLDS ST	006-006	B012-07	\$154,900	\$61,960	\$61,960
01-01665	B01207006007	1321 UNION ST	006-007	B012-07	\$468,400	\$187,360	\$0
01-01667	B01207006009	1327 UNION ST	006-009	B012-07	\$223,100	\$89,240	\$89,240
01-01703	B01207010001	1001 EGMONT ST #12	010-001	B012-07	\$2,990,900	\$1,196,360	\$0
01-01704	B01207010002	1215 ALBANY ST	010-002	B012-07	\$52,000	\$20,800	\$20,800
01-01705	B01301021001	1400 GLOUCESTER ST	021-001	B013-01	\$69,500	\$27,800	\$0
01-01706	B01301021002	1416 AMHERST ST	021-002	B013-01	\$578,700	\$231,480	\$0
01-01707	B01301021003	1410 AMHERST ST	021-003	B013-01	\$7,000	\$2,800	\$2,800
01-01708	B01301021004	1406 AMHERST ST	021-004	B013-01	\$7,000	\$2,800	\$2,800
01-01709	B01301021005	1404 AMHERST ST	021-005	B013-01	\$7,000	\$2,800	\$2,800
01-01710	B01301021006	1400 AMHERST ST	021-006	B013-01	\$57,000	\$22,800	\$22,800
01-01711	B01301021007	1407 MONCK ST	021-007	B013-01	\$33,700	\$13,480	\$13,480
01-01712	B01301021008	1407 MARTIN LUTHER KING JR BLVD	021-008	B013-01	\$16,900	\$6,760	\$6,760
01-01713	B01301021009	1411 MARTIN LUTHER KING JR BLVD	021-009	B013-01	\$7,300	\$2,920	\$2,920
01-01714	B01301021010	1413 MARTIN LUTHER KING JR BLVD	021-010	B013-01	\$29,200	\$11,680	\$11,680
01-01715	B01301021011	1417 MARTIN LUTHER KING JR BLVD	021-011	B013-01	\$62,800	\$25,120	\$25,120
01-01716	B01301021013	1412 GLOUCESTER ST	021-013	B013-01	\$210,100	\$84,040	\$84,040
01-01717	B01301022001	1300 GLOUCESTER ST #A	022-001	B013-01	\$98,400	\$39,360	\$39,360
01-01718	B01301022002	1422 ALBANY ST	022-002	B013-01	\$29,000	\$11,600	\$11,600
01-01719	B01301022003	1416 ALBANY ST	022-003	B013-01	\$21,400	\$8,560	\$8,560
01-01720	B01301022004	1414 ALBANY ST	022-004	B013-01	\$10,800	\$4,320	\$4,320
01-01721	B01301022005	1410 ALBANY ST	022-005	B013-01	\$5,400	\$2,160	\$2,160
01-01722	B01301022006	1406 ALBANY ST	022-006	B013-01	\$24,200	\$9,680	\$9,680
01-01723	B01301022007	1404 ALBANY ST	022-007	B013-01	\$12,600	\$5,040	\$5,040
01-01724	B01301022008	1402 ALBANY ST	022-008	B013-01	\$61,200	\$24,480	\$24,480
01-01725	B01301022009	1305 MONCK ST	022-009	B013-01	\$4,900	\$1,960	\$1,960
01-01726	B01301022010	1405 AMHERST ST	022-010	B013-01	\$42,000	\$16,800	\$16,800
01-01727	B01301022011	1407 AMHERST ST	022-011	B013-01	\$5,400	\$2,160	\$2,160
01-01728	B01301022012	1411 AMHERST ST	022-012	B013-01	\$31,100	\$12,440	\$12,440
01-01729	B01301022013	1413 AMHERST ST	022-013	B013-01	\$28,600	\$11,440	\$11,440
01-01730	B01301022014	1417 AMHERST ST	022-014	B013-01	\$5,400	\$2,160	\$2,160
01-01731	B01301022015	1419 AMHERST ST	022-015	B013-01	\$29,000	\$11,600	\$11,600
01-01732	B01301022016	1421 AMHERST ST	022-016	B013-01	\$22,800	\$9,120	\$9,120
01-01733	B01301022017	1302 GLOUCESTER ST	022-017	B013-01	\$63,700	\$25,480	\$25,480
01-01734	B01301022018	1310 GLOUCESTER ST	022-018	B013-01	\$100,300	\$40,120	\$40,120
01-01783	B01306007001	1600 GLOUCESTER ST	007-001	B013-06	\$63,200	\$25,280	\$25,280
01-01784	B01306007002	1416 STONEWALL ST	007-002	B013-06	\$29,400	\$11,760	\$11,760
01-01785	B01306007003	1410 STONEWALL ST	007-003	B013-06	\$23,900	\$9,560	\$9,560
01-01786	B01306007004	1406 STONEWALL ST	007-004	B013-06	\$28,300	\$11,320	\$11,320
01-01787	B01306007005	1402 STONEWALL ST	007-005	B013-06	\$70,900	\$28,360	\$28,360
01-01788	B01306007006	1401 LEE ST	007-006	B013-06	\$32,400	\$12,960	\$12,960
01-01789	B01306007007	1403 LEE ST	007-007	B013-06	\$41,500	\$16,600	\$16,600
01-01790	B01306007008	1411 LEE ST	007-008	B013-06	\$34,100	\$13,640	\$13,640
01-01791	B01306007009	1413 LEE ST	007-009	B013-06	\$31,600	\$12,640	\$12,640
01-01792	B01306007010	1417 LEE ST	007-010	B013-06	\$40,700	\$16,280	\$16,280
01-01793	B01306007011	1421 LEE ST	007-011	B013-06	\$173,700	\$69,480	\$69,480
01-01795	B01306007013	1608 GLOUCESTER ST	007-013	B013-06	\$106,100	\$42,440	\$42,440
01-01798	B01306008001	1504 GLOUCESTER ST	008-001	B013-06	\$274,000	\$109,600	\$109,600
01-01800	B01306008003	1416 MARTIN LUTHER KING JR BLVD	008-003	B013-06	\$8,000	\$3,200	\$3,200
01-01801	B01306008004	1410 MARTIN LUTHER KING JR BLVD	008-004	B013-06	\$3,000	\$1,200	\$1,200
01-01802	B01306008005	1408 MARTIN LUTHER KING JR BLVD	008-005	B013-06	\$4,000	\$1,600	\$1,600
01-01803	B01306008006	1406 MARTIN LUTHER KING JR BLVD	008-006	B013-06	\$5,500	\$2,200	\$2,200
01-01805	B01306008008	1402 MARTIN LUTHER KING JR BLVD	008-008	B013-06	\$6,700	\$2,680	\$2,680
01-01806	B01306008009	1400 MARTIN LUTHER KING JR BLVD	008-009	B013-06	\$28,100	\$11,240	\$11,240
01-01807	B01306008010	1505 MONCK ST	008-010	B013-06	\$5,800	\$2,320	\$2,320
01-01808	B01306008011	1403 STONEWALL ST	008-011	B013-06	\$40,400	\$16,160	\$16,160
01-01810	B01306008013	1411 STONEWALL ST	008-013	B013-06	\$27,700	\$11,080	\$11,080
01-01811	B01306008014	1413 STONEWALL ST	008-014	B013-06	\$23,300	\$9,320	\$9,320
01-01812	B01306008015	1415 STONEWALL ST	008-015	B013-06	\$4,700	\$1,880	\$1,880

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-01813	B01306008016	1510 GLOUCESTER ST	008-016	B013-06	\$146,200	\$58,480	\$58,480
01-01814	B01306008018	1414 MARTIN LUTHER KING JR BLVD	008-018	B013-06	\$4,400	\$1,760	\$1,760
01-01980	B01406002001	1408 SONNY MILLER WAY #32000	002-001	B014-06	\$712,300	\$284,920	\$0
01-01994	B01501002001	400 G ST	002-001	B015-01	\$58,300	\$23,320	\$23,320
01-01996	B01501002003	1608 NEWCASTLE ST #200	002-003	B015-01	\$573,800	\$229,520	\$229,520
01-01997	B01501002004	1604 NEWCASTLE ST	002-004	B015-01	\$185,800	\$74,320	\$74,320
01-01998	B01501002005	1600 NEWCASTLE ST	002-005	B015-01	\$319,800	\$127,920	\$127,920
01-01999	B01501002006	409 F ST	002-006	B015-01	\$0	\$0	\$0
01-02004	B01501002011	1619 REYNOLDS ST	002-011	B015-01	\$0	\$0	\$0
01-02008	B01501002015	410 G ST	002-015	B015-01	\$16,200	\$6,480	\$6,480
01-02010	B01501003001	1704 BAY ST	003-001	B015-01	\$105,100	\$42,040	\$42,040
01-02011	B01501004001	1609 NEWCASTLE ST	004-001	B015-01	\$129,200	\$51,680	\$0
01-02013	B01501006001	101 GLOUCESTER ST #13000	006-001	B015-01	\$1,396,100	\$558,440	\$558,440
01-02018	B01501008001	200 F ST	008-001	B015-01	\$21,200	\$8,480	\$0
01-02019	B01501008002	1524 BAY ST	008-002	B015-01	\$106,100	\$42,440	\$42,440
01-02020	B01501008003	1516 BAY ST	008-003	B015-01	\$124,700	\$49,880	\$49,880
01-02021	B01501008004	209 GLOUCESTER ST	008-004	B015-01	\$375,900	\$150,360	\$150,360
01-02022	B01501009001	1531 NEWCASTLE ST	009-001	B015-01	\$201,400	\$80,560	\$80,560
01-02023	B01501009002	1525 NEWCASTLE ST	009-002	B015-01	\$82,900	\$33,160	\$33,160
01-02024	B01501009003	1521 NEWCASTLE ST	009-003	B015-01	\$95,500	\$38,200	\$38,200
01-02025	B01501009004	1519 NEWCASTLE ST #1	009-004	B015-01	\$111,000	\$44,400	\$44,400
01-02026	B01501009005	1515 NEWCASTLE ST	009-005	B015-01	\$98,600	\$39,440	\$39,440
01-02027	B01501009006	1513 NEWCASTLE ST	009-006	B015-01	\$42,100	\$16,840	\$0
01-02028	B01501009007	1505 NEWCASTLE ST	009-007	B015-01	\$686,300	\$274,520	\$274,520
01-02029	B01501009008	303 GLOUCESTER ST	009-008	B015-01	\$478,257	\$191,303	\$191,303
01-02030	B01501009009	1527 NEWCASTLE ST	009-009	B015-01	\$68,400	\$27,360	\$27,360
01-02031	B01501010001	1530 NEWCASTLE ST	010-001	B015-01	\$550,600	\$220,240	\$0
01-02032	B01501010002	1520 NEWCASTLE ST #1	010-002	B015-01	\$105,600	\$42,240	\$42,240
01-02033	B01501010003	1518 NEWCASTLE ST	010-003	B015-01	\$272,500	\$109,000	\$109,000
01-02034	B01501010004	1512 NEWCASTLE ST	010-004	B015-01	\$42,700	\$17,080	\$17,080
01-02035	B01501010005	1512 NEWCASTLE ST #13000	010-005	B015-01	\$42,100	\$16,840	\$0
01-02036	B01501010006	1510 NEWCASTLE ST #206	010-006	B015-01	\$497,900	\$199,160	\$199,160
01-02037	B01501010007	1506 NEWCASTLE ST	010-007	B015-01	\$190,200	\$76,080	\$76,080
01-02038	B01501010009	1500 NEWCASTLE ST	010-009	B015-01	\$977,100	\$390,840	\$390,840
01-02039	B01501011001	504 F ST	011-001	B015-01	\$164,000	\$65,600	\$65,600
01-02040	B01501011002	1524 RICHMOND ST	011-002	B015-01	\$204,400	\$81,760	\$81,760
01-02041	B01501011003	1514 RICHMOND ST	011-003	B015-01	\$117,400	\$46,960	\$46,960
01-02042	B01501011004	501 GLOUCESTER ST #201	011-004	B015-01	\$1,545,000	\$618,000	\$618,000
01-02043	B01501011005	513 GLOUCESTER ST	011-005	B015-01	\$292,100	\$116,840	\$116,840
01-02045	B01501011007	1507 REYNOLDS ST	011-007	B015-01	\$58,400	\$23,360	\$23,360
01-02046	B01501011008	1523 REYNOLDS ST	011-008	B015-01	\$13,500	\$5,400	\$5,400
01-02047	B01501011009	1529 REYNOLDS ST	011-009	B015-01	\$203,600	\$81,440	\$81,440
01-02049	B01501012001	1528 REYNOLDS ST	012-001	B015-01	\$37,400	\$14,960	\$14,960
01-02050	B01501012002	1520 REYNOLDS ST	012-002	B015-01	\$18,000	\$7,200	\$7,200
01-02051	B01501012003	1509 UNION ST	012-003	B015-01	\$298,600	\$119,440	\$119,440
01-02052	B01501012004	601 GLOUCESTER ST	012-004	B015-01	\$1,305,500	\$522,200	\$0
01-02053	B01501012005	1519 UNION ST	012-005	B015-01	\$17,600	\$7,040	\$7,040
01-02054	B01501012006	1521 UNION ST	012-006	B015-01	\$13,500	\$5,400	\$5,400
01-02055	B01501012007	1523 UNION ST	012-007	B015-01	\$13,500	\$5,400	\$5,400
01-02056	B01501012008	1525 UNION ST	012-008	B015-01	\$13,500	\$5,400	\$5,400
01-02057	B01501013001	1526 UNION ST	013-001	B015-01	\$86,200	\$34,480	\$34,480
01-02058	B01501013002	777 GLOUCESTER ST #200	013-002	B015-01	\$3,028,200	\$1,211,280	\$1,211,280
01-02059	B01501014001	1528 ELLIS ST	014-001	B015-01	\$205,800	\$82,320	\$82,320
01-02060	B01501014002	1522 ELLIS ST	014-002	B015-01	\$8,900	\$3,560	\$0
01-02061	B01501014003	1518 ELLIS ST	014-003	B015-01	\$8,900	\$3,560	\$0
01-02062	B01501014004	805 GLOUCESTER ST	014-004	B015-01	\$2,143,100	\$857,240	\$857,240
01-02063	B01501014005	1521 EGMONT ST	014-005	B015-01	\$26,000	\$10,400	\$0
01-02064	B01501014006	1527 EGMONT ST	014-006	B015-01	\$34,400	\$13,760	\$0
01-02065	B01501015001	1527 NORWICH ST	015-001	B015-01	\$84,600	\$33,840	\$33,840

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-02066	B01501015002	1521 NORWICH ST	015-002	B015-01	\$21,100	\$8,440	\$0
01-02067	B01501015003	1515 NORWICH ST	015-003	B015-01	\$21,100	\$8,440	\$0
01-02068	B01501015005	903 GLOUCESTER ST	015-005	B015-01	\$74,900	\$29,960	\$0
01-02069	B01501016005	1526 NORWICH ST	016-005	B015-01	\$456,500	\$182,600	\$182,600
01-02070	B01501017001	1100 F ST	017-001	B015-01	\$191,400	\$76,560	\$0
01-02071	B01501017002	1524 JF MANN WAY	017-002	B015-01	\$7,000	\$2,800	\$2,800
01-02072	B01501017003	1520 JF MANN WAY	017-003	B015-01	\$20,000	\$8,000	\$0
01-02073	B01501017004	1516 JF MANN WAY	017-004	B015-01	\$9,300	\$3,720	\$3,720
01-02074	B01501017005	1512 JF MANN WAY	017-005	B015-01	\$50,000	\$20,000	\$20,000
01-02075	B01501017006	1101 GLOUCESTER ST	017-006	B015-01	\$129,600	\$51,840	\$0
01-02076	B01501017007	1107 GLOUCESTER ST	017-007	B015-01	\$339,200	\$135,680	\$0
01-02077	B01501017009	1108 F ST	017-009	B015-01	\$11,200	\$4,480	\$4,480
01-02078	B01501017010	1110 F ST	017-010	B015-01	\$3,700	\$1,480	\$1,480
01-02079	B01501017011	1106 F ST	017-011	B015-01	\$2,500	\$1,000	\$1,000
01-02080	B01501017012	1104 F ST	017-012	B015-01	\$2,500	\$1,000	\$1,000
01-02081	B01501017013	1102 F ST	017-013	B015-01	\$4,400	\$1,760	\$1,760
01-02082	B01501018001	1520 WOLFE ST	018-001	B015-01	\$192,800	\$77,120	\$0
01-02083	B01501018002	1514 WOLFE ST	018-002	B015-01	\$4,700	\$1,880	\$1,880
01-02084	B01501018003	1512 WOLFE ST	018-003	B015-01	\$18,700	\$7,480	\$7,480
01-02085	B01501018004	1201 GLOUCESTER ST	018-004	B015-01	\$174,100	\$69,640	\$0
01-02086	B01501018005	1205 GLOUCESTER ST	018-005	B015-01	\$16,800	\$6,720	\$0
01-02087	B01501018006	1209 GLOUCESTER ST	018-006	B015-01	\$84,100	\$33,640	\$0
01-02088	B01501018007	1507 ALBANY ST	018-007	B015-01	\$7,000	\$2,800	\$2,800
01-02089	B01501018008	1509 ALBANY ST	018-008	B015-01	\$26,000	\$10,400	\$10,400
01-02090	B01501018009	1513 ALBANY ST	018-009	B015-01	\$7,000	\$2,800	\$2,800
01-02091	B01501018010	1515 ALBANY ST	018-010	B015-01	\$18,300	\$7,320	\$7,320
01-02093	B01501018012	1523 ALBANY ST	018-012	B015-01	\$24,500	\$9,800	\$9,800
01-02094	B01501018013	1529 ALBANY ST	018-013	B015-01	\$14,000	\$5,600	\$5,600
01-02098	B01502120009	127 F ST	120-009	B015-02	\$361,900	\$144,760	\$0
01-02120	B01502144001	1725 NORWICH STREET LN	144-001	B015-02	\$1,700	\$680	\$680
01-02121	B01502144002	BRUNSWICK 31520	144-002	B015-02	\$3,700	\$1,480	\$1,480
01-02122	B01502144003	1730 NORWICH ST	144-003	B015-02	\$178,000	\$71,200	\$71,200
01-02123	B01502144004	1724 NORWICH ST	144-004	B015-02	\$68,900	\$27,560	\$27,560
01-02124	B01502144005	1720 NORWICH ST	144-005	B015-02	\$26,200	\$10,480	\$10,480
01-02125	B01502144006	1714 NORWICH ST	144-006	B015-02	\$36,000	\$14,400	\$14,400
01-02126	B01502144007	1708 NORWICH ST	144-007	B015-02	\$74,800	\$29,920	\$29,920
01-02127	B01502144008	1700 NORWICH ST	144-008	B015-02	\$157,300	\$62,920	\$62,920
01-02129	B01502144010	1103 G ST	144-010	B015-02	\$8,900	\$3,560	\$3,560
01-02130	B01502144011	1701 WOLFE ST	144-011	B015-02	\$10,000	\$4,000	\$4,000
01-02131	B01502144012	1705 WOLFE ST	144-012	B015-02	\$7,400	\$2,960	\$2,960
01-02132	B01502144013	1707 WOLFE ST	144-013	B015-02	\$9,300	\$3,720	\$3,720
01-02133	B01502144014	1709 WOLFE ST	144-014	B015-02	\$22,600	\$9,040	\$9,040
01-02134	B01502144015	1713 WOLFE ST	144-015	B015-02	\$5,000	\$2,000	\$2,000
01-02135	B01502144016	1715 WOLFE ST	144-016	B015-02	\$22,100	\$8,840	\$8,840
01-02136	B01502144017	1717 WOLFE ST	144-017	B015-02	\$3,200	\$1,280	\$1,280
01-02137	B01502144019	1719 WOLFE ST	144-019	B015-02	\$40,600	\$16,240	\$16,240
01-02138	B01502144020	1726 NORWICH STREET LN	144-020	B015-02	\$3,200	\$1,280	\$1,280
01-02139	B01502144021	1108 H ST	144-021	B015-02	\$7,700	\$3,080	\$3,080
01-02140	B01502144022	1106 H ST	144-022	B015-02	\$6,500	\$2,600	\$2,600
01-02141	B01502144023	1104 H ST	144-023	B015-02	\$4,100	\$1,640	\$1,640
01-02142	B01502144024	1102 H ST	144-024	B015-02	\$10,500	\$4,200	\$4,200
01-02143	B01502144025	1100 H ST	144-025	B015-02	\$7,900	\$3,160	\$3,160
01-02144	B01502144026	1010 H ST	144-026	B015-02	\$1,300	\$520	\$520
01-02153	B01502145009	901 G ST	145-009	B015-02	\$80,000	\$32,000	\$32,000
01-02155	B01502145011	1701 NORWICH ST	145-011	B015-02	\$107,200	\$42,880	\$42,880
01-02156	B01502145012	1707 NORWICH ST	145-012	B015-02	\$15,300	\$6,120	\$6,120
01-02157	B01502145013	1718 ELLIS STREET LN	145-013	B015-02	\$113,000	\$45,200	\$45,200
01-02159	B01502145015	1721 NORWICH ST	145-015	B015-02	\$50,600	\$20,240	\$20,240
01-02160	B01502145016	1723 NORWICH ST	145-016	B015-02	\$20,700	\$8,280	\$8,280

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-02161	B01502145017	1729 NORWICH ST	145-017	B015-02	\$161,900	\$64,760	\$64,760
01-02162	B01502145018	900 H ST	145-018	B015-02	\$13,400	\$5,360	\$5,360
01-02165	B01502147001	1725 REYNOLDS ST	147-001	B015-02	\$1,283,000	\$513,200	\$0
01-02169	B01502147005	1712 NEWCASTLE ST	147-005	B015-02	\$36,300	\$14,520	\$14,520
01-02170	B01502147006	1707 NEWCASTLE STREET LN #102	147-006	B015-02	\$255,600	\$102,240	\$102,240
01-02171	B01502147007	1705 NEWCASTLE STREET LN	147-007	B015-02	\$3,800	\$1,520	\$1,520
01-02172	B01502147008	1700 NEWCASTLE ST	147-008	B015-02	\$273,900	\$109,560	\$109,560
01-02213	B01502149009	901 F ST	149-009	B015-02	\$25,600	\$10,240	\$0
01-02214	B01502149010	1601 NORWICH ST	149-010	B015-02	\$40,100	\$16,040	\$16,040
01-02215	B01502149011	1609 NORWICH ST	149-011	B015-02	\$185,200	\$74,080	\$74,080
01-02218	B01502149014	1615 NORWICH ST	149-014	B015-02	\$38,400	\$15,360	\$15,360
01-02219	B01502149015	1625 NORWICH ST	149-015	B015-02	\$109,600	\$43,840	\$43,840
01-02222	B01502149018	1629 NORWICH ST	149-018	B015-02	\$67,900	\$27,160	\$27,160
01-02223	B01502149019	904 G ST	149-019	B015-02	\$138,100	\$55,240	\$55,240
01-02224	B01502149020	902 G ST	149-020	B015-02	\$19,400	\$7,760	\$7,760
01-02229	B01502150001	1012 G ST	150-001	B015-02	\$34,400	\$13,760	\$13,760
01-02230	B01502150002	1654 NORWICH ST	150-002	B015-02	\$173,200	\$69,280	\$69,280
01-02231	B01502150003	1615 NORWICH STREET LN	150-003	B015-02	\$8,600	\$3,440	\$3,440
01-02232	B01502150004	1608 NORWICH ST	150-004	B015-02	\$10,900	\$4,360	\$4,360
01-02233	B01502150005	1606 NORWICH ST	150-005	B015-02	\$36,900	\$14,760	\$14,760
01-02234	B01502150006	1602 NORWICH ST	150-006	B015-02	\$6,800	\$2,720	\$0
01-02235	B01502150007	1600 NORWICH ST	150-007	B015-02	\$59,300	\$23,720	\$23,720
01-02236	B01502150008	1009 F ST	150-008	B015-02	\$7,400	\$2,960	\$2,960
01-02237	B01502150009	1101 F ST	150-009	B015-02	\$3,900	\$1,560	\$1,560
01-02238	B01502150010	1103 F ST	150-010	B015-02	\$3,900	\$1,560	\$1,560
01-02239	B01502150011	1107 F ST	150-011	B015-02	\$18,000	\$7,200	\$7,200
01-02240	B01502150012	1605 WOLFE ST	150-012	B015-02	\$3,700	\$1,480	\$1,480
01-02241	B01502150013	1607 WOLFE ST	150-013	B015-02	\$5,500	\$2,200	\$2,200
01-02242	B01502150014	1609 WOLFE ST	150-014	B015-02	\$3,600	\$1,440	\$1,440
01-02243	B01502150015	1608 NORWICH STREET LN #.5	150-015	B015-02	\$4,800	\$1,920	\$1,920
01-02244	B01502150016	1611 WOLFE ST	150-016	B015-02	\$12,050	\$4,820	\$4,820
01-02245	B01502150017	1610 NORWICH STREET LN	150-017	B015-02	\$24,500	\$9,800	\$9,800
01-02246	B01502150018	1613 WOLFE ST	150-018	B015-02	\$9,700	\$3,880	\$3,880
01-02247	B01502150019	1612 NORWICH STREET LN	150-019	B015-02	\$11,500	\$4,600	\$4,600
01-02248	B01502150020	1615 WOLFE ST	150-020	B015-02	\$8,900	\$3,560	\$3,560
01-02249	B01502150021	1617 WOLFE ST	150-021	B015-02	\$14,700	\$5,880	\$5,880
01-02250	B01502150022	1621 WOLFE ST	150-022	B015-02	\$10,000	\$4,000	\$4,000
01-02251	B01502150023	1623 WOLFE ST	150-023	B015-02	\$8,500	\$3,400	\$3,400
01-02252	B01502150024	1625 WOLFE ST	150-024	B015-02	\$3,300	\$1,320	\$1,320
01-02253	B01502150025	1110 G ST	150-025	B015-02	\$10,000	\$4,000	\$4,000
01-02254	B01502150026	1104 G ST	150-026	B015-02	\$5,700	\$2,280	\$2,280
01-02255	B01502150027	1102 G ST	150-027	B015-02	\$4,400	\$1,760	\$1,760
01-02256	B01502150028	1100 G ST	150-028	B015-02	\$4,200	\$1,680	\$1,680
01-02257	B01502150029	1624 NORWICH STREET LN	150-029	B015-02	\$4,000	\$1,600	\$1,600
01-02258	B01502150030	1622 NORWICH STREET LN	150-030	B015-02	\$5,200	\$2,080	\$2,080
01-02261	B01502150033	1619 NORWICH STREET LN	150-033	B015-02	\$6,400	\$2,560	\$2,560
01-02262	B01502150034	1611 NORWICH STREET LN	150-034	B015-02	\$8,600	\$3,440	\$3,440
01-02263	B01502150035	1612 NORWICH ST	150-035	B015-02	\$75,400	\$30,160	\$30,160
01-02264	B01502151001	1628 WOLFE ST	151-001	B015-02	\$10,500	\$4,200	\$4,200
01-02265	B01502151002	1620 WOLFE ST	151-002	B015-02	\$27,800	\$11,120	\$11,120
01-02266	B01502151003	1612 WOLFE ST	151-003	B015-02	\$11,200	\$4,480	\$4,480
01-02267	B01502151004	1606 WOLFE ST	151-004	B015-02	\$20,500	\$8,200	\$8,200
01-02268	B01502151005	1201 F ST	151-005	B015-02	\$5,400	\$2,160	\$2,160
01-02269	B01502151006	1203 F ST	151-006	B015-02	\$13,000	\$5,200	\$5,200
01-02270	B01502151007	1603 ALBANY ST	151-007	B015-02	\$168,400	\$67,360	\$67,360
01-02272	B01502151009	1613 ALBANY ST	151-009	B015-02	\$4,100	\$1,640	\$1,640
01-02273	B01502151010	1615 ALBANY ST	151-010	B015-02	\$5,900	\$2,360	\$2,360
01-02274	B01502151011	1621 ALBANY ST	151-011	B015-02	\$56,000	\$22,400	\$22,400
01-02275	B01502151012	1625 ALBANY ST	151-012	B015-02	\$7,200	\$2,880	\$2,880

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-02276	B01502151013	1623 ALBANY ST	151-013	B015-02	\$4,300	\$1,720	\$1,720
01-02277	B01502151014	1627 ALBANY ST	151-014	B015-02	\$19,300	\$7,720	\$7,720
01-02278	B01502151015	1614 WOLFE ST	151-015	B015-02	\$5,400	\$2,160	\$2,160
01-02279	B01502151016	1616 WOLFE ST	151-016	B015-02	\$5,400	\$2,160	\$2,160
01-02280	B01601019001	1524 ALBANY ST	019-001	B016-01	\$48,700	\$19,480	\$19,480
01-02281	B01601019002	1522 ALBANY ST	019-002	B016-01	\$20,600	\$8,240	\$8,240
01-02282	B01601019003	1518 ALBANY ST	019-003	B016-01	\$17,750	\$7,100	\$7,100
01-02283	B01601019004	1516 ALBANY ST	019-004	B016-01	\$2,400	\$960	\$960
01-02284	B01601019005	1514 ALBANY ST	019-005	B016-01	\$2,700	\$1,080	\$1,080
01-02285	B01601019006	1512 ALBANY ST	019-006	B016-01	\$6,500	\$2,600	\$2,600
01-02286	B01601019007	1508 ALBANY ST	019-007	B016-01	\$19,700	\$7,880	\$7,880
01-02287	B01601019008	1500 ALBANY ST	019-008	B016-01	\$10,500	\$4,200	\$4,200
01-02288	B01601019009	1305 GLOUCESTER ST	019-009	B016-01	\$16,800	\$6,720	\$6,720
01-02289	B01601019010	1309 GLOUCESTER ST	019-010	B016-01	\$87,900	\$35,160	\$35,160
01-02290	B01601019011	1507 AMHERST ST	019-011	B016-01	\$15,300	\$6,120	\$6,120
01-02291	B01601019012	1509 AMHERST ST	019-012	B016-01	\$20,450	\$8,180	\$8,180
01-02292	B01601019013	1513 AMHERST ST	019-013	B016-01	\$42,300	\$16,920	\$16,920
01-02293	B01601019014	1515 AMHERST ST	019-014	B016-01	\$32,500	\$13,000	\$13,000
01-02294	B01601019015	1521 AMHERST ST	019-015	B016-01	\$27,300	\$10,920	\$10,920
01-02295	B01601019016	1523 AMHERST ST	019-016	B016-01	\$36,400	\$14,560	\$14,560
01-02296	B01601019017	1527 AMHERST ST	019-017	B016-01	\$14,000	\$5,600	\$5,600
01-02297	B01601019018	1510 ALBANY ST	019-018	B016-01	\$20,200	\$8,080	\$8,080
01-02298	B01601019019	1506 ALBANY ST	019-019	B016-01	\$32,500	\$13,000	\$13,000
01-02299	B01601020001	1528 AMHERST ST	020-001	B016-01	\$49,800	\$19,920	\$19,920
01-02300	B01601020002	1522 AMHERST ST	020-002	B016-01	\$34,200	\$13,680	\$13,680
01-02301	B01601020003	1518 AMHERST ST	020-003	B016-01	\$10,100	\$4,040	\$4,040
01-02302	B01601020004	1514 AMHERST ST	020-004	B016-01	\$20,400	\$8,160	\$8,160
01-02304	B01601020006	1508 AMHERST ST	020-006	B016-01	\$35,200	\$14,080	\$14,080
01-02305	B01601020008	1409 GLOUCESTER ST	020-008	B016-01	\$162,900	\$65,160	\$65,160
01-02306	B01601020009	1505 MARTIN LUTHER KING JR BLVD	020-009	B016-01	\$73,100	\$29,240	\$29,240
01-02307	B01601020010	1521 MARTIN LUTHER KING JR BLVD	020-010	B016-01	\$146,400	\$58,560	\$58,560
01-02308	B01601020011	1527 MARTIN LUTHER KING JR BLVD	020-011	B016-01	\$48,700	\$19,480	\$19,480
01-02581	B01604104001	1505 STONEWALL ST	104-001	B016-04	\$354,500	\$141,800	\$141,800
01-02582	B01604104005	1517 STONEWALL ST	104-005	B016-04	\$3,000	\$1,200	\$1,200
01-02583	B01604104006	1523 STONEWALL ST	104-006	B016-04	\$11,300	\$4,520	\$4,520
01-02585	B01604104008	1524 MARTIN LUTHER KING JR BLVD	104-008	B016-04	\$3,700	\$1,480	\$1,480
01-02586	B01604104009	1522 MARTIN LUTHER KING JR BLVD	104-009	B016-04	\$22,500	\$9,000	\$9,000
01-02587	B01604104010	1518 MARTIN LUTHER KING JR BLVD	104-010	B016-04	\$5,900	\$2,360	\$2,360
01-02588	B01604104011	1516 MARTIN LUTHER KING JR BLVD	104-011	B016-04	\$3,200	\$1,280	\$1,280
01-02589	B01604104012	1519 STONEWALL ST	104-012	B016-04	\$27,100	\$10,840	\$10,840
01-02590	B01604104013	1525 STONEWALL ST	104-013	B016-04	\$29,500	\$11,800	\$11,800
01-02591	B01604104014	1504 F ST	104-014	B016-04	\$48,200	\$19,280	\$19,280
01-02592	B01604105001	1607 GLOUCESTER ST	105-001	B016-04	\$210,000	\$84,000	\$84,000
01-02593	B01604105002	1609 GLOUCESTER ST	105-002	B016-04	\$120,200	\$48,080	\$48,080
01-02594	B01604105003	1513 LEE ST	105-003	B016-04	\$30,900	\$12,360	\$12,360
01-02595	B01604105004	1521 LEE ST	105-004	B016-04	\$30,400	\$12,160	\$12,160
01-02596	B01604105005	1525 LEE ST	105-005	B016-04	\$31,500	\$12,600	\$12,600
01-02597	B01604105006	1528 STONEWALL ST	105-006	B016-04	\$48,800	\$19,520	\$19,520
01-02599	B01604105008	1510 STONEWALL ST	105-008	B016-04	\$25,200	\$10,080	\$10,080
01-02600	B01604105009	1502 STONEWALL ST	105-009	B016-04	\$37,100	\$14,840	\$14,840
01-02601	B01604105010	1519 LEE ST	105-010	B016-04	\$45,600	\$18,240	\$18,240
01-02602	B01604105011	1526 STONEWALL ST	105-011	B016-04	\$64,100	\$25,640	\$25,640
01-02603	B01604106001	1709 GLOUCESTER ST	106-001	B016-04	\$1,580,600	\$632,240	\$0
01-02604	B01604106002	1520 LEE ST	106-002	B016-04	\$41,200	\$16,480	\$0
01-02605	B01604107001	11 JUDICIAL LN #256	107-001	B016-04	\$1,823,700	\$729,480	\$0
01-02606	B01604107002	1801 GLOUCESTER ST #A	107-002	B016-04	\$278,800	\$111,520	\$111,520
01-02607	B01604107003	1527 JOHNSTON ST	107-003	B016-04	\$6,600	\$2,640	\$2,640
01-02608	B01604107004	1800 F ST	107-004	B016-04	\$6,400	\$2,560	\$2,560
01-02609	B01604108001	1901 GLOUCESTER ST	108-001	B016-04	\$138,100	\$55,240	\$55,240

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-02610	B01604108002	1907 GLOUCESTER ST	108-002	B016-04	\$237,400	\$94,960	\$94,960
01-02611	B01604108003	1515 TILLMAN AV	108-003	B016-04	\$125,200	\$50,080	\$50,080
01-02612	B01604108004	1512 JOHNSTON ST	108-004	B016-04	\$78,600	\$31,440	\$31,440
01-02613	B01604109001	1526 JOHNSTON ST	109-001	B016-04	\$329,000	\$131,600	\$0
01-02614	B01604109002	1525 TILLMAN AV	109-002	B016-04	\$22,100	\$8,840	\$8,840
01-02615	B01604109003	1529 TILLMAN AV	109-003	B016-04	\$21,500	\$8,600	\$8,600
01-02616	B01604110001	2001 GLOUCESTER ST #14	110-001	B016-04	\$314,400	\$125,760	\$125,760
01-02617	B01604110002	2215 GLOUCESTER ST	110-002	B016-04	\$76,200	\$30,480	\$0
01-02618	B01604110003	2217 GLOUCESTER ST	110-003	B016-04	\$30,800	\$12,320	\$12,320
01-02619	B01604110004	2219 GLOUCESTER ST	110-004	B016-04	\$95,000	\$38,000	\$38,000
01-02620	B01604110005	2225 GLOUCESTER ST	110-005	B016-04	\$200,000	\$80,000	\$80,000
01-02621	B01604110006	1527 GOODYEAR AV	110-006	B016-04	\$116,000	\$46,400	\$46,400
01-02622	B01604110007	2110 ATLANTA AV	110-007	B016-04	\$48,000	\$19,200	\$19,200
01-02623	B01604110008	2020 ATLANTA AV	110-008	B016-04	\$33,200	\$13,280	\$13,280
01-02624	B01604110009	2016 ATLANTA AV	110-009	B016-04	\$50,300	\$20,120	\$20,120
01-02625	B01604110010	2006 ATLANTA AV	110-010	B016-04	\$60,000	\$24,000	\$0
01-02645	B01704071001	9 GLYNN AV	071-001	B017-04	\$214,800	\$85,920	\$85,920
01-02646	B01704071002	10 GLYNN AV	071-002	B017-04	\$117,800	\$47,120	\$47,120
01-02647	B01704071003	11 GLYNN AV	071-003	B017-04	\$219,700	\$87,880	\$87,880
01-02648	B01704071004	1811 GLYNN AV	071-004	B017-04	\$82,600	\$33,040	\$33,040
01-02649	B01704071005	1815 GLYNN AV	071-005	B017-04	\$53,400	\$21,360	\$21,360
01-02650	B01704071006	1817 GLYNN AV	071-006	B017-04	\$265,800	\$106,320	\$106,320
01-02651	B01704071007	2402 TALMADGE AV	071-007	B017-04	\$29,500	\$11,800	\$11,800
01-02653	B01704071009	1814 MACON AV	071-009	B017-04	\$18,800	\$7,520	\$7,520
01-02654	B01704071010	1810 MACON AV	071-010	B017-04	\$2,900	\$1,160	\$1,160
01-02689	B01704092001	6 GLYNN AV	092-001	B017-04	\$814,400	\$325,760	\$325,760
01-02690	B01704092002	8 GLYNN AV	092-002	B017-04	\$213,700	\$85,480	\$85,480
01-02691	B01704092003	1720 MACON AV	092-003	B017-04	\$28,000	\$11,200	\$11,200
01-02692	B01704093001	2401 GLOUCESTER ST	093-001	B017-04	\$382,300	\$152,920	\$152,920
01-02693	B01704093002	1519 GLYNN AV	093-002	B017-04	\$182,500	\$73,000	\$73,000
01-02694	B01704093003	1523 GLYNN AV	093-003	B017-04	\$177,000	\$70,800	\$70,800
01-02695	B01704093004	4 GLYNN AV	093-004	B017-04	\$330,300	\$132,120	\$132,120
01-02713	B01704111001	1516 GOODYEAR AV	111-001	B017-04	\$53,700	\$21,480	\$21,480
01-02714	B01704111007	2301 GLOUCESTER ST	111-007	B017-04	\$29,100	\$11,640	\$11,640
01-02715	B01704111003	2307 GLOUCESTER ST	111-003	B017-04	\$179,400	\$71,760	\$0
01-02716	B01704111004	2328 ATLANTA AV	111-004	B017-04	\$63,900	\$25,560	\$25,560
01-02721	B01802120003	1705 TORRAS LANDING	120-003	B018-02	\$3,709,300	\$1,483,720	\$1,483,720
01-02731	B01802121002	2020 NEWCASTLE ST #17000	121-002	B018-02	\$24,800	\$9,920	\$0
01-02732	B01802121003	2016 NEWCASTLE ST	121-003	B018-02	\$10,000	\$4,000	\$4,000
01-02733	B01802121004	2014 NEWCASTLE ST	121-004	B018-02	\$6,900	\$2,760	\$2,760
01-02735	B01802121006	2010 NEWCASTLE ST	121-006	B018-02	\$15,600	\$6,240	\$6,240
01-02736	B01802121007	2006 NEWCASTLE ST	121-007	B018-02	\$3,400	\$1,360	\$1,360
01-02737	B01802121008	2004 NEWCASTLE ST	121-008	B018-02	\$16,800	\$6,720	\$6,720
01-02738	B01802121009	2000 NEWCASTLE ST	121-009	B018-02	\$5,000	\$2,000	\$2,000
01-02845	B01802129001	1928 NORWICH ST	129-001	B018-02	\$24,200	\$9,680	\$9,680
01-02846	B01802129002	1922 NORWICH ST	129-002	B018-02	\$71,300	\$28,520	\$28,520
01-02847	B01802129003	1920 NORWICH ST	129-003	B018-02	\$25,000	\$10,000	\$10,000
01-02848	B01802129004	1912 NORWICH ST	129-004	B018-02	\$31,000	\$12,400	\$12,400
01-02849	B01802129005	1901 NORWICH STREET LN	129-005	B018-02	\$1,300	\$520	\$520
01-02850	B01802129006	1906 NORWICH ST	129-006	B018-02	\$53,200	\$21,280	\$21,280
01-02851	B01802129007	1900 NORWICH ST	129-007	B018-02	\$58,800	\$23,520	\$23,520
01-02852	B01802129008	1007 I ST	129-008	B018-02	\$5,000	\$2,000	\$2,000
01-02853	B01802129009	1009 I ST	129-009	B018-02	\$2,400	\$960	\$960
01-02854	B01802129010	1101 I ST	129-010	B018-02	\$160,600	\$64,240	\$0
01-02855	B01802129011	1105 I ST	129-011	B018-02	\$5,600	\$2,240	\$2,240
01-02856	B01802129012	1107 I ST	129-012	B018-02	\$4,000	\$1,600	\$1,600
01-02857	B01802129013	1109 I ST	129-013	B018-02	\$4,500	\$1,800	\$1,800
01-02858	B01802129014	1907 WOLFE ST	129-014	B018-02	\$22,400	\$8,960	\$8,960
01-02859	B01802129015	1911 WOLFE ST	129-015	B018-02	\$10,900	\$4,360	\$4,360

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-02860	B01802129016	1917 WOLFE ST	129-016	B018-02	\$12,300	\$4,920	\$4,920
01-02861	B01802129017	1919 WOLFE ST	129-017	B018-02	\$11,000	\$4,400	\$4,400
01-02862	B01802129018	1921 WOLFE ST	129-018	B018-02	\$10,900	\$4,360	\$4,360
01-02863	B01802129019	1923 WOLFE ST	129-019	B018-02	\$17,600	\$7,040	\$7,040
01-02864	B01802129020	1929 WOLFE ST	129-020	B018-02	\$16,000	\$6,400	\$6,400
01-02865	B01802129021	1106 J ST	129-021	B018-02	\$5,900	\$2,360	\$2,360
01-02866	B01802129022	1100 J ST	129-022	B018-02	\$189,700	\$75,880	\$0
01-02867	B01802129023	1902 NORWICH STREET LN	129-023	B018-02	\$7,000	\$2,800	\$2,800
01-02868	B01802129024	1900 NORWICH STREET LN	129-024	B018-02	\$3,000	\$1,200	\$1,200
01-02880	B01802130014	1903 NORWICH ST	130-014	B018-02	\$34,000	\$13,600	\$13,600
01-02881	B01802130015	1909 NORWICH ST	130-015	B018-02	\$70,800	\$28,320	\$28,320
01-02882	B01802130016	1911 NORWICH ST	130-016	B018-02	\$52,100	\$20,840	\$20,840
01-02883	B01802130017	1913 NORWICH ST	130-017	B018-02	\$17,000	\$6,800	\$6,800
01-02884	B01802130018	1916 ELLIS STREET LN	130-018	B018-02	\$13,500	\$5,400	\$5,400
01-02885	B01802130019	1921 NORWICH ST	130-019	B018-02	\$28,300	\$11,320	\$11,320
01-02886	B01802130020	1923 NORWICH ST	130-020	B018-02	\$15,700	\$6,280	\$6,280
01-02887	B01802130021	1927 NORWICH ST	130-021	B018-02	\$7,400	\$2,960	\$2,960
01-02888	B01802130022	900 J ST	130-022	B018-02	\$13,400	\$5,360	\$5,360
01-02890	B01802130024	1917 NORWICH ST	130-024	B018-02	\$10,200	\$4,080	\$4,080
01-02925	B01802133003	NEW TOWN LOTS 427-442 & 690-708 & ALLEYS	133-003	B018-02	\$270,400	\$108,160	\$108,160
01-02939	B01802134001	1812 NEWCASTLE ST #17000	134-001	B018-02	\$7,927,500	\$3,171,000	\$0
01-02998	B01802137015	1803 NORWICH ST	137-015	B018-02	\$209,200	\$83,680	\$83,680
01-02999	B01802137018	1807 NORWICH ST	137-018	B018-02	\$112,900	\$45,160	\$45,160
01-03000	B01802137019	1821 NORWICH ST	137-019	B018-02	\$39,700	\$15,880	\$15,880
01-03001	B01802137020	1829 NORWICH ST	137-020	B018-02	\$134,000	\$53,600	\$53,600
01-03003	B01802138001	1008 I ST	138-001	B018-02	\$37,700	\$15,080	\$15,080
01-03004	B01802138002	1824 NORWICH ST	138-002	B018-02	\$110,000	\$44,000	\$44,000
01-03005	B01802138003	1820 NORWICH ST	138-003	B018-02	\$65,600	\$26,240	\$26,240
01-03006	B01802138004	1808 NORWICH ST	138-004	B018-02	\$236,100	\$94,440	\$94,440
01-03007	B01802138005	1800 NORWICH ST	138-005	B018-02	\$62,000	\$24,800	\$24,800
01-03008	B01802138006	1816 NORWICH STREET LN	138-006	B018-02	\$6,600	\$2,640	\$2,640
01-03009	B01802138007	1109 H ST	138-007	B018-02	\$179,400	\$71,760	\$0
01-03010	B01802138008	1811 WOLFE ST	138-008	B018-02	\$11,000	\$4,400	\$0
01-03011	B01802138009	1817 WOLFE ST	138-009	B018-02	\$27,400	\$10,960	\$10,960
01-03013	B01802138011	1821 WOLFE ST	138-011	B018-02	\$15,200	\$6,080	\$6,080
01-03014	B01802138012	1823 WOLFE ST	138-012	B018-02	\$9,600	\$3,840	\$3,840
01-03015	B01802138013	1825 WOLFE ST	138-013	B018-02	\$6,100	\$2,440	\$2,440
01-03016	B01802138014	1827 WOLFE ST	138-014	B018-02	\$5,700	\$2,280	\$2,280
01-03017	B01802138015	1829 WOLFE ST	138-015	B018-02	\$3,700	\$1,480	\$1,480
01-03018	B01802138016	1100 I ST	138-016	B018-02	\$9,100	\$3,640	\$3,640
01-03020	B01802138018	1814 NORWICH STREET LN	138-018	B018-02	\$3,900	\$1,560	\$1,560
01-03255	B02004046001	2026 COOK ST	046-001	B020-04	\$76,100	\$30,440	\$30,440
01-03256	B02004046002	2007 COOK ST	046-002	B020-04	\$75,200	\$30,080	\$30,080
01-03257	B02004046003	2910 K ST	046-003	B020-04	\$14,300	\$5,720	\$5,720
01-03258	B02004046004	2005 PUTNAM ST	046-004	B020-04	\$121,300	\$48,520	\$48,520
01-03259	B02004047001	2024 PUTNAM ST	047-001	B020-04	\$5,600	\$2,240	\$2,240
01-03260	B02004047002	2018 PUTNAM ST	047-002	B020-04	\$2,300	\$920	\$920
01-03261	B02004047003	2014 PUTNAM ST	047-003	B020-04	\$2,300	\$920	\$920
01-03262	B02004047004	2105 GLYNN AV	047-004	B020-04	\$185,300	\$74,120	\$74,120
01-03263	B02004047005	2010 PUTNAM ST	047-005	B020-04	\$1,900	\$760	\$760
01-03264	B02004047006	2027 STACY ST	047-006	B020-04	\$271,500	\$108,600	\$108,600
01-03265	B02004047007	2109 GLYNN AV	047-007	B020-04	\$7,700	\$3,080	\$3,080
01-03266	B02004048001	2141 GLYNN AV	048-001	B020-04	\$43,100	\$17,240	\$17,240
01-03267	B02004048002	2123 GLYNN AV	048-002	B020-04	\$27,300	\$10,920	\$10,920
01-03321	B02105005001	2304 GLYNN AV	005-001	B021-05	\$865,700	\$346,280	\$346,280
01-03322	B02105005002	2226 GLYNN AV	005-002	B021-05	\$347,200	\$138,880	\$138,880
01-03323	B02105005003	121 WARDE ST #1	005-003	B021-05	\$237,500	\$95,000	\$95,000
01-03327	B02105005007	150 WARDE ST	005-007	B021-05	\$8,200	\$3,280	\$3,280

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-03331	B02105005014	2204 GLYNN AV	005-014	B021-05	\$75,000	\$30,000	\$30,000
01-03648	B02202118001	2120 NEWCASTLE ST	118-001	B022-02	\$5,000	\$2,000	\$2,000
01-03649	B02202118002	2106 NEWCASTLE ST	118-002	B022-02	\$5,900	\$2,360	\$2,360
01-03650	B02202118003	2104 NEWCASTLE ST	118-003	B022-02	\$0	\$0	\$0
01-03941	B02505005009	2334 GLYNN AV	005-009	B025-05	\$312,800	\$125,120	\$125,120
01-03942	B02505005010	2696 GLYNN AV	005-010	B025-05	\$177,100	\$70,840	\$70,840
01-03943	B02505005011	2700 GLYNN AV	005-011	B025-05	\$277,700	\$111,080	\$111,080
01-05260	B03303057001	3000 ROXBORO RD	057-001	B033-03	\$3,709,300	\$1,483,720	\$0
01-05261	B03305001001	3202 GLYNN AV	001-001	B033-05	\$430,400	\$172,160	\$172,160
01-05262	B03305001005	3213 NORMAN ST	001-005	B033-05	\$34,500	\$13,800	\$13,800
01-05265	B03305002001	3150 GLYNN AV	002-001	B033-05	\$292,800	\$117,120	\$117,120
01-05266	B03305002002	111 KAUFMAN ST	002-002	B033-05	\$33,300	\$13,320	\$13,320
01-05267	B03305002003	115 KAUFMAN ST	002-003	B033-05	\$58,200	\$23,280	\$23,280
01-05268	B03305002004	207 NORMAN ST	002-004	B033-05	\$51,400	\$20,560	\$20,560
01-05269	B03305002005	211 NORMAN ST	002-005	B033-05	\$49,300	\$19,720	\$19,720
01-05270	B03305002006	215 NORMAN ST	002-006	B033-05	\$53,300	\$21,320	\$21,320
01-05271	B03305002007	221 NORMAN ST	002-007	B033-05	\$47,500	\$19,000	\$19,000
01-05272	B03305002008	108 CRANDALL ST	002-008	B033-05	\$67,800	\$27,120	\$27,120
01-05273	B03305002009	3190 GLYNN AV	002-009	B033-05	\$71,300	\$28,520	\$28,520
01-05276	B03305003002	203 CRANDALL ST	003-002	B033-05	\$63,500	\$25,400	\$25,400
01-05277	B03305003003	205 CRANDALL ST	003-003	B033-05	\$53,100	\$21,240	\$21,240
01-05278	B03305003004	209 CRANDALL ST	003-004	B033-05	\$63,600	\$25,440	\$25,440
01-05279	B03305003005	208 CRANDALL ST	003-005	B033-05	\$62,700	\$25,080	\$25,080
01-05280	B03305003006	204 CRANDALL ST	003-006	B033-05	\$61,000	\$24,400	\$24,400
01-05281	B03305003007	220 NORMAN ST	003-007	B033-05	\$65,000	\$26,000	\$26,000
01-05282	B03305003008	214 NORMAN ST	003-008	B033-05	\$71,300	\$28,520	\$28,520
01-05283	B03305003009	208 NORMAN ST	003-009	B033-05	\$53,500	\$21,400	\$21,400
01-05284	B03305003010	204 NORMAN ST	003-010	B033-05	\$58,800	\$23,520	\$23,520
01-05285	B03305003011	202 NORMAN ST	003-011	B033-05	\$75,300	\$30,120	\$30,120
01-05287	B03305003013	216 NORMAN ST	003-013	B033-05	\$62,400	\$24,960	\$24,960
01-05288	B03305003014	212 CRANDALL ST	003-014	B033-05	\$66,400	\$26,560	\$26,560
01-05289	B03305003015	215 CRANDALL ST	003-015	B033-05	\$1,000	\$400	\$400
01-05290	B03305003016	BRUNSWICK 31520	003-016	B033-05	\$200	\$80	\$80
01-05291	B03305004002	120 KAUFMAN ST	004-002	B033-05	\$104,900	\$41,960	\$41,960
01-05292	B03305004004	3000 GLYNN AV	004-004	B033-05	\$94,000	\$37,600	\$37,600
01-06714	B01201044006	1207 NEWCASTLE ST	044-006	B012-01	\$88,560	\$35,424	\$35,424
01-06778	B01802129025	1910 NORWICH ST	129-025	B018-02	\$39,100	\$15,640	\$15,640
01-06791	B03305003017	BRUNSWICK 31520	003-017	B033-05	\$12,700	\$5,080	\$5,080
01-06797	620000062	3400 PARKWOOD DR	000-062	0062-00	\$1,441,300	\$576,520	\$576,520
01-06804	B01502120030	1 SAINT ANDREWS CT	120-030	B015-02	\$342,000	\$136,800	\$136,800
01-06805	B01502120029	2 SAINT ANDREWS CT	120-029	B015-02	\$150,000	\$60,000	\$60,000
01-06806	B01502120028	3 SAINT ANDREWS CT	120-028	B015-02	\$110,000	\$44,000	\$44,000
01-06807	B01502120027	4 SAINT ANDREWS CT	120-027	B015-02	\$206,400	\$82,560	\$82,560
01-06808	B01502120026	5 SAINT ANDREWS CT	120-026	B015-02	\$298,600	\$119,440	\$119,440
01-06809	B01502120025	6 SAINT ANDREWS CT	120-025	B015-02	\$220,000	\$88,000	\$88,000
01-06810	B01502120024	7 SAINT ANDREWS CT	120-024	B015-02	\$469,500	\$187,800	\$187,800
01-06811	B01502120023	8 SAINT ANDREWS CT	120-023	B015-02	\$302,400	\$120,960	\$120,960
01-06813	B01502120021	30 SAINT ANDREWS CT	120-021	B015-02	\$208,800	\$83,520	\$83,520
01-06814	B01502120020	11 SAINT ANDREWS CT	120-020	B015-02	\$167,300	\$66,920	\$66,920
01-06815	B01502120019	12 SAINT ANDREWS CT	120-019	B015-02	\$200,500	\$80,200	\$80,200
01-06816	B01502120018	13 SAINT ANDREWS CT	120-018	B015-02	\$140,300	\$56,120	\$56,120
01-06817	B01502120017	14 SAINT ANDREWS CT	120-017	B015-02	\$200,500	\$80,200	\$80,200
01-06818	B01502120016	15 SAINT ANDREWS CT	120-016	B015-02	\$36,400	\$14,560	\$14,560
01-06819	B01502120015	16 SAINT ANDREWS CT	120-015	B015-02	\$36,400	\$14,560	\$14,560
01-06820	B01502120014	17 SAINT ANDREWS CT	120-014	B015-02	\$36,400	\$14,560	\$14,560
01-06821	B01502120013	18 SAINT ANDREWS CT	120-013	B015-02	\$36,400	\$14,560	\$14,560
01-06831	B00707053006	BRUNSWICK 31520	053-006	B007-07	\$9,525	\$3,810	\$3,810
01-06836	B01501004002	1601 NEWCASTLE ST	004-002	B015-01	\$500,000	\$200,000	\$200,000
01-06839	B01802138019	1818 NORWICH STREET LN	138-019	B018-02	\$3,200	\$1,280	\$1,280

Parcel ID	PIN	Address	Lot Num	Block Nu	Market Val	Assessed Val	Tax Val
01-06843	B01502144027	1729 NORWICH STREET LN	144-027	B015-02	\$1,700	\$680	\$680
01-06846	B01201032014	1427 NEWCASTLE ST	032-014	B012-01	\$27,396	\$10,958	\$10,958
01-06849	6300000009	22 TERRY CREEK RD	000-009	0063-00	\$406,500	\$162,600	\$162,600
01-06850	6300000010	13 TERRY CREEK RD	000-010	0063-00	\$500,000	\$200,000	\$200,000
01-06876	B01201038014	1322 BAY ST	038-014	B012-01	\$60,300	\$24,120	\$24,120
01-06893	B01704092004	7 GLYNN AV	092-004	B017-04	\$170,300	\$68,120	\$68,120
01-06899	6200000067	2916 GLYNN AV	000-067	0062-00	\$1,186,400	\$474,560	\$474,560
01-06903	6300000011	5 TERRY CREEK RD	000-011	0063-00	\$315,000	\$126,000	\$126,000
01-06946	6300000012	20 TERRY CREEK RD #34000	000-012	0063-00	\$50,000	\$20,000	\$20,000
01-06973	B01201028004	706 GLOUCESTER ST	028-004	B012-01	\$84,915	\$33,966	\$33,966
01-07005	B01501010010	1514 NEWCASTLE ST	010-010	B015-01	\$52,900	\$21,160	\$21,160
01-07019	6200000069	2 TOWERS PLZ #605	000-069	0062-00	\$143,600	\$57,440	\$57,440
01-07020	B01502144028	1718 NORWICH STREET LN	144-028	B015-02	\$9,700	\$3,880	\$3,880
01-07021	B01704111008	2303 GLOUCESTER ST	111-008	B017-04	\$61,700	\$24,680	\$24,680
01-07024	B01501002018	1624 NEWCASTLE ST	002-018	B015-01	\$331,900	\$132,760	\$132,760
01-07025	B01501002019	1626 NEWCASTLE ST	002-019	B015-01	\$178,498	\$71,399	\$71,399
01-07029	B01501018014	1519 ALBANY ST	018-014	B015-01	\$13,000	\$5,200	\$5,200
01-07032	B01604105012	1515 LEE ST	105-012	B016-04	\$1,440	\$576	\$576
01-07038	B01501002021	1602 NEWCASTLE ST	002-021	B015-01	\$46,110	\$18,444	\$18,444
01-07041	B00907052003	833 BAY ST	052-003	B009-07	\$105,400	\$42,160	\$42,160
01-07042	B00907052002	901 BAY ST	052-002	B009-07	\$609,000	\$243,600	\$243,600
01-07046	B01201043006	1208 NEWCASTLE ST	043-006	B012-01	\$198,400	\$79,360	\$79,360
01-07048	B01201033013	209 MONCK ST	033-013	B012-01	\$85,146	\$34,058	\$34,058
01-07057	B01201041009	1321 REYNOLDS ST	041-009	B012-01	\$7,350	\$2,940	\$2,940
01-07069	B01704111009	1510 GOODYEAR AV	111-009	B017-04	\$136,400	\$54,560	\$54,560
01-07092	B01604107005	1808 F ST	107-005	B016-04	\$22,100	\$8,840	\$8,840
01-07119	B01502120036	30 SAINT ANDREWS CT #34000			\$0	\$0	\$0
01-07131	B01301022019	BRUNSWICK 31520	022-019	B013-01	\$2,000	\$800	\$800
01-07145	B01802138021	1825 WOLFE ST #.5	138-021	B018-02	\$5,900	\$2,360	\$2,360
01-07153	B03305002011	3120 GLYNN AV	002-011	B033-05	\$162,000	\$64,800	\$64,800
01-07219	B01502120037	9 SAINT ANDREWS CT #102	120-037	B015-02	\$0	\$0	\$0
01-07224	B01306007018	1606 GLOUCESTER ST	007-018	B013-06	\$0	\$0	\$0
01-07253	B02004046005	2701 J ST #14000	046-005	B020-04	\$610,200	\$244,080	\$244,080
01-07294	B01501017014	7 CARRIAGE HOUSE PL #100	017-014	B015-01	\$92,700	\$37,080	\$0
01-07336	B02505005013	2698 GLYNN AV	005-013	B025-05	\$225,000	\$90,000	\$90,000
01-07390	B02505005014	CITY OF BRUNSWICK RIGHT OF WAY TBN ST			\$0	\$0	\$0
01-07670	B01306008019	1407 STONEWALL ST	008-019	B013-06	\$0	\$0	\$0
01-07676	B01207010003	901 GEORGE ST	010-003	B012-07	\$241,900	\$96,760	\$0
01-07678	B01201039004	1311 NEWCASTLE ST	039-004	B012-01	\$12,300	\$4,920	\$4,920
01-07682	B01306008020	1405 STONEWALL ST	008-020	B013-06	\$0	\$0	\$0
01-07694	B01201041010	1309 REYNOLDS ST #17000	041-010	B012-01	\$1,000	\$400	\$400
01-07699	B01201038015	201 MANSFIELD ST	038-015	B012-01	\$244,300	\$97,720	\$97,720
01-07714	6200000076	2900 GLYNN AV	000-076	0062-00	\$464,900	\$185,960	\$185,960
01-07718	B03305002012	209 NORMAN ST #17000			\$0	\$0	\$0
01-07719	B03305004005	ROADS WITHIN OAK PARK			\$0	\$0	\$0
01-07755	B01201045007	1220 BAY ST			\$0	\$0	\$0
01-07761	B01201043007	1212 NEWCASTLE ST			\$0	\$0	\$0
01-07764	B01501014007	.15 AC CLOSED EGMONT ST OLD TOWN			\$0	\$0	\$0

Appendix C.

Brunswick City Council

Mayor Cornell Harvey
Mayor Pro Tem Julie T. Martin
Commissioner Johnny Cason
Commissioner Dr. Felicia Harris
Commissioner Vincent Williams

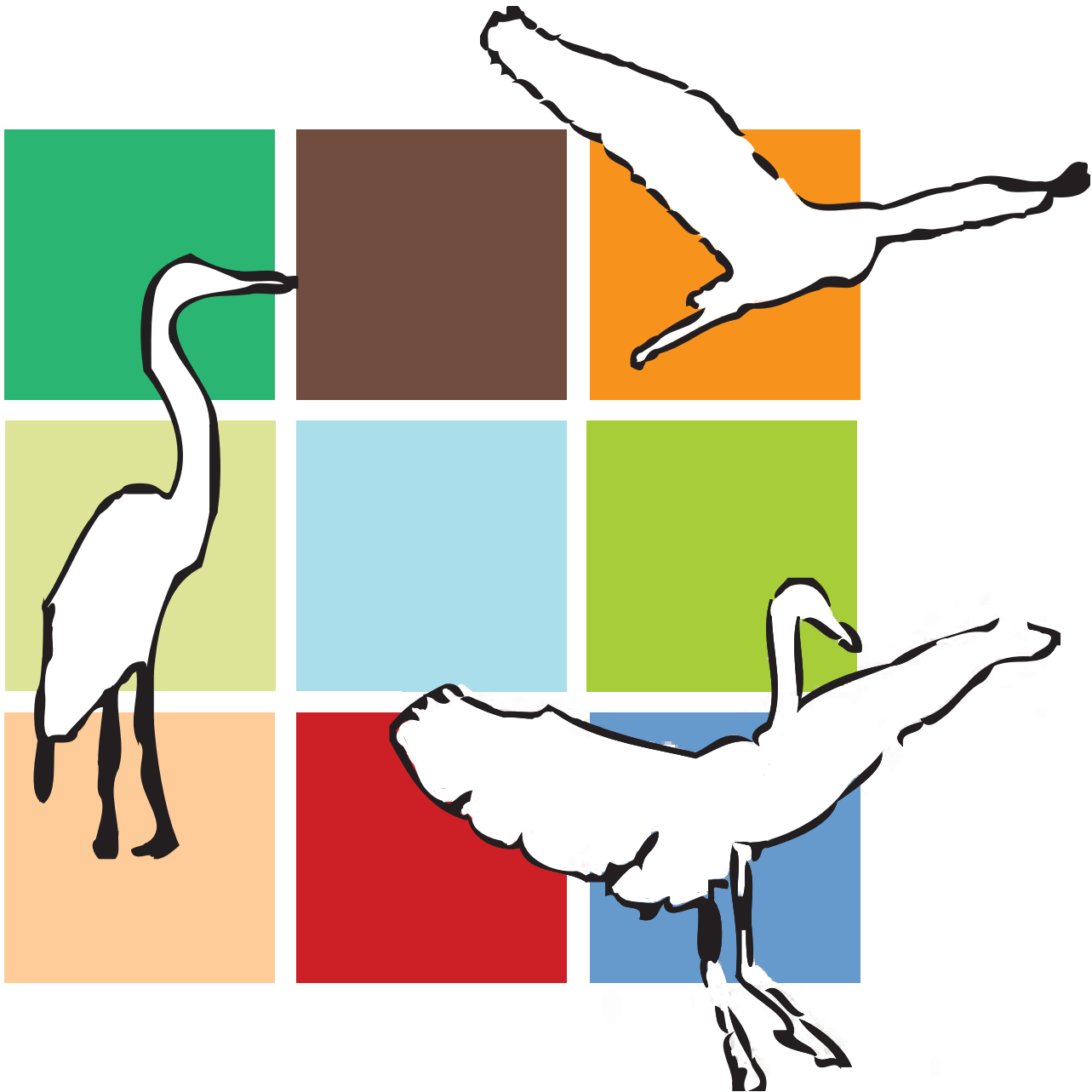
Glynn County Commissioners

Chairman Bill Brunson
Vice-Chairman Michael Browning
Commissioner Peter Murphy
Commissioner Richard Strickland
Commissioner Allen Booker
Commissioner Mark Stambaugh
Commissioner Bob Coleman

Glynn County Board of Education

Superintendent Dr. Virgil Cole
Board Member Marcus Edgy
Board Member Millard Allen
Board Member John Madala
Board Member Hank B. Yeargan
Board Member Mike Hulsey
Board Member Jerry Mancil

Appendix G



Altama Community Transformation District Corridor Plan | Adopted January 30, 2012

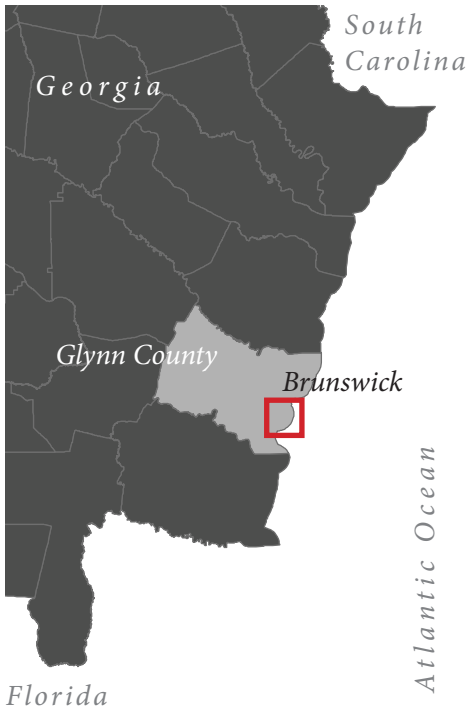
ACT District Vision

The ACT District is a welcoming, desirable destination to live, work, and play with a unique sense of place that is recognized as a clean, safe, stable, walkable, bikeable, and affordable community, with abundant greenspace and parks. The ACT District has a diversity of residents with renewed and modern commercial, health, and education facilities, providing employment, shopping, and entertainment opportunities.

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10	ACT DISTRICT VISION & PRIORITIES
13	LAND USE, ECONOMIC DEVELOPMENT, & HOUSING
14	Land Use & Zoning
15	Economic Development
17	Housing
20	POTENTIAL FUNDING AND ECONOMIC DEVELOPMENT INCENTIVE TOOLS
26	TRANSPORTATION
27	Inventory
30	Analysis
32	Altama Avenue Configurations
40	Altama Avenue Intersection Safety
44	Mass Transit
45	GREEN INFRASTRUCTURE
46	Inventory
48	Analysis
50	Greenway Network
57	Stormwater
58	Concepts
62	Native Plants
63	CHARACTER OF PLACE
64	Inventory
68	Analysis
70	Infill Development
76	Site Furnishings
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81	ACT DISTRICT PARTNERS



introduction: *(n) a preliminary presentation of general ideas and information, serving as an overview of more specific information to follow.*



Background

The Brunswick-Glynn County Archway Partnership identified Planning for Growth as one of the community’s top priorities. As a result, the Growth Task Force (GTF) was created to address growth issues and explore redevelopment opportunities across the community.

One area of the community identified by the GTF as ripe for revitalization is a 1,600 acre region along Altama Avenue referenced in this plan as the Altama Community Transformation (ACT) District. The main campuses for the College of Coastal Georgia, the Southeast Georgia Health System, the site for the new Brunswick High School, multiple neighborhoods, and commercial and industrial establishments are located within the ACT District. The prospects for future population growth, the expansion plans of the College, the Southeast Georgia Health System, and Glynn County Board of Education, as well as the interests of business and property owners for a vibrant, thriving community underpin the need to revitalize this area of Brunswick.

During the Fall of 2010, a group of University of Georgia (UGA) Public Service and Outreach (PSO) faculty met with the GTF to discuss how UGA might contribute to the efforts

to revitalize the ACT. As a result of those conversations, UGA proposed a phased approach to creating a design plan for the ACT District. Given the size and diverse character of the District, a phased approach ensures that the overall design aligns with the unique and desirable attributes of the different character areas within the ACT. This Phase 1 plan is focused along the Altama Avenue Corridor, and while the design plan is specific to this corridor and its surroundings, the public engagement information and resulting design concepts can be transferred to the remainder of the District as appropriate.

Project Purpose and Focus

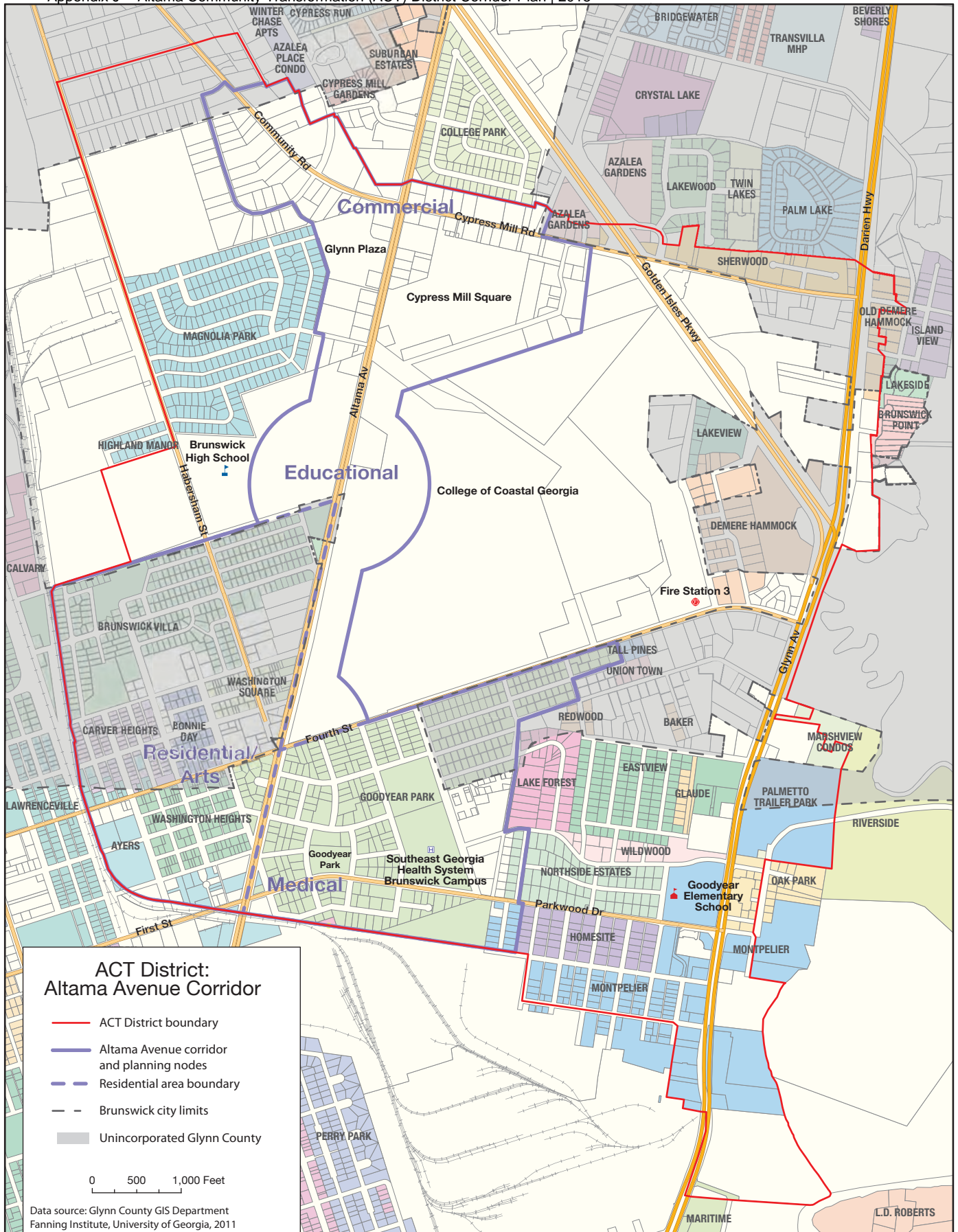
The purpose of Phase 1 was to assist a diverse committee of stakeholders including members of the GTF and ACT District stakeholders (residents, local business owners, representatives of key institutions, etc.) as they created a design for the Altama Avenue Corridor and an implementation plan outlining the strategies and actions necessary to implement the design. Research and analysis of previous planning efforts was conducted as well as extensive stakeholder input and engagement to best inform the development of the corridor design and implementation plan.

In recognition of the value of building broad-based support for the project, customized education and training programs for elected officials and key ACT stakeholders regarding funding options were developed and delivered during the planning project. The Carl Vinson Institute of Government will serve as a resource to assist with updating land use and development ordinances to encourage redevelopment.

The focus of the project is outlined below. It addresses the goals and objectives of the Growth Task Force as represented in the Executive Summary of the ACT District whitepaper dated August 9, 2010.

The plan focuses on:

1. Corridor Design addressing:
 - a. Zoning and land use issues;
 - b. Streetscape including street trees, lighting, sense of entry, way-finding signage, sidewalks, and pedestrian crossings;



Introduction | Project Area & Components

- c. Architectural building design concepts and sample standards (materials, styles, heights, fenestration, etc.);
 - d. Historic preservation (no commercial or residential properties of historic significance found in Phase 1 area);
 - e. Greenspace and recreation;
 - f. Infill construction (residential and commercial);
 - g. Right-of-way design and use (lane layout, access and traffic design, control and calming alternatives); and
 - h. Alternative transportation including pedestrian accessibility and safety, transit, and bicycles.
2. Housing:
 - a. Uses; single family; and/or multi-family; and
 - b. Condition issues and solutions.
 3. Economic Development:
 - a. Redevelopment opportunities; and
 - b. Businesses best suited for the corridor given traffic flow, College and Southeast Georgia Health System growth, new Brunswick High School campus, and residential areas.

Project Area

This Phase 1 plan takes into account the ACT District as a whole, but the primary project area is the Altama Avenue right-of-way corridor from the intersection with Community Road to the north to the intersection with Parkwood Drive to the south. To develop design concepts that can be transferable to the remainder of the District, Phase 1 also includes planning and design for the diverse areas along and adjacent to the Altama Avenue right-of-way. The project area includes sub-area planning nodes that have separate and distinct characters and need planning focused on the specific nodes of the plan. These are shown on the map (See p. 6) and include a commercial redevelopment node around the intersection of Altama Avenue and Community Road; an Education node centered on the intersection of the entrances to the new Brunswick High School and the College of Coastal Georgia; a Residential/Arts node at the intersection of Altama and Fourth; and finally a node at the intersection of Altama at Fourth and Parkwood focused on the Southeast Georgia Health System and surrounding neighborhoods.

Project Components *(See Plan Process, p.8)*

The ACT planning process consisted of three primary parts:

1. **Research and Analysis:** To provide the appropriate background information, the UGA team researched and analyzed existing plans impacting the ACT District. The team also conducted an examination of existing housing types and styles as well as condition. Research on environmental constraints and an analysis of the current business climate was done to ensure that the corridor design plan was based on the actual conditions and needs found in the District.
2. **Public Input and Stakeholder Engagement:** These were critical elements to the overall plan for the corridor. The UGA team worked extensively with stakeholders from the corridor and gathered input from the Archway Executive Committee, the Growth Task Force, and community members in multiple ways including: personal interviews, focus groups, a town hall meeting, and informal conversations with corridor users.
3. **Design and Implementation Plan Development:** The UGA team worked with the Archway Executive Committee, the Growth Task Force, and the Design Steering Committee to develop the final elements of the plan which are contained in this report.

ALTAMA COMMUNITY TRANSFORMATION DISTRICT DESIGN PLAN PROCESS (PHASE ONE)

Steering Committee Formation Weeks 1-3

Steering Committee Formation → Kick-Off Meeting → Agenda Setting

Research & Analysis Weeks 1-12

Review of Other Planning Efforts & Development Ordinances
 Housing Assessment
 Assessment of Built Environment
 Economic Analysis

Public Input & Stakeholder Engagement Weeks 6-8

Focus Groups → Potential Techniques → Visual Preference Survey
 Stakeholder Interviews → Electronic Survey → Town Hall Meetings

Deliverables Weeks 12-16

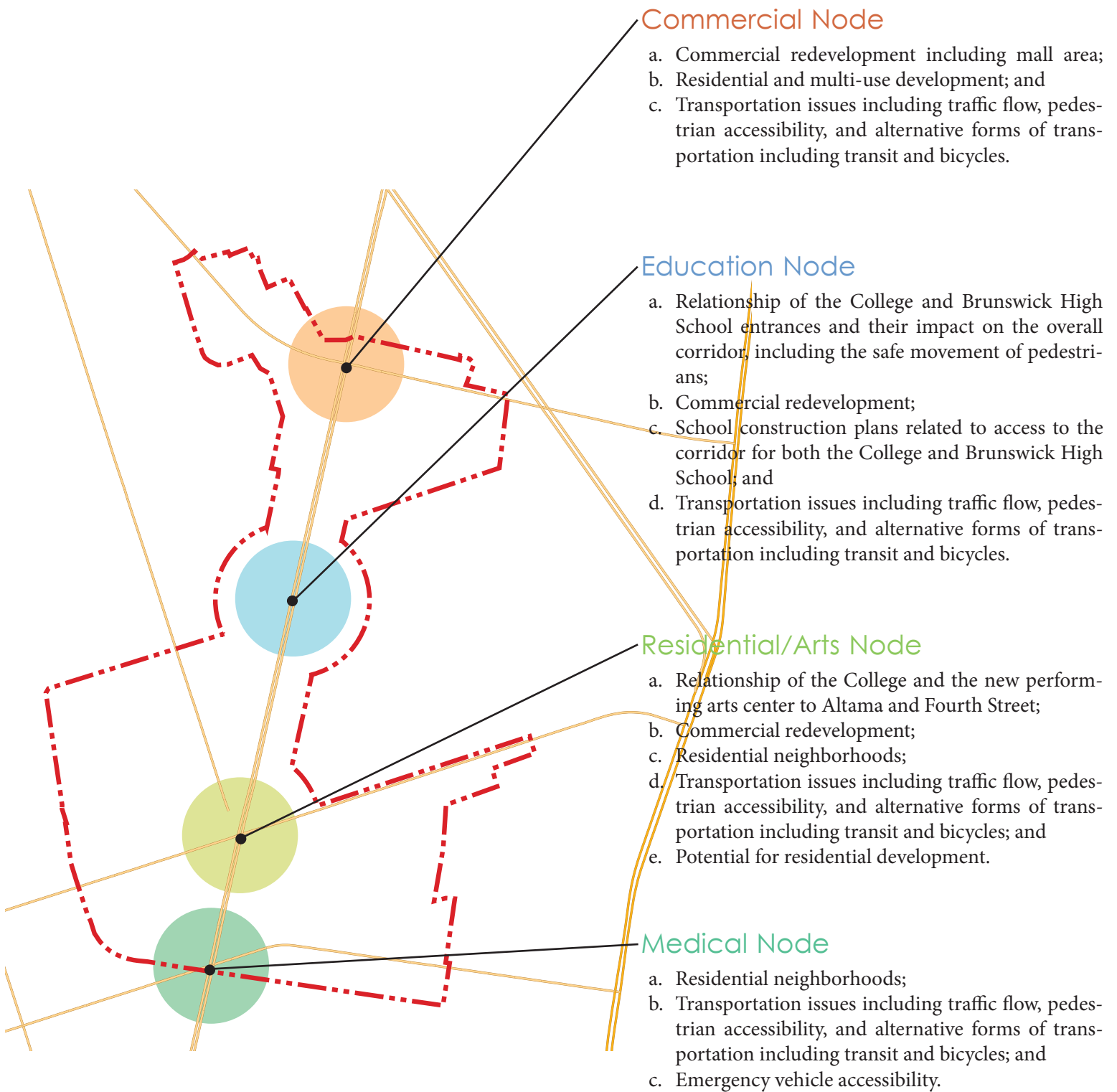
Final Corridor Design Plan
 Conceptual Design Elements and Drawings
 Customized Training Program

Design & Implementation Development Plan Weeks 9-13

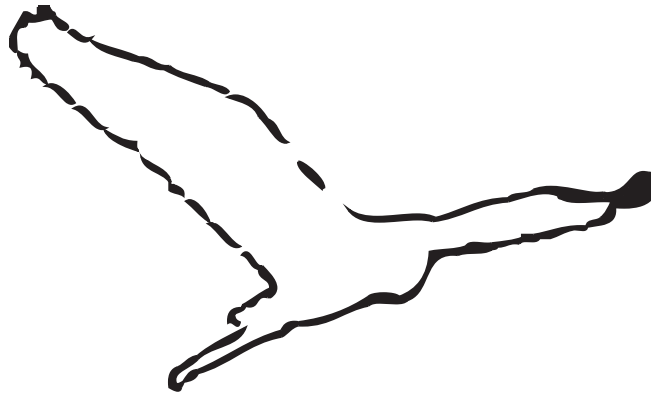
Steering Committee
 Design & Development Retreat
 Archway Executive Committee and Growth Task Force Review



Introduction | Planning Nodes



ACT District Vision & Priorities



vision: *(n) a vivid conception or anticipation of what is to come.*

ACT District Vision & Priorities

The vision of the future for the ACT District and the priorities and implementation strategies found in this chapter were established by the ACT Design Steering Committee based on their review of the information from the research, stakeholder engagement, and public input conducted during the six month planning process.

ACT District Vision

The ACT District is a welcoming, desirable destination to live, work, and play with a unique sense of place that is recognized as a clean, safe, stable, walkable, bikeable, and affordable community, with abundant greenspace and parks. The ACT District has a diversity of residents with renewed and modern commercial, health, and educational facilities, providing employment, shopping, and entertainment opportunities.

ACT District Priorities and Implementation Strategies

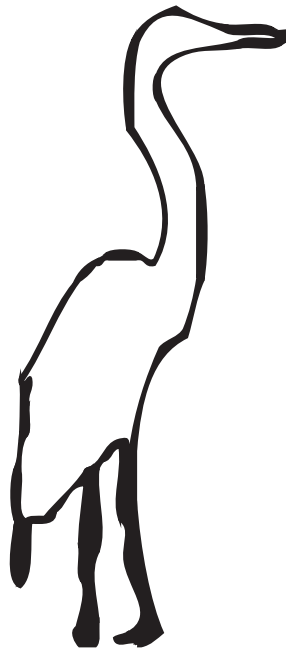
The ACT Design Steering Committee identified the following strategies at their planning session in July 2011. At that session, the Committee reviewed the research, stakeholder engagement, and public input and identified these implementation priorities. They are in order of significance as determined by the Committee.

1. Construct bike lanes; plant landscaping and street trees; repair and connect sidewalks; and install way finding signage and lighting along the Altama Corridor. Identify which of the three right-of-way configurations is most desired, recognizing that this may be a combination with different concepts implemented along different sections of the Altama Corridor.
 - a. Responsible Party:
 - i. GTF and Archway Executive Committee work with city and county officials and citizens to recommend right-of-way concepts; and
 - ii. City and County responsible for funding and construction.
 - b. Timetable for Implementation:
 - i. Contingent upon when funding is available and action by government authorities; and
 - ii. Project timetable is estimated at 510 days (see pre-engineering report in Appendix C) including all fieldwork, engineering, and construction.
2. Publicize current “approved” plan for intersection of new Brunswick High School and the College.
 - a. Responsible Party: City, Board of Education, and College of Coastal Georgia.
 - b. Timetable for Implementation: As soon as possible.
 - c. Budget: Minimal, to conduct public input, but additional funds may be needed for any redesign based on the public input.
 - d. Partners: City, Board of Education, College of Coastal Georgia, GTF, and Archway Executive Committee.
 - e. Obstacles:
 - i. Lack of public knowledge of intersection plans;
 - ii. Design may conflict with ACT design plan; and
 - iii. How does a different design affect the approved plan?
3. Construct new College of Coastal Georgia and Brunswick High School intersection.
 - a. Responsible Party:
 - i. City: Median and traffic light;
 - ii. Board of Education;
 - iii. College of Coastal Georgia; and
 - iv. College Place Methodist Church.
 - b. Timetable for Implementation: Coordinate with construction and opening of new Brunswick High School.
 - c. Budget: Funding sources:
 - i. Board of Education;
 - ii. College of Coastal Georgia; and
 - iii. City.
- c. Budget: Dependent on which of the three right-of-way configuration options is selected. The pre-engineering report that is included in Appendix C shows itemized elements and pricing of each option. The following are estimates and will change based on final engineering and construction plans:
 - i. Option A (only bike lane striping) - \$170,000;
 - ii. Option A-1 (bike lane striping, sidewalks, lighting, street trees, and site furnishings) - \$2,900,000;
 - iii. Option B - \$3,200,000; and
 - iv. Option C - \$5,140,000.
- d. Partners: City and County governing authorities including grant writers, planners, and engineers; and
- e. Obstacles: Availability of funding.

ACT District Vision & Priorities

- d. Partners: Board of Education, College of Coastal Georgia, and City
 - e. Obstacles:
 - i. Coordinating funding;
 - ii. Economic stress; and
 - iii. Congruency with bike lane and other improvements in the ACT District Plan.
4. Research and implement Financial and Zoning Incentives to refurbish and reinvest in commercial properties.
- a. Responsible Party: UGA partners, City, County, and GTF.
 - b. Timetable for Implementation: To Be Determined.
 - c. Budget: Funding options:
 - i. City and County; and
 - ii. Brunswick and Glynn County Development Authority.
 - d. Partners: UGA, City, and County and their planners, Merchants, Development Authority, Chamber of Commerce, GTF, and Archway Executive Committee.
 - e. Obstacles: Funding for research study.
5. Form joint City-County task force to create zoning overlay for the Altama Corridor that includes permitted uses and architectural design standards for new development along the corridor.
- a. Responsible Party: City, County, and Coastal Regional Commission.
 - b. Timetable for Implementation:
 - i. Draft ordinance—6 to 9 months from start; and
 - ii. Adoption—12 months from start.
 - c. Budget: minimize necessity of additional funds by using city and county planning staff.
 - d. Partners: City, County, Archway, and other UGA partners.
 - e. Obstacles:
 - i. Push back from landowners; and
 - f. Perception that development standards may deter new business.
6. Conduct study to develop ways to increase access into and out of the ACT District.
- a. Responsible Party: City and County agree to develop Request for Proposals.
- b. Timetable for Implementation: Unknown at this time.
 - c. Budget: sources—B.A.T.S. (Brunswick Area Transportation Study), SPLOST, T-SPLOST, and other sources.
 - d. Partners: City, County, Southeast Georgia Health System, College of Coastal Georgia, area merchants, property owners, and residents.
 - e. Obstacles:
 - i. Funding; and
 - ii. Resistance from neighbors.

Land Use, Economic Development, & Housing



recommendation: *(n) a representation to induce acceptance or favor for a particular action, concept or idea.*

Land Use, Economic Development, & Housing

This chapter contains the recommendations from the UGA team focused on Land Use, Economic Development, and Housing. They were developed based on information gleaned from the research, stakeholder engagement, and public input elements of the ACT District planning process.

Land Use and Zoning

Municipalities and counties are authorized to exercise planning and zoning powers under the state constitution and laws. Thus, only the Brunswick City Commission and the Glynn County Commission may enact changes to their zoning ordinances. State law establishes zoning procedures that must be followed to rezone any property. The Carl Vinson Institute of Government will provide technical assistance to update land use and zoning to help implement the plan.

Some of the proposed transportation design changes to Altama Avenue may not require zoning changes but any changes to requirements, such as lot size, building dimensions and materials, permitted uses of the property and density of occupancy, building setbacks from the street, sidewalks, curb removal or cuts, landscaping improvements and buffers, parking and loading restrictions, and signage, require amendment of the zoning code of the jurisdiction where the property is located. UGA, through the Vinson Institute, will work with the city and county to determine the specific zoning changes that may be needed to implement the proposed redevelopment of properties and streetscape along Altama Avenue. Because Altama Avenue is located within both the City of Brunswick and unincorporated Glynn County, it is recommended that the two governments adopt zoning classifications that are compatible and have similar requirements on comparable properties located within the ACT in order to support redevelopment of the Altama Avenue Corridor.

In order for the ACT District Corridor to redevelop in the future as a walkable area, with an identifiable character, the zoning regulations must be changed to achieve those results. Walkability has many characteristics: compact building, mixing of uses (commercial, residential, office, and institutional), sidewalks and pedestrian safety zones, street trees, commercial offerings scaled to the user, and connectivity between all transportation networks. However, simply slowing traffic down by enclosing the corridor with buildings at zero lot-line setback, street trees, and concealing parking lots

behind buildings, will create an environment that is pedestrian-friendly, inviting, and identifiable as its own destination.

While pieces of other City of Brunswick zoning classifications are applicable, a new classification is suggested for the main corridors, especially parcels fronting Altama Avenue, Cypress Mill Road, Parkwood Drive, and Fourth Street. This new classification should include text that is particularly reflective of the intent of the existing Planned Development-Traditional Neighborhood District (PD-TN) and Local Commercial District (LC), respectively. The following is taken from that existing language:

- a. *Encourage mixed-use, compact development that is pedestrian in scale, sensitive to the environmental characteristics of the land, and facilitates the efficient use of services within the City of Brunswick;*
- b. *Have residences, shopping, employment, and recreational uses located within close proximity with each other and efficiently organized to provide for the daily needs of the residents;*
- c. *Provide for a range of housing types within pedestrian-oriented, human-scale neighborhoods; and*
- d. *Provide efficient interconnected circulation systems for pedestrians, non-motorized vehicles, and motorists that serve to functionally and physically integrate the various land activities.*

The regulations which apply within this district are designed to encourage the formation and continuance of a stable, healthy, and compatible environment for uses that are located so as to provide nearby residential areas with convenient shopping and service facilities, reduce traffic and parking congestion, avoid the development of "strip" business districts, and to discourage industrial and other encroachment capable of adversely affecting the localized commercial character of the district.

In addition to working with existing zoning and land use regulations, new concepts should be considered along the Altama Avenue Corridor. The conceptual design images on pages 70 through 75 show possible interpretation of the following concepts.

- The narrower streets, walkable block lengths, mature landscaping, and vegetation of the neighborhoods on both sides of Altama Avenue within the ACT Corridor Nodes possess their own character and are not in need of traffic-calming or substantial regulation changes. However, if redevelopment along the corridors is going to occur, these neighborhoods do need regulations for appropriately scaled infill development and protection from encroachment of other/incompatible uses in areas off the main corridors.
- Encourage multi-family residential uses as a transitional buffer area, providing protection to existing neighborhoods from the commercial and mixed use developments that front along Altama Avenue and other commercial corridors in the ACT District.
- Large parcels such as Cypress Mill Square should have an interconnected pattern of streets introduced to create more street-frontage, break up large paved areas and to create walkable blocks. This infrastructure investment will have the greatest impact on the character of new development in the area.
- All buildings along the major corridors should have zero lot line setback fronting the street (and side street, if a corner parcel).
- All buildings should have windows and serviceable doors on the street front façade (and side street, if a corner parcel) with pedestrian access to the street.
- To facilitate redevelopment of the District, redevelopment, reuse, construction, repair or remodeling that meets or exceeds 10 to 25% of the value/cost of the building or structure acted upon should trigger application of the terms of the revised zoning.
- Existing commercial density should be increased. Consider a floor area ratio to increase density and compact building design.
- Minimum of six foot sidewalks should be required of all redevelopment and construction on all corridors.
- Parking should be located on either the side or behind the buildings fronting Altama Avenue and other commercial corridors in the District. No surface lots or street-front parking should be allowed in area meant to be pedestrian friendly.
- Parking lot standards should include requirements for pedestrian pathways, landscaping, shade trees, and pervious paving.
- Commercial and office buildings with residential uses on upper floors should be encouraged. Residential use should not be allowed on the ground floor of buildings that front Altama Avenue and other commercial corridors in the ACT District.
- Multi-family residential should also be zero lot line setback and have pedestrian access to the street.
- Consider design standards, a pattern book or at least, generally acceptable and unacceptable materials list for redevelopment, reuse, construction, repair, or remodeling.
- Signage should be pedestrian in scale.

As the corridor and District redevelop inline with these concepts into a more walkable live-work-play community, it will be attractive to a diverse array of individuals and families some of which the ACT Corridor community expressed interest in attracting to the District. These include young professionals, college students, and empty nesters looking for more amenities, less house and yard, and proximity to work, school and the heart of the Golden Isles. This plan should be used to attract those types of residents to the ACT District.

Economic Development

When fostering the redevelopment of the Altama Community Transformation (ACT) District – 1600-acres of what is considered to be prime real estate for Glynn County – there is an exciting opportunity to better position this area to be of greater service for those frequenting the corridor. Currently, the District includes a mix of commercial, residential, and light industrial development – most of which developed before the conversion of the College of Coastal Georgia from a two-year commuter College to the four-year degree granting, residential institution that it has become today. Other anchors for the District include the growing Southeast Georgia Health System and soon-to-be constructed Brunswick High School. Given these major developments, community leaders are interested in knowing (1) what types of businesses might find it advantageous to locate in the District to be near these anchors and (2) what supportive infrastructure is needed to make the District a viable location for such businesses.

To help answer these questions, a targeted economic development assessment was conducted by the Georgia Small Business Development Center (SBDC), a unit of UGA's Pub-

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lic Service and Outreach. This assessment included two key components. One of the components involved a series of four facilitated discussion groups to ascertain community perceptions and concerns regarding the local retail market and other conditions within the District. These four groups included: residents, College students, merchants, and Southeast Georgia Health System and College administrators and employees.

The other key component involved a business gap analysis to explore whether certain business sectors (retail trade, accommodations, food service) are potentially oversupplied or undersupplied in the District when compared to comparable areas. The primary objective of these research endeavors was to provide some insight into the potential types of businesses – among those in line with the economic development vision expressed by community stakeholders – which may be attracted to the District given the transformations underway.

What Community Stakeholders Shared

Nearly three-dozen stakeholders participated in the discussion groups facilitated by SBDC. Overall, these stakeholders – residents, students, merchants or College or Southeast Georgia Health System employees – appear to be in general agreement concerning their views and perceptions of the District. Following is a summary of key findings from these facilitated group discussions.

- Most of the stakeholders viewed the College expansion positively, both in terms of physical changes and in enrollment growth.
- Many stakeholders viewed the Archway Partnership as a potential key catalyst for spurring positive changes in the District.
- There is a general expectation that the initial design work portion (and resulting changes) of the project will result in many positive outcomes for the community. There seems to be a climate of anticipation about the entire project, and the possible positive effects.
- One major general concern was the effect of any growth and the tension which might result. Unintended consequences of unplanned growth were of some concern within the resident group. Congestion was named as a specific concern.

- When asked to name what types of new developments they'd like to see in the corridor, several stakeholders (representing all four groups) suggested more entertainment options, especially those geared toward serving College students and young residents. Consistent across groups, they observed how there was little to access in the way of entertainment in the area.
- When asked to identify types of new businesses to encourage for the District, some stakeholders suggested seeking those businesses which are commonly found in other college towns – that is, businesses which cater to college-age (and other) consumers. Some mentioned specific examples such as delis and other restaurants, coffee shops, and gaming and other entertainment venues such as putt-putt golf and batting cages. In other words, the stakeholders generally expressed their belief that the District is well positioned for an expansion of retail offerings and activities.

Recommendations

The ACT District Corridor has the potential to be revitalized in significantly meaningful ways which will truly be life-changing for the community. Following is a summary of key recommendations for supporting and enabling this revitalization.

- Foster collaboration among local entities (i.e., Chamber of Commerce, City of Brunswick, Glynn County, etc) to establish a proactive and defined plan (i.e., possible incentives, other enticements) for attracting and retaining business prospects. A strategically coordinated local area marketing plan (and even a “branding” project) would be helpful for achieving aggregate growth in the corridor. More targeted retail is particularly recommended, with possible incentives (e.g., façade grants) or rebates/tax breaks to encourage store front improvements and property upkeep.
- Create a “sense of place” for the Altama Corridor Transformation District. Utilizing tools to ensure consistent form-based design standards throughout the District will be key for creating a consistent sense of place. Developing standards for and enhancing area signage will help identify and brand the District. Signage for the

main entrance to the College will reinforce its role as a key anchor. Disguising or otherwise adjusting the huge expanses of blacktop and concrete that comprise the mall/retail parking areas (the Southeast Georgia Health System's lot is an example of how it could be achieved) will help improve the psychological connectivity among places within the corridor. Other amenities of the Health System Campus including the Medical Mall, Pharmacy, Medical Supply, ophthalmology, walking path, and art gallery are examples of how to create a sense of place. Active and immediate consideration to address the local transportation needs is also recommended, either as a community transit system or as a College-based bus program.

- Incorporate pedestrian-friendly elements into the District. More and better sidewalks would eliminate some of the issues related to walkability, connectivity, and access to retail establishments by the pedestrian market. Attractive streetscapes and attention to curb cuts and areas for loading and unloading (particularly on the College campus) would assist in making the area more attractive and conducive to walkability. The new population of residential students is likely to result in an increased volume of foot traffic in areas connected or close to the campus so special attention should be paid toward maintaining safe and well managed pedestrian pathways in such areas.
- Leverage the College and Southeast Georgia Health System campuses for greater community use. The Health System campus has a cafeteria and coffee shop on site to accommodate the needs of that community. The College also has a campus cafeteria. While students and faculty are the primary customer for this amenity, the cafeteria is being marketed and leveraged for wider community use.
- Encourage the success of existing and new businesses in the corridor. Technical assistance (such as that offered by the local Small Business Development Center and other organizations) can provide the expertise to assist in developing viable business plans and executing workable marketing ideas. This support might assist in reducing the constant turnover of businesses that enter and leave the area with regularity as was reported by stakeholders.
- Prioritize commercial infill development, along with general maintenance of existing properties, both occupied

and empty. Substantial comments centered on the closed and neglected commercial space in the corridor. Attention to revitalization/redevelopment, initially through simple maintenance and repair/refurbishment, would make the area more attractive to the various stakeholders (particularly shoppers and potential retailers). Perhaps incentives or fines (code enforcement) would be sufficient to motivate general upkeep of current property (both occupied and empty) in the corridor.

- Further investigate – with state-level retail experts – the future development potential of business sectors which fit the community's vision for economic development in the District. Consulting with retail experts as an immediate next step could provide some additional insights on the District's potential and the region's market for these business sectors. Given the anticipated growth of the College, efforts should be made to explore the potential for those business types which are commonly found in college campus communities. Those businesses which also fall within the sectors identified as potentially undersupplied in this assessment should receive particular attention.

Housing

The housing assessment presents current conditions of the ACT District and offers possible strategies to consider for improving the health of the neighborhoods adjacent to the corridor. Data sources used for this analysis include the U.S. Census 2010, the U.S. Census 2000, the American Community Survey (ACS) 2005-2009, the Glynn County Tax Assessor's parcel data, and the City of Brunswick 2009 Housing Survey data. Census Block Group data are aggregated to present information for the District. Please note that Census geographies do not match the District boundaries exactly, and Census boundaries changed from 2000 to 2010. In addition, the ACS data, which utilizes the Census 2000 boundaries, are estimates.

An overview of general demographics of the ACT District indicates a diverse population. According to the 2010 Census, the area comprised about 5,200 people, including about 37% white, 53% black, and 8% Hispanic. The median age was 40 years old; 34% of households included persons at least 65 years old; and 31% of the households included persons under the age of 18. Compared to the City of Brunswick, the ACT Dis-

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tract has a larger percentage of white residents, a smaller percentage of black and Hispanic residents, a larger percentage of households with elderly residents, and a smaller percentage of households with children less than 18 years old.

In 2000, the poverty rate for the ACT District was 19%, lower than the City of Brunswick's rate of 30%, but higher than the state rate of 13%. A few Census Block Groups that overlap with the District had poverty rates greater than 40% (5013 & 7003). According to the ACS 2005-2009 estimates, the estimated median household income in the District was higher than the City of Brunswick, about \$37,000 compared to roughly \$27,000. These incomes are lower than the state median, almost \$50,000. Nearly 23% of homeowners and 50% of renters in the District are cost burdened, paying 30% or more of gross income on housing costs.

The percentage of all housing units that were vacant (unoccupied) increased from 2000 to 2010 in Georgia, Brunswick and the ACT District. In the ACT District, nearly 14% of units were vacant. At 53%, the homeownership rate in the ACT District was much lower than the state's rate of 66%, but significantly higher than the City of Brunswick's homeownership of just 40%. According to the ACS 2005-2009 estimates, the vast majority of housing units in the District were single-family detached units (84%) and only 5% multi-family with 5 or more units.

According to the Glynn County Tax Assessors online database, median single family home values in ACT neighborhoods ranged from about \$34,000 in Brunswick Villa to roughly \$114,000 in Northside Estates/Lakeside in 2010. Brunswick Villa is the largest neighborhood with nearly 400 homes. Values in most neighborhoods are down from 2008-2009, but neighborhoods east of Altama Avenue around Fourth St. and Parkwood Dr. have seen the largest decline. In general, the number of home sales in the ACT District has declined from 2006 to 2010. In Northside Estates/Lakeside and Eastview this trend reversed in 2008 and increased in 2009 and 2010. According to the City of Brunswick 2009 Housing Survey, there are numerous dilapidated and uninhabitable homes and vacant lots in Washington Heights. An informal windshield survey of Brunswick Villa and surrounding neighborhoods in the County indicate similar conditions.

Findings and Recommendations

Neighborhoods in the Medical/Parkwood area are changing. This area has relatively active home/property sales; a mix of home values; overall good housing conditions; and changing demographics because of students moving into the area.

- Convene meeting of stakeholders, practitioners, and residents, to discuss the housing situation and plan a vision for the future.
- Major employers could provide employee assisted home-buyer programs to encourage employees to live in these neighborhoods.
- Promote the Georgia Dream Homeownership Program and the PEN (Police, Educators, and Nurses) Down Payment Assistance Program.

The redevelopment of the Altama Corridor into a live-work-play community will be attractive to young professionals, and their housing wants and needs should be considered and implemented. Future demand is also anticipated for off-campus student housing.

- Consider mixed use development along Altama Avenue with commercial on first floor and apartments suitable for students and young professionals above. See pages 70 through 75 for conceptual design images for mixed use development that includes commercial and residential uses; and pages 14 and 15 for zoning and land use concepts encouraging mixed use, pedestrian-oriented development.
- Consider garden style (or other low-rise) apartments, townhouses, or condos on the edge of neighborhoods abutting major roads. Encouraging the use of multi-family residential uses as a transitional buffer area will provide protection to existing neighborhoods from the commercial and mixed use developments that front Altama Avenue and other commercial corridors in the ACT District. See pages 70 through 75 for conceptual design images for mixed use development that include commercial and residential uses, and pages 14 and 15 for zoning and land use that encourages mixed use, pedestrian oriented development.
- Survey incoming students about current/future housing preferences. The College of Coastal Georgia recently conducted a housing market study, the results of which should be reviewed in the decision-making process.

The District has a relatively high percentage of households with elderly residents (about one-third).

- Promote City’s rehabilitation program for elderly in need of home repairs.
- Research possibility of building a retirement facility.

The district abuts areas with poverty rates greater than 29% but is within easy travel to employment and education.

- Promote the production of new affordable rental housing that targets workforce and those “low-income” citizens with incomes at or below 60% of Area Median Income.
- Affordable rental housing should be garden style or other low-rise apartments or townhouses constructed on the edge of the commercial area.

There is some substandard housing (dilapidated and uninhabitable) and vacant lots are common in Washington Heights (City), Brunswick Villa (County), and surrounding neighborhoods. See map on page 6 for more detail as to which neighborhoods are in Brunswick and which are in unincorporated Glynn County.

- Partner with Weed and Seed to establish neighborhood improvement program or other neighborhood associations.
- Conduct housing conditions survey of Brunswick Villa and surrounding neighborhoods in the unincorporated area of the county to map dilapidated and uninhabitable homes and vacant lots. Consider applying to Department of Community Affairs (DCA) for CHIP and/or CDBG funds to establish demolition, rehabilitation, and homeowner down payment assistance programs. Identify potential infill sites and partner with Habitat for Humanity or other non-profit for development.
- Identify Washington Heights (in Census Block Group 7003) as the next target area in the City’s URA and consider using CHIP and CDBG funds for rehabilitation and demolition. Identify potential infill sites and partner with Habitat or other non-profit for development. Increase enforcement and education of property maintenance code.
- Consider adopting a tax on dilapidated structures (blighted property tax/ordinance) to encourage property owners to rehab or demolish blighted properties and help finance redevelopment.

- Consider creating a Land Bank Authority.

Create a task force and seek technical assistance for developing a housing action plan.

- To leverage resources and activities most effectively for improving housing conditions in the ACT District, partner with the Community Housing Resource Assistance Board (CHRAB)/Georgia Initiative for Community Housing (GICH) committee.
- Take advantage of the City’s participation in the GICH technical assistance program by attending future retreats and utilizing the listserv. Learn from technical experts and network with other communities about programs or initiatives identified as possible vehicles for housing and neighborhood revitalization.

Potential Funding and Economic Development Incentive Tools



incentive: *(n) something that incites or tends to incite to action or greater effort, as a reward offered for increased productivity.*

Potential Funding and Economic Development Incentive Tools

There are several funding methods and tools that could be potentially utilized to finance the ACT District plans or provide economic development incentives for the area. The potential funding methods include pay-as-you-go financing; bonds issued by the Brunswick and Glynn County Development Authority; funding through the federal Transportation Enhancement Program; tax increment financing in connection with a tax allocation district; and community improvement district financing. The potential economic development tools include tax abatement transactions and opportunity zone incentives. This section provides a summary of the tools and incentives, but is intended to be an overview of the potential options. There are detailed criteria relating to the implementation and utilization of each of the options, including specific legal requirements.

Certain funding sources are dependent upon the specific elements of the project, and each of the options described below requires some form of approval and action on the part of the local governing bodies, including the Brunswick City Commission, the Glynn County Board of Commissioners, and in some instances the Glynn County Board of Education. Accordingly, the implementation of any of the options below requires the support of, and in most cases the initiation on the part of, the elected officials of the area's local governing bodies. In addition, certain economic development tools may conflict with potential funding methods. For example, tax abatement transactions may significantly impact the feasibility of a tax allocation district if tax abatements are authorized for property within the tax allocation district.

1. Potential Funding Methods

- **PAY-AS-YOU-GO FINANCING**

Pay-as-you-go financing involves paying for capital projects with cash on hand. In other words, local governments pay for capital improvements by using current-year revenues rather than long-term financing. The City of Brunswick, Glynn County, or both, could utilize pay-as-you-go financing to fund the ACT District Project. The primary consideration will be the willingness of the City of Brunswick and Glynn County to allocate current-year revenues to the project, rather than use those revenues to fund other projects.

Initial Actions Required:

Local elected officials and staff of the City of Brunswick and Glynn County must agree to include the ACT District plans in their respective budgets.

- **SPECIAL PURPOSE LOCAL-OPTION SALES TAX (SPLOST) FINANCING**

SPLOST is an optional one percent county-wide sales tax used to fund capital outlay projects proposed by a county government and participating municipalities. SPLOST proceeds may not be used for operating expenses or for maintenance of any county or municipal project; rather, the primary intent of SPLOST is to provide a funding source for specifically enumerated and approved capital projects. The tax is imposed when a county board of commissioners calls a local referendum and the voters subsequently pass the referendum. Currently, SPLOST V is in place in Glynn County.

Initial Actions Required:

The ACT District can be part of a SPLOST project list, and that would require action on the part of the Brunswick City Commission and the Glynn County Board of Commissioners. As an initial step, discuss with local elected officials the option of adding the ACT District plans to a list of proposed SPLOST projects and request that the Brunswick City Commission and the Glynn County Board of Commissioners take appropriate action, including the adoption of resolutions approving the addition of the ACT plans to the list of proposed SPLOST projects.

- **TRANSPORTATION INVESTMENT ACT 2010**

The Transportation Investment Act (TIA) of 2010 created 12 special tax district regions based on existing regional commission boundaries for the purpose of levying a special sales tax for transportation projects. The City of Brunswick and Glynn County are located within the Coastal Region. The TIA allows each region to levy a 1% transportation sales tax for 10 years. The funds collected in each region from the tax must be spent within that region. The projects to be funded with the proceeds of the sales tax were selected and approved by regional roundtables consisting of each county chair and at least one mayor from each county within each region. All 12 regional roundtables, in-

Potential Funding and Economic Development Incentive Tools

cluding the Coastal Region's roundtable, approved a list of transportation projects for their region by the specified October 15, 2011 deadline. Voters in each region will vote on the proposed sales tax in a referendum to be held on July 31, 2012. The TIA specifies that 75% of each region's proceeds from the sales tax will be used to fund the projects approved by the regional roundtables, and 25% of the region's proceeds will be divided among the region's local governments to be spent on discretionary transportation projects. The Georgia Department of Transportation projects that more than \$1.6 billion in TIA sales tax revenues will be collected in the Coastal Region over the 10 year period in which the sales tax will be imposed. The 25%, which amounts to over \$402 million region-wide, will be distributed using a formula based on population and road mileage.

Initial Actions Required:

As described above, the Coastal Region's roundtable approved a list of projects for the region prior to the October 15, 2011 deadline. The ACT District Project is not one of the specific projects approved by the Coastal Region's roundtable. Nonetheless, as described above, 25% of the sales tax proceeds collected in the region will be distributed to local governments for discretionary transportation projects, which could include portions of the ACT District Project. The referendum on the imposition of the sales tax will be held on the date of the 2012 general primary, which is July 31, 2012. Votes will be tallied by region, and the tax will be imposed if a majority of the voters within the region approve. If the sales tax is approved in the July 31, 2012 referendum, the collection of the tax will begin on January 1, 2013.

- **DEVELOPMENT AUTHORITY FINANCING**

The Georgia Constitution permits two or more public entities to enter into intergovernmental contracts for up to 50 years for the provision of services or the joint or separate use of facilities, so long as such contracts deal with activities, services, or facilities that the contracting parties are authorized by law to undertake or provide. Accordingly, an authority having power to issue revenue bonds for a project can issue bonds to fi-

nance the project and enter into an intergovernmental contract to provide for the use of the project by a local government. The local government can agree, pursuant to the intergovernmental contract, to pay for such use. The payments made by the local government under the terms of the intergovernmental contract will be pledged as security for and used to make the payments on the bonds. Development authority financing allows local governments to avoid the referendum requirements applicable to general obligation bonds. The Brunswick and Glynn County Development Authority (Authority) is authorized to issue revenue bonds that could be used to finance the ACT District Project, although such ability is subject to review by counsel for the Authority.

Initial Actions Required:

- Obtain the support of the members of the Authority to issue revenue bonds for the purpose of financing the ACT District plans and request that the Authority take appropriate action, including the adoption of a resolution authorizing the issuance of such revenue bonds; and
- Obtain the support of the local elected officials to enter into an intergovernmental contract for the purpose of making payments on the Authority's revenue bonds and request that the Brunswick City Commission and the Glynn County Board of Commissioners take appropriate action, including the adoption of resolutions authorizing the execution of such intergovernmental contract to be pledged as security for the payment of the Authority's revenue bonds.

- **TRANSPORTATION ENHANCEMENT PROGRAM FUNDING**

The Transportation Enhancement (TE) Program was created by federal law and is administered in Georgia by the Georgia Department of Transportation (GDOT). The program was established as a means to enrich the traveling experience of motorists, bicyclists, and pedestrians, through federally funded enhancements to the surface transportation system. Projects that qualify for TE Program must involve one or more of the following activities:

- Provision of facilities for pedestrians and bicycles;
- Provision of safety and educational activities for pedestrians and bicycles;
- Acquisition of scenic easements and scenic or historic sites, including historic battlefields;
- Scenic or historic highway programs, including the provision of tourist and welcome center facilities;
- Landscaping and other scenic beautification;
- Historic preservation;
- Rehabilitation and operation of historic transportation buildings, structures, or facilities, including historic railroad facilities and canals;
- Preservation of abandoned railway corridors, including the conversion and use of such corridors for pedestrian or bicycle trails;
- Inventory, control, and removal of outdoor advertising;
- Archaeological planning and research;
- Environmental mitigation to address water pollution due to highway runoff or reduce vehicle-caused wildlife mortality while maintaining habitat connectivity; and/or
- Establishment of transportation museums.

Some of the most popular categories of TE Program projects have been bicycle and pedestrian facilities, streetscapes, and historic preservation. Federal funds are available under the TE Program to pay for up to 80% of the total project cost (up to a maximum of \$1 million per project). A local match, in the form of cash, in-kind services, or donated services, materials, or real property, from a local sponsor of least 20% of the total project cost is required. Funds may be awarded for use in any or all of the three project phases of preliminary engineering, right-of-way, and construction, and are made available to the project on a cost reimbursable basis. In other words, the local project sponsor must incur the expense before TE Program funds are paid for the project. The Georgia Transportation Board member serving the 1st Congressional District (currently Jay Shaw) will make the final selections for Brunswick and Glynn County and determine the funding level for each selected project.

Initial Actions Required:

There are detailed application and other project requirements for obtaining TE Program funds that will be described in a Call for Projects. Historically, a Call for Projects for TE funds occurs in the fall every 2 years. The most recent call occurred in 2010, and projects were awarded TE Program funding in May 2011. Accordingly, the following initial steps are required to obtain TE Program funds for the ACT District Project:

- Secure a project sponsor, which can be the City of Brunswick, Glynn County, College of Coastal Georgia, or the Brunswick and Glynn County Development Authority;
- Identify a source for the local match; and
- Monitor GDOT’s website the announcement of the next Call for Projects.

- **TAX INCREMENT FINANCING (TAX ALLOCATION DISTRICTS)**

Tax Allocation Districts (TADs) can be created in Georgia for the purpose of financing certain infrastructure and redevelopment projects pursuant to Georgia’s Redevelopment Powers Law. There are specific statutory procedures that must be followed to establish a TAD, including the holding of a public hearing, the adoption of a redevelopment plan, and the approval of the redevelopment plan by the local city council, county board of commissioners, and in most instances the county school board. Once a TAD has been created, the city or county may issue tax allocation bonds for the purpose of financing the redevelopment costs of projects located within the TAD. Tax allocation bonds (also known as tax increment financing or TIF) are payable from the incremental increase in tax revenues collected within the TAD above a base level of tax revenues set upon the creation of the TAD. The incremental increase in revenues can occur if new development takes place in the TAD or if the value of existing property rises.

Initial Actions Required:

- The Georgia General Assembly must enact a local law authorizing the activation of redevelopment powers by the City of Brunswick and Glynn County (both are required if the TAD is geographically consistent with the ACT District and thus located

Potential Funding and Economic Development Incentive Tools

partially within the unincorporated area of Glynn County and the incorporated area of the City of Brunswick) and designating a redevelopment agency;

- A majority of the qualified voters of the City of Brunswick and Glynn County voting in a referendum for such purpose must approve the local law and the activation of the redevelopment powers;
- The redevelopment agency must submit a redevelopment plan including the proposed TAD to the Brunswick City Commission, the Glynn County Board of Commissioners, and the Glynn County Board of Education for consent;
- The Brunswick City Commission and the Glynn County Board of Commissioners must each adopt a resolution:
 - *Describing the boundaries of the TAD;*
 - *Creating the TAD;*
 - *Assigning a name to the TAD;*
 - *Specifying the estimated tax allocation increment base;*
 - *Specifying the ad valorem property taxes used for computing tax allocation increments;*
 - *Specifying the property to be pledged for payment or the security for payment of tax allocation bonds; and*
 - *Containing findings that the redevelopment area meets the specific criteria set forth in the Redevelopment Powers Law.*

• **COMMUNITY IMPROVEMENT DISTRICT FINANCING**

Community Improvement Districts (CIDs) can be created in Georgia for the purpose of providing any one or more of the following governmental services and facilities:

- Street and road construction and maintenance, including curbs, sidewalks, street lights, and devices to control the flow of traffic on streets and roads;
- Parks and recreational areas and facilities;
- Stormwater and sewage collection and disposal systems;
- Development, storage, treatment, purification, and distribution of water;
- Public transportation;
- Terminal, dock, and parking facilities; and

- Such other services and facilities as may be provided for by general law.

The administrative (or governing) body of the CID will be the local governing body of the county or city in which it is created unless otherwise provided for by the law creating the CID. The administrative body may levy taxes, fees, and assessments within the CID on non-residential real property, and any such tax, fee, or assessment may not be more than two and one-half percent of the value of such real property. A CID's administrative body may not tax, charge a fee, or assess property used for residential, agricultural, or forestry purposes, tangible personal property or intangible property. The revenues collected must be used for the purpose of providing governmental services and facilities within the CID and not the county or municipality as a whole. The CID is authorized to incur, without a voter referendum, debt backed by the CID revenues in order to finance on an upfront basis the projects the CID is authorized to undertake.

Initial Actions Required:

- The Georgia General Assembly must enact a local law providing for the conditions under which the CID is to be created;
- The Brunswick City Commission and the Glynn County Board of Commissioners must each adopt a resolution (both are required if the CID is geographically consistent with the ACT District and thus located partially within the unincorporated area of Glynn County and the incorporated area of the City of Brunswick) approving the establishment of the CID; and
- Written consent must be obtained from:
 - *A majority of the owners of the real property within the CID that is subject to taxes, fees, and assessments levied by the CID; and*
 - *The owners of the real property within the CID that is subject to taxes, fees, and assessments levied by the CID constituting at least 75% by value of all such real property.*

2. Potential Economic Development Tools

- **TAX ABATEMENT TRANSACTIONS**

Property tax abatements can be provided in Georgia using a bond-lease transaction. Under the transaction's structure, title to the property subject to the tax abatement is transferred to a development authority that is exempt from taxation. The property is then leased to a private company. Typical tax abatements last between five and fifteen years, with ten years being most common. In many localities, the leasehold interest held by the private company is subject to taxation; however, there is no statutory guidance on how such leasehold interest should be valued for ad valorem tax purposes. The Georgia Supreme Court has held that each county may determine the fair market value of the lease on a "reasonable" basis. Typically, the terms of the lease, and the methodology for valuation of the leasehold interest, are negotiated up front with the county tax assessor, and an agreement referred to as a Payment in Lieu of Taxes (PILOT) agreement is executed setting forth the valuation methodology and the amounts that the company will owe during the term of the tax abatement transaction. The development authority will issue bonds to acquire the property, and the bonds are secured by the lease payments from the private company. While actual financing can be the purpose of the bonds, generally the sole purpose of the bond-lease transaction is the tax abatement. In such cases, the private company "buys" the bonds, and thus the company is both the obligor on the bonds through the lease payments and the holder of the bonds. In most bond-lease transactions for tax abatement purposes, the documentation provides that the payments under the lease can be paper transactions in lieu of an actual transfer of funds.

Initial Actions Required:

Tax abatement bond transactions are typically initiated by private developers seeking the tax abatement or by development authorities seeking to provide incentives for economic development. It is not a separate funding source for projects. It is important to note that tax abatement bond transactions, and in particular, the leasehold valuation methodology used by local governments, have been the subject of recent litigation at

the Georgia Supreme Court that remains unresolved. Bond and local government counsel must be consulted in connection with any such transaction.

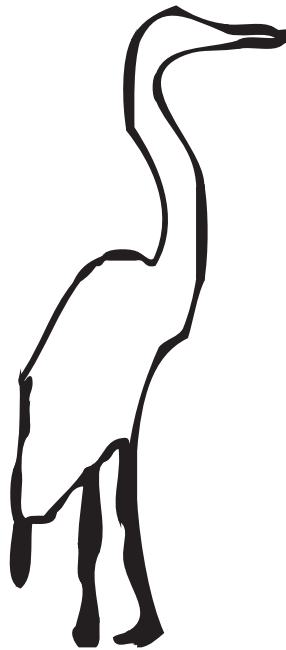
- **OPPORTUNITY ZONES**

Opportunity Zones (OZs) are administered by the Georgia Department of Community Affairs (DCA) and are a combination of three state programs: state enterprise zones, urban redevelopment areas, and job tax credits. Local governments that undertake redevelopment and revitalization efforts in certain older commercial and industrial areas can qualify those areas for the maximum state job tax credit if the area has received an OZ designation. DCA considers designations for areas that are within or adjacent to a census block group with 15% or greater poverty and in which there also exists an enterprise zone or urban redevelopment plan that has been adopted pursuant to the relevant Georgia statutes. The designation criteria generally are met in poverty areas that are in decline, suffering from disinvestment, and are in need of redevelopment and revitalization. Upon designation as an OZ, any business that expands or locates within the OZ can claim a state job tax credit of \$3,500 per eligible new job, with the credit being first applied against the 100% of the business' Georgia income tax liability. Any excess credit can be applied against withholding taxes that the business would otherwise be required to pay to the state.

Initial Actions Required:

The following steps are required to designate an OZ: (1) determine if the ACT District meets the poverty criteria for designation as an OZ; and (2) either (a) determine if the ACT District meets the criteria for designation as an enterprise zone, and if so, the Brunswick City Commission and the Glynn County Board of Commissioners must adopt a joint resolution making such designation, or (b) the Brunswick City Commission and the Glynn County Board of Commissioners must each adopt a resolution declaring the ACT District an urban redevelopment area and designating an appropriate urban redevelopment agency.

Transportation



transportation: *(n) means of conveyance or travel from one place to another.*

Transportation | Inventory

Inventory

Understanding existing circulation patterns is an important part of the planning process that will aid in understanding connectivity in the ACT District. An inventory of the circulation system of the ACT District area includes a photographic inventory of existing transportation conditions and infrastructure, a recent (March 2010) traffic study which assessed existing and future traffic conditions on Altama Avenue, and GIS spatial data provided by Glynn County GIS department and the City of Brunswick planning department. These resources were used in conjunction with comments delivered at the ACT design committee meetings to gather a comprehensive inventory of vehicle, pedestrian, and bicycle movement along the corridor.



1. Looking north along Altama Avenue



2. Streetscape, signage, and curb cuts along Altama Avenue
 3. Altama Avenue center median near intersection with Community Road
 4. Typical string mounted traffic signals



5. Streetscape, signage, and curb cuts along Community Road
 6. Pedestrian controlled signalized intersection along Community Road
 7. Typical safety signage

Transportation | Inventory



8. Typical street signage

9. ADA ramp not aligned with designated crosswalk in residential node

10. Crosswalk outlined in white

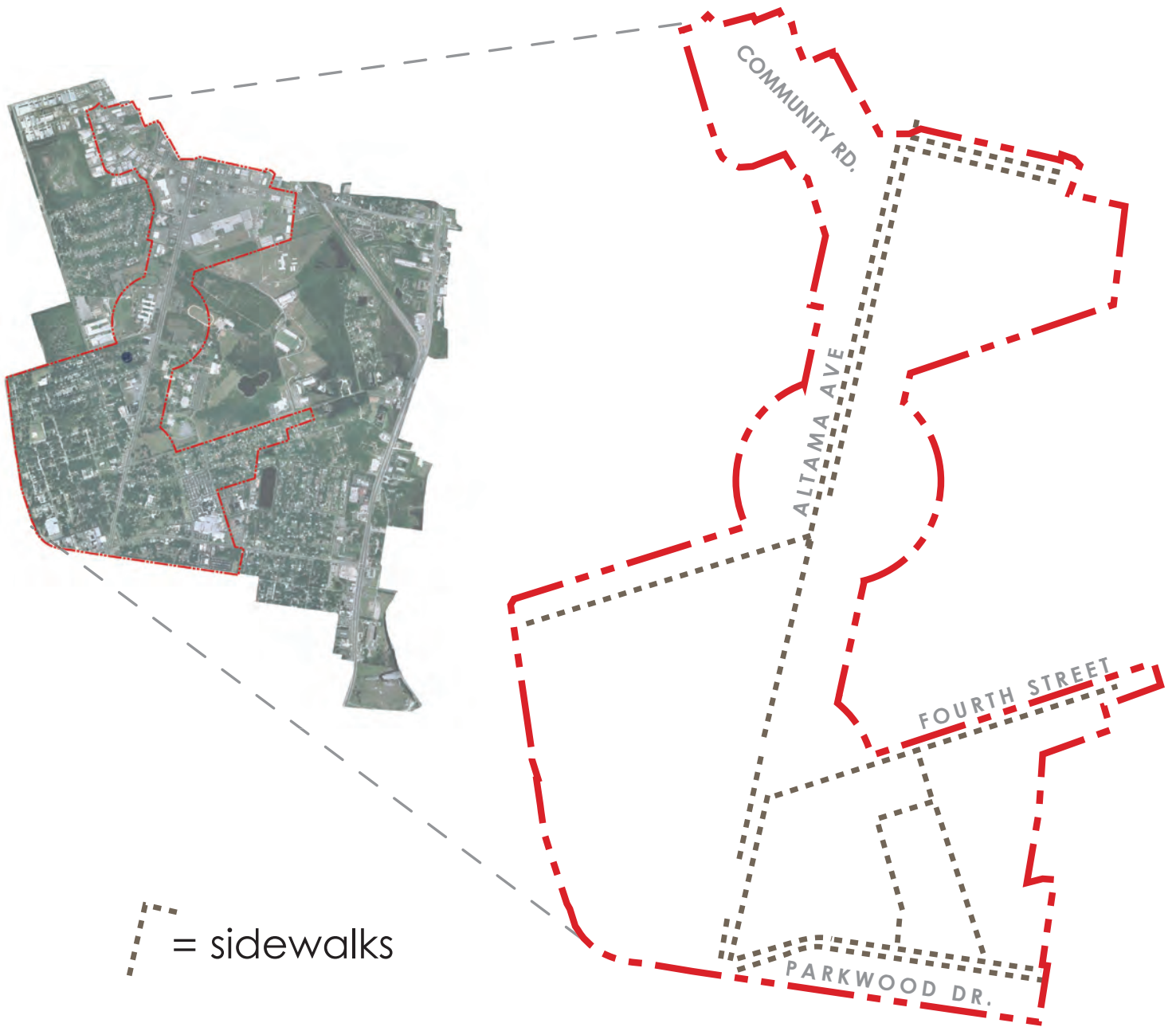
11. Southeast Georgia Health System wayfinding; lack of sidewalk and pedestrian crossings

12. Looking south down Altama Avenue

13. Streetscape, signage, and curb cuts along Altama Avenue

Pedestrian Circulation

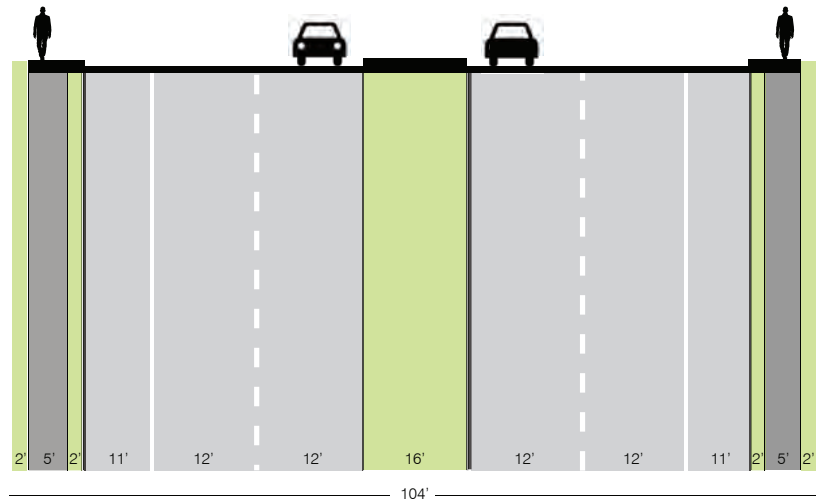
The image to the lower right shows existing sidewalks in the corridor and provides an important reference for understanding pedestrian movement in the area.



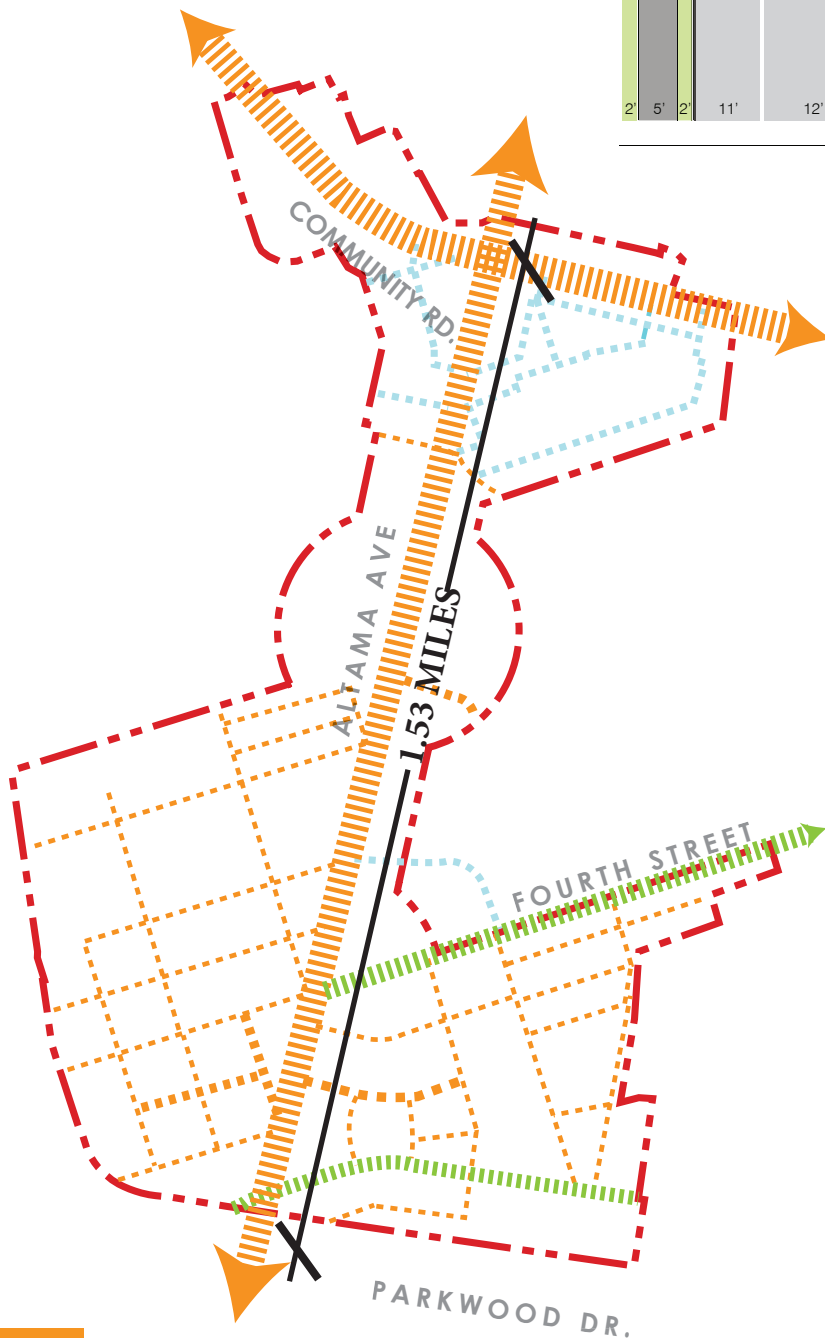
Transportation | Analysis

Altama Avenue Right-of-Way

The Right-of-Way (ROW) is that area of land used for a road and the area along the side of the roadway. It is also a thoroughfare or path established for public use.



Altama Right-of-Way



Vehicular Circulation

The diagram below indicates traffic volume and movement in the corridor and also provides vital information for understanding transit opportunities and constraints in the corridor. The relative size of the line is indicative of the volume of traffic experienced on the road.

Source: *Traffic Impact Analysis For The Altama Avenue & Fourth Street Area, Brunswick, Georgia, March 2010, Stantec Consulting.*

- = Private road
- = Residential collector
- = Minor Arterial
- = Major Arterial

Photo Analysis

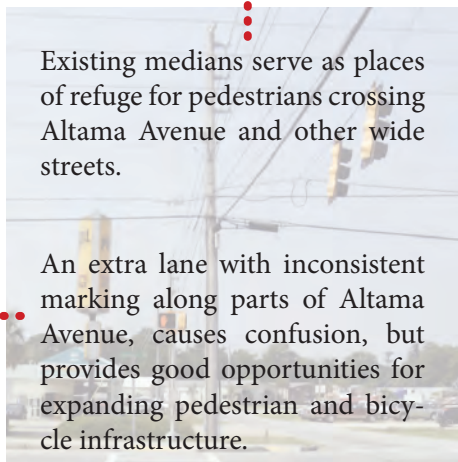
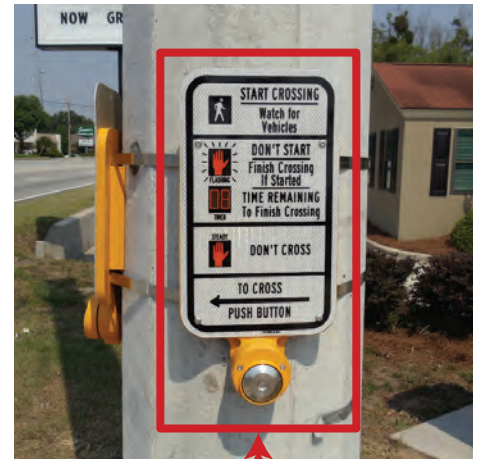
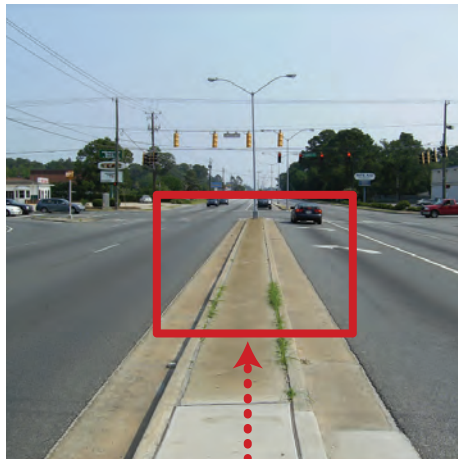
With the data collected in the inventory, opportunities and constraints for improvement were identified. This photo analysis is the basis for the designs presented later in this chapter.



Excessive cuts disrupt traffic flow along the corridor and pose threats for pedestrians.

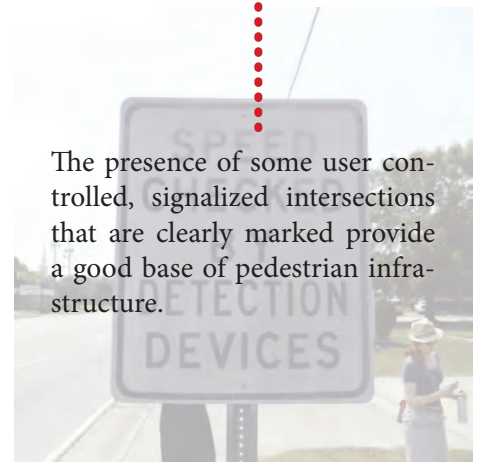


Additional sidewalks enhance pedestrian mobility and safety while increasing visual appeal.



Existing medians serve as places of refuge for pedestrians crossing Altama Avenue and other wide streets.

An extra lane with inconsistent marking along parts of Altama Avenue, causes confusion, but provides good opportunities for expanding pedestrian and bicycle infrastructure.

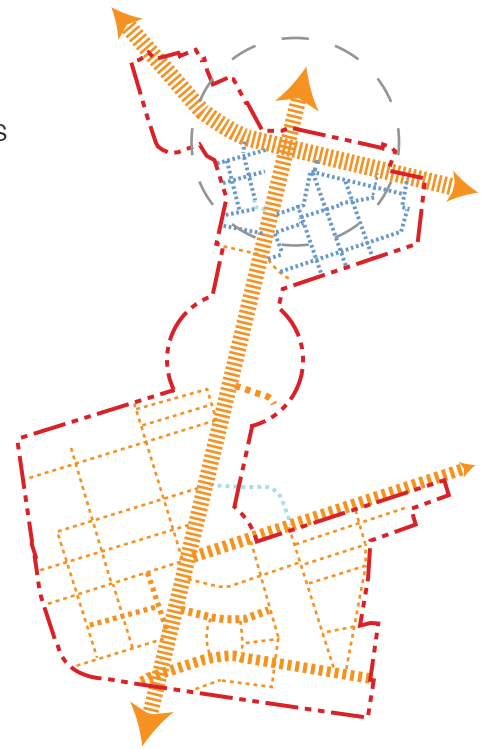
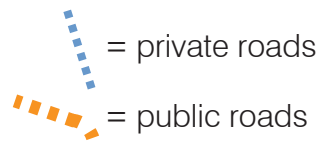
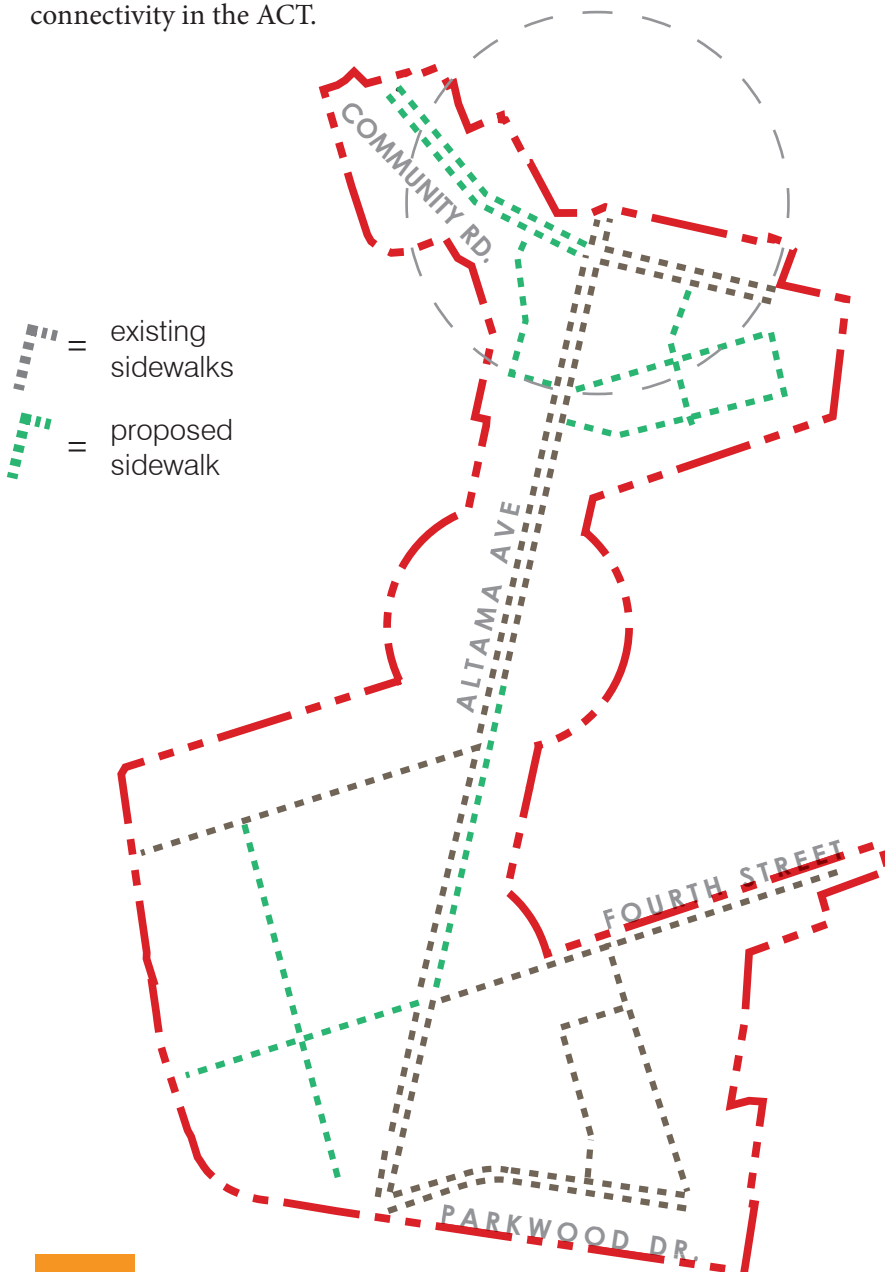


The presence of some user controlled, signalized intersections that are clearly marked provide a good base of pedestrian infrastructure.

Transportation | Altama Avenue Configurations

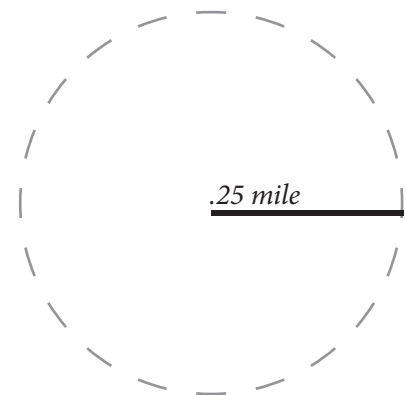
Pedestrian Circulation

With a good stock of existing sidewalks, the extension of the sidewalk from Fourth Street to the College of Coastal Georgia would improve pedestrian circulation. The existing sidewalk requires more regular maintenance but provides a great opportunity to improve overall connectivity in the ACT.



Vehicular Circulation

Private roads could become valuable thoroughfares for infill designs in the commercial node and could improve connectivity in the educational node.



A .25 mile radius is shown to illustrate the approximate distance for an 8 minute walk.

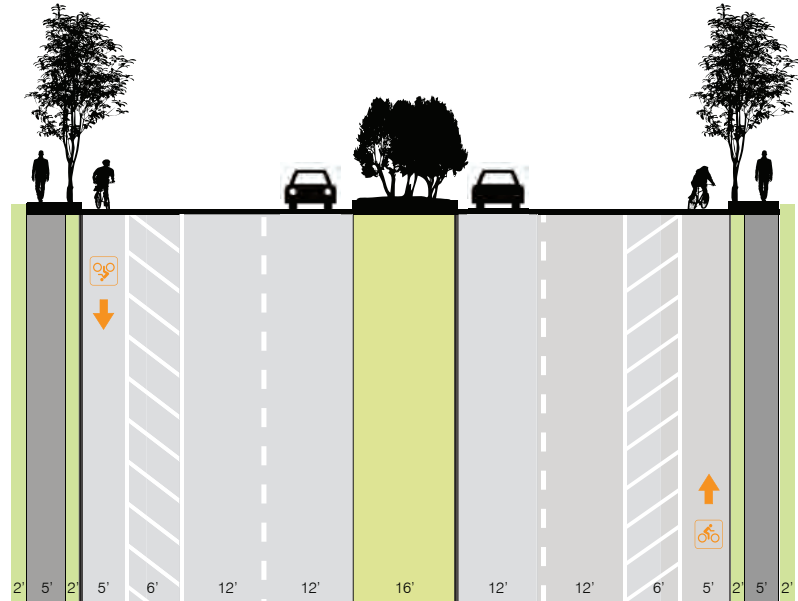
ROW Configurations

In the following section, three Right-of-Way configurations are described and illustrated. It is important to keep in mind that Altama Avenue through the ACT may be comprised of multiple configurations depending on community needs, suitability, and budget.

ROW Configuration A

Altama could be restriped to include a 5 foot bike lane with a 6 foot on-street painted buffer. This simple design is safe, inexpensive, and effective. The inclusion of site furnishings along the corridor such as bike racks and street trees further support pedestrian and bicycle travel.

The estimated cost for just striping the bike lane is \$170,000. Estimated cost of the full streetscape, including sidewalks, street trees, street furniture, and other amenities is \$2.9 million, which includes engineering, contingency, and project administration. The estimated project schedule from the initial field-work to completion is 510 days (for the full Configuration A buildout). See the complete pre-engineering report in Appendix C for more information and an itemized price list.



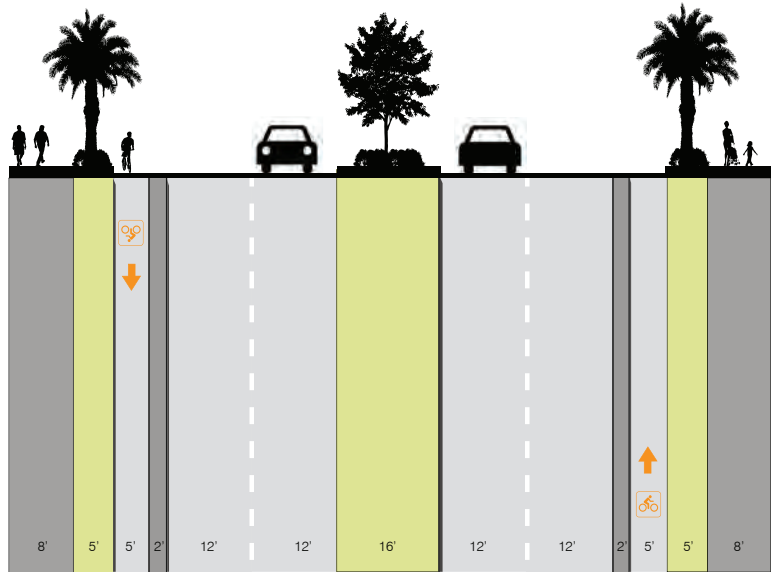
Configuration A

Transportation | Altama Avenue Configurations

ROW Configuration B

This image shows Altama Avenue with a 5 foot bike lane separated and protected from vehicular traffic by a 2 foot curb. This redesign includes wider sidewalks, street trees and other site furnishings such as benches and bike racks. Trees in the median enhance the visual character of the corridor and serve to calm traffic and lower ambient temperatures.

The estimated project schedule from the initial fieldwork to completion is 510 days. The estimated cost for ROW Configuration B is \$3.2 million. See the complete pre-engineering report in Appendix C for more information and an itemized price list.

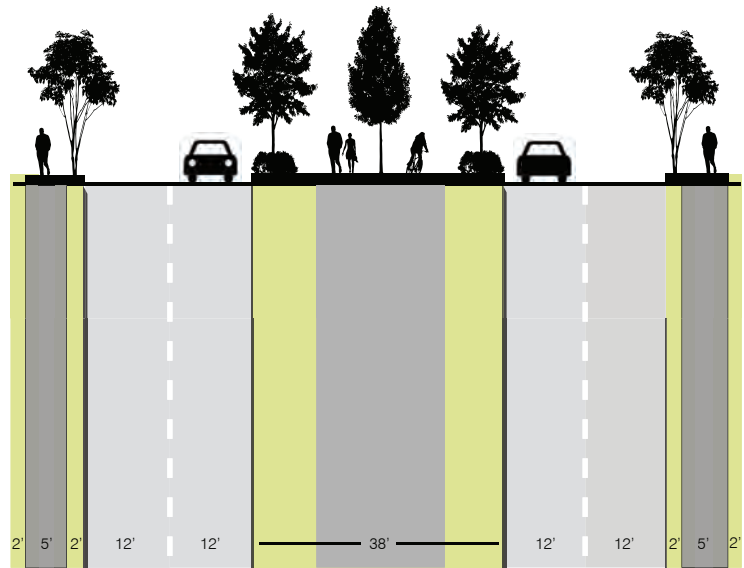


Configuration B

ROW Configuration C

In this configuration the median is expanded to 38 feet and includes a central multi-use path with native plantings, benches, pedestrian scale lighting, water fountains and trash bins, transforming the center median into a linear park connecting the corridor in a unified and visually appealing package. This configuration can also easily accommodate bus stops, a trolley car, light rail transit (LRT), or bus rapid transit (BRT).

The estimated project schedule from the initial fieldwork to completion is 510 days. The estimated cost for ROW Configuration C is \$5.14 million. See the complete pre-engineering report in Appendix C for more information and an itemized price list.



Configuration C

Transportation | Altama Avenue Configurations



ROW Configuration A



ROW Configuration B



ROW Configuration C

ROW Configuration A in Context



Existing Conditions

Step One: Add street paint to separate vehicular and bicycle traffic.

Step One



Step Two: Provide sidewalks and street trees.

Step Two



Step Three: Support local agencies and events, like banners on light poles. Increase safety with additional pedestrian oriented light poles and emergency call boxes. Guide infill development to adhere to architectural design guidelines.

Step Three



Transportation | Altama Avenue Configurations

ROW Configuration B in Context



Existing Conditions

Step One: Add curb separating vehicular traffic from bike traffic. Add new curb separating bike traffic from pedestrian traffic.

Step One



Step Two: Provide shade trees. Expand the sidewalk in high traffic areas and keep vegetation in areas of low traffic.

Step Two



Step Three: Support local agencies and events, like banners on light poles. Increase safety with additional pedestrian oriented light poles and emergency call boxes. Guide infill development to adhere to architectural design guidelines.

Step Three



ROW Configuration C in Context



Existing Conditions

Step One: Create a linear park by expanding the center median to 38' wide. Add bicycle and shade trees to center median.

Step One



Step Two: Support local agencies and events, like banners on light poles. Increase safety with additional pedestrian oriented light poles and emergency call boxes.

Step Two



Step Three: Guide infill development to adhere to architectural design guidelines.

Step Three

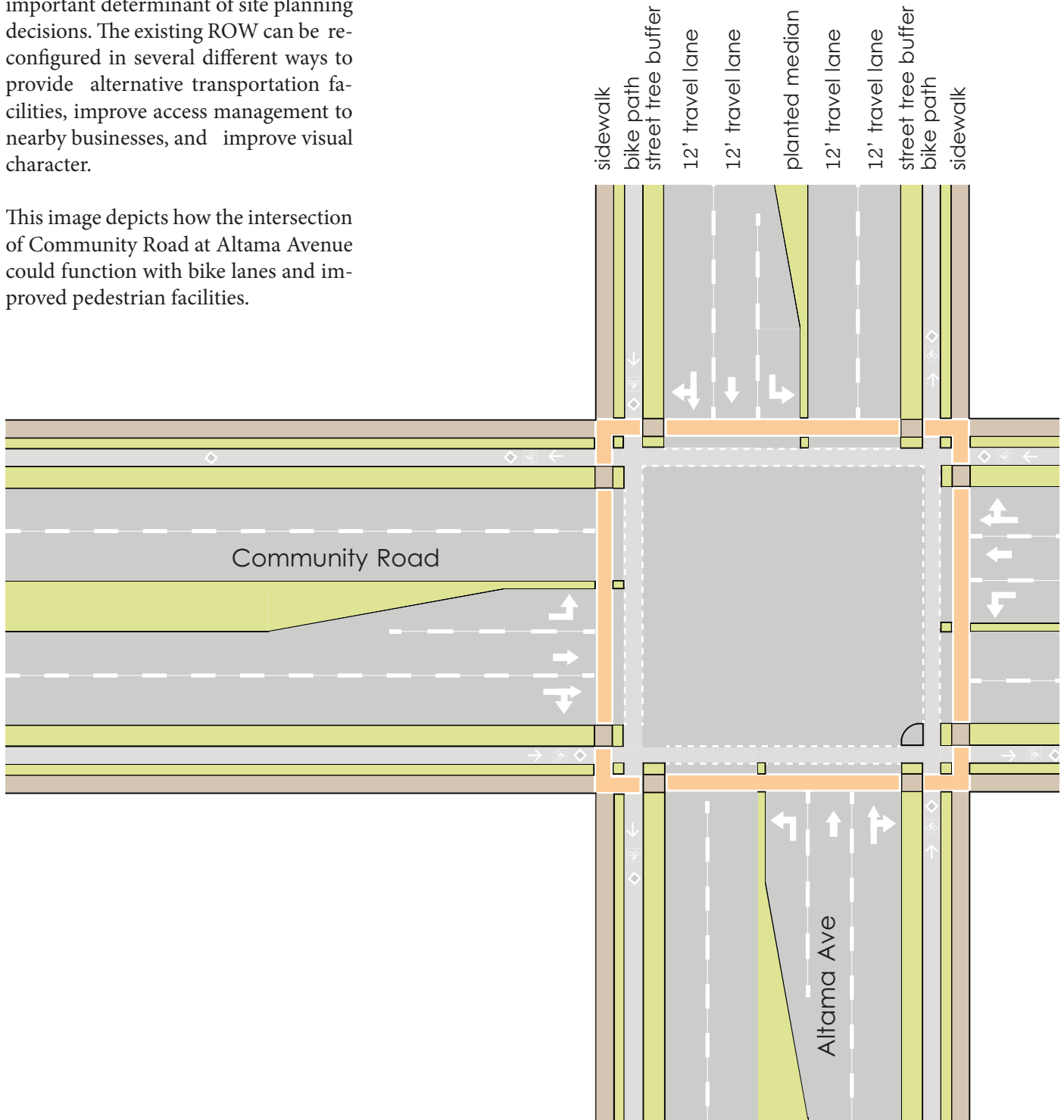


Transportation | Altama Avenue Intersection Safety

Commercial Node

The built environment is a complex array of infrastructure. The design of the transportation infrastructure is an important determinant of site planning decisions. The existing ROW can be re-configured in several different ways to provide alternative transportation facilities, improve access management to nearby businesses, and improve visual character.

This image depicts how the intersection of Community Road at Altama Avenue could function with bike lanes and improved pedestrian facilities.



Education Node

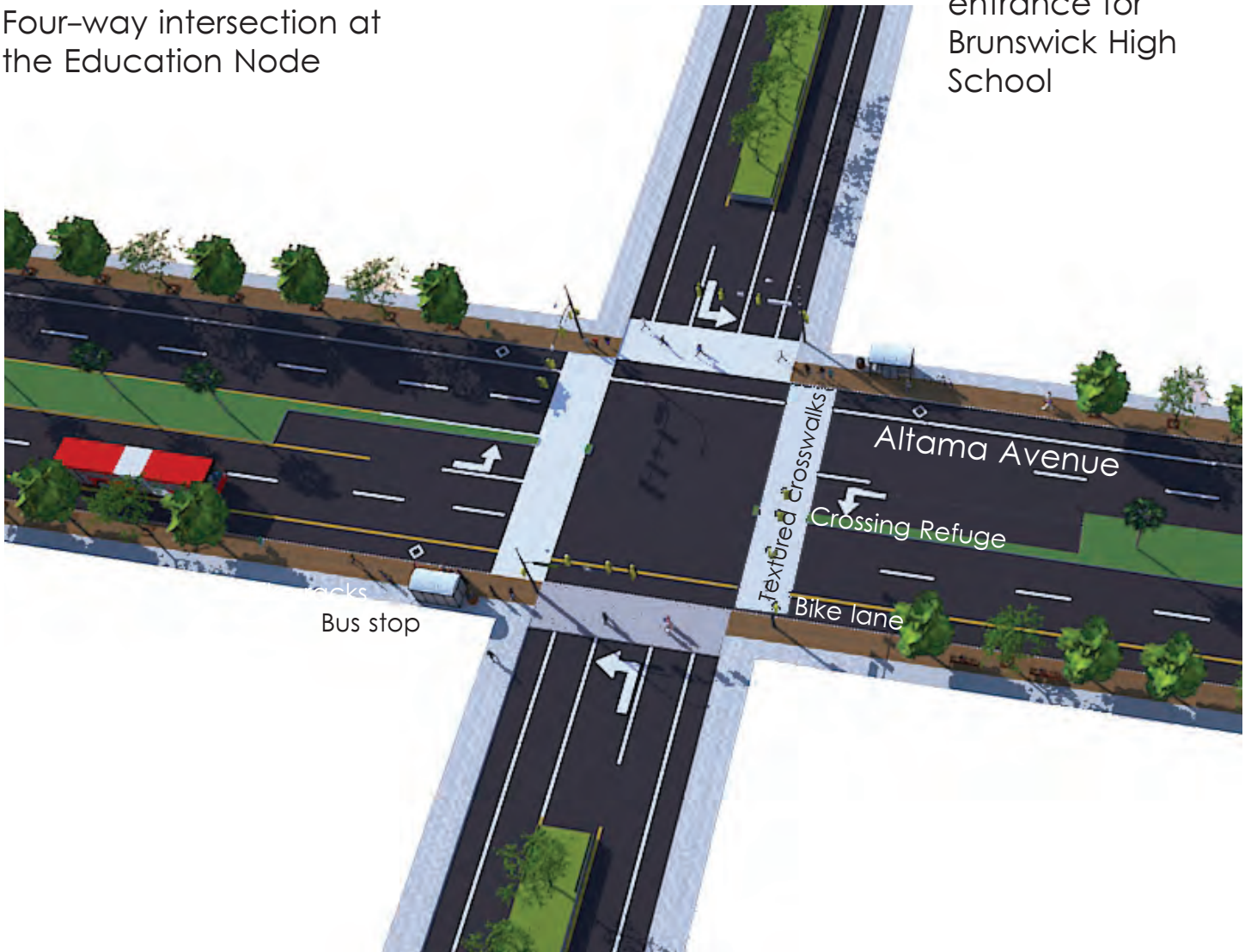
Illustrated is a transit-oriented design for the Education Node that incorporates an intersection on Altama Avenue for the College of Coastal Georgia and Brunswick High School. This intersection would facilitate the vehicular ingress and egress of the two institutions and increase pedestrian safety crossing Altama Avenue.



Transportation | Altama Avenue Intersection Safety

Four-way intersection at the Education Node

Proposed entrance for Brunswick High School



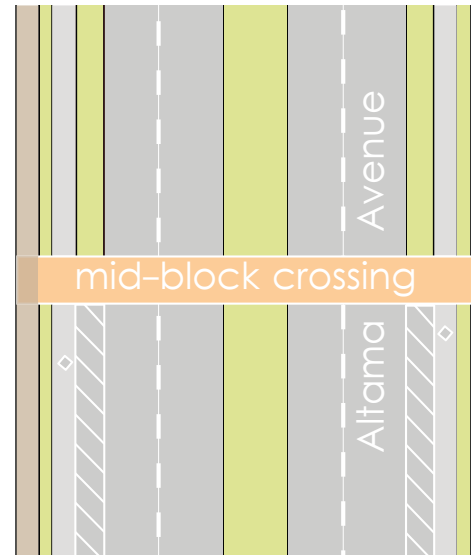
This image above shows a four-way intersection linking the entrances of Brunswick High School and the College of Coastal Georgia to one location on Altama Avenue. ROW Configuration B is illustrated but other ROW configurations are compatible with the four-way intersection design.

Proposed entrance for the College of Coastal Georgia

Mid-block intersection

This image depicts a typical mid-block crossing. This type of crossing can be used in any of the suggested right-of-way options.

The aerial view of Altama Avenue to the right illustrates how mid-block intersections can improve pedestrian movement across the road. This type of crossing shortens the pedestrian's distance to cross vehicle lanes and provides a larger, more comfortable median for pedestrian refuge.



Transportation | Mass Transit

Bus Stops

With expectations of future growth in the area, mass transit services may become a viable option. Illustrated below is how a transit stop would look with Configuration A.

Bus stop locations with bus shelters, trash cans, bike racks, wayfinding signage, and streetlighting help to provide a more convenient, efficient, and attractive experience for commuters. Bus service should be considered as part of the long-term growth plan for the community as funding is made available or a T-SPLOST is passed.

Bus stop and bike lane configurations are meant as conceptual design ideas only. Final designs, including those for the bus stop-bike lane interactions, should be determined by design engineers following the guidelines of the [Manual on Uniform Traffic Control Devices, Chapter 9C. Markings](#).



Green Infrastructure



green infrastructure: *(n) an interconnected network of open spaces and natural areas, such as greenways, wetlands, parks, forest preserves, and native plant vegetation, that naturally manages stormwater, reduces flooding risk, and improves water quality.*

Green Infrastructure | Inventory

Inventory

Green Infrastructure includes strategically planned infrastructure that helps reduce human impact on local and regional ecosystems. This can include utilizing natural and man-made systems. Examples of green infrastructure are: green roofs, vegetated bioswales, street trees, permeable paving systems, and rain water harvesting cisterns.

A photographic site inventory was used to assist with the incorporation of green infrastructure within the ACT District. The site inventory primarily focuses on the amount and types of vegetation planted throughout the corridor and the existing storm water management systems. The combination of the photographic inventory, GIS data, and the comments and suggestions from the ACT Design Steering Committee meetings provide a complete overview for the inventory. The information gathered from the inventory allows for a comprehensive, thorough analysis of the site's infrastructure and possible solutions. Together, the inventory and analysis are used to begin the design process and discover possibilities for incorporating economically feasible and environmentally friendly suggestions for green infrastructure in the ACT District.



1. Signage and facilities at Goodyear Park
2. Bioretention in parking lots of new facilities on the College of Coastal Georgia campus
3. Stormwater quality awareness decals on manholes
4. Streetscape, signage, and bioswale along Fourth Street
5. Pine tree canopy on the campus of the College of Coastal Georgia
6. Landscape buffer plantings along Community Road



7. Exposed dumpster near Cypress Mill Square
8. Parking lot plantings at Cypress Mill Square
9. Recreational facilities at Paula Park

10. Drainage easement off Rose Drive
11. Drainage easement behind Glynn Plaza Shopping Center

12. Drainage swale without plantings in the Rose Drive area

Green Infrastructure | Analysis

Analysis

With the data collected in the inventory, opportunities and constraints for improvement were identified. This analysis is the basis for the designs presented later in this chapter. The existing greenspaces throughout the corridor may provide opportunities to incorporate important points of interest along a connected greenway system.



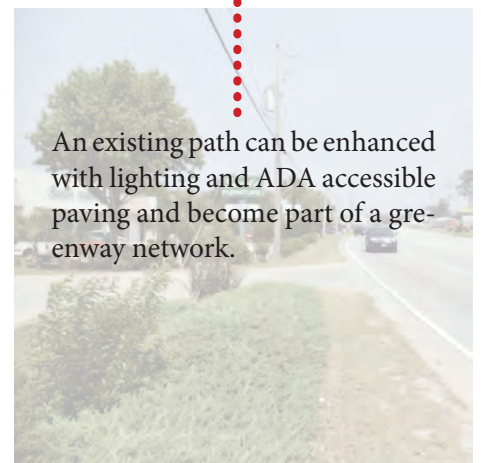
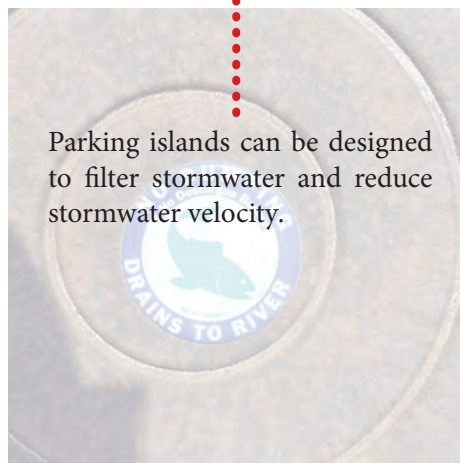
This drainage easement along Fourth Street is an opportunity for greenway connections.



Parking islands can be designed to filter stormwater and reduce stormwater velocity.

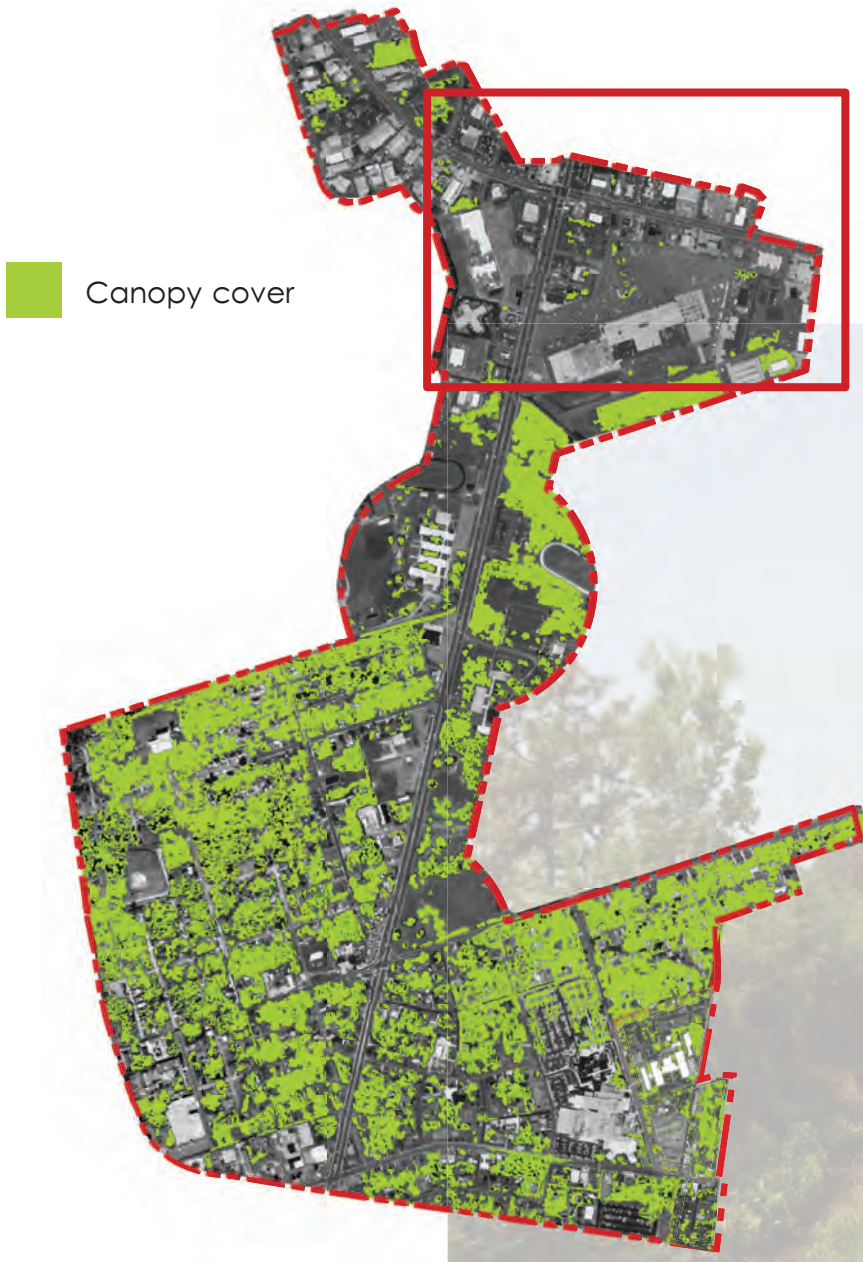


An existing path can be enhanced with lighting and ADA accessible paving and become part of a greenway network.



Vegetation

The commercial node of the corridor is lacking in vegetation. This area would be most positively impacted by the installation of street trees, bioswales, rain gardens, and planting beds. Large shade trees, in particular, make it more comfortable for pedestrians to circulate throughout the corridor. Including vegetation throughout the entirety of the District helps provide habitat for wildlife and at the same time, reduces the heat island affect.



Opportunities exist throughout the ACT District to use utility easements to support a greenway network.

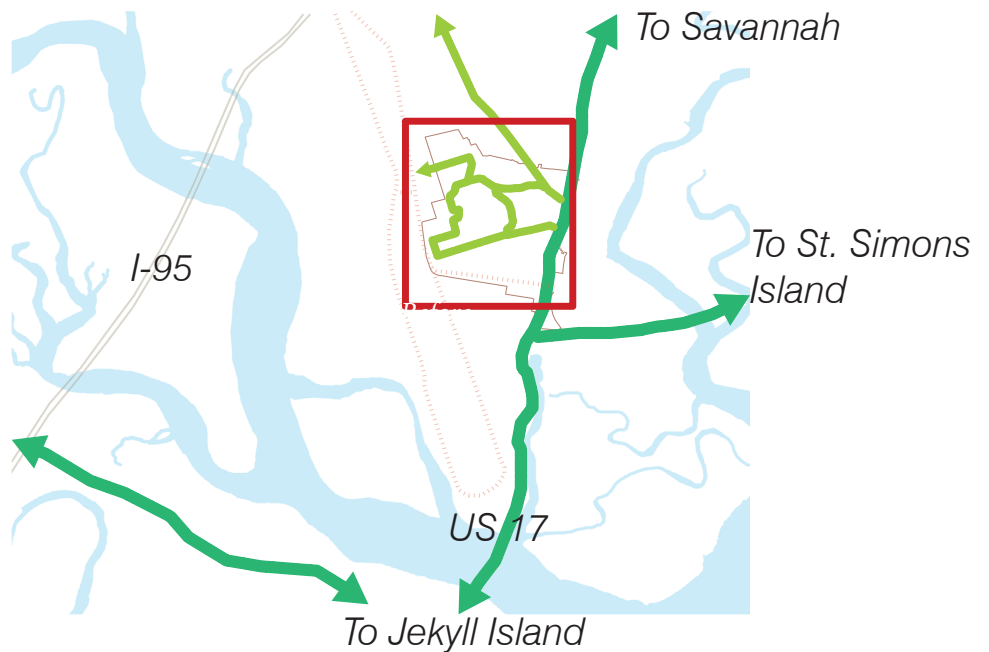


Green Infrastructure | Greenway Network

Greenway Connections

A greenway is a corridor or path that connects greenspaces, like city parks or natural forests, in order to create a protected area for wildlife and human recreation. Greenways often follow natural waterways, like streams, or man-made paths like abandoned railroads.

A suggested Brunswick Greenway could connect to the Coastal Georgia Greenway Trail which is a continuous green corridor for joggers, bicyclists, and nature enthusiasts. The Coastal Georgia Greenway, estimated to attract nearly a quarter of a million visitors by 2020, will generate revenue for local businesses and create jobs for trail construction and maintenance. The Coastal Georgia Greenway will eventually become part of the East Coast Greenway, running from Florida to Maine.



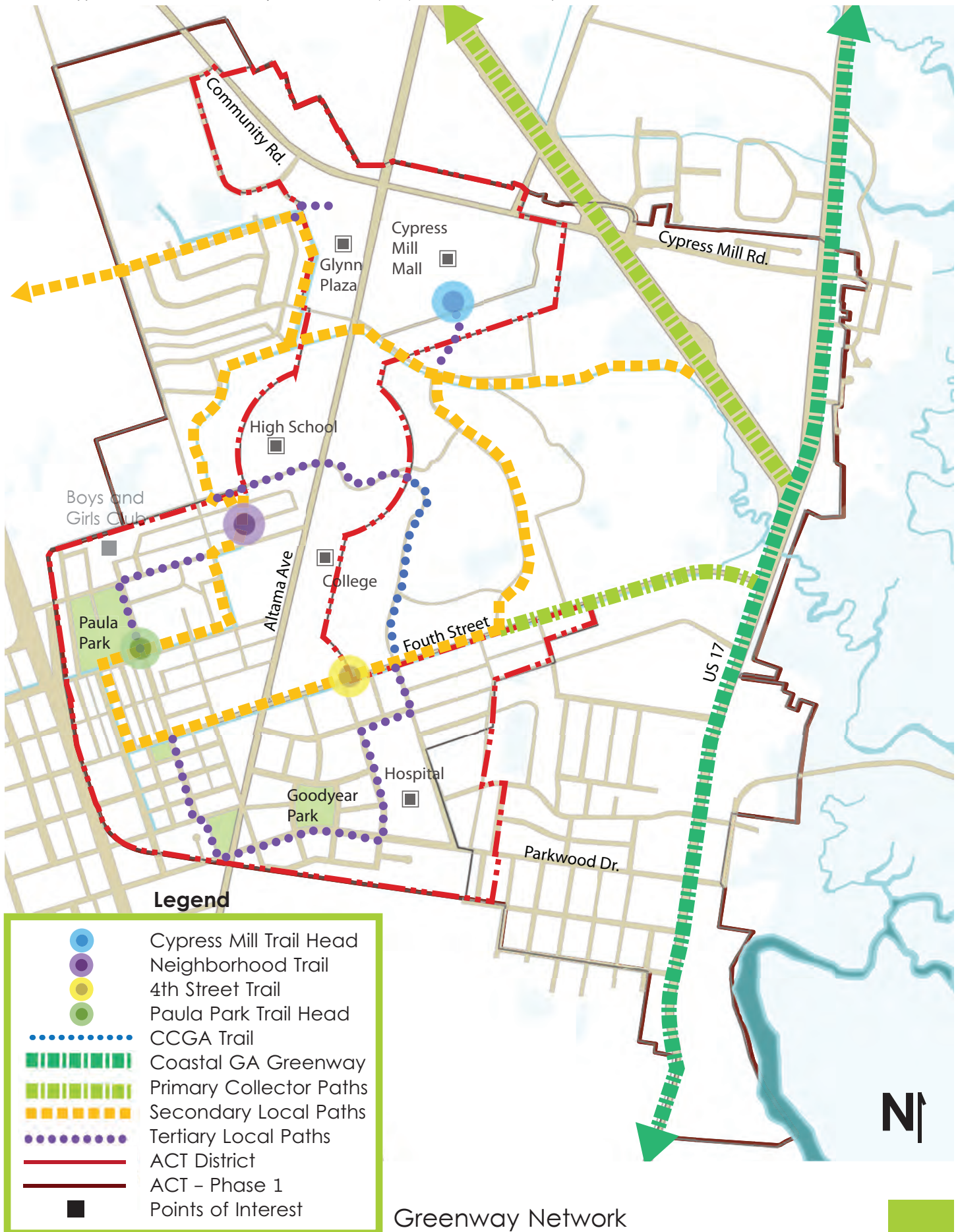
Integrated Greenway Network at the College of Coastal Georgia and Brunswick High School



before



after



Legend

- Cypress Mill Trail Head
- Neighborhood Trail
- 4th Street Trail
- Paula Park Trail Head
- ⋯ CCGA Trail
- ▬ Coastal GA Greenway
- ▬ Primary Collector Paths
- ▬ Secondary Local Paths
- ⋯ Tertiary Local Paths
- ▬ ACT District
- ▬ ACT - Phase 1
- Points of Interest

Greenway Network

Green Infrastructure | Greenway Network

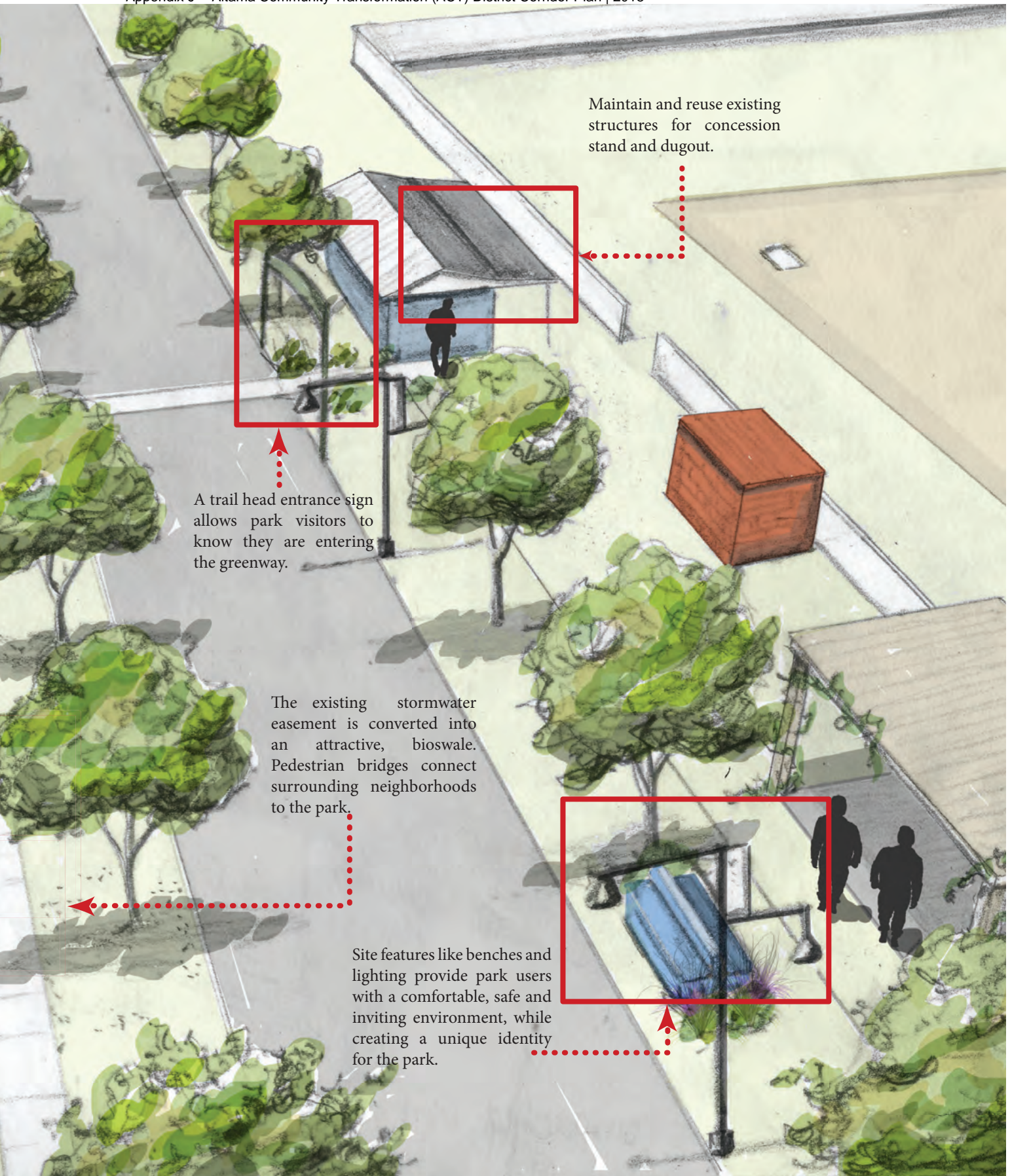
Neighborhood Trail at Paula Park

Neighborhood trails could connect District parks, like Paula Park on 6th Street, to the larger community. Neighborhood trails are also referred to as tertiary local paths. They should be between six and eight feet wide and should feature a grass buffer between the path and the roadway. Neighborhood trails provide residents with safe pedestrian routes and create strong connections among adjoining residential and commercial areas.



Greenway Site Key





Maintain and reuse existing structures for concession stand and dugout.

A trail head entrance sign allows park visitors to know they are entering the greenway.

The existing stormwater easement is converted into an attractive, bioswale. Pedestrian bridges connect surrounding neighborhoods to the park.

Site features like benches and lighting provide park users with a comfortable, safe and inviting environment, while creating a unique identity for the park.

Green Infrastructure | Greenway Network

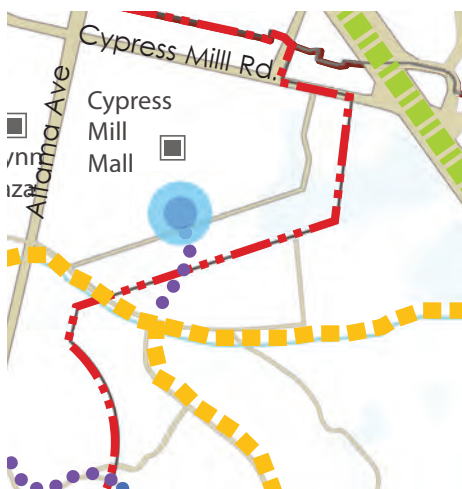
Cypress Mill Trail Head

The silhouette to the right shows a possible entrance to a primary local path within the proposed Brunswick Greenway. Primary local paths should range from 12-16 feet in width, allowing room for multiple pedestrians and bikers to utilize the trail. On each side, the trail is lined with at least five foot wide native planting bed or vegetated bioswales.

The image to the right shows a conceptual visualization of the trail head behind the Cypress Mill Square. The buildings in the background show the proposed infill, creating an inviting downtown feel. The trail could be easily accessible from the shops and restaurants and provides visitors of the trail plenty of dining and retail options.



Greenway Site Key



Secondary Local Paths

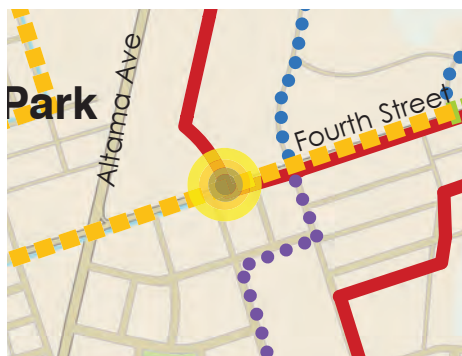
The silhouette to the right shows a possible secondary local path within the Brunswick Greenway. Secondary local paths should range from 10-12 feet in width, allowing room for pedestrians and bikers to simultaneously access the trail. A bioswale with native plantings borders the path, providing habitat for wildlife, and shade and visual interest for trail users.

The image to the lower right shows a conceptual visualization of Fourth Street near the secondary entrance to the College of Coastal Georgia. The path would safely and comfortably connect students and the neighborhood with the businesses along the Altama Corridor.

The blue arrows (lower right) highlight a storm drain that allows runoff water from the street to move under the sidewalk, flowing into the bioswale. The water then slowly infiltrates into the soil, lessening the impact of stormwater on the local sewer system, cleansing the water, and recharging local aquifers.

The light from pedestrian and vehicular lighting fixtures should be focused down. Light reflected into the night sky causes unnecessary light pollution and disrupts nocturnal creatures' activity.

Greenway Site Key



Green Infrastructure | Greenway Network

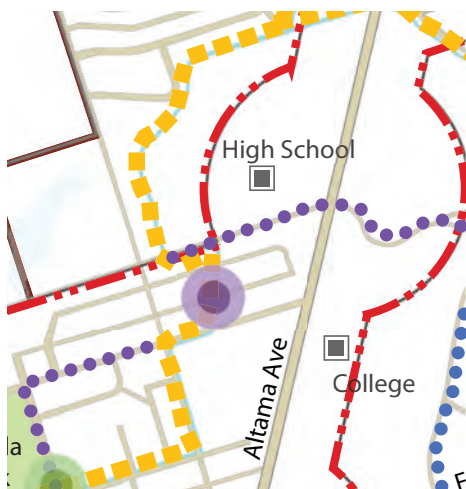
Tertiary Local Paths

The silhouette on the right shows a tertiary local path, the narrowest trail, that could run through neighborhoods, and to the Brunswick Greenway. Tertiary local paths should range from 6-8 feet in width, allowing room for mostly pedestrians to access the trail. A narrow strip of grass acts as a visual buffer from the street, making visitors feel safer.

This image shows a conceptual visualization of a tertiary path that follows the stormwater easement between Blain Street and Colson Street. The Brunswick Greenway trail could turn this unused piece of land into a neighborhood amenity. Storm drains allow water to flow directly into the bioswale and slowly infiltrate into the soil. There should be plenty of seating along the trail. Include pedestrian scale signage to create a sense of place along the Greenway.



Greenway Site Key

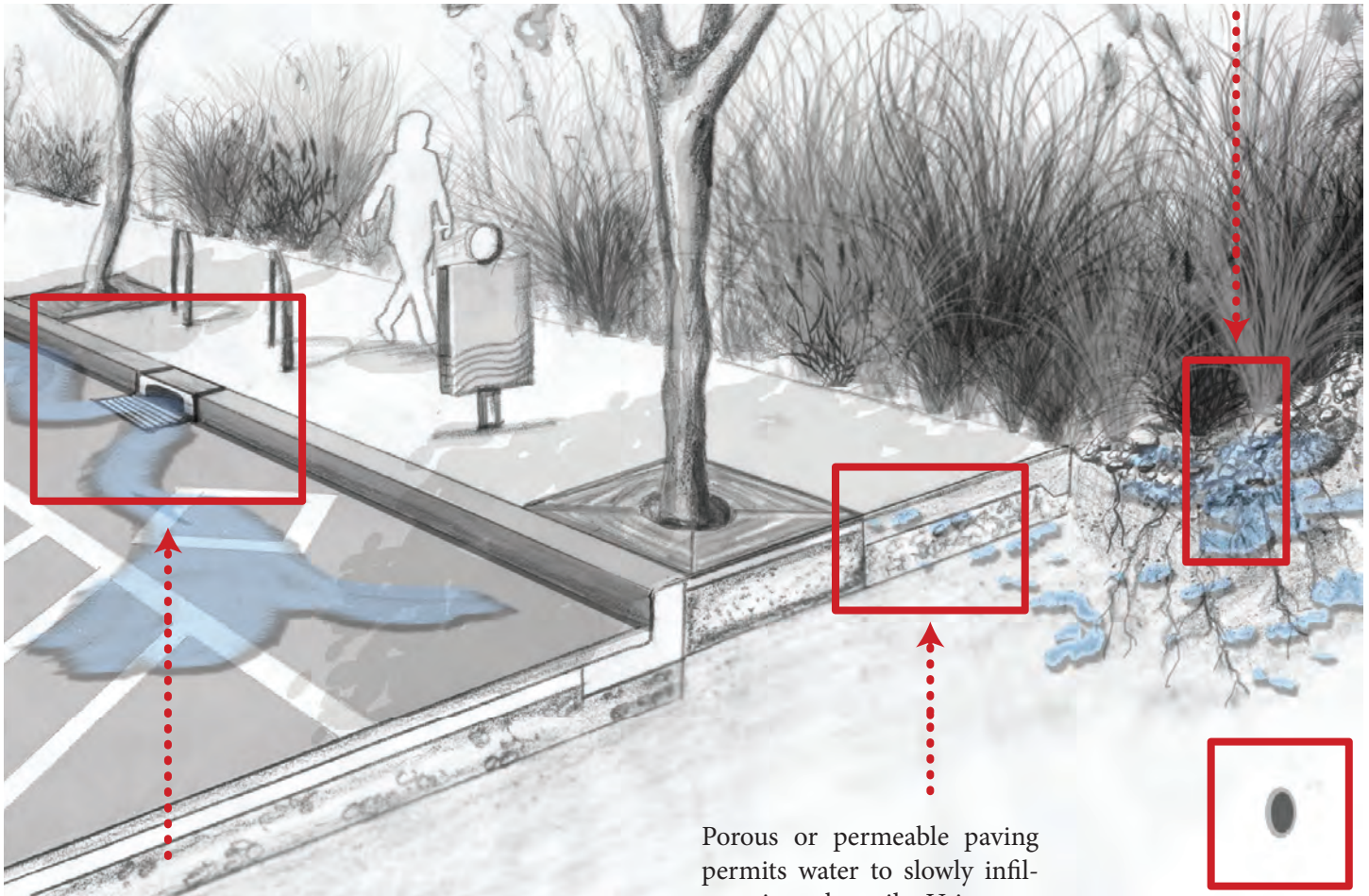


Green Infrastructure | Stormwater

Bioswale Mechanics

Bioswales are landscape elements designed to remove silt and pollution from surface runoff water and to reduce potentially hazardous flooding.

A prepared mixture of sand, rocks, and native soils in the bed of the bioswale allows for maximum infiltration of stormwater runoff.



Storm drain cuts along streets allow water to be piped into the bioswale and slowly infiltrate into the soil. The infiltration process helps clean the stormwater while it gradually percolates into the soil and recharges underlying aquifers.

Porous or permeable paving permits water to slowly infiltrate into the soil. Using porous concrete for sidewalks can help reduce the pressure on local stormwater systems.

An under-drain prevents the bioswale from flooding in heavy rain storms. The perforated drain is connected to the local stormwater system.

Green Infrastructure | Concepts

Utilizing Greenspace

The greenspaces throughout the Altama Corridor are underutilized, but present great opportunities for communal gatherings and activities. This large concrete pad in Goodyear Park, for example, could host a weekly farmers' market or community festival. Events like these would bring together people from throughout the neighborhoods, creating a greater sense of community.

This space could also be used as a basketball court with the simple installation of two basketball goals. In addition, painting lines on the pavement could encourage neighborhood kids to play games like four square or hop scotch. These games could stimulate community gatherings, as well as promote healthy outdoor activities.



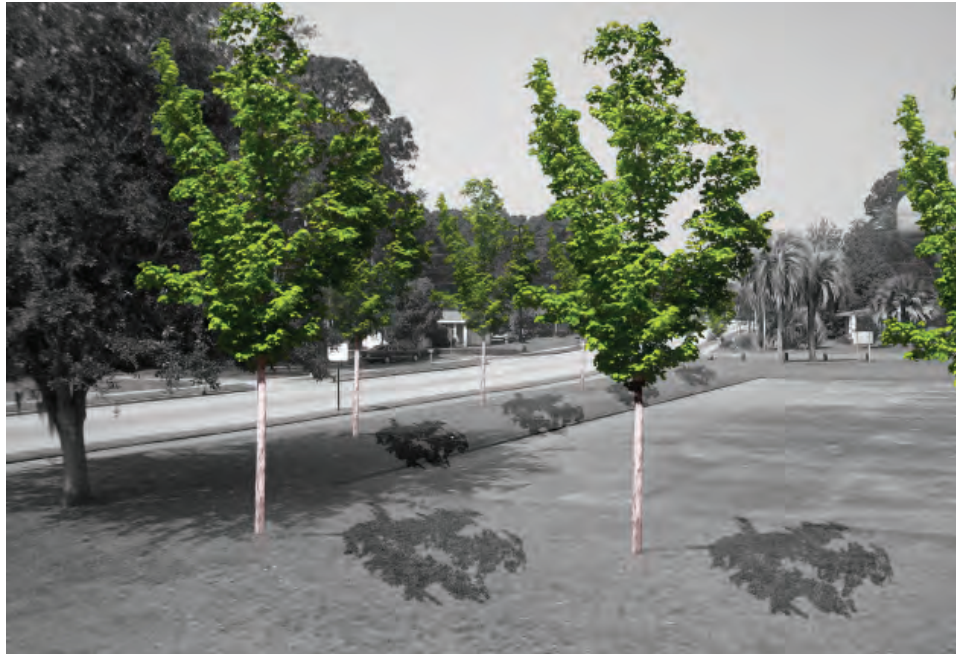
Existing conditions at Goodyear Park



Proposed uses at Goodyear Park

Streetscape Tree Farm

The planting of large shade trees along the Altama Corridor can be an expensive and a laborious process. To mitigate these costs, a Streetscape Tree Farm could be initiated. This process would involve the planting of small, inexpensive, and easy to manage hardwood trees in large open, park-like areas. Once the trees reach a certain age, they could be relocated to the corridor. The planting of smaller, easier to manage hardwood trees like live oaks, could provide the Altama Corridor with shade and cooler temperatures.



Tree planting at Goodyear Park

Bioswales

Bioswales or vegetative swales can be much more than maintained grass. Time, energy, and resources can be saved if the planting in these areas transition to drought resistant native grass mixes. Additionally, mowing heights could be adjusted according the distance to the road or sidewalk. For example, grasses closer to high traffic areas could be shorter in height and cut more often. Conversely, grasses in the bottom of vegetative swales could be cut at higher height and less often. These measures are an effective way to increase stormwater infiltration capabilities and reduce the maintenance costs.



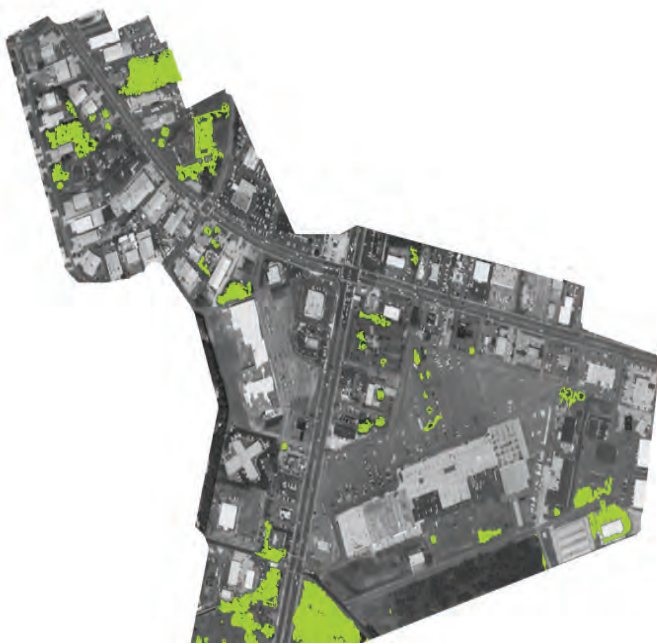
Improvements to the bioswale along Fourth Street

Green Infrastructure | Concepts

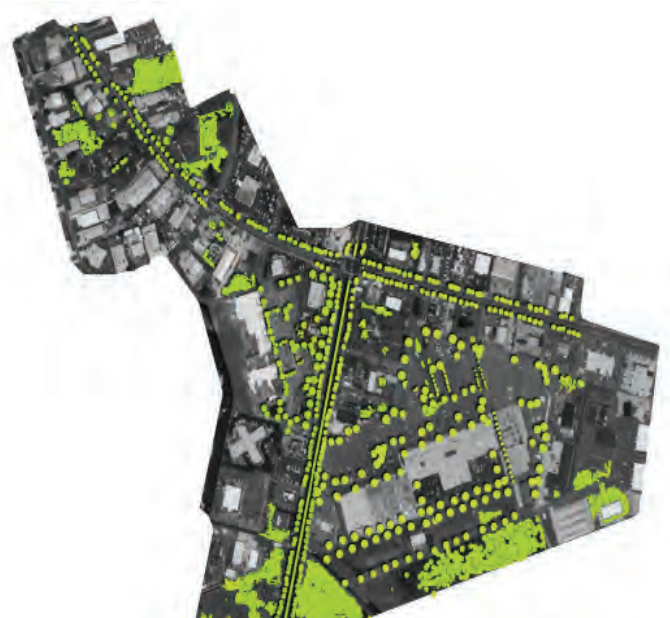
Parking Lot Improvements

Parking lot improvements in the commercial node will not only increase water and air quality but also make a more enjoyable experience for the shopper. Shade providing canopy trees like the ones illustrated to the right, can lower the ambient temperature of the area they surround.

Parking lot improvements can also increase the level of safety for the shopper. By reducing the number of curb cuts and unnecessary driveways, pedestrians walking along the sidewalk have fewer encounters with vehicular intersections.



Existing commercial node tree canopy



Proposed commercial node tree canopy



Proposed parking lot and streetscape



Existing parking lot island consists of only painted yellow stripes



Proposed parking lot island with vegetated bioswale

Green Infrastructure | Native Plants

Native Plant Palette

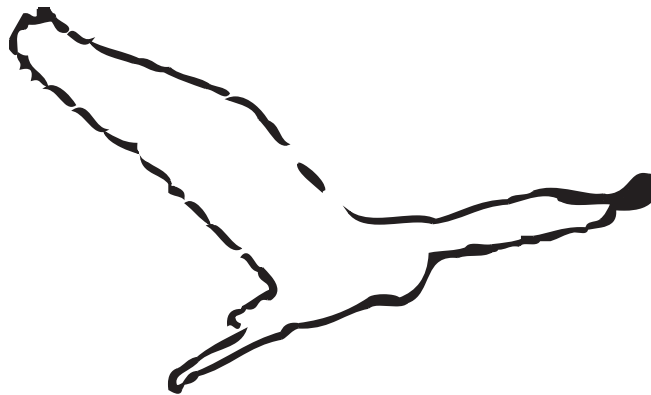
When choosing plants, it is important to consider many factors that are site specific, including the micro-climate, sun/shade requirements, soil type, heat tolerance, and moisture needs. By carefully selecting native plants that thrive in the specific site conditions, plantings will require less maintenance and attract native wildlife, like birds and butterflies.

Other elements that should be considered in plant selection are color, texture, and a variety of sizes. Varying the landscape will create visual interest for those passing by.

The University of Georgia Marine Extension Service has developed myriad extensive lists that provide information on plants appropriate for site-specific conditions. The plant lists can be found at www.coastscapes.org. This native plant search engine should be used to determine the best plant types for specific site locations. See Appendix D for additional information and resources.



Character of Place



character of place: *(n) confluence of geography, history, culture, and architecture of a defined location that reflects and discloses the journey of the civilization*

Character of Place | Inventory

The character of a place can be defined by physical, biological, and cultural attributes that make up an area. Historical, legal, aesthetic, and other socially significant attributes are all supporting elements to the character of place. A site visit and photographic inventory of Altama Avenue, specifically the Cypress Mill Square and Glynn Plaza shopping centers, were vital in understanding current conditions of the area. Understanding cultural features of the area help to give a clearer vision of opportunities and constraints presently found.



1. Signage for Rose Drive



2. Wayfinding signage for the Southeast Georgia Health System on Parkwood Drive
3. Signage for walking trail on the Southeast Georgia Health System campus



4. View of Glynn Plaza from Altama Avenue
5. Bench and sidewalk on the Southeast Georgia Health System campus
6. Trash cans and picnic tables at Goodyear Park



7. Architecture on the campus of the College of Coastal Georgia
8. Recreational business along Altama Avenue
9. Typical street light on Altama Avenue

10. Architecture at Cypress Mill Square
11. Entry signage along Community/Cypress Mill Road

12. Abandoned structure at Paula Park

Character of Place | Inventory

Site Furnishings

Here is an inventory of the current site furnishings. These furnishings include, traffic signals, caution signals, pedestrian crosswalks with signals, single and double overhead street lighting, trash cans, and benches. By identifying what site furnishings are currently in place, we may begin to understand how the area is being used and what areas are in need of site furnishings.



Legend

-  traffic signal
-  caution signal
-  pedestrian crosswalks
-  overhead vehicular lights
-  trash can
-  bench



Parking and Curb Cuts

This map shows where parking is located in the corridor. The majority of parking is located in the northern commercial area. The College of Georgia and the Southeast Health System also have large asphalt parking areas.

In addition to showing parking, the map also indicates where curb cuts are located. This is where traffic turns on or off of Altama Avenue from private lots or businesses, not other street-to-street intersections. In the northern part of the parking, most of these curb cuts are concentrated in the commercial area.

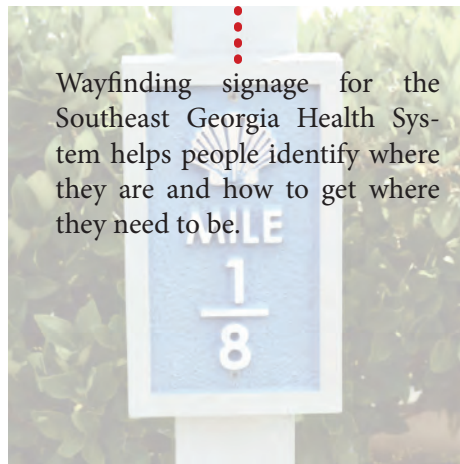


Legend

	parking lot
	curb cut

Character of Place | Analysis

After the inventory of the site was completed, the next step was to study the information. This analysis guides decisions made during the design phase and other steps in the project.



Wayfinding signage for the Southeast Georgia Health System helps people identify where they are and how to get where they need to be.



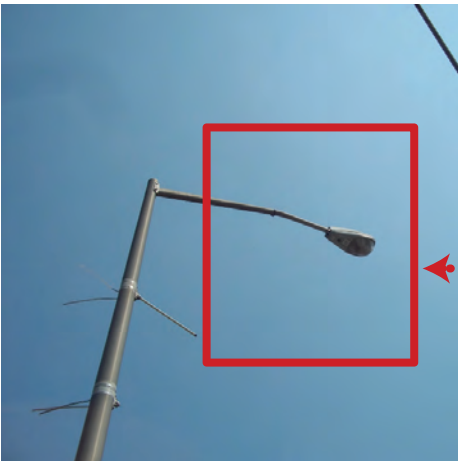
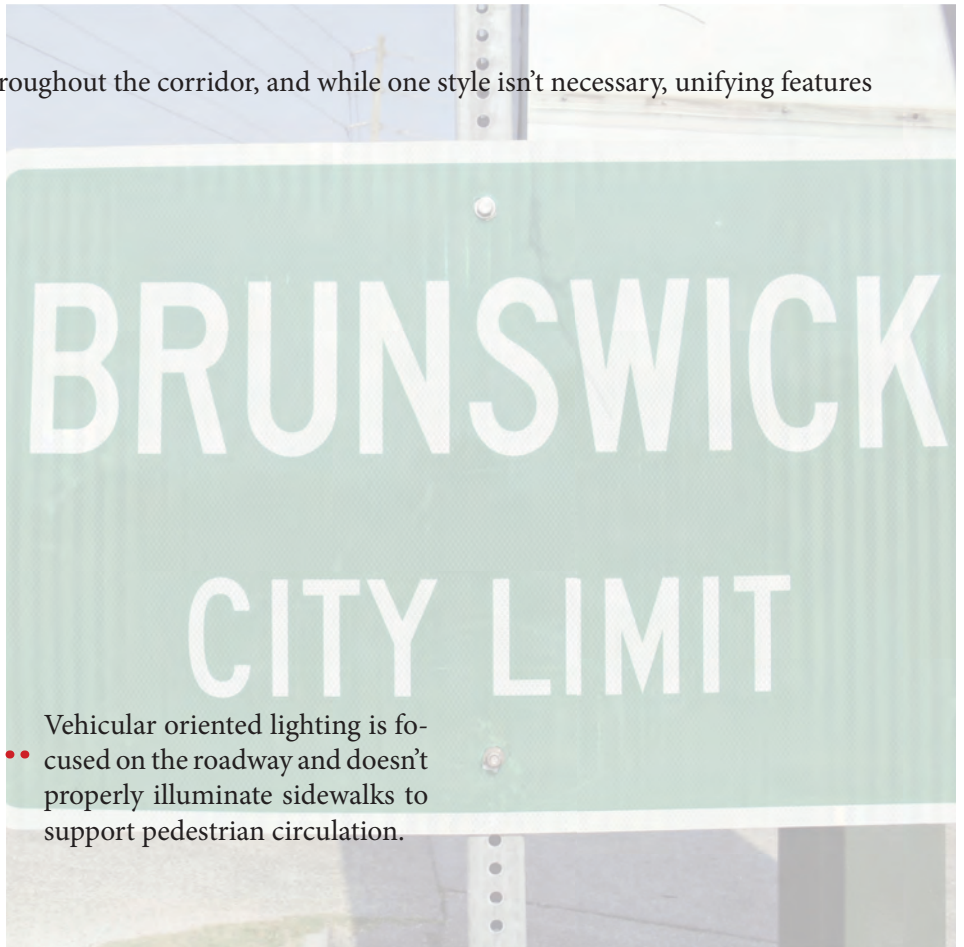
Trash cans like these found at Goodyear Park can reduce littering in the area.



A sense of entry onto Rose Drive and other commercial corridors can increase the visibility of the numerous businesses in the area.



Architectural styles vary greatly throughout the corridor, and while one style isn't necessary, unifying features will give the area a cohesive feel.



Vehicular oriented lighting is focused on the roadway and doesn't properly illuminate sidewalks to support pedestrian circulation.

Character of Place | Infill Development

Infill Concepts

The design concepts included in this section are just one set of ideas for the redevelopment of these aging commercial sites. The property owners, in consultation with their designers and the governing authority will determine final designs and uses. The owners' design engineers will also need to take into account the need for parking decks and service areas at build-out once the final design decisions have been made.

Each concept in this section is based on multi-use, multi-story development within the site. Commercial uses on the ground floor with residential and office uses on the upper floors are strongly encouraged. In some cases single use residential buildings are shown to provide a transitional buffer between intensive commercial areas and existing neighborhoods or natural areas. See pages 14 and 15 for land use and zoning techniques needed to implement these concepts.

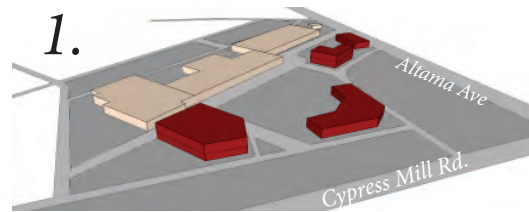
Cypress Mill Square

Cypress Mill Square is located at the southeast corner of Altama Avenue and Cypress Mill Road. This is a high traffic area and Cypress Mill Square has prime access to the large number of travelers that use Altama Avenue and Cypress Mill Road each day. Infill development is a technique used to take what is already in place and build around it in a way that will revitalize the area and spawn new growth. This phased approach to growth brings about positive change in gradual steps that can be better monitored and managed.

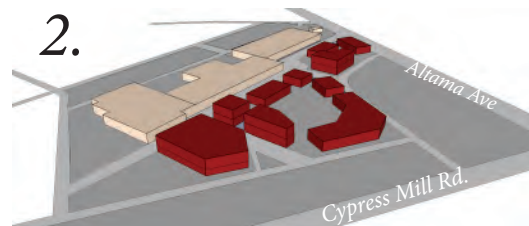
Phased infill development will provide opportunities for controlled economic growth, focusing the new development within the commercial area.



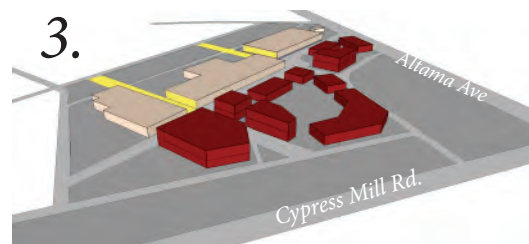
Existing conditions at Cypress Mill Square



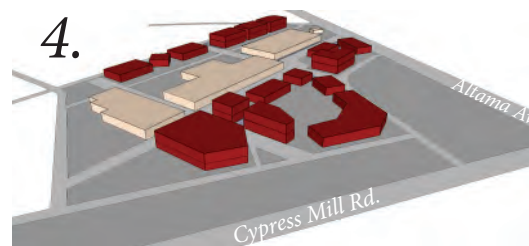
Phase 1: Introduce a defined series of interior streets and locate new buildings along perimeter, and add street trees. On-street parking is defined.



Phase 2: Further infill of buildings, including a parking deck, between existing and Phase 1 buildings.



Phase 3: New retail opportunities are created in the existing buildings and connections are made from the front to the rear by creating new streets that link the entire site.



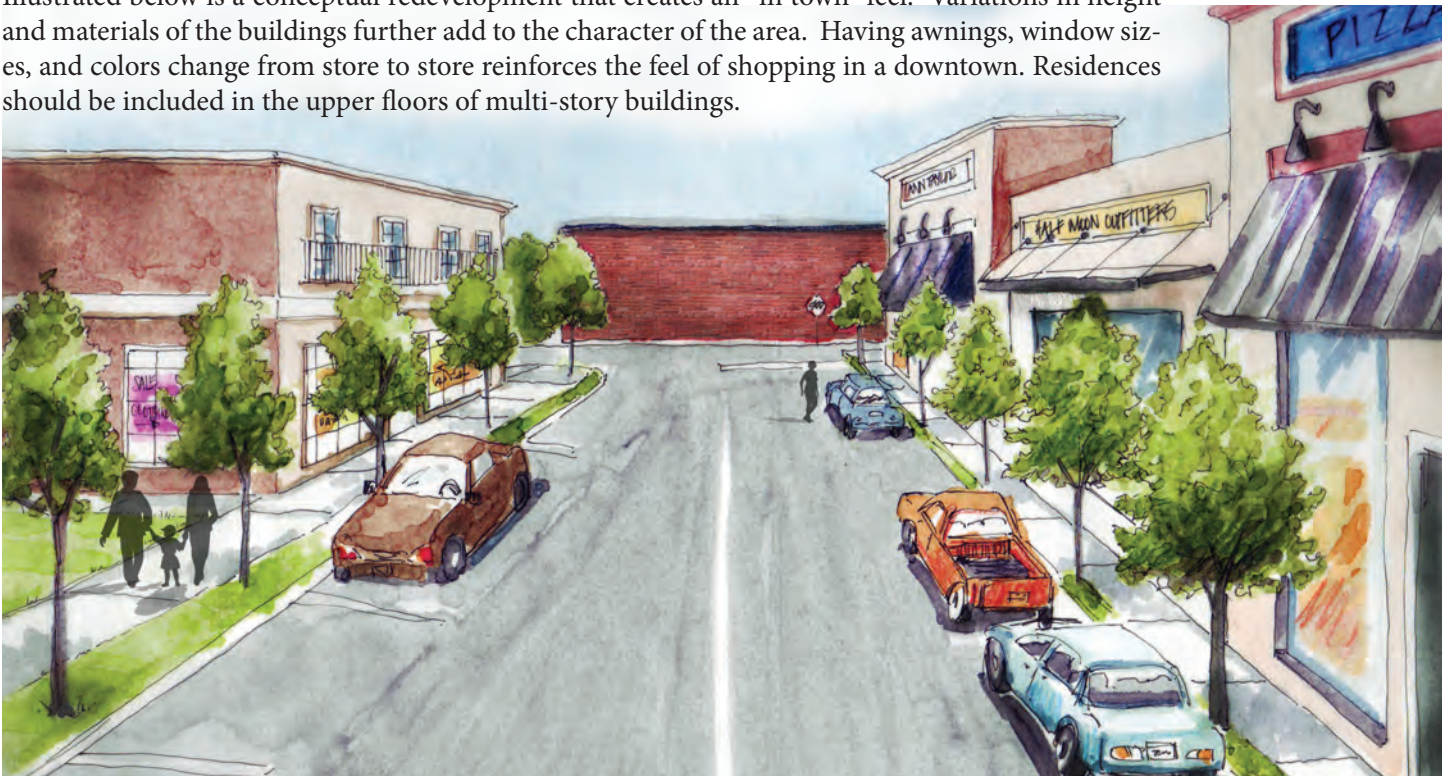
Phase 4: In the final phase, additional retail space is added along with residential apartments to complete the live-work-play concept.

This plan shows the site after all phases have been completed. The addition of on-street parking will help to control traffic speeds and will allow shoppers to park near the desired shops. Street trees provide shade and help to beautify the area. Having store fronts on all of the streets engages pedestrians and encourages shoppers to walk and remain in the area.

- Interior parking lot* —
- Commercial infill* —
- On-street parking* —
- Parking deck (multi-level)* —
- New streets to expand store frontage* —
- Residential infill* —
- Street trees* —



Illustrated below is a conceptual redevelopment that creates an “in town” feel. Variations in height and materials of the buildings further add to the character of the area. Having awnings, window sizes, and colors change from store to store reinforces the feel of shopping in a downtown. Residences should be included in the upper floors of multi-story buildings.



Character of Place | Infill Development

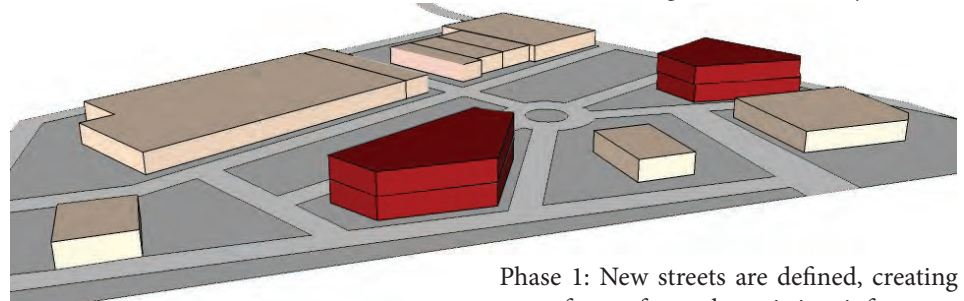
Glynn Plaza

Glynn Plaza is located across Altama Avenue from Cypress Mill Square. Two strong businesses, McDonalds and Walgreens, are located on Altama Avenue in front of Glynn Plaza, but patrons of these establishments rarely go beyond them and into the mall area. Because of the existing successful businesses nearby and the large expanse of parking lot, Glynn Plaza is an ideal location for infill development.

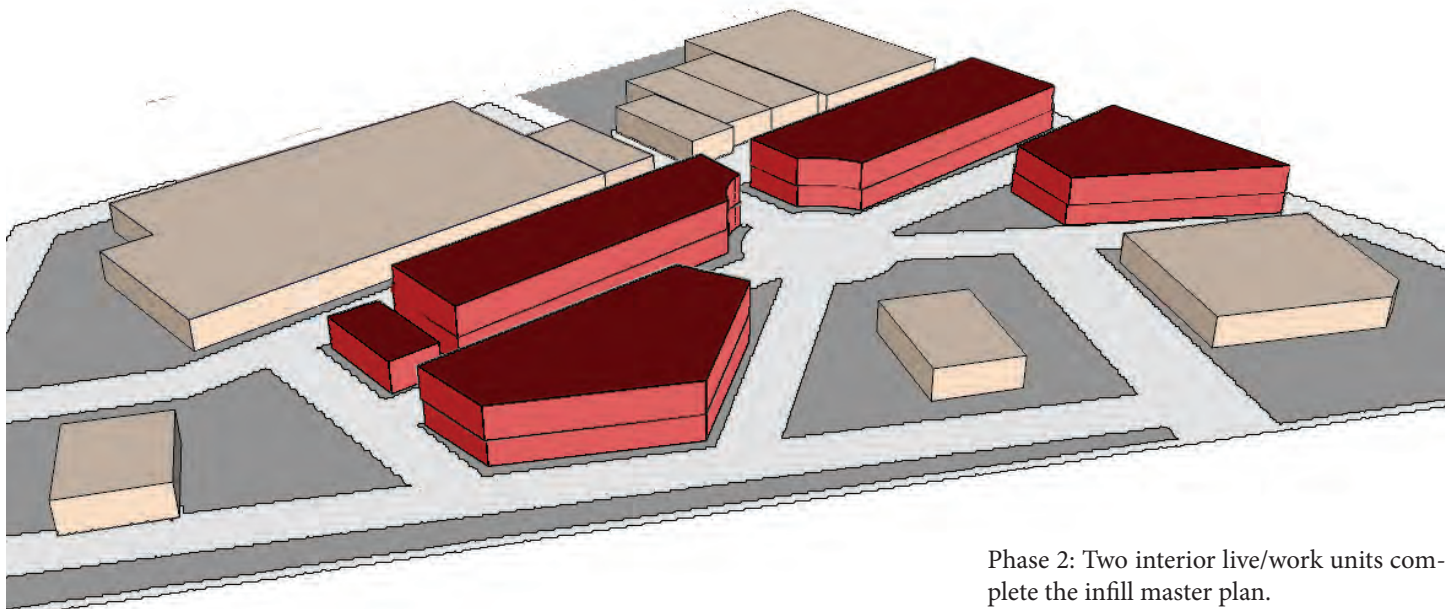
The proposed infill development shows how the completed design would look. On-street parking and a traffic circle are used to control the flow and speed of movement as well as add visual appeal. Street trees cool sidewalks for shoppers as they walk from one shop to the next. Like the Cypress Mill Square infill development plan, a phased approach is proposed, allowing for gradual transition from under utilized space to a fully functional retail center.



Existing conditions at Glynn Plaza



Phase 1: New streets are defined, creating store fronts from the existing infrastructure.



Phase 2: Two interior live/work units complete the infill master plan.



Build-out of Glynn Plaza



A phased approach is proposed allowing for gradual transition from under utilized space to a fully functional retail center. On-street parking and a traffic circle are used to control the flow and speed of vehicular movement. Street trees cool sidewalks for shoppers as they walk from one shop to the next. Residential uses should be encouraged for upper floors of multi-story buildings.

Character of Place | Infill Development

Infill Development

Here is an example of infill along Altama Avenue near the Education Node. Currently a business is set back from the street with parking between the street and business. The addition of buildings in the front will engage the street and make it more pedestrian friendly. The addition of green roofs to existing buildings will help make them more environmental friendly and help reduce the heat island effect. In this proposal, no buildings would be demolished and additional buildings would create more of a downtown feel that is often desired by pedestrians.

Before



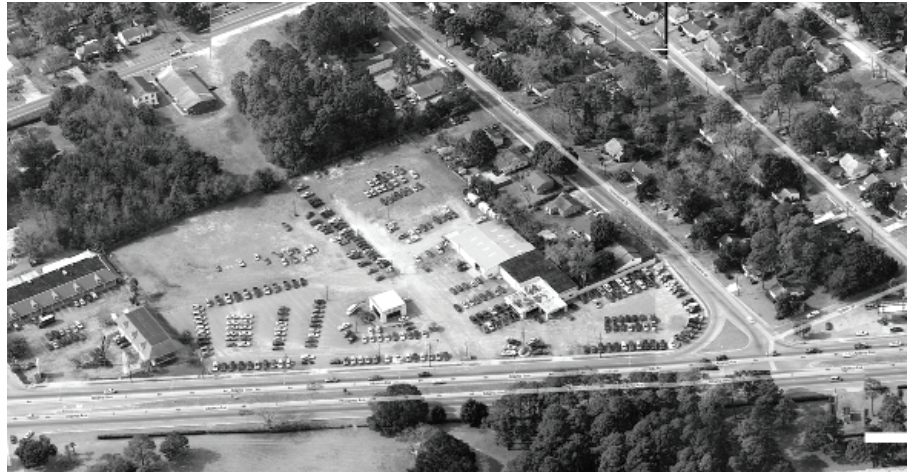
After



Infill Development

Here is another example of mixed-use infill development along Altama Avenue in the Educational Node. The new road configuration supports infill opportunities that highlight architecture of civic prominence. On-street parking is incorporated to slow traffic for pedestrians safety. High density mixed use development is located adjacent to the sidewalk to engage Altama Avenue and encourage pedestrian foot traffic.

Before



After

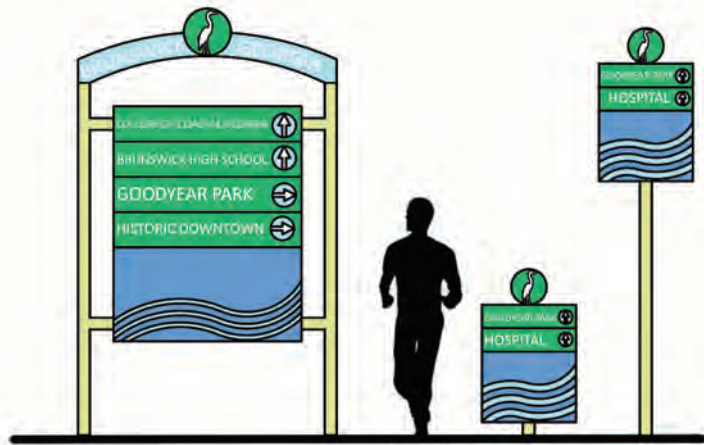


Character of Place | Site Furnishings

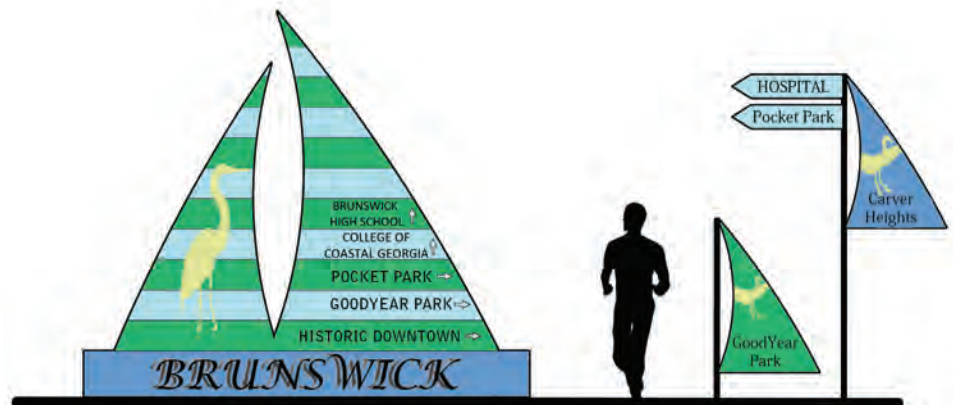
Wayfinding Signage

Wayfinding is a unified sign program that informs and visually knits together an area. Successful wayfinding signage allows people to determine where they are, what their destination is, and how to get there.

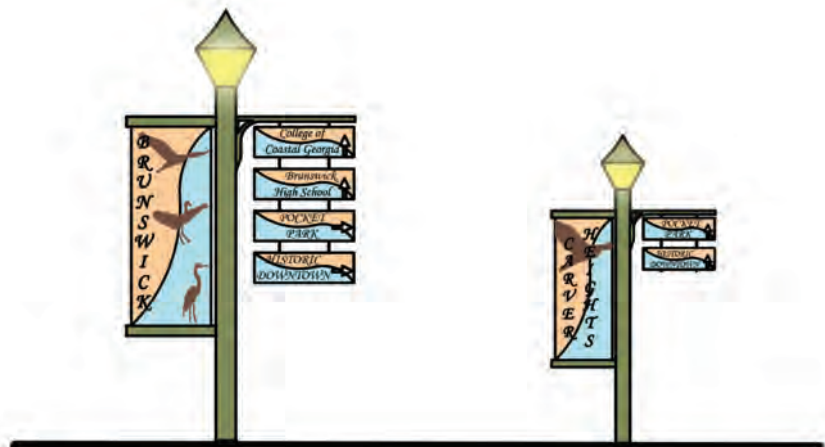
Illustrated are three different options for wayfinding signage for the ACT. Each option shows different sizes of signs which would be used at different points in the corridor depending if they were meant to be read by vehicular traffic, pedestrians, or both. Option A is a basic design but is easily readable and has hints that remind you that you are near the coast of Georgia. Option B is more direct in its coastal imagery. The large sign is shaped like a sail boat with the other signs having sail like elements. Option C is designed to have the look and feel of signage you would see in a downtown.



Option A



Option B



Option C

Example Furnishings In and Around the Corridor

Adding benches along the corridor is a basic way to make it more pedestrian friendly. Benches give people a place to rest, wait for friends, or relax in the shade.



Large signs provide information for vehicular traffic as well as people walking through the corridor. Placing trash cans throughout the corridor is an easy and efficient way to reduce litter and debris from the ACT.



Emergency call boxes and pedestrian scale lighting located in the area increase safety and encourage use during the day and night.



Lighting Options

There are a variety of lighting styles and options available. The ACT District should choose standard styles throughout the corridor that support pedestrian and vehicular lighting needs.



Character of Place | Zoning & Architectural Guidelines

Examples in and around the ACT District

The facades of downtown Brunswick shops have varying colors, heights, and ornamentations. The fenestrations change from shop to shop making it a comfortable and pleasant place to walk and shop. These attributes could be mimicked in the facades of the proposed infill development.



The buildings on the campus of the College of Coastal Georgia can influence future infill development with similar proportions and use of historically appropriate building materials. Doing this would give the commercial and educational nodes a unified feel and make students more comfortable when traveling off campus.



The style of architecture of condominiums in and around Brunswick could serve as an example for future development. Varying colors and materials coupled with recessed facades make it unimposing to pedestrians.



Commercial Architectural Guidelines

BUILDING ORIENTATION

- Buildings shall be oriented to face the primary thoroughfare.

SETBACKS

- Buildings shall be setback no more than fifty (50) feet from the edge of the right-of-way with parking located to the sides and rear of the building. Landscape buffers shall be used to separate structures from thoroughfares.
- No structures other than signs shall be placed between the front property line and the building's façade.

FACADES

Building facades shape the identity of the corridor, orient visitors, and serve as walls for public spaces. Building facades should have visual appeal and reflect the vision of the ACT District.

- All building facades should be comparable in quality to the primary entry façade.
- Building entrances should be distinct, intuitive, and visible from the street and parking areas.
- Many buildings may have multiple public entrances. The entrances should express a clear hierarchy.
- Commercial and other uses on the ground floor of buildings should have a minimum 70% glazing, as measured between two (2) and twelve (12) feet from the adjacent ground plane.
- Transparency and reflectivity should allow visibility from the street during the day.
- Maximum building glazing is 70% of the total surface of each facade.
- Facade treatment should reflect solar orientation. To reduce solar heat gain and glare, designers are encouraged to utilize vegetation, screens, louvers, roof overhangs, recessed windows, light shelves, and/or high efficiency glazing.

FENESTRATION

- The length of façade without intervening fenestration or entryway should not exceed twenty (20) feet.
- Fenestration shall begin not more than two (2) feet above the floor and shall extend to a height not more than twelve (12) feet above the floor.

- Fenestration shall be provided for a minimum of sixty percent (60%) of the length of street frontages.
- Entryways may be counted towards fenestration requirements.

BUILDING HEIGHTS

- Building heights should not exceed five stories or 60 feet in height.
- Rooflines shall be broken up so that the roofline shall not go for more than one hundred (100) feet without changing height.
- Cornices shall be utilized on the front of the building.
- A flat roof must be concealed by a parapet wall along the roofline to conceal mechanical equipment.

MATERIALS AND COLORS

Materials and colors unify buildings and link the development to the natural landscape.

- Materials and colors should draw on regional examples and the natural environment.
- Public areas, building entrances, and ground floors should use durable, long lasting materials carefully detailed.
- Buildings shall use materials such as brick, pre-cast concrete, and large expanses of windows on elevations oriented toward the primary streets.
- Minimize the number of primary exterior building materials to three, with one serving as the dominant cladding.
- Appropriate exterior wall materials are brick, stucco, wood or artificial siding, or natural stone.

PARKING

- There shall be a minimum ten (10) foot vegetative buffer around parking areas. Buffers shall consist of densely planted trees and shrubs.
- Trees shall be at least two and one-half (2.5) inch diameter at planting.
- Curb cuts shall be kept to a minimum to prevent problems with vehicular and pedestrian traffic.
- Where possible, curb cuts shall be shared between neighboring properties.
- Parking lots shall connect with adjacent parking lots.

Character of Place | Zoning & Architectural Guidelines

ACCESSORY STRUCTURES

- Accessory structures shall be consistent with the design of the dominant building.
- Trash cans and benches shall be free from advertisements and shall be constructed using metal, wood, brick, or stone.

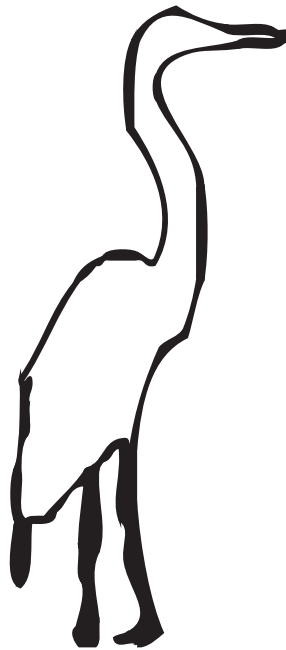
MECHANICAL EQUIPMENT, UTILITIES, AND DUMPSTERS/RECEPTACLES

- Architectural features such as parapets shall be used to screen mechanical and HVAC equipment from view by pedestrian and vehicular traffic.
- Mechanical equipment, HVAC systems, and/or utilities located at ground level shall be screened from pedestrian and vehicular traffic through the use of fencing and vegetation.
- Any dumpster, trash, grease, or waste receptacle shall be located at the rear of the property. Any such receptacle shall not be visible from the public right-of-way and shall be enclosed (not able to be seen from front, sides, or rear) by a wall.

SIGNAGE

- Freestanding signs shall be no more than seven (7) feet tall and ten (10) feet wide.
- No property shall have more than two (2) signs.
- Signs affixed to buildings shall not extend above the roofline.
- Signs affixed to buildings shall not occupy more than twenty percent (20%) of the façade.

ACT District Partners



partner (*n*) *a person or organization who shares or is associated with another in some action or endeavor; sharer; associate.*

ACT District Partners

ACT Design Steering Committee

Ron Adams
 Jim Andersen
 Mark Baker
 Al Boudreau
 Michael Butcher
 Aaron Carone
 Greg Carver
 Toni Cockeram
 David Dantzler
 Patrick Ebri
 Patti Fort
 Arne Glaeser
 Cate Gooch-Coolidge
 Rob Grotheer
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 Jo Claire Hickson
 Barbara Hurst
 Mia Knight-Nichols
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 Walter McNeely
 Kelly O'Rourke
 Jerry Rhyne
 Midi Shaw
 Tamela Shirah
 Bobby Shupe
 Ben Slade
 Jeffry Smith
 Mark Spaulding
 Shannon Thompson
 Anita A. Timmons
 Ken Tollison
 Yolanda Ward
 Chris West
 Joel Willis
 Woody Woodside

Archway Executive Committee

Joel Willis (*Chairman*), *Brunswick and Glynn County Development Authority*
 DelRia Baisden, *Southeast Georgia Health System*
 Pat Grozier, *Pinova, Inc.*
 Dr. Valerie Hepburn, *College of Coastal Georgia*
 Mary Hunt, *Glynn County Board of Commissioners*
 Jerry Mancil, *Glynn County Board of Education*
 Tony Sammons, *Georgia Power*
 Bryan Thompson, *City of Brunswick*

Ex Officio Members

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 Al Boudreau, *Glynn County School System*
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 Bill Dawson, *Georgia Ports Authority*
 Greg Evans, *UGA Marine Extension*
 Keren Giovengo, *UGA Marine Extension*
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 Keith Morgan, *Brunswick-Glynn County Joint Water and Sewer Commission*
 Randal Morris, *Georgia-Pacific*
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College of Family and Consumer Sciences
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Small Business Development Center
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Design Team Students: Mario Cambardella (Lead), Daniel DeLaigle, Jason Ernest, Kaitlyn McShea, and Cassie Nichols

I. PREFACE

1.1 PURPOSE

The City of Brunswick launched the Glynn Avenue Design Framework Initiative to create a new framework to guide development and redevelopment along U.S. Highway 17 / Glynn Avenue, which serves as a gateway to the City of Brunswick and the Golden Isles of Georgia. The City initiated this project due to decline and disinvestment in some of the commercial areas along Glynn Avenue.

Prior to initiating development plans, the reader is strongly encouraged to review the *Glynn Avenue Design Framework Charrette Summary, May 10 - 13, 2016*, to more fully understand the community vision for Glynn Avenue.

1.2 GOALS

Active Placemaking

Create a sense of place

Market Realism

Incubate incremental development

Community Predictability

Provide a nimble framework for organic, predictable growth

1.3 INTENT

The Guiding Principles articulate the long-term vision for Glynn Avenue. The Design Principles provide the standards for achieving this vision over time. All development proposals, particularly those requesting exceptions, developments in special districts, or similar instances of special review, shall conform with the principles set forth below.

1.3.1 Guiding Principles

1. Glynn Avenue should reflect vernacular architecture appropriate to coastal Georgia.
2. Our marshes, waterways, and scenic vistas are natural resources that should be available and accessible to all.
3. Responsible development should minimize impact to the sensitive natural environment, particularly along the eastern edge of Glynn Avenue.
4. Access to properties along Glynn Avenue should be safely and easily accessible for pedestrians and cyclists, as well as motorists.
5. Individual development should respect and contribute positively to the public realm.
6. Glynn Avenue should evolve into an activity center that is complimentary to, but not competitive with, downtown Brunswick.
7. Investment in the public realm should guide and enhance private sector investment.

1.3.2 Design Principles

1. Public Waterfront + Public Space

The marsh and waterfront are public resources and should not be privatized for the enjoyment of only a few. Maintaining public access along the marsh and waterfront is a high priority.

Public access may be achieved through a roadway along the waterfront which continues the design elements of Main Street - on-street parking, generous sidewalks, street trees, etc., or through a waterfront park or pedestrian promenade along the marsh.

2. Pedestrian-orientation

The current condition of Glynn Avenue does not lend itself to the creation of a 'Main Street.' However, this does not mean that the desire to create walkable, human scaled places should be abandoned.

These regulations set forth a development strategy to capture passing vehicles while also fostering a 'Main Street' character on streets parallel to Glynn Avenue.

3. Mixed-Use Environment

The creation of a mixed use environment provides an ideal transition from more highway-oriented scale along US 17 to more neighborhood-compatible scale, while accommodating a variety of uses, including commercial, office, institutional, and residential.

4. Blocks + Streets

Building an interconnected network of compact blocks is critical to ensure a walkable area that fosters diverse uses and building types. This block pattern can still accommodate large-scale retailers, but does so in a way that maintains the importance of human-scaled development.

Streets should generally include on-street parking, street trees, sidewalks, and pedestrian amenities such as benches, street lights, trash facilities, etc. Highly connected streets are important to provide access without requiring traffic to re-enter Glynn Avenue to reach nearby destinations.

5. Quality Design

The importance of urban form cannot be overstated. To foster community character and create a walkable, vibrant community, the elements of the built environment are more critical than the use. Buildings should be human-scaled, have a primary entrance facing the public realm, and be set close to the street to foster a pedestrian environment.

Civic buildings are places of community focus and center. They should be located in places of prominence, such as facing a square, town green, or other central public space.

6. Sense of Place

The Glynn Avenue corridor is intended to develop as a high quality, mixed-use, pedestrian oriented environment. This area should develop as a complement to, not in competition with, downtown Brunswick.

1.4 SUSTAINABLE PRACTICES

1. Greenspace

Greenspace is essential to providing a high quality of life, community gathering spaces, wildlife habitat, and access to the area's natural beauty. It may occur formally through parks and squares, or more informally in passive habitat areas.

While private development is certainly expected to occur along the marsh and waterfront, it should be set back from the marsh edge, and public access such as trails or boardwalks should be available for all to enjoy this public resource.

2. Non-Motorized Transportation

The City of Brunswick has started developing a ten-foot multi-purpose path on the west side of Glynn Avenue, which will eventually parallel Glynn Avenue from Howard Coffin Park south. The Coastal Georgia Greenway in this area deviates from US 17 in order to connect the Greenway to downtown Brunswick. This is a very important connection and should certainly be implemented.

In addition, the continuous connection along Glynn Avenue already initiated should be continued, along with the Coastal Georgia Greenway on-road facility for regional cyclists. Private development along Glynn Avenue should enhance connectivity to the greenway.

3. Coastal Conservation

The state of Georgia is blessed to have approximately 1/3 of the remaining salt marsh along the entire eastern seaboard. Our coastal marshes and waterways provide critical habitat for shellfish, fish, and other aquatic life; provide a tremendous economic benefit through commercial and recreational fishing; and are an essential element of our coastal landscape.

Development should respect our coastal environment and incorporate resiliency to adjust to rising sea levels. Responsible development will also address not only the quantity, but also the quality, of stormwater through innovative strategies associated with low impact development techniques.

4. Canopy Trees

The natural landscape is a major defining factor of local character. While the marshes are perhaps most commonly thought of as the most significant element of the coastal landscape, trees and other flora are equally important. Fortunately, many of the parcels along Glynn Avenue, particularly on the east side, have large canopy trees, including live oaks, located on the property.

Preservation of healthy canopy trees is a high priority as redevelopment occurs. While maintaining the tree canopy is the primary driver, this can also lead to creative design as buildings, drives, walks, etc. are ‘tucked under’ trees, creating a unique sense of place based on the local natural environment.

5. Sustainable Building Practices

Developers are encouraged to implement sustainable building practices which reduce energy and water use, utilize recycled and rapidly renewable resources, and create healthier and more productive indoor environments for building occupants. Developments certified under LEED, SITES, WELL, or other standards administered by GBCI are eligible for incentives as outlined in Section 5.4.

II. GENERAL PROVISIONS

2.1 DISTRICT BOUNDARY

These regulations shall apply to all properties included within the District Boundaries provided in Appendix A. Generally, all lots fronting U.S. 17, including Lanier Boulevard, from Spur 25 to the Sidney Lanier Bridge are included in the U.S. 17 Overlay, herein referred to as the District.

Any property outside the District Boundary which is combined, whether through a lot combination or for master planning purposes, with a property within the District Boundary shall also comply with these regulations.

Any property(ies) which are adjacent to the Glynn Avenue district that are rezoned from a residential district to a non-residential district shall be incorporated into the Glynn Avenue Design Framework istrict at the time of the rezoning.

Any property(ies) located in unincorporated Glynn County which are adjacent to Glynn Avenue between the Golden Isles Parkway and the Brunswick River shall be incorporated into the Glynn Avenue Design Framework district at the time of annexation.

2.2 APPLICABILITY

This District shall be the exclusive and mandatory development standards. Property owners within the District area shall submit development plans in accordance with the provisions of this District. Plans complying with the standards of this District shall be approved administratively.

2.3 DEFINITIONS

The following definitions shall apply to words used in this District:

Frontage buildout. Linear distance of the lot line that is occupied by the building façade.

Livework. A unit which allows commercial/office on the ground floor and residential on the upper floor(s).

Lot coverage. The area of a lot covered with an impervious surface.

Marsh jurisdiction line. The edge of the marsh, surveyed by a registered surveyor and verified by the Georgia Dept. of Natural Resources, Coastal Resources Division.

Substantial modification. Alternation to a building that is valued at more than 50% of the replacement cost of the entire building, if new.

Thoroughfare. A way for use by vehicular and pedestrian traffic and to provide access to lots and open spaces.

2.4 USES

2.4.1. Uses by Right. Uses by right shall be determined by the base zoning district.

2.4.2. Conditional Uses. All uses permitted on a conditional basis and subject to the conditions set forth in the underlying zone district shall be permitted on a conditional basis in the U.S. 17 Overlay District subject to the conditions set forth in section 23-25-4.

2.5 PRE-EXISTING CONDITIONS

2.5.1. Existing buildings and appurtenances that do not conform to the provisions of the Glynn Avenue Design Framework District may continue in the same use and form until a substantial modification occurs, at which time the Planning Director shall determine the provisions of this District that shall apply. Existing single-family lots and residences in existence upon the effective date of this district shall be exempt.

2.5.2. Existing buildings that have at any time received a certificate of occupancy shall not be required to upgrade to the current building code and when renovated may meet the standards of the building code under which they were originally permitted upon approval by the Planning Director.

2.5.3. The modification of existing buildings is permitted by right if such changes result in greater conformance with the specifications of this District.

2.5.4. Where buildings exist on adjacent lots, the Planning Director may require that a proposed building match one or the other of the adjacent setbacks and heights rather than the provisions of this District.

2.5.5. The restoration or rehabilitation of an existing building shall not require the provision of (a) parking in addition to that existing or (b) on-site stormwater retention/detention in addition to that existing. Existing parking requirements that exceed those for this District may be reduced as provided by in section 4.3.

2.6 SPECIAL DISTRICTS

Special Districts consist of areas that, by their intrinsic size, function, or configuration, may not conform to the requirements of this ordinance. Conditions of development for Special Districts shall be determined in by the City Commission.

- a. Development regulations, including base zoning and associated overlay districts, shall remain in place for Special Districts established at the effective date of this District until further modified and approved as specified herein.
- b. In order to establish a Special District General, a proposed development must contain an area of not less than three acres, have direct access to at least one street, and conform with the Guiding Principles and Design Principles of the Glynn Avenue Overlay District as stated in Section 1.3.1 and 1.3.2 of this District. A master plan meeting the requirements of Section 23-15-2 of the Brunswick zoning ordinance shall be submitted by the developers for review and approval by the City Commission.
- c. In order to establish a Special District Traditional Neighborhood, a proposed development must contain an area of not less than one acres, have direct access to at least one street, and conform with the Guiding Principles and Design Principles of the Glynn Avenue Overlay District as stated in Section 1.3 of this District. A master plan meeting the requirements of Section 23-16-2 of the Brunswick Zoning Ordinance shall be submitted by the developers for review and approval by the City Commission.



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III. STREETS + BLOCKS

3.1 GENERAL PROVISIONS

Consistent with Section 19-70 of the City of Brunswick code, pedestrian comfort shall be a primary consideration of thoroughfares. Design conflict between vehicular and pedestrian movement generally shall be decided in favor of the pedestrian.

All thoroughfares shall terminate at other thoroughfares, forming a network. Internal thoroughfares shall connect wherever possible to those on adjacent sites. Cul-de-sacs shall be subject to approval to accommodate specific site conditions only.

Each lot shall face a vehicular thoroughfare, except that 20% of the lots within a development may face a passage (public park, multi-use path, etc).

3.2 ACCESS MANAGEMENT

3.2.1. US 17 Access. The southern portion of Glynn Avenue, between Gloucester Street and the Sidney Lanier Bridge, maintains expansive views of the marshes and has few intersections or curb cuts. Along that portion of the parkway specifically existing between Gloucester Street and the Sidney Lanier Bridge, additional curb cuts are prohibited.

To maintain the regional function of US 17 and the visual quality of the entire parkway, curb cuts shall be limited where possible. Direct access shall only be provided when access is not available via one of the options below:

- a. If access is available via a street with direct access to US 17, no additional access shall be granted to US 17.
- b. Whenever practical, shared access between two adjacent parcels shall be provided.

3.2.2. Interparcel connectivity. Adjacent parcels shall be interconnected in order to facilitate local access between developments.

- a. If the adjacent parcel(s) does not already have a shared access point identified, one shall be provided.
- b. If the adjacent parcel(s) has a shared access point identified, the subject parcel shall connect.

3.3 BLOCKS

3.3.1 North of Torras Causeway

- a. Existing streets parallel to US 17, namely Carrie Street and Harold J Freidman Drive/ Norman Street shall remain fully open and be extended consistent with the grid street pattern. Freidman Drive should be extended to the south to the extent practicable.
- b. As redevelopment occurs, development of a similar parallel street should be a high priority between Wildwood Drive and 4th Street.

3.3.2 South of Torras Causeway

- a. Existing streets parallel to US 17, namely Macon Avenue and Lanier Boulevard, shall remain fully open and be extended consistent with the grid street pattern.
- b. Redevelopment of Lanier Plaza shall extend the adjacent street grid and/or establish a new grid consistent with the standards of this District.

3.3.3 Block Perimeter

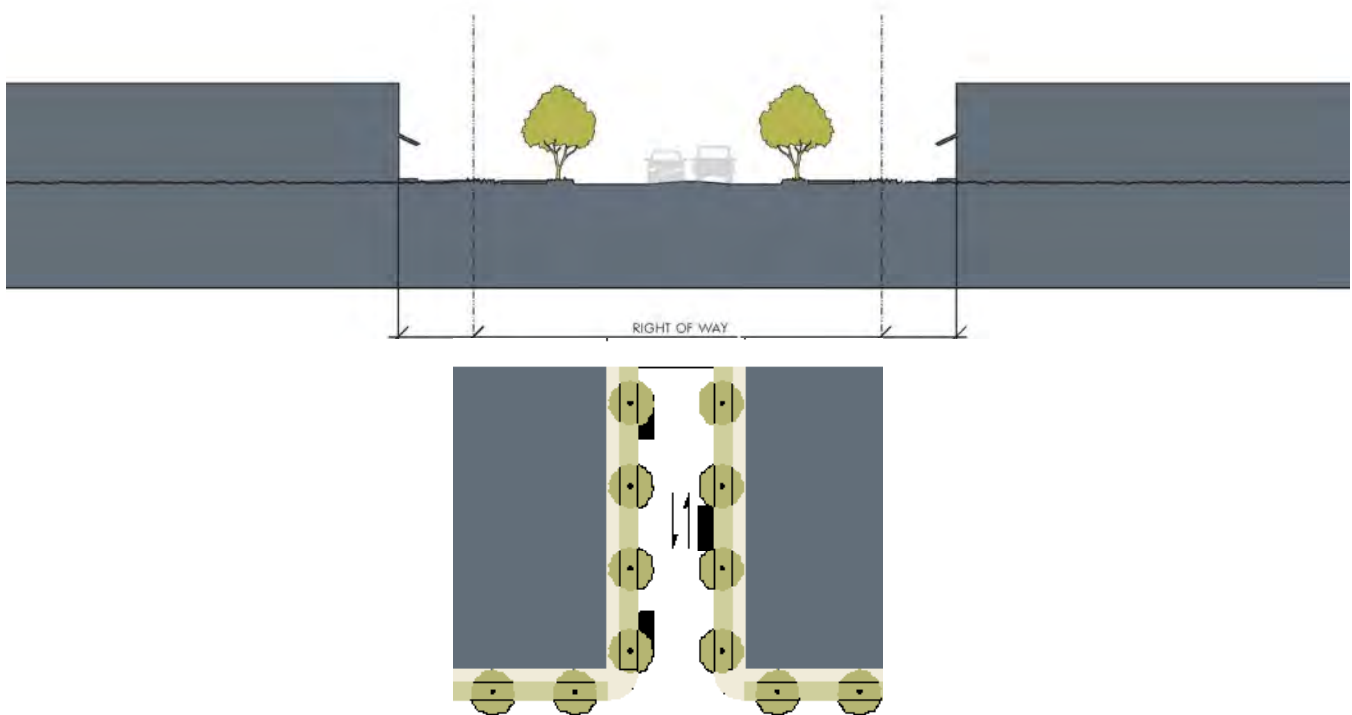
The maximum block perimeter shall be 2400'. Exceptions may be granted in order to reduce curb cuts on US 17.

3.4 ALLEYS AND LANES

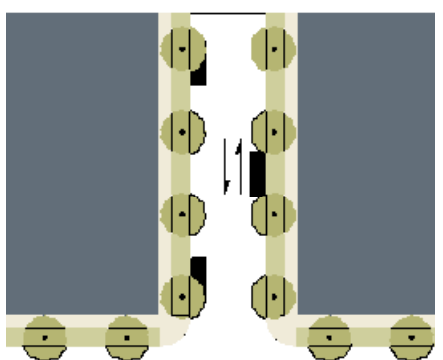
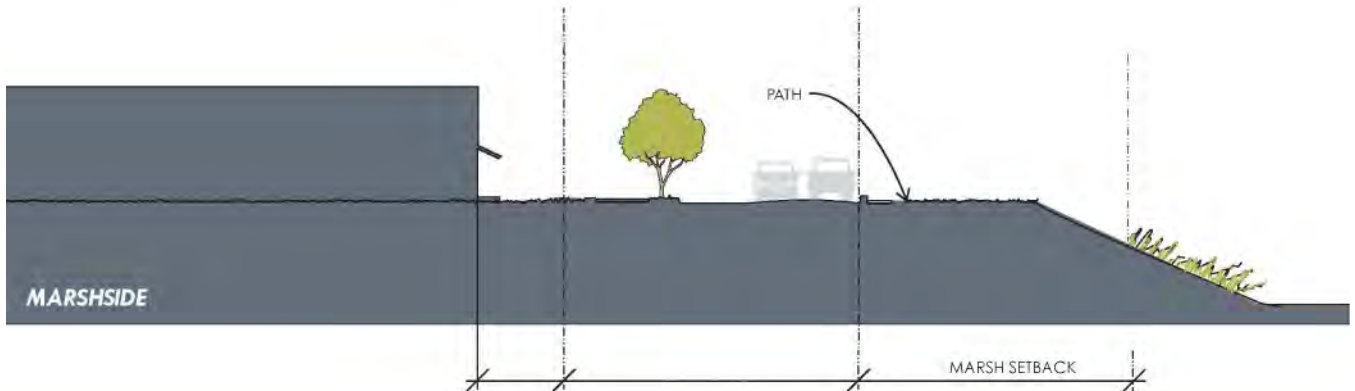
The use of alleys and lanes is encouraged to facilitate efficient delivery of municipal services and minimize the visual impact of utilities and refuse collection. Alleys/lanes shall conform to the standards set forth in 3.5.2.

3.5 THOROUGHFARE STANDARDS

3.5.1 Local Access. Local access streets are intended to be the “Main Street” of the Glynn Avenue corridor. As such, they should be designed to maximize pedestrian accessibility and comfort. Bicycles shall also be accommodated within the local access zone.



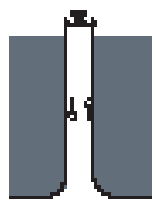
Right of Way Width	52' min
Pavement Width	28' - 36'
Travel Lanes	2 lanes
Parallel Parking	Both sides
Tree Yard	6' min
Sidewalk	6' min



Right of Way Width	50' min
Pavement Width	20' - 36'
Travel Lanes	2 lanes
Parallel Parking	0, 1 or 2 sides
Tree Yard	6' min, 1 or 2 sides
Sidewalk	6' min (land)
Multi-Purpose Path*	10' min

*May be located within 20' of the landward side marsh setback.

3.5.2 Lanes and Alleys



Right of Way Width	20'
Pavement Width	10'
Travel Lanes	Yield

Lanes and alleys may be gravel or other pervious, non-paved surface in residential areas with approval of the Planning Director.

4.1 GENERAL

4.1.1. This District is organized into two Regulating Districts based on the street(s) adjacent to the lot proposed for development.

- a. Glynn Avenue Frontage: This Regulating District provides standards to accommodate local and regional scale development.
- b. Local Access Frontage: This Regulating District provides standards to maximize the pedestrian environment.

4.1.1.1. Any property within the US 17 Overlay District boundary may utilize the Local Access Frontage standards in their entirety.

4.1.2. Standards of the Glynn Avenue Frontage Regulating District are only permitted for parcels immediately adjacent to US 17 and within the area shown on the District Map in Appendix A. For parcels with a split designation, the Glynn Avenue Frontage line may be shifted upon approval of the Planning Director, provided the Intent of this District is met.

4.2 BUILDINGS DISPOSITION

4.2.1. Newly platted lots shall be dimensioned according to the provisions within each Regulating District.

4.2.2. Buildings shall be located on their lots and in relation on to the lot lines according to the provisions of each Regulating District.

4.2.3. One principal building at the frontage, and one outbuilding to the rear of the principal building, may be built on each lot as according to the provisions of each Regulating District.

4.2.4. Lot coverage by building shall not exceed that recorded in each Regulating District.

4.2.5. Facades shall be built parallel to a rectilinear principal frontage line or to the tangent of a curved principal frontage line, and along a minimum percentage of the frontage width at the setback, as specified as frontage buildout for each Regulating District.

4.2.6. Particularly for buildings requiring elevation of the first floor due to code requirements, buildings shall be designed in a manner to minimize wide variations in entry level heights from adjacent buildings and / or street elevations to the extent feasible.

4.2.7. Where permitted, encroachments into the sidewalk may be allowed according to the provisions of each Regulating District, provided a minimum 6' clear space remains. Encroachments shall not be placed over underground utilities.

4.2.8. All development shall be set back from the marsh jurisdiction line by a minimum of forty-five feet (45'). Exceptions may be permitted by the Planning Director for publicly-accessible facilities, provided the Intent of this District is met.

4.3 PARKING

4.3.1. In General

- a. On-street parking directly adjacent to a lot shall count toward fulfilling the parking requirement of that lot. One parking space credit shall be given for every space in front of the lot that is over 50 percent of the length of the parking space.
- b. The required number of parking spaces may be reduced by demonstrating the possibility of shared parking. The shared parking factor is available for any two functions within any pair of adjacent blocks.
- c. The maximum number of parking spaces shall be limited to 120 percent of the minimum number of spaces required.
- d. Accessory units do not count toward density calculations.
- e. Retail spaces less than 2000 square feet and liner buildings less than 30 feet deep and no more than two stories may be exempt from parking requirements with approval from the Planning Director.
- f. Primary street frontages shall have no vehicular entries for properties with another street frontage. Properties with a single-frontage on a primary street shall be limited to either 1) one two-way entry a maximum of 24' in width or 2) two single lane-width vehicular entries separated by a minimum of 20 feet.
- g. Adjacent parking lots shall have vehicular connections via an alley or internally.
- h. Parking lots for civic, small-scale retail, office, and residential uses shall be graded, compacted, and landscaped, but may be left unpaved or paved with grass-ring paving or other acceptable pervious surface with approval from the Planning Director.

4.3.2. Parking Location

- a. Open parking areas shall be masked from the street by a building or streetscreen for all areas according to Regulating District standards as defined in Section 5.3.
 - i. U.S. Highway 17 and Lanier Drive streetscreen. Continuous vegetated buffer of at least ten (10) feet in width, provided for the entire lot width, no shorter than three (3) feet at planting; or a continuous screening fence or wall constructed of the same material used in the buildings for the entire lot width; or a continuous evergreen hedge forms that grow to or are maintained at a three (3) to four (4) foot height maximum planted along the entire parking area or along any required frontage.
 - i. Local Access Regulating District. Continuous vegetated buffer of at least five (5) feet in width for the entire lot width, no shorter than three (3) feet at planting; or a continuous screening fence or wall constructed of the same material used in the buildings for the entire lot width; or a continuous evergreen hedge forms that grow to or are maintained at a three (3) to four (4) foot height maximum planted along the entire parking area or along any required frontage.

- b. Parking areas and garages shall be located as required for each Regulating District.
- c. Parking Structures on primary corridors shall have liner buildings lining the first floor.
- d. For parking lots with fifteen (15) or more spaces, bicycle racks shall be provided to accommodate a minimum of one bike per every ten (10) parking spaces or portion thereof.
- e. Side parking and the required streetscreen(s) shall begin no closer to the primary street than the primary building front wall plane.

4.4 LANDSCAPING

4.4.1. Existing Trees

- a. Designation of a Specimen Tree. A tree located on commercial, industrial, institutional or multifamily property may be designated as a “Specimen Tree” if it is found by the Planning Director to meet the following criteria: recommended large canopy tree species as defined in 4.4.2.b; over twenty four (24) inches in diameter at breast height (dbh); normal proportion, characteristics and attributes for its size and species; free of disease, pest or injury; and has a life expectancy of at least 10 years. Any tree designated as a “Specimen Tree” shall be deemed desirous of preservation by the City of Brunswick and shall not be removed without a permit.
- b. Prior to the issuance of a Land Disturbance Permit, a site plan shall be approved which indicates all Specimen Trees and identifies all Specimen Trees proposed for removal.
- c. The removal of a Specimen Tree shall require replacement by two canopy trees.

4.4.2. Canopy Trees

- a. Street trees. Lots shall provide at least one canopy tree for every 50 feet of frontage, with the lot width at the frontage rounded to the nearest 50 feet; i.e., lots with a width less than 75 feet shall provide at least one canopy tree, lots with a width of 75 to 124 feet shall provide at least two canopy trees, etc. Relief may be granted by the Planning Director for driveways, utilities and other unmovable obstructions.
 - i. Glynn Avenue Frontage: Canopy trees shall be located in the front setback parallel to U.S. 17.
 - ii. Local Access Frontage: Canopy trees may be located in the tree yard of local access streets or in the front setback parallel to the local access street.
- b. Canopy tree requirements. Canopy trees shall be a minimum of ten feet in height, with a four- to five-foot spread, and a two-inch caliper trunk at time of planting.

Recommended Canopy Trees	
Botanical Name	Common Name
Quercus Phellus	Willow Oak
Celtis Laevigatta	Hackberry
Quercus virginiana	Live Oak*

- c. Existing trees 18 inches in caliper or greater and located in the front setback may count towards the tree requirement. All plantings shall be installed free from disease in a manner that ensures the availability of sufficient soil and water for healthy growth and which is not intrusive to underground utilities. Dead or diseased trees shall be removed. Replacement trees shall be provided for any required trees which die or are removed for any reason and shall meet all minimum standards and conform to these regulations.
- d. Canopy tree substitution. Due to the existence of utility lines along U.S. 17, understory trees may be substituted for canopy trees where overhead utility conflicts exist. A grouping of three or more palm trees shall be considered equivalent to one canopy tree. Palms shall have a minimum of ten feet of clear trunk at time of planting. Two understory trees shall be considered equivalent to one canopy tree. Understory trees shall be a minimum of eight feet in height, with a three- to four-foot spread, and a one and one-half-inch caliper trunk at time of planting.

Recommended Understory Trees		
Botanical Name	Common Name	Multiplier
Sabal palmetto	Cabbage Palmetto	3
Magnolia stellata	Star Magnolia	2
Magnolia soulangiana	Saucer Magnolia	2
Ligustrum lucidum	Ligustrum (tree-form)	2
Ilex vomitoria	Yaupon Holly	2
Ilex opaca	American Holly	2
Juniperus virginiana	Red Cedar	2
Lagerstroemia fuariei, or L. indica	Crepe Myrtle (large varieties)	2
Goadonia alatomaha	Gordonia	2
Cornus florida	Flowering Dogwood	2
Cercis Canadensis	Eastern Redbud	2

4.4.3. Parking Lots

- a. Canopy trees shall be planted in tree islands which shall have 400 square feet of unpaved soil for root development. The standard tree island shall be 20 feet by 20 feet; provided, however, that where the islands are an extension of a ten-foot-wide landscape median, the islands may be reduced in width to 16 feet.
- b. Islands shall not be separated by more than 12 parking spaces, including the landscaped ends of drive aisles, and shall be designed so as to minimize foot traffic across them.

- c. The use of porous paving to provide root space for planted and preserved trees to meet the necessary rooting space requirement may be allowed at the discretion of the Planning Director. The use of pervious surfaces shall be excluded from lot coverage calculations.

4.4.4. Native Vegetation

A native plant is a plant that is indigenous in natural associations to a particular region, ecosystem and habitat. They have evolved over thousands of years prior to significant human impacts and alterations of the landscape. Plants that existed on the North American continent before European settlement (prior to 1513) are North American native plants. Native plants include all kinds of plants from mosses and ferns to wildflowers, grasses, shrubs and trees. (Source: marex.uga.edu)

The use of native plants is highly encouraged, especially on properties east of U.S. Highway 17. Native plants typically require less water, fertilizer, and maintenance and reinforce the coastal ecosystem of Brunswick.

4.5 STORMWATER MANAGEMENT

All rules and regulation for stormwater management in the City of Brunswick shall apply. The use of low impact development strategies as provided for in the Coastal Stormwater Supplement are highly encouraged and may qualify for development incentives as outlined in Section 5.4.



4.6 LIGHTING

4.6.1. Lighting shall be designed to minimize light trespass and glare. No lighting level shall exceed one footcandle at any property line.

4.6.2. All lighting shall have no light emitted above 90 degrees. Exceptions may be permitted by the Planning Director for the following: sports facilities; construction lighting; parking structures; urban parks; ornamental and architectural lighting of bridges, public monuments, statuary and public buildings.

4.6.2.1 Light fixtures used to illuminate flags, statues or any other objects mounted on a pole, pedestal or platform, shall use a narrow cone beam of light that will not extend beyond the illuminated object.

4.6.2.2. Other upward directed architectural, landscape or decorative direct light emissions shall have at least ninety (90) percent of their total distribution pattern within the profile of the illuminated structure.

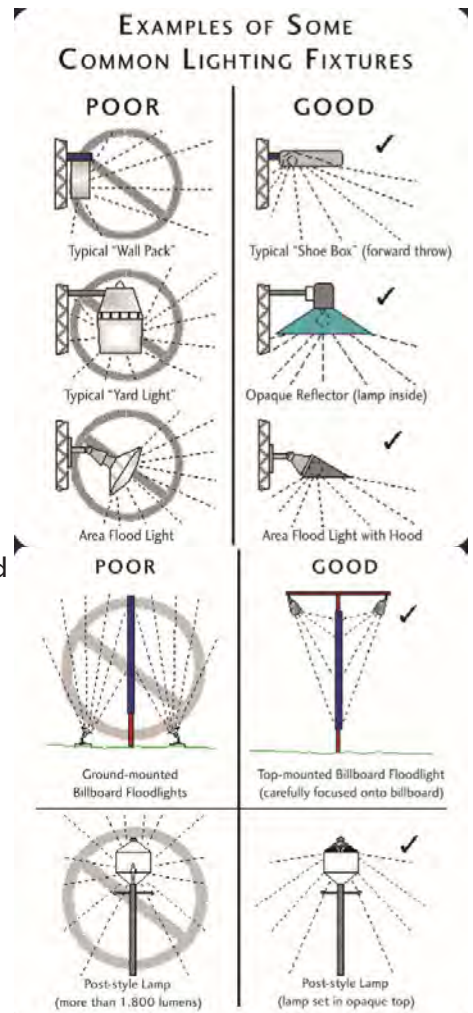


Image Source: Otesgo County Conservation Association, www.occainfo.org

4.7 UTILITIES

4.7.1. All utilities shall be located underground.

4.7.2. Where lanes are provided, utilities shall be located within lane right-of-way to the extent feasible.

4.8 SCREENING REQUIRED

4.8.1. Dumpsters, outside storage, mechanical equipment, etc. shall not be visible from the public right-of-way and shall be screened by a landscape wall high enough to visually conceal equipment, storage, and/or service areas located behind. The minimum height of the wall shall be the actual height required to screen the object from view.

V. DESIGN STANDARDS

The following pages provide the Standards for the Glynn Avenue Frontage along Glynn Avenue/US 17 and the Local Access Frontage standards, located generally one block in from Glynn Avenue. The premise for these standards was established during the project design charrette and the resulting plan, a portion of which is shown to the right.



5.1 GLYNN AVENUE FRONTAGE STANDARDS

These standards apply for lots immediately adjacent to US 17 only as shown on the District Boundary Map in Appendix A.

REGIONAL COMMERCIAL BUILDING

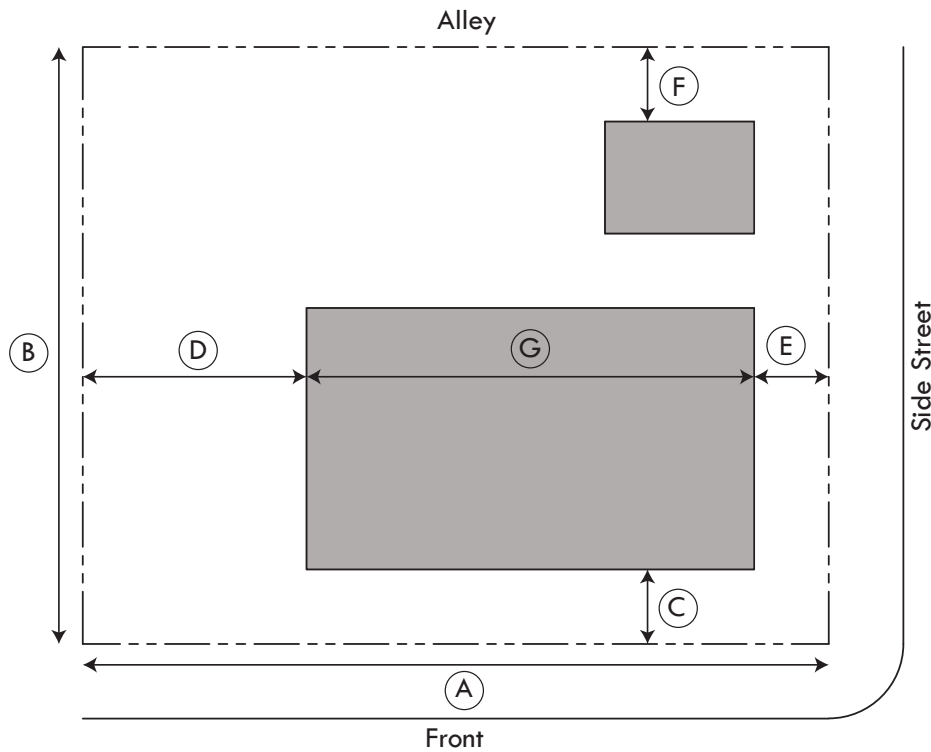
This is a medium scale building typology that is based off of industrial warehouses, workshops and more vernacular agricultural types.



5.1.1. GLYNN AVENUE FRONTAGE LOT STANDARDS

Lot Width	55' min., 200' max.	(A)
Lot Depth	80' min., 250' max.	(B)
Setbacks		
Front	20' min. - 100' max.	(C)
Front, Ancillary Building	Principal Building + 20'	
Side	0' min.	(D)
Side Corner	10' min.	(E)
Rear	5' min.	(F)
Lot Coverage	80% max*	
Frontage Buildout		(G)
Front	50% min.	
Side corner street	50% min.	

*unless prohibited by stormwater management requirements

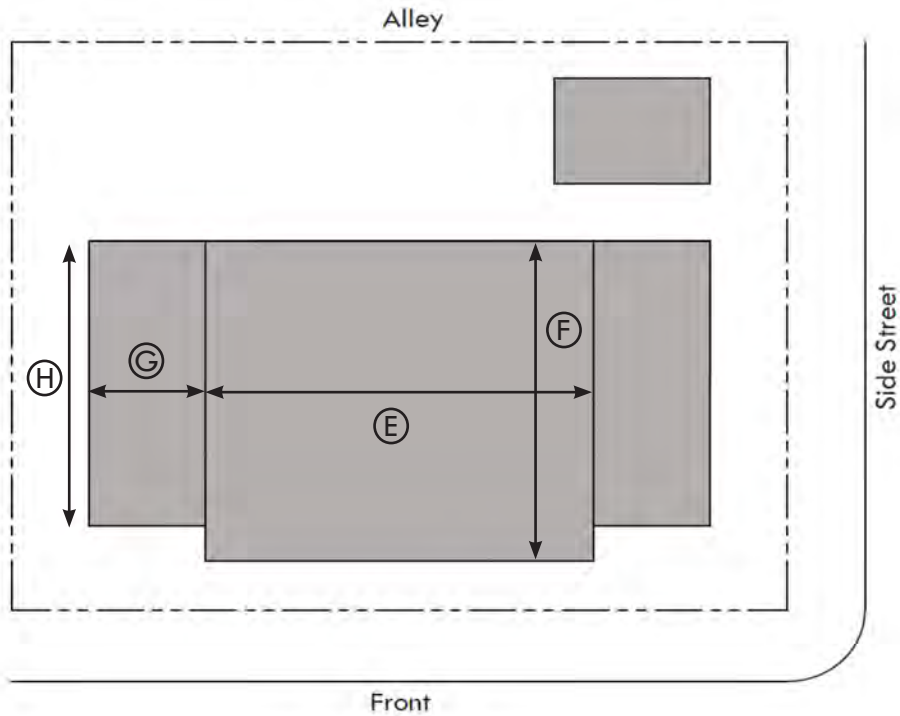


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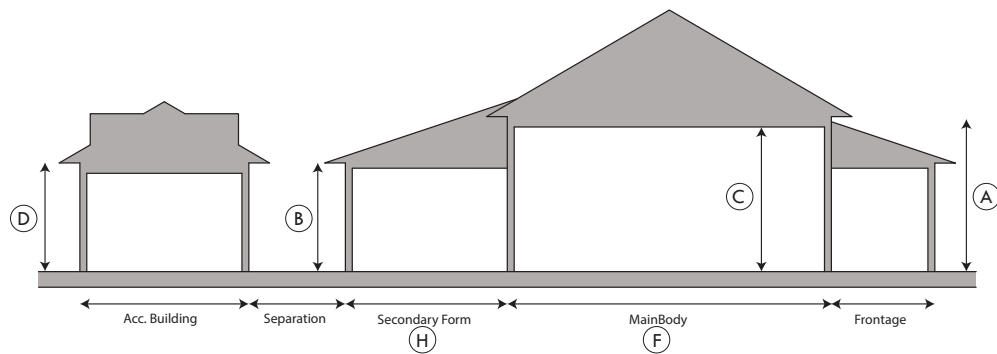
- R.O.W./ Property Line
- Building

5.1.2. GLYNN AVENUE FRONTAGE BUILDING FORM

Height		
Main Body	1 Story max.	(A)
Secondary Form(s)	1 Story max., must have lower roof line than main form	(B)
Ground Floor Ceiling Height	14' min.	(C)
Accessory Buildings	Single story max., may not have a higher roof bearing than primary form	(D)
Main Body		
Width	100' max.	(E)
Depth	175' max.	(F)
Secondary Form(s) / Accessory Building		
Width	25' max.	(G)
Depth	170' max (sides)	(H)



--- R.O.W./ Property Line
 [Grey Box] Building



Secondary Form / Accessory Building Standards:

A secondary form or accessory building shall have a smaller footprint, narrower width, and a shallower depth than the primary form.

Secondary form may be built on the side(s) and/ or rear of a primary form but not in front. They are optional.

The secondary form wall plane shall be 5' min. behind the primary form wall plane. Accessory buildings shall be separated from the main building by 10' min.

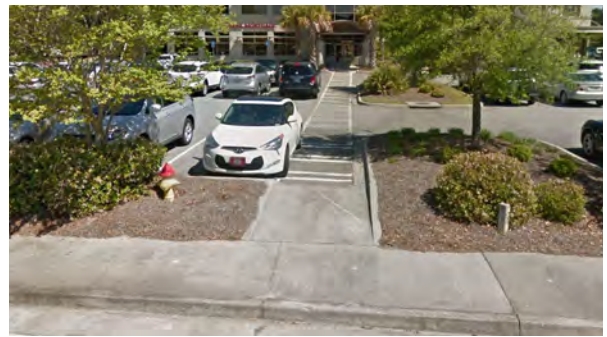
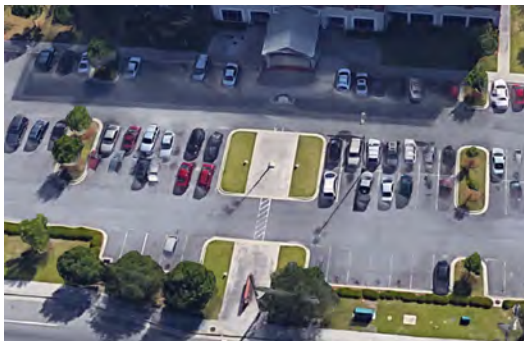
5.1.3. ADDITIONAL STANDARDS

The Principal Frontage of the primary building shall face Glynn Avenue.

In no instance shall a facade facing a local street consist of a blank wall, but instead shall consist of windows, doors, and similar elements associated with a front facade.

A primary public entrance shall be provided on the front of the building.

Parking Placement: Parking may be located to the front, side, or rear of a building. Clearly delineated pedestrian access (8' minimum width) shall be provided through parking areas when parking is located to the front of the building.



5.2 LOCAL ACCESS FRONTAGE STANDARDS

These standards may be utilized for development for any lot included in this District as shown on the District Boundary Map in Appendix A.

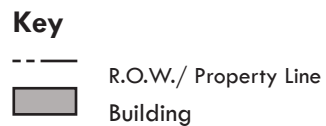
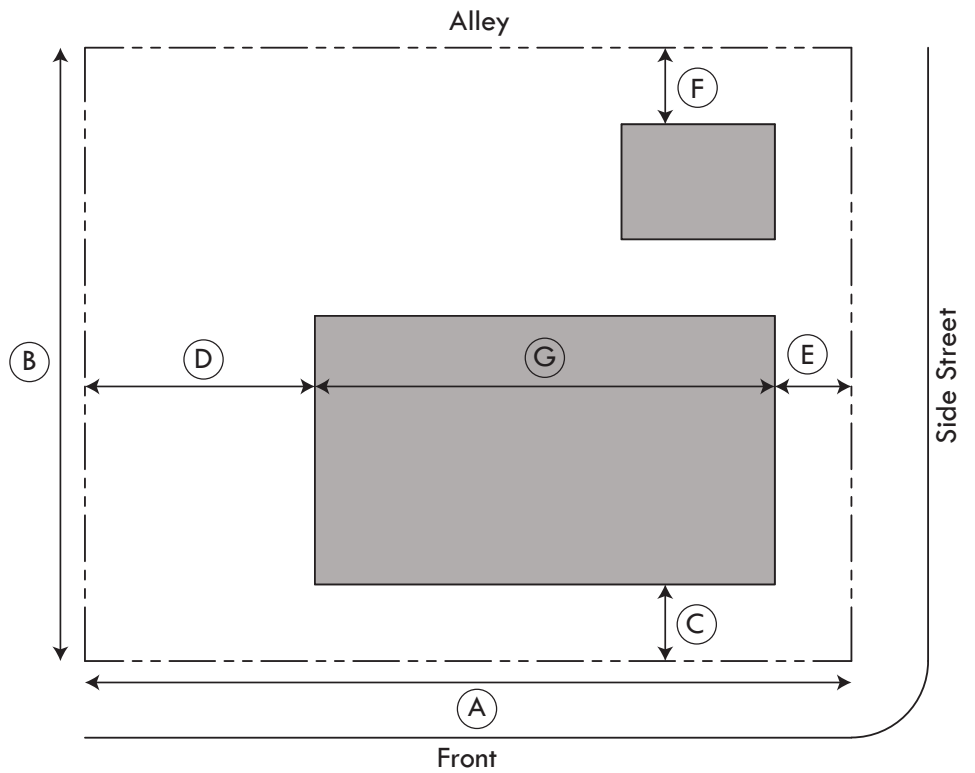
5.2.1 MAIN STREET BUILDING

This building type is a very typical commercial or mixed use building. It is a small to medium scale building and may vary between one to three stories (additional height may be permitted as specified in Section 5.4). This building type may be attached or freestanding, depending on the lot configuration. It is designed to front the major public street that it sits on.



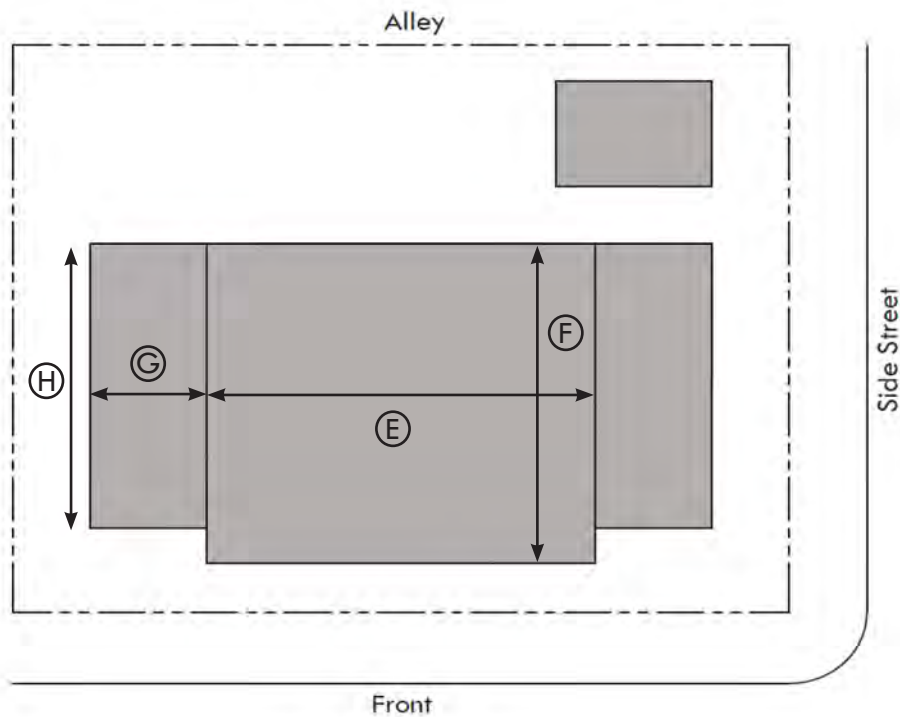
5.2.1.1. MAIN STREET BUILDING LOT STANDARDS

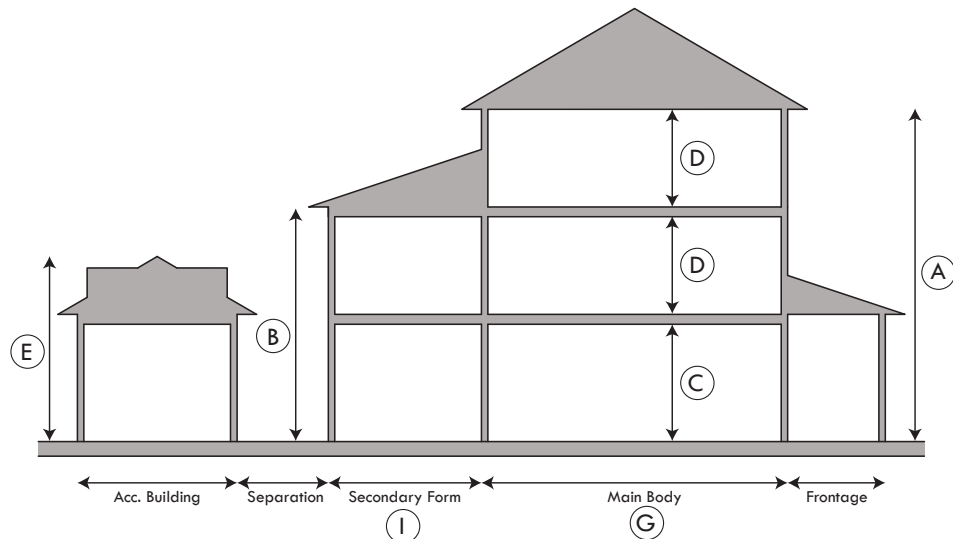
Lot Width	24' min., 150' max.	(A)
Lot Depth	80' min., 250' max.	(B)
Setbacks		
Front	0' min - 12' max	(C)
Ancillary Building - Front	Principal Building + 20' min.	
Side	0' min.	(D)
Side corner street	6' min. - 12' max.	(E)
Rear	3' or 15' from centerline of lane	(F)
Lot Coverage	80% max.	
Frontage Buildout		(G)
Front	70% min.	
Side corner street	50% min.	



5.2.1.2. MAIN STREET BUILDING FORM

Height		
Main Body	As determined by base zoning	(A)
Secondary Form(s)	As determined by base zoning & lower height than main form.	(B)
Ground Floor Ceiling Height	12' min.	(C)
Upper Floor Ceiling Height	9' min. recommended	(D)
Accessory Buildings	2 Stories max., may not be higher than main building.	(E)
Main Body		
Width	60' max.	(F)
Depth	75' max.	(G)
Secondary Form(s) / Accessory Building		
Width	20' max. (side)	(H)
Depth	70' max	(I)





Secondary Form / Accessory Building Standards:

A secondary form or accessory building shall have a smaller footprint, narrower width, and a shallower depth than the primary form.

Secondary form may be built on the side(s) and/ or rear of a primary form but not in front. They are optional.

The secondary form wall plane shall be 5' min. behind the primary form wall plane. Accessory buildings shall be separated from the main building by 10' min.

5.2.1.3. ADDITIONAL STANDARDS

Ground floor spaces shall have a primary entrance on the front of a building.

Ground floor commercial shall have a minimum glazing requirement of 50% of the frontage. If a shopfront facade is used, then the requirement shall be 70% of the frontage.

All parking shall be located to the side or rear of the building. See Section 4.3 for requirements.

Detached residential lots shall be a minimum of 45' in width shall require access via rear lane when the lot width is 60' or less.

For detached residential lots not served by a lane, parking shall be located 20' behind the frontage of the principal building.

Residential attached (Apartments, Townhomes, Single Family, etc.) and Liveworks shall have car access via rear lane.

5.2.2 SMALL APARTMENT BUILDING

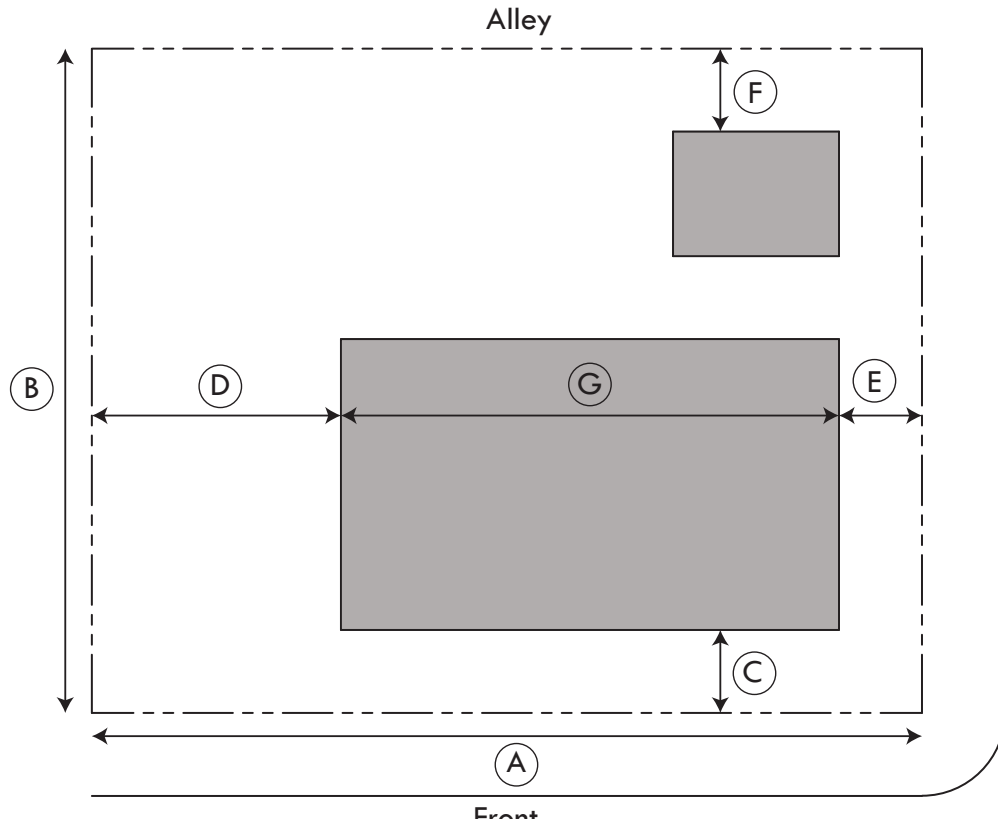
This is a medium-sized building type that has 4-12 multi-family units.



5.2.2.1. SMALL APARTMENT BUILDING LOT STANDARDS

Lot Width	50' min., 100' max.	(A)
Lot Depth	65' min., 150' min.	(B)
Setbacks		
Front	10'-25' max.	(C)
Ancillary Building - Front	Principal Building + 20'	
Side	5' min.	(D)
Side Corner	5' min - 20' max	(E)
Rear	5' min.	(F)
Lot Coverage	80% max.*	
Frontage Buildout		(G)
Front	50% max.	
Side corner street	50% min.	

*unless prohibited by stormwater management requirements

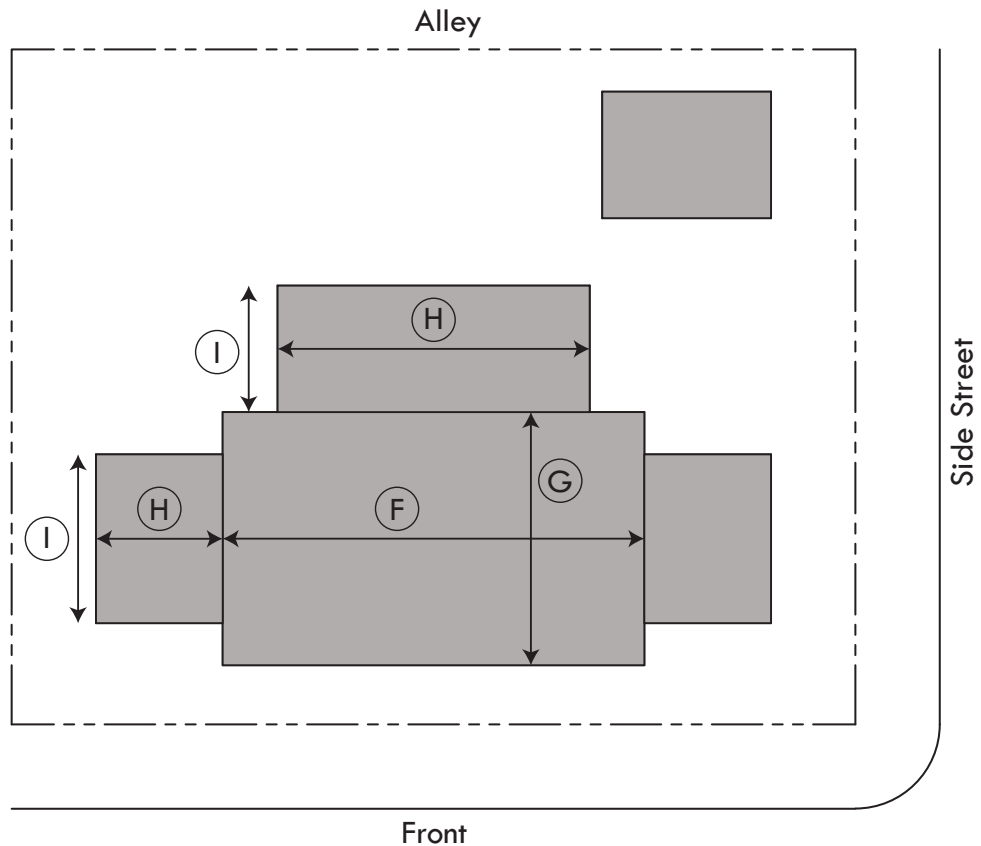


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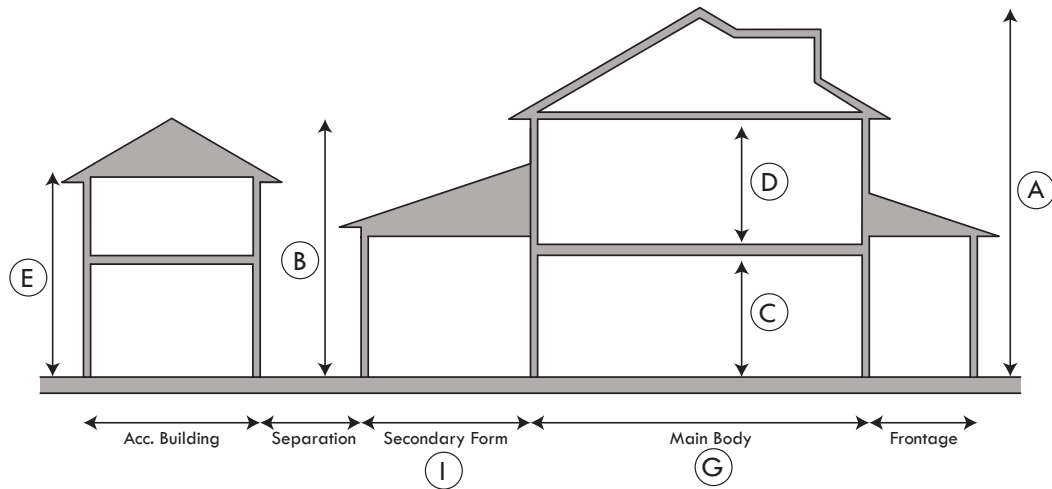
- -- R.O.W./ Property Line
- Building

5.2.2.2. SMALL APARTMENT BUILDING FORM

Height		
Main Body	As determined by base zoning	(A)
Secondary Form(s)	As determined by base zoning	(B)
Ground Floor Ceiling Height	10' min.	(C)
Upper Floor Ceiling Height	9' min. recommended	(D)
Accessory Buildings	As determined by the base zoning & not higher than main building.	(E)
Main Body		
Width	50' max.	(F)
Depth	60' max.	(G)
Secondary Form(s) / Accessory Building		
Width	15' max. (side), 40' max. (rear)	(H)
Depth	50' max. (side), 25' rear	(I)



- Key**
- R.O.W./ Property Line
 - Building



5.2.2.3. ADDITIONAL STANDARDS

Parking shall be located to the side and/ or rear of a building. Rear parking is encouraged. See Section 4.3 for requirements.

On corner lots, side parking shall be on the interior side only.

Ground floor spaces shall have a primary public entrance on the side or front of a building.

5.2.3. HOUSE FORM

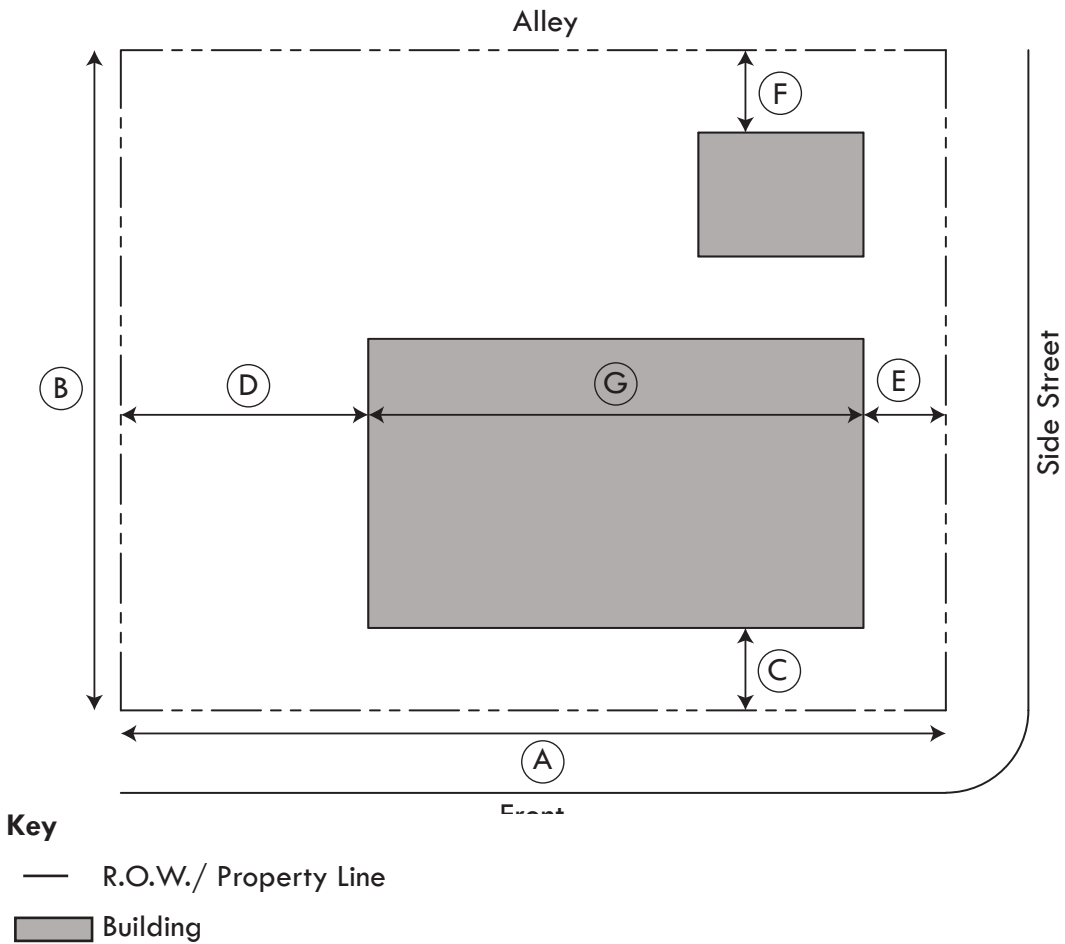
This is a medium sized house form building that could accommodate a variety of usage including single-family, small 2-4 unit multifamily and light commercial.



5.2.3.1. HOUSE FORM LOT STANDARDS

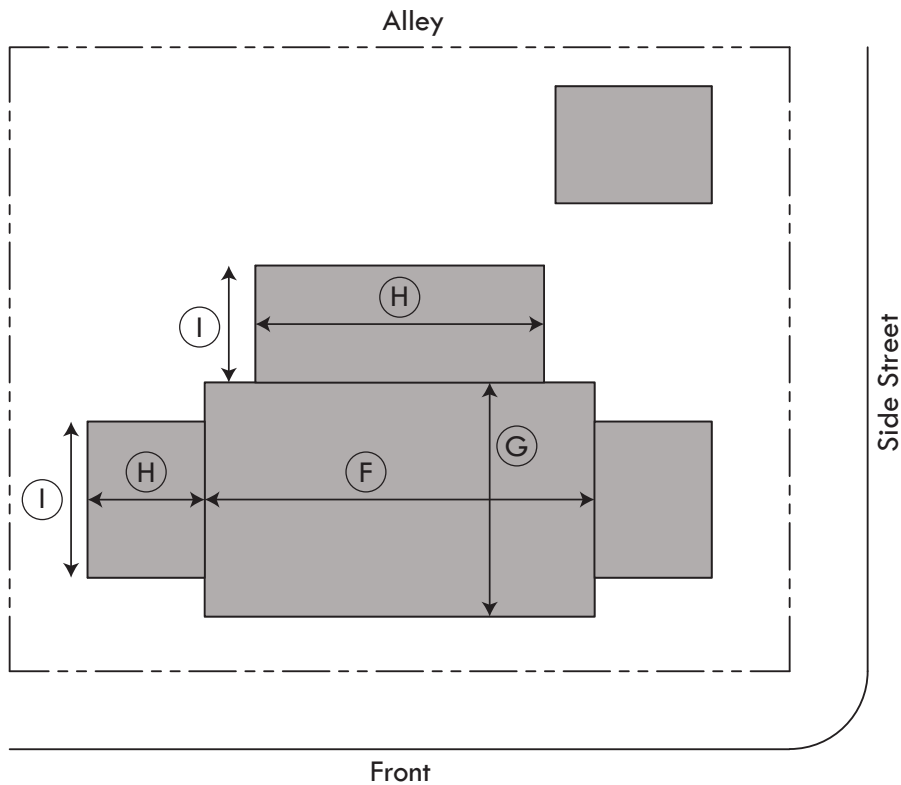
Lot Width	30' min., 70' max.	(A)
Lot Depth	75' min., 150' min.	(B)
Setbacks		
Front	10'-25' max.	(C)
Side	5' min.	(D)
Side Corner	5' min - 20' max.	(E)
Rear	5' min.	(F)
Lot Coverage	80% max.*	
Frontage Buildout		(G)
Front	50%	
Side corner street	50%	

*unless prohibited by stormwater management requirements



5.2.3.2. BUILDING FORM

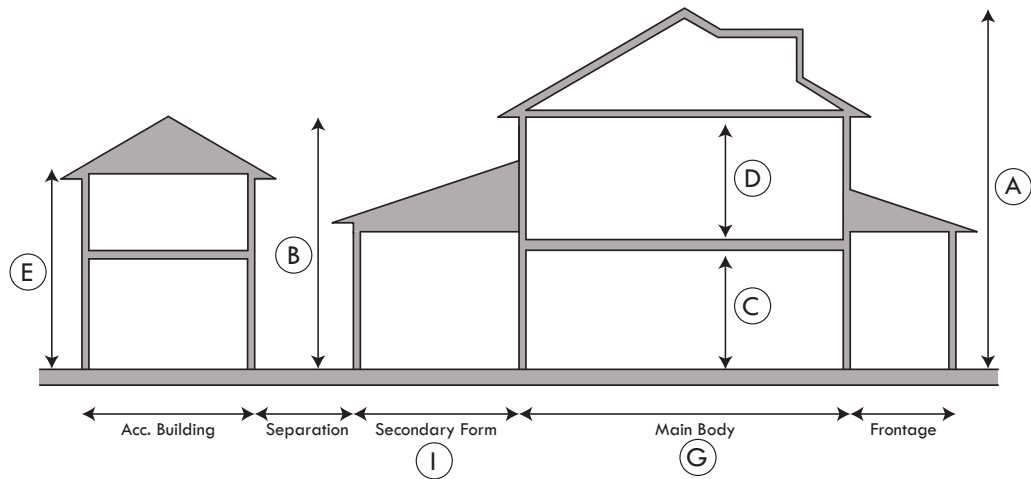
Height		
Main Body	As determined by base zoning	(A)
Secondary Form(s)	As determined by base zoning	(B)
Ground Floor Ceiling Height	10' min.	(C)
Upper Floor Ceiling Height	9' min. recommended	(D)
Accessory Buildings	As determined by base zoning, may not be higher than main building.	(E)
Main Body		
Width	35' max.	(F)
Depth	45' max.	(G)
Secondary Form(s) / Accessory Building		
Width	15' max. (side), 25' max. (rear)	(H)
Depth	40' max.	(I)



Key

-- -- R.O.W./ Property Line

■ Building



5.2.3.3. ADDITIONAL STANDARDS

- Parking shall be located to the side and/ or rear of a building.
- On corner lots, side parking shall be on the interior corner only.
- Rear parking access and connectivity with adjacent properties is encouraged.
- Ground floor spaces shall have a primary public entrance on the side or front of a building.

5.3 STREETScreens AND FENCES

This section regulates walls, fences and hedges in the Glynn Avenue corridor. Walls, fences and hedges help to define property lines but also serve to define public frontages, the public street and give the District a sense of character.

5.3.1. Living Fence

A post and rail fence fitted with a wire mesh allowing plants to grow.

Standard:

Plant Growth

Height:

- 36” max. in front of building face
- 72” max behind front face of building
- Corner lots shall count both front and side corner of building as building face

Materials:

Wood, Metal mesh or wire. (Chain link is not permitted)



5.3.2. Picket Fence

Standard:

A series of typically wood posts with vertical pickets.

Height:

- 36" max. in front of building face
- 72" max behind front face of building
- Corner lots shall count both front and side corner of building as building face

Materials:

Wood, Composite, Brick



5.3.3. Masonry Wall

A masonry based wall with typically brick or stucco over the block. It may be partially open and may express pilasters/ piers.

Materials: Brick, Stucco or Tabby over CMU.



5.3.4. Hedge Wall

A nearly solid row of hedges. It may have masonry piers.



5.3.5. Metal Fence

Decorative metal fence. Brick, tabby, or stucco piers may be used.

Materials: Painted metal, Brick / Stucco / tabby piers



5.3.6. Rail Fence

Typically a wooden fence made of post and rails



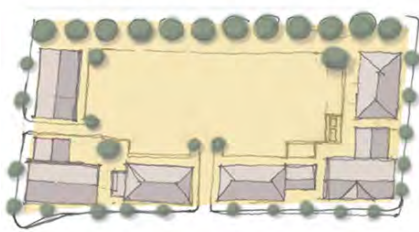


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5.5 EXAMPLE SITE DESIGNS

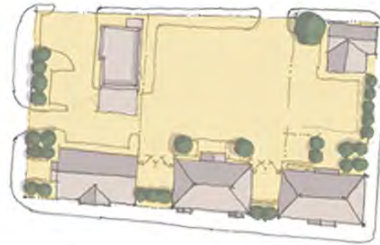
Infill and redevelopment presents unique for design standards due to the vast number of variables in lot size, configuration, etc. The example site designs below are all acceptable and comply with this District.

Glynn Avenue / US 17 Frontage



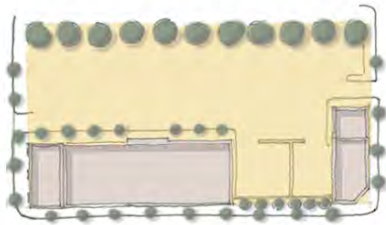
Local Access Frontage

Glynn Avenue / US 17 Frontage



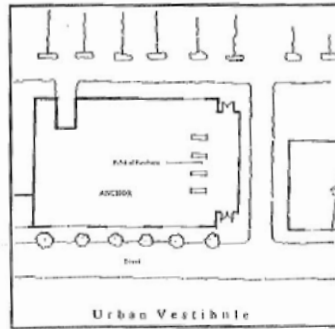
Local Access Frontage

Glynn Avenue / US 17 Frontage

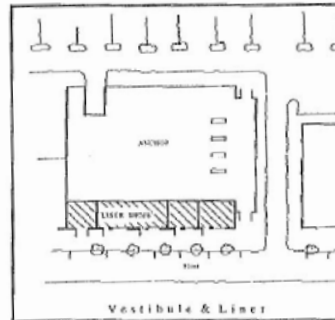


Local Access Frontage

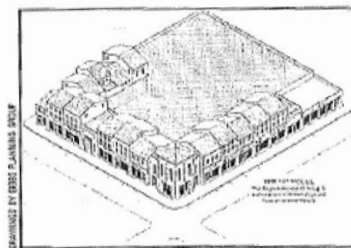
The layout above illustrates how one building can address two frontages. The parking is visible and accessible from Glynn Avenue, yet the building is also pedestrian-oriented by also fronting the local street. Access is provided from both the local street and the parking lot while maintaining a single point-of-sale, as shown in the sketches to the right.



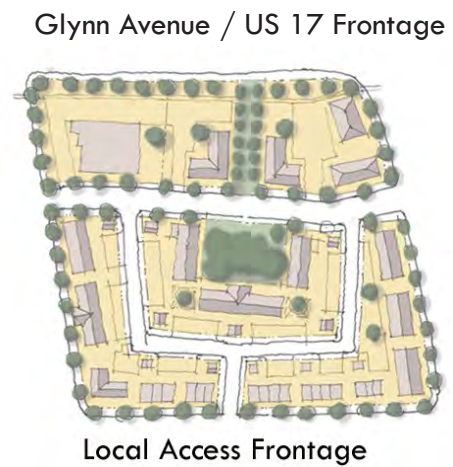
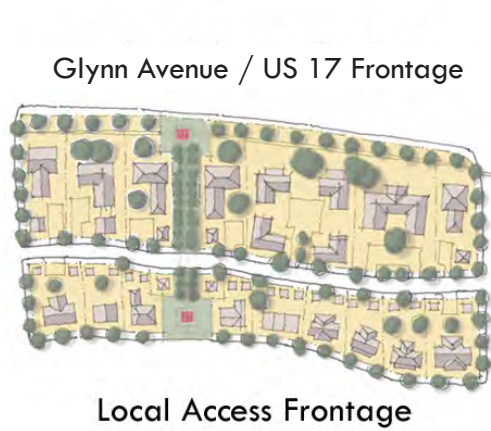
Good



Better



Best



These standards are designed to accommodate a mix of uses, from regional commercial to local commercial to office to a range of residential.

The layouts above demonstrate how the appropriate use of scale can create a seamless transition to accommodate diverse land use types.

VI. Building Design Standards & Principals

6.1 MASSING

6.1.1. Buildings should be composed of primary forms and secondary forms. Primary forms should be delineated from the secondary forms by both wall plane and roof form. The secondary form wall plane should be 5' min. back from the primary wall plane.



6.2 ARTICULATION

6.2.1. Building should present attractive facades to all sides with visual interest.

Facades shall not have long blank walls. Use of windows, pilasters, columns, awnings and other architectural elements shall be used to break up the facades.



6.2.2. Buildings shall also have vertical articulation with a defined top, middle and base. The proportions depend on the building style and height.



6.3 ROOFS

6.3.1. Pitched Roofs: Roofs should be a pitch between 4:12 and 12:12 for a primary roof form and 2.5:12-6:12 for secondary roof forms. Roof overhangs should be integrated into the building design. False Mansard style roofs are not permitted.

6.3.2. Flat Roofs: Flat roofs shall be used only with a full building parapet that extends to all side of a building. The parapet should be designed as a visual element of the building (Typically the “top or cap”). Building equipment mounted on the roof shall not be visible from any point at street level.



Pitched Roof

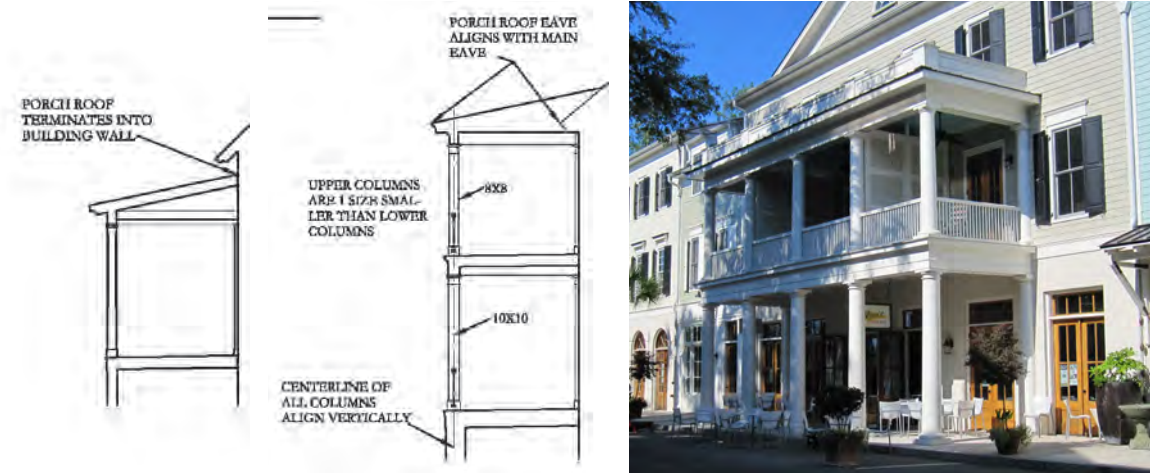


Flat Roof

6.3.3. Canopies: The roof of a canopy, including but not limited to gas stations, shall be of similar architectural style and materials to the main building with which it is associated.



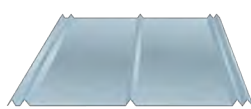
6.4 PORCHES AND GALLERIES



6.5 MATERIALS

6.5.1. Roofs

- a. Pitched: 5V Metal, Low Profile Standing Seam, Corrugated Metal, Asphalt, Wood Shingles, Terra Cotta
- b. Flat: No materials standards



5V Metal



Low Profile Standing Seam



Corrugated Metal



Asphalt or Wood Shingles



5V Metal Roofing



Asphalt Shingles

6.5.2. Gutters / Downspouts

Half Round and Round profiles in metal.

6.5.3. Eaves

- a. Closed: Wood, Composition Board, PVC, Fiber-Cement Board.
- b. Open: Wood, Composition Board, PVC, Fiber-Cement Board
- c. Vents: Round Soffit or Eve vents



Downspout



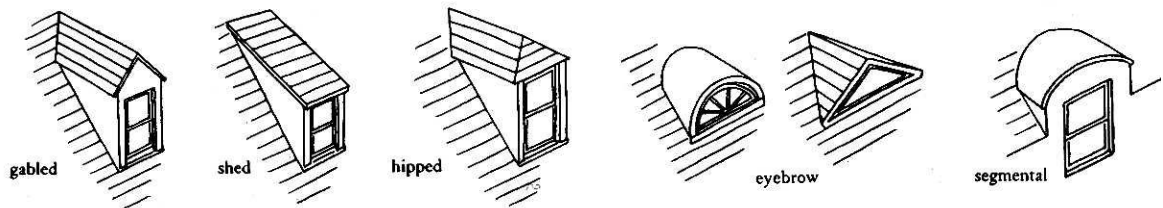
Open Eave



Closed Roof Eave

6.5.4. Dormers

Materials: Wood, Composition Board, PVC, Fiber-Cement.



6.5.5. Walls

Wall materials should generally be consistent on a building and the Primary Form shall be the same material on all sides. Secondary forms may change materials from the Primary Form.

- a. Brick: Wood Mold or Tumbled only. Mortar joints to be Beaded, Flush or Concave
- b. Siding:
 - i. Materials: Wood, Cement Board
 - ii. Profiles: Lap Siding, Shiplap, V-Groove and Vertical Board and Batten.
- c. Stucco: Smooth Sand Finish Portland Cement Stucco, Tabby
- d. Panel: Wood, Composite, PVC or Fiber-Cement Panels



Brick



Siding



Stucco

6.5.6. Foundations

Materials: Painted Poured Concrete, Brick, Tabby and Stucco.

6.5.7. Columns

Materials: Wood, Fiberglass, Composite.

Profiles: Square, Round



Rounded Columns



Square Columns

6.5.8. Windows

Materials: Wood, Aluminum Clad-Wood, Vinyl-clad, PVC, Painted Metal

Type: Single, Double or Triple Hung, Casement.

Glazing: Clear (No tinted, mirrored or opaque windows glazing allowed)

Note: Painted metal windows on brick/ stucco finish only



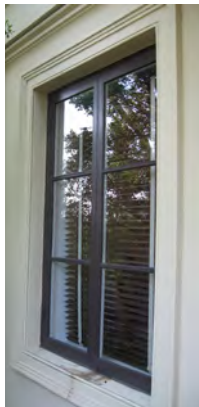
Single Hung



Double Hung



Casement



6.5.9. Trim

Materials: Wood, Composite, PVC, Fiber-Cement.

Profiles (Siding):

Corner Boards 3.5"-8"

Eaves: 8" min.

Window/ Door Trim:

3.5" Jamb,

8" Heads with Cap. min,

2" Sloped sills min.

Profiles (Brick/ Stucco):

Express Lintel/ Header

Brick/ Stucco Sill

Note: Primary Entry Door may have larger trim.



Window Trim



Stucco Header and Sill



Brick Header and Sill

6.5.10. Shutters

When used, shutters shall be operable types with appropriate hardware. They shall be sized to match the opening with which they are associated.

Materials: Wood, Composite, PVC.

Type: Louvered, panel, side swing and Bermuda.



Louvered Shutter



Panel Shutter



Bermuda Shutter

6.5.11. Doors

Materials: Wood, Aluminum-Clad Wood, Vinyl-clad Wood, Fiberglass, Painted Metal
 Glazing: Clear (No tinted, mirrored or opaque door glazing allowed)



Metal Door



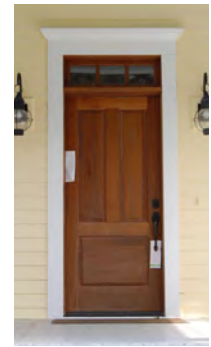
Metal Door



French Door



Panel Door with Glass



Panel Door

6.5.12. Shopfronts

Materials: Wood, Aluminum-Clad Wood, Vinyl-clad Wood, PVC

Foundations: Brick, Painted Poured in Place Concrete, Stucco, Tabby.



- Proportioned entablature
- Shop front windows equal
- Windows recessed from adjacent material
- Recessed shop front panels
- Recessed entrance



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VII. Sign Standards

7.1 IN GENERAL

7.1.1.1 Purpose.

Increased numbers and size of signs distract the attention of motorists and interfere with traffic safety. More importantly, the indiscriminate erection and maintenance of signs seriously detracts from the enjoyment and pleasure in the natural scenic beauty of the city and, in turn, injuriously affects the economic well-being of the citizenry. The purpose of limiting signage is to increase traffic safety, enhance the scenic beauty of the U.S. 17 Parkway and improve the economic viability of this commercial corridor.

7.1.2. Applicability.

The requirements of this section shall apply to all signs constructed, placed, or replaced after adoption of this ordinance and these requirements are in addition to article 24 of the this chapter. Provided, this chapter shall not preclude the replacement of any existing non-conforming sign which is damaged or destroyed by casualty (such as fire, wind, flood or vandalism) where the loss was not caused by the owner; in such event, if the sign is replaced the non-conformity may not be increased or varied (for example, a five hundred square foot sign that is 25 feet in height could not be replaced by a 600 square foot sign, nor by 150 feet in height).

7.2 GENERAL STANDARDS

7.2.1. Sign material and design. The design, color, location, and illumination of signage shall be compatible with the overall design of the development.

7.2.2. Prohibited Signs: The following signs are prohibited from being viewed from a public right of way.

- Billboard and pole style signs
- Flashing signs and signs with visually moving parts or messages are prohibited except as allowed in subsection 23-24-13(r), and subsection 23-24-13(s).
- Moving signs or signs with moving parts

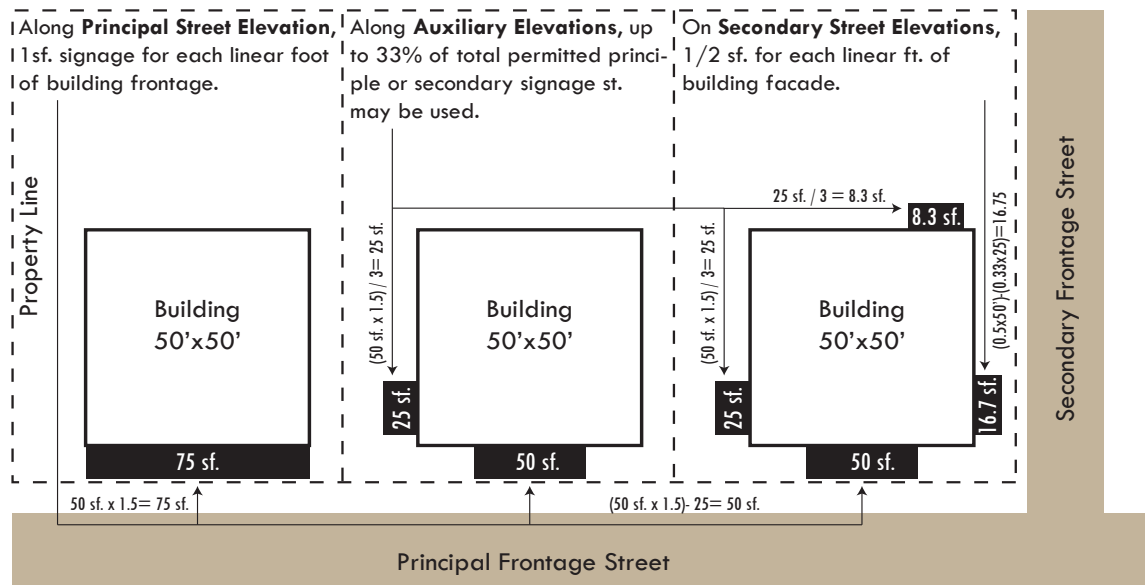
Neon signs are allowed provided they comply with all other sections of this District.

7.2.2.3. Lighting:

1. External illumination shall be by a steady stationary light source, shielded and directed solely at the sign. Light fixtures shall be restricted to not more than one shielded light fixture per side for signs up to 40 square feet and not more than two shielded light fixtures per side for signs over 40 square feet.
2. Light sources to illuminate signs shall neither be visible from any street right-of-way, nor cause glare hazardous to pedestrians or vehicle drivers or so as to create a nuisance to adjacent properties. All ground-mounted lighting must be obscured by landscaping approved by the Planning Director.

3. The intensity of the light shall not exceed 20 foot-candles at any point on the sign.
4. Signs shall not have light-reflecting backgrounds but may use light-reflecting lettering or halo lighting.
5. Lamps shall only produce a white light.

7.3 TOTAL SIGN AREA



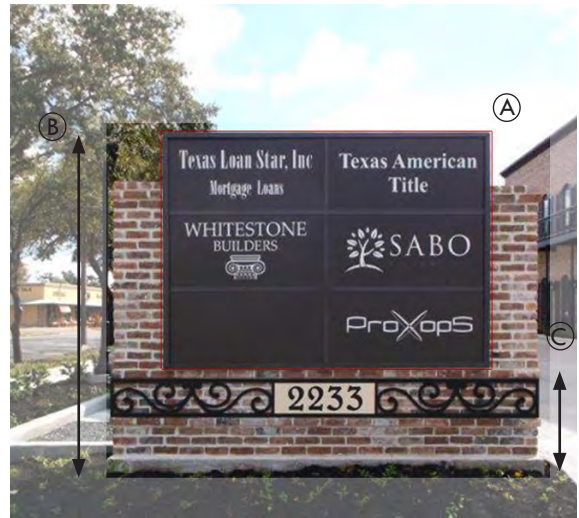
Aggregate Signage Standards for Building
Attached Signs based on a 50'x50' Single-Tenant Building.

7.4 SIGN TYPOLOGY STANDARDS

7.4.1. Monument Signs

Freestanding sign which may be for a single tenant or multiple tenants.

Size		
Signable Area (per side):		(A)
Up to 150' frontage	48 sf. max	
Up to 500' frontage	60 sf. max.	
Over 500' frontage	80 sf. max	(B)
Location		
Height of Wall	10' max.	(C)
Mounting Height:		
Above Grade	4' max.	
	12" min	
Number of Signs	1 per wall face	
Miscellaneous		
Changeable Copy Signs are allowed for information which changes on a regular basis, such as gasoline price signs, restaurant food specials, films and live entertainment, etc.		



7.4.2. Landscape Wall Signs

Attached to freestanding walls and are often used to mark a place of significance or the entrance to a location. The signs are often used in place of a monument sign.

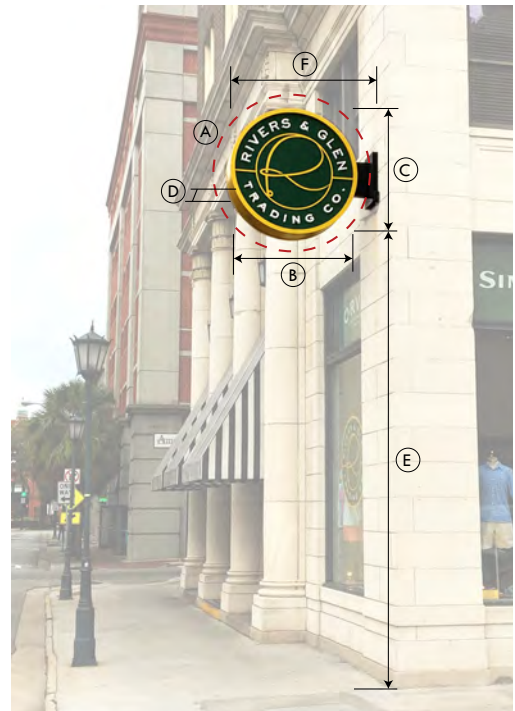
Size		
Signable Area:	24 sf. max.	(A)
Location		
Height of Wall	4' max.	(B)
Mounting Height:		
Top of Wall		(C)
Above Grade	At least 12"	(D)
Number of Signs	1 per wall face	



7.4.3. Projecting Sign

Typically mounted perpendicular to a building facade and are typically hung from decorative cast or wrought iron brackets. May also be mounted at a 45-degree angle on a corner.

Size		
Signable Area:		(A)
Area	6 sf. max.	(B)
Width	48" max.	(C)
Height	36" max.	(D)
Thickness	4" max. (Special and creative signs that have 3-D quality may have greater thickness subject to approval by the Planning Director)	
Location		
Clear Height:	8' min.	(E)
Extension	8.5' max.	(F)
Signs per building	1 per storefront max.	



7.4.4. Sidewalk Signs

Provide secondary signage and may be used to announce daily specials, sales, or provide direction. Chaser lights or illuminated signs may not be used.

Size		
Signable Area:		
Area	6 sf. max.	(A)
Width	30" max.	(B)
Height	42" max.	(C)
Location		
Sidewalk signs must be located on or adjacent to a sidewalk and shall not interfere with pedestrian travel or encroach upon the required accessible path.		
Sidewalk signs may only be displayed during business hours and must be removed when the business is closed.		
Sign per building	1 per storefront max.	



7.4.5. Wall Signs

They are flat against the facade consisting of individual cut letters applied directly to the building, or painted directly on the surface of the building. Wall signs are placed directly above the main entrance and often run horizontally.

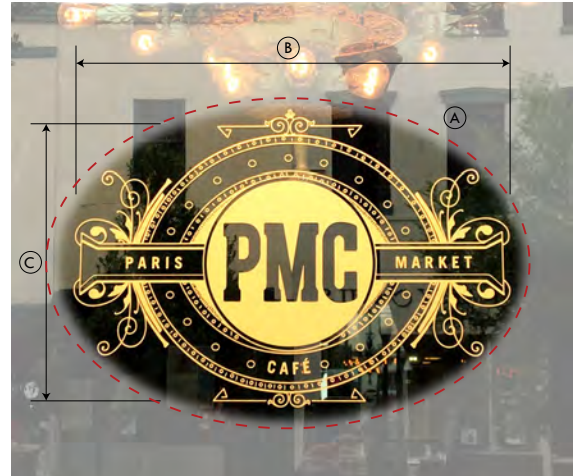
Size		
Signable Area:		
Area	1 sf. per linear foot of shop front width up to 80 sf. max.	(A)
Width	Storefront width max.	(B)
Height	12" min.; 5' max.	(C)
Lettering:		
Width	75% of signable width, max.	(D)
Height	75% of signable height, max.; 35" max.	(E)
Location		
Projection from facade	8" max.	
Signs per building	1 per shop front and/ or elevation	
2nd Story Business	1 sign located at 1st floor entrance, max size 1 sf.	



7.4.6. Window Signs

Professionally painted consisting of individual letters and designs, gold leaf individual letters and designs, applied directly on the inside of a window.

Size		
Sign Area:		(A)
Per Shop front Bay	25% max.	
Per Shop front	15% max.	
Width	5' max.	(B)
Height	36" max.	(C)
Location		
Window signs shall be placed at or above eye level.		
Window signs shall be applied directly to the inside of the glass.		
Miscellaneous		
Applied plastic or vinyl cut letters are strongly discouraged.		
Window signs must have a clear background.		



7.4.7. Directional Signs

Provide guidance to entrances and parking locations.

Size		
Signable Area	6 sf. max.	(A)
One sf may be added for each listing with a max. sign area of 10 sf		
Location		
Width:	2' max.	(B)
Height:		(C)
Wall Mounted	8' max.	
Freestanding	6' max.	
Number of Signs	1 per lot or access way	
Miscellaneous		
The name of business or address may appear on directional sign.		
Directional signs shall be limited to directional and warning messages only.		



7.4.8. Awning

Traditional storefront fitting made of canvas or other material stretched on a frame and used to protect the storefront, window, doorway from sun or rain. Awning may display store name and signs.

Size		
Projecting:		
Sign Area	1 per sf. linear ft. of shop front, max.	(A)
Lettering Height	16" max.	(B)
Lettering Thickness	6" max.	(C)
Sloping Plane:		
Sign Area	25% coverage max.	(D)
Lettering Height	18" max.	(E)
Valance:		
Sign Area	75% coverage max.	(F)
Width	Store front width max.	(G)
Height	8" min.; 16", max	(H)
Lettering Height	8" min.	(I)
Location		
Clear Height	8' min.	
Sign per awning	1 projecting; or 1 valance and 1 sloping plane max.	(J)
Miscellaneous		
Open-ended awnings are encouraged.		
Fabric awnings shall be covered only with canvas, woven acrylic, or similar fabric materials. Shiny or glossy materials including but not limited to vinyl and plastic are not permitted.		
Sign copy on awnings on secondary story windows is not permitted.		



7.4.8. Service station signs

Gasoline service stations and other establishments selling gasoline shall be permitted additional signs as follows:

- a. One gasoline and/or self-service/full service sign per pump island. The sign shall have a maximum of eight square feet in surface area per side, a total aggregate of 16 square feet and shall be secured to each pump island. The gasoline sign shall not count toward the total maximum signage permitted in this section.
- b. Each gasoline pump shall be permitted to display only the brand name or logo of the gasoline and shall not exceed the face of the pump.

7.4.9. Tenant directory signs

- a. Tenant directory signs shall be permitted in multi-building, multi-tenant professional, office, and/or business centers.
- b. One tenant directory sign up to 32 square feet in surface area per side shall be permitted per street frontage.
- c. Tenant directory signs shall not count toward the total maximum signage permitted in this section.
- d. Tenant directory signs shall not be located within any yard setback.
- e. The base of the tenant directory sign shall be landscaped.
- f. Only the name of the business and the address shall be permitted on tenant directory signs. Logos are not permitted.
- g. The tenant directory sign must be located at least 25 feet from any adjacent right-of-way.

7.4.10. Outdoor drive-through menu boards

- a. Outdoor drive-through menu boards are signs associated with drive-through restaurants which list the type and price of food items offered for sale at the establishment.
- b. Outdoor drive-through menu boards shall not count toward the total maximum signage permitted in this section, if they are not visible from any street right-of-way. If a menu board is visible from a street right-of-way, it shall count toward the maximum attached signage.
- c. New outdoor drive-through menu boards shall be no more than 32 square feet per side in size and shall be designed, located, and landscaped so that to the degree

feasible, they are not to be visible from any street right-of-way. The base of the menu board shall be landscaped and/or incorporated into the landscaping plan.

- d. The Planning Director may permit internal illumination for menu board signs for eating establishments with a drive-through. Such signs shall not cause glare hazardous to pedestrians or vehicle drivers or so as to create a nuisance to adjacent properties. Such signs shall be placed and angled so that, to the greatest extent possible, they are not visible from public or private streets.

APPENDIX A DISTRICT BOUNDARY





APPENDIX I

City of Brunswick

Urban Redevelopment Plan, Fifth Amendment

May 2018

☐ **Table of Contents**

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Executive Summary

- Purpose
- Background
- Goals & Objectives
- Strategies
- Essential Tools

Urban Redevelopment Plan

Attachments

- 1- Notice of Public Hearing on the Proposed Amendment to the Brunswick Urban Redevelopment Plan
- 2- Public Comments on the Proposed Brunswick Urban Redevelopment Plan
- 3- Resolution Describing the Boundaries of the Urban Redevelopment Area within the City of Brunswick, and for other purposes
- 4- Resolution Amending the Urban Redevelopment Plan and Establishing Qualifications and Terms of Office for Members of the Urban Redevelopment Agency of Brunswick
- 5- Legal Department Certification
- 6- 2012 Substandard Housing Analysis
- 7- City of Brunswick Demolition Properties and Demolished Structures Map
- 8- Mary Ross Waterfront Park Master Plan
- 9- Perry Elementary School Redevelopment Plan for 2301 Stonewall Street
- 10- City of Brunswick Urban Redevelopment Area Map
- 11- Aerial of the Oglethorpe Block Redevelopment Project
- 12- Perry Elementary School Master Development Plan

Introduction

“This plan outlines best practices that will help Brunswick redevelop those areas of our community that have suffered from blight or are otherwise threatened. It underscores our commitment to protect and preserve those things which have always made Brunswick a unique place; to fulfill our responsibilities to the environment; to create upward mobility for our citizens, and enhance their quality of life; to encourage investment and to realistically plan for the inevitable growth that is coming.

“The keys to making this work are partnerships and perseverance. Our tools include good codes, professional planning, quality enforcement, concerned leadership, and the active involvement of our citizens. Our focus must always be on improving our community and making a place we are all proud of.”

Bryan Thompson
Mayor of Brunswick

Executive Summary

Purpose:

The Brunswick Urban Redevelopment plan provides a general outline for redevelopment of blighted or threatened areas of the City of Brunswick.

Background:

The Brunswick Urban Redevelopment Plan was created in accordance with the Official Code of Georgia Annotated Section 36-61-7 (Georgia’s Urban Redevelopment Law). This plan describes the City’s broad powers derived from the Urban Redevelopment Law; which enables the City to redevelop blighted or threatened areas of the community. The plan articulates goals and objectives, describes strategies for accomplishing them, and identifies essential tools.

The Components of the Brunswick Urban Redevelopment Plan include:

1. Boundaries of the redevelopment area.
2. Evidence that the area on the whole has not been subject to growth and development through private enterprise and would not reasonably be anticipated to be developed in the near future without the approval of this plan.
3. Explanation of proposed uses for urban redevelopment purposes and proposed method of financing any construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration or remodeling of property for such uses and estimated cost thereof.

4. Description of proposed construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration or remodeling of any public works, public housing, or other public facilities, estimates of cost thereof, and explanation of proposed method of financing same.
5. Description of proposed construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration or remodeling of privately owned property, estimates of cost thereof, and explanation of proposed method of financing same.
6. Description of contracts, agreements and other instruments creating obligations of more than one year which are proposed to be entered into by the City of Brunswick to implement this plan.
7. Description of type of relocation payments proposed to be authorized by this plan and estimates of cost thereof.
8. Statement of conformity of plan to master plan, zoning ordinances and building codes of the City of Brunswick and exceptions thereto.
9. Summary of estimated expenditures from public and private financing sources for each of the first ten years following implementation of this plan.
10. Historic Property within the redevelopment area, as defined in Section 10 herein will be sought to be preserved.

The Brunswick Urban Redevelopment Plan is established by:

- Drafting a Brunswick Urban Redevelopment Plan.
- Holding a public hearing and soliciting comments on the draft plan.
- City Commission Resolution appointing a redevelopment authority or organization to implement the plan.
- City Commission Resolution describing the boundaries of the urban redevelopment area(s) within the City.
- City Commission Resolution to approve the Brunswick Urban Redevelopment Plan.
- Implementation

Amendment:

The City of Brunswick adopted an Urban Redevelopment Plan on March 18, 2009 and amended that Plan on December 19, 2012 to modify the boundaries in accordance with the updated Urban Redevelopment Law of Georgia. A second amendment was approved on September 4, 2013 to add an additional priority project to the Urban Redevelopment Plan of the City of Brunswick. This priority project, commonly referred to as the Oglethorpe Block, is a designated SPLOST project and is consistent with the 2007 Comprehensive Plan and the 2008 Community Agenda and the Short Term Work Program of the City of Brunswick. The other priority projects, the C.B. Greer School site and the Perry Elementary School site, remained as priority projects under the Urban Redevelopment Plan. In addition, the second amendment clarified the role of the Redevelopment Agency of Brunswick as the Redevelopment Agency of the City of Brunswick per the requirements of the Urban Redevelopment Law of Georgia, as well as designating the City Office of Planning and Development to serve as the City of Brunswick's coordinating office and as staff liaison with the Brunswick Redevelopment Agency. A third amendment was approved on May 21, 2014 to amend the procedure for nominating Agency members to delete the two nominations that were to be put forth by the Board of Commissioners of

Glynn County and to have the Mayor appoint the board of commissioners of the Urban Redevelopment Agency. A fourth amendment to the Urban Redevelopment Plan was approved on February 17, 2016 to add the Mary Ross Waterfront Park and the Highway 17 corridor as additional priority projects. The C.B. Greer School site is removed from the Urban Redevelopment Plan due to the completion of the Norwich Commons development on the old C.B. Greer School site. A fifth amendment to the Urban Redevelopment Plan is being considered to add the master plan and estimates of costs for the Perry Elementary School Site redevelopment and incorporate the redevelopment into the redevelopment plan.

Goals & Objectives:

- Implement a process that does not require a referendum
- Have a plan that is fairly easy and inexpensive to prepare and amend; and one that can be implemented by a City-appointed authority
- Use appropriate tools to buy and assemble property for revitalization and resale
- Encourage private enterprise/public-private partnerships to redevelop neglected areas of the community
- Use tax exempt bonds, secured by loans or grants, for redevelopment purposes
- Keep the public informed of what is being planned for the redevelopment area
- Guide City investments in infrastructure to support redevelopment
- Allow the City to negotiate variances and selectively waive portions of its existing zoning and development requirements in order to achieve the optimum economic and aesthetic results in the redevelopment area
- To utilize the development of public facilities within the Urban Redevelopment Area as catalyst for the creation of new desired private development, consistent with this plan

Strategies:

- The City's redevelopment actions are based on Georgia Law and reflect the best practices of other municipalities.
- All code enforcement and redevelopment decisions are impartial and based on the state of the properties. Ownership is not a consideration.
- Public understanding and support for redevelopment will be accomplished through a continuing public information and outreach effort involving elected officials, City staff, news media, and other key communicators.
- Code Enforcement is used to identify occupied houses that should be brought into the redevelopment process. These properties are targeted for redevelopment ONLY when they become vacant. This avoids future implications of the Uniform Relocation Act.
- All reasonable efforts will be taken to cause rental property owners to bring their properties up to standards if they want to continue to rent. With a redevelopment plan in place, properties which have been identified as substandard with outstanding code violations will receive a prioritized focus from City Code Enforcement to bring these properties to minimum housing standards.

- Junk cars are remediated by enforcing existing codes.
- Eminent Domain will remain at the bottom of the toolbox because of its provocative reputation.
- Condemnation will be avoided if possible; except in title-clearing cases (friendly condemnation). This process ties up scarce resources and creates public dissention.
- Selected City staff members will be trained and certified as asbestos inspectors and certified as lead paint inspectors
- All demolition will be supervised by the City Demolition Coordinator and may be performed by the City Public Works Department to reduce costs. Certified asbestos inspectors will determine the demolition method to be used for each property. In those cases where a property has salvage value, demolition may be performed by someone willing to take it down for the valued construction materials. If contracting is needed for disposal, it should include trying to recycle tin, wood and brick; sort inert debris; and using a loader that allows shaking the dirt out before loading.
- Apply to the Georgia Department of Community Affairs for Opportunity Zone tax credits for all areas in the Urban Redevelopment Area
- Utilize the Urban Redevelopment Agency of Brunswick as a vehicle for the investment of public funds for public purposes in development activities within the Urban Redevelopment Area that are designed to encourage, promote, facilitate and participate in the creation of new private development consistent with this Plan

Essential Tools:

Create an atmosphere and vehicle by which the Urban Redevelopment Plan will afford maximum opportunity, consistent with the sound needs of the municipality as a whole, for the rehabilitation or redevelopment of the Urban Redevelopment Area by private enterprise.

Establish the Urban Redevelopment Agency of Brunswick as the primary development entity for master planning and developing of such priority projects as may be designated by the Plan from time to time and to utilize the Urban Redevelopment Agency of Brunswick as the development entity for those public projects that serve to enhance the opportunity for the rehabilitation or redevelopment of the Urban Redevelopment Area by private enterprise.

Provide such public resources, consistent with the sound needs of the municipality as a whole, as will allow the Urban Redevelopment Agency of Brunswick to perform these functions. Enter into such agreements with the Urban Redevelopment Agency of Brunswick for the provision of public facilities, as are consistent with the sound needs of the municipality as a whole, and to facilitate the such agreements between the Urban Redevelopment Agency of Brunswick and other public and private entities as will further the purposes of the Plan.

The Nuisance Abatement Process, previously the primary tool for redevelopment, will continue to be a critical component of the Plan. Based on the City Codes, it uses the processes and forms found in the plan's attachments. A lien can be attached equal to a tax lien for clean-up costs; and the property can be foreclosed-on should the need arise. Nuisance Abatement also allows the City to include demolition removal costs in the lien. Although the lien may exceed the value of the property, the City is investing in the community and not trying to generate short-term profits.

Professionally qualified staff and other resources must be available to implement the program. This includes the Building Inspection, Code Enforcement, Demolition Coordination, Asbestos Inspection, Police, Fire Inspection, Public Works, and Municipal Court functions. All must be thoroughly familiar with the City codes pertaining to public nuisances and the nuisance abatement processes; then rigorously follow them. The Municipal Court must also have an understanding of O.C.G.A. Section 36-61.

The City Commission must understand and support the legitimacy and impartiality of the nuisance abatement process. This must be clearly communicated to the public.

The Blighted Buildings Act (HR 391) may be used as a tool for redevelopment. This is a constitutional amendment (Ga. L. 2002, p.1497, Par. 1), which revised Article IX, Section II, paragraph VII (Community Redevelopment) to provide that counties and municipalities may establish community redevelopment tax incentive programs (i.e. a Community Redevelopment Tax Incentive Ordinance) under which increased taxation shall apply to properties maintained in a blighted condition and decreased taxation shall apply for a time to formerly blighted property which has been rehabilitated. It was approved by a majority of the state voters voting in the general election held November 5, 2002. The Office of Downtown Development, Georgia Department of Community Affairs, is currently conducting research to determine what communities have successfully utilized this act and how it was implemented.

Accessible sources of funding are vital to support rehabilitation of housing and commercial properties, and redevelopment of targeted areas in concert with private investment and nonprofit organizations such as Habitat for Humanity. This includes such things as revolving loan funds, Community Development Block Grants (CDBG), Community Home Investment Program (CHIP) Grants, Revitalization Area Strategy (RAS/CHIP) grants, Georgia Department of Community Affairs home ownership programs, US Department of Agriculture programs, and other public and private financial resources. Other potential sources of funding and financing might include downtown development-specific programs such as the Georgia Department of Community Affairs Downtown Development Revolving Loan Fund and the Redevelopment Fund, Tax Exempt Bond Financing, Historic Tax Credits, New Market Tax Credits, the Georgia Cities Foundation Revolving Loan Fund, and a Tax Allocation District. Conventional Market Rate financing will also be utilized where applicable and appropriate.

City of Brunswick Urban Redevelopment Plan

This plan shall constitute a written redevelopment plan adopted and approved under the provisions of Official Code of Georgia Annotated Section 36-61-7 for the Urban Redevelopment Areas identified and described herein.

Section 1. Boundaries. The boundaries of the area proposed for redevelopment are as follows:

See attached map entitled “*Brunswick Redevelopment Area.*”

Section 2. Evidence that area on the whole has not been subject to growth and development through private enterprise and would not reasonably be anticipated to be developed without the approval of this plan.

- (a) Within just 4 neighborhoods contained in the Urban Redevelopment Area, some five hundred and twelve (512) properties are vacant, two hundred and eighty-four (284) residential units are in “poor” condition, and one hundred and two (102) residential units are considered “uninhabitable”.
- (b) Numerous unkempt vacant lots adversely affect tax base and slow development of neighborhoods. All determinations made by on-site inspections.
- (c) A 2012 substandard housing analysis revealed 22.65% of dwellings in the City of Brunswick meet the definition of "uninhabitable," "poor condition," or "fair condition needing major repair" (see attachment 6).
- (d) Since January 2006, 155 structures have been demolished citywide for being dilapidated beyond repair and 179 structures remain on the City's demolition list. The City offers demolition assistance grants and the amount of the demolition grant depends on the income of the property owner (see attachment 7).

Section 3. Explanation of proposed uses for urban redevelopment purposes and proposed method of financing any construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration or remodeling of property for such uses and estimated cost thereof.

Propose to reestablish housing and commercial uses per the existing zoning wherever practical, or in compliance with such specific redevelopment plans as contained herein, though the utilization of the Urban Redevelopment Agency of Brunswick as the master developer, in concert with private investment and not-for-profit developers such as Habitat for Humanity, the Brunswick Housing Authority, Southeast Georgia Community Land Trust, Southeast Georgia Community Development Corporation, and others. Anticipated demolition costs will be split between the property owner and the City to the extent practicable. CHIP, CDBG, DCA, and local funding may be used for down-payment assistance

and/or rehabilitation and incentives per available programs. The City will work with the Department of Community Affairs on other options to finance home ownership; thereby making development more enticing to private sector.

Where consistent with the sound needs of the municipality as a whole, the City shall enter into such agreements with the Urban Redevelopment Agency of Brunswick as will provide for the necessary expansion, rehabilitation or addition of public facilities. The potential sources of funding and financing for Public and Private investment contemplated for downtown redevelopment projects, may include downtown development-specific programs such as the Georgia Department of Community Affairs Downtown Development Revolving Loan Fund and the Redevelopment Fund, Tax Exempt Bond Financing, Historic Tax Credits, New Market Tax Credits, the Georgia Cities Foundation Revolving Loan Fund, and a Tax Allocation District. Conventional Market Rate financing will also be utilized where applicable and appropriate.

Section 4. Description of proposed construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration or remodeling of any public works, public housing, or other public facilities, estimates of cost thereof, and explanation of proposed method of financing same.

- (a) The City and Glynn County wish to see the redevelopment of the property known as the Oglethorpe Block as a mixed use development. The development is to include meeting space (referred to in SPLOST IV as the “Oglethorpe Convention Center” or “Oglethorpe Conference Center”) as well as commercial development such as hotel, retail, office and residential uses, along with such structured parking as may be required to support these and other uses. The development will be a combination of both public and private sector initiatives and is anticipated to be a phased project that will span several years until completion. It is contemplated that the Urban Redevelopment Agency of Brunswick will serve as the "Master Developer" of the site, utilizing public- and private-sector expertise and financing as appropriate and necessary for the successful completion of the Oglethorpe Block project.

The Oglethorpe Block is one of the Catalyst Sites referred to in Sections 5-1 in both the 2007 Comp. Plan (p. 168) and the 2008 Community Agenda (p. 79). The site totals approximately 3.1 acres and includes properties owned by the City and County. The property is favorably located between the City's central business district and the waterfront, near an existing marina and proposed waterfront development project to the northeast. The parcel has been partially cleared for redevelopment and SPLOST funds have been allocated for traffic and park improvements at the north end of the site. The property has the potential to expand the commercial boundary of downtown and connect downtown to the waterfront, offering a prime location for a mixed-use development and a potential site for a downtown hotel. The Oglethorpe property is close enough to the waterfront to achieve higher residential values than other locations within the City, but would not necessarily attract second home buyers. Residential development within the project could include mixed-income units.

Funding for the Public portion of the project will utilize the SPLOST allocation per the Memorandum of Understanding and other SPLOST agreements related to the Oglethorpe Block Project between the City of Brunswick and Glynn County, as well as other funding and incentives available for projects of this type. At this time the nature of public sector participation is to be determined based upon the development of the master plan for the project. Summaries of estimated expenditures from public and private financing sources will be available once the project has an updated master plan, cost projections and financing strategies developed. An amendment to this plan will be presented that provides detailed estimates of costs and expenditures once a master development and financing plan is developed and available for inclusion in the Urban Redevelopment Plan.

- (b) Mary Ross Waterfront Park
Pursue redevelopment opportunities in Mary Ross Waterfront Park in accordance with the Mary Ross Waterfront Park Master Plan adopted June 17, 2015.

Section 5. Description of proposed construction, reconstruction, expansion, renovation, rehabilitation, repair, demolition, alteration or remodeling of privately owned property, estimates of cost thereof, and explanation of proposed method of financing same.

- (a) Perry Elementary School Site. This is a proposed residential and commercial reconstruction to be funded by private enterprise and/or the Housing Authority if applicable. The proposed development should include affordable rental housing. This workforce housing should target citizens with low income or income at or below 60% Area Median Income. All available state and federal home buyer assistance will be utilized to enable loan qualification. The City may dispose of real property in an urban redevelopment area in such manner as provided by Georgia law. Under this plan, the City and/or Urban Redevelopment Agency may invite proposals from and make available all pertinent information to private redevelopers or any persons interested in undertaking to redevelop or rehabilitate an urban redevelopment area or any part thereof. The notice shall identify the area or portion thereof and shall state that such further information as is available may be obtained at the City's Office of Planning and Development or such other location as shall be designated in the notice. The City and/or the Urban Redevelopment Agency shall consider all such redevelopment or rehabilitation proposals and the financial and legal ability, and experience with similar projects of the persons making such proposals to carry them out and may negotiate with any persons for proposals for the purchase, lease, or other transfer of any real property acquired by the City in the urban redevelopment area . The City and/or the Urban Redevelopment Agency may accept such proposal as it deems to be in the public interest and in furtherance of the purposes of this plan. The City and/or the Urban Redevelopment Agency may execute contracts in accordance with this plan and deliver deeds, leases, and other instruments and take all steps necessary to effectuate such contracts.

- (b) Oglethorpe Block Redevelopment. Proposed public/private redevelopment of the site is to be funded by private enterprise and/or the public sector funding if applicable. The City and County wish to see the redevelopment of the property known as the Oglethorpe Block as a mixed use development. The development is to include meeting space (referred to in SPLOST IV and V as the “Oglethorpe Convention Center” or “Oglethorpe Conference Center”) as well as commercial development such as hotel, retail, office and residential uses, along with such structured parking as may be required to support these and other uses. The development will be a combination of both public and private sector initiatives and is anticipated to be a phased project that will span several years until completion. It is contemplated that the Urban Redevelopment Agency of Brunswick will serve as the "Master Developer" of the site, utilizing public- and private-sector expertise and financing as appropriate and necessary for the successful completion of the Oglethorpe Block project.

The Oglethorpe Block is one of the Catalyst Sites referred to in Sections 5-1 in both the 2007 Comp. Plan (p. 168) and the 2008 Community Agenda (p. 79). The site totals approximately 3.1 acres and includes properties owned by the City and County. The property is favorably located between the City's central business district and the waterfront, near an existing marina and proposed waterfront development project to the northeast. The parcel has been partially cleared for redevelopment and SPLOST funds have been allocated for traffic and park improvements at the north end of the site. The property has the potential to expand the commercial boundary of downtown and connect downtown to the waterfront, offering a prime location for a mixed-use development and a potential site for a downtown hotel. The Oglethorpe property is close enough to the waterfront to achieve higher residential values than other locations within the City, but would not necessarily attract second home buyers. Residential development within the project could include mixed-income units.

Funding for the Public portion of the project will utilize the SPLOST allocation per the Memorandum of Understanding and other SPLOST agreements related to the Oglethorpe Block Project between the City of Brunswick and Glynn County, as well as other funding and incentives available for projects of this type. At this time the nature of public sector participation is to be determined based upon the development of the master plan for the project. Summaries of estimated expenditures from public and private financing sources will be available once the project has an updated master plan, cost projections and financing strategies developed. An amendment to this plan will be presented that provides detailed estimates of costs and expenditures once a master development and financing plan is developed and available for inclusion in the Urban Redevelopment Plan.

- (c) Glynn Avenue Corridor
Pursue redevelopment opportunities in accordance with the design guidelines being composed and ultimately adopted for all of the Glynn Avenue Corridor in the City of Brunswick.

Section 6. Description of contracts, agreements and other instruments creating obligations of more than one year which are proposed to be entered into by the City of Brunswick to implement this plan.

(a) The Urban Redevelopment Agency of Brunswick may enter into agreements with qualified private sector developer and/or contractors to serve in a variety of capacities such as a fee developer/development manager for the project, a project architect, a project engineer, a construction company and other professionals as might be needed to successfully complete the development of the Oglethorpe Block and other priority projects. In addition, the Urban Redevelopment Agency of Brunswick may enter into agreements with the City of Brunswick, Brunswick Downtown Development Authority, Glynn County or other public entities for the provision of public facilities and the financing thereof. There are currently no multi-year contracts in place or specifically contemplated, but multi-year contracts may be required once the project is in the construction and development management phase.

Section 7. Description of type of relocation payments proposed to be authorized by this plan and estimates of cost thereof.

All target properties at this juncture are vacant. Future inhabited properties, if applicable, will be handled in accordance with the Georgia Relocation Act and Federal Uniform Relocation Act.

Section 8. Statement of conformity of plan to master plan, zoning ordinance and building codes and exceptions thereto.

This plan is in complete conformity with the comprehensive plan, zoning ordinances, and building codes of the City of Brunswick, with the following exceptions:

No predetermined exceptions. Any case specific exceptions that develop will be subject to approval by the City Commission.

No predetermined zoning changes are contemplated. The City has an abundance of underutilized commercial, industrial, and residential zoned properties.

The Oglethorpe Block Project is one of the Catalyst Sites referred to in Sections 5-1 in both the 2007 Comp. Plan (p. 168) and the 2008 Community Agenda (p. 79).

The Mary Ross Waterfront Park Master Plan was adopted by the City Commission on June 17, 2015 and incorporated it as part of the City's Comprehensive Land Use Plan.

Section 9. Summary of estimated expenditures from public and private financing sources for each of the first ten years following implementation of this plan.

- (a) Perry Elementary School Site. Summaries of estimated expenditures from public and private financing sources, along with the master development plan may be found in Attachment 12.

- (b) Oglethorpe Block Project. Summaries of estimated expenditures from public and private financing sources will be available once the project has an updated master plan, cost projections and financing strategies developed. An amendment to this plan will be presented that provides detailed estimates of costs and expenditures once a master development and financing plan is developed and available for inclusion in the Urban Redevelopment Plan.
- (d) Mary Ross Waterfront Park. The estimated cost to complete the improvements included in the Mary Ross Waterfront Park Master Plan is \$12 to \$15 million.
- (e) Glynn Avenue Corridor. Summaries of estimated expenditures from public and private financing sources will be available once the design guidelines project is completed.

Section 10. Historic Property. Any property located within this redevelopment area which is either designated as a historic property under Article 2 of Chapter 10 of Title 44, the “Georgia Historic Preservation Act”, or is listed on or has been determined by any federal agency to be eligible for listing on the National register of Historic Places, will not be:

- (a) Substantially altered in any way inconsistent with technical standards for rehabilitation; or
- (b) Demolished unless feasibility for reuse has been evaluated based on technical standards for the review of historic preservation projects; which technical standards for rehabilitation and review shall be those used by the state historic preservation officer, although nothing in this subparagraph shall be construed to require approval of a redevelopment plan or any part thereof by the state historic preservation officer.

Section 11. Urban Redevelopment Agency of Brunswick. By Resolution of the Mayor and Commission of the City of Brunswick, dated June 16th, 2010, the Mayor and City Commission created a redevelopment agency pursuant to the terms of the Urban Redevelopment Law to be known as the “Brunswick Redevelopment Agency”. By action at a duly called meeting of the Mayor and City Commission on September 15th 2010, the initial Commissioners or said agency were appointed. The initial terms of office of all such appointees has since expired. O.C.G.A. Section 36-61-18 provides, in part, that such agency shall be known as the “Urban Redevelopment Agency of Brunswick”, as such shall be known henceforth. Said law further provides that the number of Commissioners of such agency, their terms of office and qualifications shall be as proscribed by the Mayor and City Commission.

- (a) The Urban Redevelopment Agency of Brunswick shall consist of a total of seven (7) Commissioners. The Mayor, by and with the advice and consent of the City Commission, shall appoint a board of commissioners of the Urban Redevelopment Agency. The Mayor shall designate a chairman and vice-chairman from among the commissioners.
- (b) Each Commissioner shall serve a term of three years, with those appointed to fill the expired terms of the initial Commissioners serving staggered terms such that two shall

serve for one year, two for two years and three for three years. Each appointment thereafter shall be for a term of three years.

- (c) Each person appointed to fill the position of Commissioner of the Urban Redevelopment Agency of Brunswick shall meet the following qualifications:
 - (i) Such person shall reside within five (5) miles of the City limits of the City of Brunswick, such constituting the “Area of Operation” of the Urban Redevelopment Agency of Brunswick as defined by O.C.G.A. Section 36-61-2; and,
 - (ii) Such person shall have been a resident of the area described above for a period of not less than three years as of the time of the appointment; and,
 - (iii) Such person shall own or operate a business within Area of Operation; or, Such person shall have business experience in one of the following areas:
 - (a) Banking and/or finance;
 - (b) Real estate marketing, real estate development, and/or real estate law;
 - (c) Historic preservation and/or rehabilitation;
 - (d) Business management; or, tourism and/or hospitality.

Section 12. Urban Redevelopment Plan Amendment. This Plan may be amended from time to time by the Mayor and Commission of the City of Brunswick as provided by the Urban Redevelopment Law of Georgia (O.C.G.A. Section 36-61), provided however, such plan shall not be amended to include any project outside the corporate boundaries of the City of Brunswick except with the consent and approval of the Board of Commissioners of Glynn County.

Attachment 1 - Notice of Public Hearing on the Proposed Amendment to the Brunswick Urban Redevelopment Plan

Published in The Brunswick News on May 11, 2018 and posted at all entrances to City Hall and Old City Hall.

**Public Meeting Notice
Brunswick Urban Redevelopment Plan
May 16th, 2018 at 5:30 p.m.**

Second Floor meeting room Old City Hall, 1229 Newcastle Street
Brunswick, Georgia 31520

The City of Brunswick is preparing an amendment to its Urban Redevelopment Plan for adoption and approval under the provisions of the Official Code of Georgia Annotated Section 36-61-7.

The proposed Brunswick Urban Redevelopment Plan is available in draft for public viewing and downloading on the City website at www.brunswickga.org. A printed version is available for review at City Hall, 601 Gloucester Street, Brunswick, Georgia from 8:00 AM to 5:00 PM; Monday thru Friday.

A public meeting will be held in the second floor meeting room at Old City Hall, 1229 Newcastle Street, Brunswick, GA 31520, on May 16, 2018 at 5:30 P.M. The purpose of this meeting is to obtain citizen input and comments on the proposed Urban Redevelopment Plan amendment. Persons with special needs relating to handicapped accessibility or foreign language should contact Bren White-Daiss at (912) 267-5502 prior to May 16, 2018. Persons with hearing disabilities can contact the GA Relay Service at (TDD) 1-800-255-0056 or (VOICE) 1-800-255-0135.

Attachment 2 - Public Comments on the Proposed Brunswick Urban Redevelopment Plan

February 17, 2016 City Commission public hearing note on proposed amendment to Urban Redevelopment Plan

Arne Glaeser, City Planning and Development Manager gave a short presentation on the proposed changes to the U.R.P.

Zack Lyde, citizen, asked about Bobby Hall's project and the L.E. Lewis project.

Mayor Harvey asked that Zack Lyde provide more information about each of those projects to City Staff for possible future inclusion to the U.R.P.

Gary Cross, citizen, suggested that Mary Ross Waterfront Park not be assigned to the Urban Redevelopment Agency.

City Commission approved a motion to add the Mary Ross Waterfront Park project and the Highway 17 project to the Urban Redevelopment Plan and the motion was approved unanimously. Staff was directed to make the requested amendments to the Urban Redevelopment Plan and place this item on the March 2, 2016 City Commission agenda for Commission review.

May 16, 2018 City Commission public hearing on proposed amendment to Urban Redevelopment Plan

Mathew Hill, Downtown Development Authority Executive director gave a short presentation on the proposed changes to the U.R.P.

George Tullos, citizen, stated that Workforce Housing is an important aspect that should be included in the U.R.P.

City Commission approved a motion to add Workforce Housing to the Urban Redevelopment plan and the motion was approved unanimously. Staff was directed to make the requested amendments to the Urban Redevelopment Plan and place this item on the June 6, 2018 City Commission Agenda for adoption of the resolution.

Attachment 3 - Resolution Describing the Boundaries of the Urban Redevelopment Area within the City of Brunswick, and for other purposes

CITY OF BRUNSWICK
URBAN REDEVELOPMENT PLAN

RESOLUTION

A RESOLUTION TO DESCRIBE THE BOUNDARIES OF THE URBAN REDEVELOPMENT AREA WITHIN THE CITY OF BRUNSWICK, AND FOR OTHER PURPOSES

Be it hereby resolved by the Brunswick Commission that:

WHEREAS, the Office of Planning and Development of the City of Brunswick, Georgia, has been constituted and designated as the urban redevelopment agency of and for the City of Brunswick by resolution duly approved on the 19th day of December 19, 2012,

NOW, THEREFORE, BE IT RESOLVED by the Mayor and City Commission of the City of Brunswick, Georgia, in meeting duly assembled, pursuant to the authority granted by Official Code of Georgia Annotated section 36-61-7(a), that the following described area is hereby declared to be an area in which there is a predominance of buildings or improvements, whether residential or nonresidential, which by reason of dilapidation, deterioration, age, or obsolescence; inadequate provision for ventilation, light, air, sanitation, or open spaces; high density of population and overcrowding; existence of conditions which endanger life or property by fire and other causes; or any combination of such factors is conducive to ill health, transmission of disease, infant mortality, juvenile delinquency, or crime and is detrimental to the public health, safety, morals, or welfare; or in which by reason of the presence of a substantial number of slum, deteriorated, or deteriorating structures; predominance of defective or inadequate street layout; faulty lot layout in relation to size, adequacy, accessibility, or usefulness; unsanitary or unsafe conditions; deterioration of site or other improvements; tax or special assessment delinquency exceeding the fair value of the land; the existence of conditions which endanger life or property by fire and other causes; or any combination of such factors substantially impairs or arrests the sound growth of the City of Brunswick, retards the provisions of housing accommodations, constitutes an economic or social liability and is a menace to the public health, safety,

morals, or welfare in their present condition and use; and therefore meet the definitions contained in O.C.G.A. Chapter 36-61-2(18); and said area is hereby designated and determined to be appropriate for an urban redevelopment project, pursuant to the authority of O.C.G.A. Chapter 36-61-7(a):

the entire City of Brunswick, in multiple tracts as shown on attached map titled "*Brunswick Urban Redevelopment Area.*"

BE IT FURTHER RESOLVED that Bryan Thompson as Mayor for the City of Brunswick is duly authorized to execute this RESOLUTION for and on behalf of the City Commission.


This resolution shall be effective upon adoption.

This 19th day of December, 2012

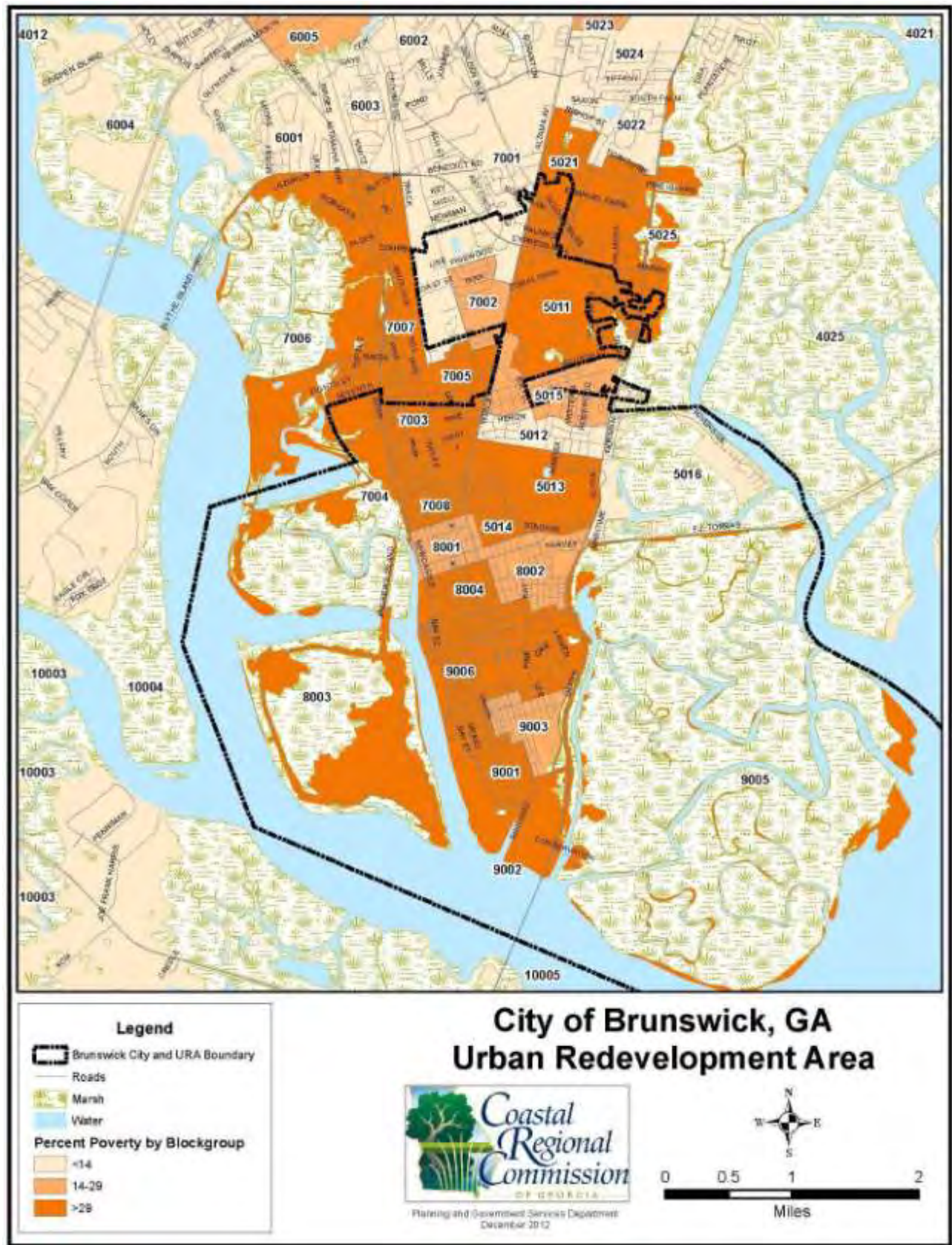
CITY OF BRUNSWICK, GEORGIA

BY: 
BRYAN THOMPSON, MAYOR

ATTEST:


NAOMI D. ATKINSON, CITY CLERK

This the 19th day of December, 2012.



Attachment 4 - Resolution amending the Urban Redevelopment Plan and establishing qualifications and terms of office for members of the Urban Redevelopment Agency of Brunswick

RESOLUTION OF THE MAYOR AND CITY COMMISSION OF THE CITY OF BRUNSWICK TO AMEND THE CITY'S URBAN REDEVELOPMENT PLAN SO AS TO INCLUDE THE MARY ROSS WATERFRONT PARK AND THE HIGHWAY 17 PROJECT AS PRIORITY PROJECTS FOR THE URBAN REDEVELOPMENT AGENCY

WHEREAS, the Mayor and City Commission of the City of Brunswick (the "City") adopted resolutions on March 18, 2009 approving the City's Urban Redevelopment Plan (the "Urban Redevelopment Plan") that identifies areas of the City that have significant poverty, unemployment, rates of home foreclosures, and general distress; and

WHEREAS, the City adopted a resolution on June 16th, 2010 establishing a separate redevelopment agency to be known as the "Brunswick Redevelopment Agency"; and

WHEREAS, the City adopted resolutions on December 19th, 2012, September 4, 2013, and May 21, 2014 amending the City's Urban Redevelopment Plan; and

WHEREAS, the City is desirous of developing and redeveloping parcels within the City in order to foster public and private sector development within the City, all for the benefit of its citizens; and

WHEREAS, after careful study and investigation, the Mayor and City Commissioners have determined that it is in the best interests of the citizens of the City to re-establish the "urban redevelopment agency as provided for by O.C.G.A. Section 36-61-18, to be called the "Urban Redevelopment Agency of Brunswick" (the "Agency"), to further the City's stated goals of fostering public and private development and redevelopment of parcels within the City; and

WHEREAS, the City is desirous of identifying certain priority projects within the City in order to foster public and private sector development within the City, all for the benefit of its citizens; and

WHEREAS, the City wishes to assist in the redevelopment of the property known as the Oglethorpe Block as a mixed use development, to include meeting space (referred to in SPLOST IV as the "Oglethorpe Convention Center" or "Oglethorpe Conference Center") as well as commercial development such as hotel, retail, office and residential uses. The development will be a combination of both public and private sector initiatives and is anticipated to be a phased project that will span several years until completion (the "Project"); and

WHEREAS, the City wishes to assist in the redevelopment of the property known as the Mary Ross Waterfront Park, to include open space, boating and fishing opportunities, as well as commercial development such as a restaurant. The development will likely be a combination of both public and

private sector initiatives and is anticipated to be a phased project that will span several years until completion (the "Project"); and

WHEREAS, the City wishes to assist in the redevelopment of the corridor known as the Glynn Avenue Corridor (i.e. Highway 17), to encourage redevelopment and investment along this entry corridor. The project will include the development of design guidelines and the implementation of those design guidelines. The project will likely be a combination of both public and private sector initiatives and is anticipated to be a phased project that will span several years until completion (the "Project"); and

WHEREAS, it is in the best interest of the City that the Urban Redevelopment Agency of Brunswick serve as the "Master Developer" of all three projects, utilizing public and private-sector expertise and financing as appropriate and necessary for the successful completion of the Projects; and

NOW THEREFORE, BE IT RESOLVED by the Mayor and City Commissioners of the City as follows:

1) Pursuant to O.C.G.A. Section 36-61-5, it is hereby found that (1) one or more slum areas (as defined in the Urban Redevelopment Plan) exist in the City and (2) the rehabilitation, conservation, or redevelopment, or a combination thereof, of such area or areas is necessary in the interest of the public health, safety, morals, or welfare of the residents of the City.

2) It is in the public interest to have the City's urban development powers exercised by an urban redevelopment agency as provided in Code Sections 36-61-17. Such urban redevelopment agency shall be known as the "Urban Redevelopment Agency of Brunswick" (the "Agency"). The Agency is hereby activated and authorized to transact business and exercise powers under O.C.G.A. Sections 36-61-18.

3) The nominations, qualifications and terms of office for the Commissioners of such Agency shall be as follows:

(a) The Urban Redevelopment Agency of Brunswick shall consist of a total of seven (7) Commissioners. The Mayor, by and with the advice and consent of the City Commission, shall appoint a board of commissioners of the Urban Redevelopment Agency. The Mayor shall designate a chairman and vice-chairman from among the commissioners.

(b) Each Commissioner shall serve a term of three years, with those appointed to fill the expired terms of the initial Commissioners serving staggered terms such that two shall serve for one year, two for two years and three for three years. Each appointment thereafter shall be for a term of three years.

(c) Each person appointed to fill the position of Commissioner of the Urban Redevelopment Agency of Brunswick shall meet the following qualifications:

1) Such person shall reside within five (5) miles of the City limits of the City of Brunswick, such constituting the "Area of Operation" of the Urban Redevelopment Agency of Brunswick as defined by O.C.G.A. Section 36-61-2; and,

2) Such person shall have been a resident of the area described above for a period of not less than three years as of the time of the appointment; and,

3) Such person shall own or operate a business within Area of Operation; or such person shall have business experience in one of the following areas:

- i. Banking and/or finance;
- ii. Real estate marketing, real estate development, and/or real estate law;
- iii. Historic preservation and/or rehabilitation;
- iv. Business management; or, tourism and/or hospitality.

BE IT FURTHER RESOLVED that the Mayor of the City of Brunswick is duly authorized to execute this Resolution for the Mayor and on behalf of City Commission.

Adopted this 2nd day of March, 2016.

CITY OF BRUNSWICK, GEORGIA

By:



CORNELL L. HARVEY, MAYOR

ATTEST:



Naomi D. Atkinson, City Clerk

Attachment 5 - Resolution amending the Urban Redevelopment Plan adding Workforce Housing and the development plan for the Perry School Site.

RESOLUTION 2018-06 OF THE MAYOR AND CITY COMMISSION OF THE CITY OF BRUNSWICK TO AMEND THE CITY'S URBAN REDEVELOPMENT PLAN SO AS TO INCLUDE WORKFORCE HOUSING

WHEREAS, the Mayor and City Commission of the City of Brunswick (the "City") adopted resolutions on March 18, 2009 approving the City's Urban Redevelopment Plan (the "Urban Redevelopment Plan") that identifies areas of the City that have significant poverty, unemployment, rates of home foreclosures, and general distress; and

WHEREAS, the City adopted a resolution on June 16th, 2010 establishing a separate redevelopment agency to be known as the "Brunswick Redevelopment Agency"; and

WHEREAS, the City adopted resolutions on December 19th, 2012, September 4, 2013, May 21, 2014, and March 2, 2016 amending the City's Urban Redevelopment Plan; and

WHEREAS, the City is desirous of developing and redeveloping parcels within the City in order to foster public and private sector development within the City, all for the benefit of its citizens; and

WHEREAS, after careful study and investigation, the Mayor and City Commissioners have determined that it is in the best interests of the citizens of the City to foster public and private development and redevelopment of parcels within the City to provide housing for its working citizens; and

WHEREAS, the City is desirous of identifying certain priority projects within the City in order to foster public and private sector development within the City, all for the benefit of its citizens; and

WHEREAS, the City wishes to assist in the redevelopment of the property known as the Perry School Site to provide housing units that are "affordable", but also to enhance the MLK Corridor and surrounding community; and

NOW THEREFORE, BE IT RESOLVED by the mayor and city Commissioners of the city as follows:

Pursuant to O.C.G.A. Section 36-61-5, it is hereby found that (1) one or more slum areas (as defined in the Urban Redevelopment Plan) exist in the City and (2) the rehabilitation, conservation, or redevelopment, or a combination thereof, of such area or areas is necessary in the interest of the public health, safety, morals, or welfare of the residents of the City.

BE IT FURTHER RESOLVED that the Mayor of the city of Brunswick is duly authorized to execute this Resolution for the Mayor and on behalf of the City Commission.

Adopted this 6th day of June, 2018.

CITY OF BRUNSWICK, GEORGIA

By: 
CORNELL L. HARVEY, MAYOR

ATTEST:


Naomi D. Atkinson, City Clerk



CITY OF BRUNSWICK

601 Gloucester Street • Post Office Box 550 • Brunswick • Georgia • 31520-0550 • (912) 267-5500 • Fax (912) 267-5547

Connell L. Harvey, Mayor
Felicia M. Harris, Mayor Pro Tem
John A. Canon III, Commissioner
Julie T. Martin, Commissioner
Vincent T. Williams, Commissioner

City Attorney
Brian D. Corry

City Manager
James D. Drum

CERTIFICATION

I, Brian D. Corry, as City Attorney for the City of Brunswick, Georgia, hereby certify that on May 16, 2018, in a publicly advertised hearing of a regularly scheduled City Commission meeting for the City of Brunswick, the Downtown Development Authority Director, Mr. Mathew Hill presented a proposed amendment to the City of Brunswick Urban Redevelopment Plan to include Workforce Housing at the Perry School Site and add the master plan for the Perry School Site, and estimates of costs for redevelopment of said site. The public hearing was held by the City Commission to receive public input on the proposed amendment to the City of Brunswick's Urban Redevelopment Plan that was approved by the City Commission on May 16, 2018 and adopted by resolution on June 6, 2018. This public hearing was advertised in the legal organ of the City of Brunswick seven days prior to the public hearing. Additionally, signs for the public hearing were posted at all public entrances to City Hall and Old City Hall in the City of Brunswick. At the public hearing one person chose to speak on the matter. The City Commission unanimously approved the proposed amendment to the City of Brunswick Urban Redevelopment Plan to include Workforce Housing to the Perry School Site and add the master plan for the Perry School Site and estimates of costs for redevelopment of said site. As the City Attorney for the City of Brunswick, I certify that the foregoing facts are accurate and in compliance with the provisions set forth in O.C.G.A. § 36-61-7 specifically, and O.C.G.A. § 36-61-1, et seq. generally.



Brian D. Corry
City Attorney
City of Brunswick

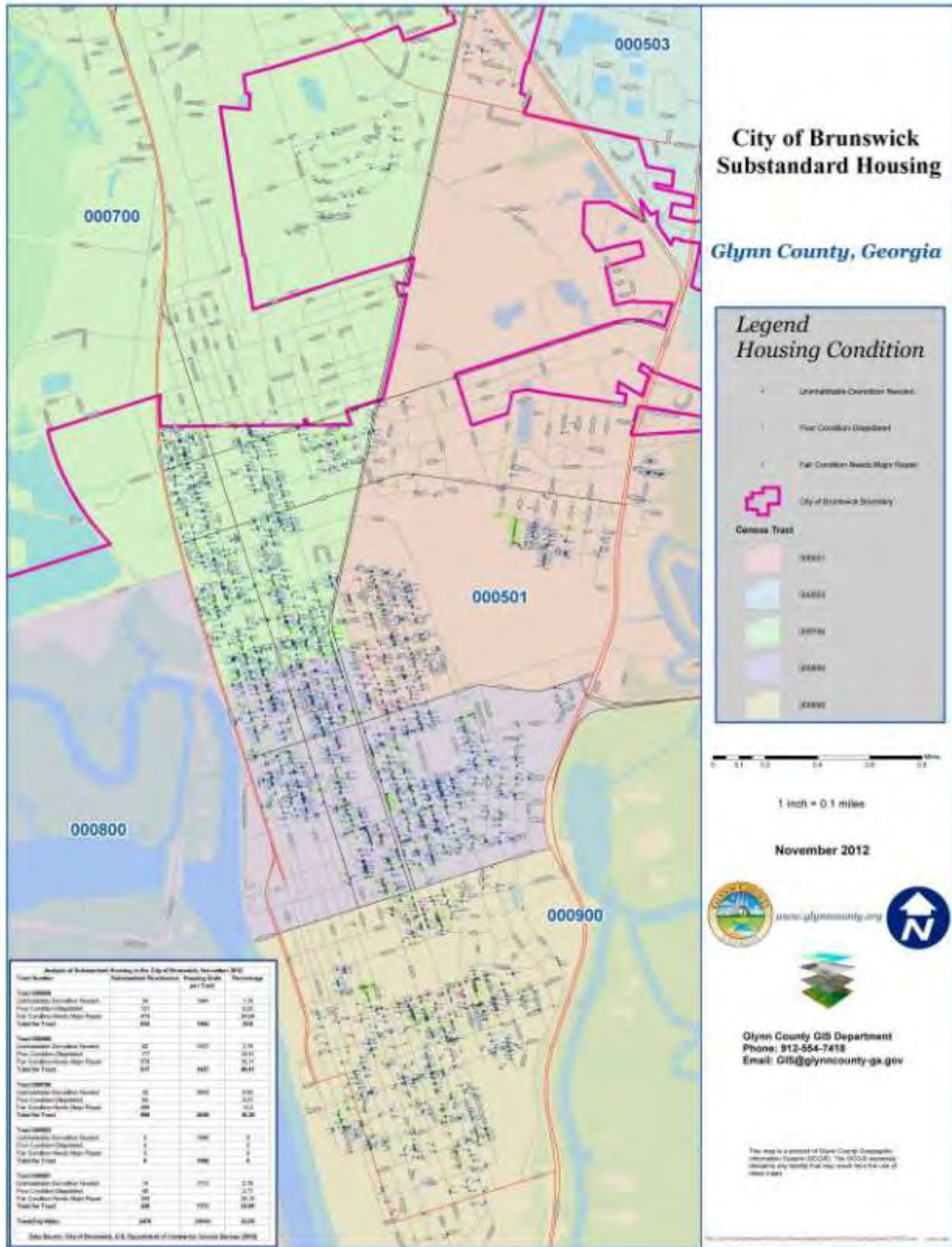
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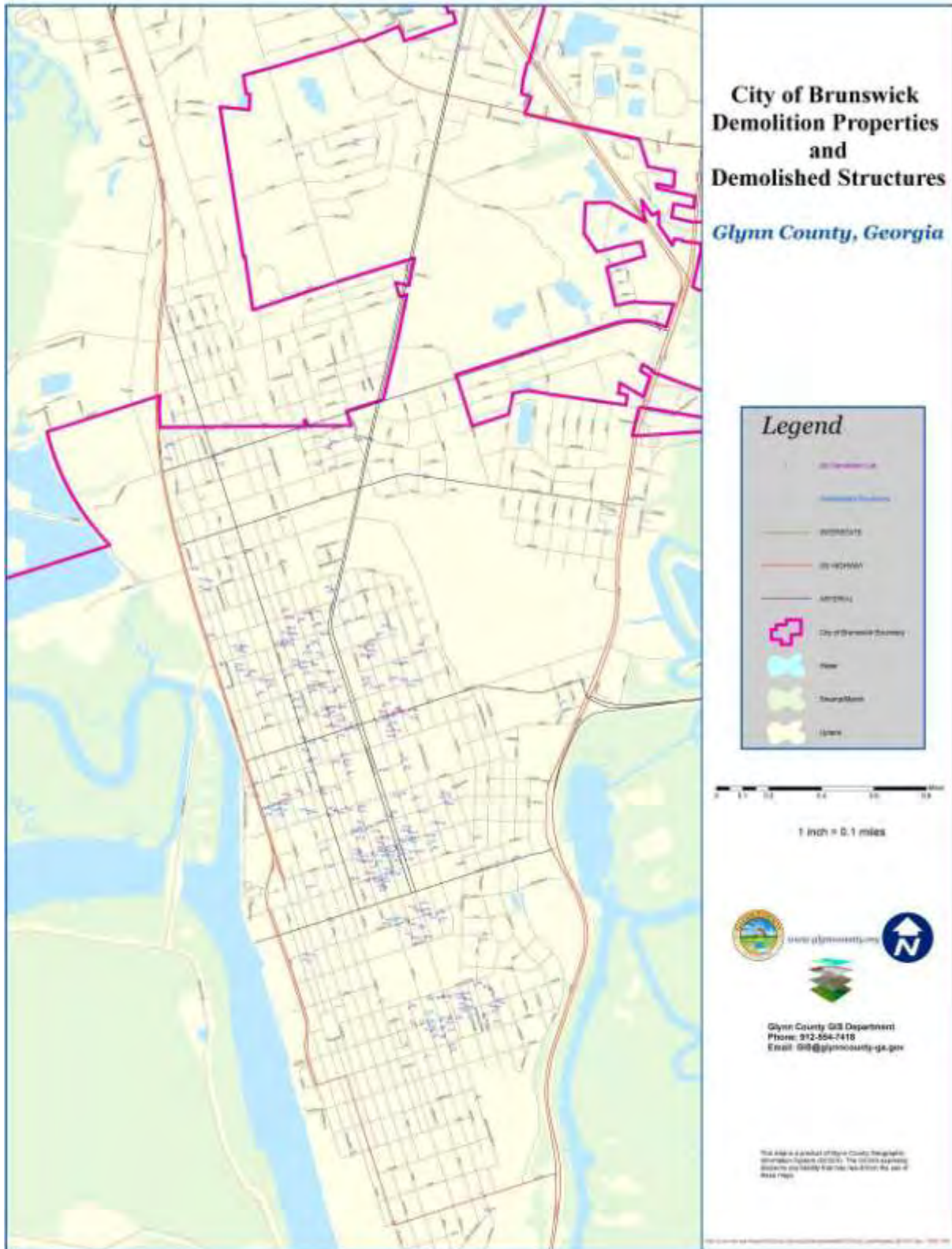
Sworn to me this 11th day
Of June, 2018


Notary Public



www.brunswickga.org
601 Gloucester Street • Brunswick, GA 31520







MARY ROSS

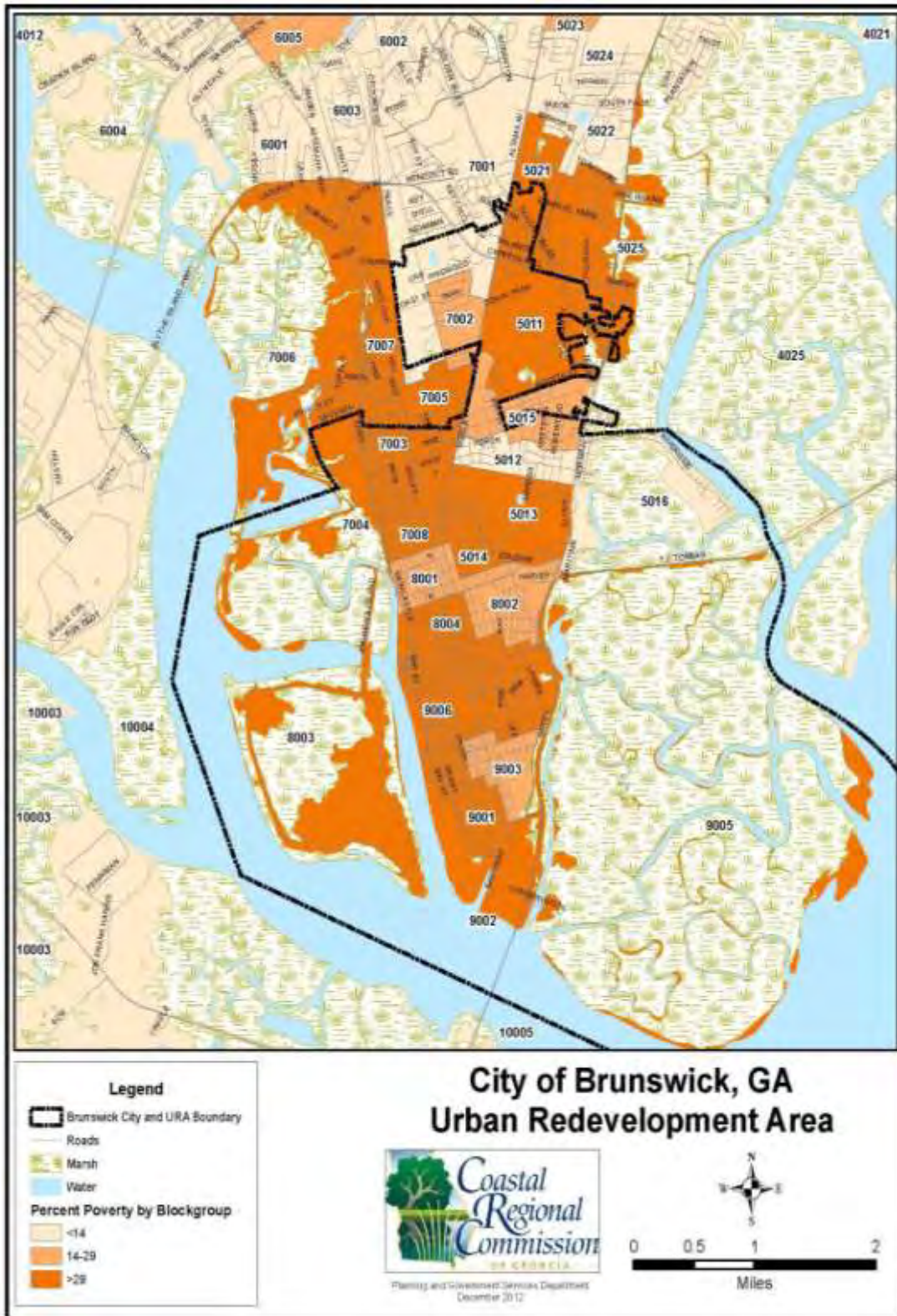
WATERFRONT PARK

- PARK AMENITIES:**
1. Section 100: Main entrance area with trees for shading
 2. Section 101: Seaplane ramp (existing with future) / Seaplane / Seaplane Pilot
 3. Section 102: Seaplane Pilot
 4. Section 103: Seaplane Pilot
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 99. Section 198: Seaplane Pilot
 100. Section 199: Seaplane Pilot
 101. Section 200: Seaplane Pilot

ORION PLANNING GROUP

alta

ROSS CIVIL ENGINEERS



Attachment 11 - Aerial Photo of the Oglethorpe Block Redevelopment Project



Attachment 12 – Perry School Site Master Development Plan

The overall vision for Perry Square is a mixed income / mixed housing residential development with reserved open green space within the community for use by residents. Perry Square will certify as an EarthCraft Community for green building design and cohesion with the surrounding neighborhood. The southwest corner of the South School Site, approximately 0.2 acres, is not included in the purchase with the intent that it will be used by the City and the greater Brunswick community for neighborhood activities such as farmers markets and other community events.

The conceptual site design plan is for 11 residential buildings with 54 townhomes, five (5) single family homes located throughout the surrounding neighborhood and a community building, which will house the property manager office and a variety of community amenities. There will be reserved open space that will be available for residents for leisure and events. The unit mix will include eight (8) onebedroom, 26 two-bedroom, and 20 three-bedroom homes. The five (5) single family homes will feature two-bedroom, one and a half baths. The fifty-four (54) townhome units will be set aside as affordable, with the five (5) single family homes as market rate.

Unit amenities will include direct exterior entrance to each individual unit, a range/oven, refrigerator, garbage disposal, dishwasher, microwave, blinds, ceiling fans, and washer and dryer connections. Living areas will feature nine-foot ceilings and wall-to-wall carpet, with hard surface floors in the kitchen and bath areas. Closets and cabinet space will provide ample storage. Natural light will filter through energy efficient windows.

Amenities in the community will include a fully equipped fitness center, fully equipped computer center, indoor gathering areas, including an equipped and furnished community kitchen, and outdoor recreation areas. The leasing office will have a full-time, on-site property manager fully trained in leasing, community relations, and operations compliance. Additionally, residents will have the option to attend low cost preventative health screenings and wellness programs facilitated by a local provider. Funding for the development, construction, operation, and management of Perry Square will primarily come from Low Income Housing Tax Credits, with additional financing from a conventional construction loan. WHG follows the guidelines of the LIHTC program requirements. Affordable housing communities are operated after completion according to the Compliance Period of 15 years, Extended Use Period of an additional 15 years, and Extended Affordability Commitment of 5 more years, taking ownership to a period of no less than 35 years.

Perry School Site Development Plan



Perry School Site typical building



Perry School Site Financial Structure

Funding for the development, construction, operation, and management of Perry Square will primarily come from Federal and State Low Income Housing Tax Credits, with additional financing from a conventional construction loan and a conventional permanent loan. The estimated total development cost is approximately \$11,900,000, which includes a proposed land purchase price of \$3,357,500 for the south school site and \$42,500 for the five single family home lots. This cost will be financed through funds approximated at an equity (tax credit) commitment of \$10,860,000, a loan amount (conventional and HUD) of \$1,000,000, and a deferred developer fee contribution of \$48,000.

The proposed purchase and sale agreement will include a timeline to close on the land in Spring 2019. Construction is anticipated to commence July 1, 2019 and conclude June 30, 2020. AEP and Fairway Management will provide pre-leasing services to obtain a near total or total occupancy in anticipation of the Certificate of Occupancy.

Perry Square will have positive economic and fiscal impacts on the City as a whole. It will bring the much needed high quality affordable housing, a need demonstrated by the extensive waiting list at Norwich Commons. It will also provide usable greenspace for community and It will create jobs

Uses of Funds

Acquisition costs - School Site	\$357,500
Acquisition costs - Single Family Lots*	\$42,500
Operating & replacement reserves	\$258,616
Hard construction costs	\$8,140,968
Other development costs	<u>\$3,106,989</u>
Total Uses	\$11,906,573

Sources of Funds

Total tax credit equity	\$10,858,462
Limited & general partner equity	\$110
Conventional Permanent Loan	\$1,000,000
Deferred developer's fee	\$48,002
Total Sources	\$11,906,573

**Represents the full taxable value of the 5 single family home lots listed on the tax assessors website*

APPENDIX J

SIDNEY LANIER PARK IMPROVEMENTS

CONCEPTUAL MASTER PLAN
03/03/15



TABLE OF CONTENTS

PROJECT LOCATION

SITE PHOTOS

EXISTING PARK CONDITIONS

CONCEPTUAL MASTER PLAN

PARK FEATURES

COST ESTIMATES

PROJECT LOCATION



SITE PHOTOS



View looking North following overpass.



View of existing floating dock and boat ramp.



View of waterfront wetland vegetation.



View from floating dock Sidney Lanier Bridge.



Parking with the pedestrian sidewalk.



Existing green space with protective bollards.



Parking area.

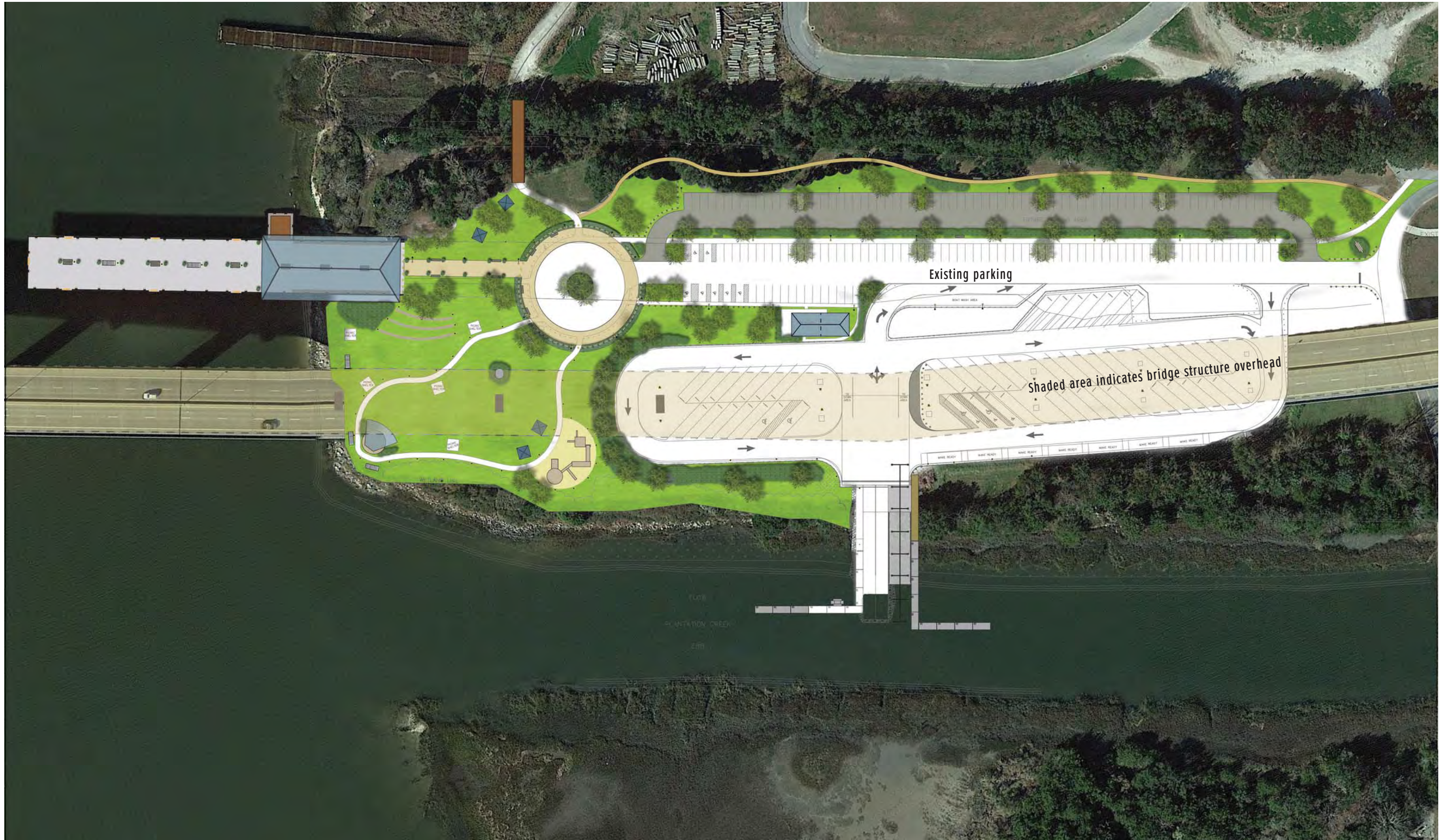


Boat launch parking area.

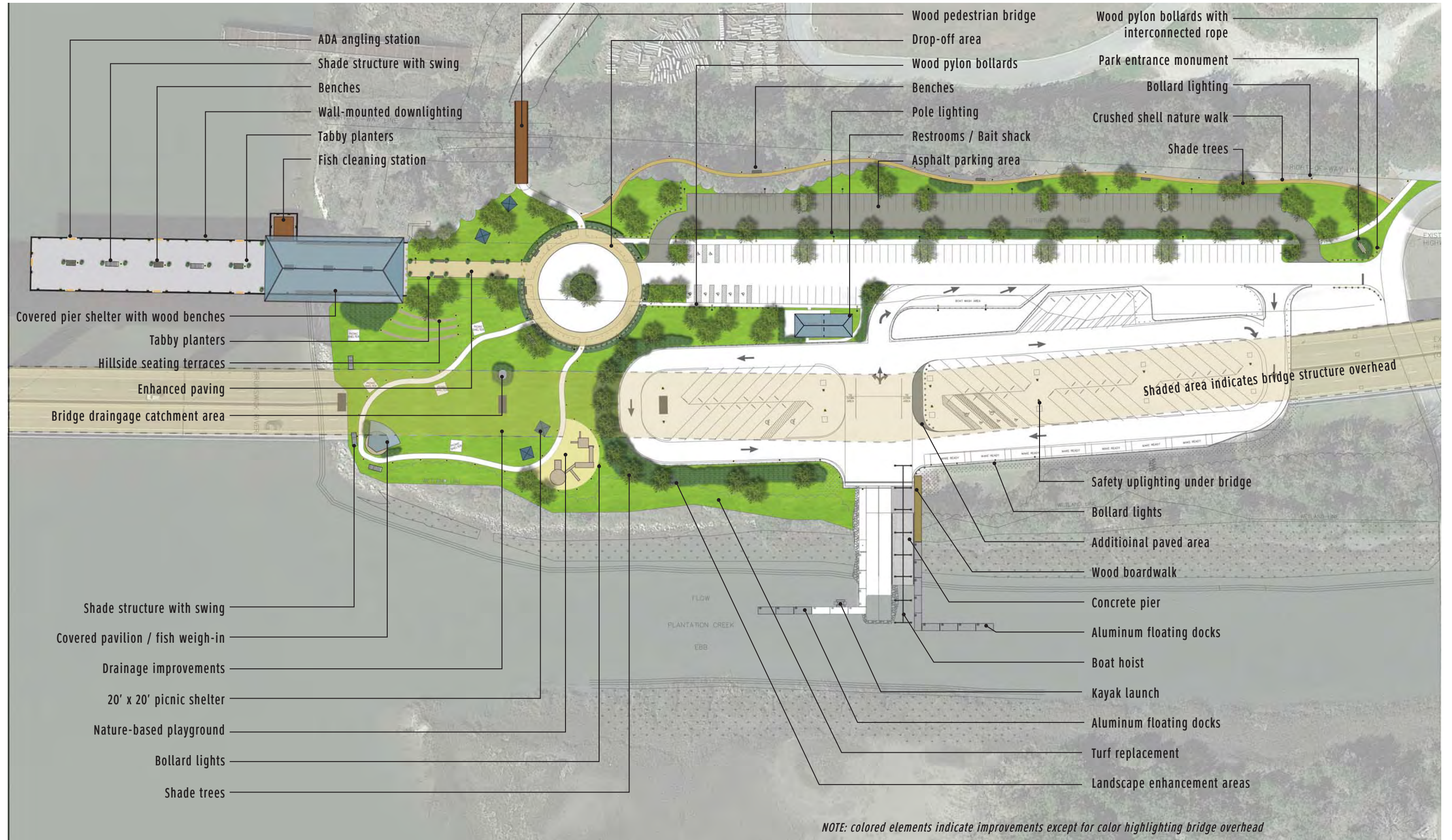
EXISTING PARK CONDITIONS



CONCEPTUAL MASTER PLAN



CONCEPTUAL MASTER PLAN



PARK FEATURES

Pier Cover



Lawn



Park



Bollards



New Sidewalk



Docks



Crosswalk



New Parking



PARK FEATURES

Terraced Seating



Bollards



Shade Trees



Shade Structure with Swing



Bike Racks



Boat Hoist



Picnic Table



Interpretive Signs



PARK FEATURES

Pier Fishing



Fish cleaning



Landscape enhancements



Pavilion



Kayak Launch



Telescopes



COST ESTIMATES

Sidney Lanier Waterfront Park Cost Estimates

Misc.					
Item No.	Description	Est. Qty.	Units	Unit Price	Amount
1	Demolition	1	LS	\$ 50,000.00	50,000
2	Hillside seating terraces	210	L.F.	\$ 150.00	31,500
3	New Sidewalks	2,000	S.F.	\$ 5.00	10,000
4	Waste receptacles	16	EA.	\$ 500.00	8,000
5	Concrete Pavers / Specialty Paving	9,000	SF	12.00	108,000
6	200 amp electrical service at pavilion	1	EA.	\$ 6,800.00	6,800
7	Striping	1,530	L.F.	\$ 4.00	6,120
8	Wheel Stops	60	EA.	\$ 24.00	1,440
9	High Visibility Crosswalk	1	EA.	\$ 4,200.00	4,200
10	Drainage improvements (catch basins, piping, grading, imported soil)	1	LS	\$ 85,000.00	85,000
11	Regulatory Signage	1	L.S.	\$ 2,500.00	2,500
12	Lighting (Eq & Inst., 30 Candle Ft/1500 Sq. Ft.)	310,000	S.F.	\$ 0.66	204,600
13	Interpretive signage package (materials / design)	1	LS	\$ 13,000.00	13,000
14	Road Arrow	12	EA.	\$ 50.00	600
15	Emergency Call Box	4	EA.	\$ 4,000.00	16,000
16	Traffic Control	1	L.S.	\$ 6,000.00	6,000
17	Erosion Control	1	L.S.	\$ 20,000.00	20,000
					\$ 573,760
Parking Lots					
Item No.	Description	Est. Qty.	Units	Unit Price	Amount
1	Additional Parking Expansion subbase	35,150	S.F.	1.00	\$ 35,150
2	Asphalt	5,884	S.Y.	15.00	\$ 88,266
					\$ 123,416
Maritime elements					
Item No.	Description	Est. Qty.	Units	Unit Price	Amount
1	Aluminum Gator Docks (Includes gangways)	12	EA.	10,000.00	\$ 120,000
2	Fish Cleaning Station	1	LS	5,000.00	\$ 5,000
3	Dock Box (25x17x12)	8	EA.	300.00	\$ 2,400
4	Misc Dock Components (cleats, hose bibs, etc)	1	LS	5,000.00	\$ 5,000
5	Fish Weigh-In Station	1	EA.	2,000.00	\$ 2,000
6	Live Well	2	EA.	1,000.00	\$ 2,000
7	Boat Hoist / Structure	1	LS	40,000.00	\$ 40,000
8	Kayak Launch (attaches to Gator Docks)	2	EA.	4,500.00	\$ 9,000
					\$ 185,400
Landscaping					
Item No.	Description	Est. Qty.	Units	Unit Price	Amount
1	Shade Tree	64	EA.	\$ 800.00	\$ 51,200
2	Landscape enhancements	21,000	S.F.	3.50	\$ 73,500
3	Tabby planters	25	EA.	650.00	\$ 16,250
4	Sod	85,000	EA.	0.95	\$ 80,750

COST ESTIMATES

5	Irrigation (System Cost, Labor, Materials)	85,000	S.F.	0.75	\$ 63,750
					\$ 285,450

Buildings/Structures

Item No.	Description	Est. Qty.	Units	Unit Price	Amount
1	Covered pavilion	1	L.S.	20,000.00	\$ 20,000.00
2	Nature based play area	1	EA.	66,000.00	\$ 66,000.00
3	Restrooms / Bait shack	1,200	SF	75.00	\$ 90,000.00
4	Fish cleaning station deck	600	SF	30.00	\$ 18,000.00
5	Pier Shade Structure	1	L.S.	150,000.00	\$ 150,000.00
					\$ 344,000

Amenities

Item No.	Description	Est. Qty.	Units	Unit Price	Amount
1	Bike Racks	24	EA.	325.00	\$ 7,800.00
2	20' x 20' picnic shelter	4	EA.	10,000.00	\$ 40,000.00
3	Washdown Station	1	EA.	2,500.00	\$ 2,500.00
4	Telescopes	4	EA.	1,599.00	\$ 6,396.00
5	Removeable / Lockable Bollards	14	EA.	500.00	\$ 7,000.00
6	Wood pylon bollards	1	LS	15,000.00	\$ 15,000.00
7	Shade Structures w/ Swings	5	EA.	8,000.00	\$ 40,000.00
8	ADA angling station	8	EA.	2,500.00	\$ 20,000.00
9	Benches	27	EA.	810.00	\$ 21,870.00
					\$ 160,566

Operational Costs over a 10 year Horizon

Item No.	Description	Est. Qty.	Units	Annual Cost	Amount
1	Part-Time Security	10	EA.	20,000.00	200,000
2	Landscape Maintenance	10	EA.	16,000.00	160,000
					\$ 360,000

				Sub-Total:	\$ 2,032,592
				10% Construction Contingency:	\$ 203,259
				Total Construction:	\$ 2,235,851
				8% Design / Engineering:	\$ 134,151
				4% CM:	\$ 89,434
				Total Cost:	\$ 2,459,436

**City of Brunswick, Georgia
Transit Service Plan**

Summary Report

May 2022

Prepared by:

Whitman, Requardt & Associates, LLP



Atlas Technical Consultants, LLC

Transport Studio

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1.0 Introduction

The City of Brunswick, GA has developed a Transit Service Plan to guide the implementation of a local transit system. This initiative builds on several prior studies and has advanced that work to complete a detailed analysis of transit service options, and ownership and funding options. This recent work also developed the required Title VI Plan, Procurement Policy and Maintenance Policy. And, in the fall of 2021, the City initiated a public outreach effort to solicit input as well as to communicate the City's progress on this initiative. The City published a video and fact sheet on its website highlighting the draft Transit Service Plan. Additionally, the City distributed an online survey to gather feedback from citizens and stakeholders about possible future transit service. This Transit Service Plan summarizes the planning, analysis and outreach efforts leading to the City's consideration of implementing the local transit system.

Other Documents of this Transit Service Plan:

- Brunswick Transit Title VI Plan, January 2021
- City of Brunswick Transit Procurement Policy, May 2021
- 5307 FTA Asset Maintenance Plan, City of Brunswick, May 2021
- Public Opinion Survey report, January 2022
- Focus Groups Summary memo, October 2021
- Various presentations made to the City staff, City Council, BATS committees and stakeholders groups

Study Conclusion

Public transportation services are needed within the Brunswick / Glynn County Urbanized area. Transit services would connect employers with workers, support improved access to jobs, increase mobility for growing number of seniors and persons with disabilities and improve access to educational opportunities. Transit is needed to important destinations in both the City and County.

While federal funding is available to pay for 80% of capital costs and 50% of operations, to be sustainable, the future transit program must be financially supported by both the City and County.

The proposed transit program with a City / County Micro-transit service and flex bus route to Saint Simons Island will require local operating support of \$750,000 to \$800,000 annually. The Brunswick Urbanized Area population is approximately 30% within the City and 70% in unincorporated Glynn County. The City cannot sustain the area's transit program without County financial support.

2.0 Prior Studies

This Transit Service Plan references and expands on several prior plans and studies. Many prior studies were reviewed and can be found online on the Glynn County's web site (<https://www.glynncounty.org/1960/Plans-and-Documents>). The most relevant of those prior studies are discussed below.

The Brunswick-Glynn Transit Implementation Plan was prepared jointly for the City and County in 2009. This study quantified the local need for transit and identified potential types of transit services. This effort was substantially revised and updated through the 2019 BATS 5303 Planning Technical Memo. This study identified possible transit fixed routes, summarized program management alternatives, identified capital procurement needs (5 buses) and provided projections of available Federal funds. It also provided a system implementation and service plan. This study did not quantify the necessary local funding requirements for ongoing system operations but did identify that as an issue to be studied further.

The Brunswick urbanized area is required by Federal planning rules to coordinate transportation planning and funding through a designated Metropolitan Planning Organization and to maintain a long-range transportation plan (or metropolitan transportation plan). The Brunswick Area Transportation Study (BATS) is the designated MPO and the 2040 Metropolitan Transportation Plan, amended on October 1, 2018 is the adopted transportation plan. This plan summarizes public input expressing desire for transit service, refers to prior studies, identifies some of the transit needs in the Brunswick area, and identifies that securing dedicated funding remains an obstacle to implementation. This Plan also identifies potential Federal funding sources and cites the required minimum local funding percentages necessary to leverage Federal funds.

3.0 Existing Conditions

3.1 Planning Context

The City of Brunswick is the county seat of Glynn County, Georgia. As such it is the center for many government, medical, educational and social opportunities in the county. Brunswick is very historic, with Spanish settlers known to have first located here in the early 18th century and containing many beautiful historic buildings and properties. Brunswick is also the gateway to several barrier islands including the popular St. Simons Island and Jekyll Island. The Georgia Ports Authority operates the nearby Port of Brunswick which handles roll-on/roll-off trade of cars, trucks and construction and farming equipment.

The City of Brunswick is located within Glynn County, Georgia. The City of Brunswick and Glynn County coordinate on the provision of many services to area residents. US Census designates the Brunswick Urbanized Area (UZA) as including the City of Brunswick and parts of Glynn County. It is anticipated that the Census-designated UZA boundary will soon be revised as a result of the 2020 census. This designation and boundary of the UZA is particularly important in this context as it affects the eligibility of certain USDOT/Federal Transit Administration funding sources for provision of transit (i.e. FTA Section 5307 funds are available for eligible transit services only within the UZA boundary).

3.2 Population, Employment and Commuting Patterns

The planning team obtained population and employment data from the US Census Bureau, Glynn County Planning & Zoning, and the Georgia Association of Regional Commissions. This information was used in analysis for elements of the Title VI Plan, service planning, and funding analyses. This analysis also included a detailed review of available data describing commuting patterns – namely data from US Census’ Longitudinal Employment Household Dynamics (LEHD) dataset. This dataset matches employees’ home locations and work locations to provide aggregate commute pattern information.

Brunswick contains approximately 16,000 persons, 5,700 workers and 13,500 jobs. So, the City contains far more jobs than workers residing in the City. Therefore, many workers commute to the City. In fact, approximately 90% of the jobs in Brunswick are filled by workers who live outside the City. Glynn County (not including the City of Brunswick) contains approximately 69,000 persons, 25,900 workers and 23,500 jobs.

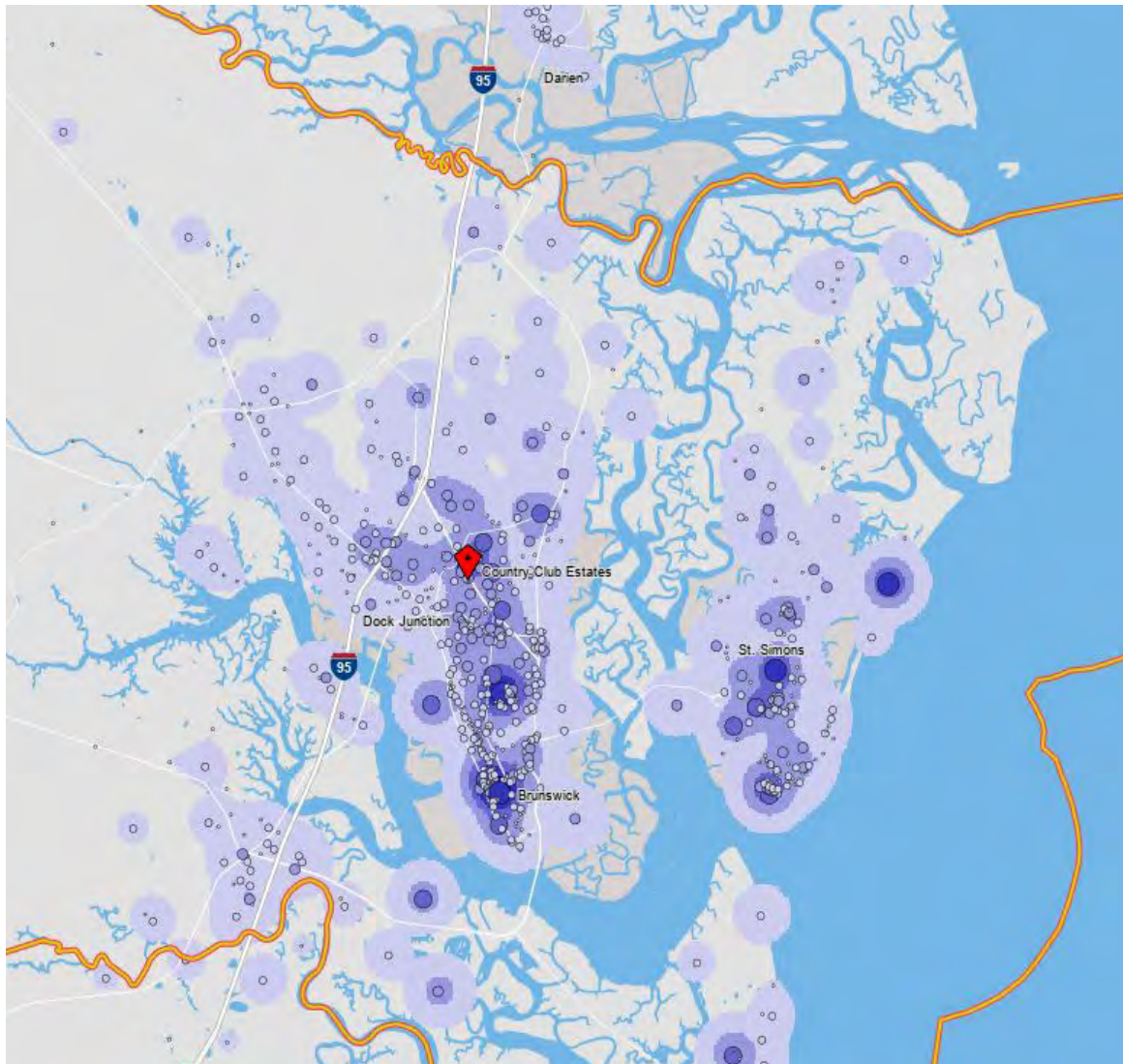
Table 1 - Key Job Centers

Zone	Workers	Jobs
Brunswick	5,700	13,500
St. Simons Island	5,400	6,300
Jekyll Island	350	2,100

The number of workers and jobs are listed in Table 1. Brunswick, St. Simons Island and Jekyll Island are the key areas which import workers to satisfy all the jobs. There is a strong commute pattern from Glynn County to jobs in Brunswick. In addition, there is a strong commute pattern from Brunswick to

jobs on St. Simons Island and Jekyll Island, which are both outside the City and within Glynn County. The spatial distribution of job locations can be seen below in Figure 1.

Figure 1 - Spatial Distribution of Jobs



The home locations of workers as compared to the locations of jobs discussed above points to some clear commute patterns. And these patterns are confirmed by the LEHD data to confirm the major commute patterns. Figures 2 and 3 below come from the LEHD On The Map tool and illustrate worker inflows and outflows to/from Brunswick and St. Simons Island, respectively.

Figure 2 - Brunswick Worker Flows

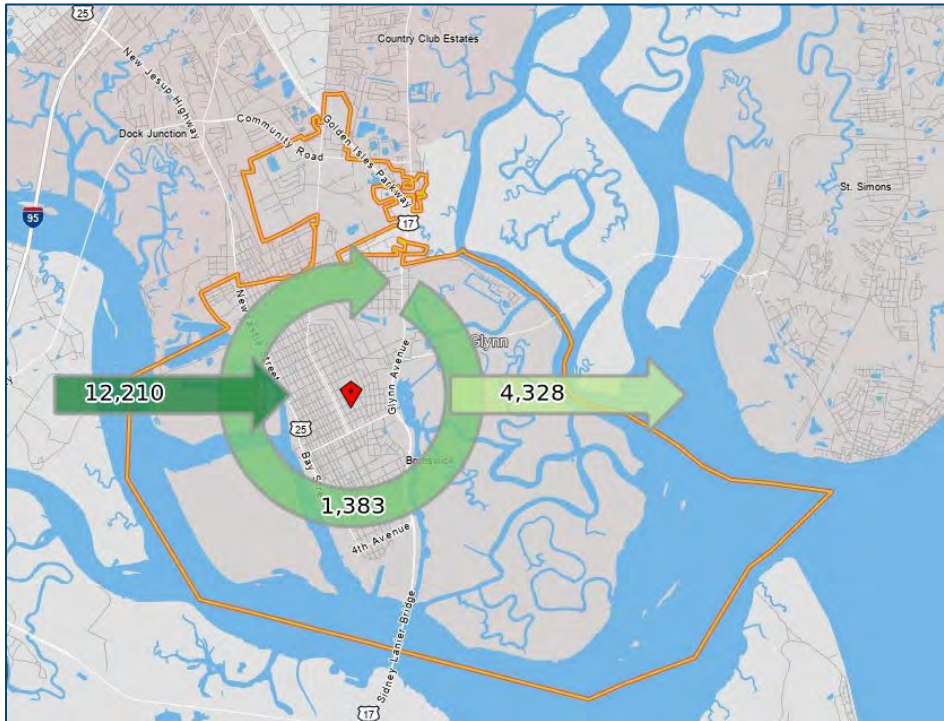


Figure 3 - St. Simons Island Worker Flows



The WRA team also downloaded the raw LEHD data and divided the study area into the following study zones for analysis purposes. These zones provide even greater understanding of commute patterns throughout Glynn County. These analyses also confirm the primary commute patterns discussed above. These patterns were taken into account as the study team developed potential transit service scenarios which best respond to existing travel needs.

Figure 4 - LEHD Analysis Zones



Table 2 - Worker Flows by Analysis Zone

Zone	Brunswick	St. Simons	Jekyll	Other Glynn Co.	Outside Glynn Co.	Total	% Workers
Brunswick	1,367	817	144	1,181	1,805	5,314	12%
St. Simons	1,352	2,395	45	652	1,423	5,867	13%
Jekyll	108	41	13	92	73	327	1%
Other Glynn Co.	5,681	2,536	540	5,910	5,414	20,081	45%
Outside Glynn Co.	4,631	1,854	403	6,194	-	13,082	29%
Total	13,139	7,643	1,145	14,029	8,715	44,671	100%
% Jobs	29%	17%	3%	31%	20%	100%	

3.3 Existing Transit Services

There are currently no City-wide public transit services in Brunswick – neither fixed route nor demand-response.

There is a demand-response rural transit service provided by Coastal Regional Commission (CRC) which provides trips from rural areas to destinations in Brunswick. Due to the funding eligibility rules of FTA Section 5311 (Formula Grants for Rural Areas), the CRC’s rural transportation service is not available for trips entirely within the urbanized area nor within Brunswick.

There are also transportation providers providing demand-response services operating under contract for Georgia

Department of Human Services (DHS) coordinated transportation services and Georgia Department of Community Health for eligible transportation trips. DHS-funded transportation may cover a range of eligible trips funded through the Division of Aging Services (DAS), Division of Family and Children Services (DFCS), Department of Behavioral Health and Disabilities (DBHDD), Georgia Vocational Rehabilitation Agency (GVRA), Georgia DOT (GDOT) and/or FTA Section 5310 (Mobility of Seniors & Individuals with Disabilities). DCH administers transportation funding programs servicing Medicaid non-emergency transportation. However, these services are available only for trips to certain destinations and for certain trip purposes and are not provided City-wide.

Types of Transit Services

Fixed Route Transit – transit service which runs on a set route and schedule, such as local bus service which stops at designated bus stops.

Demand-Response Transit – transit service which responds to advance reservations, such as door-to-door medical or senior transportation.

4.0 Transit Service Alternatives

This study examined a range of potential types of transit services including fixed-route, demand response, micro-transit and demand taxi. Each of the service types operating within Census-designated urbanized area are eligible for FTA 5307 funding to assist with capital and operating costs.

These are described in the following subsections.

4.1 Transit Service Types

Fixed-Route

Fixed-route transit, as its name implies, is transit service which operates on a fixed route and schedule with fixed, designated stops. Typical local bus and trains are examples of fixed-route transit. In this study, potential fixed-route service would be provided by buses either large or small. Large, city buses may be up to 40' in length while small-to-medium sized vehicles may be 20-30' in length.



Demand Response (also called Complimentary Paratransit)

Demand response transit service does not follow a designated, fixed route, but instead is scheduled on demand and typically provides door-to-door service. Trips are typically scheduled at least 24 hours in advance and may have to meet certain eligibility requirements established by the transit agency. Complimentary paratransit service is required where FTA funds are used to operate fixed route transit service and typically provide for trips for seniors and/or disabled persons.



Micro-Transit

Micro-transit is a newer form of public transit where trips are called by the customer within a designate zone of service and the next available vehicles is dispatched to provide the requested trip. Unlike Demand Response service, micro-transit does not have to be schedule 24 hours in advance and may be simultaneously carry additional passengers. Typically, trips can be requested either via telephone or via a smart-phone app. The vehicles can be of any size but are typically smaller buses or large vans.



Demand Taxi

Demand taxi services uses traditional taxi providers but subsidizes qualified trips within a designated geographic area. That area could be city-wide or a special zone such as a downtown. The City would select a broker and regulate eligible taxis. Local taxis may opt to enroll in the program to augment their existing business. Customers would enroll in the program and receive a taxi card. The City may elect to qualify participants according to their place of residence (i.e. City), age, disability, income or other criteria as the City desires. There is typically a base fare paid by the customer and the balance of the fare paid by the program. This results in lower trip costs to the customer but may still cost the City less overall than more traditional forms of transit.



The study team inventoried the current taxis and shuttle in Brunswick and found those to include:

Taxis

- Altamaha Taxi – 4 cars, 6 drivers
- On-time Taxi – 5 cars, 5 drivers
- Island Transport – 2 cars, 2 drivers
- J&J Taxi – 1 car, 1 driver
- Latino Taxi
- Metro Cab - 2 cars, 2 drivers

Non-emergency and agency transport

- Gateway – 10 vehicles – Contract with GA Department of Human Services
- Coastal Regional Commission – 69 peak vehicles (2019)
- Jones Transport – 9 vehicles, 7 drivers
- SNS Transportation – 5 vehicles, 5 drivers

Hotel and business shuttles

- The King and Prince Beach & Golf Resort – 8:30 AM from Winn Dixie
- Jekyll Island Club Hotel and the Westin Jekyll Island in-house transportation to employees
- Sea Island provides employee transportation for their resort properties

4.2 Peer Cities

Before defining viable alternatives for consideration, the study team identified a list of peer cities in Georgia who operate local transit system. Table 3 includes service, operating and cost metrics for each of these peer cities. Each of these operates both fixed route and demand-response services. They range in size from 4 peak vehicles to 37 peak vehicles, and local share funding ranges from approximately \$350,000 to \$2.9 million. These provide a point of comparison to define reasonable transit service alternatives.

Table 3 - Local Transit Peer Cities

Urbanized Area	2010 Population	Mode *	Operations Contract**	Peak Vehicles	Operating Costs (Annually)	Cost per Hour (Annually)	Operating Revenues (Annually)	Net Cost of Service (Annually)	Net Cost per Passenger Trip	Local share (Annually)
Albany	95,779	MB	DO	13	\$3,535,200	\$97.33	\$751,269	\$2,783,931	\$3.69	\$1,711,806
		DR	DO	5	\$699,967	\$71.40	\$42,116	\$657,851	\$34.11	
Athens-Clarke Co	128,754	MB	DO	21	\$5,158,627	\$64.12	\$1,120,005	\$4,038,622	\$3.17	\$2,869,505
		DR	DO	3	\$494,594	\$84.98	\$23,599	\$470,995	\$64.91	
Gainesville	130,846	MB	DO	6	\$2,967,812	\$169.89	\$86,661	\$2,881,151	\$19.74	\$618,334
		DR	DO	5	\$460,044	\$61.77	\$39,000	\$421,044	\$40.90	
Hinesville	51,456	MB	PT	3	\$740,686	\$82.89	\$15,450	\$725,236	\$37.18	\$357,918
		DR	PT	1	\$79,207	\$204.14	\$2,465	76,742	\$92.57	
Macon	137,570	MB	DO	23	\$4,962,283	\$111.79	\$542,635	\$4,419,648	\$7.91	\$2,802,243
		DR	DO	6	\$677,438	\$34.09	\$66,279	\$611,159	\$18.39	
Rome	60,851	MB	DO	31	\$2,967,812	\$96.23	\$661,707	\$2,306,105	\$2.12	\$1,302,968
		DR	DO	6	\$359,605	\$36.91	\$140,392	\$219,213	\$9.22	

* MB = Motor Bus / DR = Demand Response

** DO = Directly Operated / PT = Purchased Transportation

4.3 Alternatives Evaluated

The study examined four alternatives for providing local transit services throughout Brunswick. These included:

- 1 – City / County Fixed Route Bus
- 2 – Micro-transit
- 3 – Demand Taxi
- 4 – City Only Fixed Route Bus

Alternative 1 – City / County Fixed Route Bus

Alternative 1 would operate buses on three fixed routes. These routes extend outside of the City of Brunswick to key destinations in Glynn County and to St. Simons Island. These routes would operate on fixed routes and schedules, making stops at designated bus stop locations. These routes, illustrated in Figure 5, connect residential communities with businesses, governmental offices, the hospital and Coastal College.



All buses would meet ADA requirements including wheelchair accessibility. ADA complimentary paratransit service would also be provided to all destinations within ¼ mile of the fixed routes. WRA recommends that fixed route service be free, because the cost of collecting fares will likely consume most of the fares collected. The service would require 10 buses plus 2 spares. In Alternative 1 it is assumed that the service would be managed by a City Transit Director. Bus drivers and maintenance personnel could be City employees or provided through a contractor. A bus maintenance and storage facility will be required to accommodate this small fleet of buses. Service and operational characteristics are shown in Table 4 and Table 5.

Alternative 1 provides excellent coverage of key destinations, good hours of service and reasonable frequency of service. The traditional fixed route service is recognizable and easily understood by customers. The fixed route would require creation of bus stops and a storage and maintenance facility. However, the total local cost of Alternative 1 is probably not sustainable for the City.

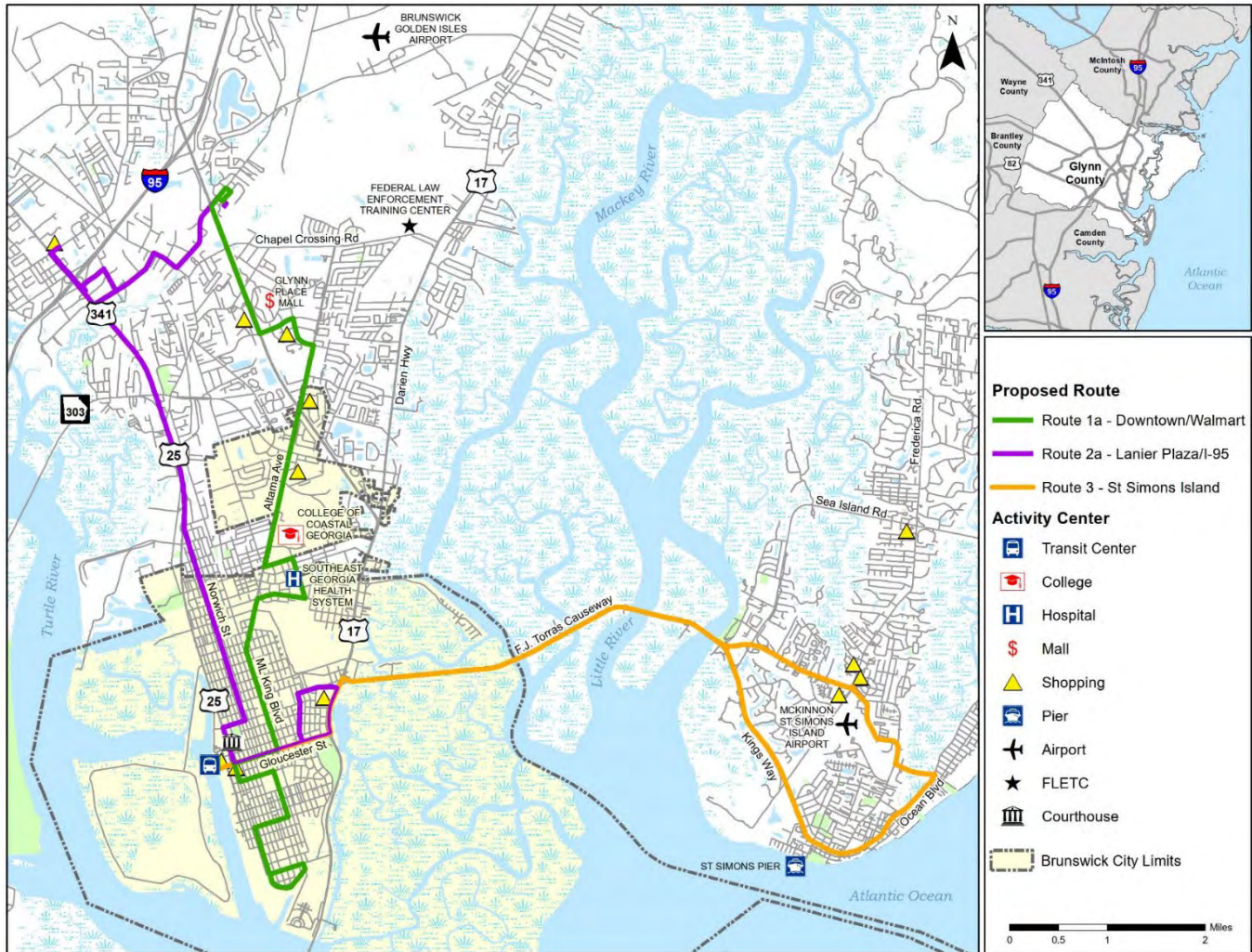
Table 4 - Alternative 1 Service Characteristics

Route #	Name	Cycle Time (minutes)	Frequency (minutes)	Peak Buses	Span – Monday to Saturday
1	Downtown/Walmart	90	30	3	6AM to 9PM
2	Downtown/Lanier Plaza	90	30	3	6AM to 9PM
3	St. Simons Commuter	120	120	1	Peak Only
	ADA Paratransit			1	6AM to 9PM

Table 5 - Alternative 1 Operational Characteristics

Route #	Name	Route Round Trip Miles	City Miles	County Miles	City %	County %
1	Downtown/Walmart	22.2	15	7.2	67.6%	32.4%
2	Downtown/Lanier Plaza	21.2	9.2	12	43.4	56.6%
3	St. Simons Commuter	25.4	7.2	18.2	28.3%	71.7%
	ADA Paratransit				54.2%	45.8%

Figure 5 - Alternative 1 Fixed Routes



Alternative 2 – Micro-Transit

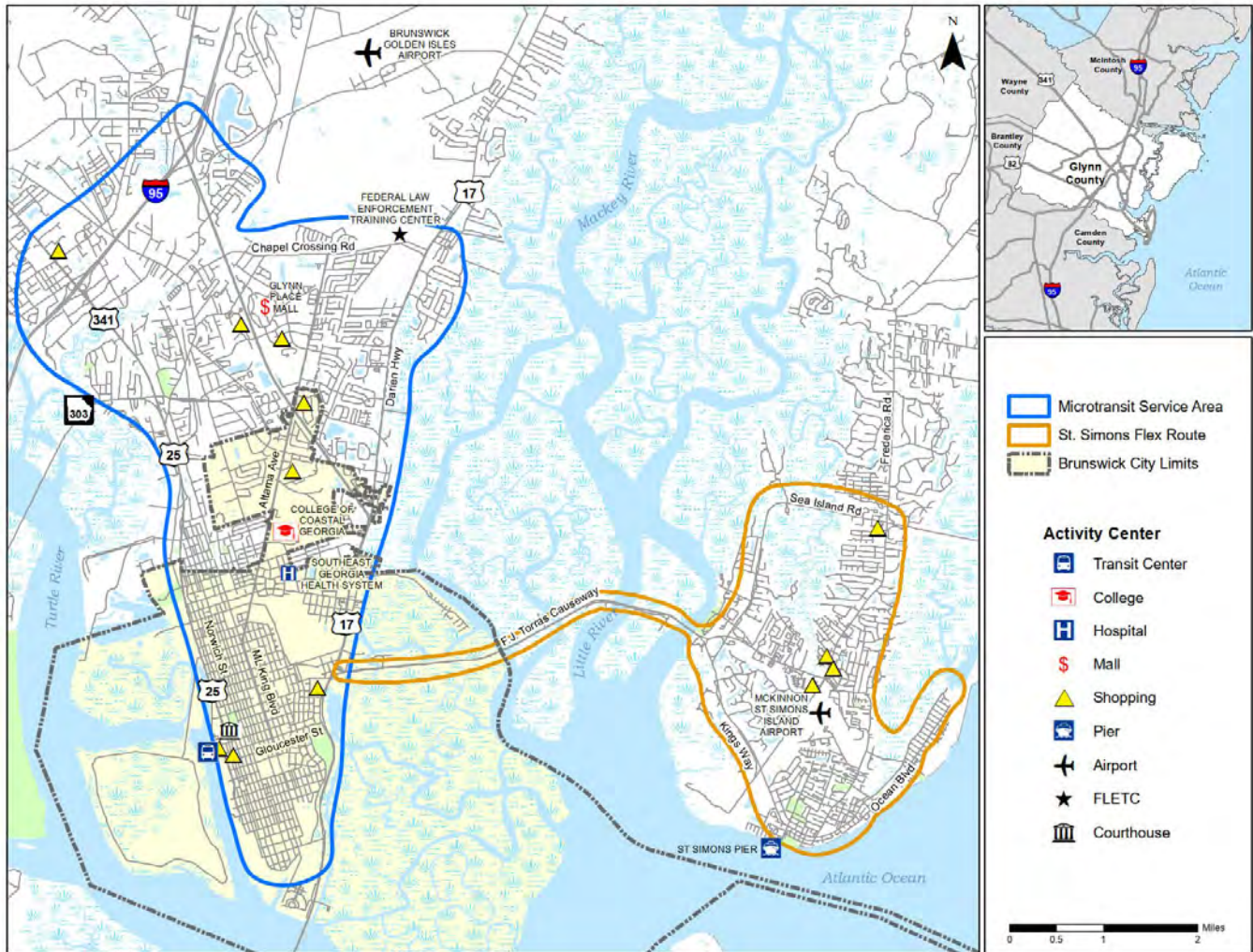
Alternative 2 would operate micro-transit in a core service area and a flex route to St. Simons Island. The micro-transit service area, shown in Figure 6, would include all of the City of Brunswick plus portions of Glynn County out to roughly I-95. The flex route would travel out to St. Simons Island, make a defined loop around the island and divert (or flex) to specific requested destinations. Each service would be based on a smart phone app and routing system. Trips would cost the customer a flat rate of \$3.00 one way. It is estimated that this service would require up to 5 peak vehicles and could be operated by City staff (with app and routing technology purchased from the private sector), CRC or a private contractor. Key service characteristics are listed below in Table 6.



Table 6 - Alternative 2 Service Characteristics

Characteristic	
<i>Service Area</i>	Citywide; north to I-95; St. Simons Island
<i>Proposed Fare</i>	\$3.00
<i>Operations</i>	City staff, CRC or contractor
<i>Peak Vehicles</i>	5
<i>Daily Revenue Hours</i>	62
<i>Hours</i>	6 AM to 9 PM – Monday to Saturday

Figure 6 - Alternative 2 Service Areas



Alternative 3 – Demand Taxi

Alternative 3 would create and manage a demand taxi service. Customers would apply for and obtain a taxi card from the City based on criteria established by the City. The service would be provided by local taxi companies with guidelines established by the City. The trip eligibility and costs are fully controlled by City policy. Eligibility may consider customers’ age, disability, income or other criteria. It is recommended that eligibility be limited to City residents only. This analysis recommends a trip cost of \$2.00 plus all costs over \$12.00. In this way, the City subsidy is limited to \$10 per trip. The recommended service area is the same as that for Alternative 2 shown in Figure 6 - Alternative 2 Service Areas.



Table 7 - Alternative 3 Service Characteristics

Characteristic	
Service Area	Citywide; north to I-95; St. Simons Island
Proposed Fare	\$2.00 base plus cost over \$12.00
Operations	Local taxis
Peak Vehicles	Varies
Daily Revenue Hours	Varies
Hours	Anytime

To assess if there exists sufficient taxi infrastructure to support this type of service, the WRA team assembled an inventory of know existing taxis, transport entities and shuttles. The operators and key characteristics are listed below in Table 8.

Table 8 – Brunswick Existing Taxis and Shuttles

Category	Operator	Characteristics
Taxis	Altama Taxi	4 cars
	On-Time Taxi	5 cars
	Island Transport	2 cars
	J&J Taxi	1 car
	Latino Taxi	n/a
	Metro Cab	2 cars
Non-Emergency and Agency Transport	Gateway	10 vehicles
	Coastal Regional Commission	69 vehicles
	Jones Transport	9 vehicles
	SNS Transportation	5 vehicles
Hotel and Business Shuttles	The King and Prince	Shuttle from Winn Dixie to resort
	Jekyll Island Club and Hotel	Employee transportation
	Sea Island	Employee transportation

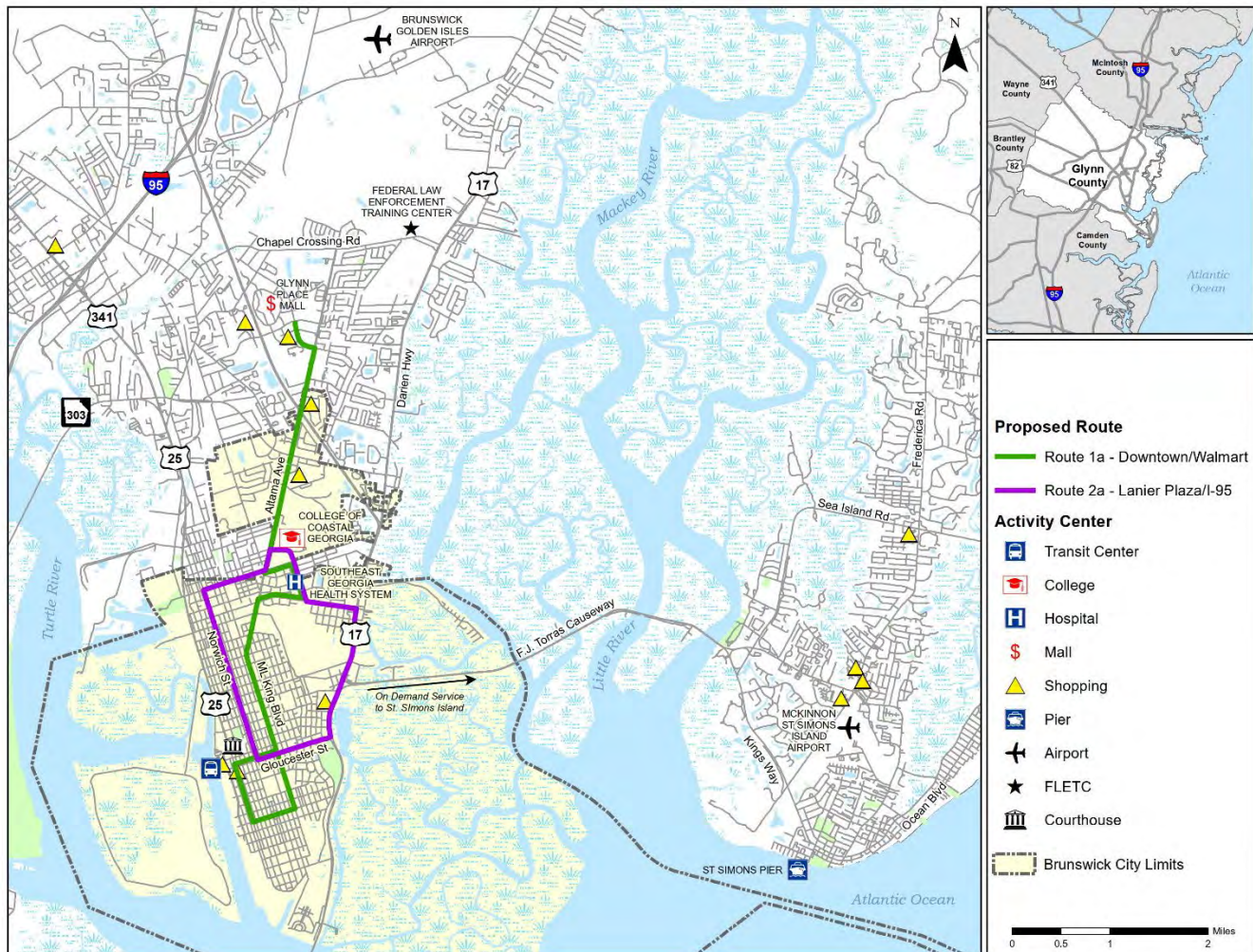
Alternative 4 – City Only Fixed Route Bus

Alternative 4 would scale back the services of Alternative 1 to limit service just to the City. Alternative 4 has two fixed routes plus complimentary ADA paratransit service with 3/4 mile of the fixed routes. Like Alternative 1, the transit service could be operated with City staff or through a contractor. In either case, the City would manage the service, bus stops and shelters through a City Transit Supervisor.

Table 9 - Alternative 4 Service Characteristics

Route #	Name	Frequency (minutes)	Peak Buses	Span – Monday to Saturday
1	Downtown/Walmart	30	2	6AM to 9PM
2	Norwich / 4 Street	30	1	6AM to 9PM
	ADA Paratransit		1	6AM to 9PM

Figure 7 - Alternative 4 Service Area



4.4 Evaluation of Alternatives

The WRA Team evaluated the four alternatives using both quantitative and subjective criteria. These include considerations like the frequency and quality of service, equity of transit service, operational considerations, cost effectiveness, flexibility, partnerships and funding eligibility. The City leadership provided overall direction by providing four Transit Essential Criteria.

Transit Essential Criteria:

- **Productive**
 - The transit service needs to work for City residents
 - The service must be well utilized
- **Sustainable**
 - Long-term the transit service must be affordable for the City
- **Infrastructure**
 - Improved sidewalks, shelters, transit hubs
- **Partnerships**
 - County
 - Major employers, College, hospital
 - Hospitality industry

Each of the four alternatives is unique in type of service, type of benefits, areas served and total costs. In addition to the operational and cost data presented previously, WRA also prepared analyses of potential ridership – that information is provided in Appendix A. And, in order to provide a more complete analysis of the City’s out-of-pocket costs, an analysis of funding was also conducted and is summarized in the following section of this report.

Table 10 - Comparison of Alternatives

Alternative	#1 – City / County Fixed-Route Bus	#2 – Microtransit	#3 – Demand Taxi	#4 City-Only Fixed Route Bus
Dispatching	3 fixed routes	App-based on-demand	Taxi companies	2 fixed routes
Annual Riders	238,000	37,200 to 74,400	30,000 to 60,000	138,000
Cost per Rider	\$10.35	\$22.62 to \$45.23	\$11.83 to \$16.55	\$9.20
Net Cost	\$2,387,239	\$1,495,408 to \$1,571,008	\$496,642 to \$709,642	\$1,271,643
Federal	\$699,093	\$699,093	\$248,321 to \$354,821	\$635,822
Glynn Co.	\$809,304			
City of Brunswick	\$878,842	\$796,315 to \$871,915	\$248,321 to \$354,821	\$635,822

4.5 Transit Funding

Transit funding eligibility and requirements through USDOT Federal Transit Administration and Georgia DOT is complex. This section provides an overview of the most important considerations for transit funding in the City of Brunswick.

Bipartisan Infrastructure Law

A new Federal infrastructure funding bill (Infrastructure Investment and Jobs Act, a.k.a. Bipartisan Infrastructure Law) became public law in November 2021. Most of the major programs and rules for transit funding are unchanged, while the levels of funding available have increased.

What does the new Infrastructure Bill mean for public transportation?

- Maintained current transit program structure (based on AASHTO Analysis September 15, 2021)
 - Urban formula (5307) +30%
 - Elderly / Disabled formula (5310) +47.5%
 - Rural formula (5311) +22.7%
 - Low-No Emission Buses +523.1%
 - Ferry service for rural communities \$200 million per year
- **Federal Transit Assistance**
 - Capital – up to 80% federal
 - Operating – up to 50% of net cost of service
- **Brunswick Urbanized Area**
 - 2010 US Census designated Brunswick Urbanized Area - greater than 50,000 population
 - Brunswick no longer eligible for 5311 rural program funding – beginning in 2013
 - Approximately \$700k in annual federal formula funds for capital and operating assistance
 - 2020 US Census boundaries – to be announced Spring 2022
 - Urbanization of St. Simons?

The adopted infrastructure Act increases the urban formula program by 30% with 2% to 2.6% annual increase. The annual appropriations may differ.

FTA Section 5307 Funding

Because Brunswick is within a Census-designated Urbanized Area, local transit services would be eligible for FTA Section 5307 (Urbanized Area Formula Grants). Should Brunswick begin to operate fixed-route transit service, they will also be required by FTA funding rules to provide demand-response transit service (also called complimentary paratransit) within the same geographic area for persons with disabilities. The 5307 program is available for up to 80% of the costs of eligible projects including planning, buses, transit centers, maintenance tools and facilities, bus shelters, pedestrian walkways and more. The Infrastructure Investment and Jobs Act increased the 5307 program as shown in the FY2022 appropriation.

Table 11 - Brunswick Annual 5307 Appropriations

Fiscal Year	Federal Appropriation
2017	\$657,347
2018	\$671,835
2019	\$682,220
2020	\$701,395
2021	\$699,093
2022	\$898,428

CARES Act Funding

The CARES Act of 2020 provides additional funding to offset additional burdens and financial needs of changes in public services as a result of COVID-19. These include additional monies available for certain transportation needs. These are summarized for capital and planning in Table 12 and Table 13.

Table 12 - CARES Act Approved Capital Funding

Line Item	Budget	Federal	State	Local
5 buses	\$633,720	\$633,720	\$0	\$0
Shop Equipment	\$158,000	\$158,000	\$0	\$0
Security Cameras	\$8,700	\$8,700	\$0	\$0

Table 13 - CARES Act Approved Planning and Operations

Line Item	Budget	Federal	State	Local
Planning	\$206,070	\$206,070	\$0	\$0
Operations	\$700,080	\$700,080	\$0	\$0

5.0 Coordination and Outreach

Throughout the planning effort, the consultant team and key City staff coordinated and sought input from City leadership, City staff, the citizens of Brunswick, key stakeholders (business owners and community organizations) and planning partners such as Georgia DOT, Coastal Regional Commission and Glynn County.

The project team created summary information and posted to the City’s web site. Here was also placed a public informational video providing an overview of the initiative and encouraging involvement and input.

The project team also conducted outreach to seven focus groups and held virtual interviews with 12 participants. These included:



- Employers
- Social Services
- Housing Authority
- Sea Island
- Jekyll Island
- College
- Health System
- Public Opinion Survey

The project team developed and distributed an online survey on transit needs and opportunities. The following images capture some of the questions and input received through this survey.

Nine Question Survey

Brunswick Transit Service Survey

1. Do you, or a member of your household, ever have difficulty getting where you need to go because of a lack of transportation?

- Yes
- No

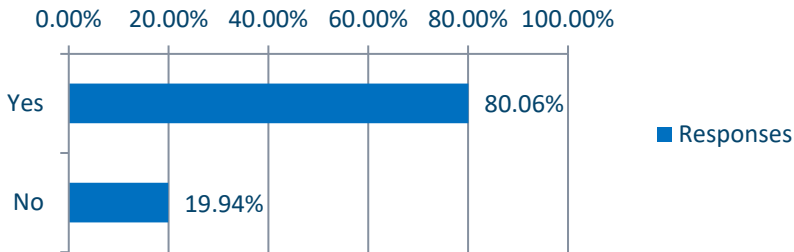
2. Are you aware of other people in Brunswick who miss trips because of a lack of transportation?

- Yes
- No

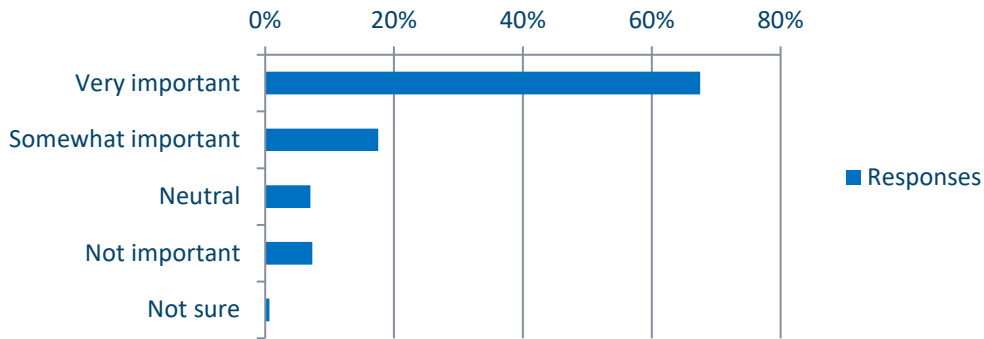
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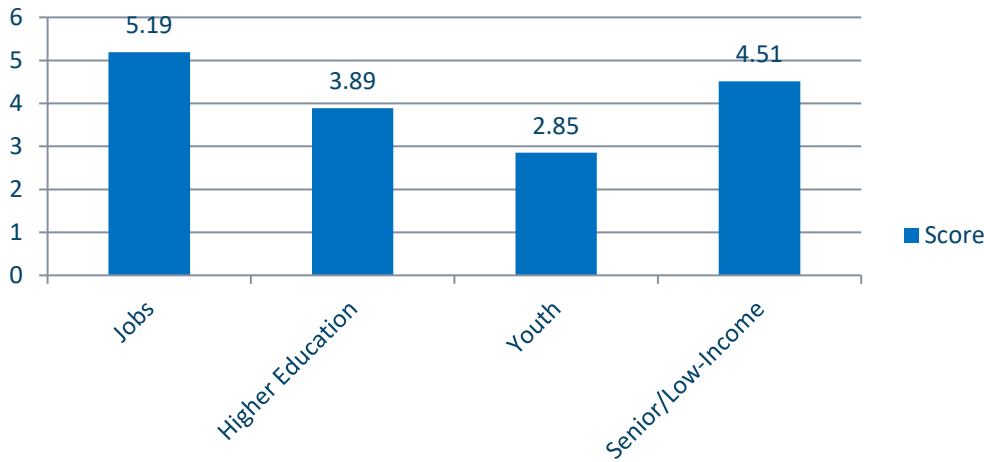
Are you aware of other people in Brunswick who miss trips because of a lack of transportation?

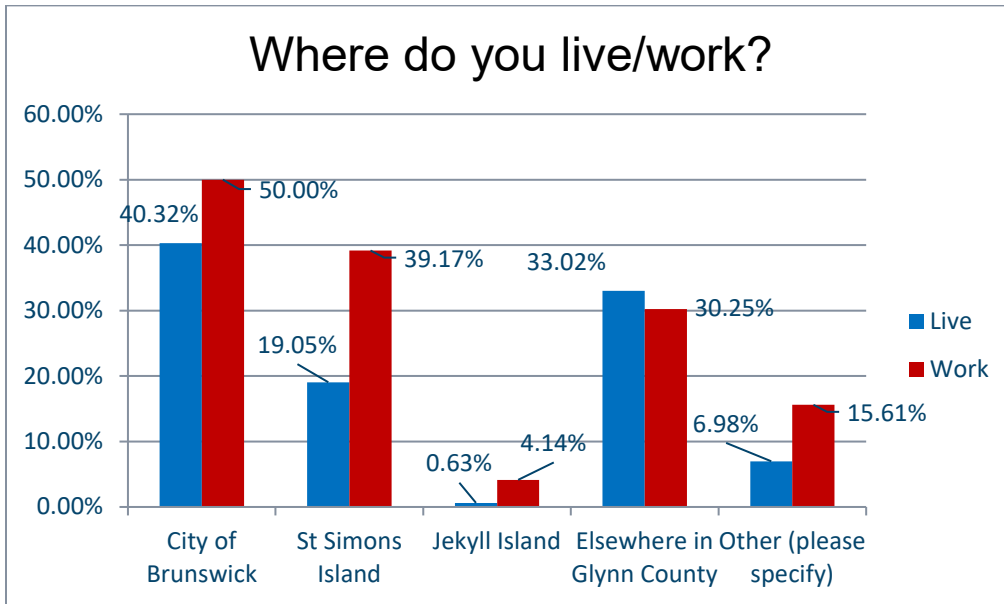


How important do you think it is for Brunswick to offer public transit service to its residents and visitors?



Trip Priority Ranking





Several key themes emerged for the input received. These include:

- There are broad needs for public transportation in Glynn County
- Service to destinations in the County makes the most sense
- Lack of transportation is a major workforce barrier for hospitality employers on the islands
- Community has trouble getting to health care appointments
- Residents could attend the college if there was reliable transportation
- Students would benefit from service to shopping and recreation

6.0 Recommended Transit Proposal

Based on both the technical analyses, public input, guidance by City leadership and fiscal realities, the recommended transit concept for implementation includes:

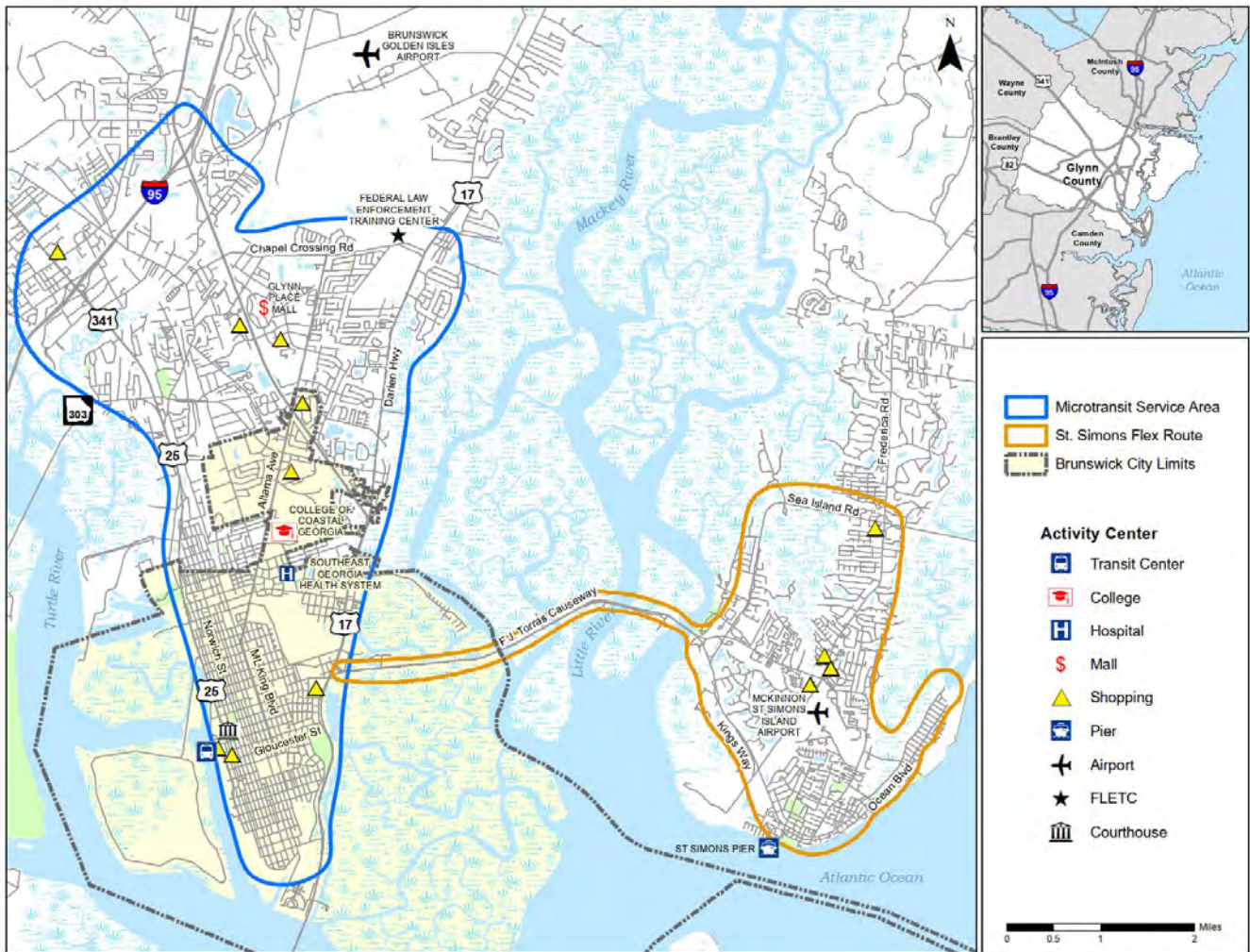
- **Micro-transit** zone encompassing all of the City of Brunswick and portions of Glynn County
- **Flex route** to St. Simons Island.

The micro-transit will be on-call through either a smart phone app or telephone reservation. Advanced reservations will not be required. The service will operate Monday through Saturday. The Flex Route will connect Brunswick with St. Simons Island – providing a much-needed employment connection. The local portions of operating costs may come from combinations of LOST funds, City funds, County funds and/or St. Simons employers. The services may be operated by City staff, contracted through a private operator or through the Coastal Regional Commission.

6.1 Transit Service Areas

The transit service areas for the city micro-transit service and the St. Simons Island Flex Route are shown below in Figure 8 - Recommended Transit Service Areas.

Figure 8 - Recommended Transit Service Areas



6.2 Transit Program Budget

The estimated operating budget and capital budget for the recommended transit program are summarized in Table 14 and Table 15, respectively.

Table 14 - Transit Program Operating Budget

Line Item	Estimated Annual Budget	Comments
City Administration	\$328,694	Transit supervisor and clerk
Microtransit Operations	\$798,600	Contract operations plus fuel
St. Simons Flex Route Operations	\$639,960	Contract operations plus fuel
City Bus Maintenance	\$251,214	Two maintenance employees plus parts and outside repairs
Total Operating Costs	\$2,018,468	
Microtransit Revenues	\$130,680	\$3 trip
St. Simons Flex Route Revenues	\$290,400	\$5 trip
Human Service Agency Revenues	\$63,750	\$12.50 per agency trip
Total Operating Revenues	\$484,830	
Net Cost of Service	\$1,533,638	
Federal – 5307 and 5311	\$766,819	50% of Net Cost of Service
Local	\$766,819	

Table 15 - Transit Program Capital Budget

Line Item	#	Unit Cost	Cost Estimate	Approved Grant	Future Grant
Grant Federal Share				100% Federal	80% Federal
Micro Transit Buses	6	\$62,500	\$375,000		
St. Simons Island – 25' bus	3	\$80,000	\$240,000		
Vehicles subtotal			\$615,000	\$633,750	
Security cameras – per vehicle	9	\$1,500	\$13,500	\$8,700	
Bus parking and site improvements			\$750,000		\$750,000
Shop Tools			\$158,000	\$158,000	
Bus Stop and Sidewalk			\$250,000		\$250,000
Capital Total			\$1,786,500	\$800,420	\$1,000,000

6.3 Branding Concepts

A local transit system should have a recognizable “brand” which is memorable to the customers. This usually includes a name for the service, consistent color scheme and often a logo. Some preliminary branding concepts were developed here using the names “Brunswick BeeLine”, “Brunswick Buzz” or “Brunswick Breeze”. These would be prominently displayed on the vehicles, fare media, informational handouts, etc.



6.4 Transit Facility Improvement

The transit system will require certain infrastructure including a yard for vehicle storage, a plan for vehicle maintenance and bus stop improvements. The WRA project team has prepared a preliminary bus parking concept layout – shown in Appendix B. The recommended plan for initial and future facilities includes:

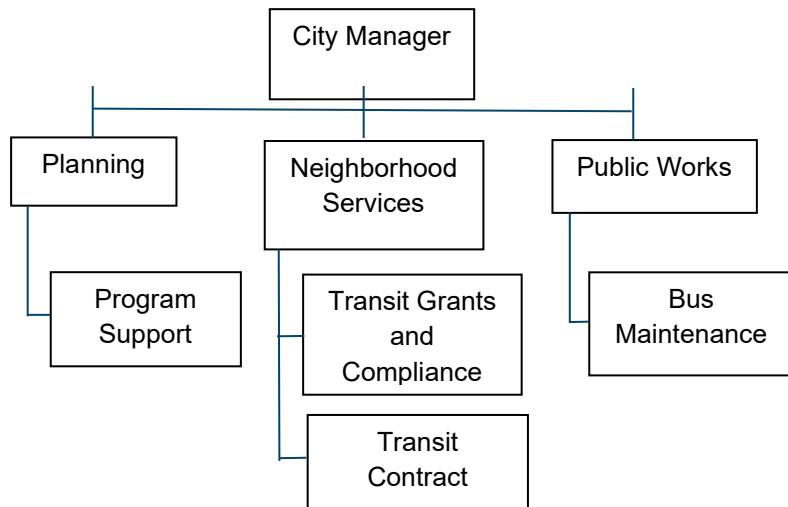
- City Yard
 - Short Term - \$158K
 - Use existing City Yard with access from Lakewood
 - Fencing and gate access control
 - Offices in Public Works Facility
 - Mid-Term
 - Paved parking and wash shed
 - Long Term
 - Transit maintenance bay
- Bus Stop Improvements
 - Future year request

6.5 Transit Staff Responsibilities

It will be necessary to have certain management and staff for ongoing support for transit planning, operations and grants. These include:

- Planning
 - Program support
- Neighborhood Services
 - Transit grants and compliance
 - Transit program supervisor
 - Transit marketing assistant
- Public Works
 - Bus maintenance
 - 5 small buses, 3 medium buses
 - 240,000 miles per year
 - 1-2 technicians

Below is a recommended organization of those support functions within the City’s current structure.



6.6 Implementation Plan

Finally, upon adoption and commitment to launch the City's transit service, the following is a tentative plan and schedule to implementation of the new transit system.

- Receive Recommendations
 - December 2021
- LOST Negotiations
 - Winter / Spring 2022
- Plan Adoption
 - April 2022
 - Operations Agreement
 - Vehicle Procurement
 - Technology Procurement
 - Marketing Plan
- Public works improvements
 - Bus parking and fencing
 - Design – April 2022
 - Bids / construction – 2023
 - Bus stop improvements
 - Design – July 2022
 - Bids / construction – 2023
- System Start-up
 - Fall / Winter 2022

Appendix A
Transit Ridership Analysis

Peer Cities' and Alternative Population and Demographic Data

	Service Area Population	% Minority	% Low Income	% Zero Car Households
Albany	75,616	76.5%	33.2%	15.5%
Gainesville	192,865	15.9%	16.1%	5.1%
Hinesville	39,063	57.8%	16.5%	5.5%
Macon	153,691	58.5%	26.7%	12.4%
Glynn County	79,626	32.4%	18.8%	7.7%
Alt #1 – City / County Bus	33,335	47.2%	25.8%	12.1%
City of Brunswick Alt #2 - Microtransit Alt #3 - Demand Taxi	16,122	58.8%	33.1%	18.6%
Alt #4 – City Bus	19,604	63.2%	31.0%	17.6%

Georgia Small Urban Ridership

Urbanized Area	2010 UZA Population	Estimated Transit Area Population	FY2019 Transit Trips	FY2019 Trips Rides per Capita
Albany	95,779	75,616	773,757	10.2
Gainesville	130,846	192,865	156,242	0.8
Hinesville	51,456	39,063	20,333	0.5
Macon	137,570	153,691	592,201	3.9

Brunswick Transit Estimated Ridership

Alternative	Alt. 1 - City / County Bus	Alt 2 - Microtransit	Alt 3 - Demand Taxi	Alt 4 - City Only Bus
Estimated Service Area Population	33,335	16,122	16,122	19,604
Riders per Hour	7	2 to 4	Not applicable	10
WRA Estimated Riders	238,000	37,200 to 74,400	30,000 to 60,000	138,000
Per Capita	7.14	2.31	1.86	7.04
Ridership if 10 Rides per Capita	333,350	161,220	161,220	196,040

Appendix B
Transit Yard Layout



Appendix L -- Policy: Complete Streets Ordinance | 2017

ORDINANCE NO. 1048

AN ORDINANCE TO CREATE ARTICLE IV OF CHAPTER 19 OF THE CITY OF BRUNSWICK CODE OF ORDINANCES, TO PROVIDE FOR A COMPLETE STREETS ORDINANCE; TO PROVIDE FOR AN ADVISORY BOARD; TO PROVIDE AN EFFECTIVE DATE; TO REPEAL ALL ORDINANCES AND PARTS OF ORDINANCES IN CONFLICT HEREWITH; AND FOR OTHER PURPOSES.

WHEREAS the City of Brunswick actively promotes safe streets through design, education, and enforcement of all its transportation network; and

WHEREAS a complete streets program is designed to reduce congestion, increase the transportation network capacity, increase consumer choice while decreasing consumer transportation costs and improving air quality and community health, enhance community aesthetics, augment economic growth, increase community stability by providing accessible and efficient connections between home, school, work, recreation, and retail destinations; and

WHEREAS Complete Streets are Rights-of-Way that are planned, designed, constructed, operated, and maintained in such a way as to enable safe, comfortable, and convenient access along and across the Rights-of-Way by users of all ages and abilities, including but not limited to, pedestrians, bicyclists, transit riders, motorcyclists, emergency, freight, and vehicle operators; and

WHEREAS Complete Streets may include facilities and amenities including but not limited to pavement markings and signs; sidewalks and pedestrian safety improvements such as medians, curb extensions, and crosswalks; Americans with Disabilities Act (ADA) accessible curb ramps and accessible pedestrian signals; transit shelters, signage, and improved pedestrian and bicycle access to transit stops and stations; wide travel lanes, bike lanes, or shared use lanes; bicycle parking facilities; street trees, landscaping, street lighting, and street furniture; and adequate drainage facilities including opportunities for storm water quality treatment facilities; and

WHEREAS the Georgia Department of Transportation adopted a Complete Streets Design Policy to be implemented on all State roadways on September 20th, 2012 as a means for improving mobility, access, and safety for the traveling public throughout Georgia;

NOW THEREFORE, BE IT ORDAINED by the Mayor and Board of Commissioners, acting in its capacity as the governing authority of the City of Brunswick, Georgia, that the attached Complete Streets Ordinance is adopted and shall be applicable to the planning

Appendix L -- Policy: Complete Streets Ordinance | 2017

and design of all new transportation and Complete Streets improvements initiated after the adoption hereof:

SECTION ONE

Sec. 19-70 – Complete Streets

- (a) All transportation projects in the City shall create complete streets that allow safe and convenient travel along and across streets for users of all ages and abilities and for all modes of transportation, including motorists, bicyclists, public transportation vehicles and their passengers, and pedestrians.
- (b) Section 1(A) shall apply to all transportation projects conducted by, or using funds awarded by, the City, or any other local, State, or Federal agency. This shall include new construction, reconstruction, resurfacing, restoration, repaving, and rehabilitation of highways, roads, and streets.
- (c) The City of Brunswick shall modify its procedures, documents, training programs, and performance measures within one year of the effective date of this Act to ensure that the needs of all users of the highways, roads, and streets in Brunswick are included in all phases of all transportation projects, including funding, planning, designing, operating, and maintaining transportation infrastructure.
- (d) The City of Brunswick shall develop and/or adapt design manuals, standards, and guidelines based on the latest and best practices of street design, construction, operations, and maintenance as these apply to bicycle, pedestrian, transit, and highway facilities. All manuals, standards, and guidelines must be made publicly available.

Sec. 19-71 – Exceptions to Complete Streets Requirements

- (a) A transportation project shall not be required to accommodate the needs of a particular user group if the City Engineer, Director of Public Works, or other senior management personnel determines in writing that:
 - 1. The use of the transportation facility by the particular user group is prohibited by law;
 - 2. The cost of accommodating the needs of the particular user group for the transportation project would be excessively disproportionate to the current or future need or probable use of the facilities by the particular user group;
 - 3. There is a demonstrated absence of future need by the particular user group, as determined by factors including current and future land use, current and projected user volumes, population density, and crash data; or

Appendix L -- Policy: Complete Streets Ordinance | 2017

4. The adverse impacts of accommodating the needs of the particular user group significantly outweigh the benefits.

(b) The determination shall be supported by data and written documentation. The determination shall identify the applicability of an exception for each user group whose needs will not be accommodated by the transportation project.

Sec. 19-72 – Advisory Board

The City's Development Review Team (DRT) shall act as an advisory board to help the City Engineering and Public Works Departments comply with the Complete Streets Act and to provide ongoing feedback related to the implementation of the Complete Streets Act.

Sec. 19-73 – Program Evaluation and Reporting

(a) The City Engineering or Public Works Department, in conjunction with any Department or Agency that plans or implements transportation projects, shall establish benchmarks reflecting the ability of all users to travel safely and conveniently along highways, roads, and streets within the agency's jurisdiction.

Examples of such benchmarks may include:

1. New miles of bicycle lanes and sidewalks; new street trees or plantings; the number of new curb ramps and improved street crossings; and improved signage;
2. Measurements regarding existing levels of service for different modes of transport and categories of users, including public transportation ridership;
3. Collision statistics by neighborhood and mode of transportation, as well as bicycle and pedestrian injuries and fatalities;
4. Other benchmarks to track the safety, functionality, and actual use of the neighborhoods and areas within the City of Brunswick by each category of users.

(b) Each such Department or Agency also shall develop plans and set goals to ensure the successful implementation of the Complete Streets Act in low- and moderate-income communities. On or before June 30th, 2018, each such Department or agency shall prepare an initial report to identify barriers, and propose solutions, to successful implementation of the Complete Streets Act in low- and moderate-income communities.

(c) Each such Department or Agency shall collect and monitor data to determine compliance with the established benchmarks.

(d) Each such agency shall provide annual reports to the City Planning, Development & Codes Department (PDC) to allow the Department to evaluate implementation of the Complete Streets Act. Each annual report shall include the data collected pursuant to

Appendix L -- Policy: Complete Streets Ordinance | 2017

Section 4 as well as a list of transportation projects initiated or completed during that fiscal year. The report also shall include a list of on-going transportation projects. If any exceptions are applied to transportation projects pursuant to Section 2 herein, such projects and the relevant exceptions should be identified in the annual report.

- (e) All benchmarks and reports shall be made publicly available online.
- (f) For the purpose of this section, “low income community” refers to any census tract that meets one of the following criteria (as reported in the most recently completed decennial census published by the U.S. Bureau of the Census):
 - 1. The poverty rate for the census tract is at least 20 percent; or
 - 2. For a community within a metropolitan area, the MFI for a census tract does not exceed 80 percent of the greater of statewide MFI or metropolitan area MFI; or
- (g) For the purpose of this section, “moderate income community” refers to any population whose income is between 81 and 95 percent of the MFI for the area.

Sec. 19-74 – Effective Date

The Complete Streets Act shall take effect on the date of final adoption by the City of Brunswick City Commission, provided that it shall not apply to any transportation project for which a preliminary design has been completed on or before said adoption.

SECTION TWO

All ordinances or parts of ordinances in conflict with this ordinance are hereby repealed.

SECTION THREE

If any section, clause, sentence or phrase of this ordinance is held to be invalid or unconstitutional by any court of competent jurisdiction, then said holding shall in no way effect the validity of the remaining portions of this ordinance.

SECTION FOUR

This ordinance shall become effective immediately upon its adoption by the City Council.

SO ORDAINED, this ____ day of _____, 2017.

Cornell L. Harvey, Mayor
City of Brunswick, Georgia

Appendix L -- Policy: Complete Streets Ordinance | 2017

ATTEST:

Naomi D. Atkinson, City Clerk

APPENDIX M

DRAFT Report
June 2021

Brunswick Area Transportation Study
connect bay street
CORRIDOR PLAN

Bay Street Corridor Study

This report was prepared in cooperation with, and financial assistance from, the United States Department of Transportation Federal Highway Administration, the Federal Transit Administration, and the Georgia Department of Transportation.

Brunswick Area Transportation Study (BATS)
c/o Glynn County Community Development
1725 Reynolds Street, 2nd Floor
Brunswick, Georgia 31520

<https://www.glynncounty.org/303/Metropolitan-Planning-organization-BATS>

The opinions, findings, and conclusions in this publication are those of the author(s) and not necessarily those of the Department of Transportation, State of Georgia, or the Federal Highway Administration.

The BATS MPO prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program.

Section 1: Introduction

Introduction

Glynn County was designated an urbanized area by the Federal government following the 1990 census, which led to the establishment of the Brunswick Area Transportation Study (BATS) Metropolitan Planning Organization (MPO). According to Federal law, the transportation planning process must be carried out by MPOs for designated urbanized areas that exceed a population of 50,000, as well as the area expected to become urbanized within the next 20 years. The Lead Planning Agency, responsible for the BATS planning process, is the Glynn County Planning Department. In addition, the Georgia Department of Transportation (GDOT) provides technical support to, and coordinates with, the MPO throughout the transportation planning process.

As the designated MPO for Glynn County, the BATS is responsible for overseeing long range transportation planning within the MPO planning area to ensure continued accessibility, connectivity, efficiency, mobility, and safety for the movement of people and goods. The BATS works collaboratively with partner agencies in order to address transportation needs by leading planning efforts and directing the flow of federal transportation funds.

What is Connect Bay Street?

Connect Bay Street is a single corridor planning process that identified short- and long-term recommendations for the Bay Street corridor in Glynn County and The City of Brunswick, Georgia. While there has been past effort to look at segments of the Bay Street corridor, there has not been a singular document that has looked at the entirety of the corridor. Until now. While this corridor faces many unique challenges, its foundation is similar to many other corridors in the community such as being a commuter route, an employment hub, access to neighborhoods and parks, and a gateway to downtown. Most notably, the corridor has specific assets and future opportunities that will benefit the entire community.

Connect Bay Street focuses on issues and opportunities within and outside the right-of-way. The process considered conditions related to transportation, mobility, land use, and economic development. A community-focused process, rooted in the active involvement of staff, elected officials, and corridor stakeholders, helped identify the main challenges affecting each corridor and coordinated opportunities to improve how the corridors will look, function, and contribute to broader community initiatives in the decades to come.

Planning Process

Connect Bay Street engaged the community in an intentional way while evaluating transportation, land use, and design strategies without losing sight of market and economic dynamics that the corridor and community offer to the region as well as its statewide impact

During the 10-month process, the project team worked with residents, business owners, and other stakeholders throughout public events and online engagement, reviewed and assessed existing and projected conditions, and considered best practices in how to blend the interests of transportation, land use, and economics.



Why now?

Glynn County and the City of Brunswick are a diverse and dynamic community due to its people, economy, and places. As growth continues, their greatest assets need to be protected and leveraged. And, looming challenges need to be documented and overcome. The urgency for Connect Bay Street extend well beyond the corridor itself, as detailed in the Envision Glynn County and the Brunswick Area Transportation Study (BATS) Long Range Transportation Plan (LRTP) process. The conditions and trends affecting the County and the City puts added pressure on repositioning these vital corridors.

The Connect Bay Street plan is the blueprint for transportation alternative improvements and the foundation upon which future transportation decisions will be based. The plan responds to existing challenges, anticipated future needs, and prepares the community to accommodate future growth. The plan will guide the City and County and their partner agencies BATS and the Georgia Department of Transportation (GDOT) to accommodate future enhancements to the corridor. This plan should guide future city project, comprehensive plans, LRTP's, and capital investments from BATS, the City, County and adjacent property owners along the corridor.

At its core this study evaluates the mobility needs for the Bay Street Corridor and determines feasible improvements for the short and long term to improve mobility in the network. As with any study, Connect Bay Street should be revisited as the future unfolds as projects are implemented and new information becomes available.



Relationship to Other Plans

Developing a transformative strategy for the Bay Street Corridor required us to consider transportation performance as well as how moving people and goods safely and efficiently can positively influence prosperity and quality of life. Below are a few of the representative studies that informed the development of the Bay Street Corridor Study.

Envision Glynn

Envision Glynn serves as a blueprint for physical growth and development in Glynn County over a twenty-year time span. Outlined are measures that will ensure the maintenance of the county's current high quality of life, efficiency and competitiveness that fuels economic growth and development. The study broadly groups future development areas while providing detailed information on the current and proposed future activity centers and major corridors for various areas within each group. Numerous recommendations were made regarding future development patterns and appropriate land uses

2045 MTP

This plan was prepared by CDM Smith for the Brunswick Area Transportation Study (BATS) Metropolitan Planning Organization (MPO). The MTP document provides an extensive overview of the importance of a long-range transportation plan, its vision, goals, objectives, as well as strategies that will aid in the implementation of these goals through the horizon year of 2040. The 2040 MTP highlights what future population and employment growth looks like for the county given its existing land use conditions and transportation system performance. The BATS 2040 MTP is fiscally constrained, based on projections of federal, state, and local funding for transportation, and includes 24 roadway improvement projects funded within the 2040 horizon.

Bike and Multipurpose Trail Study

The Bike and Multipurpose Trail Study was designed to identify gaps in Glynn County's existing bicycle and pedestrian network and establish a comprehensive list of recommended projects and initiatives. These recommended projects were intended to support alternative modes of transportation, as well as improved and additional recreational opportunities, to residents and visitors of Glynn County, City of Brunswick, and St. Simons Island. Findings from the study indicated that most individuals would consider walking or biking more if improved facilities were available. Recommendations included the implementation of various facility types, as well as major and minor trail networks alongside development corridors.

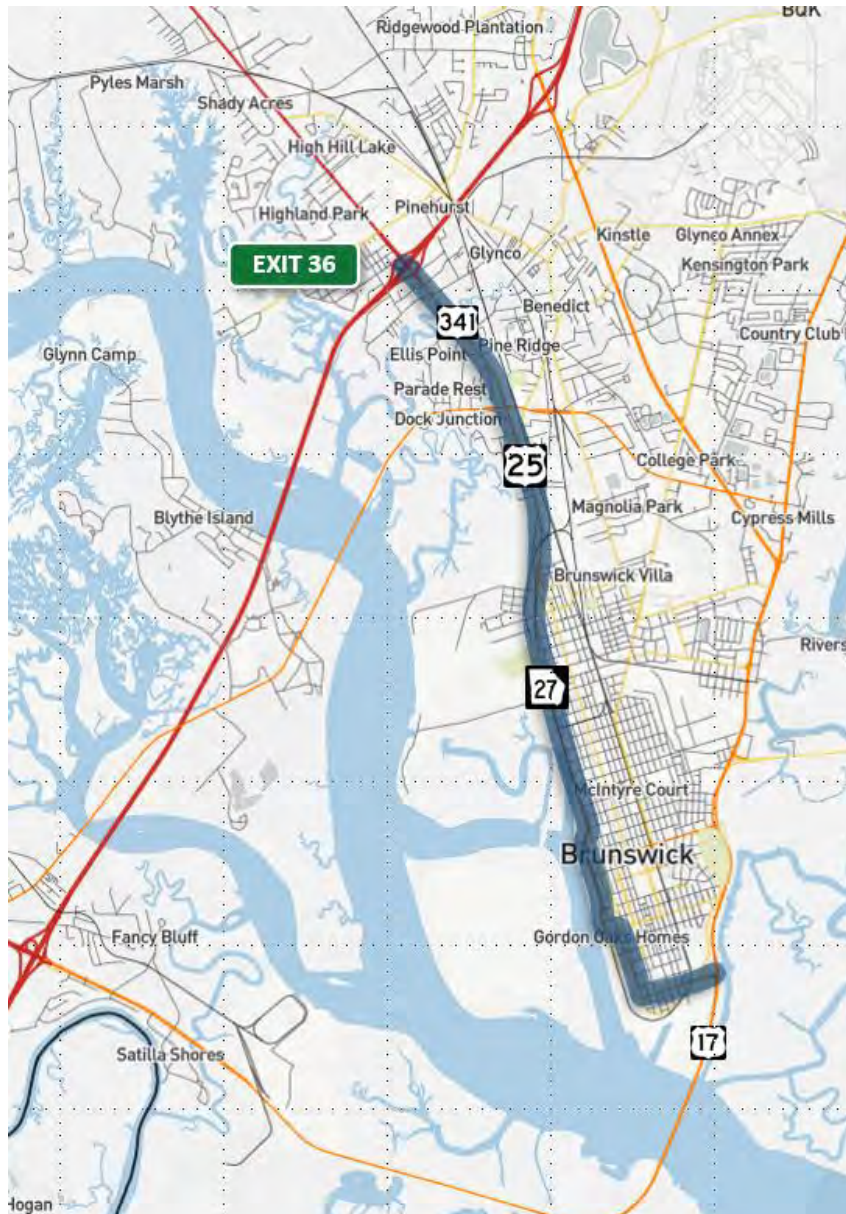
Georgia Ports Authority, State of Brunswick Port

Georgia Ports Authority's 2017 fact sheet report on the Port of Brunswick gives a very concise overview of the type and quality of service provided by Colonel's Island, Mayor's Point and East River terminals. It discusses the need for more infrastructure, interstate access, rail services, and expansion. The Port of Brunswick serves more than 60 auto and heavy equipment manufacturers and is ranked number one for new import vehicles in the United States\

Meet the Corridor

Connect Bay Street focuses on the SR 27/US 25/341 corridor within Glynn County, Georgia. Glynn County is roughly 422 miles located along the southern coast of Georgia and encompasses the City of Brunswick, Jekyll Island, Saint Simmons Island, Little Saint Simmons Island, and Sea Island. The City of Brunswick is the county seat and serves as the gateway to the adjacent communities, an interface with I-95 and interstate commerce, and an employment hub for the region. The City of Brunswick also serves as one of two ports operated by the Georgia Port Authority (GPA) in the state. The County is part of the Coastal Plain the largest and least populated geographic region in the State. Overall, the County and City are recognized for its natural features, access to the coast, quality of life, commerce, and climate.

The corridor serves as major north-south connector for residents, commuters, and visitors to the City of Brunswick and surrounding areas as well as a gateway to downtown Brunswick.



Bay Street by the Numbers

- 7.3 miles in length
- 3 traffic signals
- 1 interchange
- 5 road name changes
- 11 major intersections
- 4 distinct context areas
- 1 railroad overpass
- Railroad parallels corridor for 3.7 miles
- Several major employers – industrial, processing, distribution

SR 27/US 25/341 (Bay Street)

The Bay Street study area begins at the intersection with I-95 and extends south through the City of Bay Street to its intersection with US 17 (Glynn Avenue), a distance of roughly 7.3 miles. This corridor is a major freight and employment corridor for the County, with large-scale commercial development along segments of the corridor. The corridor also serves as a gateway from I-95 to the City of Brunswick and the associated GPA facilities. Established residential neighborhoods surround the corridor to the east, with development taking on an urban character. Bay Street serves as direct commuter connection to Downtown Brunswick.

- » **7.3 miles | I-95 (Exit 36) to US 17 (Glynn Avenue)**
- » **Connects points north and to the City of Brunswick**
- » **One of the region's largest economic corridors**
- » **Major freight corridor**
- » **Daily traffic and zoning encourage economic investment**

Foundations | Key Takeaways

It was critical to establish a basis of understanding early in the planning process. The Foundations Report organized challenges and opportunities for Atlanta Highway around three overlapping themes: Land Use and Community Design, Economics, and Mobility.

Land Use and Community Design

- » The sequencing of growth has occurred sporadically along the corridor over the last 50 years.
- » The diversity of land uses increases as you move away from the corridor. Still, the planning area is predominantly commercial with room for growth.
- » The corridor lacks cohesion and a unique identity that would suggest it has a sense of place.

Economics

- » The corridor is a major economic engine for the region and state supporting connections to GPA's Mayor Point Terminal, Brunswick Cellulose, Downtown Brunswick, manufacturing and processing facilities, and connectivity to the islands and beaches.
- » The corridor is a major freight corridor in the states GRIP program that connects the Golden Isles to the Atlanta Metropolitan area.

Mobility

- » The corridor struggles to balance regional through trips and local destination trips, resulting in ongoing traffic and safety issues particularly near major intersections.
- » The corridor lacks continuity of facilities and connectivity to destinations that would make it more accessible by foot or on bike.
- » Uncontrolled access and poor signage control undermine the corridor's role as a gateway from the North.

The SR 27/US 25/341 corridor is also a major freight corridor connecting the Port of Brunswick to I-95 and the Atlanta Region. The corridor is a part of the GRIP or Governors Road Improvement Program which was initiated in 1989 with a purpose to:

- **Connectivity** – provide 95% of the Cities in Georgia of 2,500 people access to an Interstate and ensure the 98% of all areas in the state are within 20 miles of a four-lane road
- **Growth** – Support economic development through safe and efficient mobility throughout the state
- **Efficient** and Effective Mobility
- **Safety** – Reduce crashes along 2-lane corridor through multilane widenings

The Bay Street corridor also known as the Golden Isles Parkway through the GRIP program runs along the US 341 corridor from I-75, just south of Atlanta, to its terminus at the Mayor's Point terminal in the City of Brunswick (Bay Street).

The Bay Street corridor serves as a vital connection for the State of Georgia and the Georgia Ports Authority (GPA). Centered around the Mayor's Point Terminal and the Colonel Island Terminal, GPA estimates a \$128m impact to the state's GDP (Gross Domestic Product) through these two terminals in Brunswick.

The Mayor's Point Terminal is a 22-acre break-bulk cargo, such as wood pulp, liner board, plywood, and paper facility. It is currently served by the SR 27/US 25/341 5-lane corridor adjacent to the facility as well as a joint CSXT and Norfolk Southern railroad track. The facility is approximately 355,000 sf in size.

Adjacent and joining these facilities is the East River and Lanier docks. This area comprises approximately 72 acres in size and primarily services cargo that is liquid in nature and dry bulk commodities.

The Colonels Island terminal is located across the East River and serves singularly as an automotive distribution and receiving facility for the east coast.



What the Community Said

Engaging stakeholders and the public in meaningful ways as part of a larger effort to understand the dynamics of a critical corridor was important. Over the course of the planning process, the project team sought ways to reach beyond typical voices and engage the broader interests for the corridor with an eye toward the future. The intent was to allow public processes to be at the heart of how we developed recommendations regarding transportation, safety, and design.

Engagement at a Glance

Brunswick and the associated Glynn County areas of the corridor is an energized community with strong neighborhood advocates; diverse interests; and a middle-aged, well-educated population. Given a choice, the community will engage with a planning process if their interests are demonstrated. The corridor study needed a conversation that was informative, transparent, inclusive, and connected. Like many things COVID-19 influenced the approach to engagement with stakeholders through the process. However, even with the impact, engagement with stakeholders throughout the community and leadership occurred. This provided better comprehension of the issues facing the users of the corridor and their interface with it.

Stakeholders

To ensure the planning process captured the issues important to the broader community, stakeholders included leaders representing Glynn County Government, City of Brunswick, Georgia Department of Transportation, real estate, small business, Brunswick Area Transportation Study Policy Committee, BATS Technical Committee, BATS Citizen Advisory Group, Georgia Port Authority and the faith community, residents, and advocacy groups. Their input was key to provide guidance on:

- **Provide ongoing direction**
- **Develop key messages about the process**
- **Provide an initial step in inclusive engagement**
- **Offer the perspective of the larger community and be a liaison to those they represent**
- **Evaluate findings, help develop recommendations, and offer input on priorities**

KEY TAKEAWAYS

Function & Safety:

- Identify and investigate known problem areas or intersections
- Improve the connectivity between Selden Park at 4th Street & from Downtown to Mary Ross Park
- Enhance pedestrian mobility along Bay Street
- Connectivity to East Coast Greenway
- Wayfinding improved to increase both driver and pedestrian safety
- Speeds along US 341 are high south of Blythe Island Highway

Aesthetics & Amenities:

- Landscaping, trees, buffering, overall beautification
- Develop a brand, design standards, and overall cohesiveness to give identity to the corridor
- Wayfinding and signs should be included
- Preserving greenspace, adding more trees and parks
- Enhancing access to Parks
- Utilize space in Bay Street for more parking

Business & Economics:

- Further Development of the waterfront along the Marina
- Mayor's Point Terminal is currently active for GPA (Regional and State impact)
- Tourism is a key economic generator for area (Beaches & Downtown)
- Desire for improved connectivity between the waterfront and downtown
- Improve sidewalks and lighting
- Add greenspace
- Create a cohesive identify.

Mobility:

- Improve bicycle and pedestrian mobility
- Address congestion and safety issues at key intersections
- Support long-term development efforts through transportation improvements.

Project Goals and Objectives

Working with the project stakeholders' and utilizing collected and analyzed data, project goals and objectives for the Bay Street Corridor Study were developed. Input was received on the goals and objectives before formally adopting them through BATS Citizens Advisory Committee, the Technical Committee, and the Policy Committee.

Goals	Objectives
Identify mobility issues along the Bay Street Corridor	Prepare an operational assessment of the corridor including capacity and crash analysis
	Understand the existing and future corridor operational purposes and needs.
	Identify key connections between land uses/features and the conflicts between them for all roadway users
Maintain and enhance the efficiency and safety of the corridors' segments and key intersections and between key land uses.	Develop solutions that enhance mobility for all road users of the corridor
	Build upon past improvements and efforts where appropriate
	Reduce the number of potential conflict points for all modes
	Establish a safe speed within the corridor
Support intergovernmental cooperation between all local jurisdictions in the project area as well as local, regional and state agencies	Encourage adoption and support of the Corridor Plan by all stakeholders
	Develop implementable solutions for the corridor segments and key intersections
	Explore ways to fund enhancement to the corridor outside of traditional sources
Enhance the appeal of the corridor for all users	Explore opportunities for enhancement and beautification of the corridor
	Balance connectivity between both sides of the corridor
Enhance the current and emerging economic drivers in the community	Provide safe and efficient access to the port
	Explore ways to support emerging community economic drivers.

Plan Framework

Results don't happen by accident. Rather, they're garnered through thoughtful planning, diligent work, and unwavering focus by those empowered during the planning process. Connect Bay Street coupled data-driven planning (*What does the analysis indicate the corridor needs?*) with the tradeoffs inherent to the decision-making process (*What steps will be necessary to make scenarios work for all users?*) and an acknowledgment that outcomes must be realistic (*How can we establish a blueprint to achieve corridor safety and balance the needs of a freight corridor?*).

The process was dynamic and responded incrementally as information was collected from previous plans, stakeholders, and new analysis. The plan rests on four pillars:

- 1. Leverage the work of earlier plans**
- 2. Create a holistic understanding of the corridor dynamics**
- 3. Provide a framework to offer realistic and measurable strategies for mobility, design, and transportation**
- 4. Communicate the process and a plan of action**

The Connect Bay Street report has been designed to be a readable, functional document to understand the relationship between freight, vehicular and multimodal transportation needs, and to recommend potential solutions to identified conflicts. The following narrative on the Bay Street corridor is divided into **three components**:

Corridor Characteristics

The Corridor Characteristics sets the stage for the actions and strategies to come. The vision was built with significant input from residents, stakeholders, and staff.

Transportation Strategy

The Transportation Strategy presents key findings and organizes recommendations within the context of travel mode and corridor aesthetics.

Implementation Plan

The Implementation Plan adds the final layer of detail to the corridor plans. It helps explain specific strategies within the context of cost, partnerships, and likely impact.

Section 2: Corridor Characteristics

Introduction

The SR 27/US 25/341 (Bay Street) corridor is a critical thoroughfare in Glynn County, the City of Brunswick, and the State of Georgia. Due to this, the demands on the corridor are unique and varied. In 2019, the corridor studied carried between 23,200 vehicles per day (vpd) and 2,620 vpd (source: GDOT). For decades, this corridor has served as a commercial corridor for the surrounding region providing access to the port, the City of Brunswick, and other large industrial uses along the East River and parallel to the corridor. The Bay Street corridor also provides connectivity to residential neighborhoods east of the corridor as well as two community parks – Selden Park and Mary Ross Park. County zoning helped reinforce the area as a variety of uses along the corridor and a relatively homogenous development pattern.

- » **The Bay Street Corridor provides regional mobility with local access to the employment centers, Mayor’s Point Terminal, Downtown Brunswick, shops, restaurants, and other uses that line the corridor. Meanwhile, the auto-oriented corridor has limited bicycle and pedestrian amenities.**

- » **The corridor has very little greenspace to break up the pavement and asphalt.**

- » **The long sections of uninterrupted traffic flow along the corridor have allowed speeds to exceed the posted speed limits.**

- » **The higher speeds and long crossing distances coupled with the railroad act as a barrier between the two parks along the corridor creating a heightened level of caution which limits pedestrian and bike access to these facilities.**

- » **The corridor has four distinct context zones each with their own unique role, issues, and opportunities. However, they each share an underlying role which is to support mobility and connectivity for the variety of uses along the corridor.**

These concerns help frame the opportunities to improve the mobility and adaptability of the corridor long-term for all roadway users.

The SR 27/US 25/341 (Bay Street) corridor area comprised of both the unincorporated areas of Glynn County and the City of Brunswick has been at the center of mobility and the economy for the region since the settling of the area in the early 1700's. The continued growth of the communities surrounding the corridor has shifted the dynamics over the centuries, but the primary purpose of the corridor – supporting commerce – has remained consistent. The conflict between modes of mobility and land uses have raised concerns associated with land use access, urban design, natural resource protection, and the function of the corridor in the area's transportation network. This chapter describes the existing context of the study area. The data, observations, and feedback received from stakeholders throughout the process helped shape the recommendations contained in the Bay Street Corridor Study.

Existing Conditions – Chapter Overview

This Chapter provides a set of facts and figures related to growth, development, constraints, traffic and safety. The chapter concludes with a collection of maps that reflect the environmental and transportation land uses of the study area. The following topics are covered in this chapter:

Built & Natural Conditions

Transportation Characteristics

Safety

Future Conditions

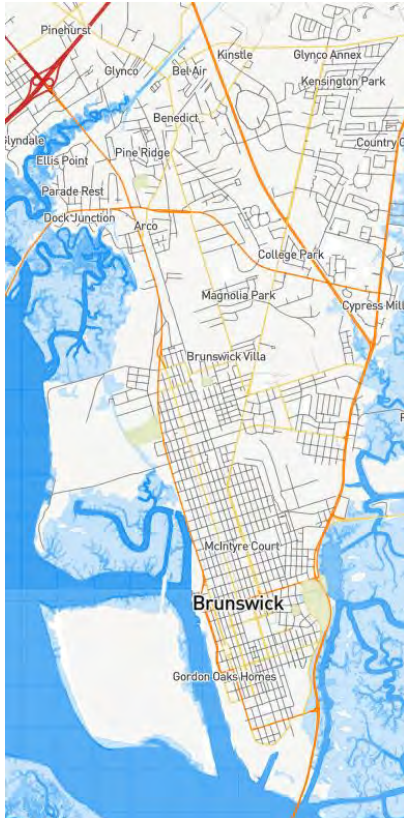


Bay Street throughout the corridor and context areas



Vulnerability

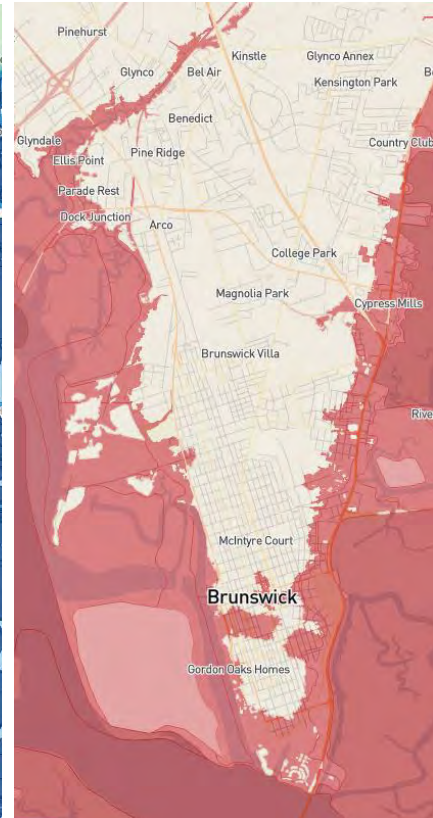
The SR 27/US 25/341 Corridor and the adjacent railroad were located in close proximity to the East River and the Oglethorpe Bay to have access to and to facilitate the distribution and receiving of goods. The proximity provides for quick and easy access to the river and bay for commerce but like any facility located along the coast is susceptible to hazards. Hazards including storm surge, sea level rise and inundation from storm events both large and small scale have the potential to impact the corridor. And by such its ability to function with its intended purpose and for any mode of transportation. The images below depict the vulnerability of the Bay Street corridor through a variety of threats. Like any community along the coast, protection of critical infrastructure must be at the forefront of investments to provide long term resilience. Bay Street is a critical corridor for Glynn County, the City of Brunswick, and the State of Georgia.



Existing Mean Hazard High Water



Category 2 Storm Inundation



FEMA Flood Hazard areas

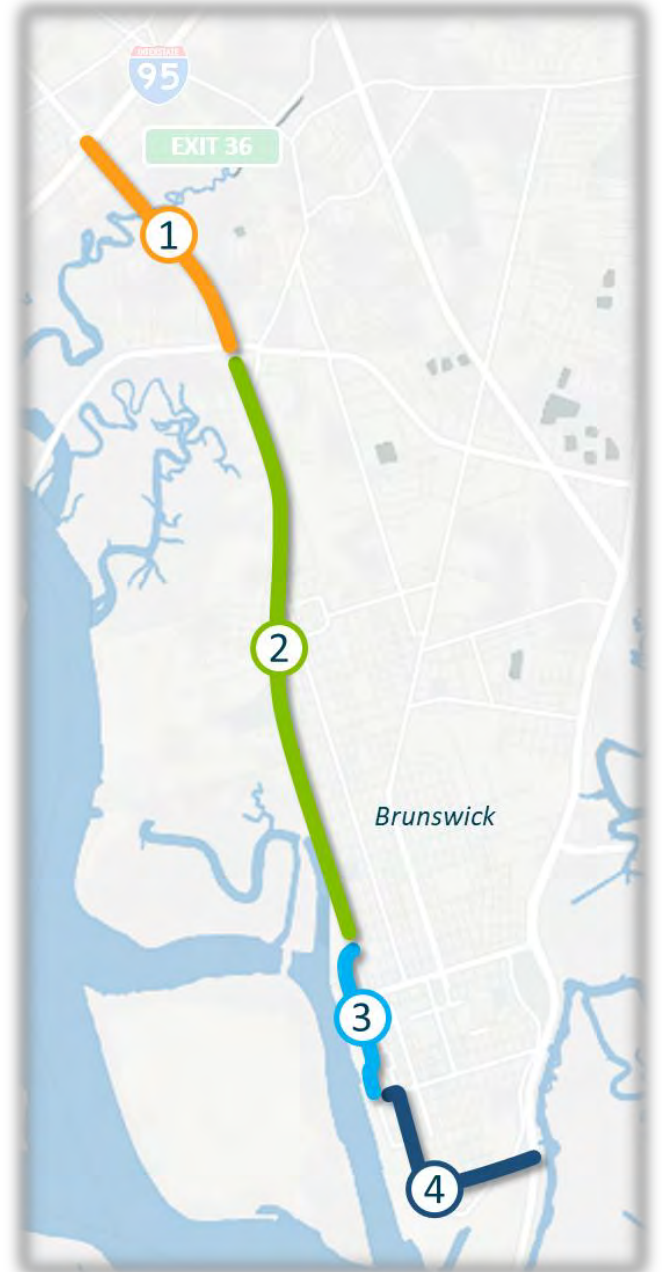
Corridor Characteristics

Much like the natural resources of community that increase the quality of life to a community, the transportation network services as the backbone of the community connecting land uses, resources, assets and promoting commerce and mobility for the community. As such, understanding the roadway and active transportation (bike and pedestrian) facilities serving a community is critical in the development of a mobility strategy for the SR 27/US 25/341 corridor.

Corridor Profile & Context Zones

The Bay Street corridor within the study area has four distinct context zones. Each of these zones has a unique context and operational impact on the corridor. The uses in these context zones is unique and, in some areas, diverse. Like the land uses, the transportation needs and demands on the corridor are also unique within each of the context zones.

- 1 COMMERCIAL** – this section of the corridor is primarily focused on mobility and access to goods and services. The area immediately connected to Exit 36 focuses on access to highway commercial with short trips to and from I-95. Towards Blythe Island Highway the corridor continues to facilitate access to commercial and employment land uses.
- 2 TRANSITIONAL** – this section of the corridor introduces a greater percentage of residential as well as Selden Park. Employment lane uses like Brunswick Celulose and other supporting industries are present. The railroad is primarily adjacent to Bay Street through this section.
- 3 WATERFRONT** – this section of the corridor runs adjacent to the Oglethorpe Bay and along downtown Brunswick. Access to Mayors Point Terminal and Mary Ross Park also occur from Bay Street. The posted speed limit along this section of the corridor are lower.
- 4 COMMUNITY** – the smallest segment of the corridor which primarily runs through the established neighborhoods within the historic Brunswick. This section is also a designated truck route to connect over to US 17 (Glynn Avenue) on the east side.



Traffic Volume, Corridor Growth, Speed, and Crashes

Corridor Growth

-01% SR 27/US 25/341 operates as a gateway corridor to downtown Brunswick and the Mayor's Point Terminal for travelers coming from Exit 36 with I-95. It is classified as a principal arterial with a variable posted speed limit between (45 mph and 25 mph). The corridor is also a designated freight route, a GRIP corridor, and a hurricane evacuations route. The corridor runs north/south through the study area and has the following recorded 2019 Average Annual Daily Traffic Volumes (AADT) within the study area as shown on the graphic to the right.

A review of historical volumes provided by GDOT indicate that the Bay Street corridor has grown between 2.4% between I-95 (Exit 36) and GA 303 Blythe Island Highway between 2010 and 2019. This growth is associated with the increase in volumes along I-95 and users utilizing Exit 36 for highway commercial trips (gas and food).

Between GA 303 and 9th Street through the transitional zone of the corridor, historical growth in traffic volumes over a 10-year period indicates 0.3% in growth. This section has remained relatively stable in land use and expansion or creation of new land uses.

Within the waterfront zone of the corridor a growth rate of -0.1% is realized over a 10-year period. This section of the corridor is between H Street and Newcastle Street along Bay Street.

The community section of the corridor has experienced a growth rate of 0.8% between 2010 and 2019. This section of the corridor is primarily residential in nature and facilitates the designated truck route to US 17 from the westside of downtown.

The table on the following page highlights the growth rates along the corridor based on GDOT historical traffic volumes.



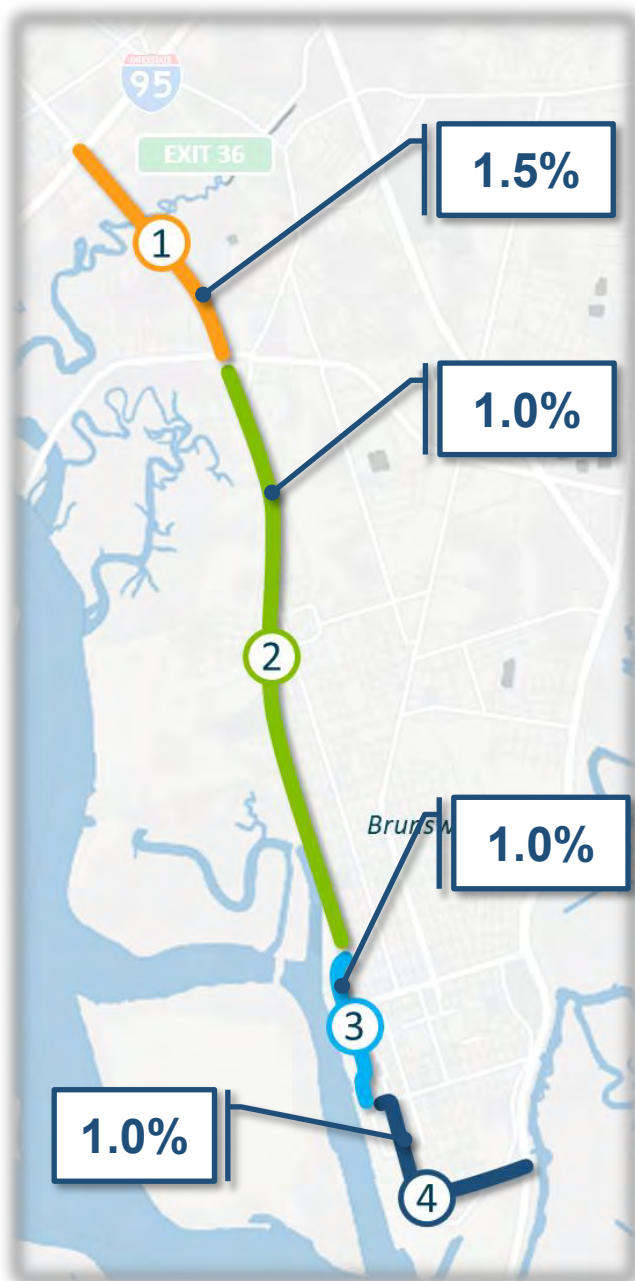
Segment ID	Context Area	Segment Name	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	10-Year Growth (%)
1	1 - Commercial	Between I-95 and GA 303	18,300	23,900	23,600	21,000	21,000	22,000	22,600	21,500	21,300	23,200	2.4%
AVG	1 - Commercial	-	-	-	-	-	-	-	-	-	-	-	2.4%
2	2 - Transitional	Between GA 303 and Old Jesup Highway	17,600	17,300	15,800	15,700	17,000	17,600	18,100	17,400	16,400	16,500	-0.6%
3	2 - Transitional	Between GA 303 and Old Jesup Highway	21,300	18,700	18,400	18,400	18,400	19,300	19,900	20,000	19,800	20,300	-0.5%
4	2 - Transitional	Between Old Jesup Rd and 9th St	23,800	23,500	21,800	21,700	21,700	22,400	23,100	23,300	22,900	23,100	-0.3%
5	2 - Transitional	Between Old Jesup Rd and 9th St	13,400	15,200	15,000	14,000	14,000	14,700	15,100	15,200	15,100	16,100	1.9%
6	2 - Transitional	Between 9th Street and H St	14,600	14,400	14,200	14,200	15,100	15,600	16,100	16,100	15,100	15,200	0.4%
7	2 - Transitional	Between 9th Street and H St	12,200	13,400	13,200	12,300	12,300	13,600	14,000	14,100	14,000	13,700	1.2%
8	2 - Transitional	Between 9th Street and H St	14,000	13,800	12,500	12,500	13,200	13,600	14,000	14,100	13,200	13,300	-0.5%
9	2 - Transitional	Between 9th Street and H St	11,600	12,400	12,200	12,200	12,200	12,800	13,200	13,300	13,200	13,600	1.6%
10	2 - Transitional	Between 9th Street and H St	11,100	10,900	9,900	9,870	10,900	11,300	11,600	11,700	10,800	10,900	-0.2%
AVG	2 - Transitional	-	-	-	-	-	-	-	-	-	-	-	0.3%
11	3 - Waterfront	Between H St and Gloucester St	6,070	5,500	5,430	5,410	5,410	5,710	5,880	5,920	5,870	6,040	0.0%
12	3 - Waterfront	Between Gloucester St and Prince St/Newcastle St	4,950	4,880	4,110	4,100	4,530	4,680	4,570	4,600	4,680	4,720	-0.5%
13	3 - Waterfront	Between Gloucester St and Prince St/Newcastle St	3,800	3,500	3,450	3,100	3,100	3,900	4,060	4,190	4,210	3,880	0.2%
AVG	3 - Waterfront	-	-	-	-	-	-	-	-	-	-	-	-0.1%
14	4 - Community	Between Prince St and 4th Ave	1,370	1,350	1,100	1,100	1,030	1,060	1,290	1,300	1,210	1,220	-1.2%
15	4 - Community	Between Prince St and 4th Ave	1,370	1,180	1,160	1,170	1,170	1,320	1,360	1,460	1,450	1,410	0.3%
16	4 - Community	Between Prince St and 4th Ave	2,040	2,010	2,080	2,070	2,360	2,440	2,510	2,330	2,600	2,620	2.5%
17	4 - Community	Between Prince St and 4th Ave	2,200	2,050	2,020	1,850	1,850	1,940	2,000	2,190	2,170	2,450	1.1%
18	4 - Community	Between 4th Ave and US 17	2,210	2,180	1,720	1,710	1,730	1,790	1,840	1,850	1,960	1,980	-1.1%
19	4 - Community	Between 4th Ave and US 17	2,830	2,860	2,820	2,390	2,390	2,420	2,490	2,510	2,490	2,970	0.5%
20	4 - Community	Between 4th Ave and US 17	3,940	3,880	3,680	3,670	3,860	3,990	4,110	4,470	4,420	4,460	1.2%
AVG	4 - Community	-	-	-	-	-	-	-	-	-	-	-	0.8%

In addition to the historical growth rate calculations along the corridor, we utilized the BATS Regional Travel Demand Model to review growth along the corridor. The summary table on the following page highlights the observed model growth from the corridor between 2015 and 2045. Like the historical ADT data, the table is segment to match the context zones.

Segment ID	Segment Description	Context Area	2015 BATS Model AADT	2045 BATS Model AADT	BATS Model Growth (%)
1	Between I-95 and Glyndale Drive	1 - Commercial	27,150	32,228	0.6%
2	Between I-95 and Glyndale Drive	1 - Commercial	26,339	30,733	0.5%
3	Between Glyndale Drive and GA 303	1 - Commercial	25,653	28,541	0.4%
4	Between Glyndale Drive and GA 303	1 - Commercial	24,773	27,513	0.4%
5	Between Glyndale Drive and GA 303	1 - Commercial	24,774	27,527	0.4%
AVG	Between I-95 and GA 303	1 - Commercial	-	-	0.4%
6	Between GA 303 and Old Jesup Rd	2 - Transitional	18,205	20,880	0.5%
7	Between Old Jesup Rd and 9th St	2 - Transitional	22,311	25,720	0.5%
8	Between Old Jesup Rd and 9th St	2 - Transitional	22,150	25,527	0.5%
9	Between Old Jesup Rd and 9th St	2 - Transitional	22,140	25,431	0.5%
10	Between Old Jesup Rd and 9th St	2 - Transitional	20,261	17,008	-0.6%
11	Between 9th Street and H St	2 - Transitional	21,720	17,297	-0.8%
12	Between 9th Street and H St	2 - Transitional	21,510	17,267	-0.7%
13	Between 9th Street and H St	2 - Transitional	21,284	18,033	-0.6%
14	Between 9th Street and H St	2 - Transitional	19,500	18,815	-0.1%
15	Between 9th Street and H St	2 - Transitional	19,237	18,595	-0.1%
16	Between 9th Street and H St	2 - Transitional	18,168	18,571	0.1%
17	Between 9th Street and H St	2 - Transitional	17,981	18,439	0.1%
18	Between 9th Street and H St	2 - Transitional	17,949	18,409	0.1%
19	Between 9th Street and H St	2 - Transitional	17,786	18,227	0.1%
20	Between 9th Street and H St	2 - Transitional	17,881	18,011	0.0%
21	Between 9th Street and H St	2 - Transitional	17,656	17,737	0.0%
22	Between 9th Street and H St	2 - Transitional	13,358	14,881	0.4%
23	Between 9th Street and H St	2 - Transitional	13,234	14,770	0.4%
24	Between 9th Street and H St	2 - Transitional	13,203	14,474	0.3%
25	Between 9th Street and H St	2 - Transitional	13,022	14,434	0.3%
26	Between 9th Street and H St	2 - Transitional	12,677	13,810	0.3%
27	Between 9th Street and H St	2 - Transitional	12,393	14,075	0.4%
AVG	Between I-95 and GA 303	2 - Transitional	-	-	0.1%
28	Between H St and Gloucester St	3 - Waterfront	8,032	7,012	-0.5%
29	Between H St and Gloucester St	3 - Waterfront	8,015	7,000	-0.5%
30	Between H St and Gloucester St	3 - Waterfront	7,530	6,821	-0.3%
31	Between H St and Gloucester St	3 - Waterfront	7,517	6,770	-0.3%
32	Between H St and Gloucester St	3 - Waterfront	7,521	6,783	-0.3%
33	Between H St and Gloucester St	3 - Waterfront	7,384	6,579	-0.4%
34	Between H St and Gloucester St	3 - Waterfront	6,552	6,383	-0.1%
AVG	Between I-95 and GA 303	3 - Waterfront	-	-	-0.3%
35	Between Gloucester St and Prince St/Newcastle St	4 - Community	2,752	2,558	-0.2%
36	Between Gloucester St and Prince St/Newcastle St	4 - Community	2,228	2,054	-0.3%
37	Between Gloucester St and Prince St/Newcastle St	4 - Community	1,019	1,373	1.0%
38	Between Gloucester St and Prince St/Newcastle St	4 - Community	1,160	1,446	0.7%
39	Between Gloucester St and Prince St/Newcastle St	4 - Community	946	1,231	0.9%
40	Between Gloucester St and Prince St/Newcastle St	4 - Community	944	1,228	0.9%
41	Between Prince St and 4th Ave	4 - Community	3,924	4,214	0.2%
42	Between Prince St and 4th Ave	4 - Community	3,883	4,149	0.2%
43	Between Prince St and 4th Ave	4 - Community	3,354	3,850	0.5%
44	Between 4th Ave and US 17	4 - Community	1,769	2,467	1.1%
45	Between 4th Ave and US 17	4 - Community	2,129	2,799	0.9%
46	Between 4th Ave and US 17	4 - Community	2,619	3,405	0.9%
47	Between 4th Ave and US 17	4 - Community	3,243	4,220	0.9%
48	Between 4th Ave and US 17	4 - Community	6,325	8,132	0.8%
49	Between 4th Ave and US 17	4 - Community	6,828	8,665	0.8%
AVG	Between I-95 and GA 303	4 - Community	-	-	0.6%

The table below summarizes the growth rates for each of the corridor context zones and by each method studied. In addition, the recommended growth rate for each corridor context zone is also indicated. These growth rates are also shown on the graphic below by context zone. The growth rate will be utilized to grow the collected and calibrated traffic volumes to the horizon years studied in this corridor study. 2025 and 2035 were chosen as the interim and future year horizons for the study. These were based on discussions with GDOT, BATS and community stakeholders.

Context Area	GDOT Historic Growth (%)	BATS Model Growth (%)	Chosen Growth Rate (%)
1 - Commercial	2.4%	0.4%	1.5%
2 - Transition	0.3%	0.1%	1.0%
3 - Waterfront	-0.1%	-0.3%	1.0%
4 - Community	0.8%	0.6%	1.0%



While the growth rate for the Commercial zone is lower than what the historical traffic volume growth indicated. It is important to understand that the 2025 and 2035 horizon years will have a compounded growth of 1.5% per year. The 2.4% is based on an average of 10 years. The compound each year approach utilized results in a higher growth rate over the same 10-year period.

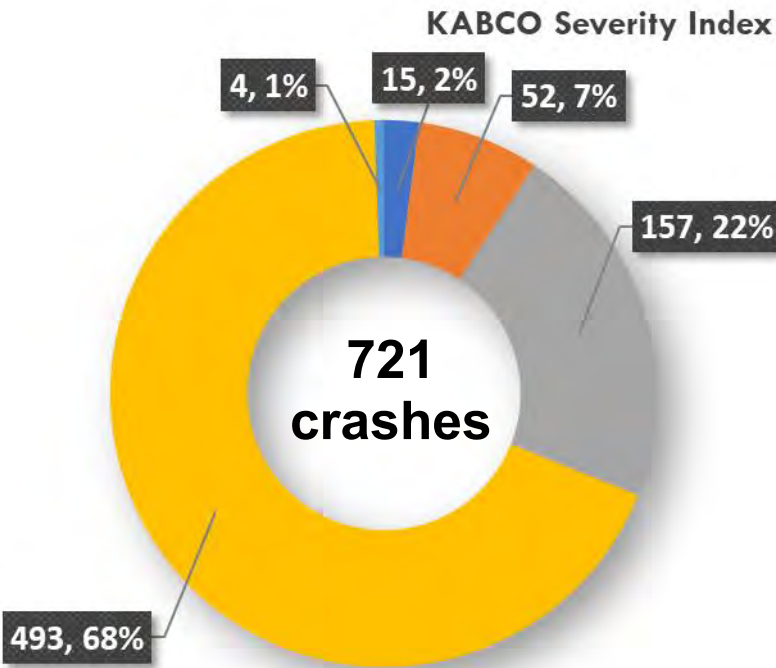
It was also determined to utilize a higher growth rate for the other three (3) context zones to account for increased commercial growth in the corridor associated with the port, development of the marina, and activity in downtown Brunswick.

As such, this approach should be considered conservative in nature.

Traffic Safety

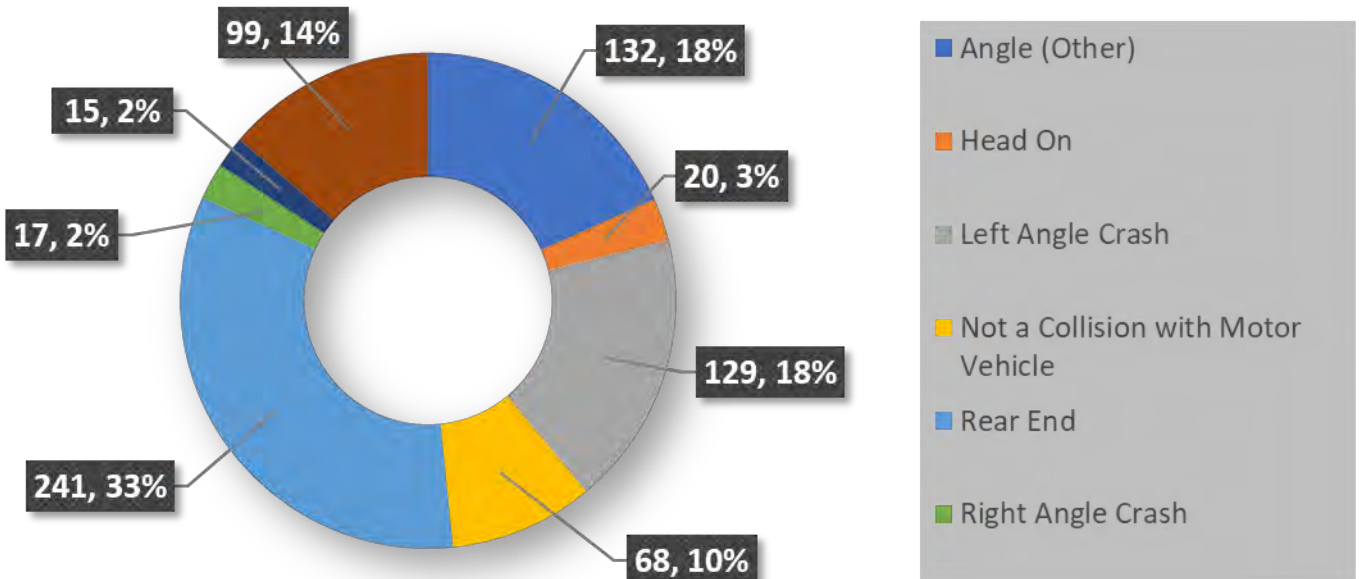
The Georgia Department of Transportation keeps records of crashes that occur on state-maintained roadways, with every crash being classified by the worst injury occurring as a result of the incident type. GDOT uses the “KABCO” injury scale developed by the National Safety Council (NSC). The KABCO elements include the following classifying injuries as indicated in the table below.

Type	Description
Fatality (K)	Death occurring within twelve months of the crash
Disabling Injury (A)	Visible injury: driver or passengers incapacitated or severely injured.
Non-incapacitating injury (B)	Visible injury, but those involved in the crash complain of pain or momentary unconsciousness
Possible Injury (C)	No visible injury, no complaints of pain or unconsciousness.
No Injury (0)	No injury; property damage only



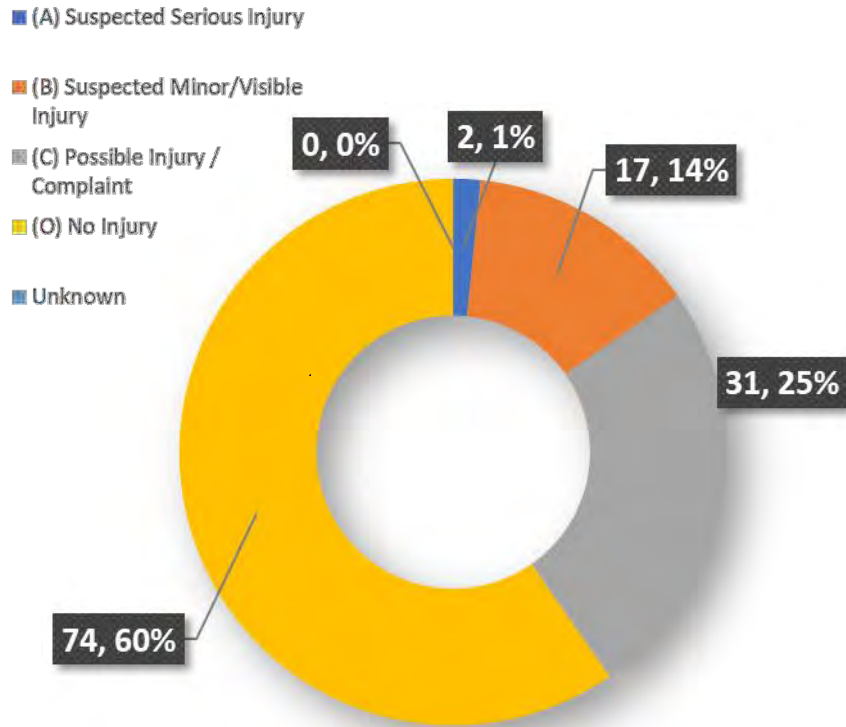
The frequency of each incident type was plotted to determine the crash types that are present throughout the entirety of the corridor. The crash types observed, and their frequencies are displayed in the graphic below.

Manner of Collision



The crashes along the corridor depict the corridor in its entirety. However, there is a need to examine critical intersections within the corridor to determine intersection specific improvements or mitigation factors associated with the prevailing crash types present. Key intersections within the corridor are summarized on the following pages.

SR 27/US 25/341 (New Jessup Highway) at Glyndale Circle



Summary

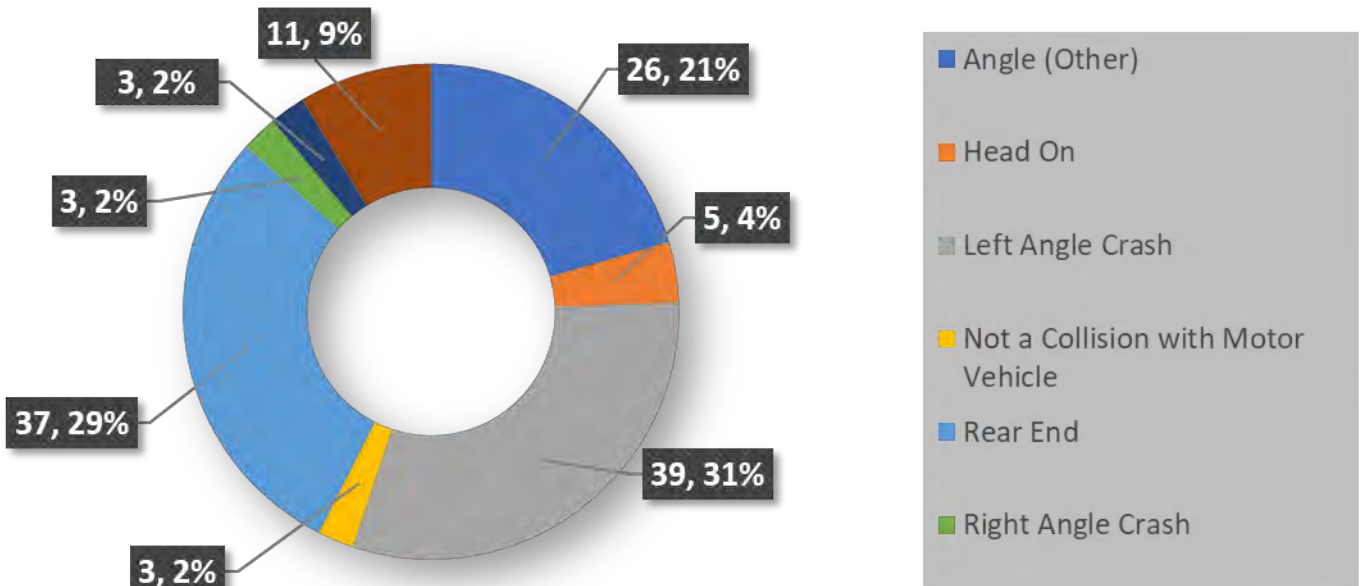
124 Total crashes

- majority on SR 27

Predominant crash types

1. Left Angle
2. Rear End
3. Angle

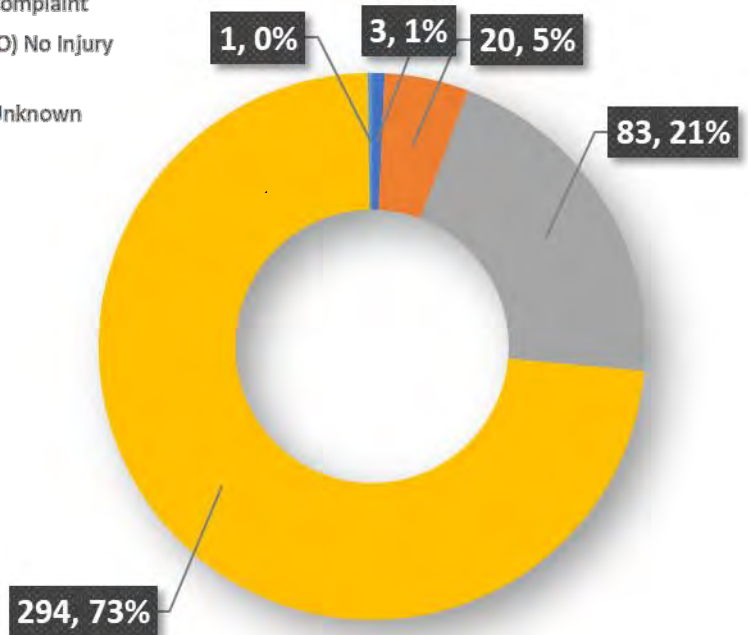
Manner of Collision



SR 27/US 25/341 (New Jessup Highway) at GA 303 (Blythe Island Road)/Community Road



- (A) Suspected Serious Injury
- (B) Suspected Minor/Visible Injury
- (C) Possible Injury / Complaint
- (O) No Injury
- Unknown



Summary

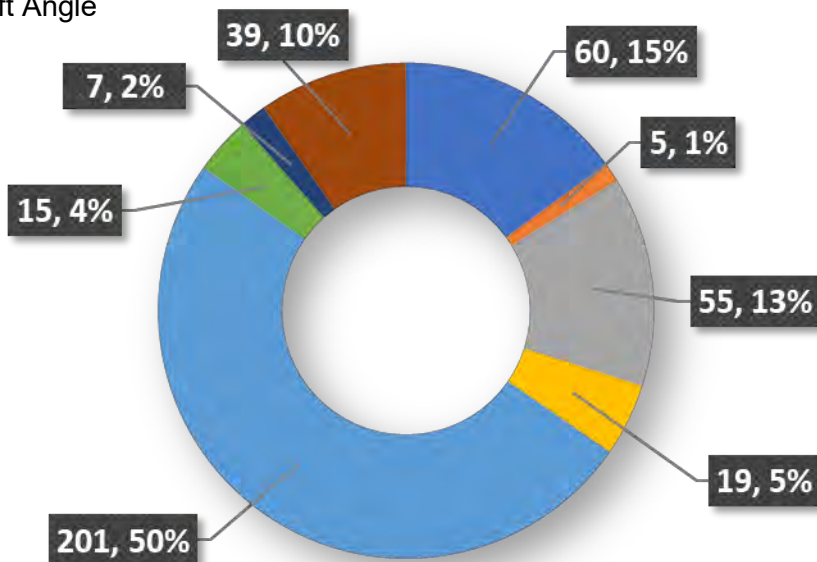
401 Total crashes

- 55% of corridor crashes occur at this intersection
- 152 crashes at intersection
- 99 crashes on Blythe Island at Railroad and Old Jessup Road
- 54 crashes on the NB approach to signal

Predominant crash types

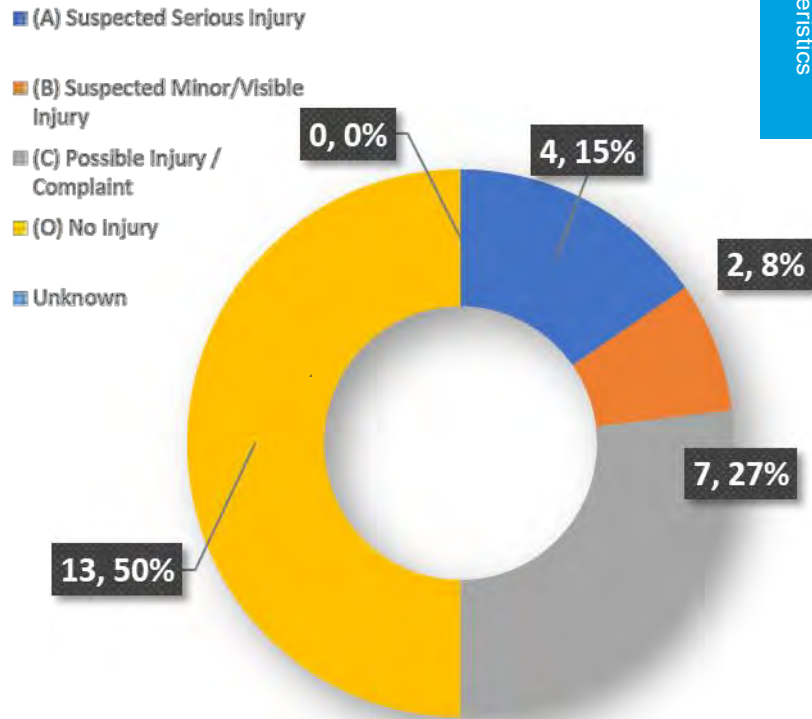
1. Rear End
2. Angle
3. Left Angle

Manner of Collision



- Angle (Other)
- Head On
- Left Angle Crash
- Not a Collision with Motor Vehicle
- Rear End
- Right Angle Crash

SR 27/US 25/341 (Newcastle Street) at 4th Street



Summary

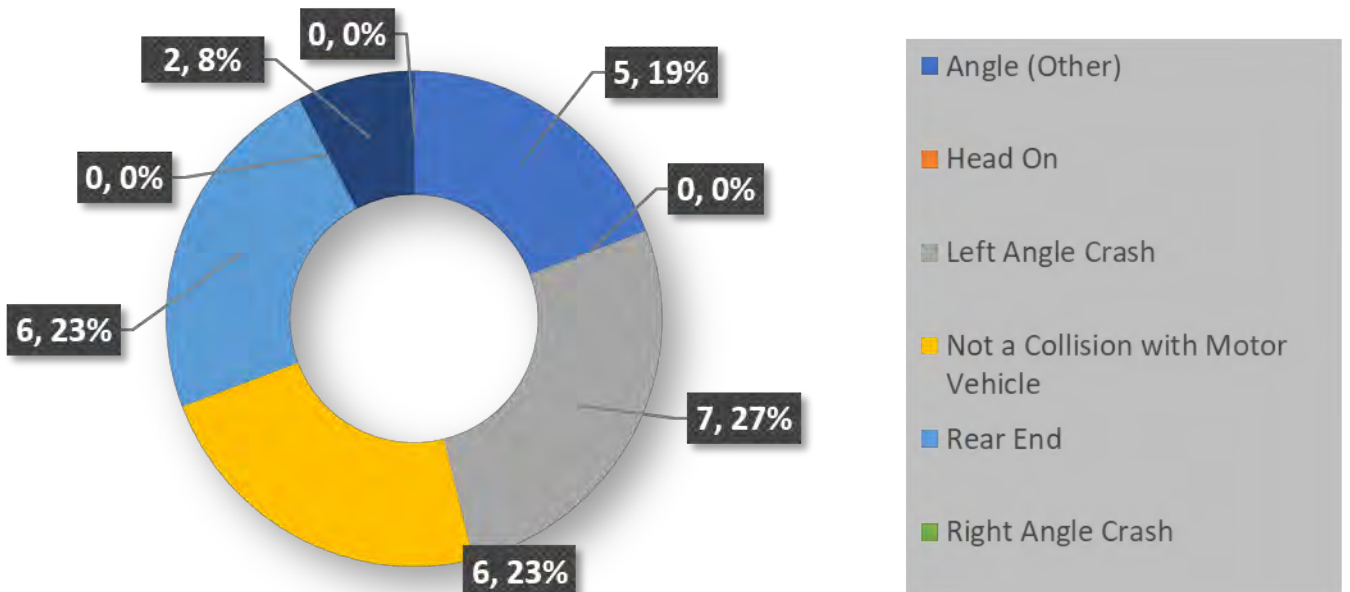
24 Total crashes

- Entrance to Selden Park
- Unsignalized intersection
- Adjacent to railroad

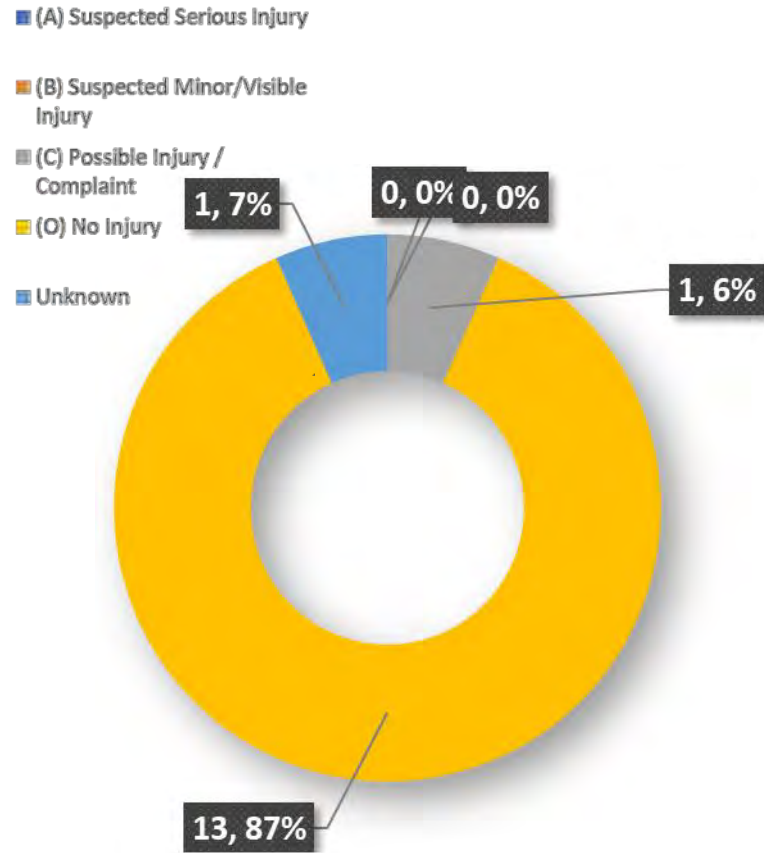
Predominant crash types

1. Left Angle
2. Rear End
3. Other

Manner of Collision



SR 27/US 25/341 (Newcastle Street) at SR 17/US 25/341 (Bay Street)



Summary

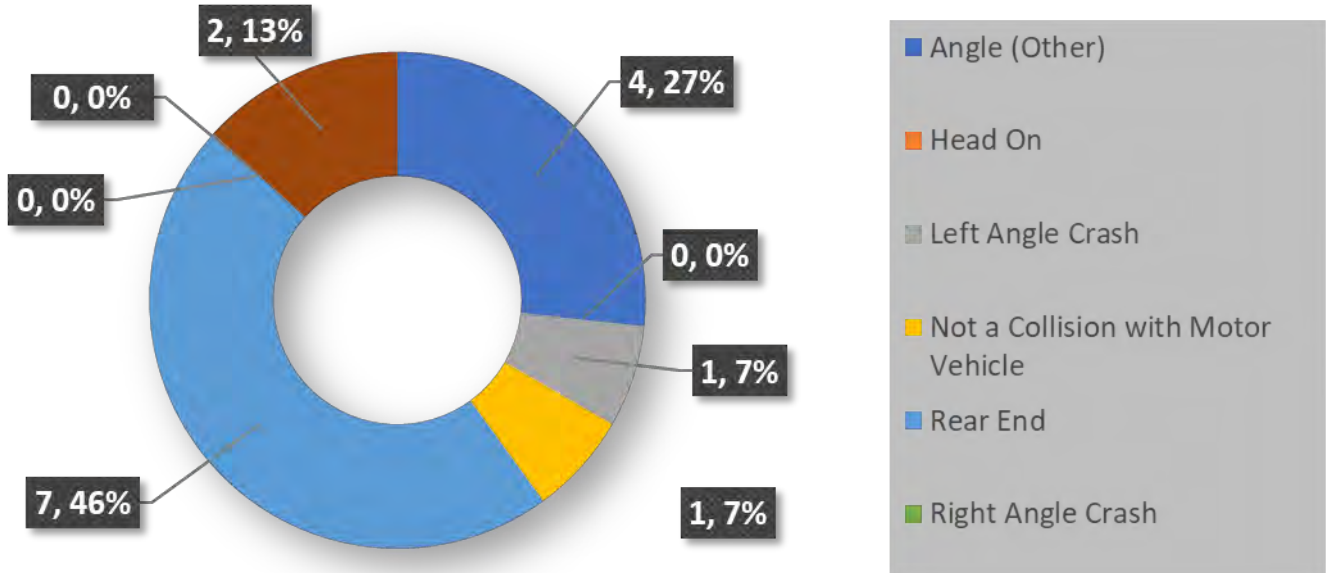
15 Total crashes

- 4 crashes at intersection
- Unsignalized intersection
- Transition point into downtown

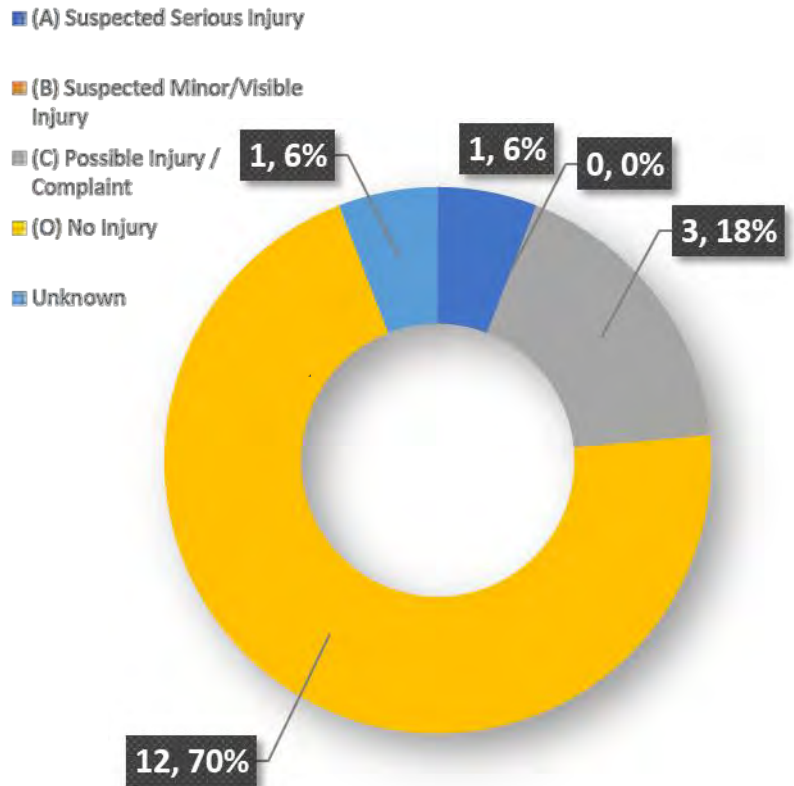
Predominant crash types

1. Rear End
2. Angle

Manner of Collision



SR 27/US 25/341 (Bay Street) through to Gloucester Street



Summary

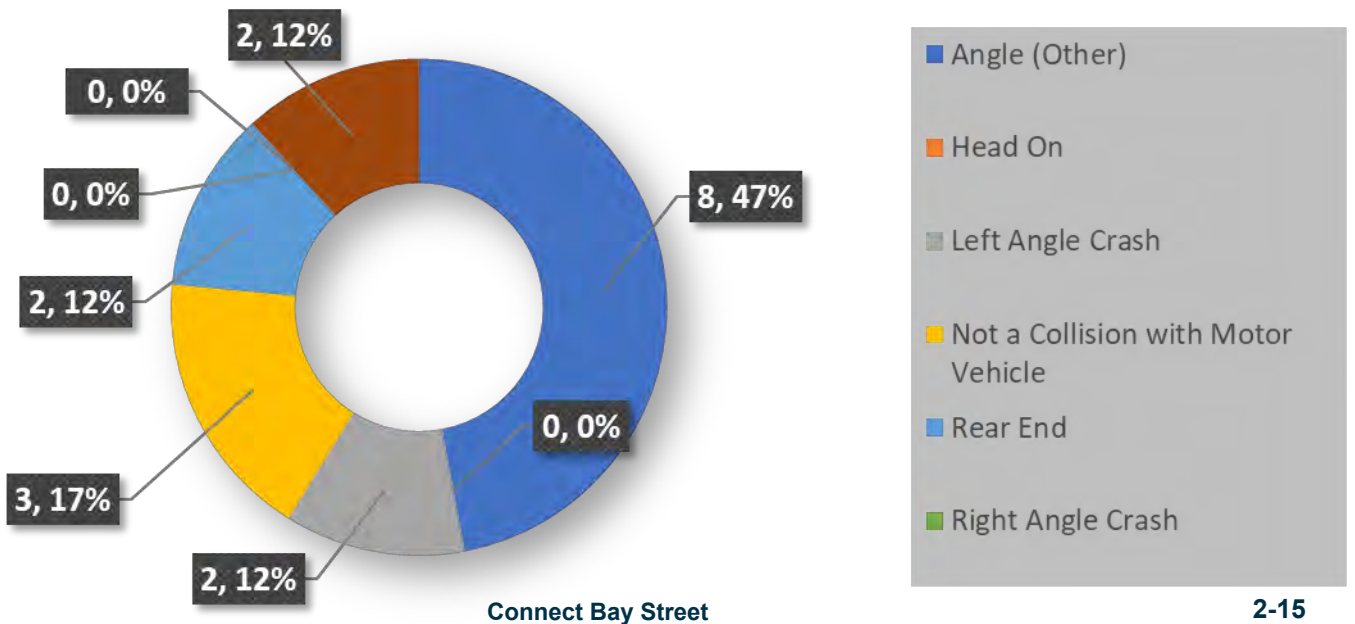
17 Total crashes

- 9 crashes at Gloucester
- Unsignalized intersection
- Transition point into downtown

Predominant crash types

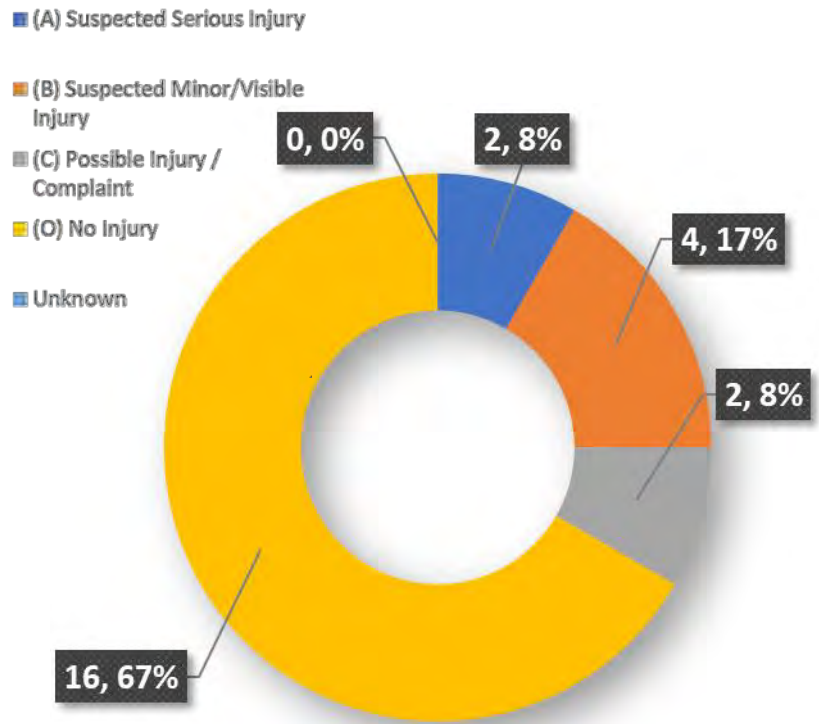
1. Angle
2. Other Collision

Manner of Collision



Connect Bay Street

US 17 (Glynn Avenue) at 4th Avenue



Summary

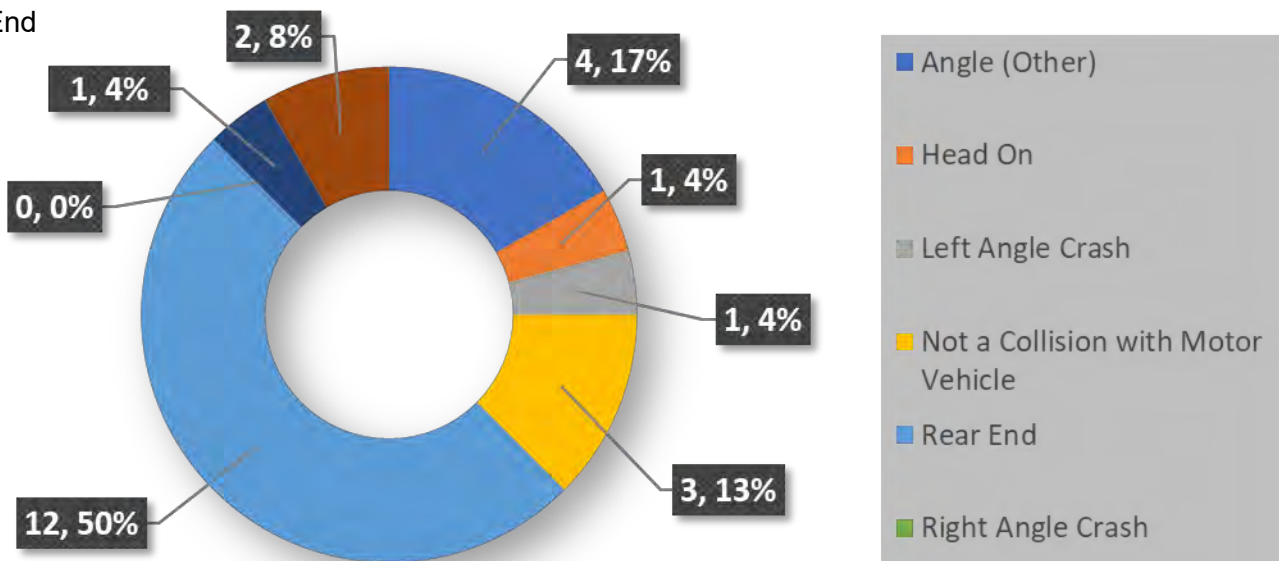
24 Total crashes

- 5 crashes on EB approach
- 6 crashes at EB left and NB thru merge

Predominant crash types

1. Rear End
2. Angle

Manner of Collision



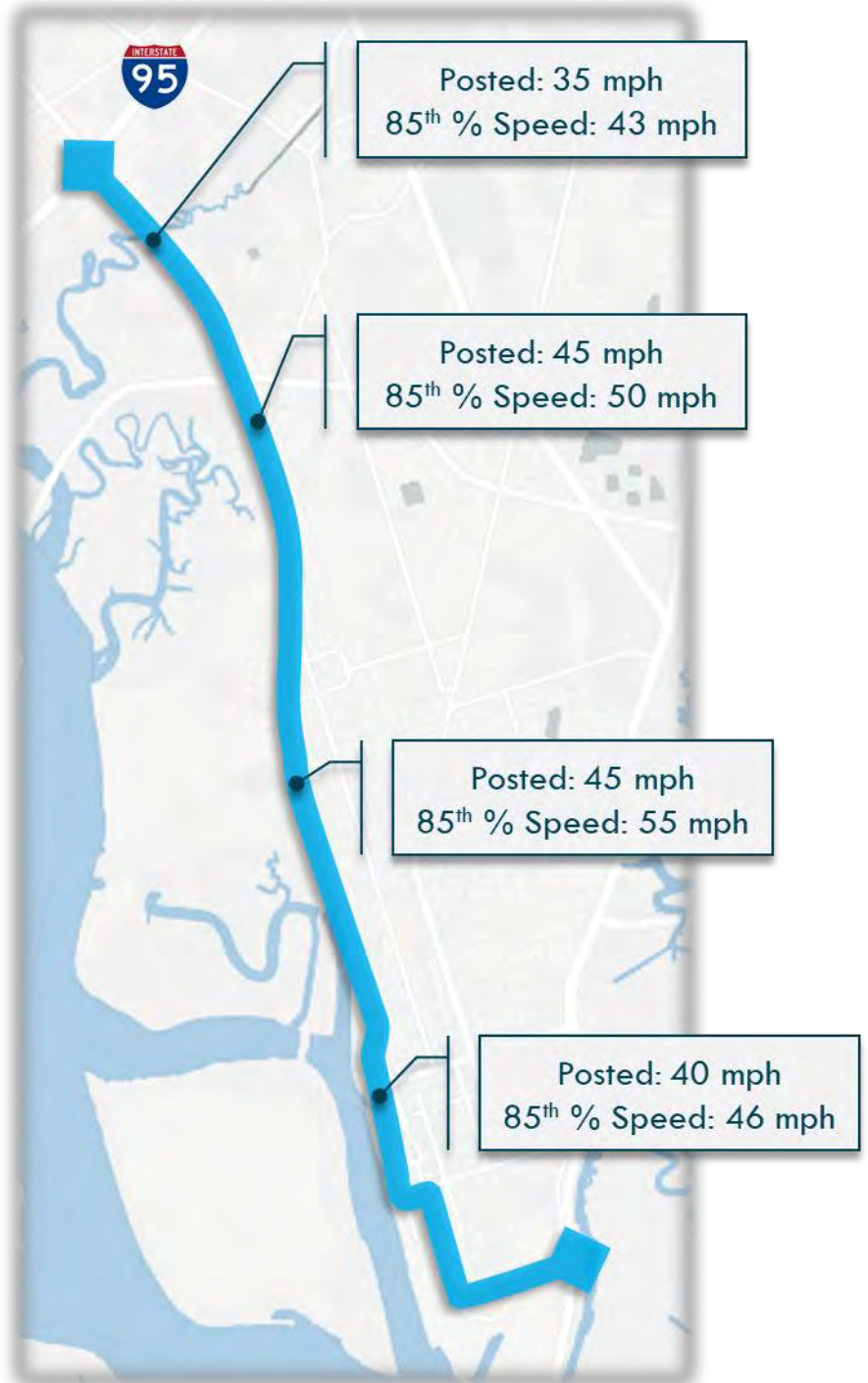
Corridor Speeds

The Bay Street corridor is 7.3 miles in length. From the north at Exit 36 through downtown to US 17, there are only three signals along the corridor. The highest concentration of signals is adjacent to Exit 36. The southern most traffic signal occurs at the intersection of SR 27/US 25/341 at GA 303 (Blythe Island Road). South of the signal at Blythe Island Road it is approximately 3.6 miles before a change in the roadway geometry occurs significant enough that it causes a change in speeds. This point is at the intersection of Bay Street and Newcastle Street.

The graphic to the right depicts the posted speeds and the observed speeds along the corridor.

South of the Blythe Island signal, the corridor traverse through the transitional zone between the Commercial zone and the Waterfront zone. Through this section there are major land uses including Brunswick Cellulose and Selden Park. Because of this long section of uninterrupted flow, speeds along through this section trend higher than the posted speed limits. 85th percentile speeds through this section are 10 mph over the posted speed limit.

The increase in speed can increase the severity of crashes that occur as well as intimidate other more vulnerable road users or those try to cross over SR 27/US 25/341. As in the case of pedestrians and bicycles at 4th Street to Selden Park.



Truck Volumes

As discussed previously, the Bay Street corridor is a GRIP corridor and designated freight route. The corridors connectivity to land uses that are frequented by freight vehicles (Brunswick Cellulose, Rich's Products, King & Prince Seafood, Mayor's Point terminal), leads to a higher than normal heavy vehicle presence in the corridor. This increase in heavy traffic on the corridor has several impacts on the operations and needs for the corridor.

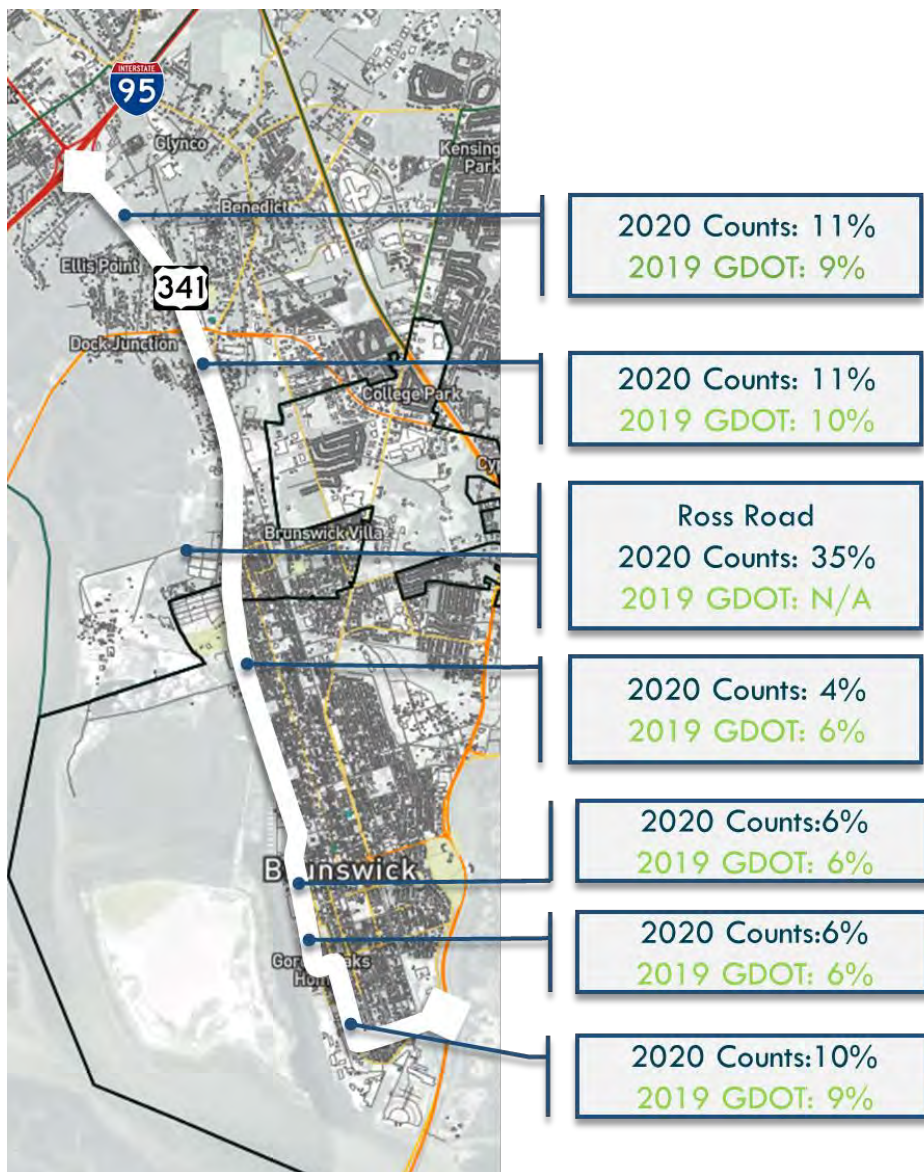
Like all street design efforts, designing for truck movements is completed on a case-by-case basis. In general, providing for truck movements through the City's various industrial, commercial, and residential districts follows certain principles for different urban environments. For example, because freight corridors like SR 27/US 25/341 accommodate a high volume of trucks, it is important that the corridor provide lane widths, turning radii, and other street features that can accommodate trucks without impeding their access and ability to maneuver.

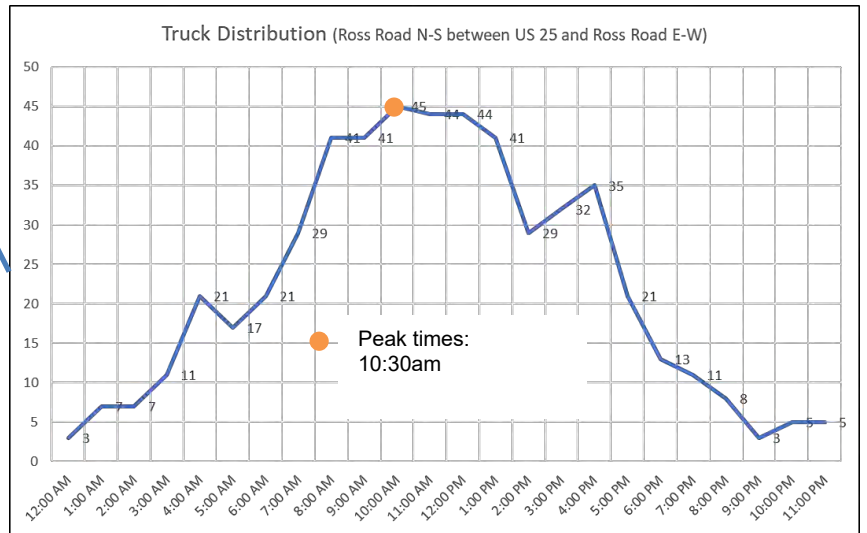
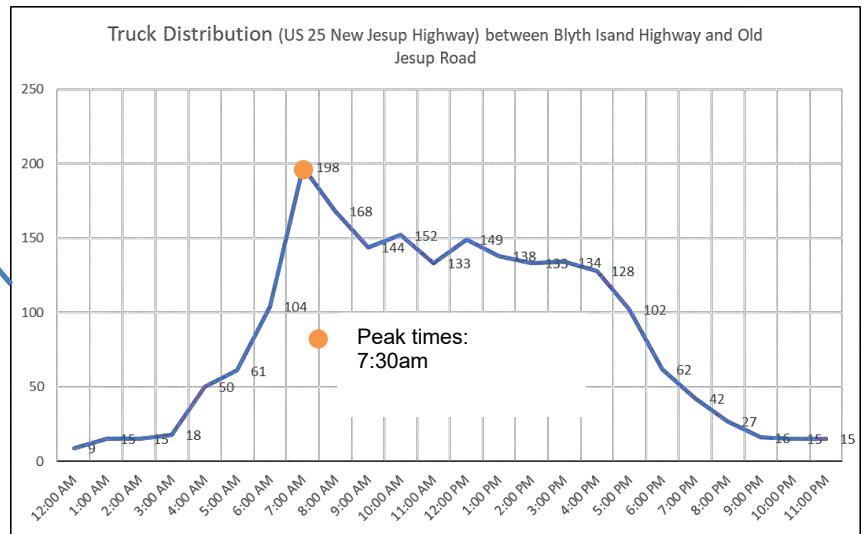
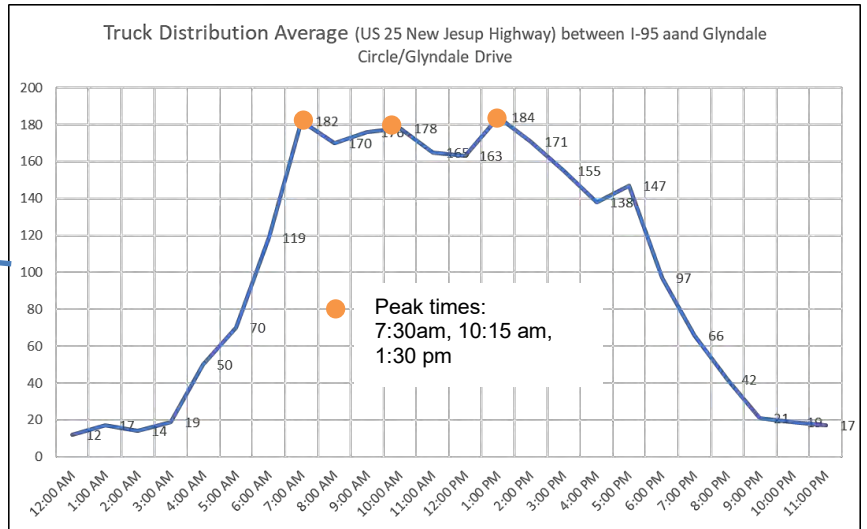
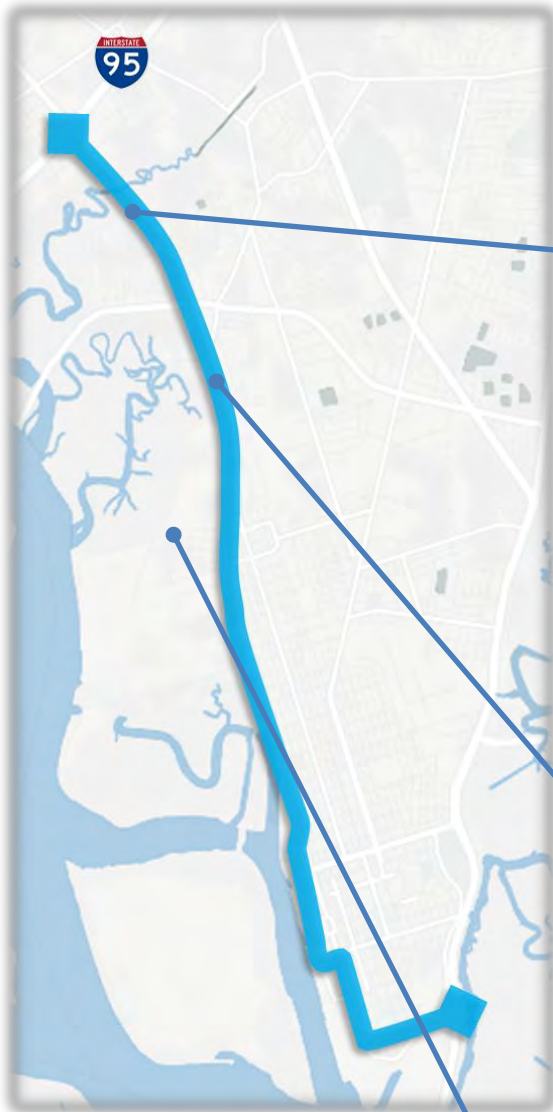
Freight is the physical manifestation of the economy. The effective and efficient movement of goods supports a vast network of commercial and industrial activities that help create vibrant communities and millions of jobs. Freight delivers food and many of life's other necessities. The United States Department of Transportation (USDOT) estimates that the transportation system moves over 54 million tons of goods — worth nearly \$48 billion — each day, or almost 63 tons of freight per person per year. Freight tonnage is forecasted to increase 45 percent by 2040.¹ Many economic activities rely on "just in time" supply chain management; thus any disruptions in freight systems can have an immediate ripple effect through the economy.

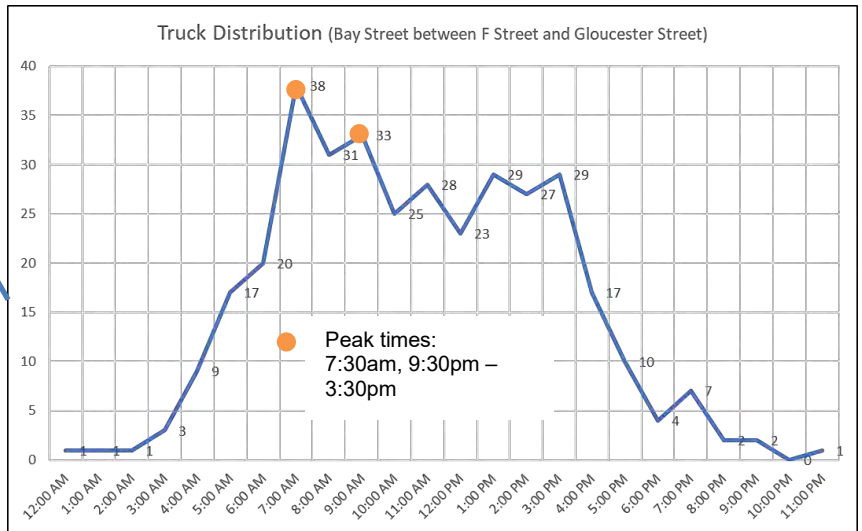
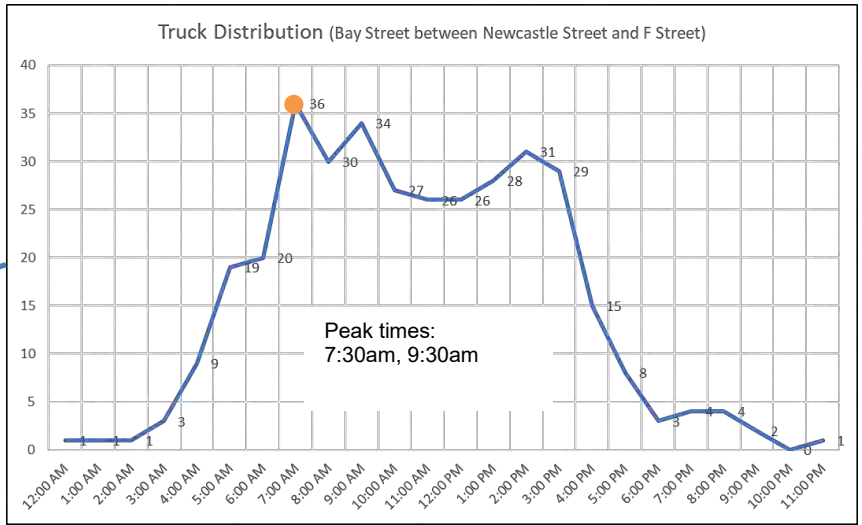
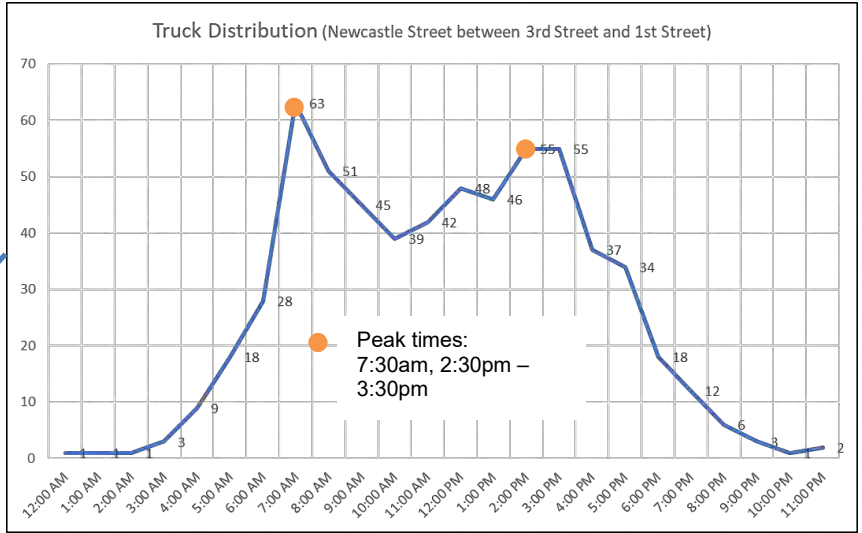
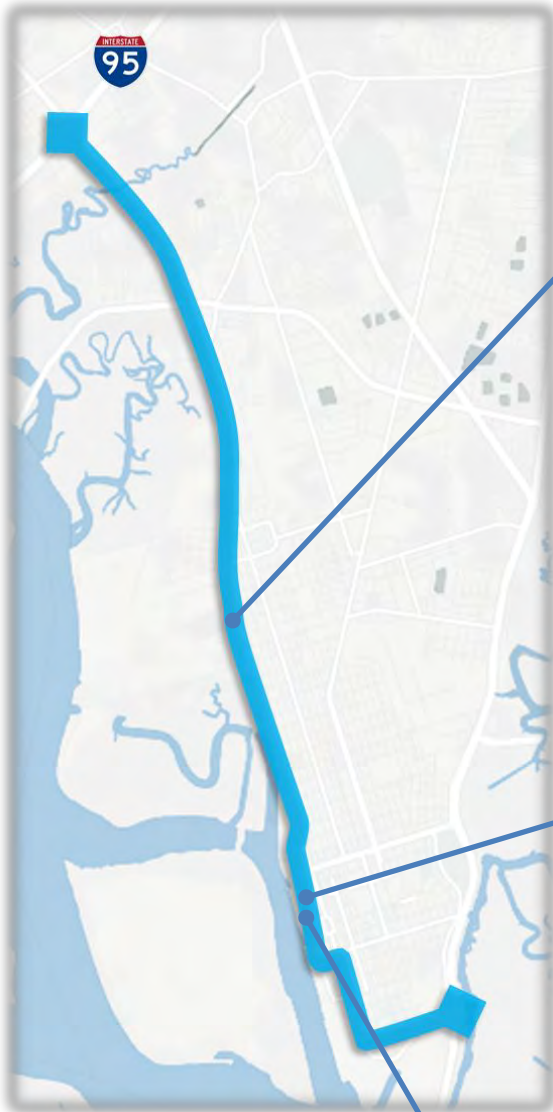
While freight growth is an indicator of a strong economy, care must be taken to mitigate negative externalities that can impact our communities. Current methods of freight movement impact the sustainability of communities that have freight intensive uses or facilities. Freight movement contributes to noise, congestion and air pollution. Communities must support freight movement, while taking steps to support policies and design forms which attempt to harmonize the movement of freight within the natural and built environment.

The following pages provide an overview of freight movements along the Bay Street corridor including heavy vehicle percentages along the corridor and hourly distributions of heavy vehicles. This information is instrumental in understanding the complexity of the corridor as well as future enhancements to the corridor.

The graphic to the right depicts the observed 2020 heavy vehicle percentages along the corridor as compared to the 2019 GDOT observed heavy vehicle percentages. As shown, the heavy vehicle percentages increased or stayed the same along the corridor for much of the corridor.







Turning Movement Volumes

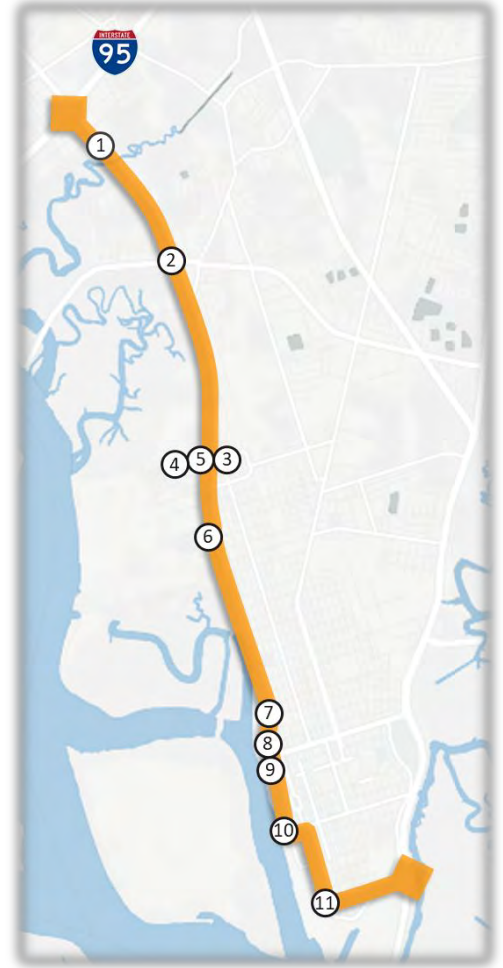
The base data utilized to analyze the performance of both signalized and unsignalized intersections are turning movement counts. These counts depict where traffic travels once it enters an intersection. For example, does traffic traveling south on SR 27/US 25/341 continue through the intersection of Blythe Island Highway or turn left or turn right? Turning movement counts provide insight into the movements which in turn can be utilized to understand the overall intersection operations, approach and individual movement operations, and the resulting queuing at that intersection.

Eleven (11) key intersections were analyzed as a part of the Bay Street Corridor Study. These intersections represent the strategic intersections within the corridor and the basis for future recommendations. The study area for the Bay Street corridor is shown to the right.

Key intersections include the following:

1. New Jessup Highway at Glyndale Circle/Glyndale Drive
2. New Jessup Highway at Blythe Island Highway/Community Road
3. Newcastle Street at 9th Street
4. Ross Road at 9th Street
5. Norwich Street at 9th Street
6. Newcastle Street at 4th Street
7. Newcastle Street at Bay Street
8. Bay Street at F Street
9. Bay Street at Gloucester Street
10. Bay Street at Prince Street
11. Newcastle at 4th Avenue

The following pages depict the operations performance for the key intersections



Capacity Analysis

Capacity analyses were performed for the AM and PM peak hours using the Synchro Version 10 software to determine the operating characteristics at the signalized and stop-controlled intersections of the adjacent street network and to evaluate the impacts of the proposed development. Capacity is defined as the maximum number of vehicles that can pass over a particular road segment, or through a particular intersection, within a specified period of time under prevailing operational, geometric and controlling conditions within a set time duration.

The *Highway Capacity Manual* (HCM) defines level of service (LOS) as a “quantitative stratification of a performance measure or measures representing quality of service” and is used to “translate complex numerical performance results into a simple A-F system representative of travelers’ perceptions of the quality of service provided by a facility or service”. The HCM defines six levels of service, LOS A through LOS F, with A having the best operating conditions from the traveler’s perspective and F having the worst. However, it must be understood that “the LOS letter result hides much of the complexity of facility performance”, and that “the appropriate LOS for a given system element in the community is a decision for local policy makers”. According to the HCM, “for cost, environmental impact, and other reasons, roadways are typically designed not to provide LOS A conditions during peak periods but instead to provide some lower LOS that balances individual travelers’ desires against society’s desires and financial resources. Nevertheless, during low-volume periods of the day, a system element may operate at LOS A.”

LOS for a two-way stop-controlled (TWSC) intersection is determined by the control delay at the side-street approaches, typically during the highest volume periods of the day, the AM and PM peak periods. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. With respect to field measurements, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. It is typical for stop sign-controlled side streets and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. The majority of the traffic moving through the intersection on the major street experiences little or no delay.

LOS for signalized intersections is reported for the intersection as a whole, also typically during the highest volume periods of the day, the AM and PM peak periods. One or more movements at an intersection may experience a low level-of-service, while the intersection as a whole may operate acceptably.

LOS for roundabout intersections is also reported for the intersection as a whole but uses the same control delay thresholds as the unsignalized intersections. However, if the volume-to-capacity ratio on an approach of the intersection is greater than 1.0, that approach or intersection is reported as LOS F regardless of the reported control delay.

Table 6.0-A and **6.0-B** list the LOS control delay thresholds published in the HCM for unsignalized and signalized intersections, respectively, as well as the unsignalized operational descriptions assumed herein.

Table 6.0-A Level-of-Service Control Delay Thresholds for Unsignalized Intersections			Table 6.0-B Level-of-Service Control Delay Thresholds for Signalized Intersections	
Level-of-Service	Average Control Delay per Vehicle [sec/veh]		Level-of-Service	Control Delay per Vehicle [sec/veh]
A	≤ 10		A	≤ 10
B	> 10 – 15		B	> 10 – 20
C	> 15 – 25		C	> 20 – 35
D	> 25 – 35		D	> 35 – 55
E	> 35 – 50		E	> 55 – 80
F	> 50		F	> 80
		Short Delays		
		Moderate Delays		
		Long Delays		

2020 Existing Conditions													
New Jesup Highway at Glyndale Circle													
AM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
2020 Existing	LOS (Delay)	D (52.1)			E (56.2)			B (15.3)			B (18.3)		C (22.6)
	Synchro 95th Q	82'	27'	102'	30'	0'	18'	132'	0'	67'	333'	0'	
PM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
2020 Existing	LOS (Delay)	D (45.7)			D (52.8)			C (22.2)			B (19.6)		C (26.2)
	Synchro 95th Q	44'	38'	131'	55'	68'	32'	295'	0'	96'	182'	0'	
New Jesup Highway at Blythe Island Highway/Community Road													
AM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL		SBTR	Intersection	
2020 Existing	LOS (Delay)	E (72.8)			D (49.3)			D (41.2)		D (51.1)		D (52.8)	
	Synchro 95th Q	91'	#553	#145	167'	34'	52'	201'	#372	#595'	N/A		
PM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL		SBTR	Intersection	
2020 Existing	LOS (Delay)	E (55.7)			E (67.4)			E (64.9)		D (53.0)		E (61.1)	
	Synchro 95th Q	#171	312'	82'	#584	170'	124'	394'	#348	310'	N/A		
Newcastle Street at 9th Street													
AM Peak Hour		EBLTR		WBLTR			NBL	NBTR	SBLTR				
2020 Existing	LOS (Delay)	-		F (1356.4)			A (0.6)		A (0.7)				
	Synchro 95th Q	-		373'			5'	0'	3'				
PM Peak Hour		EBLTR		WBLTR			NBL	NBTR	SBLTR				
2020 Existing	LOS (Delay)	F (188)		F (432.9)			A (0.1)		A (1.6)				
	Synchro 95th Q	120'		258'			0'	0'	8'				
Ross Road at 9th Street													
AM Peak Hour		EBLTR		WBLTR			NBLTR		SBLTR				
2020 Existing	LOS (Delay)	B (10.8)		B (10.3)			A (1.3)		A (0.4)				
	Synchro 95th Q	3'		5'			0'		0'				
PM Peak Hour		EBLTR		WBLTR			NBLTR		SBLTR				
2020 Existing	LOS (Delay)	B (10.7)		B (11.0)			A (0.3)		A (0.6)				
	Synchro 95th Q	5'		5'			0'		0'				
Norwich Street at 9th Street													
AM Peak Hour		EBLTR		WBLTR			NBL	NBTR	SBLTR				
2020 Existing	LOS (Delay)	B (12.7)		B (13.4)			A (1.3)		A (1.1)				
	Synchro 95th Q	13'		15'			3'	0'	3'				
PM Peak Hour		EBLTR		WBLTR			NBL	NBTR	SBLTR				
2020 Existing	LOS (Delay)	B (13.0)		C (18.2)			A (0.6)		A (2.3)				
	Synchro 95th Q	15'		33'			3'	0'	5'				
Newcastle Street at 4th Street													
AM Peak Hour		EBLTR		WBLTR			NBL	NBT	NBR	SBL	SBTR		
2020 Existing	LOS (Delay)	F (148.3)		F (120.5)			A (0.3)			A (0.9)			
	Synchro 95th Q	73'		103'			3'	0'	0'	13'	0'		
PM Peak Hour		EBLTR		WBLTR			NBL	NBT	NBR	SBL	SBTR		
2020 Existing	LOS (Delay)	E (47.2)		F (155.8)			A (0.2)			A (0.9)			
	Synchro 95th Q	33'		180'			3'	0'	0'	5'	0'		

Newcastle Street at Bay Street									
AM Peak Hour		EBL	EBR	WBLTR		NBL	NBT	SBT	SBR
2020 Existing	LOS (Delay)	B (14.8)		-		A (0.0)		A (0.0)	
	Synchro 95th Q	48'	3'	-		0'	0'	0'	0'
PM Peak Hour		EBL	EBR	WBLTR		NBL	NBT	SBT	SBR
2020 Existing	LOS (Delay)	C (17.6)		-		A (0.0)		A (0.0)	
	Synchro 95th Q	90'	0'	-		0'	0'	0'	0'
Bay Street at F Street									
AM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBL	SBTR
2020 Existing	LOS (Delay)	B (14.8)		B (13.3)		A (0.7)		A (0.2)	
	Synchro 95th Q	5'		3'		3'	0'	0'	0'
PM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBL	SBTR
2020 Existing	LOS (Delay)	B (13.9)		B (13.5)		A (0.4)		A (0.1)	
	Synchro 95th Q	15'		5'		3'	0'	0'	0'
Bay Street at Gloucester Street									
AM Peak Hour		EBL	EBTR	WBLTR		NBL	NBTR	SBL	SBTR
2020 Existing	LOS (Delay)	C (15.0)		B (13.4)		A (0.2)		A (1.3)	
	Synchro 95th Q	3'	3'	18'		0'	0'	5'	0'
PM Peak Hour		EBL	EBTR	WBLTR		NBL	NBTR	SBL	SBTR
2020 Existing	LOS (Delay)	B (13.6)		B (14.7)		A (0.3)		A (1.8)	
	Synchro 95th Q	8'	5'	23'		0'	0'	5'	0'
Bay Street at Prince Street									
AM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBL	SBTR
2020 Existing	LOS (Delay)	A (0.0)		A (9.8)		A (0.0)		A (3.1)	
	Synchro 95th Q	0'		10'		0'	0'	10'	0'
PM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBL	SBTR
2020 Existing	LOS (Delay)	B (14.1)		A (9.9)		A (0.1)		A (2.6)	
	Synchro 95th Q	3'		15'		0'	0'	5'	0'
Newcastle Street at 4th Avenue									
AM Peak Hour		EBLTR		WBLT	WBR	NBLT	NBR	SBL	SBTR
2020 Existing	LOS (Delay)	B (12.9)		B (14.5)		A (3.2)		A (5.1)	
	Synchro 95th Q	8'		20'	0'	0'	0'	8'	0'
PM Peak Hour		EBLTR		WBLT	WBR	NBLT	NBR	SBL	SBTR
2020 Existing	LOS (Delay)	B (12.3)		B (12.3)		A (0.0)		A (5.6)	
	Synchro 95th Q	8'		0'		0'	0'	5'	0'

The results of the existing conditions analysis indicate that the majority to intersections within the study area operate at an acceptable level of service in the AM and PM peak hours for the 2020 horizon year. The intersections that show a significant drop in LOS are briefly discussed below.

The intersection of New Jessup Highway at Glyndale Circle currently operates at LOS C in the AM and PM peak hours. The WB approach is the only current approach that operates at LOS E in the AM peak hour. No significant queuing is present in the AM or PM peak hours.

The intersection of New Jessup Highway at Blythe Island Highway/Community Road currently operates at LOS D in the AM peak hour and LOS E in the PM peak hours. The EB through/Right movement has an AM queue of over 550 feet and a PM peak hour queue of 312 ft. The EB approach is currently operating at LOS E in the AM and PM peak hours. In the PM peak hour, the WB and NB approaches are also at LOS E.

Newcastle at 9th Street is an unsignalized intersection that is operating with an WB and EB approaches at LOS F in the AM and PM peaks hours for the 2020 horizon year. The WB approach in the AM peak hour experience significant peak hour delays of 1,356 seconds. In the PM peak hour, the WB approach has delays approximately 430 seconds in length.

The intersection of Newcastle Street at 4th Street is currently operating with side street delay in the AM and PM peak hours. The EB approach delay is 148 seconds in the AM and 48 seconds in the PM peak hour. The WB approach is 120 seconds in the AM peak hour and 155 seconds in the PM peak hour.

In addition to the intersection analysis, corridor capacity analysis was performed for the four context zones described previously. This capacity analysis is based on the industry standards and available public data. The foundation of the model analysis is based upon an evaluation of current average daily traffic volumes collected as a part of this corridor study and those provided by GDOT.

The analysis utilizes factors along the segments including but not limited to the presence of traffic signals, turn lanes, number of lanes, speed limits, presence of medians and the projected capacity of the corridor. This information is used along with the desired LOS for the corridor, for this analysis LOS D was utilized, to calculate the % capacity used and remaining capacity. This along with the intersection LOS provides a sound overview of the corridor's operations.

2020 Existing Segment Capacity Summary										
Context Area	Segment	Posted Speed Limit	Number of Lanes	Median Configuration	AADT Estimate	Level of Service Standard	Base Capacity (vehicles per day)	Adjusted Capacity (vehicles per day)	% Capacity Used	% Capacity Remaining
1 - Commercial	Between I-95 and Glyndale Drive	35	6	D	23,200	D	50,000	52,500	44%	56%
	Between Glyndale Drive and GA 303	45	4	U	23,200	D	39,800	37,800	61%	39%
2 - Transitional	Between GA 303 and 9th Street	45	4	U	23,100	D	39,800	37,800	61%	39%
	Between 9th Street and H Street	45	4	U	15,200	D	39,800	37,800	40%	60%
3 - Waterfront	Between H Street and Gloucester Street	40	4	D	6,040	D	32,400	32,400	19%	81%
	Between Gloucester Street and Prince Street	40	4	D	3,880	D	32,400	32,400	12%	88%
4 - Commercial	Between Prince Street and 4th Avenue	35	2	U	2,620	D	14,800	11,800	22%	78%
	Between 4th Avenue and US 17	35	4	U	4,460	D	32,400	24,300	18%	82%

As shown above for the individual context zones, the Commercial and the initial segment of the transitional segment are at approximately 60% capacity. The other remaining segments are well below 40% capacity utilized.

The capacity analysis for the 2025 Horizon Year is shown on the following pages.

2025 Horizon Year Conditions														
New Jesup Highway at Glyndale Circle														
AM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection	
2025 Horizon Year	LOS (Delay)	D (51.8)			E (56.5)			B (15.8)			B (19.3)		C (23.3)	
	Synchro 95th Q	84'	28'	105'	31'	0'	18'	141'	0'	70'	359'	0'		
PM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection	
2025 Horizon Year	LOS (Delay)	D (44.9)			D (52.6)			C (23.8)			C (20.8)		C (27.3)	
	Synchro 95th Q	46'	40'	137'	58'	69'	34'	320'	0'	117'	195'	0'		
New Jesup Highway at Blythe Island Highway/Community Road														
AM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL		SBTR		Intersection	
2025 Horizon Year	LOS (Delay)	E (67.4)			E (74.5)			D (41.2)		E (55.7)			E (59.2)	
	Synchro 95th Q	96'	#564'	#202'	177'	35'	#60'	208'	#372'	#636'	N/A			
PM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL		SBTR		Intersection	
2025 Horizon Year	LOS (Delay)	E (71.5)			E (70.5)			F (101.8)		D (48.7)			E (75.3)	
	Synchro 95th Q	#195'	329'	85'	#617'	209'	#132'	#462'	#336'	320'	N/A			
Newcastle Street at 9th Street														
AM Peak Hour		EBLTR		WBLTR			NBL	NBTR	SBLTR					
2025 Horizon Year	LOS (Delay)	-		F (1963.5)			A (0.8)		A (0.8)					
	Synchro 95th Q	-		418'			3'		3'					
PM Peak Hour		EBLTR		WBLTR			NBL	NBTR	SBLTR					
2025 Horizon Year	LOS (Delay)	F (366.2)		F (432.9)			A (0.1)		A (1.7)					
	Synchro 95th Q	158'		300'			0'		8'					
Ross Road at 9th Street														
AM Peak Hour		EBLTR		WBLTR			NBLTR	SBLTR						
2025 Horizon Year	LOS (Delay)	B (10.8)		B (10.3)			A (1.3)		A (0.4)					
	Synchro 95th Q	3'		5'			0'		0'					
PM Peak Hour		EBLTR		WBLTR			NBLTR	SBLTR						
2025 Horizon Year	LOS (Delay)	B (10.7)		B (11.0)			A (0.3)		A (0.6)					
	Synchro 95th Q	5'		5'			0'		0'					
Norwich Street at 9th Street														
AM Peak Hour		EBLTR		WBLTR			NBL	NBTR	SBLTR					
2025 Horizon Year	LOS (Delay)	B (13.1)		B (13.8)			A (1.3)		A (1.1)					
	Synchro 95th Q	15'		15'			3'	0'	3'					
PM Peak Hour		EBLTR		WBLTR			NBL	NBTR	SBLTR					
2025 Horizon Year	LOS (Delay)	B (13.4)		C (19.5)			A (0.6)		A (2.3)					
	Synchro 95th Q	15'		38'			3'	0'	5'					
Newcastle Street at 4th Street														
AM Peak Hour		EBLTR		WBLTR			NBL	NBT	NBR	SBL	SBTR			
2025 Horizon Year	LOS (Delay)	F (199.5)		F (189.8)			A (0.3)			A (0.9)				
	Synchro 95th Q	83'		133'			3'	0'	0'	13'	0'			
PM Peak Hour		EBLTR		WBLTR			NBL	NBT	NBR	SBL	SBTR			
2025 Horizon Year	LOS (Delay)	F (56.7)		F (237.1)			A (0.2)			A (0.9)				
	Synchro 95th Q	38'		223'			3'	0'	0'	5'	0'			

Newcastle Street at Bay Street											
AM Peak Hour		EBL	EBR	WB	NBL	NBT	SBT	SBR			
2025 Horizon Year	LOS (Delay)	C (15.5)		-	A (0.0)		A (0.0)				
	Synchro 95th Q	58'	3'	-	0'	0'	0'	0'			
PM Peak Hour		EBL	EBR	WB	NBL	NBT	SBT	SBR			
2025 Horizon Year	LOS (Delay)	C (18.9)		-	A (0.0)		A (0.0)				
	Synchro 95th Q	103'	0'	-	0'	0'	0'	0'			
Bay Street at F Street											
AM Peak Hour		EBLTR		WBLTR	NBL	NBTR	SBL	SBTR			
2025 Horizon Year	LOS (Delay)	C (15.3)		B (13.7)	A (0.7)		A (0.2)				
	Synchro 95th Q	5'		3'	3'	0'	0'	0'			
PM Peak Hour		EBLTR		WBLTR	NBL	NBTR	SBL	SBTR			
2025 Horizon Year	LOS (Delay)	B (14.4)		B (13.9)	A (0.3)		A (0.1)				
	Synchro 95th Q	18'		5'	3'	0'	0'	0'			
Bay Street at Gloucester Street											
AM Peak Hour		EBL	EBTR	WBLTR	NBL	NBTR	SBL	SBTR			
2025 Horizon Year	LOS (Delay)	C (15.5)		C (13.9)	A (0.2)		A (1.4)				
	Synchro 95th Q	3'	3'	20'	0'	0'	5'	0'			
PM Peak Hour		EBL	EBTR	WBLTR	NBL	NBTR	SBL	SBTR			
2025 Horizon Year	LOS (Delay)	B (14.1)		C (15.4)	A (0.3)		A (1.9)				
	Synchro 95th Q	8'	5'	25'	0'	0'	5'	0'			
Bay Street at Prince Street											
AM Peak Hour		EBLTR		WBLTR	NBL	NBTR	SBL	SBTR			
2025 Horizon Year	LOS (Delay)	A (0.0)		A (9.9)	A (0.0)		A (3.1)				
	Synchro 95th Q	0'		10'	0'	0'	10'	0'			
PM Peak Hour		EBLTR		WBLTR	NBL	NBTR	SBL	SBTR			
2025 Horizon Year	LOS (Delay)	B (14.1)		B (10.0)	A (0.1)		A (2.6)				
	Synchro 95th Q	3'		18'	0'	0'	5'	0'			
Newcastle Street at 4th Avenue											
AM Peak Hour		EBLTR		WBLT	WBR	NBLT	NBR	SBL	SBTR		
2025 Horizon Year	LOS (Delay)	B (13.3)		C (15.0)		A (3.1)		A (5.1)			
	Synchro 95th Q	8'		20'		0'	0'	8'	0'		
PM Peak Hour		EBLTR		WBLT	WBR	NBLT	NBR	SBL	SBTR		
2025 Horizon Year	LOS (Delay)	B (12.5)		B (12.5)		A (0.0)		A (5.7)			
	Synchro 95th Q	8'		3'		0'	0'	5'	0'		

The results of the 2025 Horizon Year analysis indicate that the majority to intersections within the study area operate at an acceptable level of service in the AM and PM peak hours for the 2025 horizon year. The intersections that show a significant drop in LOS are briefly discussed below.

The intersection of New Jessup Highway at Glyndale Circle currently operates at LOS C in the AM and PM peak hours. The WB approach is the only current approach that operates at LOS E in the AM peak hour. No significant queuing is present in the AM or PM peak hours.

The intersection of New Jessup Highway at Blythe Island Highway/Community Road currently operates at LOS E in the AM and PM peak hours. The EB through/right movement has an AM queue of over 550 feet and a PM peak hour queue of 329 ft. The EB approach is currently operating at LOS E in the AM and PM peak hours. In the PM peak hour, the WB approach is also at LOS E. The NB PM peak hour approach is at LOS F with 101.8 seconds of delay.

Newcastle at 9th Street is an unsignalized intersection that is operating with an WB and EB approaches at LOS F in the AM and PM peaks hours for the 2025 horizon year. The WB approach in the AM peak hour experience significant peak hour delays of 1,963 seconds. In the PM peak hour, the WB approach has delays approximately 430 seconds in length.

The intersection of Newcastle Street at 4th Street is currently operating with side street delay in the AM and PM peak hours. The EB approach delay is 199 seconds in the AM and 57 seconds in the PM peak hour. The WB approach is 189 seconds in the AM peak hour and 238 seconds in the PM peak hour.

In addition to the intersection analysis, corridor capacity analysis was performed for the four context zones described previously. This capacity analysis is based on the industry standards and available public data. The foundation of the model analysis is based upon an evaluation of current average daily traffic volumes collected as a part of this corridor study and those provided by GDOT.

2025 Interim Year Segment Capacity Summary										
Context Area	Segment	Posted Speed Limit	Number of Lanes	Median Configuration	AADT Estimate	Level of Service Standard	Base Capacity (vehicles per day)	Adjusted Capacity (vehicles per day)	% Capacity Used	% Capacity Remaining
1 - Commercial	Between I-95 and Glyndale Drive	35	6	D	25,400	D	50,000	52,500	48%	52%
	Between Glyndale Drive and GA 303	45	4	U	25,400	D	39,800	37,800	67%	33%
2 - Transitional	Between GA 303 and 9th Street	45	4	U	24,500	D	39,800	37,800	65%	35%
	Between 9th Street and H Street	45	4	U	16,100	D	39,800	37,800	43%	57%
3 - Waterfront	Between H Street and Gloucester Street	40	4	D	6,400	D	32,400	32,400	20%	80%
	Between Gloucester Street and Prince Street	40	4	D	4,100	D	32,400	32,400	13%	87%
4 - Commercial	Between Prince Street and 4th Avenue	35	2	U	2,800	D	14,800	11,800	24%	76%
	Between 4th Avenue and US 17	35	4	U	4,700	D	32,400	24,300	19%	81%

As shown above for the individual context zones, the Commercial and the initial segment of the transitional segment are at approximately 70% capacity. The other remaining segments are well below 40% capacity utilized.

The capacity analysis for the 2035 Horizon Year is shown on the following pages.

2035 Horizon Year Conditions

New Jesup Highway at Glyndale Circle

AM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
2035 Horizon Year	LOS (Delay)	D (50.7)			E (57.3)			B (16.8)			C (22.0)		C (25.3)
	Synchro 95th Q	92'	28'	115'	33'	0'	20'	164'	0'	78'	419'	0'	
PM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
2035 Horizon Year	LOS (Delay)	D (43.5)			D (52.3)			C (27.3)			C (24.8)		C (30.3)
	Synchro 95th Q	50'	44'	148'	61'	72'	37'	375'	0'	171'	223'	0'	

New Jesup Highway at Blythe Island Highway/Community Road

AM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL		SBTR	Intersection
2035 Horizon Year	LOS (Delay)	F (80.7)			F (99.3)			D (52.0)		F (87.3)		F (83.3)
	Synchro 95th Q	104'	#639'	#238'	195'	34'	#74'	246'	#511'	#765'	N/A	
PM Peak Hour		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL		SBTR	Intersection
2035 Horizon Year	LOS (Delay)	E (70.7)			F (87.0)			F (168.3)		E (68.4)		F (107.3)
	Synchro 95th Q	#214'	363'	91'	#699'	210'	#226'	#573'	#392'	389'	N/A	

Newcastle Street at 9th Street

AM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBLTR		
2035 Horizon Year	LOS (Delay)	-		F (3951.5)		A (0.7)		A (1.4)		
	Synchro 95th Q	-		488'		3'		3'		
PM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBLTR		
2035 Horizon Year	LOS (Delay)	-		F (1465.4)		A (0.1)		A (2.2)		
	Synchro 95th Q	-		400'		0'		8'		

Ross Road at 9th Street

AM Peak Hour		EBLTR		WBLTR		NBLTR		SBLTR		
2035 Horizon Year	LOS (Delay)	B (10.8)		B (10.3)		A (1.3)		A (0.4)		
	Synchro 95th Q	3'		5'		0'		0'		
PM Peak Hour		EBLTR		WBLTR		NBLTR		SBLTR		
2035 Horizon Year	LOS (Delay)	B (10.7)		B (11.0)		A (0.3)		A (0.6)		
	Synchro 95th Q	5'		5'		0'		0'		

Norwich Street at 9th Street

AM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBLTR		
2035 Horizon Year	LOS (Delay)	B (14.0)		C (15.1)		A (1.3)		A (1.1)		
	Synchro 95th Q	18'		20'		3'	0'	3'		
PM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBLTR		
2035 Horizon Year	LOS (Delay)	B (14.9)		C (23.8)		A (0.6)		A (2.3)		
	Synchro 95th Q	20'		53'		3'	0'	5'		

Newcastle Street at 4th Street

AM Peak Hour		EBLTR		WBLTR		NBL	NBT	NBR	SBL	SBTR	
2035 Horizon Year	LOS (Delay)	F (554.9)		F (929.9)		A (0.3)			A (0.9)		
	Synchro 95th Q	83'		133'		3'	0'	0'	13'	0'	
PM Peak Hour		EBLTR		WBLTR		NBL	NBT	NBR	SBL	SBTR	
2035 Horizon Year	LOS (Delay)	F (130.7)		F (561.5)		A (0.2)			A (0.9)		
	Synchro 95th Q	75'		330'		3'	0'	0'	5'	0'	

Newcastle Street at Bay Street									
AM Peak Hour		EBL	EBR	WB		NBL	NBT	SBT	SBR
2035 Horizon Year	LOS (Delay)	C (15.5)		-		A (0.0)		A (0.0)	
	Synchro 95th Q	58'	3'	-		0'	0'	0'	0'
PM Peak Hour		EBL	EBR	WB		NBL	NBT	SBT	SBR
2035 Horizon Year	LOS (Delay)	C (23.3)		-		A(0.0)		A (0.0)	
	Synchro 95th Q	140'	0'	-		0'	0'	0'	0'
Bay Street at F Street									
AM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBL	SBTR
2035 Horizon Year	LOS (Delay)	C (16.8)		B (14.6)		A (0.7)		A (0.2)	
	Synchro 95th Q	5'		3'		3'	0'	0'	0'
PM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBL	SBTR
2035 Horizon Year	LOS (Delay)	B (15.7)		B (14.7)		A (0.3)		A (0.1)	
	Synchro 95th Q	18'		5'		3'	0'	0'	0'
Bay Street at Gloucester Street									
AM Peak Hour		EBL	EBTR	WBLTR		NBL	NBTR	SBL	SBTR
2035 Horizon Year	LOS (Delay)	C (17.0)		C (15.4)		A (0.2)		A (1.4)	
	Synchro 95th Q	3'	3'	28'		0'	0'	5'	0'
PM Peak Hour		EBL	EBTR	WBLTR		NBL	NBTR	SBL	SBTR
2035 Horizon Year	LOS (Delay)	C (15.3)		C (15.4)		A (0.3)		A (1.9)	
	Synchro 95th Q	8'	5'	25'		0'	0'	5'	0'
Bay Street at Prince Street									
AM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBL	SBTR
2035 Horizon Year	LOS (Delay)	A (0.0)		B (10.0)		A (0.0)		A (3.1)	
	Synchro 95th Q	0'		13'		0'	0'	10'	0'
PM Peak Hour		EBLTR		WBLTR		NBL	NBTR	SBL	SBTR
2035 Horizon Year	LOS (Delay)	C (15.7))		B (10.2)		A (0.1)		A (2.6)	
	Synchro 95th Q	3'		20'		0'	0'	5'	0'
Newcastle Street at 4th Avenue									
AM Peak Hour		EBLTR		WBLT	WBR	NBLT	NBR	SBL	SBTR
2035 Horizon Year	LOS (Delay)	B (13.9)		C (16.4)		A (3.1)		A (5.1)	
	Synchro 95th Q	8'		28'		0'	0'	8'	0'
PM Peak Hour		EBLTR		WBLT	WBR	NBLT	NBR	SBL	SBTR
2035 Horizon Year	LOS (Delay)	B (13.1)		B (12.9)		A (0.0)		A (5.7)	
	Synchro 95th Q	10'		3'		0'	0'	5'	0'

The results of the 2035 Horizon Year analysis indicate that the majority to intersections within the study area operate at an acceptable level of service in the AM and PM peak hours for the 2035 horizon year. The intersections that show a significant drop in LOS are briefly discussed below.

The intersection of New Jessup Highway at Glyndale Circle currently operates at LOS C in the AM and PM peak hours. The WB approach is the only current approach that operates at LOS E in the AM peak hour. No significant queuing is present in the AM or PM peak hours.

The intersection of New Jessup Highway at Blythe Island Highway/Community Road overall intersection operations degrade to LOS F in the AM and PM peak hours. The EB through/right movement has an AM queue of over 639 feet and a PM peak hour queue of 363 ft. The EB approach operates at LOS F in the AM peak hour and LOS E in the PM peak hour. In the AM and PM peak hours, the WB approach is also at LOS F. The NB PM peak hour approach is at LOS F with 168 seconds of delay.

Newcastle at 9th Street is an unsignalized intersection that is operating with an WB and EB approaches at LOS F in the AM and PM peaks hours for the 2025 horizon year. The WB approach in the AM and PM peak hour experience significant peak hour delays.

The intersection of Newcastle Street at 4th Street is currently operating with side street delay in the AM and PM peak hours.

In addition to the intersection analysis, corridor capacity analysis was performed for the four context zones described previously. This capacity analysis is based on the industry standards and available public data. The foundation of the model analysis is based upon an evaluation of current average daily traffic volumes collected as a part of this corridor study and those provided by GDOT.

2035 Horizon Year Segment Capacity Summary										
Context Area	Segment	Posted Speed Limit	Number of Lanes	Median Configuration	AADT Estimate	Level of Service Standard	Base Capacity (vehicles per day)	Adjusted Capacity (vehicles per day)	% Capacity Used	% Capacity Remaining
1 - Commercial	Between I-95 and Glyndale Drive	35	6	D	29,400	D	50,000	52,500	56%	44%
	Between Glyndale Drive and GA 303	45	4	U	29,400	D	39,800	37,800	78%	22%
2 - Transition	Between GA 303 and 9th Street	45	4	U	27,100	D	39,800	37,800	72%	28%
	Between 9th Street and H Street	45	4	U	17,800	D	39,800	37,800	47%	53%
3 - Waterfront	Between H Street and Gloucester Street	40	4	D	7,100	D	32,400	32,400	22%	78%
	Between Gloucester Street and Prince Street	40	4	D	4,500	D	32,400	32,400	14%	86%
4 - Commercial	Between Prince Street and 4th Avenue	35	2	U	3,100	D	14,800	11,800	26%	74%
	Between 4th Avenue and US 17	35	4	U	5,200	D	32,400	24,300	21%	79%

As shown above for the individual context zones, the Commercial and the initial segment of the transitional segment are at approximately 80% capacity. The other remaining segments are well below 40% capacity utilized.

Section 3: Transportation Strategy

Introduction

For many residents, business, and commuters in Brunswick and Glynn County, the congestion the communities have experienced over the last 10-20 years is most evident on the communities' roadway network. The challenges facing the community are not limited to vehicles on the road.

Throughout the planning process, the communities noted the need for improved bicycle and pedestrian amenities at key intersections. The transportation strategy for the study area represents a balanced approach serving all travel modes and roadway users.

This strategy is a partnership by the City of Brunswick, Glynn County, the Brunswick Area Transportation Study (BATS) and the Georgia Department of Transportation (GDOT).

The recommendations for the Bay Street Corridor Study are the result of stakeholder engagement, staff engagement with GDOT, analysis and comprehensive planning and transportation engineering.

Specifically, this chapter communicates a plan to improve safety and mobility of the study area intersections and the Bay Street corridor between Exit 36 and US 17. Specific recommendations have been made including: intersection treatments, pedestrian enhancements, corridor operational and technology improvements.

Stakeholders including business owners, technical staff at the City, County, BATS and GDOT, and community members played a key and integral part in the development of the recommendations for the corridor. Their local knowledge offered a collective insight that if overlooked, could have potentially minimized the success of this study. Using this insight, alternatives were developed that addressed the issues identified both technically through the analysis and based on stakeholder input.

Transportation Strategy – Chapter Overview

The transportation strategy for the *Bay Street Corridor Plan* responds to existing and projected traffic while respecting the integrity of existing places. The strategy builds on a foundation of community mobility through the addition of roadway capacity along the Bay Street corridors while maintaining mobility for the existing freight users along the corridor. Efforts were made to improve the quality and safety of walking and bicycling environments at key intersections. Enhancements to the corridor beyond those for mobility were also considered at key intersections.

The approach to this corridor study and the included recommendations focus on strategies that offer a balanced approach to transportation in response to the operational analysis, stakeholder and agency guidance, freight mobility, and community needs.

The approach to the recommendations in the Bay Street Corridor Study is one that develops an access strategy for the study area collectively rather than focusing on an individual interchange or intersection. The strategy looks to build upon improved access and mobility working as a system rather than individual intersections. This allows the intersections to be retooled to work in better harmony with the surrounding community. As the recommendations shown on the following pages are implemented, staff should reassess the impacts and whether additional improvements are needed.

Design Considerations

The goals and objectives for the Bay Street corridor study were translated into specific design considerations. These design considerations were developed to aid in evaluating the scenarios developed for the key intersections where improvements are recommended. The design criteria, as described below, were placed in a matrix and ranked based on the scenario considered ability to meet the criteria. This objective ranking was used to help determine if a recommendation was recommended for further evaluation.

Three criteria were utilized in this evaluation. As shown to the right, the criteria included:

Each of the design considerations are described below along with the matrix to the right.

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria

- **Beautification** – enhances the visual appeal/look of the corridor or intersection
- **Multimodal Intersection Design** – accommodates or enhances all modes of transportation with its geometric design features
- **Freight Vehicle Design Accommodation** – accommodates freight vehicles through the corridor or intersection with its geometric design features
- **Enhanced Pedestrian Accommodations** – enhances the pedestrian accommodations through design features including geometrics, signage and guidance, and safety enhancement.
- **Traffic Operations** – sufficient intersection capacity to handle projected traffic with acceptable levels of service.
- **Parking** – provides opportunities for additional parking supply
- **Safety Enhancement** – improves the overall or movement safety for all modes at the intersection or segment of the corridor.
- **Driver Expectation** – offers predictable designs that reduce driver confusion
- **Contextually Appropriate** – alternatives fit within the context of the corridor.
- **Impacts to Natural Features** – avoids encroachment on sensitive lands and environmental features.
- **Supportive of Economic Development** – design alternative does not restrict future land development opportunities
- **Railroad Impacts** – design alternative does not intentionally or overtly impact the operations along the current active railroad line

Design Considerations	
Beautification	
Design for Freight Vehicles	
Multimodal Intersection Design	
Traffic Operations	
Parking	
Enhanced Pedestrian Accommodations	
Supportive of Economic Development	
Railroad impacts/complications	
Natural Features Impacts	
Driver Expectations	
Safety Enhancement	
Contextually Appropriate	

Exit 36 at I-95

Guidance for recommendations:

Explore operational improvements at Exit 36 and Interstate 95.

Key Considerations & Issues

- Peak hour congestion
- Driver familiarity
- Close and frequent driveway spacing.
- Close intersection spacing
- Signalized intersections
- Wide typical section

Exit 36 is for many the first they see of Glynn County or the City of Brunswick. Located along I-95, the exit provides travelers with access to food, beverages, gas and other services. As such drivers may or may not be familiar with the intersections and roadway configurations.

The recommendations offered for this area include those intended to provide for long-term mobility as well as address driver unfamiliarity with the area.

The area currently has auxiliary turn lanes in at key intersections and driveways. Multiple through lanes exist on SR 27/US 25/341 currently. By closing closely and redundantly spaced intersections along the corridor and encouraging interconnectivity, the corridor can retain capacity long-term. In addition, directional guidance shields for I-95 on the pavement in advance of the interchange will help drivers positioning themselves for access to I-95. This will reduce last minute lane changes and weaving along SR 27, thus preserving capacity, and reducing angle and rear end collisions. Both were frequent crash types at this location.



Pavement Markings

US 341 at Blythe Island Highway

Guidance for Recommendations: Explore operational improvements at US 341 and Blythe Island Highway

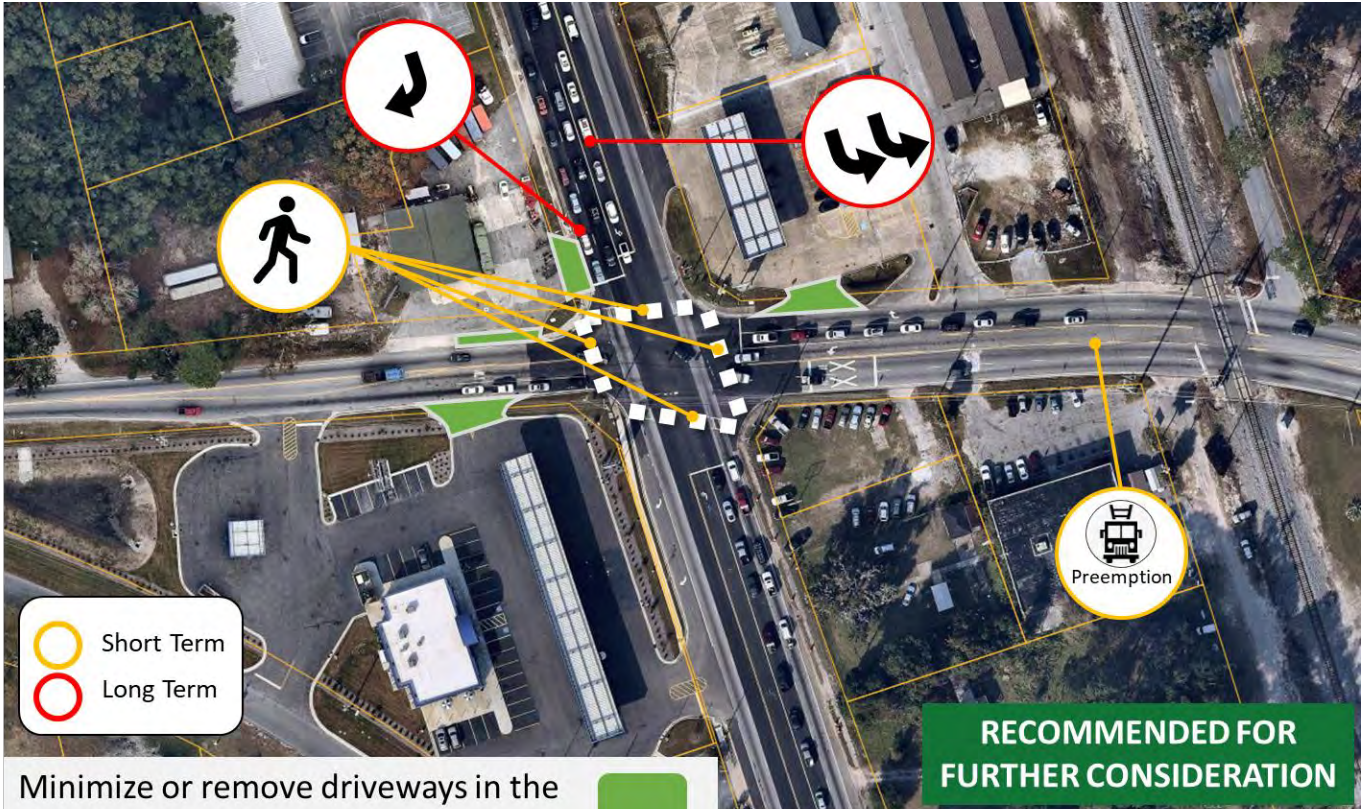
Key Considerations & Issues

- Peak hour congestion
- Close and frequent driveway spacing.
- Close intersection spacing
- Signalized intersections
- Auto-oriented land uses
- Emergency services proximity
- Railroad proximity

341 at Blythe Island is a key intersection in the overall roadway network along the Bay Street corridor. It is the first intersection from Exit 36 that cuts east across the peninsula. For this reason, there are heavy left-turning movements in the AM and PM peak hours for the SB left movement. In comparison of the overall corridor, 55% or 401 crashes occurred at this intersection or within proximity. Immediately adjacent to the east is the Norfolk Southern railroad and Old Jesup Highway intersection. Lastly Glynn County Fire Station 1 sits in between both.

Peak hour congestion in the 2025 and 2035 horizon year shows the need for an additional SB left and right turn lanes. In addition, consolidation of closely spaced driveways within the influence area of the intersection will improve overall capacity beyond 2035.

Technology improvement including adaptive signal timing and emergency preemption will help the corridor and intersection function between after emergency calls for fire station 1.



US 341 at Blythe Island Highway

Design Considerations	
Beautification	<input type="radio"/>
Design for Freight Vehicles	<input type="radio"/>
Multimodal Intersection Design	<input checked="" type="radio"/>
Traffic Operations	<input type="radio"/>
Parking	n/a
Enhanced Pedestrian Accommodations	<input type="radio"/>
Supportive of Economic Development	<input checked="" type="radio"/>
Railroad impacts/complications	<input type="radio"/>
Natural Features Impacts	<input type="radio"/>
Driver Expectations	<input type="radio"/>
Safety Enhancement	<input type="radio"/>
Contextually Appropriate	<input type="radio"/>

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria

Recommendation:

- Prioritize intersection improvements for future funding opportunities (*MPO, GDOT, local*)

Newcastle Street at Fourth Street and Selden Park

Guidance for

Recommendations: Explore means to improve pedestrian connectivity with Selden Park and the neighborhoods across Bay Street.

Key Considerations & Issues

- High speeds along the corridor
- Railroad proximity
- Five-lane Bay Street crossing
- Long stretch of the corridor with limited vehicle interruption
- Limited to no pedestrian infrastructure at Fourth Street
- Freight Corridor

Fourth Street is a key intersection in the roadway network for the peninsula. It serves as the entrance to Selden Park on the west side and the residential neighborhoods on the right. Newcastle Street acts as a barrier between the two.

Due the length of the crossing, the speeds of vehicles along this section and the vehicle mix, pedestrians are intimidated to try and cross. As a result, park use from the neighborhood is limited and those who do use Selden Park drive rather than drive.

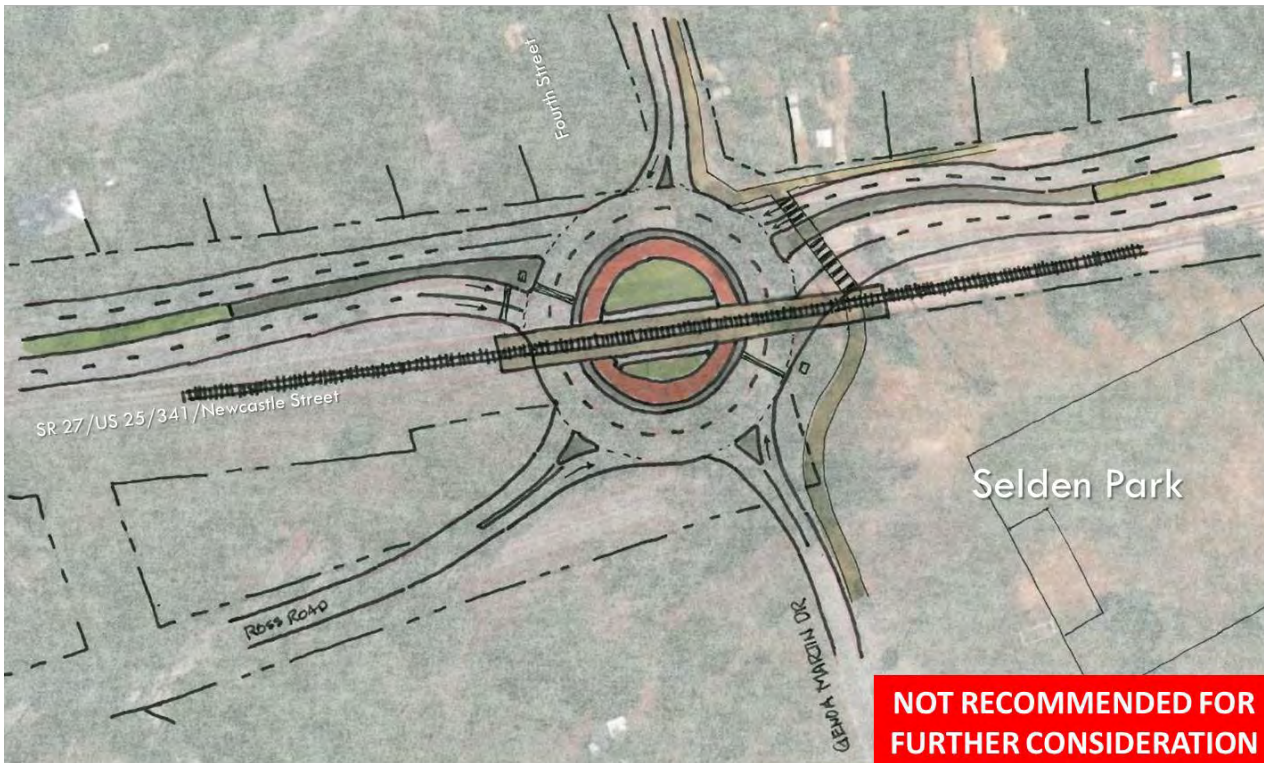
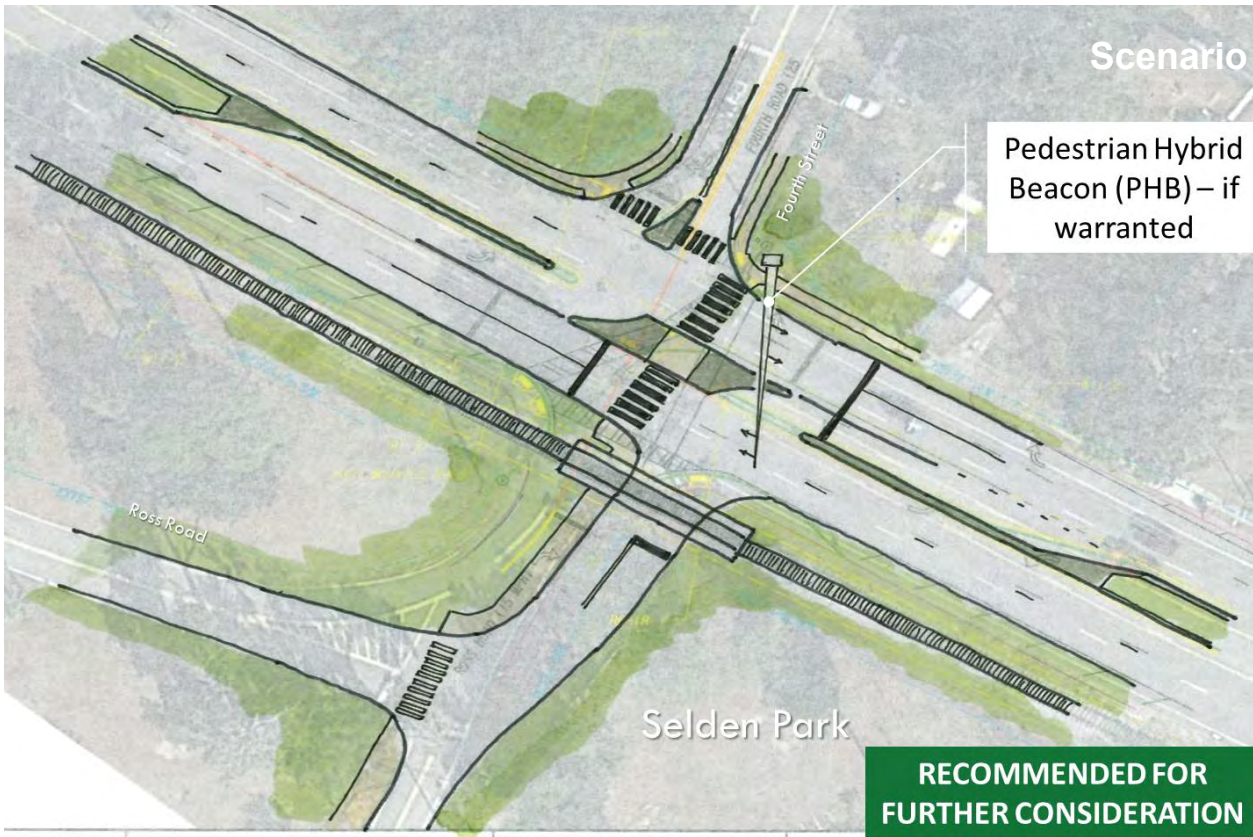
Providing a safe, controlled crossing at Fourth Street is needed to improve the safety for pedestrians accessing the Park. Community desire for improvement at this intersection is high. Improvements at this location are supported by Glynn County, the City of Brunswick, and the Georgia Department of Transportation.

Several improvements have been considered for this intersection as a part of this study and by others including the Georgia Department of Transportation. Consideration and evaluation for a traffic signal, a directional crossover with a pedestrian hybrid beacon, and a roundabout have been considered for implementation. While each facilitates a crossing of the street, they each do not provide the same level of safety for the pedestrian crossing, meet the criteria for installation, and each have a different impact to adjacent traffic along Newcastle Street.

The following pages describe and depict the improvements considered at the intersection of Fourth Street and Newcastle Street.

Considerations for each and a determination for additional study is also provided.

Newcastle Street at Fourth Street and Selden Park



Newcastle Street at Fourth Street and Selden Park



Traffic Signal Warrants

The Manual on Uniform Traffic Control Devices (MUTCD) provides guidance on the evaluation and installation of traffic signals between two intersecting streets. The investigation and need for a traffic control signal shall include and analysis of factors relating to the existing operation and safety at the location and the potential to improve these conditions, and the applicable factors contained in the following traffic signal warrants:

- Warrant 1, Eight-Hour Vehicular Volumes
- Warrant 2, Four-Hour Vehicular Volumes
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection near a railroad grade crossing

A review of the signal warrants at this location indicate that the crossing does not meet Warrants 1, 2, 2, 4, 5, 6, 7, and 8 based on collected data for this study. Warrant 9 is intended to be utilized when the warranting of a signal is primarily needed based on the crossing. In this case Warrant 9 does not apply.

Newcastle Street at Fourth Street and Selden Park

Design Considerations	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Beautification	○	○	○	●	○
Design for Freight Vehicles	○	○	○	○	○
Multimodal Intersection Design	○	○	○	○	○
Traffic Operations	○	○	○	○	○
Parking	n/a	n/a	n/a	n/a	n/a
Enhanced Pedestrian Accommodations	○	○	○	○	○
Supportive of Economic Development	○	○	○	○	○
Minimizes Railroad impacts/complications	○	○	○	○	○
Natural Features Impacts	○	○	○	○	○
Driver Expectations	○	○	○	○	○
Safety Enhancement	○	○	○	○	○
Contextually Appropriate	○	○	○	○	○

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria

Recommendation:

- Coordinate with GDOT on implementation of Scenario 3 as a safety project

Considerations

- Scenario 4 requires a significant local investment for implementation
- Scenario 4 as compared to Scenarios 1-3 is less accommodating to pedestrians but more than current conditions
- Significant railroad engagement and permission will be needed for implementation of Scenario 4.
- Scenario 4 could prove difficult to fund without local prioritization and sole sourcing
- Scenario 5 is not warranted
- Scenarios 1-3 could be funded through GDOT

Newcastle Street at Bay Street

Guidance for
Recommendations: Explore alternatives to improve operations and safety at Bay Street and Newcastle Streets.

Key Considerations & Issues

- Transition point in the corridor
- Railroad proximity
- Freight Corridor
- Unique intersection geometry
- Gateway Intersection to Downtown Brunswick

The intersection of Bay Street and Newcastle Street is a transitional intersection within the overall network for the community. Within the study area Newcastle Street serves as a freight corridor up to the intersection with Bay Street, where it becomes the entry in downtown Brunswick and Bay Street becomes a freight corridor.

This dual purpose of the intersection where it must balance mobility to and from the port facilities as well as act as a gateway and transition point into Brunswick. These functions required of the intersection are unique and diverse and require an intersection configuration that accommodates the asks of the intersection.

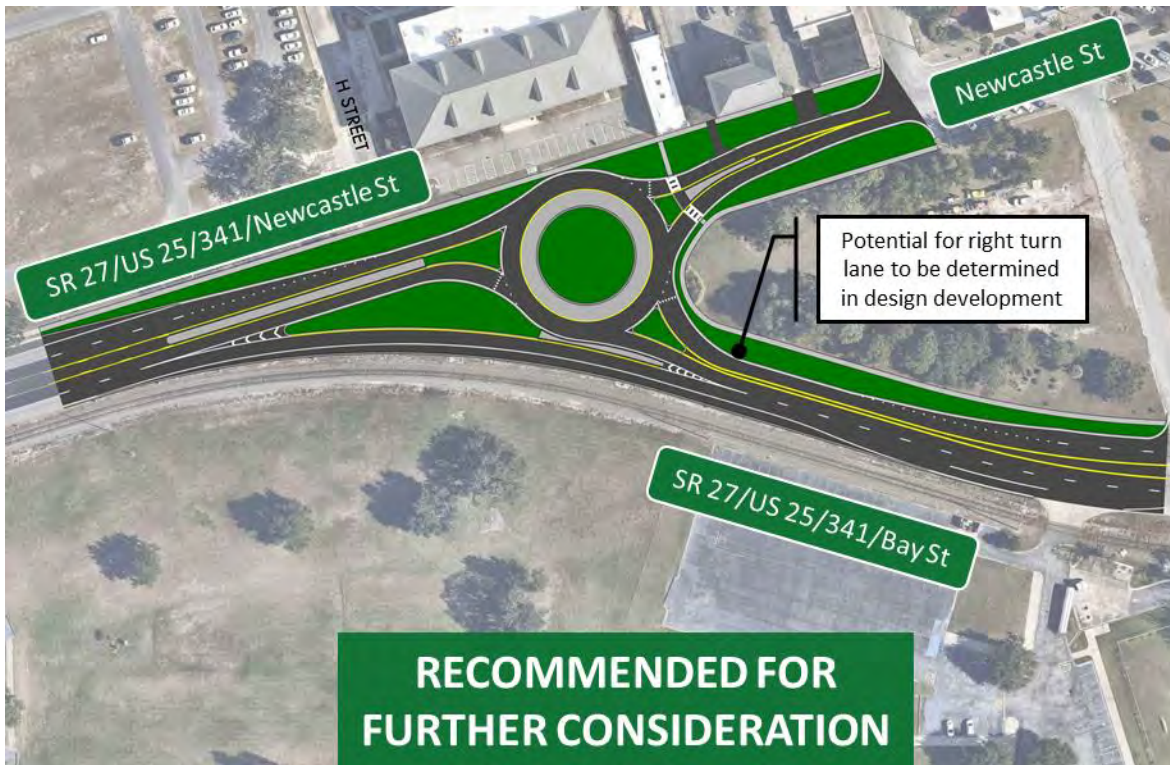
The unique configuration of the intersection with its approximate 70-degree skew lends itself to simplify certain approach movements (SB Newcastle Street to Bay Street) and complicates others (NB Newcastle to Bay Street). Furthermore, the proximity to the port and need facilitate truck movements is critical.

The intersections proximity to Downtown Brunswick provides the opportunity to create a gateway. In addition to provides an opportunity to slow traffic coming into downtown from Newcastle Street.

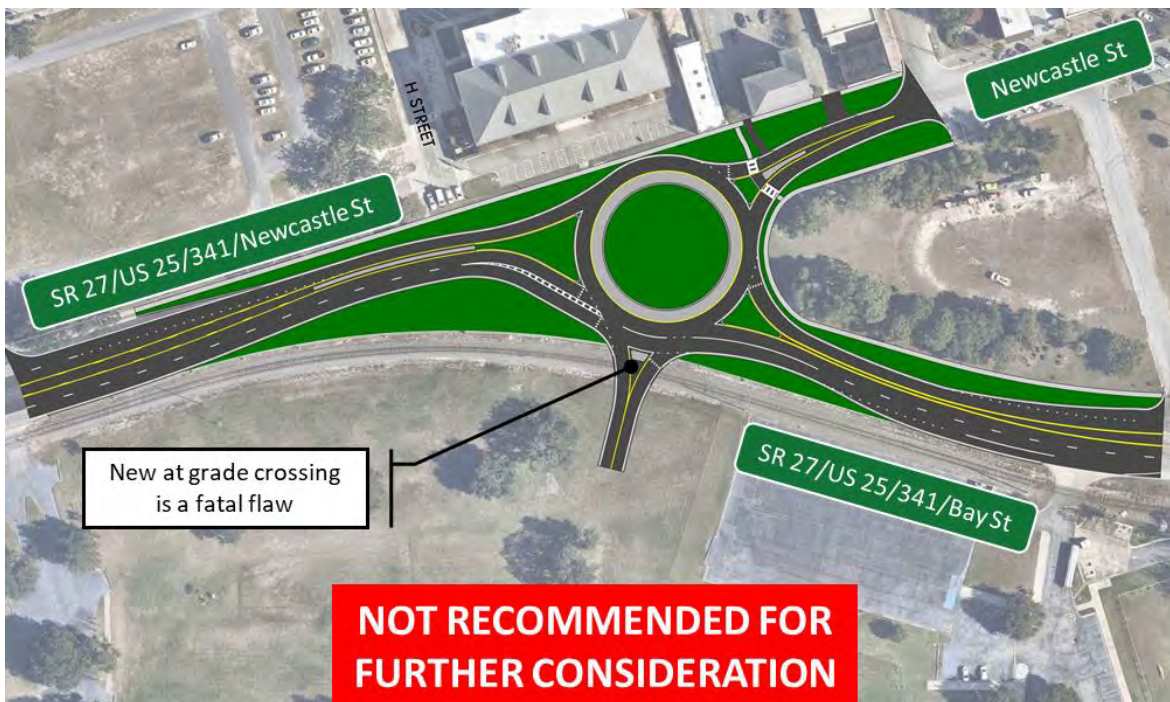
The following page depicts the scenario considered at the intersection of Newcastle Street and Bay Street.

Newcastle Street at Bay Street

Scenario 1



Scenario 2



Newcastle Street at Bay Street

The following actions respond directly to these findings.

Design Considerations	Scenario 1	Scenario 2
Beautification	<input type="radio"/>	<input type="radio"/>
Design for Freight Vehicles	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Multimodal Intersection Design	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Traffic Operations	<input type="radio"/>	<input type="radio"/>
Parking	<input type="radio"/>	<input type="radio"/>
Enhanced Pedestrian Accommodations	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Supportive of Economic Development	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Minimizes Railroad impacts/complications	<input type="radio"/>	<input type="radio"/>
Natural Features Impacts	<input type="radio"/>	<input type="radio"/>
Driver Expectations	<input type="radio"/>	<input type="radio"/>
Safety Enhancement	<input type="radio"/>	<input type="radio"/>
Contextually Appropriate	<input type="radio"/>	<input type="radio"/>

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria

Considerations

- Scenario 2 requires additional right-of-way for construction
- Scenario 2 implementation would likely require the closing of the existing crossings at I Street and along Bay Street opposite G Street at a minimum
- Operational benefits shown in the table to left, depict significant operational gains from the roundabout over the unsignalized intersection
- The roundabout would create a gateway into downtown Brunswick
- The roundabout would also slow traffic down coming into Brunswick along Newcastle Street
- The roundabout accommodates freight vehicles well and would reduce their travel time from the port to I-95

Newcastle Street at Bay Street							
Condition	Measure	EB		NB		SB	
		EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour							
2035 Design Year	LOS (Delay)	C (15.5)		A (0.0)		A (0.0)	
	Synchro 95th Q	58'	3'	0'	0'	0'	0'
2035 Design Year Single	LOS (Delay)	A (7.1)		A (6.1)		A (1.8)	
	Sidra 95th Q	39'		33'		29'	
PM Peak Hour							
2035 Design Year	LOS (Delay)	C (23.3)		A (0.0)		A (0.0)	
	Synchro 95th Q	140'	0'	0'	0'	0'	0'
2035 Design Year Single	LOS (Delay)	A (7.5)		B (12.9)		A (3.1)	
	Sidra 95th Q	59'		141'		18'	

Recommendation:

Prioritize intersection improvements for future funding opportunities (MPO, GDOT, local) as represented in Scenario 1

Bay Street

Guidance for

Recommendations: Explore means to improve pedestrian connectivity to Mary Ross Park and Downtown and ways to enhance the visual appeal of the Bay Street corridor

Key Considerations & Issues

- Freight Corridor
- Railroad proximity
- Five-lane Bay Street crossing
- Pedestrian crossing infrastructure at Gloucester Street and G Street
- Bay Street buffers Mark Ross Park from downtown

Bay Street is a key street within the fabric of Brunswick for many reasons. It is a historical feature, it is an economic driver, it provides access to the waterfront, and it is a key spine road throughout the peninsula. It exists as five-lane section through the corridor with two-lanes in each direction, a center turn lane and sidewalks on the east side.

Connecting both sides of the street – downtown to Mary Ross Park - is important to the City of Brunswick. Maintaining the corridor as a freight corridor and access to the port is also important to the City and their partners. Finding a way to balance these two elements is critical for any alternative scenario that is considered.

A variety of improvements have been considered for the section of Bay street between Newcastle Street and Gloucester Street. While all of the scenarios accomplish the goal of improving pedestrian connectivity to Mary Ross Park and Downtown, some do it at the expense of mobility to the port. For others the cost of implementation does not return a benefit based on the investment.

The scenarios discussed on the following pages highlight the scenario considered along with their alignment with

The following pages depict the scenarios and improvements considered along the Bay Street corridor.

Bay Street

Scenario 1 – Pedestrian Bridge



NOT RECOMMENDED FOR FURTHER CONSIDERATION

A pedestrian bridge was suggested to connect downtown to Mary Ross Park. The connection would separate pedestrian traffic from vehicular traffic on Bay Street.

To make the structure compliant with ADA guidelines, it would need to extend from Newcastle Street to the waterfront with a series of switchbacks. The switchbacks are necessary to achieve a minimum clearance of 18 feet over the highest point on Bay Street and 21 feet over the railroad.

Pedestrian bridges work best when there is a significant barrier that prohibits crossing such that it becomes the quicker path. The traffic along Bay Street is not at a level that pedestrian would choose to divert their trip to utilize the pedestrian bridges. In addition, their overall cost can be prohibitive for implementation.

Design Considerations	
Beautification	<input type="radio"/>
Design for Freight Vehicles	<input type="radio"/>
Multimodal Intersection Design	n/a
Traffic Operations	n/a <input type="radio"/>
Parking	n/a
Enhanced Pedestrian Accommodations	<input type="radio"/>
Supportive of Economic Development	<input type="radio"/>
Railroad impacts/complications	<input type="radio"/>
Natural Features Impacts	<input type="radio"/>
Driver Expectations	n/a
Safety Enhancement	<input type="radio"/>
Contextually Appropriate	<input type="radio"/>

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria

Factors to Consider:

- Expensive to implement
- Low benefit cost on investment
- Prohibitive to enforce use when easier to cross at street level
- Difficult to fund without local prioritization and sole sourcing
- Separates the pedestrian activity between the street level creating a loss in engagement

Bay Street

Scenario 2 – 2 Lane Bay Street

Creating a two-lane Bay Street has been discussed for several decades within the community to connect the downtown to the waterfront and improve the crossing for pedestrians. While a two-lane crossing would decrease the time at risk and crossing district, it would also directly impact the freight corridor serving Mayor’s Point Terminal. This would also be counter to the investments made already through the GRIP program.

While there are some attributes that align well with the design consideration including enhanced pedestrian accommodations and enhancing safety for pedestrians. Conversely, the approach also has several negative impacts on other users of the corridor. Two lane facilities are not as conducive to safe freight mobility – hence GRIP program investments in the past. In addition, it would inhibit traffic operations along the corridor. For these reasons it is not recommended that the 2-Lane Bay Street be considered further.



NOT RECOMMENDED FOR FURTHER CONSIDERATION

Design Considerations	
Beautification	<input type="radio"/>
Design for Freight Vehicles	<input type="radio"/>
Multimodal Intersection Design	<input type="radio"/>
Traffic Operations	<input type="radio"/>
Parking	<input type="radio"/>
Enhanced Pedestrian Accommodations	<input type="radio"/>
Supportive of Economic Development	<input type="radio"/>
Railroad impacts/complications	<input type="radio"/>
Natural Features Impacts	<input type="radio"/>
Driver Expectations	<input type="radio"/>
Safety Enhancement	<input type="radio"/>
Contextually Appropriate	<input type="radio"/>

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria

Factors to Consider:

- Implementation process
- Imbalance of individual corridor land uses laneage needs along this section – *freight (multi lanes), community (single lanes)*
- Roadway ownership consideration
- Past investments
- All user's perspective is critical for implementation of any project
- Counter to investment made through GRIP

Bay Street

Scenario 3 – Enhancement Plantings

Enhancing the visual look of a corridor can create additional value beyond just beautifying the corridor. Strategic enhancements can provide a calming of traffic, stormwater management, and access management.

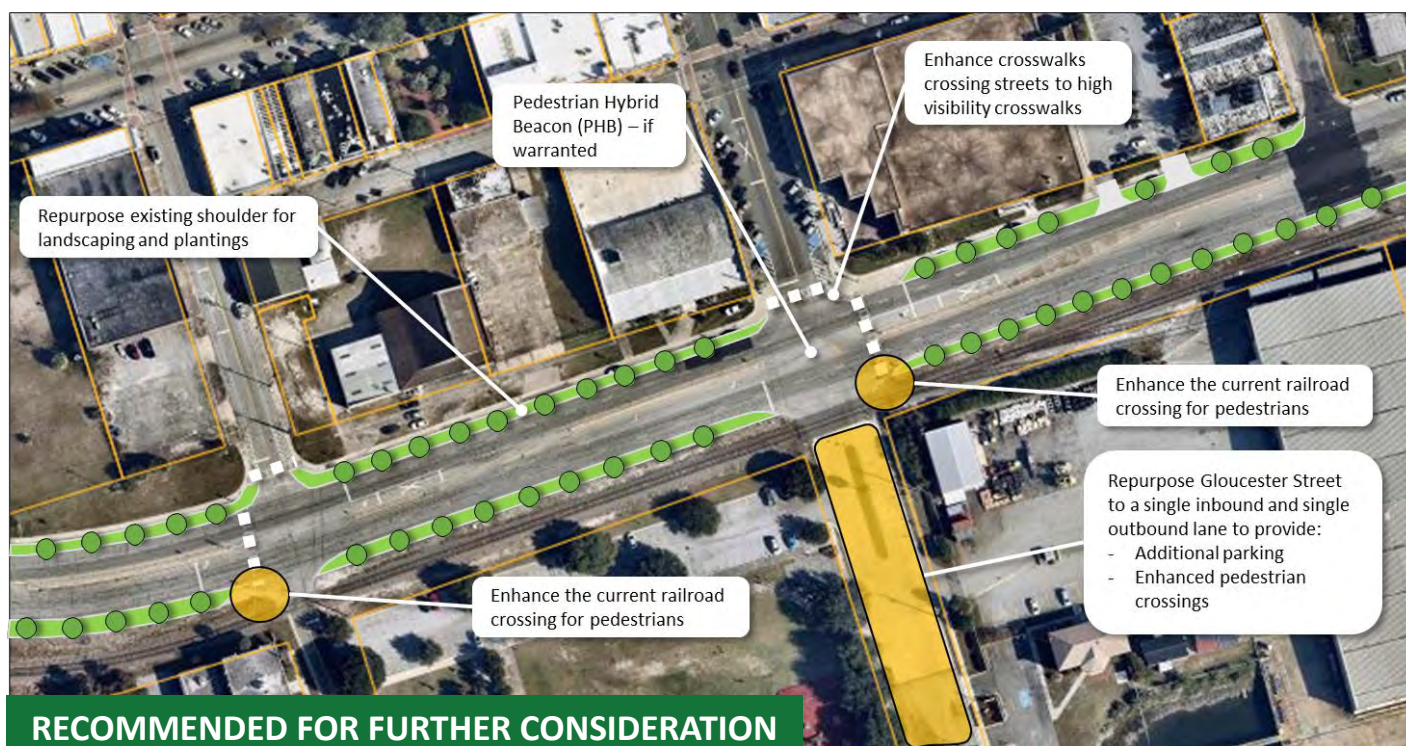
The Bay Street corridor currently is a five-lane facility with two lanes in each direction, a center turn lane, and 12 ft shoulders to the outside. The opportunity would be to convert the existing shoulders into landscaped areas. The areas could be utilized just as planted areas or as a bio-swale to help with water quality.

The planted areas would help to narrow the feel of the street without impacting the lanes and mobility of the corridor for freight. It begins to balance the mobility of the corridor without constricting any of the roadway users.

Plantings are recommended to be low and tolerant to heat. Maintaining clear sight lines for all users – vehicles, pedestrians, and bikes – is critical. GDOT provides guidance on appropriate plantings in the right-of-way.

Design Considerations	
Beautification	<input type="radio"/>
Design for Freight Vehicles	<input type="radio"/>
Multimodal Intersection Design	<input type="radio"/>
Traffic Operations	<input type="radio"/>
Parking	<input type="radio"/>
Enhanced Pedestrian Accommodations	<input type="radio"/>
Supportive of Economic Development	<input type="radio"/>
Railroad impacts/complications	<input type="radio"/>
Natural Features Impacts	<input type="radio"/>
Driver Expectations	<input type="radio"/>
Safety Enhancement	<input type="radio"/>
Contextually Appropriate	<input type="radio"/>

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria



Bay Street

Scenario 4 – Improved Crosswalk at Gloucester Street

Balancing the need to an enhanced crossing while maintaining mobility for freight vehicles is critical along Bay Street. Improving the time at risk for pedestrians while not constraining or impacting freight mobility is paramount for a successful project along Bay Street.

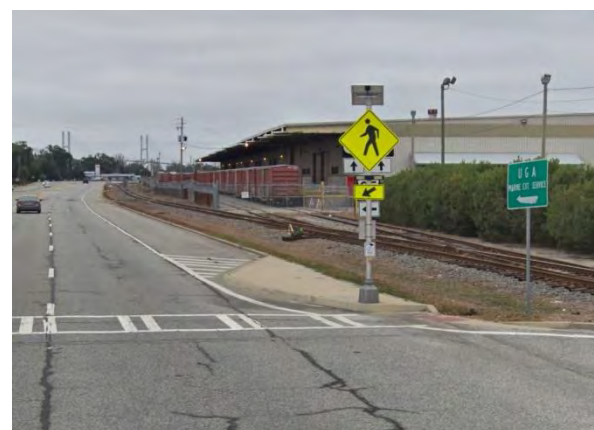
The GDOT has invested in the Bay Street corridor through the GRIP program as well as enhancing the existing crossing with rapid flashing beacons and additional signage. While this does improve the safety of the crossing, there are other items that could be implemented to enhance the crossing further. The crossing currently terminates on the west side adjacent to the railroad leaving a pedestrian exposed with limited guidance to continue to the sidewalk on Gloucester Street. The images to the right highlight the crossing from east to west. The railroad complicates the crossing and limits the extension of the sidewalk to the curb ramp.

The current left-turn movement from bay Street into Mary Ross Park is minimally used – less than 10 vehicles per hour. By removing the dedicated turn lane (left turns could still be made from the through lane) and installing a center island, a pedestrian refuge could be created. This would reduce the crossing distance for pedestrians and allow them to stage there crossing by approach. The center island would allow for pedestrians to stage their crossing or cross the full distance.

Gloucester Street, west of Bay Street is a City Street. It exists as a four-lane street the terminates at the waterfront. Through reallocation of the existing space with the street, Gloucester Street can be reconfigured to create an enhanced crossing, provide additional parking, and connect the waterfront to downtown.

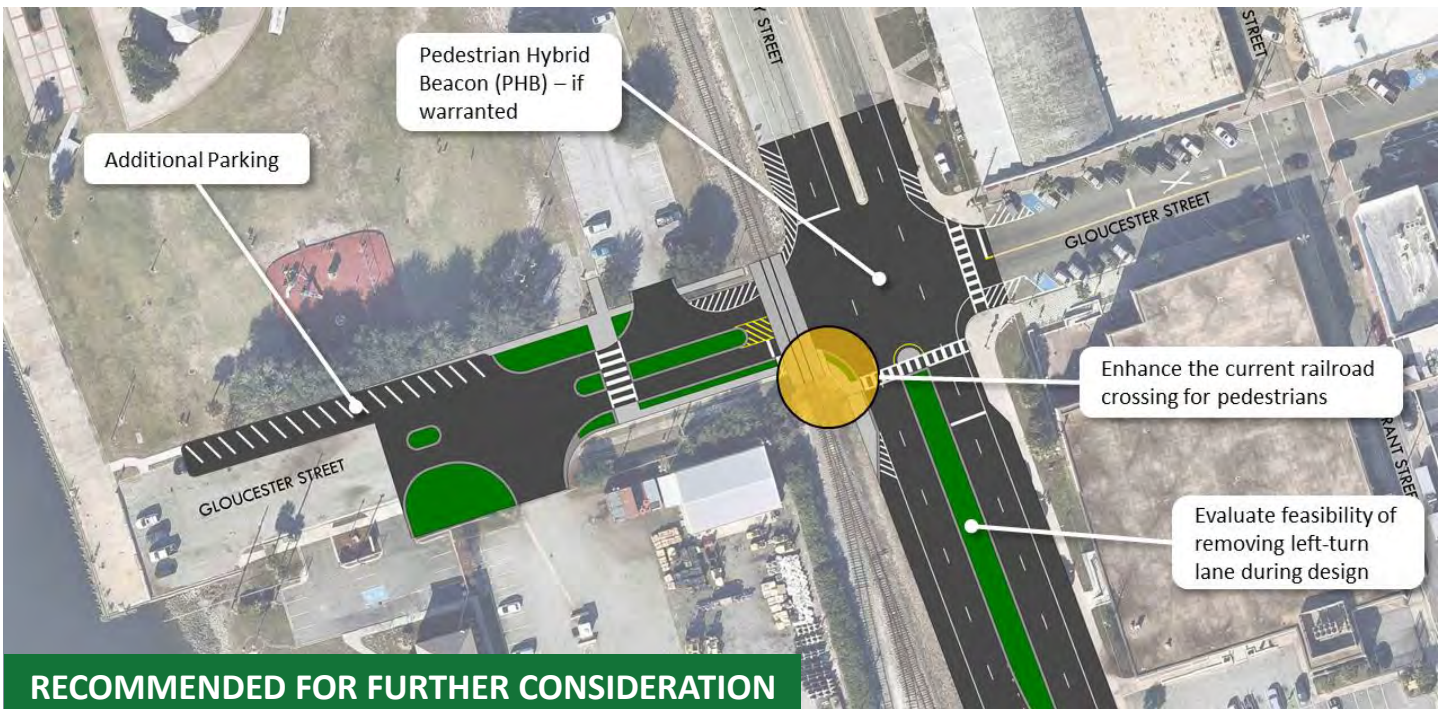
Once warranted, a pedestrian hybrid beacon could be installed to control the pedestrian crossing further by stopping traffic while pedestrians are crossing the street.

The graphic on the following page depicts the proposed improvements at Gloucester Street and Bay Street.



Bay Street

Scenario 4 – Improved Crosswalk at Gloucester Street



RECOMMENDED FOR FURTHER CONSIDERATION

Design Considerations	
Beautification	<input type="radio"/>
Design for Freight Vehicles	<input type="radio"/>
Multimodal Intersection Design	<input type="radio"/>
Traffic Operations	<input type="radio"/>
Parking	<input type="radio"/>
Enhanced Pedestrian Accommodations	<input type="radio"/>
Supportive of Economic Development	<input type="radio"/>
Railroad impacts/complications	<input type="radio"/>
Natural Features Impacts	<input type="radio"/>
Driver Expectations	<input type="radio"/>
Safety Enhancement	<input type="radio"/>
Contextually Appropriate	<input type="radio"/>

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria

The proposed recommendations at the subject intersection capitalize on previous investments by enhancing them and providing a relatively short path to implementation. With the ownership of west Gloucester Street being the City enhances the timeframe to implementation. Furthermore, the relative cost to implementation is small especially when considering the impact to pedestrian crossing safety and enhancement to the corridor.

The recommendation balances the needs of the corridor by enhancing the pedestrian crossing while maintaining mobility to and from the port for freight vehicles.

Factors to Consider:

- Enhances previous investment
- Maintains corridor mobility
- Enhances pedestrian safety
- Reduces crossing distance for pedestrians
- Speed of implementation
- Roadway ownership
- In line with investment made through GRIP

US 17 at 4th Avenue

Guidance for Recommendations: Explore operational improvements at US 17 and 4th Avenue

Key Considerations & Issues

- Eastern Gateway to Downtown Brunswick
- US Route
- Southern connector to Islands
- Multi-lane divided corridor

US 17 is the eastern throughfare on the peninsula and parallels Bay Street within the street network. The intersection with 4th Street is unsignalized and offers a unique geometric configuration with offset left-turning movements from US 17.

Recommendations at the intersection of US 17 and 4th Avenue are offered based on a geometric review of the intersection and not primarily based on capacity needs. The intersection currently has capacity through the 2035 horizon year. However, considering the likelihood of unfamiliar drivers utilizing the intersection, the undivided typical section, and the unique intersection geometry, recommendations have been made to the intersection.

The image below depicts the intersections current configuration. Recommendations for the intersection are shown on the following page.



US 17 at 4th Avenue



Design Considerations	
Beautification	<input type="radio"/>
Design for Freight Vehicles	<input type="radio"/>
Multimodal Intersection Design	<input type="radio"/>
Traffic Operations	<input type="radio"/>
Parking	<input type="radio"/>
Enhanced Pedestrian Accommodations	<input type="radio"/>
Supportive of Economic Development	<input checked="" type="radio"/>
Railroad impacts/complications	<input type="radio"/>
Natural Features Impacts	<input type="radio"/>
Driver Expectations	<input type="radio"/>
Safety Enhancement	<input type="radio"/>
Contextually Appropriate	<input checked="" type="radio"/>

- Most Satisfies the objective criteria
- Moderately satisfies the objective criteria
- Least satisfies the objective criteria

The recommendation for a roundabout at the intersection is in response to the geometric conditions and long term need to provide capacity improvements at the intersection. The roundabout provides operational gains at the intersection, but more importantly removes the conflict between the overlapping NB left and EB left movements that currently exists. The current footprint aligns closely with the proposed footprint such that additional right of way would likely not be needed for implementation.

The roundabout provides an opportunity to create a gateway into downtown Brunswick from the eastside of the peninsula.

Factors to Consider:

- Improvement is not needed from a capacity perspective through the horizon year of the analyses
- Implementation would require a localized funding source in the near term as compared to traditional prioritization process
- Could provide a southern gateway opportunity for Brunswick and the Isles

Strategic Opportunity | *Bicycle & Pedestrian*

How do we enhance bicycle and pedestrian opportunities along and across the Bay Street Corridor to encourage the use of active transportation by those of all ages and abilities?

Taking trips by bike or on foot has many benefits to the individual and their community. Cycling and walking improves the environment, promotes good health, saves money, eases the burden on roadways, and enhances the livability of a community. Many people choose to bike or walk for one or more of these reasons. For children, persons with disabilities, many elderly, and those who cannot afford an automobile, transit, bicycling, and walking may be their only option for many daily trips. Others may choose to take off on foot or by bicycle for recreation, to travel to work, or to run errands. Improving the bicycle and pedestrian network along corridors such as Bay Street is a stated goal in numerous planning efforts and is a critical component for a more livable corridor.

Findings

Bicycle facilities are limited. Pedestrian conditions and walkability are present for the Bay Street corridor, but connectivity is limited. Existing sidewalks are discontinuous and exist on the east side of the corridor for a portion and the west side for a portion. They are placed to serve the uses along the corridor. The auto-oriented corridor does not serve as a pedestrian connector and in many ways is hostile to those taking to the corridor on foot. Many of the major intersections have pedestrian crossings, but do not connect pedestrians to other facilities along the corridor.

One of the stated goals for the BATS MPO is to improve and enhance mobility for all modes of transportation. Glynn County has a well-established bicycle and pedestrian throughout and within the City of Brunswick. Sidewalks exist along the entirety of the Bay Street corridor. Bicycle infrastructure within the study area is limited. Efforts to enhance bike connectivity parallel to the Bay Street corridor is underway. Along Martin Luther King Jr Boulevard, bicycle and pedestrian improvements are being developed to enhance non-motorized travel.

Bicycle & Pedestrian | Major Challenges and Opportunities

- The benefits of biking and walking are well documented, and those benefits apply to individuals and the community as a whole.
- The demographics of Glynn County and the City of Brunswick support active use of bicycle and pedestrian facilities.
- Numerous destinations and amenities along Atlanta Highway would benefit from enhanced connectivity for active transportation modes.
- High traffic volumes and travel speeds create a barrier for bicyclists and pedestrians.
- The corridor currently lacks designated bicycle facilities and significant sidewalk gaps impede the corridor's walkability.
- Several bicycle projects are identified in the region's 2045 metropolitan transportation plan.

Strategic Opportunity / Corridor Aesthetics

How do we create a cohesive corridor identity and improve the look and feel of the Bay Street corridor?

The character of Glynn County, City of Brunswick, its neighborhoods, and places of interest are largely determined by the look and feel of its streets. This is particularly true along gateways and major commuter routes. To protect the quality of existing places and help shape the character as redevelopment occurs, Glynn County and the City of Brunswick should consider guidelines and standards that inform changes to public spaces and key activity nodes along the Bay Street Corridor. Actions in the opportunity area will provide a consistent aesthetic to the corridor. Collectively, these actions will enhance the user experience—whether in a car, on a bicycle, or on foot—and better position the corridor to receive investment.

Many factors influence the design of the Bay Street corridor. The look and feel of the Bay Street corridor is affected by conditions within the public right-of-way and in the hands of private owners. The design is characterized by changing cross sections, wide travel lanes, overhead utilities, and signs of all shapes, sizes, and designs. Issues that undermine corridor aesthetics can also contribute to poor operations. Hundreds of driveways and numerous intersections create conflict points along the Bay Street corridor. Meanwhile, greenspace is intermittent, and sidewalks are sporadic. These characteristics strip the corridor of its identity and suppress street life and activity.

The corridor lacks a sense of place or announcement of arrival. A recurring theme during the Connect Bay Street processes is that the Bay Street corridor lacks a clear and unique identity.

As a major corridor, the aesthetics and quality of places could be enhanced by increasing the tree canopy cover and landscaping. The corridor can better leverage its assets by improving active connections between them and beautifying the corridor throughout. GDOT's policy for landscaping and enhancements on right of way states that shrubs exceeding 30 inches in height cannot be planted within the horizontal clearance zone in medians. Trees must meet minimum requirements stated in the "Horizontal Clearances for Trees and Shrubs" in the policy guideline, and trees planted in medians must be limbed up to a minimum of 7 feet from the ground. The larger the posted speed or design speed used determines the horizontal clearance criteria.

Corridor Aesthetics | Major Challenges and Opportunities

- The look and feel of a street significantly affects community interest and investment in a place.
- A lack of consistent wayfinding or branding leaves the corridor without a unique identity.
- Both public and private shortcomings have undermined the corridor, and both public and private participation will be required for improvement to be realized.
- Properly executed, the corridor design could create a sense of place for the community and announce one's arrival into the city as a whole.
- Branding opportunities and gateway monumentation provide opportunities to create a unique corridor identity.
- Improvements to the aesthetics of the corridor also would improve safety, operations, and the multimodal experience. And vice versa.



Section 4: Call to Action

Action Plan

The Connect Bay Street process reflected a concerted effort to develop a plan that can be implemented. As well-thought-out course of action provides a framework in which public and private investments can lead to change. The implementation plan needs to enable decision makers to track progress and make future year adjustments. It also needs to clearly define way BATS and its partners can leverage public and private investments that foster quality design, economic stability, and environmental stewardship through coordinated transportation decisions.

Working through partnerships between BATS, GDOT, Glynn County, and the City of Brunswick a refocusing on the corridor will allow for investments of public infrastructure along the Bay Street corridor. By design the recommendations are not required collectively. Rather they are design to implemented independently, offering a flexible approach for local officials to partner with others to implement the recommendations through several phases as other projects are developed and funding becomes available. The plan also protects previous and planned infrastructure investment with careful consideration of how initial phases interact with long-term phases as well as past investments in the corridor.

The timing of the action plan is subject to factors such as:

- **The availability of time and money to implement improvements.**
- **The degree to which BATS, GDOT, and local agencies can proactively work to enhance the quality of improvements to the corridor, in both use and design.**
- **The interdependence of implementation, or the degree to which implementing one action is dependent on the successful completion of another task.**

The action plan that follows identifies each of the improvements, its relative cost and timeframe for implementation of the improvement.

Location	Recommendation	Timeframe	Cost
Downtown	Parking Study	Short Term	\$30k - \$50k
Exit 36 at I-95	I-95 Approach Shield Pavement Markings	Short Term	\$5k - \$10k
	Consolidation of Driveways	Long Term	\$1.5m - \$5m
US 341 at Blythe Island Highway	Pedestrian Improvements (<i>Crosswalks, Ramps, Timings</i>)	Short Term	\$300k - \$425k
	SB Dual Left Turn Lanes	Mid Term	\$1.2m - \$1.6m
	SB Right Turn Lanes	Long Term	\$125k - \$200k
	Consolidation of Driveway	Long Term	\$1.5m - \$3.2m
Newcastle Street at Fourth Street	Directional Crossover and Pedestrian Enhancements	Short Term	\$350k - \$1.5m
Newcastle Street at Bay Street	Roundabout	Mid Term	\$450k - \$1m
Bay Street	Shoulder Plantings & Beautification	Mid Term	\$650k - \$1.4m
	Improved Crosswalk and West Gloucester Street Enhancement	Short Term	\$950k - \$2.1m

Call to Action

The corridor plan recommendations contained herein represent the efforts of community leadership, stakeholders, and citizens. The completion of the Plan will bring about community interest in advancing the identified priority actions as quickly as possible. However, the pace with which change occurs will be dependent on several things, including consistent support for the Plan (during incremental decision-making and through partner agencies), continued strength in the real estate market, and the degree with which efforts are made to promote the plan externally. As the Plan informs future decisions, it's important to consider the following:



The Bay Street corridor is a community asset. The corridor is more than the sum of their respective parts and features. They're not simply transportation conduits nor are they exclusively places that accommodate development. While individual perspectives will influence how these corridors are perceived, one thing is clear: they are of significant value to Glynn County, the City of Brunswick, and the members of the community. It has the capacity to make positive contributions to a variety of interests, including housing, quality of life, economic opportunity, mobility, equity, and environment. The cultivation of this asset through incremental decisions and investments to generate enhanced opportunities for the individual and community, should be a principle of universal appeal. However, the recommendations contained within the Plan are designed to safeguard against actions that may limit the productivity and effectiveness of the corridors to advance community priorities.

Connecting people with community assets can benefit a variety of interests. While the planning process focused on the physical planning and design of the corridor, this project really is about connecting people with places in a positive way. How our residents experience our community is largely influenced by the physical form of commerce, the travel experience and opportunity, and the places we live, work, and play. This philosophy couldn't be more important than in the areas surrounding the Bay Street corridor.

Enhancing the connection between people and places through quality design can change the perceptions and the experience. Downtown, the Mayor's Point Terminal, our parks are all positive features that when connected to the study corridor will help to unlock unrealized potential and create competitive advantages not experienced elsewhere. However, these connections should be intentional,

frequent, and inclusive. As incremental decisions are made, efforts to enhance the connection between our community assets will result in increased vibrancy and the equity with which the benefits of vibrancy are enjoyed.





Success can be non-linear and incremental. Glynn County and the City of Brunswick should focus on opportunities where direct influence is most prevalent while simultaneously advocating and promoting the Plan with external agencies and private sector entities. This will create an environment where positive change can begin to occur, now with continued enhancements occurring over time through the actions and investments of public and private entities.

COASTAL GEORGIA GREENWAY - 155-mile route 28% existing or funded for construction

GLYNN COUNTY - Island Hopper Trail - 24.16-mile route 57% existing or funded for construction

Destination Trails

Jekyll Island Trails	20.0 mi
St. Simons Island Trails	18.2 mi
Historic Squares Trail	3.7 mi
Selden Park Trail	0.7 mi
Blythe Island Trail	3.0 mi
Harry Driggers Trail	3.3 mi
Hofwyl Broadfield	1.2 mi

Linking Trails

Musgrove Causeway	5.1 mi
Torras Causeway	4.1 mi

Trailheads

Historic Squares	21.2 ac
Mary Ross Park	4.6 ac
Selden Park	29.4 ac
N. Glynn Rec Complex	153.0 ac
Blythe Island	1,495.0 ac
Neptune Park	10.0 ac
Fort Frederica Historic Monument	104.5 ac

East Coast Greenway

Island Hopper Trail	7.4 mi
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ECG Funded Trails

Island Hopper Trail	6.26 mi
---------------------	---------

Trailheads

Liberty Ship Park	14.1 ac
Howard Coffin Park	42.7 ac
Overlook Park	8.3 ac
Hofwyl Broadfield State Historic Site	1,270.0 ac

Other Linked Sites: parks, wildlife areas, historic districts

Jekyll Island	5,242.0 ac
St. Simons Lighthouse	0.7 ac
SSI Land Trust Lands	1,000.0 ac
Bloody Marsh	8.5 ac
Causeway Island	13.6 ac



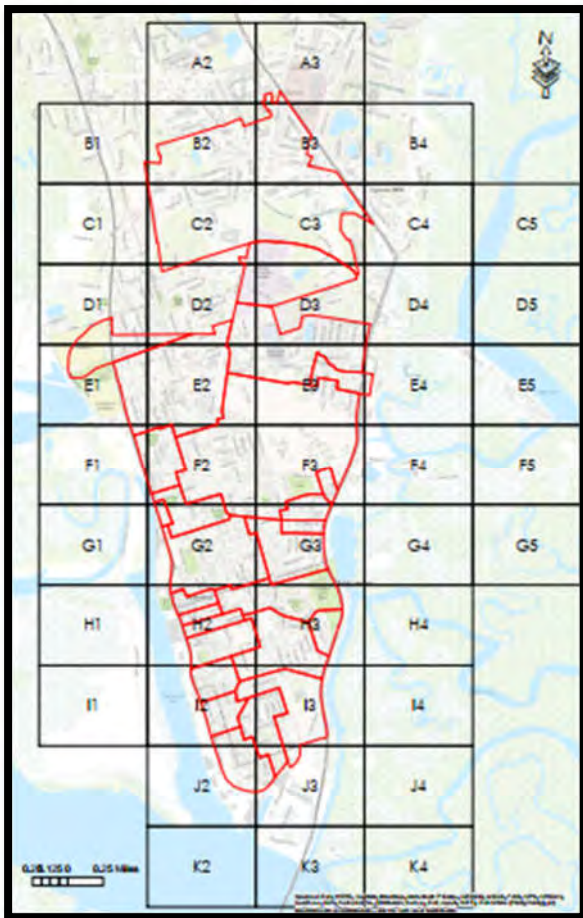
APPENDIX O

INITIAL STORMWATER MASTER PLAN

PREPARED FOR:
CITY OF BRUNSWICK



PREPARED BY:
GWES, LLC



PROJECT NO. 092.01.3.19
MARCH 2020

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I EXECUTIVE SUMMARY

The Initial Stormwater Master Plan presents an evaluation of existing stormwater issues, deficiencies, and recommendations for improving stormwater drainage in Brunswick, GA (City). The City is divided into 26 drainage basins containing 31 different outfalls. Refer to Appendix A for the City Watershed Drainage Map.

An evaluation of existing stormwater inventory, previous stormwater work, and system deficiencies was performed in due diligence to determine the appropriate course of action to properly assess and summarize known stormwater issues throughout the City. Based upon this evaluation, 15 recommended Capital Improvement Projects (CIPs) are identified based upon existing stormwater drainage system deficiencies. Each CIP is discussed and given a priority score for such improvements based on five stormwater related parameters and engineering judgment. These improvements are ranked in order of importance based on quantitative analysis and engineering judgment. Refer to Sections VIII for recommendations for improvements with preliminary opinions of probable cost, respectively. Refer to Appendix B for a Conceptual CIP Location Map. A summary of CIPs according to ranked prioritization is provided in Table 1.

Table 1: CIP - Recommended Improvements Prioritization					
CIP	Engineering Judgment Prioritization Parameters				Final Recommended Improvement Ranking
	Project Description	Priority Point Ranking	Preliminary Budgetary Cost	Opinion of CIP Improvement Impact	
A	Albany Street (near F and G St)	13	\$790,000	High	1
E	Intersection of Macon & Talmadge Ave	15	\$600,000	High	2
N	Riverside Neighborhood	14	\$690,000	High	3
C	Wildwood Ditch (near Boxwood St & Myrtle Ave)	12	\$1,400,000	High	4
H	Highway 17 Tide Control	12	\$1,605,000	High	5
K	Lanier Boulevard at Glynn Middle School	11	\$2,245,000	High	6
D	Altama Avenue and Second Street*	8	\$180,000	Low	7
F	Talmadge Avenue Ditches*	8	\$325,000	Low	8
B	Parkwood Drive (West End)	10	\$400,000	Moderate	9
I	P Street Basin	13	\$6,170,000	Moderate	10
G	Ports Authority - Tide Control	12	\$1,515,000	Moderate	11
L	Habersham Park	10	\$670,000	Moderate	12
O	GIS Inventory Collection	1	\$750,000	Moderate	13
M	Urbana Neighborhood at Atlanta Avenue	13	\$535,000	Low	14
J	Magnolia Park Outfall to Fairgrounds	2	\$925,000	Low	15

Recommended CIP preliminary opinion of probable cost overall total is approximately \$18,400,000.

II DISCLAIMER

This document entitled **Initial Stormwater Master Plan** was prepared by **GWES, LLC** (GWES) for the use of the **City**. Information provided in this document was based on GWES' professional judgment of existing stormwater drainage conditions taken from information supplied by the City and previous studies performed within identified sub-basins. This document is considered an initial master plan with an evaluation of hydrologic and hydraulic conditions related to specific stormwater drainage infrastructure based upon available information. It is the intent of this document to provide the City with a defined path to address stormwater issues and to budget for such improvements.

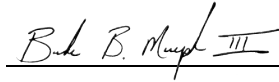
Any reliance on this document by any third party is prohibited. Any use which a third party makes of this document is the responsibility of such third party to verify all information provided by GWES. GWES shall not be responsible for financial damages suffered as a result of use of this document to justify results and decisions for future drainage projects.

Prepared by:



Barrett Neal, MBA

Reviewed by:



Burke B. Murph III, PE, MBA

III PURPOSE AND SCOPE

The City implemented a stormwater utility in August 2018, with the first planned major project of the utility being the preparation of an initial stormwater master plan. The City's intent for the initial plan is to identify potential projects to help plan for funding opportunities such as SPLOST collections CIPs and to help obtain other funding sources such as federal and state grant opportunities. The initial plan will benefit the City's understanding on how to direct utility and other funding to the highest priority maintenance and improvement areas.

The City has identified stormwater problems of varying magnitude and does desire to develop a plan to prioritize, fund, and complete remediation and improvement projects. The purpose of this report is to identify and to evaluate stormwater drainage issues in the City and to develop an initial plan detailing recommended improvement projects.

The scope of this effort includes the tasks listed below:

Task 1 – Existing Conditions Analysis

GWES delineated the City's primary drainage basins, conducted a field assessment of existing drainage features and components. In addition, GWES conducted hydrologic and hydraulic analysis of existing drainage conditions and deficiencies.

Task 2 – Stormwater Master Plan Development

Based on that analysis, GWES identified potential CIPs, provided conceptual modeling and analysis of improvement alternatives, and provided opinions of probable costs of design and construction of identified projects. GWES also developed a maintenance plan for cleaning and upkeep of ditches, pipes, and storm structures. Finally, GWES identified short-term stormwater improvements that may be accomplished by City resources as "in-house" projects.

IV EXISTING STORMWATER SYSTEM INVENTORY

Evaluation of existing stormwater infrastructure inventory included an in-depth review of available information in the City's Geographic Information System (GIS), available county-wide information in Arc-GIS, stormwater drainage infrastructure criteria gathered from previous development and improvements projects, and additional GIS information provided by Goodwyn, Mills, and Cawood, Inc. (GMC), who are in the process of updating the City's GIS.

GIS Stormwater Inventory

Per approval by the City to coordinate with Glynn County for Arc-GIS shape files associated with stormwater inventory, the following information was supplied and/or gathered for evaluation:

- *Streams / Rivers:* The streams and rivers datasets cover the entire county. It appeared to have all named and most un-named streams in the City's drainage areas.
- *Stormwater Outfalls:* GWES has identified 31 outfalls located throughout the City based on available information by location and the name.
- *Stormwater Structures:* The GIS data contains 3,659 stormwater structure locations. There are numerous attribute fields associated with this data set that are empty and/or listed as unverified. The data set is incomplete.
- *Pipes / Conveyance:* The GIS data contains 3,145 segments of stormwater conveyance infrastructure throughout the City. Similar to the above, there are numerous attribute fields associated with this data set that are empty and/or listed as unverified. Additionally, GWES has verified that there are many stormwater piping, ditches, flumes, and other methods of conveyance of stormwater that are not identified within the data set.
- *Stormwater Detention:* The GIS data identified 20 private and/or public detention areas throughout the City.
- *Watersheds / Drainage Basins:* The City's drainage basins are not defined in the GIS data; however, GWES has identified 26 drainage basins within its limits, as shown in Table 2 below. There are multiple outfalls located in five (5) of the identified drainage basins.

Table 2: City Drainage Sub-Basin	
Sub-Basin	Surface Area (Acre)
Albermarle Street/ Ocean Avenue Outfall	126
Cook Street Outfall	14
Dartmouth Street Outfall	39
E Gloucester Street Outfall	102
E Monck Street/ Holly Avenue Outfall	125
E Prince Street Outfall	134
Fourth Street Outfall	171
H Street Outfall	185
Howe Street Outfall	67
I Street Outfall	34
Lanier Boulevard Outfall	32
M Street Outfall	64
Magnolia Park Outfall	751
Mansfield Street Outfall	25
N Street Outfall	601
Newcastle Street Outfall	80
Norwich Street Outfall	78
P Street Outfall	74
Palmetto Outfall	93
Parkwood Drive Outfall	39
T Street Outfall	296
Talmadge Avenue Outfall	18
W Gloucester Street Outfall	23
W Monck Street Outfall	15
W Prince Street Outfall	47
Wildwood Drive Outfall	253

V EXISTING STORMWATER ISSUES

A detailed evaluation of stormwater issues is constrained due to the lack of storm drainage infrastructure information including, but not limited to, verified pipe/culvert/inlet/structure locations, sizes, and invert elevations, drainage easements, and detention pond design criteria and intent.

Field Reconnaissance Evaluation

As part of the field reconnaissance performed on October 14th and 15th, 2019, GWES visited the following known locations of problematic storm drainage issues (in no particular order):

- Albany Street (near F and G Street)
- Parkwood Drive (West End)
- Wildwood Ditch (near Boxwood Street and Myrtle Avenue)
- Altama Avenue and Second Street
- Intersection of Macon and Talmadge Avenue
- Talmadge Avenue Ditches
- Urbana Neighborhood at Atlanta Avenue
- Riverside Neighborhood

Field reconnaissance has been documented in Appendix C (Field Reconnaissance Photographs) and Appendix D (Field Reconnaissance Stormwater Inventory). The City's work order history for stormwater related issues has been included in Appendix E (Work Order History).

Albany Street (near F and G Street)

- Severe flooding observed on both sides of Albany Street during field visit.
- Stormwater inlets were not accepting flow on east side of Albany Street.
- Stormwater was flowing in a westerly direction over the median in the middle of Albany Street.
- Flooding was occurring at intersection of Albany Street and F Street.
- Albany Street between F and G Street appears to be a low area.
- Runoff from this area eventually flows to H Street Outfall.
- The area has been the subject of stormwater complaints in the past.
- Existing infrastructure is in need of maintenance and/or replacement.
- Additional infrastructure may also be necessary to address deficiencies.

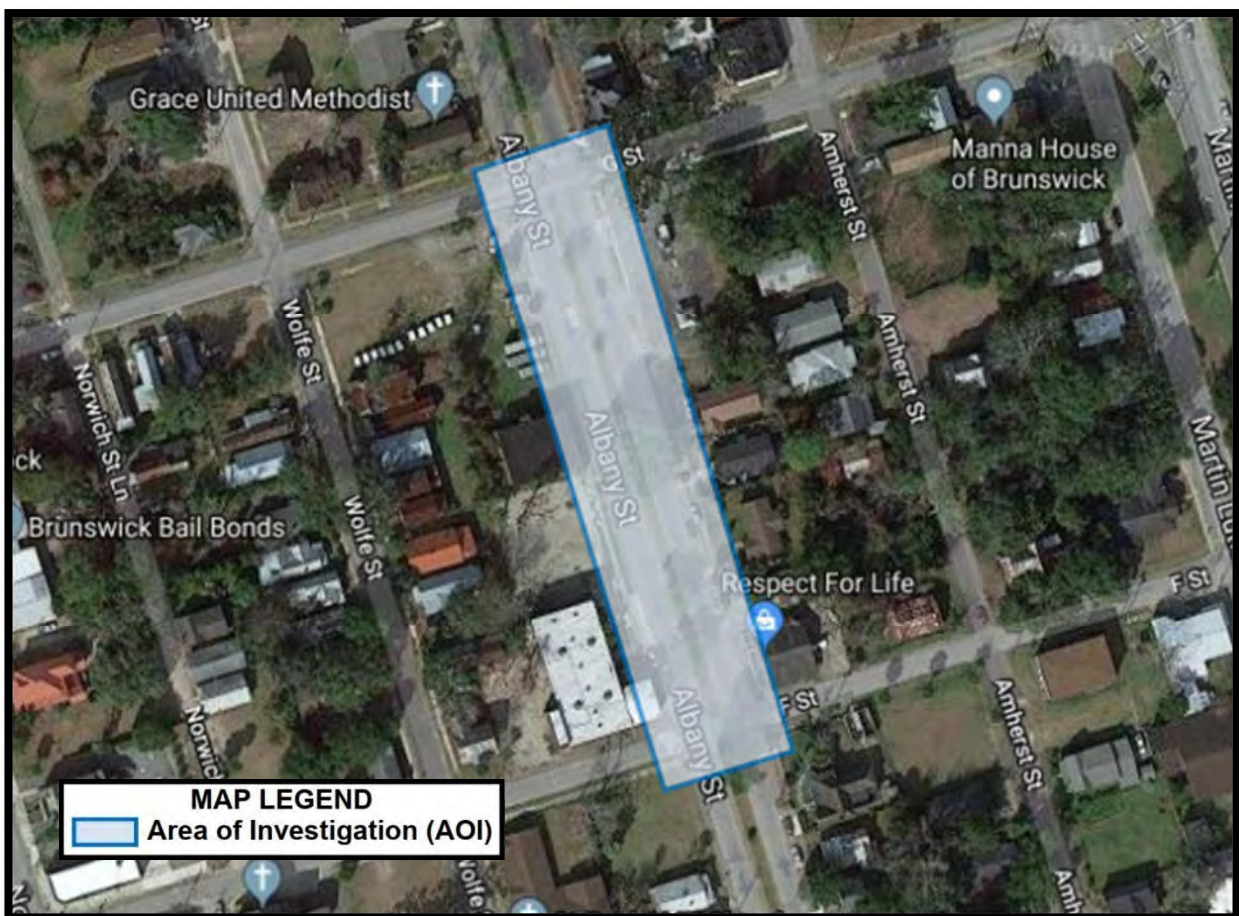


Figure 1: Albany Street (near F and G Street) AOI

Parkwood Drive (West End)

- During initial field visit, the inlets were in poor condition and had not been cleaned out, containing standing water, silt and debris.
- Could not locate yard inlet connected to pipe flowing north along N Cleburne Street on the east side.
- During another field visit following a rain event, the inlet at the corner of Parkwood Drive and N Cleburne Street was not accepting flow, water was backed up in the gutter along Parkwood Drive.
- Additionally, there was standing water in the parking lots of Coastal Medical Equipment & Uniforms and Jackie's Seafood Market.
- Runoff from this area eventually flows to T Street Outfall.
- The area has been the subject of stormwater complaints in the past.
- Existing infrastructure is in need of maintenance and/or replacement.
- Additional infrastructure may also be necessary to address deficiencies.

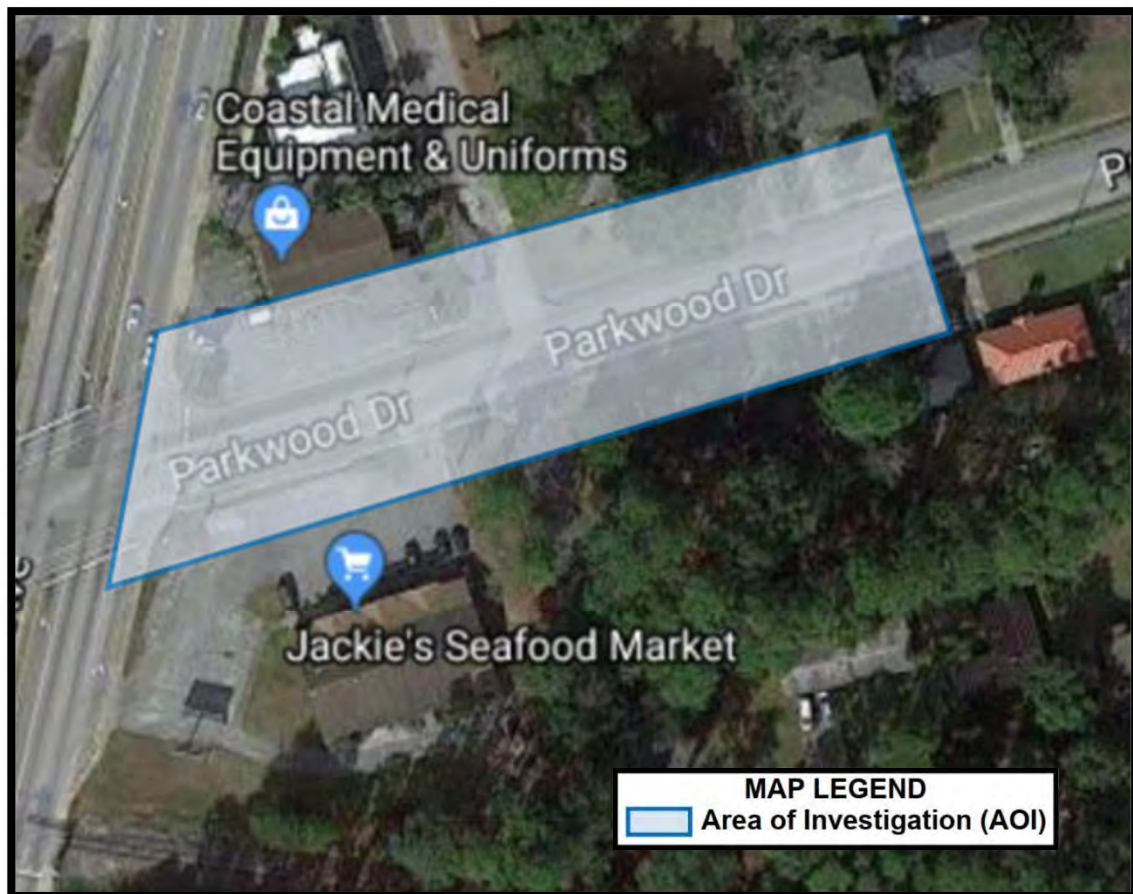


Figure 2: Parkwood Drive (West End) AOI

Wildwood Ditch (near Boxwood Street and Myrtle Avenue)

- Flooding tends to occur near church as water backs up during a rain event (affected by tides) into backyards resulting in erosion.
- Settling has occurred downstream in front of Budget Motel.
- City replaced culvert running under Wisteria Avenue in 2018, sized according to upstream pipe capacity.
- During initial field visit, the 48" pipe system that flows adjacent to church and then makes a 90 degree turn into the ditch system flowing along Myrtle Street was $\frac{3}{4}$ full at high tide.
- Upstream Wisteria Avenue 30" pipes were $\frac{1}{2}$ full, Willow Avenue 36" pipe was $\frac{1}{2}$ full.
- Private retention pond located off Lakeside Drive contains 18" overflow pipe that flows into Wildwood ditch system at corner of Lakeside Drive and Wildwood Drive.
- Runoff from this area eventually flows to Wildwood Drive Outfall.
- The area has been the subject of stormwater complaints in the past.
- Existing ditch system may require maintenance and/or shore stabilization.
- Existing stormwater infrastructure near church (48" pipe and 90 degree junction box) and tidewater may be causing bottlenecking or tailwater issue resulting in flooding.



Figure 3: Wildwood Ditches (near Boxwood Street and Myrtle Avenue) AOI

Altama Avenue and Second Street

- During initial field visit, the corner of Altama Avenue and 2nd Street appears to be a low spot.
- Curb and gutter is in place; however, it does not appear to flow to any existing structure.
- During another field visit following a rain event, there was some standing water in the gutter.
- Additionally, there were some flooding issues heading south along Altama Avenue in front of abandoned building, existing stormwater infrastructure does not appear to be accepting flow.
- Area does not appear to flow toward a specific outfall.
- The area has been the subject of stormwater complaints in the past.
- Area may require additional stormwater infrastructure in order to connect to existing system and reduce flooding issues.

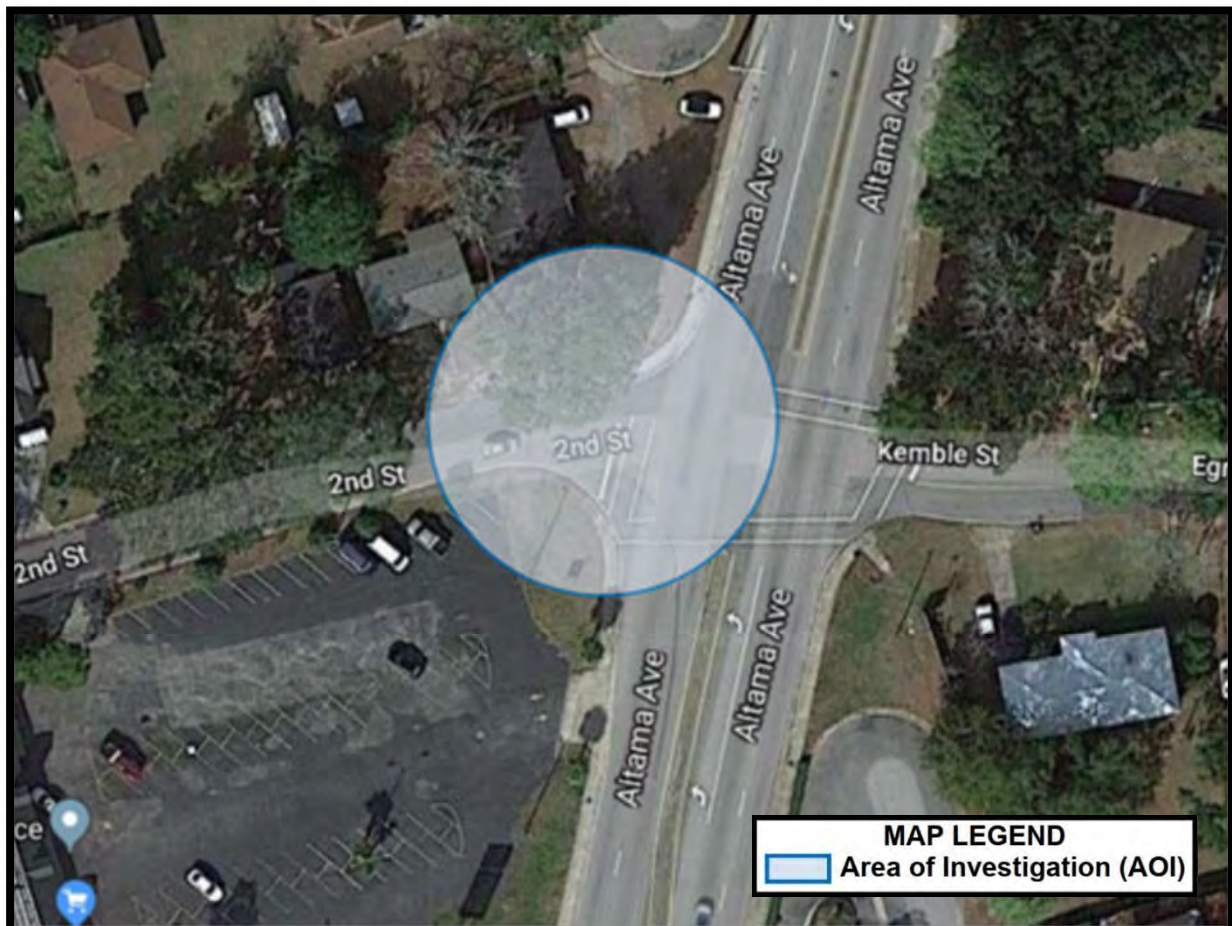


Figure 4: Altama Avenue and Second Street AOI

Intersection of Macon and Talmadge Avenue

- During initial field visit, inlets were in poor condition, full of water, silt, and debris.
- Inlets appear to be affected by tides as they were full of water during site visit prior to rain.
- During another field visit during a rain event, there was flooding at corner of Macon and Talmadge Avenue around inlet and along eastern side of Macon Avenue heading south.
- Runoff from this area eventually flows to unnamed outfall on eastern side of Highway 17 into marsh.
- The area has been the subject of stormwater complaints in the past, see Appendix E for work order history.
- Existing stormwater infrastructure is in need of maintenance and/or replacement.
- Area may require additional stormwater infrastructure, tidal control and/or an increase in capacity in order to reduce flooding issues.



Figure 5: Intersection of Macon and Talmadge Avenue AOI

Talmadge Avenue Ditches

- Talmadge Avenue does not currently have stormwater infrastructure heading west past Macon Avenue with the ability to convey water toward an outfall.
- During initial field visit, there were signs of flooding along Talmadge Avenue.
- Construction of ditches and/or installation of curb and gutter may alleviate flooding issues.



Figure 6: Talmadge Avenue Ditches AOI

Urbana Neighborhood at Atlanta Avenue

- During initial field visit during a rain event, there was flooding at multiple intersections and along the sides of Atlanta Avenue in the gutter.
- At the intersections of Tillman Avenue, Goodyear Avenue and Niles Avenue with Atlanta Avenue, the inlets are in poor condition and need to be cleaned out.
 - Curb and gutter is in need of maintenance, it is currently causing drainage issues at all intersections.
 - Multiple curb inlets contain filter fabric under the grate, causing drainage issues.
- At the intersection of Wilson Avenue and Atlanta Avenue, inlet has been paved over, causing flooding issues at that corner.
 - Other inlets are in poor condition, need to be cleaned out, full of water, silt and debris.
 - Curb and gutter is in need of maintenance, it is currently causing drainage issues.
- Pavement is 3-4 inches thick above gutter, making it difficult to perform gutter maintenance.
- Debris in gutter is causing additional drainage issues.
- Runoff from this area eventually flows to Atlanta Avenue Outfall.
- The area has been the subject of stormwater complaints in the past.
- Area may require additional stormwater infrastructure, tidal control, and/or an increase in capacity in order to reduce flooding issues.



Figure 7: Urbana Neighborhood at Atlanta Avenue AOI

Riverside Neighborhood

- During initial field visit, there were multiple signs of flooding throughout the neighborhood including erosion, roadway damage, blocked driveway culverts, and damaged lawns.
- All inlets were at least $\frac{3}{4}$ full due to tides at time of inspection, no apparent tidal control on outfalls.
- Through conversations with multiple residents, some areas experience flooding due to tides while others are susceptible to flooding during rain events.
- During another field visit following a rain event, the areas susceptible to flooding were apparent.
- Low areas with little to no infrastructure (or inadequate) appear to have the most frequent flooding issues, including Wassaw Island Circle, Julenton Island Drive, along Riverside Drive, and at the entrance to the neighborhood.
- The area has been the subject of stormwater complaints in the past.
- On-going projects in area include:
 - 1st house near entrance – replace drive culvert and install inlet to marsh
 - Talahi Island Lane – connect to existing system w/ pipe replacements
- Area may require additional stormwater infrastructure, tidal control and/or an increase in capacity in order to reduce flooding issues.



Figure 8: Riverside Neighborhood AOI

Previous Stormwater Work Evaluation

An investigation of previous stormwater consulting work performed for the City was evaluated for a more in-depth understanding of stormwater history. The previous stormwater consulting work addressed both broad and specific stormwater issues throughout the City as follows: P Street Basin, Magnolia Park Outfall to Fairgrounds, Lanier Blvd at Middle School, and Habersham Park. Field reconnaissance has been documented in Appendix C (Field Reconnaissance Photographs) and Appendix D (Field Reconnaissance Stormwater Inventory). Each identified area is discussed below:

P Street Basin

In Stantec Consulting Services, Inc's (Stantec) 2011 "N" & "P" St. Combined Hydrology Study, the "N" and "P" Street stormwater history was described as follows:

"Due to inadequate and deteriorating storm drainage infrastructure in the "N" St. & "P" St. basins, the City of Brunswick obtained the services of Stantec to evaluate and design a storm drainage system that would improve stormwater runoff in flood prone areas within the limits of the basin. The original design plan called the "N" St. Drainage and Sanitary Sewer Improvements was divided into four phases of work. The first two phases of work specific to the "N" St. basin were completed in February 2009.

Phase I was designed as a 24" PVC pipe stormwater bypass, which relieves the "N" St. basin Phase II improvements from surcharge. The bypass routes stormwater from Tillman Ave to the Lanier Plaza storm drainage system to the south and east to Terry Creek.

Phase II was designed to adequately handle stormwater runoff and replace deteriorating storm drainage infrastructure within the "N" St. basin. Phase II construction divided the "N" St. basin into the "N" St. and "P" St. basins based on the natural topographic ridge line located along "O" St. The area south of "O" St. was designed to be in the "N" St. basin and the area north to be in the "P" St. basin. Phase II construction is summarized as twin 48" reinforced concrete pipes (RCP) running west to east in the middle of "N" St. collecting stormwater runoff from Georgia DOT approved structures at intersections and on side streets, and a single 48" RCP running in the middle of "M" St. and Tillman Ave. The outfall for Phase II construction is a triple 48" RCP headwall located in the Hercules west drainage ditch.

During the construction of Phase I, representatives from Stantec, City of Brunswick, and EMC Engineering Services coordinated in an effort to allow positive drainage through the Hercules' drainage ditch at the "N" St. Outfall. At the request of EMC and with the approval of the City, the headwall was raised to an elevation specified by EMC. As a result, the slope on the 48" pipes entering the headwall was decreased as needed to meet the requested elevation of 2.90', which decreased the carrying capacity of the City's new system.

Phase III improvements were designed to adequately convey stormwater runoff from Phase IV improvements within the "P" St. basin and route it across Hercules' property to the outfall located in the Hercules east drainage ditch. Phase III construction is summarized as a 54" RCP storm sewer running east through the north part of Hercules property to a concrete headwall. Phase III design was coordinated with Hercules'

representatives during the planning of the storm piping alignment. Phase III improvements were scheduled to be complete before Phase IV improvements commenced. Phase IV improvements are summarized as a series of varying pipe sizes on side streets within the “P” St. basin routing stormwater to a main trunk line on “R” St., which is connected to the Phase III improvements. Recent reports from the City of Brunswick indicate that Phases III and IV improvements cannot be completed as designed due to inability to secure easements from Hercules” (now Pinova).

Field Reconnaissance

- During recent field visit following a rain event on October 15th, roadway surfaces were in poor condition. It was clear that there were flooding issues at multiple intersections, and stormwater infrastructure was in need of maintenance and/or repair.
- The area has been the subject of stormwater complaints in the past.

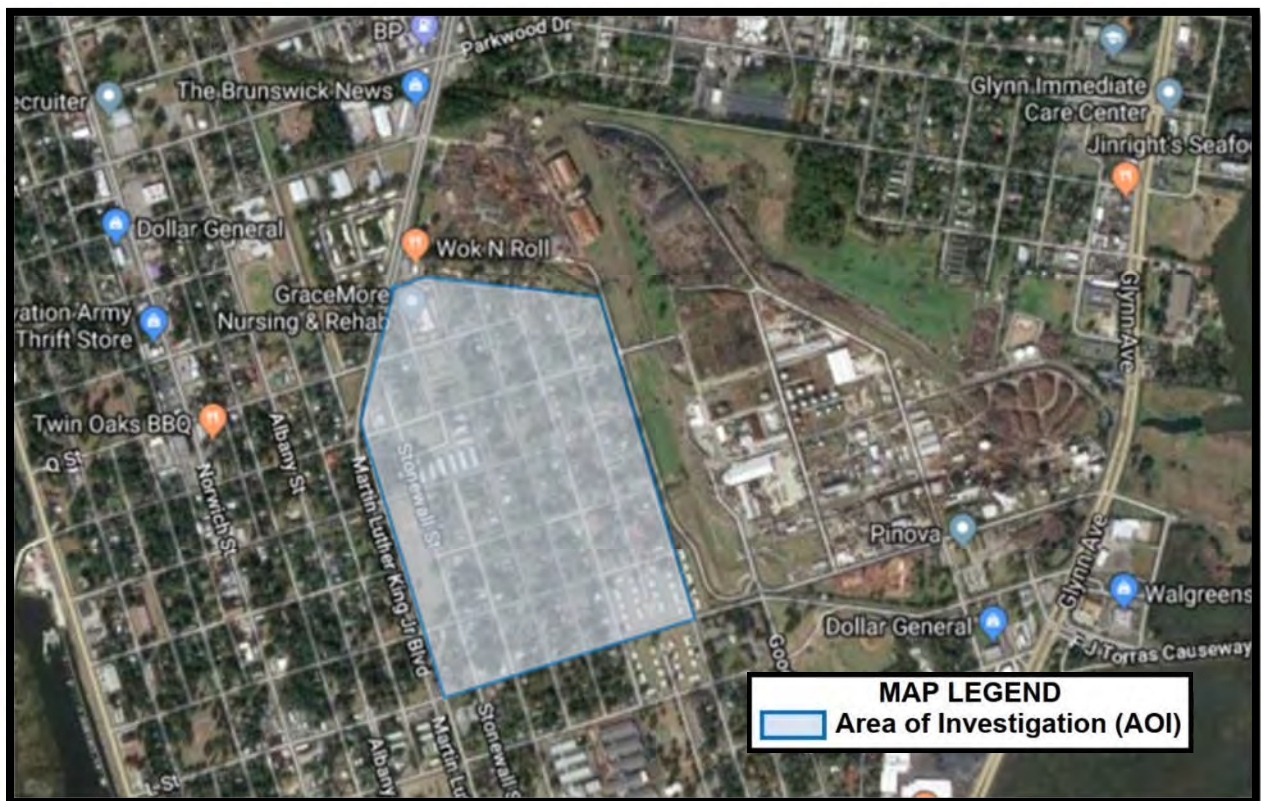


Figure 9: P Street Basin AOI

Magnolia Park Outfall to Fairgrounds

The Magnolia Park neighborhood has a history with flooding problems associated with its large watershed, its series of drainage ditches, and its existing storm drainage infrastructure. The City and Stantec worked together to address flooding problems and potential storm drainage improvements within and surrounding the neighborhood.

The first effort to improve storm drainage within the neighborhood was the *Magnolia Park Storm Drainage Improvements* project dated February 2000. This project addressed improvements to the neighborhood's perimeter drainage ditch and new infrastructure under Tara Lane and Woodland Way. These improvements were constructed in 2000. However, some improvements were designed, but not considered as a part of the contract. These improvements have not been completed to date.

The next effort was the *Watershed Drainage Study for College and Magnolia Park* dated June 2006 prepared by Stantec, which analyzed the capacities of existing storm drainage infrastructure in and surrounding Magnolia Park. Based on recommendations in the study, the first phase of improvements (Improvement MP-A) was constructed and completed in December 2011. Other recommendations in the study called for improvements (Improvement MP-B) to the perimeter drainage ditch that were not a part of the original February 2000 contract.

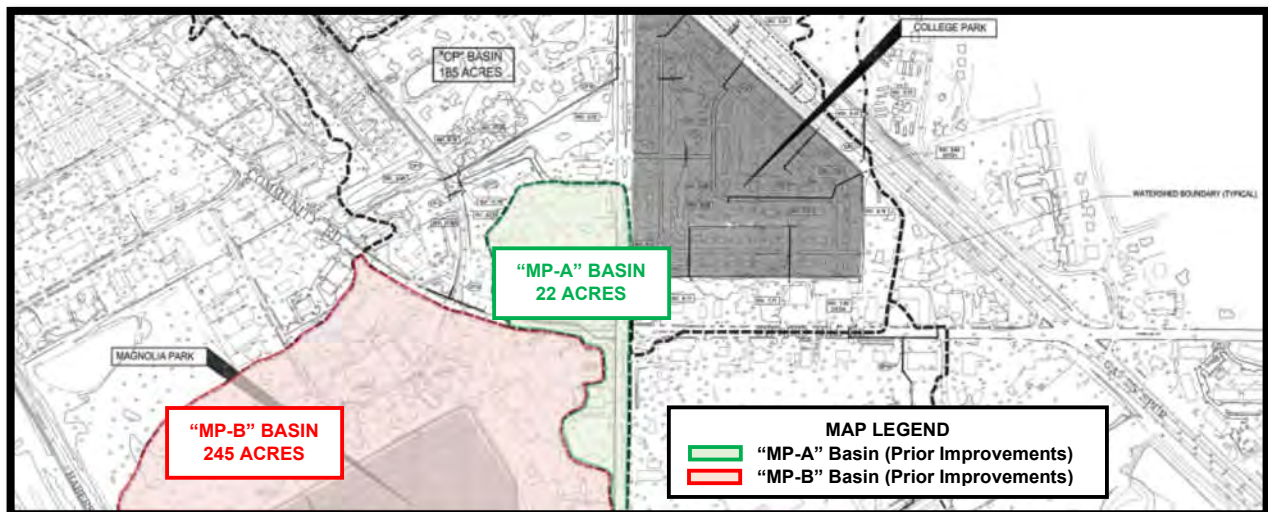


Figure 10: MP-A and MP-B Basin Map

The *Magnolia Park Storm Drainage Improvements Phase II* design, dated August 2012, included Improvement MP-B, dealt with improvements to the perimeter drainage ditch and storm drainage infrastructure. The project was completed in March 2014 and consisted of the installation of approximately 700 linear feet (LF) of storm drainage piping, storm drainage yard inlets, grading of upstream and downstream channel, and approximately 25,000 ft² of grout filled erosion control mattress.

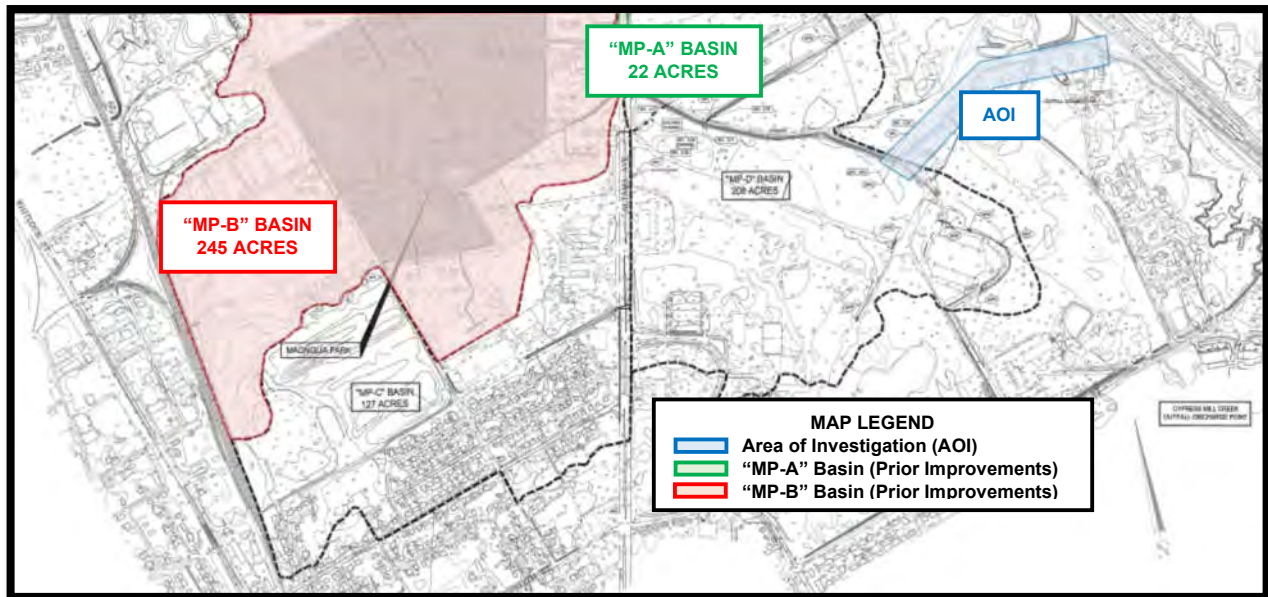


Figure 11: MP-A and MP-B Basin Map w/ AOI

In January 2018, the City released an RFP for *Magnolia Park Storm Drainage, Water Utility and Roadway Improvements* that stated the roadways within the neighborhood are in various states of disrepair and in need of resurfacing. Many of the storm drainage roadway crossings are constructed of corrugated metal pipe. Similarly, the water lines in the neighborhood are outdated and in need of replacement. The scope of this project is to include storm drainage inlet and crossing replacement, water line replacement, and roadway reconstruction. The project is currently under construction with an estimated completion in 2020.

While many of the most recent projects have been designed to address flooding issues within the Magnolia Park neighborhood, the downstream impacts of these improvements should also be addressed. Currently, all flow from the Magnolia Park basin flow under Altama Avenue and along Emory Dawson (Community Action Drive) to three (3) existing 60" RCPs. Additionally, stormwater from the Glynn County Football Stadium area flows through a 48" RCP under Community Action Drive and converge with the Magnolia Park flow into the ditch system heading east to Cypress Mill Creek.

Field Reconnaissance

- During a recent field visit, the four (4) pipes running under Community Action Drive were 1/2 full at high tide with no recent rain.
 - The outlet side of pipes are partially filled with sediment.
 - The inlet side remains clean.
 - A tailwater exists.
- The system does not flow into the large pond near Golden Isles Parkway (appears to be freshwater).
- The Magnolia Park Outfall is located at the end of Dolphin Street, downstream of where two ditch systems converge and Dolphin Street drains into Cypress Mill Creek through a 24" RCP.
- The area has been the subject of stormwater complaints in the past.
- To reduce potential flooding issues, capacity of infrastructure may need to be increased and/or tidal control structures may be necessary.



Figure 12: Magnolia Park Outfall to Fairgrounds AOI

Habersham Park

The *Habersham Park Hydrology Study*, completed in 2010 by Stantec, evaluated drainage patterns in the Habersham Park neighborhood. The report was commissioned as a result of several complaints from residents within Habersham Park regarding inadequate drainage of stormwater runoff. In order to assess potential problems within the neighborhood, storm culverts were inventoried and evaluated for capacity and compared to the estimated stormwater runoff for periodic storm events. Recommendations for improvements within the Habersham Park area were presented; however, the concepts for improving drainage were not intended to be the final design criteria for improvements.

Information used in the report was gathered from multiple sources including topographic information compiled from previous surveys for the Dixville Sanitary Sewer project, MLK Blvd Extension, and the Glynn Middle School (GMS) design drawings. The surveys were reviewed and combined with a field investigation to verify the general drainage patterns and flow routes for runoff within the studied areas.

Three (3) distinct drainage basins were determined to have a direct impact on Habersham Park's drainage. The first basin is a 48-acre residential neighborhood west of Habersham Park (Contributing Basin A). The second basin is the 12-acre Habersham Park neighborhood. The third basin is the Glynn Middle School (GMS) property consisting of 20 acres.

Field Reconnaissance

- During a recent field visit during a rain event, ditches were overgrown with vegetation, and stormwater infrastructure was in need of maintenance and/or repair.
- To reduce potential flooding issues, capacity of infrastructure may need to be increased, tidal control structures may be necessary, and/or divert flow to another outfall if feasible.



Figure 13: Habersham Park AOI

Lanier Boulevard at Glynn Middle School (GMS)

Hydrologic and hydraulic analysis for this area was covered in the *Habersham Park Hydrology Study* in 2010, prepared by Stantec.

In 2019, road improvements were made along Lanier Boulevard near GMS. During construction, it was determined that multiple pipes running under Lanier Boulevard needed to be replaced based on their deteriorated condition. According to the City, the pipes were replaced with the same size pipes at the same inverts and no additional hydrologic analysis was completed to determine if the existing pipes were adequately sized.

Field Reconnaissance

- During a recent field visit during a rain event, parts of Lanier Boulevard were under construction, ditches were near capacity, stormwater pipes under Lanier Boulevard were surcharged, and tidewater was flowing into outfall/Lanier system.
- The area has been the subject of stormwater complaints in the past.
- To reduce potential flooding issues, capacity of infrastructure may need to be increased, tidal control structures may be necessary, and/or divert flow to another outfall if feasible.



Figure 14: Lanier Boulevard at GMS AOI

In summary, existing stormwater issues are more significant in low-lying areas and in areas where the existing stormwater drainage system is affected by tides. Inadequate capacity of existing stormwater drainage infrastructure, incomplete maintenance, and erosion are commonalities in all drainage basins regarding flooding issues. Area and elevation limitations within public road rights-of-way may prove to be challenging in regard to improving ditch and/or pipe capacity. Construction permitting may also prove to be challenging due to work within tidally influenced drainage systems.

Outfall Evaluation

As shown in the FEMA Flood Zone Map located in Appendix J, the City is susceptible to flooding in multiple areas. In Table 3 below, each outfall identified by the City has been listed along with available GIS information and/or field verified data. Additional information has been included in Appendix B based on field reconnaissance and in Appendix F based on available GIS information. In some cases, the outfall was inaccessible during site visit and/or missing GIS information.

Table 3: Outfall Data					
Sub-Basin	Structure Info	# of Pipes	Pipe Size	Pipe Material	Tide Control
Albermarle Street / Ocean Avenue Outfall	Concrete Headwall	1	30"	RCP	None
Atlanta Avenue Outfall	Concrete Headwall	1	36"	RCP	None
Cook Street Outfall	Concrete Headwall	1	36"	RCP	Tidal Gate
Dartmouth Street Outfall	Clay Open Pipe	1	18"	Clay	None
E Gloucester Street Outfall	Concrete Headwall	1	48"	RCP	None
E Monck Street / Holly Avenue Outfall	Concrete Headwall	1	48"	RCP	None
E Prince Street Outfall	Concrete Headwall	1	7'x9'	BOX CULVERT	None
Fourth Street Outfall	HDPE Open Pipe	1	60"	HDPE	None
H Street Outfall	Missing GIS	UNK	UNK	RCP	None
Howe Street Outfall	Concrete Open Pipe	1	60"	RCP	None
I Street Outfall	Concrete Flared End Section	1	36"	RCP	None
Lanier Boulevard Outfall	Concrete Headwall	1	30"	RCP	None
Lanier Plaza Outfall	Concrete Open Pipe	1	24"	RCP	None
Lanier Boulevard S. of Middle School Outfall	Concrete Open Pipe	1	30"	RCP	None
M Street Outfall	Concrete Flared End Section	1	42"	RCP	None
Magnolia Park Outfall	Concrete Open Pipe	1	24"	RCP	None
Mansfield Street Outfall	Missing GIS	1	54"	RCP	Tidal Valve
N Street Outfall	Missing GIS	UNK	UNK	UNK	None
Newcastle Street Outfall (South)	Concrete Headwall	2	36"	RCP	Tide Gates
Newcastle Street Outfall (West)	Concrete Flared End Section	1	24"	RCP	None
Norwich Street Outfall	Ditch	N/A	N/A	N/A	None
P Street Outfall	Missing GIS	1	18"	RCP	None
Palmetto Outfall	Ditch	N/A	N/A	N/A	None
Parkwood Drive Outfall	Concrete Headwall	2	36"	RCP	Twin Tide Gates
T Street Outfall	Ditch	N/A	N/A	N/A	None
Talmadge Avenue Outfall	Concrete Flared End Section	1	18"	RCP	None
Talmadge and Macon Avenue Outfall	Concrete Open Pipe	1	18"	RCP	None
W Gloucester Street Outfall	Missing GIS	UNK	UNK	HDPE	None
W Monck Street Outfall	CMP Open Pipe	1	48"	CMP	None
W Prince Street Outfall	Clay Open Pipe	1	24"	Clay	None
Wildwood Drive Outfall	Concrete Headwall	1	48"	RCP	None

Ports Authority – Tide Control

Field Reconnaissance of 13 Outfalls

- During on-site field reconnaissance performed by others, it appears the majority of outfalls did not contain tide control, multiple outfalls were completely submerged based on the tide elevation, and/or the location was not accessible
- To reduce inland flooding issues, tide control may need to be installed either at the outfall or upstream location depending upon permitting issues and cost



Figure 15: Ports Authority – Tide Control AOI

Highway 17 Tide Control

Field Reconnaissance of 18 Outfalls

- During a recent field visit, the majority of outfalls do not contain tide control, multiple outfalls were completely submerged based on the tide elevation, and multiple outfalls were surrounded by marsh debris and trash, see Appendix C for photos and Appendix D for field visit notes at each outfall
- To reduce inland flooding issues, tide control may need to be installed either at the outfall or upstream location depending upon permitting issues and cost



Figure 16: Highway 17 Tide Control AOI

VI EXISTING STORMWATER SYSTEM DEFICIENCIES

Based upon the evaluation of existing stormwater inventory and known stormwater issues, it is apparent that deficiencies are causing serious flooding problems throughout the City. Deficiencies identified are broken down per category as follows:

1. GIS Stormwater Inventory

The City maintains its GIS database and is in the process of updating it. Upon evaluation, the following deficiencies per attribute are noted as follows:

- *Streams / Rivers*: This data appears to be blue lines taken from available USGS information for Glynn County. It does provide a good indication of waters of the state (streams / rivers) that exist in drainage basins within the City; however, more waters of the state may exist that are not shown in the available data. This data is considered minimally deficient.
- *Stormwater Outfalls*: The GIS attributes that define the 31 stormwater outfalls are limited with missing attributes that include the outfall type, size, condition, elevation, material, photograph, maintenance record, etc. It is unclear if more or fewer outfalls are present within the City. This data is considered moderately deficient.
- *Stormwater Structures*: Stormwater inlets may refer to catch basins, curb inlets, yard inlets, drop inlets, roadway driveway culvert headwalls, similar inlets, and outfalls. The GIS attributes that define the 3,659 stormwater structures are limited with missing attributes that include type, size, condition, elevation, material, photograph, maintenance record, flood complaints, year of construction, or other related attributes. It is unclear how many more inlets may exist within the City limits that are not identified. This data is considered moderately deficient.
- *Stormwater Detention*: The GIS attributes that define the 20 stormwater detention facilities are limited with missing attributes that include inlet size, outlet size, type, condition, elevations, material, storage capacity, photographs, maintenance records, or year of construction, or other related attributes. This data is considered moderately deficient.
- *Pipes / Conveyance*: Identification and associated attributes for much of this data is incomplete and/or unverified. Typical attributes would include pipe location, size, material, directional flow, slope, depth, elevations, condition, adequacy, maintenance records, year of construction, and other related attributes. This data is considered moderately deficient.
- *Watersheds / Drainage Basins*: The City's drainage basins are not defined in the GIS data. This data is considered extremely deficient.

2. Stormwater Drainage Infrastructure Inadequacy

From evaluation of site reconnaissance information and previous stormwater related consulting work, it is apparent most drainage issues within the City are related to infrastructure inadequacy regarding capacity, tidal influence, and/or maintenance.

Stormwater drainage infrastructure represents inlets, pipes, flumes, curb and gutter, swales, detention ponds, bridges, ditches, outfalls, etc. throughout the City. Inadequacy may refer to lack of, undersized, un-maintained, and/or damaged infrastructure.

According to the City's *Ordinance 984 - Section 22A-38* – “all conveyances including pipes and open channels except those associated with detention facilities shall be designed for the 25-year frequency storm. Inlets for conveyances shall be designed for an equal frequency storm. Similarly, Georgia Department of Transportation (GDOT) standards for infrastructure capacity typically require design criteria at the 25-year storm frequency event for culverts, drainage ditches, and other stormwater drainage infrastructure.”

Stormwater drainage infrastructure on City property and within City rights-of-way and drainage easements are the responsibility of the City to operate and maintain. As land use changes with residential, commercial, and industrial development over time, aging infrastructure that was once adequate may no longer be in regard to capacity. This may truly be the result of increased stormwater runoff from development constructed prior to City stormwater management regulations and subsequent enforcement as discussed in *Chapter 22A of the City's municipal code*.

Based upon our evaluation of information provided from site reconnaissance, available GIS information, and previous stormwater work, it is our opinion that extreme deficiencies with stormwater drainage infrastructure capacity are present in the City. It is unclear to the exact location and degree of all infrastructure capacity inadequacy based upon our evaluation of available information. However, of the areas of investigation that have been identified above, GWES has either performed and/or evaluated preliminary hydrologic and hydraulic analysis of those existing drainage conditions and deficiencies in the following section. As CIPs are identified, planned, and designed, additional hydrologic and hydraulic criteria along with topographic survey will be required to determine and/or verify infrastructure inadequacies specific to a project area.

VII HYDROLOGIC AND HYDRAULIC ANALYSIS

For each of the areas of investigation that have not been previously analyzed, a preliminary hydrologic and hydraulic model was prepared using Civil3D Hydraflow Hydrograph Software to estimate the runoff volumes and peak flows used to determine potential inadequacies within the system as well as to identify conceptual improvements.

Rainfall Estimation

Rainfall intensities for each area of investigation were derived from NOAA Atlas 14, Volume 9, Version 2 for Brunswick, GA, UGA (Latitude 31.1497°, -81.4956°).

The following table provides the rainfall depths that were used in the analysis:

Design Storm	Rainfall Depth
1-Year 24-Hour	3.36"
2-Year 24-Hour	4.08"
5-Year 24-Hour	5.04"
10-Year 24-Hour	5.76"
25-Year 24-Hour	6.72"
50-Year 24-Hour	7.68"
100-Year 24-Hour	8.16"

Peak Flow

Based on the constraints shown in the figure below, the Rational Method was used to determine peak runoff rate for each sub-basin delineated in the area of investigation, except for one sub-basin near Wildwood Drive. The SCS Method was utilized to estimate peak flows in that sub-basin due to the existing stormwater management facility. These methods were selected based upon a verification of their accuracy in duplicating local hydrologic estimates for a range of design storms and the analysis of these parameters is fundamental to the design of storm drainage systems.

Method	Size Limitations ¹	Comments
Rational	0 – 25 acres	Method can be used for estimating peak flows and the design of small site or subdivision storm sewer systems. <u>Not to be used for storage design.</u>
SCS ²	0 – 2000 acres*	Method can be used for estimating peak flows and hydrographs for all design applications.
USGS	25 acres to 25 mi ²	Method can be used for estimating peak flows for all design applications.
USGS	128 acres to 25 mi ²	Method can be used for estimating hydrographs for all design applications.
Water Quality	Limits set for each Structural Control	Method used for calculating the Water Quality Volume (WQ _v)

¹Size limitation refers to the drainage basin for the stormwater management facility (e.g., culvert, inlet).
²There are many readily available programs (such as HEC-1) that utilize this methodology
* 2,000-acre upper size limit applies to single basin simplified peak flow only.

Figure 17: Peak Flow Method Constraints

Contributing Drainage Areas and Sub-basins

The contributing watersheds for each area of investigation were delineated based on available GIS information and 1-foot contours provided by the City. Each area was split into contributing sub-basins when modeling to estimate the existing runoff volumes and peak flows.

Model Results for Existing Flow

Based on the parameters listed above, the maximum runoff rate for each sub-basin was calculated for a 25-year storm. The existing stormwater infrastructure was then analyzed to determine the current capacity of the system versus the estimated capacity required to sufficiently handle a 25-year storm. Those results have been included in a table for each area of investigation along with a summary identifying potential causes for drainage issues in the area. The model results for existing flow are included in **Appendix F**.

Albany Street (near F and G Street)

Model Results for Existing Flow

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-----	0.000	7.846	-----	9.509	10.71	12.45	13.82	15.18	Albany Street (near F and G Street)

Additional Information

Hydraflow Hydrographs Model Summary											
Drainage Sub-Basin	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Pipe Size/Ditch 2	Pipe Capacity (cfs)	Highest Elev. (ft)	Lowest Elev. (ft)	Slope	Sub-Basin Area (Ac.)	Tc (min)	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed
H Street Outfall	12" CMP	1.21			10	8	0.36%	4.77	21.00	12.45	24" RCP

Results Summary

Based upon the evaluation of available GIS information provided by the City and collected during field reconnaissance, preliminary hydrologic and hydraulic analysis of this area of investigation has identified the following issues:

- Existing infrastructure is undersized to handle 25-year storm
 - Existing 12" CMP, Clay, and HDPE Pipes are inadequate
- Existing topography in area has resulted in flooding issues (low-lying area)
- Existing infrastructure is in need of maintenance
- Lack of infrastructure in area has resulted in additional flooding issues
- Missing GIS information

Parkwood Drive (West End)

Model Results for Existing Flow

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-----	0.000	5.081	-----	6.145	6.914	8.035	8.911	9.783	Parkwood Ave - A
2	Rational	-----	0.000	7.442	-----	9.081	10.26	11.96	13.30	14.62	Parkwood Ave - B

Additional Information

Hydroflow Hydrographs Model Summary												
Drainage Sub-Basin	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Pipe Size/Ditch 2	Pipe Capacity (cfs)	Highest Elev. (ft)	Lowest Elev. (ft)	Slope	Sub-Basin Area (Ac.)	Tc (min)	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed	
A	12" RCP	2.23			15	13	0.39%	3.01	20.00	8.04	24" RCP	
B	12" RCP	2.02	15" CMP	2.07	14.5	13	0.28%	4.98	25.00	11.96	24" RCP	

Results Summary

- Existing infrastructure is undersized to handle 25-year storm
 - Existing 12" RCP's and 15" CMP's are inadequate
- Existing infrastructure is in need of maintenance
- Lack of infrastructure in area has resulted in additional flooding issues
- Missing GIS information

Wildwood Ditch (near Boxwood Street and Myrtle Avenue)

Model Results for Existing Flow

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-----	26.01	41.09	-----	72.12	103.93	156.65	205.02	257.15	Pond Sub-Basin
2	Rational	-----	0.000	22.87	-----	27.49	30.84	35.75	39.58	43.40	Hospital to Ditch
3	Rational	-----	0.000	14.20	-----	17.41	19.70	23.02	25.61	28.19	South of Wildwood Drive
4	Rational	-----	0.000	22.16	-----	26.63	29.88	34.63	38.35	42.05	South of Wildwood Ditch
5	Rational	-----	0.000	9.718	-----	11.90	13.45	15.71	17.47	19.23	North of Wildwood Ditch
6	Reservoir	1	0.769	1.251	-----	2.342	3.416	5.751	8.831	11.24	Wildwood Pond
7	Combine	2, 3, 6	0.769	31.49	-----	38.06	42.80	49.72	55.14	60.52	Wildwood and Lakeside Intersection
8	Combine	4, 5, 7	0.769	59.77	-----	72.18	81.15	94.24	104.48	114.67	Wildwood Ditch Flow

Additional Information

Hydraflow Hydrographs Model Summary												
Drainage Sub-Basin	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Pipe Size/Ditch 2	Pipe Capacity (cfs)	Highest Elev. (ft)	Lowest Elev. (ft)	Slope	Sub-Basin Area (Ac.)	Tc (min)	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed	
Hospital to Ditch					14	11	0.60%	12.48	22.60	35.75	36" RCP	
South of Wildwood	12"RCP	2.77			11	9	0.21%	10.15	17.00	23.02	30" RCP	
Pond Sub-Basin					13	10	0.44%	36.04	28.00	5.75	18" RCP	
South of Wildwood Ditch	15"RCP	4.29	18"RCP	6.98	10	8	0.41%	12.09	17.00	34.63	36" RCP	
North of Wildwood Ditch	18"RCP	5.77	15"RCP	3.55	11	8.5	0.30%	11.33	27.00	15.71	24" RCP	

Existing Wildwood Pond Assumptions

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-----	26.01	41.09	-----	72.12	103.93	156.65	205.02	257.15	Pond Sub-Basin
2	Rational	-----	0.000	22.87	-----	27.49	30.84	35.75	39.58	43.40	Hospital to Ditch
3	Rational	-----	0.000	14.20	-----	17.41	19.70	23.02	25.61	28.19	South of Wildwood Drive
4	Rational	-----	0.000	22.16	-----	26.63	29.88	34.63	38.35	42.05	South of Wildwood Ditch
5	Rational	-----	0.000	9.718	-----	11.90	13.45	15.71	17.47	19.23	North of Wildwood Ditch
6	Reservoir	1	0.769	1.251	-----	2.342	3.416	5.751	8.831	11.24	Wildwood Pond
7	Combine	2, 3, 6	0.769	31.49	-----	38.06	42.80	49.72	55.14	60.52	Wildwood and Lakeside Intersection
8	Combine	4, 5, 7	0.769	59.77	-----	72.18	81.15	94.24	104.48	114.67	Wildwood Ditch Flow

Additional Capacity Analysis of Existing Infrastructure

Existing Drainage Infrastructure	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Slope	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed
Lakeside Drive	36" RCP	36.61	0.30%	49.72	42" RCP
Willow	36" RCP	36.61	0.30%	49.72	42" RCP
Wisteria	2 - 30" RCP	45.04	0.30%	94.24	54" RCP
48" @ Church	48" RCP	78.85	0.30%	94.24	54" RCP
Ditch Capacity	12'x8'x4' Deep	18.63 to 49.68	0.30%	94.24	54" RCP

Results Summary

- Existing infrastructure is undersized to handle 25-year storm
 - Existing culverts at Lakeside Drive, Willow Ave, and Wisteria Ave are inadequate
 - Existing 48" RCP near church at eastern end of Wildwood ditch system is inadequate
 - Existing ditch at eastern end is inadequate
- Existing system design is resulting in bottlenecking
- System capacity is affected by tides; however, system is not equipped with tide control
- Existing infrastructure is in need of maintenance
- Missing GIS information

Altama Avenue and Second Street

Model Results for Existing Flow

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-----	0.000	2.609	-----	3.113	3.481	4.022	4.446	4.867	Altama and 2nd Street Model

Additional Information

Hydraflow Hydrographs Model Summary												
Drainage Sub-Basin	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Pipe Size/Ditch 2	Pipe Capacity (cfs)	Highest Elev. (ft)	Lowest Elev. (ft)	Slope	Sub-Basin Area (Ac.)	Tc (min)	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed	
I Street Outfall					17	15	0.75%	1.30	14.00	4.02	15" RCP	

Results Summary

- Lack of infrastructure in area has resulted in flooding issues
- Existing topography in area has resulted in flooding issues (low-lying area)
- Missing GIS information

Intersection of Macon and Talmadge Avenue

Model Results for Existing Flow

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-----	0.000	6.500	-----	7.846	8.820	10.24	11.35	12.46	Talmadge and Macon Int. Model

Additional Information

Hydroflow Hydrographs Model Summary											
Drainage Sub-Basin	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Pipe Size/Ditch 2	Pipe Capacity (cfs)	Highest Elev. (ft)	Lowest Elev. (ft)	Slope	Sub-Basin Area (Ac.)	Tc (min)	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed
Talmadge Avenue Outfall	12" RCP	2.62			8	5	0.54%	3.75	19.00	10.24	24" RCP

Results Summary

- Existing infrastructure is undersized to handle 25-year storm
 - Existing 12" RCP's are inadequate
- Existing topography in area has resulted in flooding issues (low-lying area)
- System capacity is affected by tides; however, system is not equipped with tide control
- Lack of infrastructure in area has resulted in additional flooding issues
- Existing infrastructure is in need of maintenance
- Missing GIS information

Talmadge Avenue Ditches

Model Results for Existing Flow

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-----	0.000	2.236	-----	2.687	3.015	3.494	3.870	4.243	Talmadge Ditches A Model
2	Rational	-----	0.000	4.227	-----	5.068	5.681	6.578	7.280	7.979	Talmadge Ditches B Model
3	Rational	-----	0.000	2.822	-----	3.392	3.806	4.411	4.885	5.356	Talmadge Ditches C Model
4	Rational	-----	0.000	1.649	-----	1.982	2.224	2.578	2.855	3.130	Talmadge Ditches C Model

Additional Information

Hydroflow Hydrographs Model Summary												
Drainage Sub-Basin	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Pipe Size/Ditch 2	Pipe Capacity (cfs)	Highest Elev. (ft)	Lowest Elev. (ft)	Slope	Sub-Basin Area (Ac.)	Tc (min)	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed	
A (Northwest)					12	8	0.77%	1.22	17.00	3.49	15" RCP	
B (Southwest)					12	8	0.73%	2.24	16.00	6.58	15" RCP	
C (Southeast)					8	5.5	0.59%	1.54	17.00	4.41	15" RCP	
D (Northeast)					8	5.5	0.62%	0.90	17.00	2.58	12" RCP	

Results Summary

- Lack of infrastructure in area has resulted in flooding issues
- Existing topography in area has resulted in flooding issues (low-lying area)

Urbana Neighborhood at Atlanta Avenue

Model Results for Existing Flow

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-----	0.000	5.621	-----	6.798	7.649	8.889	9.859	10.82	Urbana @ Atlanta Avenue A Model
2	Rational	-----	0.000	8.474	-----	10.57	12.06	14.19	15.85	17.50	Urbana @ Atlanta Avenue B Model
3	Rational	-----	0.000	12.35	-----	15.16	17.16	20.07	22.33	24.59	Urbana @ Atlanta Avenue C Model
4	Rational	-----	0.000	3.128	-----	3.798	4.280	4.982	5.530	6.076	Urbana @ Atlanta Avenue D Model
5	Rational	-----	0.000	1.266	-----	1.531	1.723	2.002	2.220	2.438	Urbana @ Atlanta Avenue E Model
6	Combine	1, 2,	0.000	9.473	-----	11.61	13.13	15.34	17.06	18.78	A+B Resultant
7	Combine	3, 6	0.000	21.03	-----	25.87	29.32	34.31	38.20	42.07	A+B+C Resultant
8	Combine	4, 7	0.000	23.16	-----	28.46	32.24	37.70	41.97	46.21	A+B+C+D Resultant
9	Combine	5, 8	0.000	23.85	-----	29.30	33.18	38.80	43.19	47.55	A+B+C+D+E Resultant

Additional Information

Hydraflow Hydrographs Model Summary												
Drainage Sub-Basin	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Pipe Size/Ditch 2	Pipe Capacity (cfs)	Highest Elev. (ft)	Lowest Elev. (ft)	Slope	Sub-Basin Area (Ac.)	Tc (min)	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed	
A (West to East)	48" RCP	74.8			12	10	0.27%	3.33	20.00	8.89	24" RCP	
B	12" RCP	1.34	15" RCP	2.88	11	9.5	0.14%	8.05	44.00	14.19	30" RCP	
C	12" Clay	1.89	15" Clay	3.43	12	9	0.28%	9.01	29.00	20.07	30" RCP	
D	12" RCP	1.99			10	8.75	0.31%	1.95	22.00	4.98	18" RCP	
E	12" RCP	2.02			9	8	0.32%	0.75	20.00	2.02	12" RCP	

Results Summary

- Some existing infrastructure is undersized to handle 25-year storm
 - Existing 12" and 15" pipes at the intersections of Niles Ave, Goodyear Ave, and Wilson Ave with Atlanta Ave are inadequate
- Existing 48" RCP running down the middle of Atlanta Avenue appears to be adequate based upon the results of the model
- Existing topography in area has resulted in flooding issues (low-lying area)
- Lack of infrastructure in area has resulted in additional flooding issues
- Existing infrastructure is in need of maintenance
- Height of pavement in relation to existing gutter line may have contributed to maintenance issues with the curb and gutter
- Missing GIS information

Riverside Neighborhood

Model Results for Existing Flow @ Wassaw Island

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-----	0.000	2.447	-----	2.960	3.331	3.871	4.293	4.713	Riverside (Wassaw Island) Model
2	Rational	-----	0.000	0.853	-----	1.005	1.118	1.285	1.416	1.547	Riverside (Entrance) Model

Additional Information

Hydroflow Hydrographs Model Summary												
Drainage Sub-Basin	Pipe Size/Ditch 1	Pipe Capacity (cfs)	Pipe Size/Ditch 2	Pipe Capacity (cfs)	Highest Elev. (ft)	Lowest Elev. (ft)	Slope	Sub-Basin Area (Ac.)	Tc (min)	Max Runoff Rate 25 Year (cfs)	Min Pipe Size Needed	
Wassaw Island	N/A		N/A		6	5	0.34%	1.45	20.00	3.87	18"RCP	
Entrance	N/A		N/A		6	5	0.93%	0.37	10.00	1.29	12"RCP	

Results Summary

- Existing infrastructure is undersized to handle 25-year storm without tide control
- Existing topography in area has resulted in flooding issues (low-lying area)
- Residential lots that have been built up to minimize flooding on the property have resulted in flooding issues on neighboring properties and in the right-of-way
- System capacity is affected by tides; however, system is not equipped with tide control
- Lack of infrastructure in area has resulted in additional flooding issues
- Existing infrastructure is in need of maintenance
- Missing GIS information

P Street Basin

Previously Completed Hydrologic and Hydraulic Analysis

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-----	83.81	114.20	-----	165.85	197.06	242.24	273.50	315.08	P St Sub-Basin
2	SCS Runoff	-----	35.10	48.05	-----	70.24	83.73	103.30	116.88	134.97	Upper N St Sub-Basin
3	SCS Runoff	-----	47.64	64.91	-----	94.27	112.01	137.69	155.46	179.10	K St Sub-Basin
4	SCS Runoff	-----	65.03	88.36	-----	127.87	151.67	186.00	209.70	241.20	Lower N St Sub-Basin
5	Combine	1, 2, 3, 4	156.41	213.63	-----	311.46	370.73	456.53	515.95	595.19	System Outfall

Results Summary

Based upon the evaluation of previously completed hydrologic and hydraulic of this area of investigation and collected during field reconnaissance, the following issues were identified:

As presented in the "N" & "P" St. Combined Hydrology Study completed by Stantec in September 2011, "an analysis of the hydrology and the hydraulics of the existing infrastructure indicates the receiving pipe on Hercules property is undersized. The infrastructure along "N" St has sufficient capacity to carry runoff generated within the watershed, however, the receiving pipe at Hercules/Pinova will act as a bottleneck and surcharge the "N" St collection system for the 5-year, 24-hour storm and above. Two general options are offered for alleviating this bottleneck; either install additional piping/ditch capacity at Hercules or re-route a portion of the flow such that it has a free-flowing outfall.

The "P" St sub-basin appears to contain sufficient infrastructure to transport runoff; however, improper routing and aging infrastructure have likely reduced its runoff capacity. Basic improvements along Bartow and Cleburne streets would connect existing "P" St infrastructure along N St and improve the overall "P" St system capacity. Furthermore, it is recommended that an investigation be performed regarding the structural integrity and degree of sediment build-up within the existing infrastructure in the "P" St sub-basin. The results of this investigation may suggest the need to improve aging infrastructure in order to maximize runoff capacity within this sub-basin."

Magnolia Park Outfall to Fairgrounds

Previously Completed Hydrologic and Hydraulic Analysis

CITY OF BRUNSWICK, GEORGIA COLLEGE PARK/ MAGNOLIA PARK DRAINAGE STUDY														
EXISTING DRAINAGE STRUCTURES														
WATERSHED BASIN: MP – MAGNOLIA PARK														
STRUCTURE IDENTIFIER	LOCATION OF DRAINAGE STRUCTURE	STRUCTURE DESCRIPTION	CROSS SECTIONAL FLOW AREA (S.F.)	THEORETICAL EXISTING STRUCTURE CAPACITY (1) (cfs)	WATERSHED DRAINAGE AREA (ACRES)	ESTIMATED EXISTING CONIDON DISCHARGES FOR STORM EVENTS, cfs (2)						STATUS (3)		COMMENTS
						2 YEAR	5 YEAR	10 YEAR	25 YEAR	50 YEAR	100 YEAR	STRUCTURE ADEQUATE FOR 25 YEAR STORM		
												YES	NO	
MP2	B.O.E. ACCESS ROAD	TRIPLE 60" RCP	56.9	510 (o)	802	170	257	349	463	546	648	X		

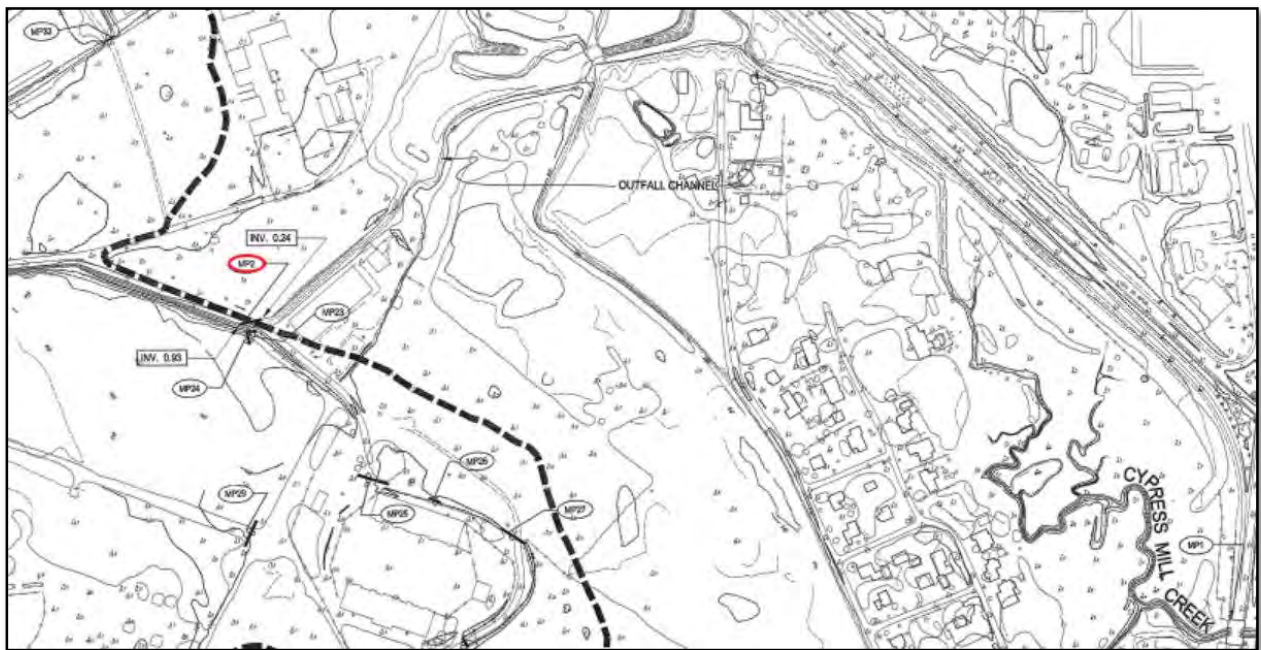


Figure 18: MP2 Structure Location

Additional Tailwater Calculation Inputs:

Headwater (Upstream Water Surface Elevation): 3.43 (1/2 full)

Culvert Inlet Invert Elevation: 0.93

Culvert Diameter: 60.00 inches

Length of Culvert: 60.00 linear feet

Culvert Outlet Invert Elevation: 0.24

Tailwater (Downstream) Elevation: 2.74 (1/2 full)

Capacity for 1 x 60" RCP (1/2 full) = 43.0 cfs

Capacity for 3 x 60" RCP (1/2 full) = **129.0 cfs**

Results Summary

Based upon the evaluation of previously completed hydrologic and hydraulic of this area of investigation and collected during field reconnaissance, the following issues were identified:

- Existing infrastructure is undersized to handle 25-year storm without tide control
- System capacity is affected by tides; however, system is not equipped with tide control
- Missing GIS information

As mentioned earlier, many of the most recent projects have been designed to address flooding issues within the Magnolia Park neighborhood; however, the downstream impacts of these improvements have not been addressed. Currently, all flows from the Magnolia Park basin flow under Altama Avenue and along Community Action Drive to three (3) existing 60" RCPs. According to the *College Park/Magnolia Park Drainage Study*, the theoretical existing structure capacity of the three (3) 60" RCPs is 510 cfs, which would be adequate to handle the 25-year storm (463 cfs). While that may be accurate, the calculations do not appear to take into account the tailwater condition created by the tidally influenced Cypress Mill Creek. Assuming the pipe is half full (as it was during field visit), the theoretical capacity of the three (3) 60" RCPs drops to 129.0 cfs when a tailwater is introduced to the equation based upon the inputs listed above. At 129.0 cfs, the RCPs would no longer be able to handle the 25-year storm and may result in potential flooding issues upstream.

Previously Completed Hydrologic and Hydraulic Analysis

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)							Hydrograph description	
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr		100-Yr
1	SCS Runoff	---	69.02	86.22	---	115.23	138.54	161.85	196.74	225.71	Contributing Basin A
2	SCS Runoff	---	20.08	25.06	---	33.46	40.21	46.95	57.04	65.42	Habersham Park Basin
3	Combine	1, 2	87.75	109.46	---	146.26	175.84	205.41	249.68	286.42	Channel A

Summary of Drainage Patterns from Drainage Basins to the Marsh

- Runoff from all three drainage basins is routed through Channel "A" which lies between GMS and Habersham Park. ($Q_{25}=220$ cfs)
- A 36" pipe under Lanier Blvd. passes runoff from Channel "A" to the marsh between Lanier Blvd. and Highway 17. ($Q_{36" \text{ Pipe}} = 47$ cfs)

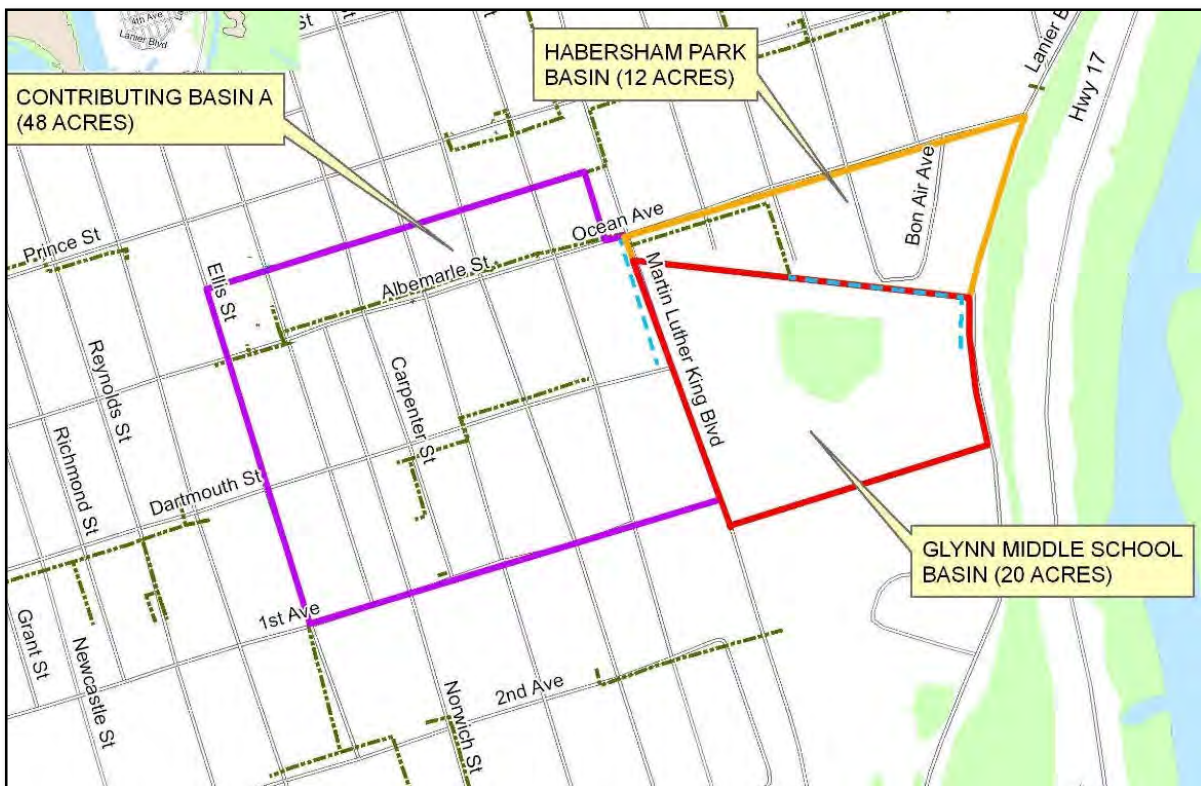


Figure 19: Drainage Basin Summary Map

Results Summary

Based upon the evaluation of previously completed hydrologic and hydraulic of this area of investigation and collected during field reconnaissance, the following issues were identified:

Potential Causes of Flooding in Habersham Park

- The piping intended to collect and pass runoff from Habersham Park is not adequately sized to pass the combined flow from Contributing Basin "A" and Habersham Park.
- The grate inlets within Habersham Park provide a source of relief for the undersized piping system, allowing runoff to surcharge out of these inlets.
- Furthermore, the grate inlets are not capable of providing drainage relief within the neighborhood.

Sizing and Condition of Channel Lying Between GMS and Habersham Park (Channel "A")

- Channel "A" is overgrown with vegetation (see photo right). Improved maintenance would increase the ability of Channel "A" to pass flow.
- Habersham Park is lower than GMS property. Any spillage out of Channel "A" will spill into Habersham park rather than GMS property.

Lanier Blvd Crossing

- Flow is intended to pass from Channel "A" through a 36" pipe under Lanier Blvd. ($Q_{25} = 220$ cfs, $Q_{36" \text{ pipe}} = 47$ cfs)
- Culvert is not adequately sized to pass flow from all three drainage basins causing backup into Channel "A" and overtopping of Lanier Blvd.

VIII IDENTIFIED CAPITAL IMPROVEMENT PROJECTS

Based upon coordination with City staff, site reconnaissance, evaluation of previously performed stormwater work, and existing stormwater drainage infrastructure deficiencies, a list of 15 potential CIPs with associated preliminary costs are evaluated for the City's use in establishing future Stormwater Improvement and Operation and Maintenance (O&M) Budgets.

Preliminary costs include approximate engineering and construction fees, but do not include land and easement acquisition or associated legal fees. These costs are subject to change based upon market conditions and the extent of work required determined during the planning and engineering phase of each CIP. Detailed opinion of probable costs of proposed improvements have been included in Appendix K. These CIPs may not include all stormwater related issues throughout the City and are not described in any particular order. Identified CIPs were discussed with City prior to detailed evaluation. Prioritization of potential CIPs are further discussed in detailed in the next section.

A. Albany Street (near F and G Street)

Localized flooding issues along Albany Street between F and G Streets have been documented by the City during periods of heavy rainfall. These flooding issues may be attributed to undersized infrastructure, a lack of infrastructure, and a need for maintenance. Recommended improvements may include, but are not limited to, installation and/or replacement of piping and structures to adequately handle stormwater flow within its specific watershed. Removal and replacement of existing curb and gutter and pavement may also be necessary to properly convey stormwater to recommended infrastructure improvements. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, 24-inch diameter pipes are recommended to handle the 25-year storm.

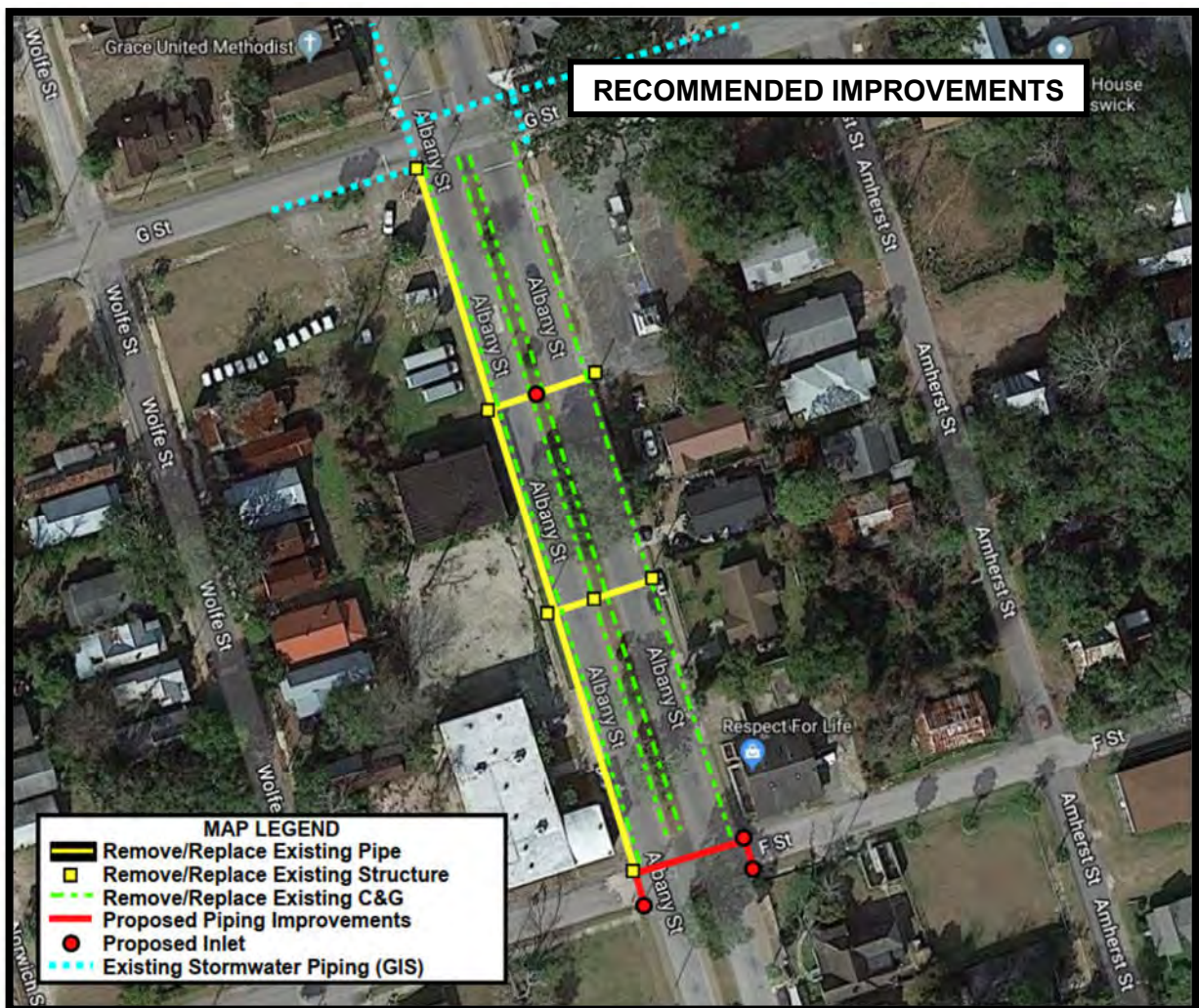


Figure 20: Albany Street (near F and G Street) Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$50,000
Traffic and Pedestrian Control	\$10,000
Erosion and Sedimentation Control	\$20,000
Grading Complete	\$50,000
Storm Drainage Infrastructure	\$393,500
Miscellaneous Utility Relocation Allowance	\$50,000
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Sub-Total	\$573,500
	<hr/>
Contingency (25%)	\$143,375
Engineering (10%)	\$71,688
	<hr/>
Total	\$788,563

B. Parkwood Drive (West End)

Localized flooding issues along the west end of Parkwood Drive have been documented by the City during periods of heavy rainfall. These flooding issues may be attributed to undersized infrastructure, a lack of infrastructure, and a need for maintenance. Recommended improvements may include, but are not limited to, installation and/or replacement of piping and structures to adequately handle stormwater flow within its specific watershed. Removal and replacement of existing curb and gutter and pavement may also be necessary in the R/W adjacent to the Coastal Medical Equipment and Uniforms parking lot in order to properly convey stormwater to recommended infrastructure improvements. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, 24-inch diameter pipes are recommended to handle the 25-year storm.

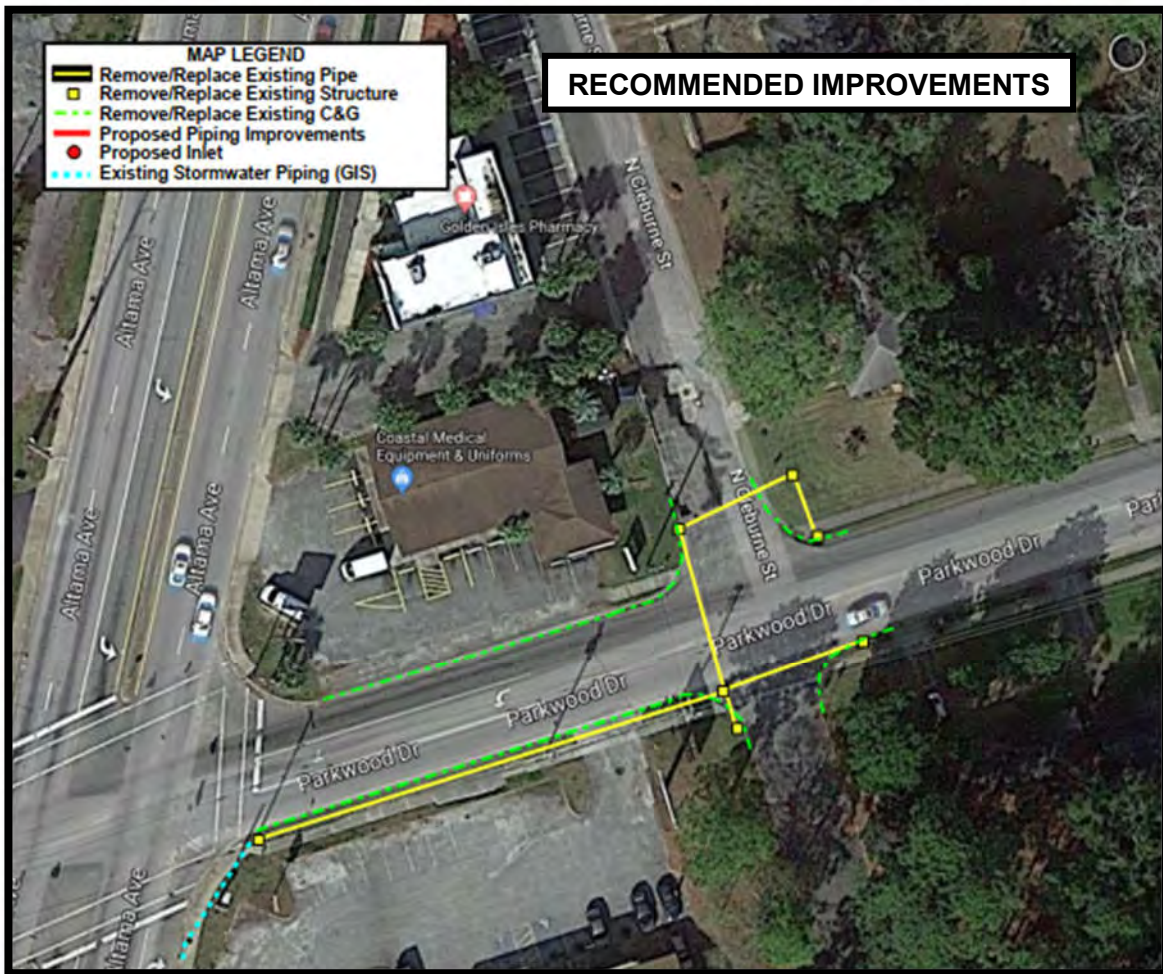


Figure 21: Parkwood Drive (West End) Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$35,000
Traffic and Pedestrian Control	\$5,000
Erosion and Sedimentation Control	\$15,000
Grading Complete	\$40,000
Storm Drainage Infrastructure	\$169,475
Miscellaneous Utility Relocation Allowance	\$25,000
	<hr/>
Sub-Total	\$289,475
	<hr/>
Contingency (25%)	\$72,369
Engineering (10%)	\$36,184
	<hr/>
Total	\$398,028

C. Wildwood Ditch (Near Boxwood Street and Myrtle Avenue)

Known flooding issues exist along the Wildwood Drive ditch system near Boxwood Street and Myrtle Avenue. Additional flooding issues have recently been reported in the areas around the Goodyear Neighborhood Pond. These flooding issues may be attributed to undersized infrastructure, a lack of tide control, an inadequate ditch system, a lack of storage capacity, and a need for maintenance. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, the existing culverts at Lakeside Drive, Willow Avenue, and Wisteria Avenue are inadequate and may need to be replaced. Recommended improvements may include, but are not limited to, installation and/or replacement of piping and structures, installation of tide control, providing ditch improvements, and performing pond improvements to adequately handle stormwater flow within its specific watershed. Recommended ditch improvements between Willow and Wisteria Avenue include the installation of 4" grout filled erosion control mattress to prevent additional erosion and reduce maintenance issues. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, 42-inch diameter pipes have been recommended from Lakeside Drive to Willow Avenue and 54-inch diameter pipes have been recommended from Wisteria Avenue to an existing ditch running along Myrtle Avenue in order to handle the 25-year storm. Specific pond improvements will need to be determined through additional investigation, survey, and system modeling.

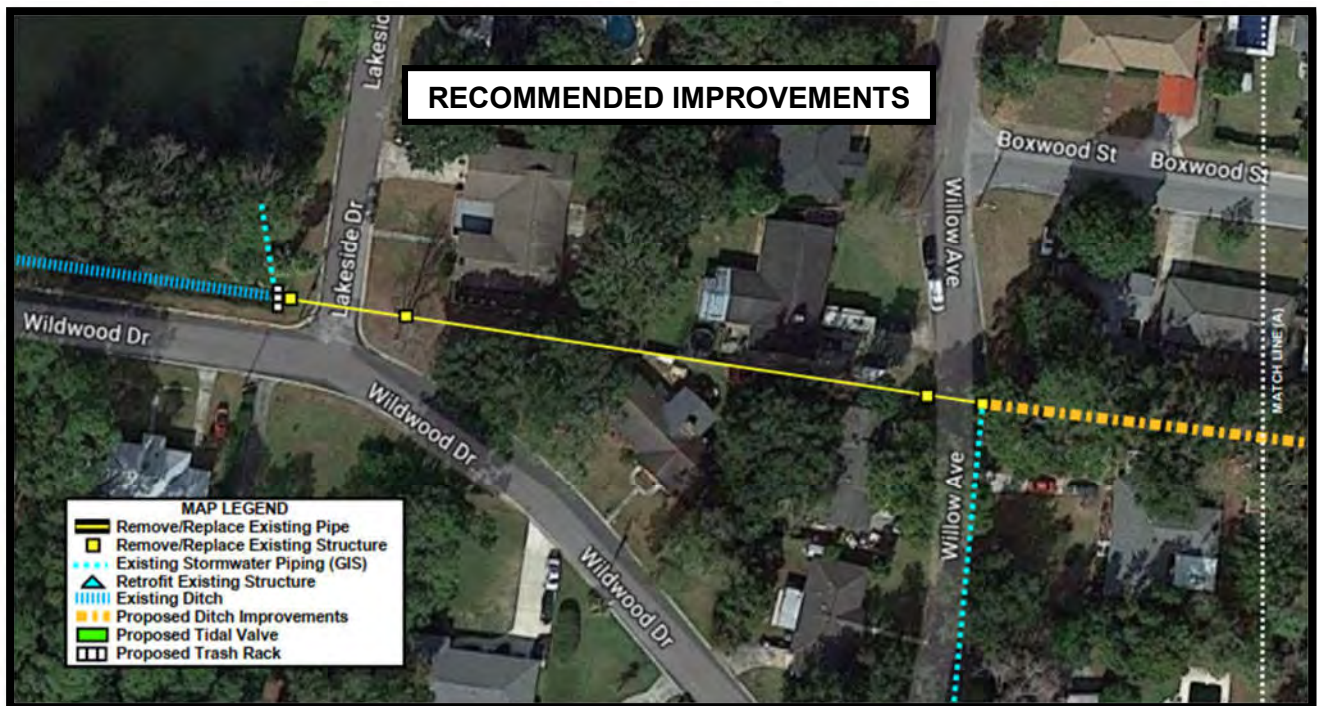


Figure 22: Wildwood Ditch (near Lakeside Dr and Willow Ave) Recommended Improvements



Figure 22: Wildwood Ditch (near Wisteria Ave and Boxwood St) Recommended Improvements

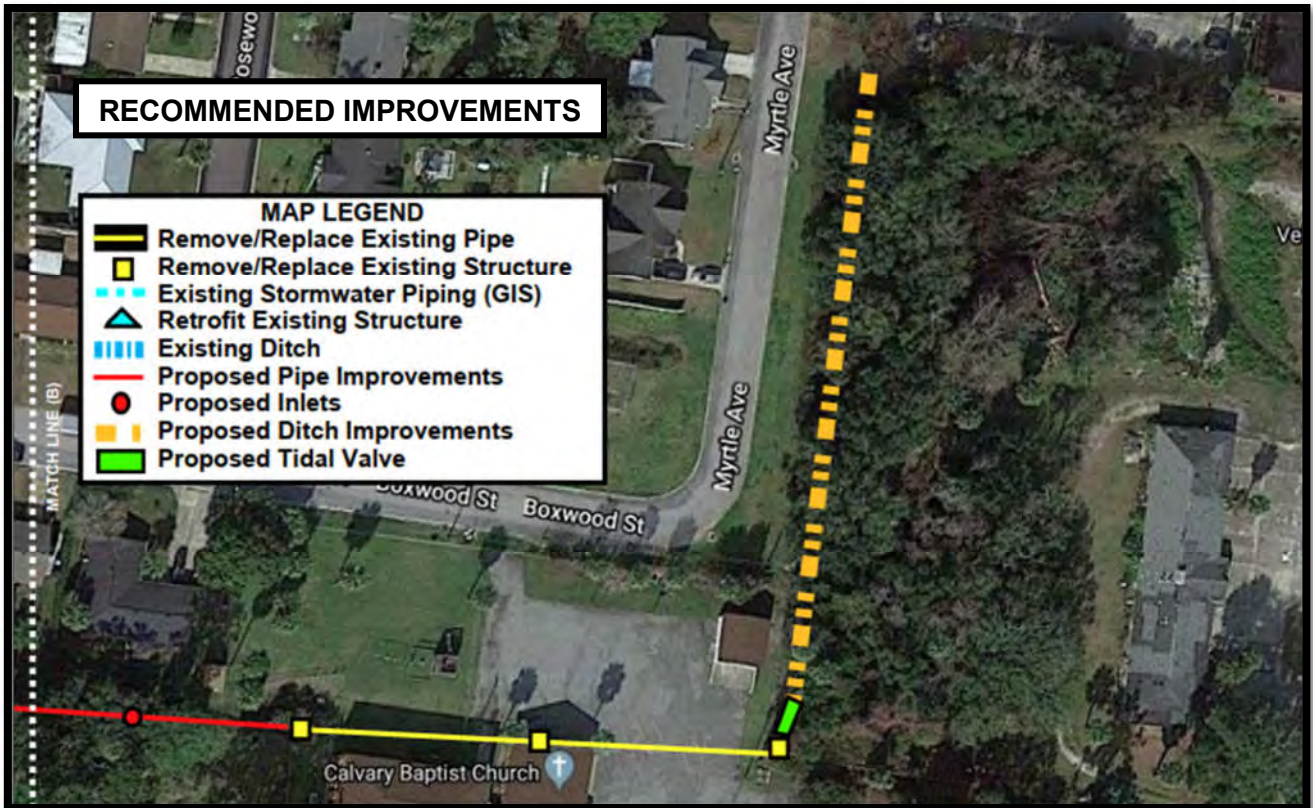


Figure 23: Wildwood Ditch (near Boxwood St and Myrtle Ave) Recommended Improvements



Figure 24: Goodyear Pond Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$100,000
Traffic and Pedestrian Control	\$15,000
Erosion and Sedimentation Control	\$20,000
Grading Complete	\$50,000
Storm Drainage Infrastructure	\$546,175
Goodyear Neighborhood Pond Improvements	\$250,000
Miscellaneous Utility Relocation Allowance	\$35,000
Sub-Total	\$1,016,175
Contingency (25%)	\$254,044
Engineering (10%)	\$127,022
Total	\$1,397,241

D. Altama Avenue and Second Street

Localized flooding issues at the intersection of Second Street and Altama Avenue have been documented by the City during periods of heavy rainfall. These flooding issues may be attributed to a lack of infrastructure. Recommended improvements may include, but are not limited to, installation of piping and structures to adequately convey stormwater flow to an existing stormwater system. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, 15-inch diameter pipes are recommended to handle the 25-year storm.



Figure 24: Altama Avenue and Second Street Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$35,000
Traffic and Pedestrian Control	\$5,000
Erosion and Sedimentation Control	\$5,000
Grading Complete	\$10,000
Storm Drainage Infrastructure	\$52,450
Miscellaneous Utility Relocation Allowance	\$25,000
Sub-Total	<u>\$132,450</u>
Contingency (25%)	\$33,113
Engineering (10%)	\$16,556
Total	<u>\$182,119</u>

E. Intersection of Macon and Talmadge Avenue

Known flooding issues exist at the intersection of Macon Avenue and Talmadge Avenue during periods of heavy rainfall. These flooding issues may be attributed to inadequately sized infrastructure, a lack of infrastructure tide control, and a need for maintenance. Recommended improvements may include, but are not limited to, installation and/or replacement of piping and structures, installation of curb and gutter along Macon Avenue, and installation of tide control to adequately handle stormwater flow within its specific watershed. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, 24-inch diameter pipes are recommended to handle the 25-year storm.



Figure 25: Intersection of Macon and Talmadge Avenue Recommended Improvements



Figure 26: Macon Avenue Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$50,000
Traffic and Pedestrian Control	\$5,000
Erosion and Sedimentation Control	\$15,000
Grading Complete	\$40,000
Storm Drainage Infrastructure	\$277,025
Miscellaneous Utility Relocation Allowance	\$50,000
Sub-Total	<hr/> \$437,025
Contingency (25%)	\$109,256
Engineering (10%)	\$54,628
Total	<hr/> \$600,909

F. Talmadge Avenue Ditches

Known flooding issues exist along Talmadge Avenue during periods of heavy rainfall. These flooding issues may be attributed to a lack of stormwater infrastructure. Recommended improvements may include, but are not limited to, construction of a ditch system along both sides of the road to adequately convey stormwater flow to an existing stormwater system. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, 18-inch diameter road culverts have been recommended to handle the 25-year storm.



Figure 27: Talmadge Avenue Ditches Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$35,000
Traffic and Pedestrian Control	\$10,000
Erosion and Sedimentation Control	\$15,000
Grading Complete	\$100,000
Storm Drainage Infrastructure	\$51,075
Miscellaneous Utility Relocation Allowance	\$25,000
	<hr/>
Sub-Total	\$236,075
	<hr/>
Contingency (25%)	\$59,019
Engineering (10%)	\$29,509
	<hr/>
Total	\$324,603

G. Ports Authority – Tide Control

Existing stormwater issues are more significant in low-lying areas and in areas where the existing stormwater drainage system is affected by tides. Recommended improvements may include, but are not limited to, installation of tide control to adequately handle stormwater flow within each sub-basin. While it would be beneficial to install tide control on every outfall throughout the City, it may not be feasible due to construction permitting, outfall location, and/or overall cost benefit. Based upon available GIS information and/or field verified data, preliminary budget costs are provided for each outfall in the table below. Budget estimates include the Tideflex Inline Check Valve (additional info provided in Appendix J) + Freight, as well as, the installed probable cost (typically ranging from 2 to 3.5 times the valve cost). Due to potential permitting issues and cost, tide control may need to be installed either at the outfall or an upstream location. Additional analysis and design services may be necessary to determine whether the existing outfall or upstream location is adequate to handle the 25-year storm within each sub-basin. In some applications, it may be necessary to utilize alternative tide control technologies based upon the outfall location and design limitations.

Preliminary Budgeting Cost

Ports Authority – Tide Control Budget Costs						
Sub-Basin	# of Pipes	Pipe Size (in)	Pipe Material	Tide Control	Preliminary Budget (Valve + Freight)	Preliminary Budget (Installed)
Dartmouth Street Outfall	1	18*	Clay	None	\$ 3,828.00	\$ 11,484.00
H Street Outfall*	UNK	UNK	RCP	UNK	\$ 50,000.00	\$ 150,000.00
Howe Street Outfall	1	60*	RCP	None	\$ 55,302.00	\$ 165,906.00
M Street Outfall	1	42*	RCP	None	\$ 17,076.00	\$ 51,228.00
Mansfield Street Outfall	1	54*	RCP	Tidal Valve	\$ 50,000.00	\$ 150,000.00
Newcastle Street Outfall (West)	1	24*	RCP	None	\$ 5,550.00	\$ 16,650.00
P Street Outfall	1	18*	RCP	None	\$ 3,828.00	\$ 11,484.00
Palmetto Outfall*	N/A	N/A	N/A	None	\$ 50,000.00	\$ 150,000.00
T Street Outfall (Ditch)*	N/A	N/A	N/A	None	\$ 50,000.00	\$ 150,000.00
W Gloucester Street Outfall*	UNK	UNK	HDPE	None	\$ 50,000.00	\$ 150,000.00
W Monck Street Outfall	1	48*	CMP	None	\$ 26,496.00	\$ 79,488.00
W Prince Street Outfall	1	24*	Clay	None	\$ 5,550.00	\$ 16,650.00

* Assumptions are made for size and associated cost.

<i>Sub-Total</i>	\$ 1,102,890.00
<i>Contingency (25%)</i>	\$ 275,722.50
<i>Engineering (10%)</i>	\$ 137,861.25
Total	\$ 1,516,473.75

H. Highway 17 - Tide Control

See Section G (Ports Authority – Tide Control) for recommended improvements analysis

Preliminary Budgeting Cost

Highway 17 – Tide Control Budget Costs						
Sub-Basin	# of Pipes	Pipe Size (in)	Pipe Material	Tide Control	Preliminary Budget (Valve + Freight)	Preliminary Budget (Installed)
Albermarle St / Ocean Ave Outfall	1	30	RCP	None	\$ 9,816.00	\$ 29,448.00
Atlanta Avenue Outfall	1	36	RCP	None	\$ 11,454.00	\$ 34,362.00
Cook Street Outfall	1	36	RCP	Tidal Gate	-	-
E Gloucester Street Outfall	1	48	RCP	None	\$ 26,496.00	\$ 79,488.00
E Monck Street/ Holly Ave Outfall	1	48	RCP	None	\$ 26,496.00	\$ 79,488.00
E Prince Street Outfall	1	7x9	BOX CULVERT	None	-	\$ 250,000.00
Fourth Street Outfall	1	60	HDPE	None	\$ 55,302.00	\$ 165,906.00
I Street Outfall	1	36	RCP	None	\$ 11,454.00	\$ 34,362.00
Lanier Boulevard Outfall	1	30	RCP	None	\$ 9,816.00	\$ 29,448.00
Lanier Plaza Outfall	1	24	RCP	None	\$ 5,550.00	\$ 16,650.00
Lanier Blvd S. of Middle School Outfall	1	30	RCP	None	\$ 9,816.00	\$ 29,448.00
Magnolia Park Outfall	1	24	RCP	None	\$ 5,550.00	\$ 16,650.00
N Street Outfall*	UNK	UNK	UNK	None	\$ 50,000.00	\$ 150,000.00
Newcastle Street Outfall (South)	2	36	RCP	Tide Gates	-	-
Norwich Street Outfall (Ditch)*	N/A	N/A	N/A	None	\$ 50,000.00	\$ 150,000.00
Parkwood Drive Outfall	2	36	RCP	Twin Tide Gates	-	-
Talmadge Avenue Outfall	1	18	RCP	None	\$ 3,828.00	\$ 11,484.00
Talmadge Ave & Macon Ave Outfall	1	18	RCP	None	\$ 3,828.00	\$ 11,484.00
Wildwood Drive Outfall	1	48	RCP	None	\$ 26,496.00	\$ 79,488.00
					<i>Sub-Total</i>	\$ 1,167,706.00
					<i>Contingency (25%)</i>	\$ 291,926.50
					<i>Engineering (10%)</i>	\$ 145,963.25
					Total	\$ 1,605,595.75

* Assumptions are made for size and associated cost.

I. P Street Basin

The existing storm sewer system was installed in the "N" Street and "P" Street basins in the late 1960's and early 1970's. Over the last fifty years, this system has become inadequate, deteriorated, and maintenance prone. Due to the scope of improvements required to address those issues, the "*N" St. Storm Drainage Improvements*" project was divided into four (4) phases of work. The first two (2) phases of work were completed in February 2009.

Phase I was constructed as a 24" PVC bypass from Davis Road to the Lanier Plaza storm drainage system to the south. Phase II was constructed to handle stormwater runoff and replace stormwater infrastructure within the "N" Street basin that had deteriorated from Pinova property to MLK Jr. Blvd. Phase II construction divided the "N" Street basin into the "N" Street and "P" Street Basins.

Phases III and IV were designed but were not constructed due to inability to secure easements from Pinova. Phase III construction consists of 54" RCP storm sewer running east through the north part of the property to a concrete headwall. Phase III construction was designed to handle stormwater runoff from Phase IV construction within the "P" Street Basin and route it through the Pinova property to the existing outfall. Phase IV construction is summarized as a system of varying pipe sizes on multiple streets within the "P" Street Basin routing stormwater runoff to a main trunk line that will be connected to the 54" RCP storm sewer constructed in Phase III.

Since the property is now owned by Pinova, it is recommended that the City revisit easement discussions with them to determine the feasibility of completing Phases III and IV of the "*N" Street Storm Drainage Improvements*". If easements can be secured, it is recommended that the previously completed plans be updated to meet current permitting and erosion and sedimentation control requirements. Additional design changes may also be necessary based on recently completed improvements within each sub-basin and/or the inability to acquire necessary easements for the existing design.

"N" STREET STORM DRAINAGE IMPROVEMENTS

FOR THE

CITY OF BRUNSWICK GEORGIA

APRIL, 2008

PHASE III - "R" STREET OUTFALL

PHASE IV - "N" STREET STORM DRAINAGE IMPROVEMENTS

CITY OFFICIALS

BRYAN THOMPSON	MAYOR
CORNELL L. HARVEY	MAYOR PRO-TEM
JAMES H. BROOKS	COMMISSIONER
JONATHAN WILLIAMS	COMMISSIONER
MARK A. SPAULDING	COMMISSIONER
ROOSEVELT HARRIS	CITY MANAGER



STANTEC CONSULTING SERVICES INC.
4675 RIVERSIDE DRIVE, MACON, GEORGIA 31210
PH: 478-474-6100 FAX: 478-474-4869
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INDEX TO DRAWINGS

SHEET NO.	DESCRIPTION
-	TITLE SHEET
1	PHASE III - "R" STREET OUTFALL - GENERAL LAYOUT
2	PLAN & PROFILE OUTFALL LINE 1 STA. 0+00 - 8+00
3	PLAN & PROFILE OUTFALL LINE 1 STA. 8+00 - 18+00
4	PLAN & PROFILE OUTFALL LINE 1 STA. 12+00 - 16+00
5	PLAN & PROFILE OUTFALL LINE 1 STA. 16+00 - 20+00
6	PLAN & PROFILE OUTFALL LINE 1 STA. 20+00 - 26+00
7	PLAN & PROFILE OUTFALL LINE 1 STA. 26+00 - 30+00
8	PLAN & PROFILE OUTFALL LINE 1 STA. 30+00 - 36+00
9	MISCELLANEOUS DETAILS
10	EROSION AND SEDIMENTATION CONTROL DETAILS
1	PHASE IV - "N" STREET STORM DRAINAGE IMPROVEMENTS-GENERAL LAYOUT
2	PLAN & PROFILE LEE ST. STA. 100+00-100+00
0-4	PLAN & PROFILE "O" ST. STA. 112+00 - 121+00
0-6	PLAN & PROFILE N. JOHNSTON ST. STA. 127+00 - 137+00
7	PLAN & PROFILE N. LEE ST. STA. 130+00 - 134+00
8-10	PLAN & PROFILE "P" ST. STA. 136+00 - 180+00
11-13	PLAN & PROFILE N. BAYVIEW ST. STA. 209+00 - 223+75
14-16	PLAN & PROFILE "Q" ST. STA. 228+00 - 237+00
17-19	PLAN & PROFILE N. CLEBURNE ST. STA. 250+00 - 286+00
20-22	MISCELLANEOUS DETAILS
23-25	EROSION AND SEDIMENTATION CONTROL DETAILS
26	WATER SHED AND MONITORING LOCATION MAP

Figure 28: "N" Street Storm Drainage Improvements Phase III & IV Plans

Preliminary Budgeting Cost

Mobilization/Demobilization	\$250,000
Traffic and Pedestrian Control	\$100,000
Erosion and Sedimentation Control	\$80,000
Grading Complete	\$200,000
Storm Drainage Infrastructure	\$3,755,510
Miscellaneous Utility Relocation Allowance	\$100,000
	<hr/>
Sub-Total	\$4,485,510
	<hr/>
Contingency (25%)	\$1,121,378
Engineering (10%)	\$560,689
	<hr/>
Total	\$6,167,576

J. Magnolia Park Outfall to Fairgrounds

Recent projects within the Magnolia Park neighborhood have been designed to address known flooding issues; however, down-gradient infrastructure improvements have not been addressed. Flow from the Magnolia Park basin conveyed under Altama Avenue and along Emory Dawson Parkway (Community Action Drive) to three (3) existing 60" RCPs. Based on evaluating previously completed hydrologic and hydraulic analysis, the existing infrastructure is undersized to handle the 25-year storm without tide control. Recommended improvements may include, but are not limited to, installation of tide control and trash racks on all three (3) existing 60" RCPs as well as the adjacent 48" RCP to adequately handle stormwater flow and reduce tailwater conditions that negatively impact the Magnolia Park Basin. Inline check valves are the recommended form of tide control in this application.

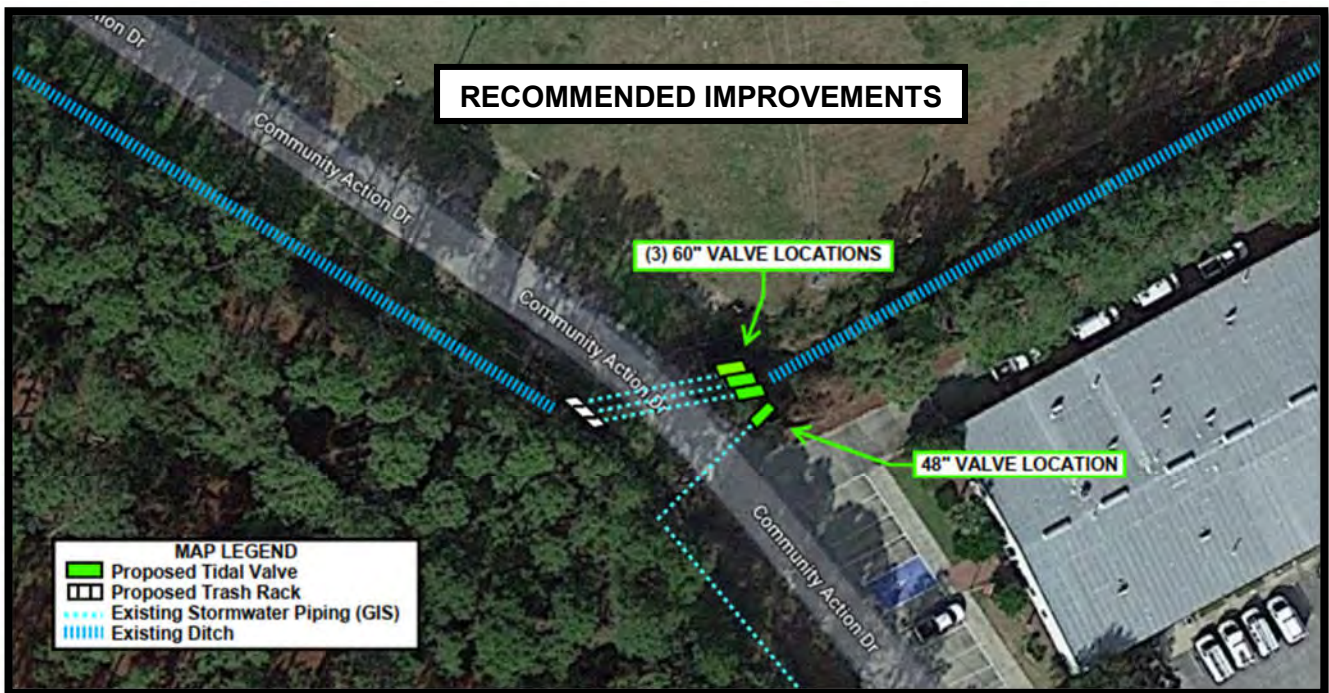


Figure 29: Magnolia Park Outfall to Fairgrounds Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$50,000
Traffic and Pedestrian Control	\$1,500
Erosion and Sedimentation Control	\$5,000
Grading Complete	\$5,000
Storm Drainage Infrastructure	\$599,706
Miscellaneous Utility Relocation Allowance	\$10,000
Sub-Total	<u>\$671,206</u>
Contingency (25%)	\$167,802
Engineering (10%)	\$83,901
Total	<u>\$922,908</u>

K. Lanier Boulevard at GMS

Known flooding issues exist along Lanier Boulevard near GMS during periods of heavy rainfall and high tides. These flooding issues may be attributed to low roadway elevation, undersized infrastructure, a lack of infrastructure, a lack of tide control, and a need for maintenance. Recommended improvements may include, but are not limited to, installation and/or replacement of piping and structures, raising the elevation of Lanier Blvd by approximately three (3) feet, and enhancing existing drainage swales to adequately handle stormwater flow within its specific watershed. Tide control was not recommended due to the area's relative location to the marsh, the potential construction permitting issues, and the current elevation of the roadway. Based on an evaluation of previous hydrologic and hydraulic analysis of this area of investigation, the following stormwater pipe sizes have been recommended along Lanier Boulevard to handle the 25-year storm:

- Replacing 36" pipe under Lanier Blvd passing runoff from Channel "A" to the marsh between Lanier Blvd. and Highway 17 with two (2) 54" pipes ($Q_{54" \text{ Pipe}} = 140$ cfs each)
- Replacing four (4) GMS entrance culverts with 36" pipes (currently 15-18")
- Replacing 18" pipe under Lanier Blvd in front of GMS with a 54" pipe
- Replacing two (2) 36" pipes under Lanier Blvd passing runoff from GMS to the marsh, east of the existing stormwater pond with two (2) 54" pipes ($Q_{54" \text{ Pipe}} = 140$ cfs each)
- Adding an additional 36" pipe to the four (4) existing 36" pipes under Lanier Boulevard to the north of 4th Avenue, increasing Q_{25} to 235 cfs



Figure 30: Lanier Boulevard at GMS Recommended Improvements



Figure 31: Lanier Boulevard at GMS Recommended Improvements

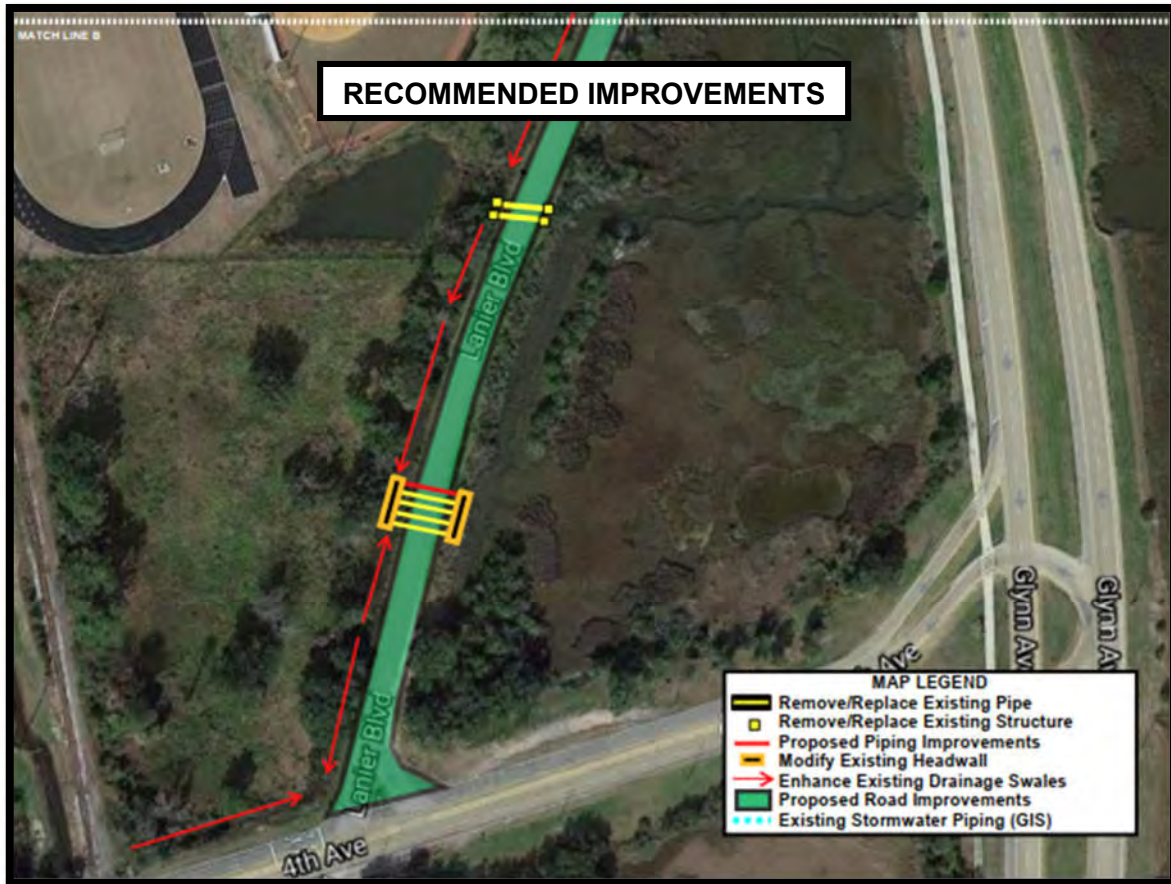


Figure 32: Lanier Boulevard at GMS Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$200,000
Traffic and Pedestrian Control	\$100,000
Erosion and Sedimentation Control	\$50,000
Grading Complete	\$400,000
Storm Drainage Infrastructure	\$807,125
Miscellaneous Utility Relocation Allowance	\$75,000
Sub-Total	\$1,632,125
Contingency (25%)	\$408,031
Engineering (10%)	\$204,016
Total	\$2,244,172

L. Habersham Park

Known flooding issues exist along Lanier Boulevard near GMS and in the Habersham Park areas during periods of heavy rainfall. These flooding issues may be attributed to undersized infrastructure, a lack of infrastructure, a lack of tide control, and a need for maintenance. In order to alleviate capacity issues along Lanier Boulevard and the existing storm drainage system within Habersham Park, it is recommended to route runoff from Contributing Basin "A" (identified in hydrologic and hydraulic analysis of area) towards drainage infrastructure to the south along MLK Jr. Blvd and under Lanier Blvd. This not only improves conditions within Habersham Park, but also provides a benefit to a greater part of the southwest Brunswick Peninsula. Recommended improvements may include, but are not limited to, installation and/or replacement of piping and structures and enhancing existing drainage swales to adequately handle stormwater flow within its specific watershed. Based on an evaluation of previous hydrologic and hydraulic analysis of this area of investigation, the following pipe sizes have been recommended to handle the 25-year storm:

- Replacing 36" CMP under abandoned railroad track with three (3) 54" pipes ($Q_{42" \text{ Pipe}} = 70 \text{ cfs}$ each)
- Installing three (3) 54" pipes ($Q_{42" \text{ Pipe}} = 70 \text{ cfs}$ each) under 4th Avenue, connecting Contributing Basin "A" with 15+ acres of new stormwater detention

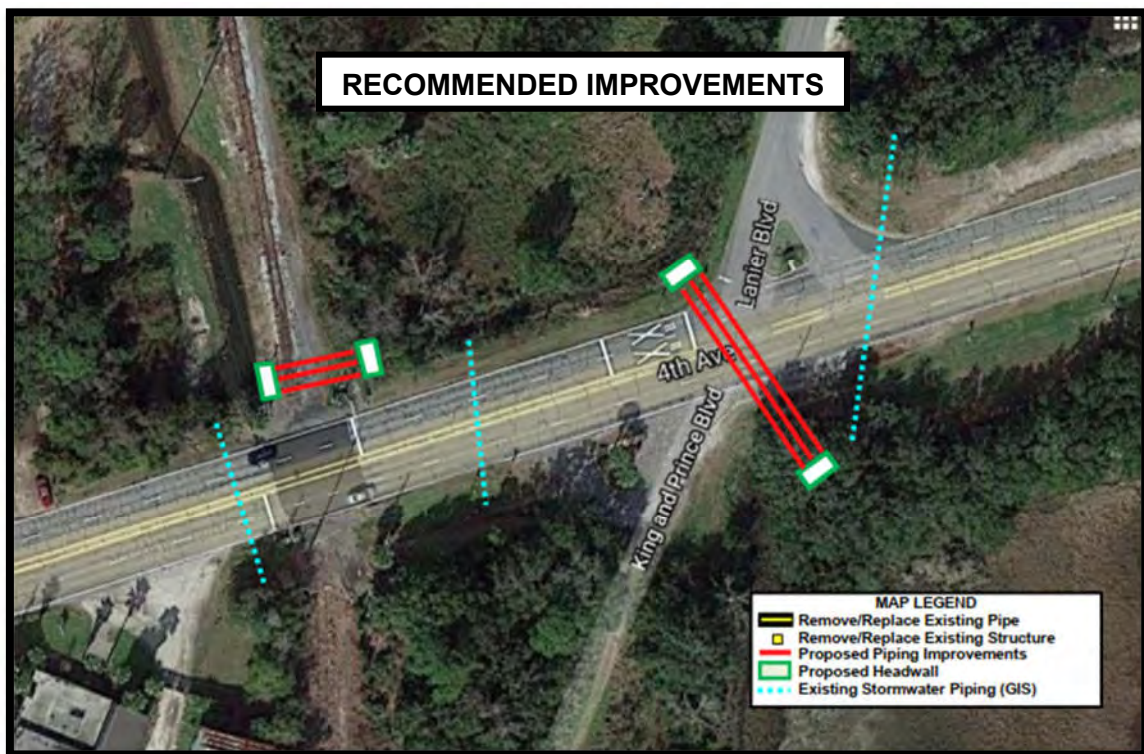


Figure 33: Habersham Park Recommended Improvements

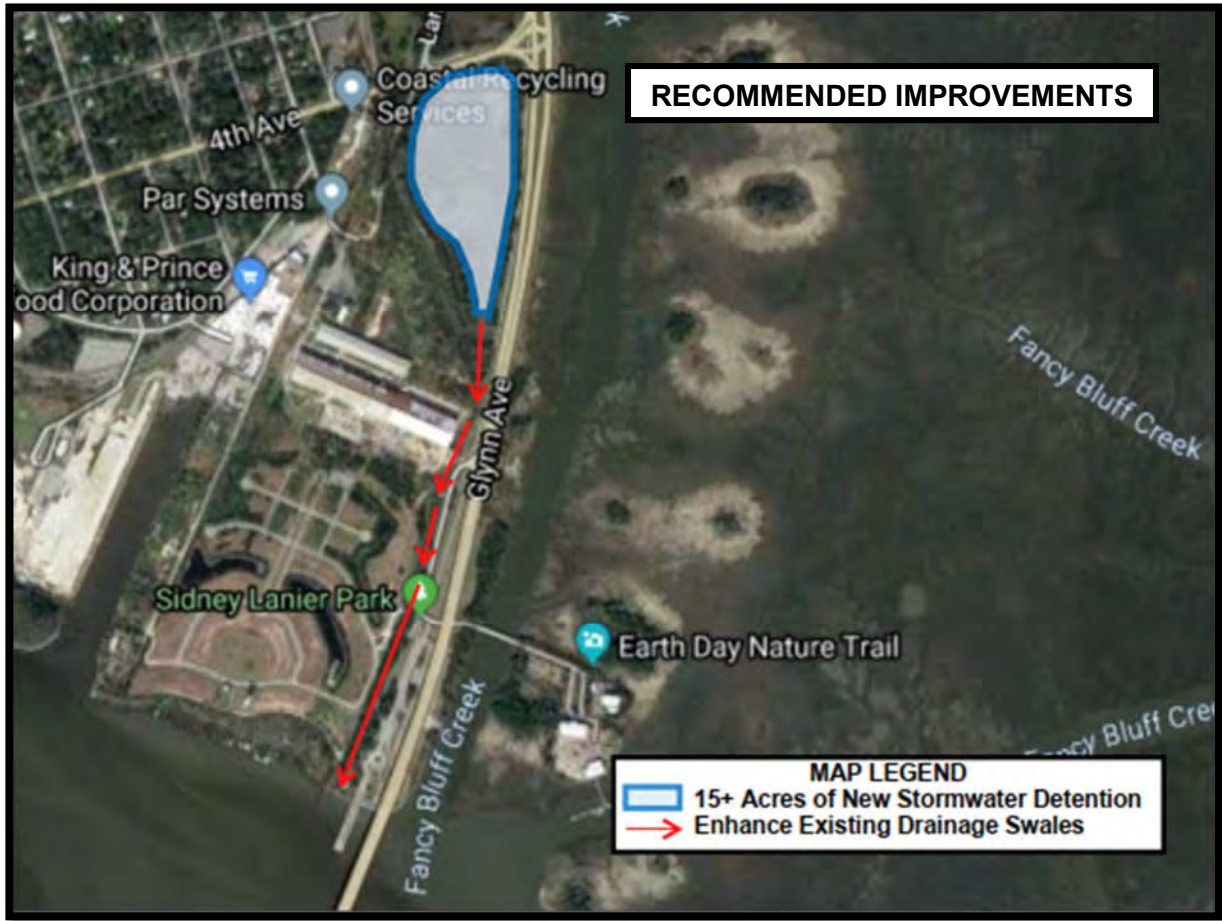


Figure 34: Habersham Park Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$50,000
Traffic and Pedestrian Control	\$25,000
Erosion and Sedimentation Control	\$25,000
Grading Complete	\$50,000
Storm Drainage Infrastructure	\$312,750
Miscellaneous Utility Relocation Allowance	\$25,000
	\$25,000
Sub-Total	\$487,750
Contingency (25%)	\$121,938
Engineering (10%)	\$60,969
Total	\$670,656

M. Urbana Neighborhood at Atlanta Avenue

Known flooding issues exist along Atlanta Avenue at multiple intersections, during periods of heavy rainfall. These flooding issues may be attributed to undersized infrastructure, a lack of infrastructure, and a need for maintenance. Recommended improvements may include, but are not limited to, installation and/or replacement of piping and structures, and improved maintenance to adequately handle stormwater flow within its specific watershed. Additionally, it is recommended that Atlanta Avenue eventually be milled down and repaved to match the gutter line elevation in order to reduce maintenance issues and improve positive drainage. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, the following pipe sizes have been recommended for each intersection with Atlanta Avenue to handle the 25-year storm:

- Tillman Avenue Intersection – 30"
- Niles Avenue Intersection – 30"
- Goodyear Avenue Intersection – 30"
- Wilson Avenue Intersection – 18"

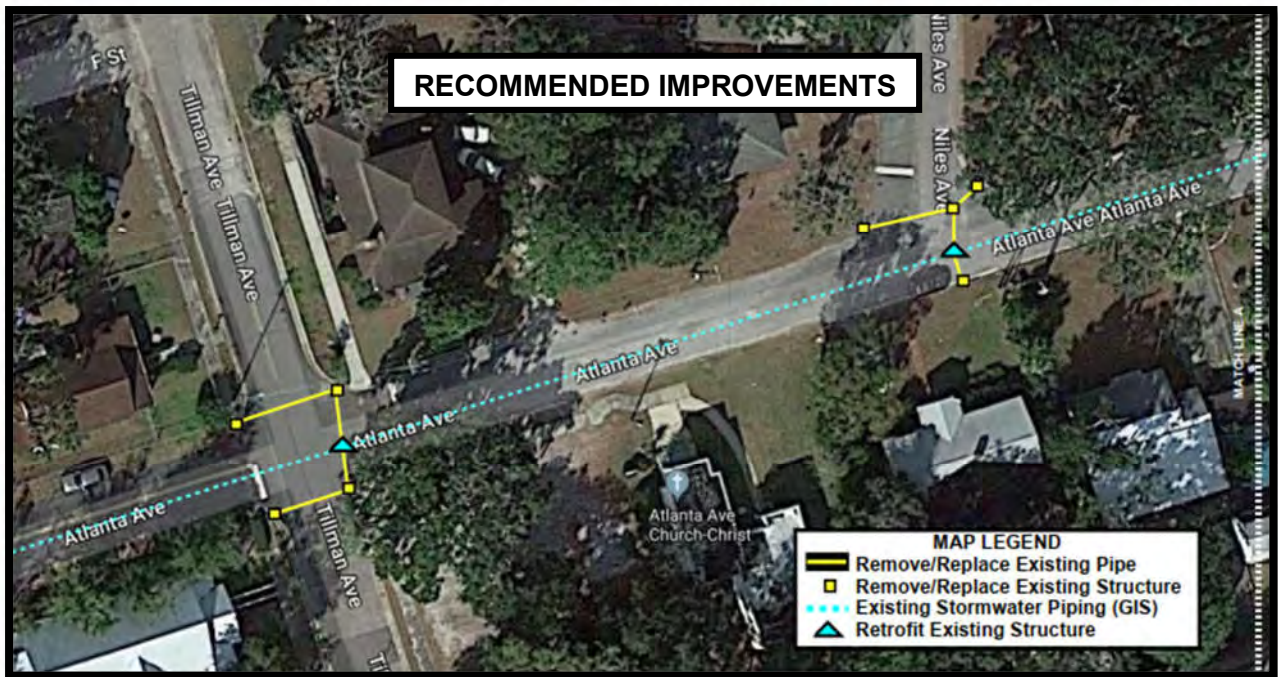


Figure 35: Atlanta Avenue Recommended Improvements



Figure 36: Atlanta Avenue Recommended Improvements

Preliminary Budgeting Cost

Mobilization/Demobilization	\$50,000
Traffic and Pedestrian Control	\$15,000
Erosion and Sedimentation Control	\$15,000
Grading Complete	\$20,000
Storm Drainage Improvements	\$190,600
Miscellaneous Utility Relocation Allowance	\$100,000
Sub-Total	\$390,600
Contingency (25%)	\$97,650
Engineering (10%)	\$48,825
Total	\$537,075

N. Riverside Neighborhood

Known flooding issues exist within the Riverside Neighborhood during periods of heavy rainfall and/or high tides. These flooding issues may be attributed to undersized infrastructure, a lack of infrastructure, a lack of tide control, its' low-lying elevation, and its relative location to the surrounding marsh. Recommended improvements may include, but are not limited to, installation and/or replacement of piping and structures and installation of tide control to adequately handle stormwater flow within its specific watershed. Based on preliminary hydrologic and hydraulic analysis of this area of investigation, 18-inch diameter pipes have been recommended for the Wassau Island Circle improvements to handle the 25-year storm. Additionally, TideFlex TF-1 Check Valves (Appendix J) have been recommended for the nine (9) outfalls identified below. Due to its' low-lying elevation, the lack of area available for storage capacity, and the relatively high cost for minimal drainage improvements, the Riverside Neighborhood will continue to be susceptible to flooding in certain areas unless significant improvements are made not only by the City, but by homeowners as well.



Figure 37: Riverside Neighborhood Recommended Outfall Improvements



Figure 38: Riverside Neighborhood Recommended Improvements

Preliminary Budgeting Estimate

Mobilization/Demobilization	\$50,000
Traffic and Pedestrian Control	\$10,000
Erosion and Sedimentation Control	\$60,000
Grading Complete	\$75,000
Installation	\$255,400
Miscellaneous Utility Relocation Allowance	\$50,000
Sub-Total	\$500,400
Contingency (25%)	\$125,100
Engineering (10%)	\$62,550
Total	\$688,050

O. GIS Inventory Collection

Multiple attributes within the City's GIS database are considered deficient. The City maintains its GIS database and GMC is in the process of updating it for the City's MS4 Permit. While some GIS attribute deficiencies may be addressed during the update, it is recommended to overhaul the existing database by mapping all system attributes at survey grade accuracy. Going forward, the GIS could serve as an asset management and analysis tool for the City to track a wide range of stormwater drainage system information including maintenance, repairs, complaints, CIPs, and verified details about all system components. For this system to function effectively, regular management and maintenance will be required. Recommended maintenance would include annual system updates and monthly database maintenance. Annual updates are necessary to ensure the database is accurate, and all aspects/attributes of the system are up to date.

Overhauling the existing database with survey grade accuracy may include the following:

- Field collection of stormwater infrastructure data using sub-meter survey grade technology
- Data conversion from paper, CAD, aerial photography, and other records
- Update existing GIS database with collected data for the following identified attributes:
 - **Streams / Rivers / Ditches** – top of bank and invert elevation
 - **Stormwater Outfalls** - outfall type, size, condition, invert elevation, material, photograph, maintenance record, etc.
 - **Stormwater Structures** - type, size, condition, top and invert elevations, material, photograph, maintenance record, flood complaints, year of construction, or other related attributes.
 - **Stormwater Detention** - inlet size, outlet size, type, condition, elevations, material, storage capacity, photographs, maintenance records, or year of construction, or other related attributes.
 - **Pipes / Conveyance** - pipe location, size, material, directional flow, slope, depth, invert elevation, condition, adequacy, maintenance records, year of construction, and other related attributes.
 - **Watersheds / Drainage Basins**

Preliminary Budgeting Estimate

Field Collection of Stormwater Infrastructure Data (Survey Grade)	\$400,000
Data Conversion	\$75,000
Update Existing GIS Database	\$125,000
	<hr/>
Sub-Total	\$600,000
	<hr/>
Contingency (25%)	\$150,000
Engineering (10%)	\$75,000
	<hr/>
Total	\$750,000

IX CAPITAL EQUIPMENT AND STAFFING NEEDS

As identified in multiple areas of investigation throughout this report, the need for maintenance is a recurring issue for an inadequate, deteriorated, and failed stormwater drainage system that is over 50 years old in some areas. The City has identified a long list of projects, this report has identified and added to that list, and with each major storm event new issues arise. While each of these identified CIPs must be addressed, it is also necessary for the City to implement a maintenance program that will allow them to be proactive with repairs and reduce the number of additional projects that may be added to the list in the future.

In order to respond quickly to identified problems, it is necessary for the City to be equipped with the necessary equipment and trained operators to do so. The ability to address small jobs in-house creates efficiency, avoiding contract and scheduling delays as well as mobilization costs. Additionally, the in-house capability to perform more frequent inspection and maintenance activities may reduce potential contracted services to perform similar activities at an increased cost. Currently, the City uses the following list of equipment to perform maintenance activities and complete small jobs in-house:

- Excavator
- Mini excavator
- Front-end loader (2)
- Track loader
- Dump truck
- Flatbed dump truck
- Street sweeper (2)
- Vacuum truck
- Camera trailer
- Pickup trucks (2)

While this list of equipment can perform maintenance activities and some in-house small projects, additional equipment is needed to address the growing number of stormwater issues around the City due to the aging infrastructure. Proper maintenance of stormwater inlets, pipe conveyances, and outlet structures is crucial in thwarting flood related risks during storm events. Cleaning streets, bike lanes, sidewalks, gutters, and other paved areas is important preventative maintenance to allow the City's stormwater system to function properly. Finally, the ability to complete more small projects in-house will allow the City to be proactive with repairs and reduce the number of emergency projects. The following list of capital equipment is recommended and/or identified by the City as needed to address these issues:

- (1) An additional combination vacuum truck and catch basin cleaner is recommended to provide adequate maintenance.
- (2) An additional street sweeper is recommended to increase the City's ability to perform needed maintenance activities.
- (3) An additional excavator and mini excavator are recommended to improve the City's ability to complete more small projects in-house.
- (4) The City has identified a need for a front-end loader, a new Closed-Circuit Television (CCTV) vehicle, a new truck with a trailer, and a new dump truck to improve maintenance activities and the ability to complete in-house projects.

(5) Additional supporting tools such as an air compressor, plugs, bypass pumping, sump pumps, etc. may also be necessary depending upon project scopes and City needs.

While the City will continuously need to replace aging equipment and employ trained operators to perform on-going maintenance activities, the additional equipment listed above will allow the City to better address maintenance issues that are prevalent in each of the CIPs mentioned above. Purchasing used models may reduce cost by up to 50%. Prioritizing equipment purchases and staffing additions is recommended as funds are available.

Preliminary Budgeting Estimate

Equipment Description	Range
Combination Vacuum Truck and Catch Basin Cleaner	\$250,000 - \$400,000
Street Sweeper	\$200,000 - \$300,000
Medium Sized Excavator (15 to 20 tons)	\$100,000 - \$200,000
Mini Excavator	\$30,000 - \$50,000
Front End Loader	\$100,000 - \$200,000
CCTV Vehicle/Trailer	\$200,000 - \$300,000
F450 Truck (or equal)	\$50,000 - \$75,000
Trailer (20 ft Gooseneck, Tandem Axle)	\$15,000 - \$30,000
Dump Truck	\$100,000 - \$150,000
Additional Supporting Equipment	\$250,000
Sub-Total	<u>\$1,295,000 - \$1,955,000</u>
Total	\$1,295,000 - \$1,955,000

In addition to the recommended/needed list of equipment, staffing to operate and maintain this equipment is also a necessity. Based on the on-going need for maintenance of the City's aging stormwater drainage system and the potential ability of performing small in-house projects with additional equipment, a synchronized increase in staffing is recommended as new equipment purchases are made.

X PRIORITIZATION

Prioritization provides the City a method for implementing the stormwater drainage improvements in a responsible and justifiable manner. It is important to identify the elements that have the greatest impact for improved stormwater drainage. Prioritization for recommended improvements is based on justifiable and quantifiable evidence of the existing stormwater conveyance infrastructure. Evidence of known flooding issues provided by the City is reviewed and engineering judgments applied in determining the final improvement rankings.

Prioritization of recommended improvements is based on a point value scale for five (5) parameters relating to the existing stormwater conveyance infrastructure. Priority points provide a quantifiable ranking system, which is used to make a value-based judgment on sub-basins having the greatest stormwater related needs. If the existing infrastructure within an identified CIP qualifies for a parameter category, the CIP receives the total point value for that stormwater related parameter. Each CIP receives a priority point total.

The point value scale and parameters are defined as follows:

Parameter	Priority Point Value
Current Flooding Issue (Street, Yard, Building)	5
Undersized Piped Sewer/Culvert Infrastructure	4
Lack of Infrastructure	3
Tide Control Issue/Non-Existent	2
Maintenance Issue	1

Refer to Table 5 for a summary of priority point totals for recommended improvements.

Table 5: CIP - Recommended Improvements Prioritization

CIP	Prioritization Parameters					Priority Points Total
	Localized Flooding (Yards, Building, Street)	Undersized Infrastructure	Lack of Infrastructure	Tide Control Issue	Maintenance Issue	
A	5	4	3	0	1	13
B	5	4	0	0	1	10
C	5	4	0	2	1	12
D	5	0	3	0	0	8
E	5	4	3	2	1	15
F	5	0	3	0	0	8
G	5	4	0	2	1	12
H	5	4	0	2	1	12
I	5	4	3	0	1	13
J	0	0	0	2	0	2
K	5	4	0	2	0	11
L	5	0	3	2	0	10
M	5	4	3	0	1	13
N	5	4	3	2	0	14
O	0	0	0	0	1	1

Prioritization of recommended improvements must also consider engineering judgment, which is not completely based on a quantitative point system. For the purpose of this master plan, engineering judgment not only considers priority points per CIP, but also the size of CIP, the preliminary opinion of probable cost, and the impacts of recommended improvements per CIP. These parameters give insight to the positive impacts made to each CIP regarding stormwater drainage improvements.

CIPs that require immediate improvements regarding flooding issues are given the highest priority; therefore, improvements in these CIPs have the greatest impact for the City. CIPs that require improvements, but are not considered immediate, are given a lower level of priority; therefore, improvements have moderate impacts in the City. By contrast, CIPs addressing localized flooding issues in a small area are given low priority.

Taking into consideration all the priority point totals and engineering judgment parameters, recommended improvements are logically and justifiably ranked. Refer to Table 1 for the final ranking for recommended improvements within the City using engineering judgment in conjunction with results in Table 6. Recommended improvements are ranked 1 through 15 in order of importance (1 – greatest impact and 15 – least impact).

Table 6: CIP - Recommended Improvements Prioritization					
CIP	Engineering Judgment Prioritization Parameters				Final Recommended Improvement Ranking
	Project Description	Priority Points	Preliminary Budgetary Cost	Opinion of CIP Improvement Impact	
A	Albany Street (near F and G St)	13	\$790,000	High	1
B	Parkwood Drive (West End)	10	\$400,000	Moderate	9
C	Wildwood Ditch (near Boxwood St & Myrtle Ave)	12	\$1,400,000	High	4
D	Altama Avenue and Second Street*	8	\$180,000	Low	7
E	Intersection of Macon & Talmadge Ave	15	\$600,000	High	2
F	Talmadge Avenue Ditches*	8	\$325,000	Low	8
G	Ports Authority - Tide Control	12	\$1,515,000	Moderate	11
H	Highway 17 Tide Control	12	\$1,605,000	High	5
I	P Street Basin	13	\$6,170,000	Moderate	10
J	Magnolia Park Outfall to Fairgrounds	2	\$925,000	Low	15
K	Lanier Boulevard at GMS	11	\$2,245,000	High	6
L	Habersham Park	10	\$670,000	Moderate	12
M	Urbana Neighborhood at Atlanta Avenue	13	\$535,000	Low	14
N	Riverside Neighborhood	14	\$690,000	High	3
O	GIS Inventory Collection	1	\$750,000	Moderate	13

*Potential in-house projects to be completed by City resources

XI "IN-HOUSE" STORMWATER IMPROVEMENT PROJECTS (SHORT TERM)

As mentioned in Section IX, the ability to complete short-term stormwater improvements as "in-house" projects creates efficiency, avoids contract and scheduling delays as well as mobilization costs, and will allow the City to be proactive with repairs and reduce the number of emergency project. Based on the City's capabilities, two (2) CIP's have been identified that may be accomplished by City crews as "in-house" projects. These CIP's include:

CIP F - Talmadge Avenue Ditches ~ \$325,000

Recommended improvements may include, but are not limited to, construction of a ditch system along both sides of the road to adequately convey stormwater flow to an existing stormwater system.

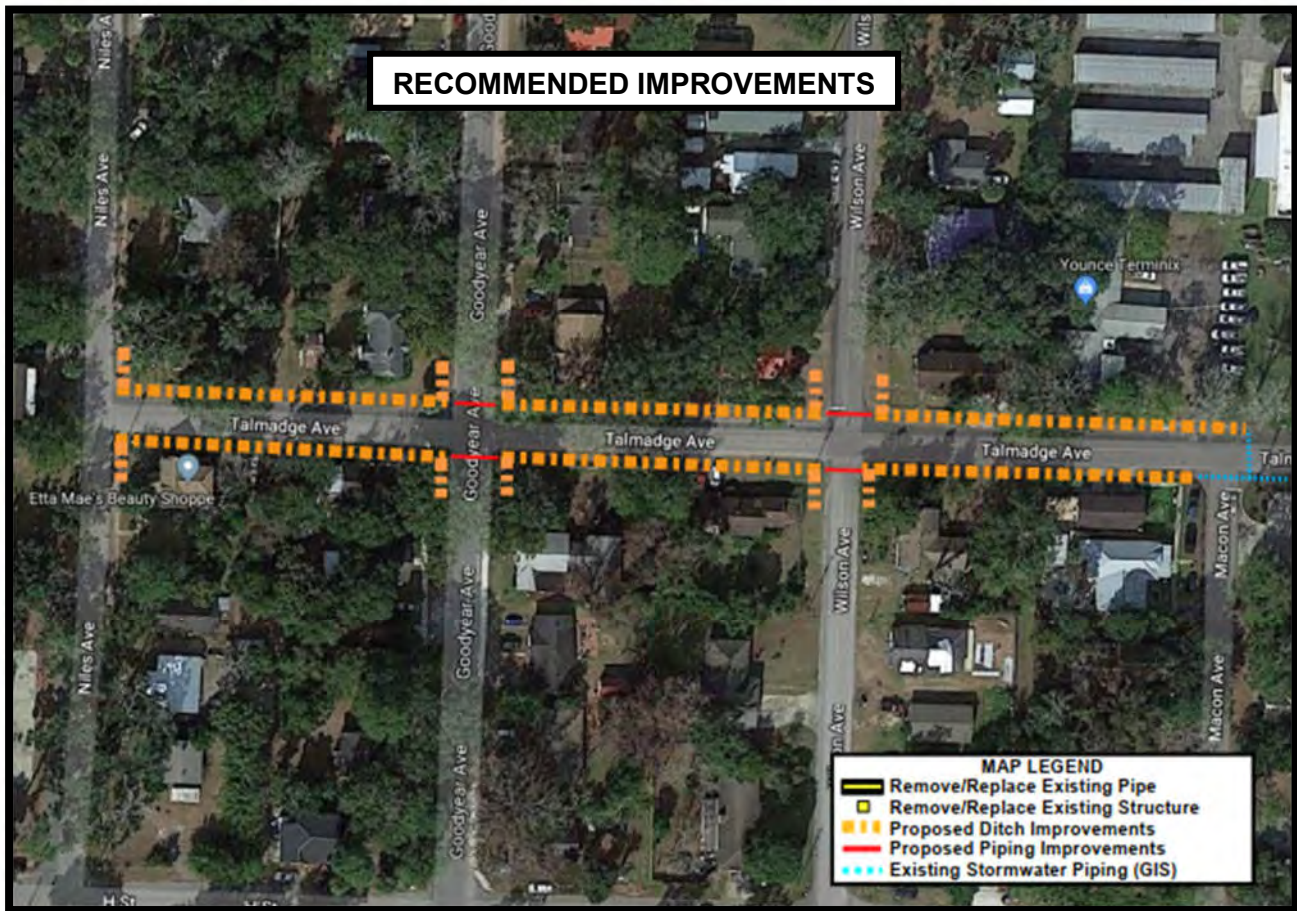


Figure 39: Talmadge Avenue Ditches Potential "In-House" Project

CIP D - Altama Avenue and Second Street ~ \$180,000

Recommended improvements may include, but are not limited to, installation of piping and structures to adequately convey stormwater flow to an existing stormwater system.



Figure 40: Altama Avenue and Second Street Potential “In-House” Project

Additional “In-House” Projects

While only two (2) complete “in-house” projects have been identified, the City also has the capability to complete some improvements identified in each of the CIP’s that may reduce existing flooding issues in certain areas and decrease the possibility of emergency projects. These improvements may include additional maintenance, installation of tide control in flood prone areas, and/or installation of erosion control measures. As capital equipment and staffing needs are addressed, the capability of City crews to complete additional “in-house” projects and perform proactive maintenance should increase.

XII STORMWATER DRAINAGE INFRASTRUCTURE MAINTENANCE PLAN

Program Objectives

- Maintain pipes, street drains, roadside ditches, in stream culverts, detention ponds, outfalls, and habitat enhancements.
- Reduce or eliminate pollutant discharges that can affect health, safety, environment, water quality, and aquatic resources.
- Meet the Illicit Discharge Detection and Elimination requirements of the City's Phase II National Pollutant Discharge Elimination System (NPDES) Permit.

Maintenance

This maintenance plan shall be used as a guide to assist staff with proper inspection, cleaning and upkeep of ditches, pipes, storm structures, and outfalls. Inspection and maintenance of stormwater drainage infrastructure is critical to the functionality of the City's system. Proper maintenance may reduce the likelihood of potential flooding issues in low lying areas. Routine inspection and maintenance records including photographs are recommended to be included in the City's GIS database for easy access and secured placement of information. Inspection and maintenance costs may include personnel, equipment, machinery, etc.

The City's O&M field crews maintain, repair, and upgrade public stormwater infrastructure, with the aim of maximizing stormwater conveyance, preventing flooding, reducing pollutant loadings, and minimizing the need for new construction projects. The City maintains 3,659 stormwater structure locations, 3,145 segments of stormwater conveyance infrastructure, 20 private and/or public detention areas, and 31 outfalls within its limits. They are currently inspected based upon the Municipal Separate Storm Sewer System (MS4) Zone they are located in. The MS4 Zones have been identified in Appendix L. All MS4 structure inspections shall be based upon deterioration of structure, clogging/ deposits, excessive silt/ vegetation, pollutants, and dry or wet weather flow.

Street and Drainage Structure Inspection and Maintenance Procedures

The 3,659 stormwater structure locations and 3,145 segments of stormwater conveyance infrastructure located in the City will be inspected every five (5) years based upon the defined MS4 Zone. This list will be updated annually to reflect new construction. Flooding complaints in the area shall be prioritized and addressed in a timely manner. An inspection and maintenance checklist has been provided on the following page for use by the City's inspection and maintenance field crews. The inspection checklist will be used and kept on file along with documentation of corrective action for any problems noted during the inspection.

Items to be inspected (included on checklist):

- Catch basin/drop inlet
- Storm manhole
- Storm sewer piping
- Ditches/channels
- Roadside/Cross Culverts
- Sediment Basins

Street and Drainage Structure Inspection and Maintenance Checklist





Street and Drainage Inspection and Maintenance Checklist Guide

Inspection Area: _____ MS4 Zone: _____

Inspection Date: _____ Last Inspection Date: _____ Inspected By: _____

Component/Item Inspected	Problems Observed	Maintenance/Repair Necessary	Maintenance Task	Action
Circle One	Circle One	Circle One	Identify Any/All Tasks	Completed
Catch Basin/Drop Inlet Storm Manhole Storm Sewer Piping Ditches/Channels Roadside/Cross Culverts Sediment Basins Other _____	Deterioration of Structure Clogged Inlet Deposits in Structure Clogged Pipe Excessive Vegetation Debris Excessive Siltation Deteriorated Pipe Excessive Sediment Deposits Pollutants Other _____	Yes	1 - Repair 2 - Clean Out 3 - Replace 4 - Mow Vegetation 5 - Schedule Ditch Cleaning 6 - Regrade Ditch 7 - Review Size and Replace 8 - Line Pipe 9 - Install Rip Rap 10 - Other _____	Yes / No
		No		Scheduled
				Yes / No
				Date

Additional Notes:

Detention Pond Inspection and Maintenance Procedures

The public detention areas located in Brunswick will be inspected every five (5) years based upon the defined MS4 Zone. This list will be updated annually to reflect new construction. Flooding complaints in the area shall be prioritized and addressed in a timely manner. An inspection and maintenance checklist has been provided on the following page for use by the City's inspection and maintenance field crews. The inspection checklist will be used and kept on file along with documentation of corrective action for any problems noted during the inspection.

Items to be inspected (included on checklist):

- Stormwater Pond
- Pond Banks
- Inlet Pipe
- Outlet Pipe
- Outlet Control Structure
- Dam/Berm
- Emergency Spillway
- Upstream Conveyance
- Downstream Conveyance
- Access Area

Detention Pond Inspection and Maintenance Checklist





Detention Pond Inspection and Maintenance Checklist Guide

Inspection Area: _____ MS4 Zone: _____

Inspection Date: _____ Last Inspection Date: _____ Inspected By: _____

Component/Item Inspected	Problems Observed		Maintenance Task	Action
Circle All That Apply	Circle All That Apply		Circle All That Apply	Completed
Stormwater Pond Pond Banks Inlet Pipe Outlet Pipe Outlet Control Structure Dam/Berm Emergency Spillway Upstream Conveyance Downstream Conveyance Access Area Other _____	Deterioration of Structure Clogged Inlet Deposits in Structure Clogged Pipe Excessive Vegetation Sediment Accumulation Water Flow Issues Trash/Debris	Excessive Siltation Storage Capacity Obstructions Structure Cracks/Holes Water Quality Erosion/Sloughing Mosquito Presence Other _____	1 - Repair 2 - Clean Out 3 - Replace 4 - Mow Vegetation 5 - Schedule Ditch Cleaning 6 - Regrade Ditch 7 - Review Size and Replace 8 - Line Pipe 9 - Install Rip Rap 10 - Mosquito Control 11 - Further Evaluation Needed 12 - Other _____	Yes / No Scheduled Yes / No Date
Maintenance/Repair Necessary				
Circle One				
	Yes	No		

Additional Notes:

Outfall Maintenance Inspection and Maintenance Procedures

The 31 outfalls located in Brunswick will be inspected every five (5) years based upon the defined MS4 Zone. This list will be updated annually to reflect new construction. Flooding complaints in the area shall be prioritized and addressed in a timely manner. An inspection and maintenance checklist has been provided on the following page for use by the City's inspection and maintenance field crews. The inspection checklist will be used and kept on file along with documentation of corrective action for any problems noted during the inspection.

Items to be inspected (included on checklist):

- Outfall Area
- Outlet Pipe
- Headwall
- Flared End Section
- Tide Control Structure
- Trash Rack
- Upstream Conveyance

Outfall Inspection and Maintenance Checklist





Outfall Inspection and Maintenance Checklist Guide

Inspection Area: _____ MS4 Zone: _____

Inspection Date: _____ Last Inspection Date: _____ Inspected By: _____

Component/Item Inspected	Problems Observed		Maintenance Task	Action
Circle All That Apply	Circle All That Apply		Circle All That Apply	Completed
Outfall Area Outlet Pipe Headwall Flared End Section Tide Control Structure Trash Rack Upstream Conveyance Other _____	Deterioration of Structure Clogged Inlet Deposits in Structure Clogged Pipe Excessive Vegetation Sediment Accumulation Water Flow Issues Trash/Debris	Excessive Siltation Deteriorated Pipe Obstructions Structure Cracks/Holes Water Quality Erosion Tide Control Failure Other _____	1 - Repair 2 - Clean Out 3 - Replace 4 - Mow Vegetation 5 - Schedule Outfall Cleaning 6 - Regrade Ditch 7 - Review Size and Replace 8 - Install Rip Rap 9 - Further Evaluation Needed 10 - Other _____	Yes / No Scheduled Yes / No Date
	Maintenance/Repair Necessary			
	Circle One			
	Yes	No		

Additional Notes:

MS4 Inspection and Maintenance Procedures

As identified in Chapter 7 of the City's Storm Water Management Plan (SWMP), the City must develop, implement, and enforce a program to detect and to eliminate illicit discharges as a part of their MS4. The control measures identified in Chapter 7 are intended to provide the City with a method of effectively addressing and detecting illegal discharges that contribute significantly to pollution. As part of the stormwater drainage maintenance plan, BMP #3a of the SWMP has been included for reference and shall be integrated into the maintenance plan schedule.

Best Management Practice (BMP) #3a: Field Inspections

Description of BMP: All 27 outfalls will be visually inspected biannually at low tide to check for dry weather flows. Public works staff will look for dry weather flow and visually apparent pollution as they clear ditches and respond to flooding. Also, the City has purchased sewer video and truck equipment. The equipment and staff will be utilized on an as-needed basis by the public works department to inspect storm sewers for emergency response or enigmatic scenarios.

Measurable Goal(s): Visually inspect 100% of the 27 outfalls every two years. Visually inspect approximately 1 mile of ditches annually. Video of storm drains will take place on an as-needed basis. The number of outfalls inspected, the number of miles of ditches inspected, and number of miles of storm sewers videoed each year will be included in the annual report.

Documentation to be submitted with each annual report: The documentation will include a list of the outfalls which were inspected during the reporting year along with photos taken of each outfall. List of items to be documented include: verification of information concerning outfalls; digital photographs of the outfall pipe or manhole showing the structure and its immediate surroundings; any visual indications of an illicit discharge. In the event that any new outfall not noted on current or past outfall inventories is discovered, a dry-weather screening noting dry weather flow, pipe size and material, direction of pipe from manhole, depth of pipe invert relative to manhole rim, and date and time of inspection will be performed. All new outfalls will be immediately reported, in writing, to the Public Works Director.

Person (position) responsible for overall management and implementation of the BMP: Public Works Director

Rationale for choosing BMP and setting measurable goal(s): The number of outfalls within the City limits lend themselves to visual inspections. Storm drains are tidally influenced and checking for dry weather flow is difficult because the pipes are filled twice per day by the tides. Any pollutants are highly diluted by tides and the high salinity of estuarine water renders many simple analytical tests invalid. Almost all of the storm drains are very old and are equally susceptible to having illicit connections. The City suspects illicit connections which can be positively identified by the video camera if necessary.

How will you determine whether this BMP is effective in reducing pollution to stormwater in accordance with Part 5.1.4 of the Permit: A reduction in the amount of illicit discharges flowing into the stormwater sewer system will indicate that the visual inspections followed by an enforcement action are effective. Video inspections will positively identify the sources of illicit discharges and allow the City to determine the source of the discharge and eliminate it.

References: *Stormwater Complaint SOP (MCM4), Stormwater Complaint Report Form (MCM4), Illicit Discharge Detection and Elimination SOP, Field Screening SOP*

In addition to Chapter 7 of the SWMP, Chapter 10 addresses pollution prevention and good housekeeping for municipal operations. It requires the City to develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations (GA EPD Guidance Document, February 2012). As mentioned for BMP #3a, these MS4 requirements have been included for reference and shall be integrated into the maintenance plan schedule. The following table identifies nine (9) good housekeeping practices for the City that will contribute greatly towards helping minimize stormwater contamination.

Table 7: Good Housekeeping Practices	
BMP	BMP Description
BMP #1 – MS4 Control Structure Inventory and Map	Develop and update an inventory and map of the MS4 structures within the permitted area.
BMP #2 – Inspection of MS4 Control Structures	Inspections of MS4 control structures will be conducted such that 100% of the structures are inspected in a 5- year period.
BMP #3 – Maintain MS4 Constructed Controls	Conduct maintenance on MS4 control structures, as needed.
BMP #4 - Street Sweeping	Sweep 25 miles per day of city streets.
BMP #5 - Training Program for City Employees	100% of affected employees trained every two years.
BMP #6 - Municipal Waste Disposal	The amount disposed from municipal outdoor activities will be tracked and reported to the EPD in the annual report.
BMP #7 – New Flood Management Project Assessments for Water Quality Impacts	Water quality improvements will be considered during the design of drainage improvements.
BMP #8 – Existing Flood Management Project Assessments for Water Quality Impacts	The City will conduct an assessment of existing publicly-owned flood management projects for potential retrofitting to address water quality impacts.
BMP #9 – Municipal Facility Inventory and Maintenance	The City will develop an inventory of municipal facilities with the potential to cause pollution (including fleet or maintenance shops, wastewater treatment facilities, drinking water treatment facilities, parks, etc). 100% of these facilities, as well as, storage/stockpile areas will be inspected within the 5-year permit term.

Please refer to Chapter 10 of the City's SWMP for additional information on the BMP requirements for pollution prevention and good housekeeping practices.

Initial Inspection and Maintenance Schedule

The initial maintenance schedule provided in this maintenance plan shall be used as a guide to assist staff with proper inspection, cleaning and upkeep of ditches, pipes, storm structures, and outfalls in conjunction with MS4 inspection and maintenance requirements. This schedule shall be updated as MS4 requirements are updated, CIP's are completed, and/or the City's capabilities change. The schedule below is broken down by stormwater structure/facility type, MS4 zone location, and recommended inspection and maintenance schedule. The College Park and Magnolia Park Neighborhoods inspection and maintenance schedule have also been included due to the number of issues identified in those areas. As improvements are made, the schedule may be updated accordingly to adequately maintain stormwater infrastructure.

Table 8: Initial Inspection/Maintenance Plan			
Structure/Facility Type	MS4 Zone	Schedule	Year/Season
Street Drainage Structure Inspection/Maintenance	1	Every 5 Years	2020
	2		2021
	3		2022
	4		2023
	5		2024
Detention Pond Inspection/Maintenance	1	Every 5 Years	2020
	2		2021
	3		2022
	4		2023
	5		2024
Non-MS4 Outfall Inspection/Maintenance	1	Every 5 Years	2020
	2		2021
	3		2022
	4		2023
	5		2024
MS4 Control Structures* Inspection/Maintenance	1	Every 5 Years	2020
	2		2021
	3		2022
	4		2023
	5		2024
MS4 Outfall** Inspection/Maintenance	1	Bi-Annually	2020
	2		2020
	3		2021
	4		2021
	5		2021
College Park Area	4	Semi-Annually	Spring Fall
Magnolia Park Area	4	Semi-Annually	Summer Winter

*MS4 Control Structure Inspection/Maintenance may also include stormwater infrastructure identified in Master Plan

**MS4 Outfall Inspection/Maintenance may also include outfalls identified in Master Plan

XIII CONCLUSIONS AND RECOMMENDATIONS

In summary, the City is in serious need to address stormwater drainage deficiencies as identified in the CIPs. Deficiencies include, but are not limited to, lack of stormwater drainage infrastructure GIS information, stormwater drainage infrastructure, proper maintenance, and equipment as well as inadequate stormwater drainage infrastructure capacity.

Stormwater drainage infrastructure may include, but is not limited to, drainage swales and ditches, tide control, catch basin curb inlets, drop and yard inlets, driveway and roadway culverts, stormwater detention facilities, and associated piping. The total preliminary opinion of probable construction cost for all 15 CIPs is \$18,400,000.

Funding these projects over a reasonable time frame may be a challenge in regard to the current stormwater budget of the City's General Fund and available SPLOST funds designated for stormwater improvements. It is recommended that the City investigate other funding mechanisms to assist with the overall costs of future stormwater improvements.

APPENDIX P

SHORELINE ASSESSMENT AND IMPLEMENTATION RESILIENCY PLAN

September 2020



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Prepared for:

Glynn County, Georgia
City of Brunswick, Georgia
Jekyll Island Authority, Georgia



Glynn County
GEORGIA



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Acknowledgement

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Executive Summary

As a result of back-to-back hurricane events in 2016 and 2017 and the associated damage, Glynn County partnered with the City of Brunswick and Jekyll Island Authority (JIA) on a Coastal Incentive Grant, through Georgia Department of Natural Resources, Coastal Resources Division, to create a Shoreline Protection Implementation Plan (SPIP) that will find eco-friendly solutions to address current shoreline vulnerabilities and future shoreline hazards. For the purposes of this plan, “Shoreline Assessment and Implementation Resiliency Plan,” shorelines include beach front, exposed marsh front, and river edges. This plan summarizes the approach and efforts and provides recommendations to enhance shoreline protection and resiliency.

A Shoreline Protection Task Force (“Task Force”) was formed with City, County, and JIA staff to share information and formulate cohesive and linked efforts between all members to increase disaster resiliency countywide. The Task Force provided feedback throughout the planning process and met five times during the first phase of this project, as detailed in **Section 1.1**. Other Task Force members included: GADNR-CRD, Brunswick-Glynn County Joint Water and Sewer Commission, The Nature Conservancy, and professors from Stetson University, Georgia Southern, and Skidaway Institute of Oceanography.

The Task Force and consultant gathered environmental and coastal hazard data, land use, habitat, infrastructure, and other relevant local and regional datasets from local GIS staff and the Georgia Coastal Hazards Portal (GCHP) website. Available GIS data, along with input from staff and the general public, which is described in **Section 2.1**, were used to identify shorelines with the highest vulnerability to erosion and shoreline change. Feedback from the public was solicited at the Glynn County EM/HSA and Community Development Department’s educational booth at CoastFest on October 5, 2019, in Brunswick. The public identified 27 locations with coastal erosion and king tide flooding, which were later reviewed with local staff to incorporate into a full project list. In fall 2019, the consultant completed a field tour with the JIA Director of Conservation and Land Manager and the City of Brunswick Public Works Director, and a virtual tour with the Glynn County Public Works Director to identify potential projects and issue areas related to erosion and king tide flooding. The consultant later completed inspections of these sites to assess the issues and determine potential solutions. From **Section 2.2**, other vulnerabilities that were identified in the previous Disaster Recovery and Redevelopment Plan (DRRP) efforts were also included in the assessment.

The Task Force reviewed shoreline protection best management practices. Overall, there was a general interest in natural practices, with noted interest in living shorelines, but these have historically had permitting challenges. It was discussed that more education is needed on these practices and to encourage alternatives to bulkheads. The Task Force discussed including nearshore shoaling and engineered sand nourishment in this plan because it may become necessary at some point and they do not want to restrict themselves. The comprehensive list of management practices discussed and the issues and opportunities identified from the Task Force are described in **Section 2.3**. The practices reviewed included: living shorelines, bulkheads/sea walls, rock revetments/jetties, rip rap, temporary beach access barriers, constructed dunes, sand/dune fencing, beach nourishment/re-nourishment, nearshore placement, land preservation, green stormwater infrastructure, tide control, streambank stabilization, and policy changes.

A matrix was developed as a step to prioritize individual projects and the most vulnerable shoreline segments that would have the greatest impact on community resiliency. **Section 3.1** describes how the matrix was developed, the factors included, and how each factor and project are scored. Nine factors were used to rank and score the projects for prioritization. The high-tier scoring factors (with a maximum score of 10 points) were infrastructure type, infrastructure proximity, and sea level rise Impacts. There was one mid-tier factor (7 points maximum) – erosion rate. The remainder were low-tier factors (5 points maximum) – flood zone, flooding frequency, low-moderate income status, ownership, and special habitat.

Moving from assessment to implementation, it is important to identify funding sources and potential partners, which are presented in **Section 4.1**. In working close to the shoreline, there are often permitting challenges that complicate scheduling, so these experiences are also described in **Section 4.1**. **Section 4.2** describes the overall results and recommendations to address areas with shoreline vulnerabilities. In total, 16 projects were identified in the City of Brunswick, 37 in unincorporated Glynn County (12 on mainland and 25 on St. Simons Island), and 14 on Jekyll Island. Prioritization is based on the calculated score from the matrix. Cost was included as a relative measure compared with other projects for that jurisdiction. This initial level of analysis is too early and broad to assign a specific value. The Potential Partners/Project Lead were identified based on property ownership and potential granting or coordinating agencies. The Proposed Solutions and Alternates were developed based on the review of best management practices, where there was a general interest in natural practices.

A secondary goal of this project was to incorporate components of a Beach Management Plan in order to be eligible for grants and programs from FEMA or Army Corps for mitigation efforts on the public beaches in Glynn County. Of the three jurisdictions in this plan and project, only Glynn County and Jekyll Island have ocean-facing beaches, so St. Simons Island and Jekyll Island are the focus of **Section 5**. The Beach Management section includes: *Background/History* (**Section 5.1**), an overview of *Beach Profile Inventory* and recommendations for data management (**Section 5.2**), summary of locations for *Public Beach Access* (**Section 5.3**), state and local *Policies and Laws* (**Section 5.4**), *Shoreline Protection Ordinance Review* (**Section 5.5**), *Environmental Considerations* for water quality monitoring, wildlife, and stormwater management (**Section 5.6**), and a listing of *Current and Future Beach Management Practices* (**Section 5.7**).

A summary and recommendations for implementation of this plan are included in **Section 6**. This plan also includes several appendices for additional information. This includes detailed matrix results in **Appendix A**, full-size maps of shoreline vulnerability projects in **Appendix B**, photos from sites with erosion issues in **Appendix C**, Task Force meeting summaries in **Appendix D**, a listing of beach management resources used in Tybee Island’s Beach Management Plan in **Appendix E**, and plan sheets for the “Johnson Rocks” rehabilitation project on St. Simons Island in **Appendix F**.

1. Introduction

As a result of recent hurricanes and associated damage, Glynn County, City of Brunswick, and the Jekyll Island Authority (JIA) have combined their efforts to protect the shorelines along the beach front, exposed marshes, and river edges countywide, by creating this “Shoreline Assessment and Implementation Resiliency Plan.” From 1996 to 2017, Glynn County experienced 13 hurricane-related events, with Hurricanes Matthew in 2016 and Irma in 2017 causing extensive damage throughout the County. Hurricane Matthew grazed the southeast Georgia coast on October 6, 2016, as a Category 3 storm. Although the storm’s eye remained approximately 60 miles off the Georgia coast, Glynn County still experienced severe tropical storm conditions. During Hurricane Matthew, the National Oceanic and Atmospheric Administration (NOAA) reported for Glynn and the surrounding areas, that there was 5 to 10 inches of rain, severe coastal erosion, and widespread flooding. NOAA also reported a storm surge of 3.18 feet with a maximum storm tide of 6 feet. Hurricane Matthew cost Glynn County approximately \$11.4M in post-disaster recovery efforts.

Not even twelve months later, on September 11, 2017, Hurricane Irma, a Category 2 storm, affected this area with widespread flooding, power outages, and additional localized coastal erosion. The cause of the massive flooding was the elevated water levels of 1 to 2 feet above normal tide that occurred for several tidal cycles before Irma’s surge and rainfall. The tidal gauge on St. Simons Island crested at 6.90 feet, and the total rainfall was 9.6 inches. Some coastal infrastructure, already weakened from Hurricane Matthew, suffered additional damages from Irma’s storm surge. Glynn County incurred over \$7M in post-disaster recovery efforts.

Although destructive water and wind forces were present during Hurricane Matthew and Irma, both storms only grazed the County. A typical Category 3 hurricane can bring 6 to 12 inches of rainfall and storm surge of 9 to 12 feet. A storm surge that may be superimposed on normal astronomical tides occurring in the fall can make these storms even more dangerous.

Unfortunately, the 2015 Hazard Mitigation Plan for Glynn County predicts that the probability of a reoccurrence of a similar storm is 60% during any given year. Compounded to this hazard, sea level rise will make hurricane-related flooding and storm surge more impactful. Although humans can do little to prevent hurricanes, they can influence the severity of the impact of these storms. A Shoreline Protection Implementation Plan will allow all three partners to mitigate future disasters and become more disaster resilient. If no action is taken in protecting the community’s shorelines, not only is the area exposed to greater damages from future storms, but any actions taken post-storm would only provide a “band-aid” solution to a deeper problem.

Glynn County, the City of Brunswick, and the JIA previously partnered in 2016-2017 on a grant from GADNR, Coastal Resources Division (CRD), to develop a Brunswick-Glynn County Disaster Recovery and Redevelopment Plan (DRRP). The DRRP was finalized in early 2017 and adopted by the County in August 2017. The DRRP is intended to increase community resiliency and disaster mitigation by providing site specific response for short-term recovery, long-term recovery, and redevelopment strategies. Due to the back-to-back hurricane-related events in 2016 and 2017, Glynn County, City of Brunswick, and the JIA pursued another grant from GADNR-CRD to create a Shoreline Protection Implementation Plan (SPIP) that will draw from the recommendations set forth

in the DRRP. This is a multijurisdictional approach in trying to find the most eco-friendly solutions to future shoreline hazards. The first component of the SPIP is a Shoreline Assessment and Implementation Resiliency Plan, which is the focus of this document. The second component, a Sea Level Rise Response Implementation Plan, will be created and completed in fall 2020 to spring 2021.

Existing shoreline conditions were evaluated through this planning process in order to provide a greater understanding of erosion problems, deterioration of existing protection walls, and/or any natural barriers that may have eroded due to the recent hurricanes. Additional information about existing gaps, needs, and overall current shoreline management will lead to more rational mitigation actions and appropriate selection of alternative solutions. This evaluation will be conducted with the assistance of the requested consultant and the Shoreline Task Force.

For the purposes of this plan, shorelines will include beach front, exposed marsh front, and river edges, as appropriate. This initial phase considers the following:

- Data gathering of environmental and coastal hazard data, land use, habitat, infrastructure, and other relevant local and regional datasets from local GIS staff and the Georgia Coastal Hazards Portal (GCHP) website.
- Review of available data and solicit feedback from staff (Task Force) to identify shorelines with the highest vulnerability to erosion and shoreline change.
- Creation of a matrix to rank shoreline segments for vulnerability and to prioritize individual projects that would have the greatest impact on community resiliency.
- Review and analysis of shoreline protection best management practices that emphasize minimal armoring and consider sea level rise adaptation, as well as beach sand control alternatives, such as sand fencing, native plants, and engineered sand nourishment.
- Review of ordinances related to shoreline protection and Shore Protection Act, specifically state and local requirements for setbacks, and identify recommendations to enhance shoreline protection.
- A final report that will summarize the approach and efforts and provide recommendations.

1.1. Shoreline Protection Task Force

Glynn County was the lead applicant for the Coastal Incentive Grant (CIG) that funded this project, and the City of Brunswick and the JIA are partners included in the CIG. As a result, the Shoreline Protection Task Force (“Task Force”) is mostly comprised of City, County, and JIA staff. These partners agreed to share information and formulate cohesive and linked efforts between all members to increase disaster resiliency countywide. The Task Force also includes members from GADNR-CRD to provide input and feedback on technical matters and to ensure that the plan follows the Shore Protection Act (O.C.G.A. Section 12-5-230 et. seq.). Other Task Force members include: Brunswick-Glynn County Joint Water and Sewer Commission (BGJWSC), The Nature Conservancy, and professors from Stetson University, Georgia Southern, and Skidaway Institute of Oceanography. As Glynn County is the primary grantee, the Assistant County Manager and staff in the Emergency Management/Homeland Security Agency (EM/HSA) and Community Development

Department also serve on the Project Team, by coordinating Task Force logistics and grant/project deliverables.

The Task Force provided feedback throughout the planning process and met five times during the first phase of this project. A brief summary of each meeting is described in Table 1.1, and detailed meeting summaries are included in Appendix D. An initial Kickoff Meeting was held on January 25, 2019, with City, County, JIA, and BGJWSC staff. In spring 2019, the County issued an RFP to hire a consultant to assist with Task Force facilitation and plan development. Goodwyn Mills and Cawood (GMC) was the consultant selected and received the NTP on July 12, 2019. The first Task Force meeting led by GMC was held on August 6, 2019. This included a Project Team meeting with the County and Task Force Meeting with all parties. The next several months focused on data gathering and meeting with City and County Public Works and Engineering staff and the JIA Conservation staff to identify issue areas and potential projects. Following the data collection period, another set of Project Team and Task Force meetings were held on January 6, 2020, to solicit additional feedback from the Task Force on preferred management practices and to review current project lists and available datasets. GMC used the results of the January meetings to create a matrix to rank and prioritize individual projects and general shoreline segments. The procedure and results were presented to the Task Force at the February 28, 2020, meeting. During the Task Force and Project Team meetings, schedules and plans were discussed for a joint Commission/Board meeting with JIA, BGJWSC, City, and County officials on March 17, 2020. However, this meeting was cancelled due to COVID-19. The same presentations were rescheduled to occur for each Commission/Board separately in September 2020.

Table 1.1: Summary of Task Force and Project Team Meetings.

Date	Meeting Type	Activities
1/25/2019	Task Force #1 (Kickoff)	<ul style="list-style-type: none"> • History, background, and need for project • Plan for Glynn County, City of Brunswick, JIA, and BGJWSC (Task Force Members) • Plan to release RFQ for consultant assistance • Presentation by Dr. Chester J. Jackson at Georgia Southern University on benefits of sand dunes, pros and cons of block barriers, standardized sand study, and recommendations for factors of concern
8/6/2019	Project Team #1	<ul style="list-style-type: none"> • Review of previous work • Discussion of project scope, and roles for GMC, County, and Task Force • Review Task Force List • Discussion of County's goals
8/6/2019	Task Force #2 (GMC Kickoff)	<ul style="list-style-type: none"> • Discussion of project scope, and roles for GMC, County, and Task Force • Discussion of project goals for Task Force members • Community engagement plans • Request for data/information sharing
10/8/2019	House & Senate Natural Resources & Environment Committees	<ul style="list-style-type: none"> • Presentation at Environmental Academy, led by UGA Carl Vinson Institute of Government • Kathryn Downs (County) and Rob Brown (GMC) presented project description, progress, and planned activities; received positive feedback and interest from the attendees
1/6/2020	Task Force #3	<ul style="list-style-type: none"> • Updates on data gathering and outreach activities since August meeting • Four "Stations" set up to solicit feedback from the Task Force: (1) Hot Spot and Vulnerable Areas, (2) Background Data (GIS Datasets), (3) Management Practice Preference Survey, and (4) General Discussion on Partners/Funding Sources/Grant Opportunities/Permitting Challenges
1/6/2020	Project Team #2	<ul style="list-style-type: none"> • Met to discuss action items and plans for upcoming month and until the next Task Force Meeting in February
2/28/2020	Task Force #4	<ul style="list-style-type: none"> • Presentation of matrix factors and results to rank/prioritize individual projects; discuss modification of some factors • Presentation of matrix on countywide-scale to identify vulnerable shoreline segments • Present and discuss beach profile data • Discussion of next steps: draft plan, joint presentation with City/County/JIA Commissions/Boards on 3/17/2020 (cancelled due to COVID-19)
2/28/2020	Project Team #3	<ul style="list-style-type: none"> • Met to discuss logistics for the joint Commission/Board presentation – timeline for updated PowerPoint and updated project list
7/9/2020	Project Team #4	<ul style="list-style-type: none"> • Revisit schedule for closing out Year #1 and kicking off Year #2 of CIG
8/28/2020	Task Force #5	<ul style="list-style-type: none"> • Review draft plan and discuss comments

2. Shoreline Assessment

The first phase of the shoreline assessment was conducted through soliciting input from multiple sources on locations of coastal erosion, king tide flooding, and general vulnerable areas. Section 2.1 describes a public engagement event at CoastFest 2019, as well as field inspections and review of vulnerable areas with local public works and conservation staff. The second phase, described in Section 2.2, was to investigate previous planning efforts, which focused on a review of the Disaster Recovery and Redevelopment Plan (DRRP) process. Section 2.3 highlights a review and analysis of best management practices for shoreline protection. An initial list was presented to the Task Force, and it was expanded with discussion at the meeting. A list of issues and opportunities identified by the Task Force for each practice is included in this section.

2.1. Public/Staff Input and Field Inspections

The process and results from input received by the public and staff on vulnerable shoreline areas are described in Section 2.1.1 and 2.1.2, respectively. Based on the locations identified from these sources, the consultant completed inspections of these sites to assess the issues and determine potential solutions. The Task Force had an opportunity to review the complete list of projects and vulnerable areas to vet this list and provide any additional locations that were missing.

2.1.1. CoastFest – Public Input

The Glynn County EM/HSA and Community Development Department regularly have an educational and interactive booth at CoastFest to display resources and educational materials from their respective departments. CoastFest is a public event organized and facilitated by GA DNR-CRD and held the first Saturday in October. The 2019 event, held on October 5th, had 12,500 visitors. Glynn County included a station to solicit public input on this project. A map of the County with historical shoreline change data was presented with red being areas with erosion and blue being accretion. County staff and the consultant were present all day to talk with the public and describe the feedback station, as depicted in Figure 2.1. Attendees placed small, numbered sticky dots on locations where there were areas with coastal erosion (orange dots) and king tide flooding (purple dots). There was a corresponding table on a clipboard for participants to add comments and a detailed address. From this event, 27 locations were identified and later reviewed with local staff to incorporate into a full project list.



Figure 2.1: Coastal Erosion and Shoreline Change Activity at CoastFest 2019.

2.1.2. Field Inspections with Staff

The consultant took a field tour with the JIA Director of Conservation and Land Manager on November 5, 2019, and the City of Brunswick Public Works Director on November 8, 2019, to identify potential projects and issue areas related to erosion and king tide flooding. The consultant met with the Glynn County Public Works Director on December 4, 2019 to review maps and take a virtual tour via GoogleMaps. In total, there were 21 potential projects and issue areas identified on Jekyll Island, 13 in City of Brunswick, and 37 in unincorporated Glynn County, with 24 of 37 being on St. Simons Island, as described in Table 2.1. Based on the field visits with local staff in fall 2019, there were 69 potential projects identified, with 58 being specific projects and 11 as general projects and problem areas. The issues were broken down by type: 40 with flooding, 15 with erosion, 13 with both, and one being some other type of issue. Distribution of issue type and location is presented in Figure 2.2.

Table 2.1: Summary of Shoreline Assessment Activities with Staff and the General Public.

Date	Meeting Type	Activities
10/5/2019	Public Activity	<ul style="list-style-type: none"> • Presentation of shoreline change dataset at Glynn County's Coastfest Booth • A total of 27 projects experiencing King Tide Flooding and Coastal Erosion were identified
11/5/2019	JIA Director of Conservation and Land Manager	<ul style="list-style-type: none"> • Identified 21 potential projects/issue areas on Jekyll Island • Several sites from Public Input were confirmed or removed based on local knowledge
11/8/2019	Brunswick Public Works Director	<ul style="list-style-type: none"> • Identified 13 potential projects/issue areas in City of Brunswick • Several sites from Public Input were confirmed or removed based on local knowledge
12/4/2019	Glynn County Public Works Director	<ul style="list-style-type: none"> • Identified 37 potential projects/issue areas in unincorporated County – 24 on St. Simons Island • Several sites from Public Input were confirmed or removed based on local knowledge

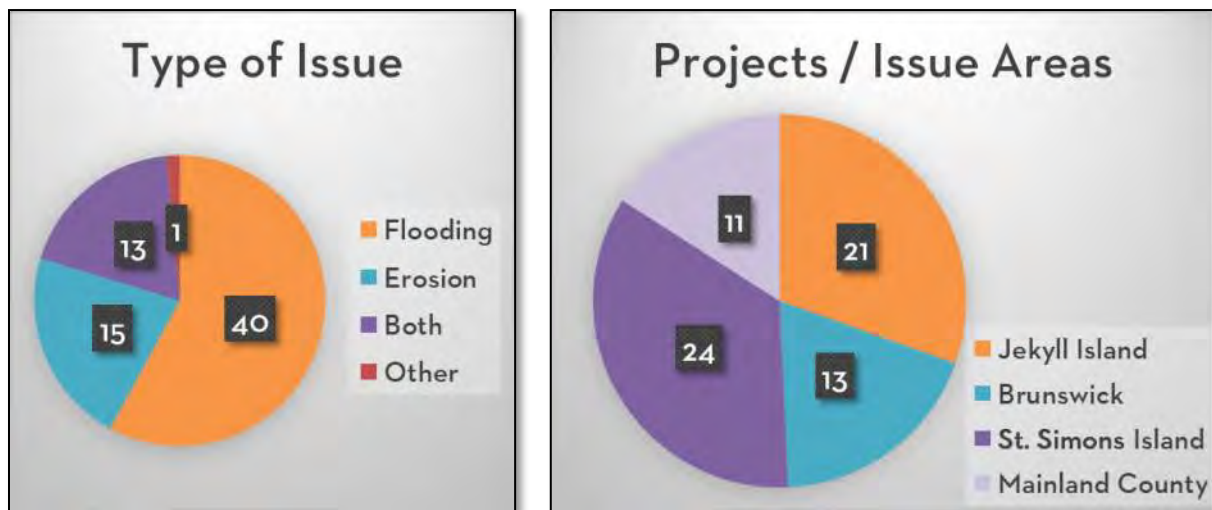


Figure 2.2: Issue Type (left) and Project Locations (right) based on Field Visits with Local Staff in Fall 2019.

This list was presented to the Task Force at the January 6, 2020, meeting to review and determine if other projects were missing. This list was refined to the final list presented in the next section.

2.2. Review of Previous Planning Efforts (DRRP)

The consultant also reviewed the May 2, 2017, meeting notes and feedback from public input session for the County's Disaster Recovery and Redevelopment Plan (DRRP) process to ensure that relevant information gathered in that planning process was conveyed to the shoreline protection project. The DRRP groups participated in two mapping exercises. In the first, they reviewed maps depicting future land use, county buildings, zoning areas, and areas of growth. The second exercise focused on sea level rise impacts. These groups highlighted areas of concern and developed redevelopment strategies for managing these concerns to facilitate recovery and redevelopment. Key and relevant areas of concern were incorporated into the project list for the Shoreline Protection Implementation Plan. A summary of key findings from the first mapping exercise includes:

- Within the City of Brunswick, ordinances should be put in place to require elevation of low-lying areas. To secure access to these areas, surrounding infrastructure (e.g., access roads) may need to be elevated as well. It is not feasible to relocate the city, so these ordinances are critical to support future recovery and redevelopment operations. This should include the schools and other critical infrastructure located within the City of Brunswick (e.g., hospital). This concept should be applied to other low-lying areas throughout the county to minimize repetitive losses.
 - Similarly, ordinances should be put in place regulating the placement of utilities to minimize disruption following an event (e.g., some utilities should be placed underground to minimize damage during a storm).
- At the north end of St. Simons Island, the group recommended the low-density area be converted to green space.
- In the event that a significant portion of businesses are destroyed, the area surrounding the airport should be prioritized as a redevelopment area where businesses could relocate.
- Reopening and providing housing for employees of St. Simons Island, Sea Island, and the Federal Law Enforcement Training Center (FLETC) should be prioritized because they are huge economic drivers within the county. Tourism is another key economic driver, so providing housing or disaster support services to individuals in the restaurant and hospitality industries should be considered.
 - These services, processes, and post-disaster resources should be communicated to these employees and other low-income residents to encourage them to return to Glynn County following an evacuation. It is critical that low-income or marginalized residents understand there is work and support available within the county.
- Review and update zoning policies to reflect current uses.
- Use of pervious pavement and other green infrastructure should be prioritized in industrial areas.
- Consider leaving some structures in downtown Brunswick unfinished or repurposing them to become open/public spaces.
- Maintain or create redundancies in critical infrastructure across the county.
- Prioritize reopening the Jekyll Island Convention Center, as it is a prominent economic driver on the island.

Overview and key findings from the second mapping exercise on sea level rise were:

- Glynn County (as a whole)
 - The county's water treatment facility in the City of Brunswick is in a poor location and should be relocated.
 - Critical IT infrastructure should also be relocated. The group suggested moving it to the county's police department.
 - Development of low-lying areas should be limited by ordinances/zoning.
- St. Simons Island
 - Elevate roads and causeways.
 - Relocate the waste water treatment plant and/or create a second facility at a new location to create redundancy.
 - Create ordinances mandating elevation of homes, businesses, and critical facilities and surrounding infrastructure.
 - Create redundant access roads to the hospital or raise the existing infrastructure to ensure the hospital is still accessible in the future as the sea level rises.
- Jekyll Island
 - Develop strategies to mitigate the following access concerns: road access at the southern end of the island, air traffic, access via main roads, and access to recreational fishing and trails.
 - Jekyll Island also faces potential loss of revenue resulting from impacts to a local golf course, access to hiking and fishing, loss of housing development areas and marinas, and public parks. Additionally, the island's water treatment facility will be impacted.
- City of Brunswick
 - Significant portions of the city's building stock will need to be elevated.
 - There is only one causeway providing access to St. Simons Island. Redundant infrastructure is critical.
 - If certain public facilities are destroyed during a disaster, they should be evaluated for relocation (e.g., public parks, athletic fields).
 - Sea level rise will likely impact the historic district and historic preservation policies.
 - Glynn Academy School will eventually be impacted by sea level rise. The county should consider relocation or elevation.



2.3. Analysis of Best Practices




Some of the initial objectives for this project were to consider approaches to protect shorelines with minimal armoring so that they could also adapt to sea level rise and ultimately increase community resiliency. Other objectives included analyzing beach sand control alternatives such as sand fencing, native plants, and engineered sand nourishment, as well as researching other tools.




At the January 2020 Task Force Meeting, the stakeholders were given a general survey of preferred management practices. Overall, there was a general interest in natural practices, with noted interest in living shorelines, but these have historically had permitting challenges. Task Force members mentioned that there are cascading effects of bulkhead use. When one is present, neighboring future development wants to follow course and use bulkheads too. It was discussed




that more education is needed on these practices and to encourage alternatives. The Task Force discussed including nearshore shoaling and engineered sand nourishment in this plan because it may become necessary at some point and they do not want to restrict themselves. Table 2.2 describes scale, context, and description of each management practice. Issues and opportunities were also identified from Task Force input, and a few representative photo examples are provided from sites in Coastal Georgia, mainly in Glynn County.



Table 2.2: Management Practice Description and Summary, with Input from Task Force.

Management Practice & Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos (from Coastal Georgia)
<p>1. Living Shorelines Scale: shoreline Context: coastal; rural to urban</p> <p>Description: bioengineering combined with native vegetation; adjacent to estuarine waters. In Georgia, this typically includes oyster reef creation.</p>	<ul style="list-style-type: none"> • Public acceptance and interest is high. • Allows natural connections between aquatic environment and adjacent upland; preserves tidal exchange; sediment conservation; allows for marsh migration. • Permitting challenges are significant. It is easier to permit bulkheads than living shorelines. • Currently construction is more expensive than bulkheads. • There is a need for high-profile demonstration projects that the public can access. • Projects can be complex. 	 <p>Source: GADNR-CRD</p>
<p>2. Bulkheads / Sea Wall Scale: shoreline Context: coastal; suburban to urban</p> <p>Description: hard armoring of the shoreline. Can often be wood, concrete, or other hard building material. A wall is created at the upland/marsh interface and backfilled to raise upland.</p>	<ul style="list-style-type: none"> • People feel safer, they want a static shoreline. • Hardened shorelines disrupt sediment movement and transport patterns. • Causes erosion on subject and neighboring properties. • Starts a “chain” effect where once one property has a bulkhead, neighboring properties want the same. • Education is needed because contractors often recommend this solution. • Use allowed adjacent to the marsh, i.e. pools and patios, often requires a bulkhead and fill. • Are exempted in the Marshland Protection Act, which incentivizes this over other solutions. 	

Management Practice & Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos (from Coastal Georgia)
<p>3. Rock Revetments & Jetties Scale: shoreline, beach Context: coastal; suburban to urban</p> <p>Description: hard armoring, expensive, designed to absorb wave energy and to reduce erosion. Can disrupt natural sediment transport.</p>	<ul style="list-style-type: none"> • Two major rock revetments in Glynn County: Johnson Rocks and Jekyll Island. • County was pursuing an expansion of the kneewall at Neptune Park from the Pier to the Lighthouse as part of SPLOST 2020. • Politically popular because the public can see the solution. • County is primarily interested in maintaining what they have, not building new ones. • Sea Island just installed a jetty at the bottom of the island which will have an impact on sand transport to St. Simons Island. 	
<p>4. Rip Rap Scale: Shoreline, channels Context: coastal and upland; rural to urban</p> <p>Description: deploying smaller rocks of varying sizes to slow flow and stabilize eroding banks.</p>	<ul style="list-style-type: none"> • Very common technique. • Allows for some natural vegetative growth. • Less expensive option. • Used to stabilize Blythe Island boat ramps. 	
<p>5. Temporary Beach Access (w/ Barrier) Scale: shoreline Context: coastal; suburban to urban</p> <p>Description: mechanism to block flow of water through a low-lying beach access point. This involves local stockpiling of materials near the entrance that can be quickly mobilized for the creation of a temporary barrier when a storm or high tide is forecasted.</p>	<ul style="list-style-type: none"> • Only requires a Letter of Permission (LOP). • For emergency flood mitigation during hurricane season. • This requires the availability of beach quality sand. • Public Works was supportive of this option. 	

Management Practice & Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos (from Coastal Georgia)
<p>6. Constructed Dunes Scale: shoreline Context: coastal; suburban to urban</p> <p>Description: restore dunes and block flow from low-lying beach access points, hardened structure beneath dunes.</p>	<ul style="list-style-type: none"> • Temporary dunes (less than 6 months) require an LOP only. Permanent Dunes must have a Shore Protection Act (SPA) permit. • If you are going to go through the trouble of building, they should be permanent. • Proprietary product PermaShield™ has been used for structural support to build dunes on Tybee Island (Guardian Retention Systems). • Pedestrian and vehicle access can be allowed over the dune, if designed accordingly. 	
<p>7. Sand / Dune Fencing Scale: shoreline Context: coastal; rural to urban</p> <p>Description: fencing used to force windblown sand to accumulate in a desired place and build up the dune, also used to prevent foot traffic from damaging the dune system.</p>	<ul style="list-style-type: none"> • Has been successfully deployed throughout Glynn County. • Inexpensive and more natural way to build dunes, but the timeframe for a mature dune is much longer. • It is an effective way of keeping foot traffic out of the dunes. • It is a politically popular measure. 	
<p>8. Beach Nourishment/Re-nourishment Scale: shoreline Context: coastal; suburban to urban</p> <p>Description: process by which sand lost through erosion is replaced from other sources, typically a repetitive process because it does not remove the physical forces but mitigates their effects.</p>	<ul style="list-style-type: none"> • Glynn County attempted to permit a beach nourishment project in the 1990s, and it was met with a lot of resistance. • It is likely that this would still be publicly unpopular. The County could conduct a survey to gauge public acceptance. • Glynn County is missing out on an opportunity to participate in the ACOE Sand Sharing project because no projects are identified. • There are eroding beaches on Jekyll Island and St. Simons Island. 	 <p>Source: WTOC 11</p>

Management Practice & Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos (from Coastal Georgia)
<p>9. Nearshore Placement Scale: shoreline Context: coastal; suburban to urban</p> <p>Description: placement of sand near-shore, but not directly on the beach to buffer wave energy and to allow natural shoaling processes to deposit additional sand and build the beach.</p>	<ul style="list-style-type: none"> • This option may have more public acceptance as it mimics natural processes. • There is interest in modeling this BMP to determine where it would be appropriate. • Has already been successful on Ft. Pulaski which is subject to erosion from shipping channel waves. • Was also used on Tybee Island as part of their Beach Management Plan. • JIA is interested in this approach (“Sand Motor”) as an option to protect northern end of the island. 	
<p>10. Land Preservation Scale: landscape, watershed, community, shoreline Context: coastal and upland; rural to urban</p> <p>Practices: natural land and open space preservation, conservation easements, establishing parks and greenways.</p>	<ul style="list-style-type: none"> • This is popular but an expensive option. • The County should prioritize preservation of natural lands that will allow for marsh migration as sea levels rise. • Available SLAMM (Sea Level Affecting Marshes Model) data that identifies marsh migration potential could be used to identify areas the County can target for conservation. • Provides a lot of CRS credit. 	
<p>11. Green Stormwater Infrastructure Scale: community, site Context: coastal and upland; suburban to urban</p> <p>Practices: bioretention, bioswales, rain gardens, permeable pavement, stormwater planters.</p>	<ul style="list-style-type: none"> • This is becoming a popular option. There are active projects already in the County, on Jekyll Island, and in Brunswick. • Maintenance is challenging. • Public acceptance is high. • Promotes infiltration and water quality treatment, reduces impervious surfaces and stormwater runoff, and provides ecological services. 	

Management Practice & Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos (from Coastal Georgia)
<p>12. Tide Control Scale: watershed, storm sewer system (MS4) Context: coastal and upland; suburban to urban</p> <p>Practices: Tide gates, tide flaps.</p> <p>Description: placed at the storm sewer system outlet to prevent tidal water from flowing back up into the storm sewer.</p>	<ul style="list-style-type: none"> • Tide control structures allow for the storm sewer system to have capacity available for rain events during higher tide periods, and they prevent “sunny-day” flooding. • There is a regular maintenance requirement to keep the tide gates or flaps operational; they can be blocked open with debris and lose functionality. • These are used in some areas of the City and County. 	
<p>13. Streambank Stabilization Scale: community, site Context: coastal and upland; suburban to urban</p> <p>Practices: Geo-textiles, staking, log structures, rip rap, stone structures.</p>	<ul style="list-style-type: none"> • More pleasing “natural” look. • Can often use on-site materials. • Designed for habitat. • County is interested in this option. • Maintenance is an issue because private property owners often resist vegetation in ditches. There is the misconception that the vegetation slows flow, causes flooding and harbors snakes and mosquitos. • Education is needed. • Permitting may be an inssue where this is used to stablize natural channels. • The JIA completed a project using Filtrexx (picture to right), which is a proprietary type of “living shoreline.” 	
<p>14. Policy Changes Scale: community Context: planning & development</p> <p>Practices: Shore Protection Act, Permitting, Buffers.</p>	<ul style="list-style-type: none"> • Create buffers around land use. • Address permitting difficulties with Living Shoreline and the inherent “incentive” the MPA exemption for bulkheads creates. Consider creation of a “Nationwide”- type permit for Living Shorelines. • Address conflicts between SPA jurisdictional line determination and the Glynn County Shoreline Protection ordinance. • Review uses allowed in the County Shoreline Protection buffer to see if they are appropriate. 	

A new tool/product that has not been implemented in Glynn County is a proprietary product PermaShield™ which is created by Guardian Retention Systems. This product is installed in the core of a constructed dune to provide storm surge protection and emergency vehicle access points. It has been used recently on Tybee Island for rebuilding their dunes. Pictures in Figure 2.3 and Figure 2.4 are from construction in January 2018 at 19th Street where a 6-ft PermaShield™ product was used to build an 8-ft dune. PermaShield™ was filled with local sand and included a mat material to allow emergency response vehicles and heavy equipment to drive up and over the dune. In spring 2020, additional installations for vehicle access points at 3rd Street and Gulick Street were also installed.



*Figure 2.3: PermaShield™ being installed at 19th St on Tybee Island.
Photo Credit: Guardian Retention Systems*



*Figure 2.4: Before (left) and After (right) of PermaShield™ Constructed Dune on Tybee Island.
Photo Credit: Guardian Retention Systems*

3. Shoreline Prioritization

A matrix was developed as a step to prioritize individual projects and the most vulnerable shoreline segments. GMC created the initial matrix following feedback received from the January 6, 2020, meeting, and it was presented at the February 28, 2020, meeting for feedback and refinement of factors and rankings. Section 3.1 describes how the matrix was developed, the factors included, and how each factor and project are scored.

3.1. Prioritization Approach (Matrix Development)

Most of the datasets used in the analysis were reviewed on the Georgia Coastal Hazards Portal (<https://www.arcgis.com/home/item.html?id=2e2d61fad5d44e0c96995c38feb7052d>). Some of the data layers were downloaded individually and added to a GMC-housed WebMap to evaluate and rank each individual project.

One of the key datasets used in determining areas with eroding shorelines and to prioritize projects was the “Shoreline Change Rate” dataset, that is available on the Georgia Coastal Hazards Portal at (https://gchp.skiio.uga.edu/arcgis/rest/services/Server/GA_ShorelineChange/MapServer). Rates are presented as change in meters per year in 0.2-m intervals with greater than 1-m of erosion (–1.0) or accretion (+1.0) being the end groups, as presented in Figure 3.1. The shoreline change rates are based on conditions from the 1930s to 2000. The program to calculate these rates is AMBUR (Analyzing Moving Boundaries Using R, which was developed by Dr. Chester Jackson, a professor at Georgia Southern University. This digital tool is effective to analyze shoreline change along barrier islands with complex shapes and highly curved shorelines.

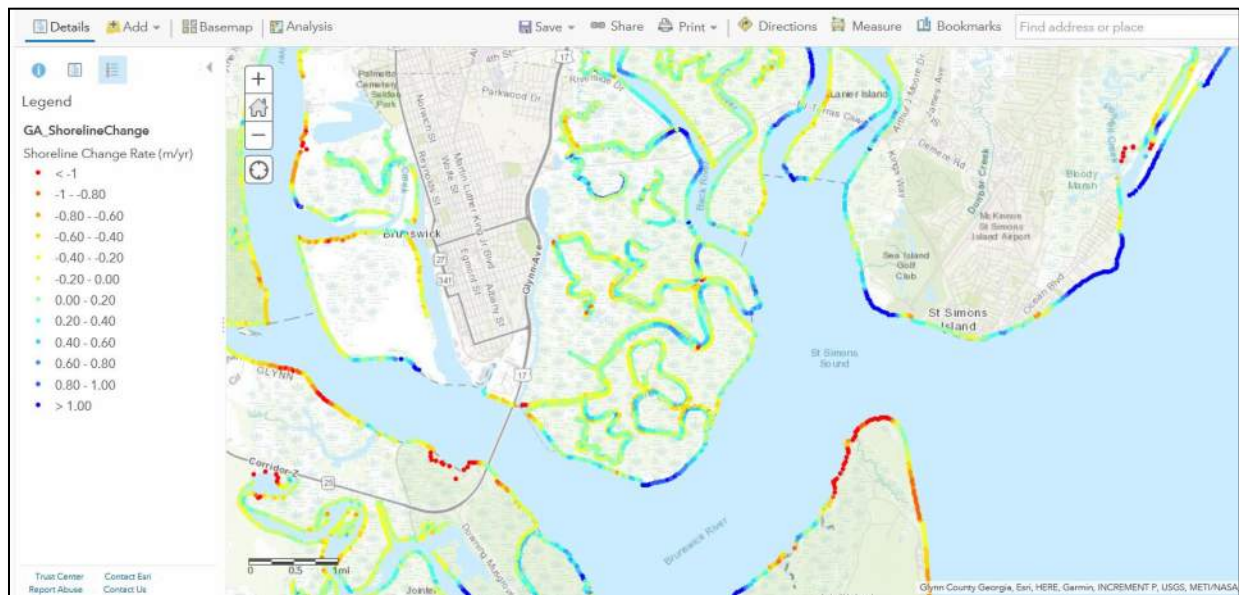


Figure 3.1: Example of “Shoreline Change Rate” Dataset.

The “Shoreline” line from the “Shoreline Change Rate” dataset is very important because it is used when calculating the distance of the shoreline to infrastructure of concern, and the rates are incorporated into an erosion rate factor. However, there are some minor channels where the “Shoreline Change Rate” data is unavailable. An example at the Palmetto Cemetery in Brunswick is presented in Figure 3.2. In this case and similar ones, current conditions and historical knowledge from staff were used to visually assess erosion condition and rate, and the edge of the eroding channel was used to measure distance to infrastructure.

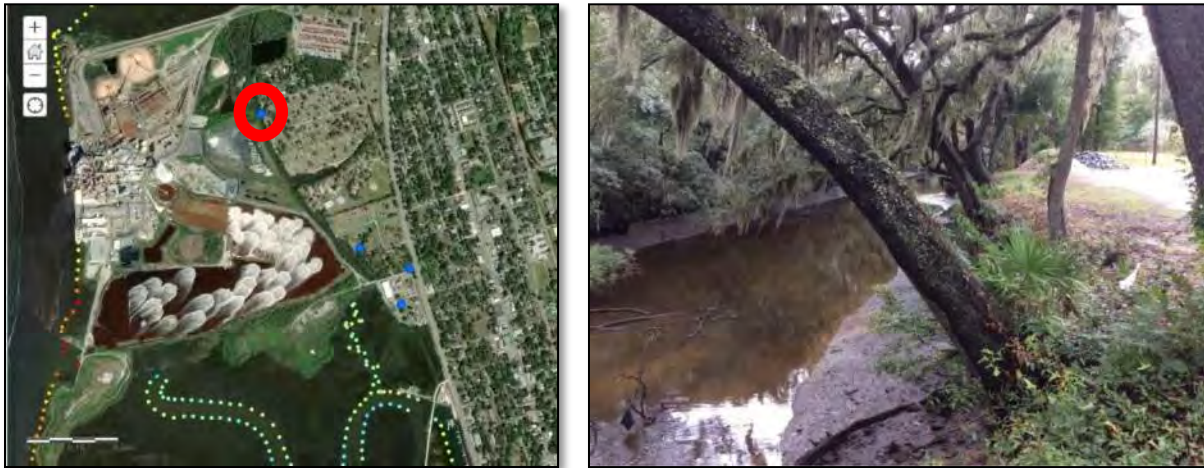


Figure 3.2: Example of Project Along Channel Without Shoreline Change Data Available.

Individual projects were identified and vetted by staff. Projects identified by the public were reviewed by the consultant and staff to determine applicability to this list. Nine factors were used to rank and score the projects for prioritization. They were prioritized into three ranking groups (10, 7, and 5) with three having a maximum score of 10, one with a maximum score of 7, and the remaining five with a maximum score of 5. Higher maximum scores equate to factors with more weight, and higher overall scores equate to higher prioritization. The factors and corresponding maximum score listed in parentheses is presented below:

- Infrastructure Type (10)
- Infrastructure Proximity (10)
- Sea Level Rise Impacts (10)
- Erosion Rate (7)
- Flood Zone (5)
- Flooding Frequency (5)
- Low-Moderate Income Status (5)
- Ownership (5)
- Special Habitat (5)

Infrastructure Type is a top-tier factor with a maximum rating of 10. Based on feedback from the Task Force, the highest rating was given to critical facilities, historical structures, and major roads. Also, residential structures were given higher priority over non-residential structures. The categories with five assigned scores are presented below:

- 10: major roads, critical facilities, historic structures
- 7: minor residential roads, residential structures
- 5: non-residential structures
- 3: recreation areas, parks
- 1: trails

Infrastructure Proximity is a top-tier factor with a maximum rating of 10. Not all project locations were adjacent to channels with “shoreline change rates” from the DNR-Coastal Hazards Portal, so proximity to an eroding channel was used if “shoreline change rates” were not available. An example calculation for the Riverside Drive Causeway, where shoreline change data is available, is presented in Figure 3.3. If there was active erosion that was closer to the infrastructure of concern, as presented in Figure 3.4 for the historic “Brewery Site” on Jekyll Island, the edge of the channel was used to calculate infrastructure proximity. A few examples of an eroding channel that did not have Shoreline Change data are presented in Figure 3.5 for “T Street Outfall at Academy Creek” in Brunswick and “Ocean Blvd Headwall Erosion” on St. Simons Island. In these cases, the distance to infrastructure was based on the edge of the eroding channel. The categories with five assigned scores are presented below:

- 10: < 50 feet
- 7: 50 to 100 feet
- 5: 100 to 200 feet
- 3: 200 to 300 feet
- 1: 300 to 500 feet

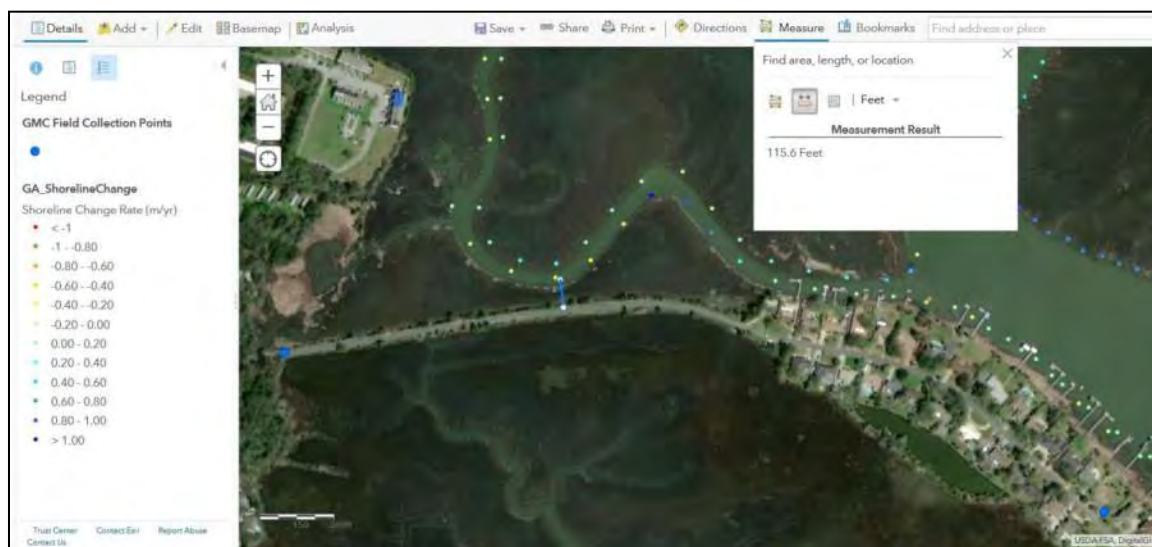


Figure 3.3: Example Calculation for Infrastructure Distance to Shoreline.



Figure 3.4: Example where Eroding Channel Outweighed Shoreline Change Rate Data.



Figure 3.5: Example Sites where Distances to Eroding Channel were Used.

In relating distance to erosion rate, the erosion rates were multiplied by durations to determine the impacted lengths by 2050, 2075, and 2100. A summary is presented in Table 3.1. Based on these results, 100-feet of erosion would occur by 2050 for areas with an erosion rate of -1.0 m/year, 2075 when the rate is -0.6 m/year, and 2100 when the rate is -0.4 m/year. An impact beyond 300 feet will only occur by 2100 for areas with an erosion rate of -1.2 m/year or greater.

Table 3.1: Calculation of Future Erosion Distance at Major Year Intervals.

Erosion Rate (m/yr)	Erosion Rate (ft/yr)	Erosion Length (ft)		
		2020-2050	2020-2075	2020-2100
-1.2	-3.9	-118	-217	-315
-1.0	-3.3	-98	-180	-262
-0.8	-2.6	-79	-144	-210
-0.6	-2.0	-59	-108	-157
-0.4	-1.3	-39	-72	-105
-0.2	-0.7	-20	-36	-52

Sea Level Rise Impacts is a top-tier factor with a maximum rating of 10. While shorelines shift due to erosion, they will also be shifting in the future due to sea level rise. The Sea Level Affecting Marshes Model (SLAMM) simulates potential impacts of long-term sea level rise on wetlands and shorelines (<https://gchp.skiio.uga.edu/arcgis/rest/services/Server/SLAMM/MapServer>). The data for Glynn County was modeled by Dr. Jackson at Georgia Southern, and it has 18 land cover categories with results available in quarter century increments for either 1-m or 2-m of sea level rise. There is also a layer of “Upland to Wetland Transition” by 2050 and 2100 for 1-m of sea level rise. Due to the large number of land use conditions and that the transition zone only has two options, NOAA sea level rise (<https://gchp.skiio.uga.edu/arcgis/rest/services/Server/NOAASLR/MapServer>) was explored as a surrogate for marsh migration. It also provided a clearer picture on a scenario when infrastructure would be inundated. Example conditions for 2-ft, 3-ft, and 4-ft of sea level rise are presented in Figure 3.6 as an overlay to individual project locations on St. Simons Island near King and Prince Resort and Ocean Blvd. The categories with five assigned scores are presented below:

- 10: 1-ft SLR Scenario
- 7: 2-ft SLR Scenario
- 5: 3-ft SLR Scenario
- 3: 4-ft SLR Scenario
- 1: 5-ft SLR Scenario or greater

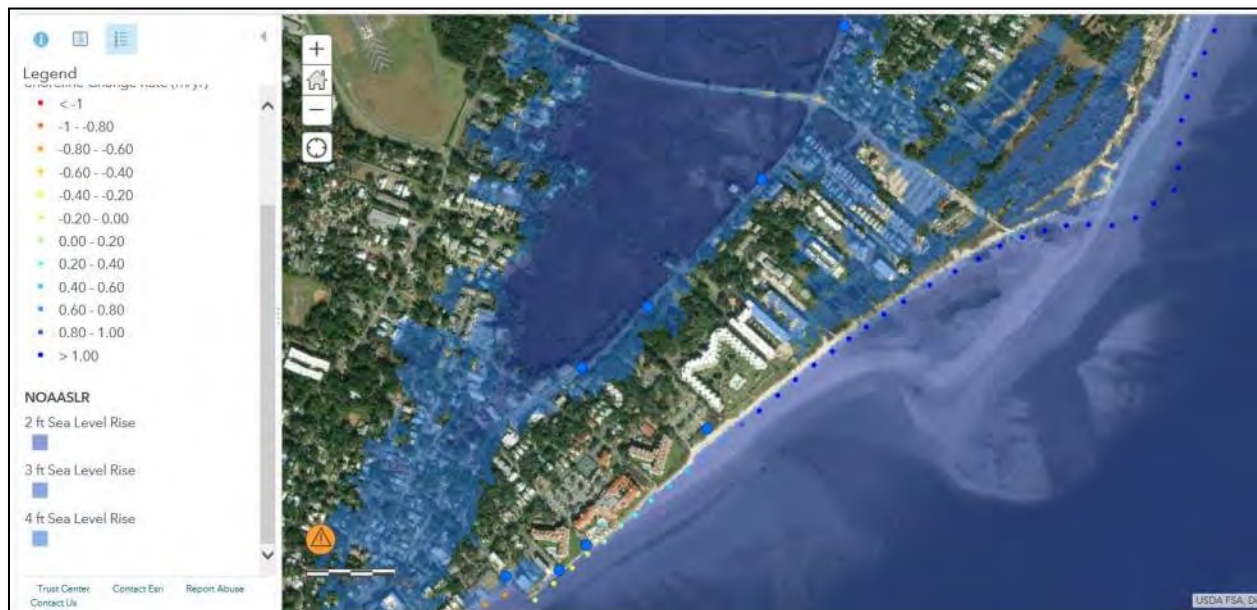


Figure 3.6: Example of “NOAA Sea Level Rise” Data on St. Simons Island.

Erosion Rate is a medium-tier factor with a maximum rating of 7. This factor was included and given higher weight due to the Task Force’s desire to account for projects that have both flooding and erosion. The data source was the Georgia Southern shoreline change dataset. If a channel was not in that data layer, then the evaluation was based on visual inspection. The categories with five

assigned scores are presented below, with shoreline change rates presented in parentheses and visual assessment in quotes:

- 7: “High” (> -1.0 m/yr)
- 5: “Moderate-High” (-0.6 to -1.0 m/yr)
- 3: “Low-Moderate” (-0.2 to -0.6 m/yr)
- 1: “Low” (0.0 to -0.2 m/yr)
- 0: None

Flood Zone is a low-tier factor with a maximum rating of 5. This factor was included to incorporate modeled flooding risk. Examples of flood zones overlaid on individual project locations on St. Simons Island and Brunswick are presented in Figure 3.7. The categories with four assigned scores are presented below:

- 5: VE Zone
- 3: A or AE Zone
- 1: Shaded X Zone
- 0: X Zone

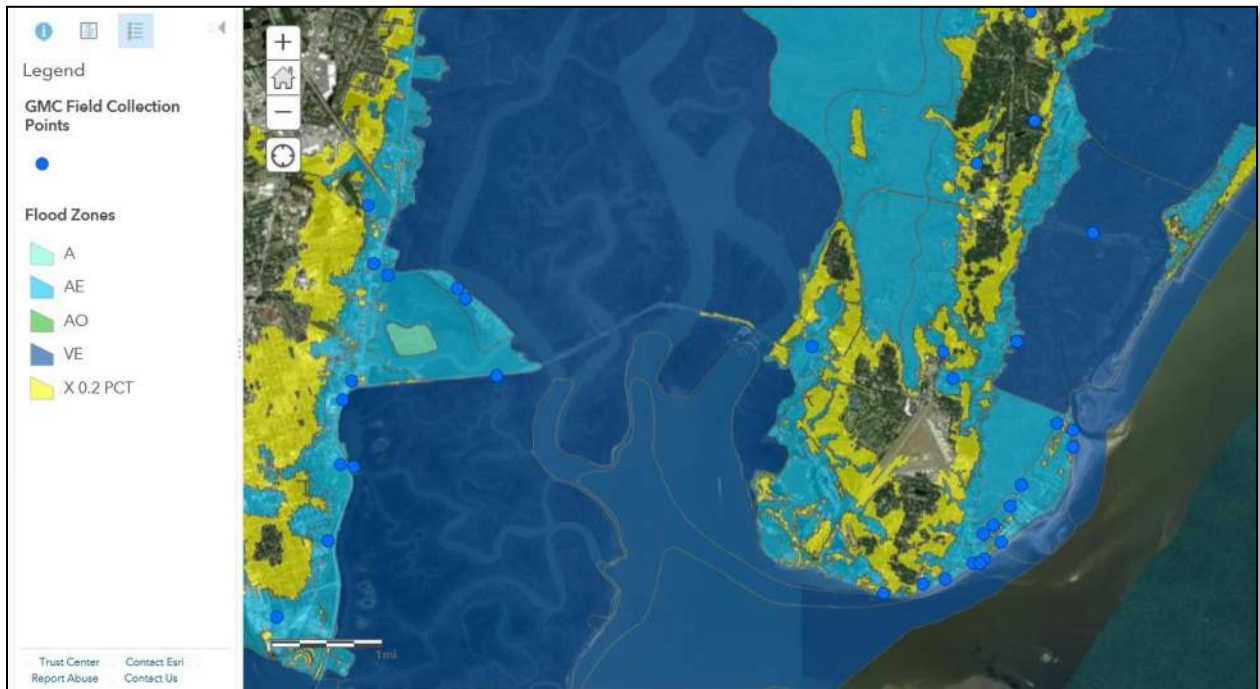


Figure 3.7: Example of “Flood Zone” Data on St. Simons Island and in Brunswick from the Digital Flood Rate Insurance Maps (DFIRM).

Flooding Frequency is a low-tier factor with a maximum rating of 5. This factor was included to incorporate recent impacts from hurricanes/tropical storms. The rating was based on feedback from local staff on whether a site experiences regular or King tide flooding, or if it flooded during

hurricanes Matthew (2016) or Irma (2017). The categories corresponding with the three assigned scores are presented below:

- 5: Regular / King Tide Flooding
- 3: Flooded during Recent Hurricanes Only
- 0: None

Low-Moderate Income Status is a low-tier factor with a maximum rating of 5. This factor was selected as a surrogate to incorporate vulnerable populations and grant eligibility. This specific criterion is used to determine eligibility for Community Development Block Grant (CDBG) funding, with greater than 50% being the threshold for prioritized eligibility. The scoring was determined based on the Census Block Group that the project was located within and corresponding CDBG Low- and Moderate-Income Data from the HUD Exchange (Department of Housing and Urban Development) for 2011-2015. The categories with three assigned scores are presented below:

- 5: > 50%
- 3: 40 to 50%
- 0: < 40%

Ownership is a low-tier factor with a maximum rating of 5. This factor was included to incorporate ease for construction and coordination, where if a property is already owned by the local government, property acquisition is not required. The categories corresponding with three assigned scores are presented below:

- 5: Public / Local Government (City, County, JIA)
- 2: Other Government (School Board, BGJWSC, DOT, State, Federal)
- 0: Private

Special Habitat is a low-tier factor with a maximum rating of 5. This factor was included to incorporate protecting special habitats. The datasets used to rate this factor were from the U.S. Fish and Wildlife Services National Wetland Inventory (NWI). Freshwater and riverine wetlands from the NWI, as well as turtle and piping plover habitats (beaches) were assigned the highest score. If there is an existing seawall or bulk head present, the project would be rated as a '3' due to the hard feature impacting natural function. Armored shorelines were assessed in the field, and a dataset for "Armored Shoreline Distribution" was also explored on the Georgia Coastal Hazards Portal (https://gchp.skio.uga.edu/arcgis/rest/services/Server/Armored_Shorelines/MapServer). The categories with three assigned scores are presented below:

- 5: Habitat is Eroding/Vulnerable
- 3: Adjacent to Habitat or Hard Feature Impacting Natural Function
- 0: None

4. Shoreline Project Implementation

Moving from assessment to implementation, it is important to identify funding sources and potential partners. These topics are presented in Section 4.1 based on feedback received from the Task Force. In working close to the shoreline, there are often permitting challenges that complicate scheduling, so these experiences are also described in this section. Section 4.2 describes the overall results and recommendations to address areas with shoreline vulnerabilities. This section culminates the process to create a prioritized list of projects by combining the matrix approach from Section 3.1, analysis of best practices from Section 2.3, and potential funding sources and partners from Section 4.1.

4.1 Funding Sources, Other Potential Partners & Permitting Challenges

During the January 6, 2020, Task Force Meeting, one of the “stations” was a general discussion on partners, funding sources, grant opportunities, and permitting challenges. A list of funding sources and potential grant opportunities is provided below. One source of local funding is a future SPLOST. There were some funds set aside for implementation of projects in this plan in the 2020 SPLOST, but it was removed from the ballot in 2020 due to uncertainty associated with coronavirus. It is possible to be included on a future SPLOST.

Potential Funding Sources & Grant Opportunities:

- Future SPLOST
- CDBG-DR; CDBG to entitled communities; CDBG to non-entitled communities
- 319(h) Grant through DNR-EPD (U.S. EPA)
- Coastal Incentive Grant through DNR-CRD (NOAA)
- Army Corps of Engineers
- National Fish and Wildlife Foundation
- Communities of Coastal Georgia Foundation
- FEMA Public Assistance (after a storm)
- FEMA BRIC Program (Building Resilient Infrastructure and Communities), created to assist with resiliency (program is still underway with FEMA)
- NOAA funding to assist with resiliency
- Include the private sector to fund part of project(s)
- National League of Cities
- Creation of a Tax Allocation District (TAD) to fund part of the project(s)

Based on the funding sources, many of these organizations would be ideal project partners or project leads, such as Army Corps of Engineers, FEMA, GEMA, Georgia DCA, and Georgia DNR. Other project partners or project leads can be associated with property ownership, such as GDOT, Georgia Power, and Glynn County School System. It was suggested to connect with Tybee Island

since they have been through a similar process. GMC previously reached out to the consultant managing Tybee Island's Beach Management Plan, Alan Robertson, and he participated in a Task Force meeting and shared experiences from Tybee Island. GMC also coordinated a tour for the Glynn County, County Engineer, and the JIA Director of Conservation to highlight beach management practices and resiliency efforts by Tybee Island staff. A full list of potential project partners and project leads is presented below.

Project Partners or Project Leads:

- Local Jurisdictions: City/County/JIA/BGJWSC
- Army Corps of Engineers
- Emergency Management: FEMA/GEMA
- CDBG: Georgia DCA / HUD
- NOAA Grants: DNR-CRD / NOAA
- U.S. EPA Grants: DNR-EPD / U.S. EPA
- State Highways: GDOT
- Utilities: Georgia Power
- Schools: Glynn County School System
- FLETC – they might have additional funding sources available and if not, at least they should be involved in the conversations since they are heavily involved in re-entry and recovery processes
- Other Coastal Communities:
 - Tybee Island because they have been through some of these processes
 - Sea Island – They already have a shoreline protection plan in place; the intent is to have their plan reflect our goals and objectives
- Private organizations and/or businesses:
 - King and Prince – shoreline projects/activities will have a direct impact on them.
 - Georgia Ports Authority
 - Pinova
- Public: members of heavily flooded neighborhoods or representatives from HOA's
- Conservation Groups

The final topic discussed in this breakout group was permitting challenges. The following items were raised by the Task Force as challenges:

- It is easier to permit a project with hardened structures than natural structures (e.g., living shorelines).
 - Living shoreline permitting is by far more difficult than hardened permitting
- Length of time for permitting:
 - The internal process is too long.
 - Federal permitting is long and tedious.

- DNR Committee’s process is too long, and at times, it can hold up the process for a very long time.
- Other issues:
 - Shoreline Protection local Committee was mentioned as a primary issue.
 - Communication issues between multiple agencies (Army Corp, NOAA and DNR).
 - Timelines – having projects in a plan but not mapping out the timing of the permitting and making sure that if any “construction” is not scheduled during any nesting season or otherwise related.
- Comments from DNR permitting representative:
 - Timing depends on the size of the project. Anything under 0.1 acre, the permit does not have to go to the DNR local Committee, whereas, anything above that, it will need to go to the committee and abide or follow whatever requirements or condition they impose.
 - Suggested to make note of the changes to the Coastal Marshlands Protection Act that became effective January 1, 2020.

A list of recommendations that came from this discussion include:

- Expand the state’s permitting process and do not rely so much on the Committee.
- Setup a pre-application permitting meeting with DNR. This will allow for timely feedback from DNR staff and possible suggestions to ease the process.
- Early in the process, list all projects with related timelines. During the creation of this list, make sure to include all permitting requirements, agencies and time restrictions.
- Map out potential supplies and vendors with a related timeline (from making the order, receiving the supplies, to paying out the vendors, etc.).

4.2. Matrix Results & Implementation Plan

The scores from the matrix, as described in Section 3.1, were calculated for each project. A summary of the scores for each individual project and jurisdiction is presented in Figure 4.1. Based on this graph, projects on Jekyll Island and in the City of Brunswick had higher scores due to presence of historical structures and special habitats on Jekyll Island, and impact of sea level rise and low-moderate income status in Brunswick. Since each jurisdiction will be funding and managing their own shoreline protection projects, the scoring for each was considered separately, and approximately one-third of the projects were assigned as near-term (highest priority), one-third as intermediate-priority (medium priority), and one-third as long-term (lowest priority). The distribution was not even thirds, but they were divided where there were clear breakpoints in the cumulate dataset in Figure 4.1. The distribution of projects and score ranges are presented in Table 4.1. The end result were 16 projects in the City of Brunswick, 37 in unincorporated Glynn County, and 14 on Jekyll Island. The unincorporated Glynn County projects were distributed with 12 on the mainland and 25 on St. Simons Island.

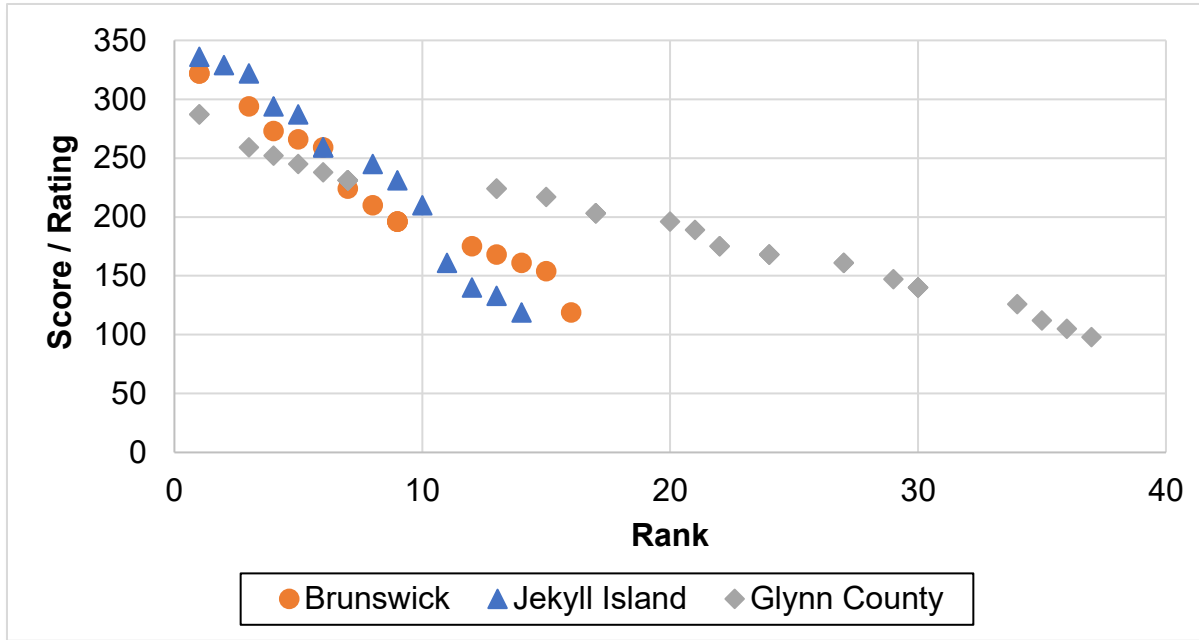


Figure 4.1: Summary of Scores for Individual Projects per Jurisdiction.

Table 4.1: Summary of Prioritization Matrix Results and Corresponding Numbers of Projects.

Prioritization Level	Score Range (points from matrix calculation)			Total Projects		
	City of Brunswick	Glynn County	Jekyll Island	City of Brunswick	Glynn County	Jekyll Island
Near-Term	259-322	231-287	287-336	6	12	5
Intermediate	196-224	168-224	210-259	5	14	5
Long-Term	119-175	98-161	119-161	5	11	4
Total				16	37	14

The next series of figures and tables present the shoreline protection project list. The summary tables include a Site ID, Site Description, Priority, Cost, Potential Partners/Project Lead, Proposed Solutions and Alternates. The Priority is based on the calculated score from the matrix and corresponding rank for each jurisdiction separately. Cost was included as a relative measure compared with other projects for that jurisdiction, so it is listed as either \$, \$\$, \$\$\$, or \$\$\$\$ for the range from lowest to highest cost. This initial level of analysis is too early and broad to assign a specific value. The Potential Partners/Project Lead were identified based on property ownership and potential granting or coordinating agencies. The Proposed Solutions and Alternates were developed based on Analysis of Best Practices in Section 2.4., where there was a general interest in natural practices. The Site ID in the table can be used to locate the project in the subsequent map/figure. A detailed and larger-scale set of maps is included in Appendix B. There are a few projects that have been partially addressed to note the current issue, but there is still a long-term solution needed to sustain future storms and sea level rise conditions.

Table 4.2: City of Brunswick Project List – Shoreline Assessment and Implementation Resiliency Plan.

Site ID	Site Description	Priority (Based on Rank)	Cost	Potential Partners / Project Lead	Proposed Solution	Alternates
B3	Palmetto Cemetery Erosion	Near-Term	\$\$	City	Living Shoreline	Rip Rap or relocate graves
B9	Marshside Grill Erosion and Flooding	Near-Term	\$\$	City / Private	Bulkhead/Sea Wall	Living Shoreline / Stream Stabilization
B8	Howard Coffin Park Ditch Erosion	Near-Term	\$	City / BGJWSC	Living Shoreline	Rip Rap
B5	T Street Outfall at Academy Creek	Near-Term	\$\$	City	Living Shoreline	Rip Rap or relocate graves
B15	Flooding on Hwy 17 at Lanier Plaza	Near-Term	\$\$\$	GDOT	Elevate Intersection	Relocate Road
B10	Riverside Drive Causeway	Near-Term	\$\$\$	GEMA/FEMA, Army Corps	Raise Causeway	N/A
B4	Greenwood Cemetery Erosion	Intermediate	\$	City	Living Shoreline/ Stream Stabilization	Rip Rap or relocate graves
B12	Lanier Blvd Flooding	Intermediate	\$\$\$	City / School Board	Elevate Road; Add/ increase pipe size	Relocate Road
B6	Brunswick Landing Marina Sediment Accumulation	Intermediate	\$\$\$	Marina	Living Shoreline	Dredge
B11	Riverside Drive Overtopping	Intermediate	\$\$\$	GEMA/FEMA, Army Corps	Elevate Road; Reroute stormwater pipes	Regional SW Mgmt / Green Infrastructure
B16	Academy Creek WWTP	Intermediate	\$\$\$\$	BGJWSC, HUD, GEFA, GEMA/FEMA	Sea wall / bulk head	Relocate structure
B2	Flooding on Hwy 17 at Torras Causeway	Long-Term	\$\$\$	GDOT	Elevate Intersection	Relocate Road
B1N	Riverside Drive Neighborhood Flooding	Long-Term	\$\$\$\$	GEMA/FEMA, HUD Army Corps	Tide Control; Regional SW Mgmt / Green Infrastructure	Elevate houses above BFE or Buy-outs
B7N	General: Flooding South of 4th Ave	Long-Term	\$\$\$\$	GEMA/FEMA, HUD Army Corps	Tide Control; Regional SW Mgmt / Green Infrastructure	Elevate houses above BFE or Buy-outs
B14	Flooding on Hwy 17 south of Redwood Street	Long-Term	\$\$	GDOT	Install tide gate	Elevate Road
B13N	Downtown Flooding	Long-Term	\$\$\$\$	GEMA/FEMA, HUD Army Corps	Tide Control; Regional SW Mgmt / Green Infrastructure	Elevate houses above BFE or Buy-outs

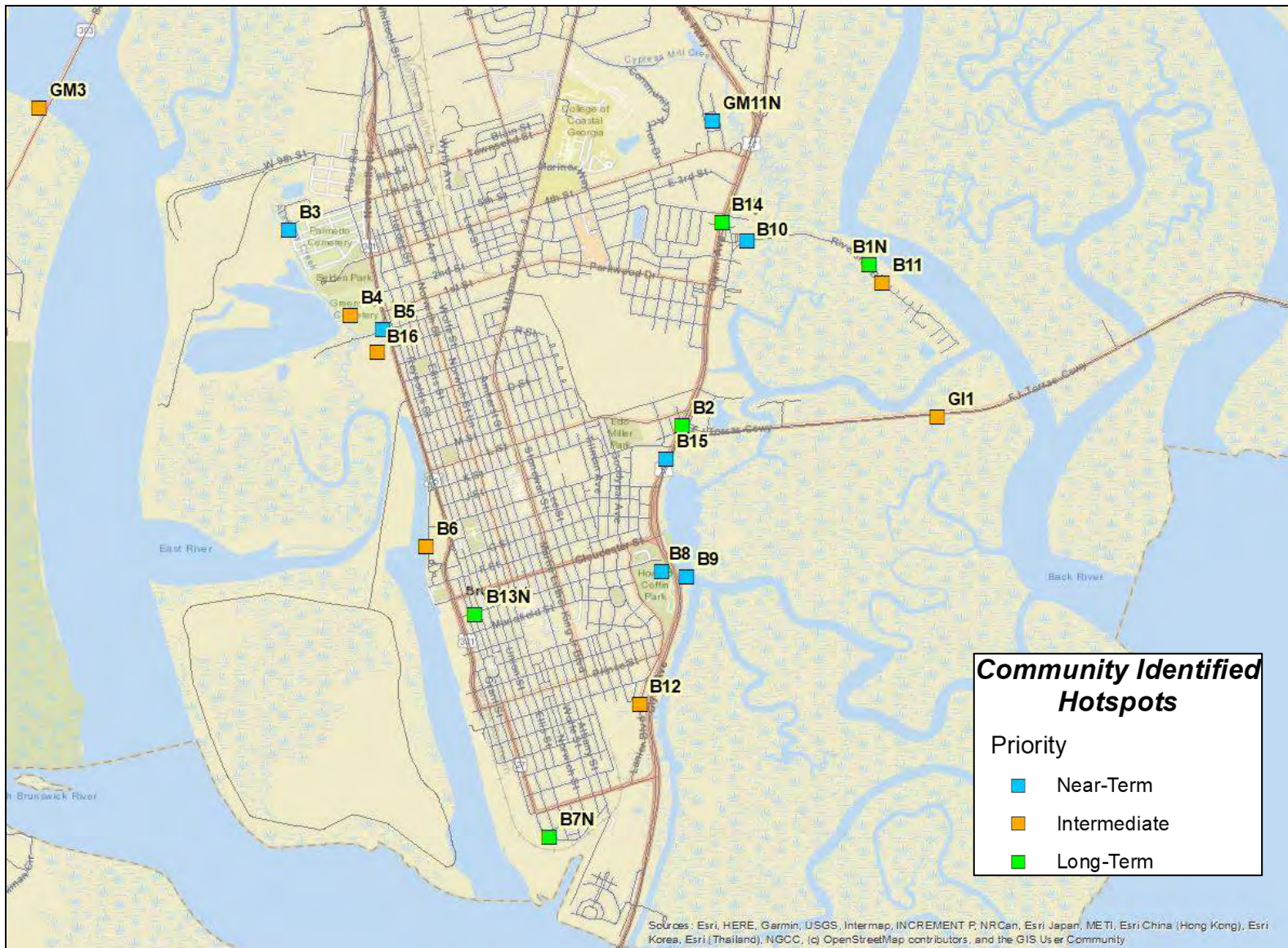


Figure 4.2: Map of Project Locations in City of Brunswick (B) and Nearby Glynn Mainland (GM).

Table 4.3: Glynn County (Mainland) Project List – Shoreline Assessment and Implementation Resiliency Plan.

Site ID	Site Description	Priority (Based on Rank)	Cost	Potential Partners / Project Lead	Proposed Solution	Alternates
GM5	Turtle River Park Boat Ramps	Near-Term	\$\$	County	Living Shoreline	Stream Restoration; Rip Rap
GM9	Altamaha Park Flooding	Near-Term	\$\$\$	GEMA/FEMA, Army Corps	Elevate Roadway & Structures	Barrier (Bulk Head, Temporary)
GM11N	Dolphin/Trout/Bream/Pike/Bass Neighborhood Flooding	Near-Term	\$\$\$\$	GEMA/FEMA, HUD, Army Corps	Tide Control; Regional SW Mgmt / Green Infrastructure	Elevate houses above BFE or Buy-outs
GM7	Choke Point at Oak Grove Island Road	Intermediate	\$\$	GEMA/FEMA, Army Corps	H&H Modeling Study	Replace Box Culvert
GM4	Blythe Island / I-95 Erosion	Intermediate	\$\$\$	GEMA/FEMA, HUD, Army Corps	Repair Rock Revetment	Increase Barrier (Rip Rap/Rock Revetment)
GM2	Turtle Creek Bridge	Intermediate	\$\$\$	GDOT, Army Corps, GEMA/FEMA	Elevate Roadway	
GM3	Blythe Island Erosion	Intermediate	\$	GDOT, County	Living Shoreline	Stream Restoration; Rip Rap
GM10	Pennick Road	Intermediate	\$\$	GEMA/FEMA, Army Corps	Pave Roadway; New Culverts	Elevate Roadway
GM1	Belle Point Parkway	Long-Term	\$\$	GEMA/FEMA, HUD, Army Corps	Elevate Roadway	Relocate Road
GM8	Hutchinson Ditch	Long-Term	\$\$\$	GEMA/FEMA, Army Corps	H&H Modeling Study	Purchase Easements/Legal Investigation; Stream Restoration
GM12N	End of Crispen Blvd	Long-Term	\$\$\$	GEMA/FEMA, HUD, Army Corps	Tide Control; Regional SW Mgmt / Green Infrastructure	Elevate houses above BFE or Buy-outs
GM6	River Ridge Rd Flooding	Long-Term	\$	County	Larger Culvert	Elevate houses above BFE or Buy-outs

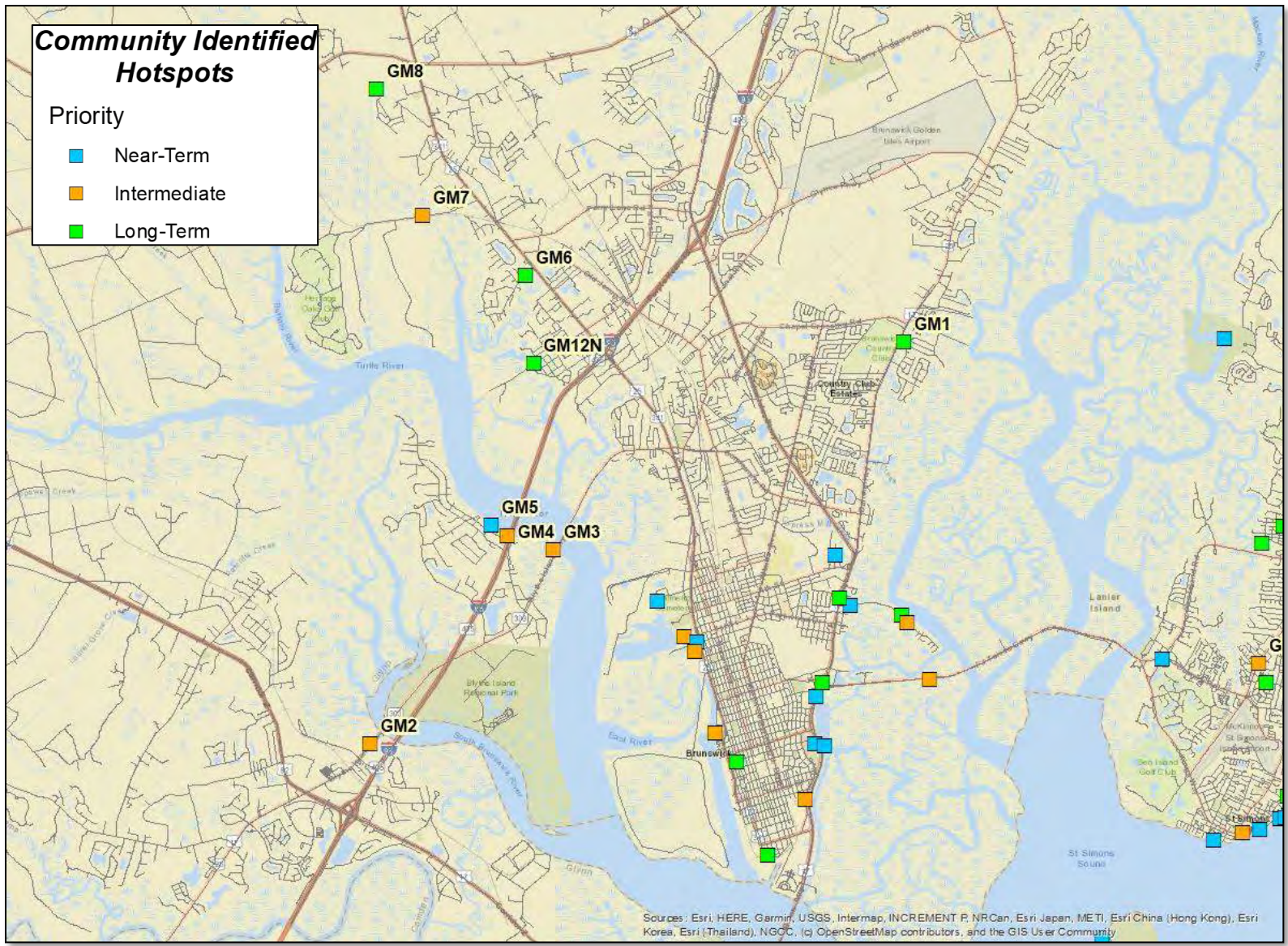


Figure 4.3: Map of Project Locations in Glynn Mainland (GM).

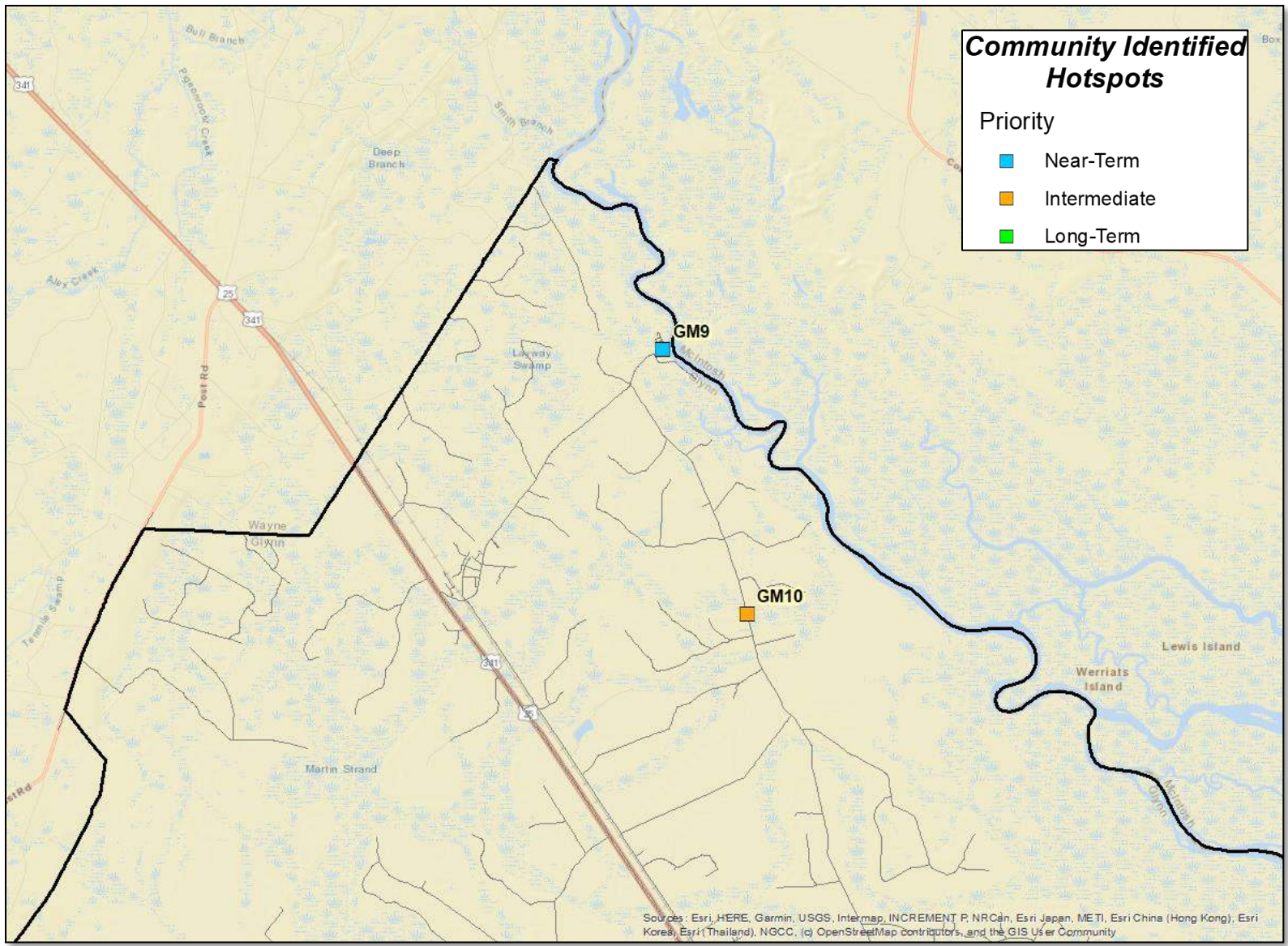


Figure 4.4: Map of Project Locations in northern Glynn Mainland (GM).

Table 4.4: Glynn County (St. Simons Island) Project List – Shoreline Assessment and Implementation Resiliency Plan.

Site ID	Site Description	Priority (Based on Rank)	Cost	Potential Partners / Project Lead	Proposed Solution	Alternates
GI6	Myrtle & Postell Beach Access	Near-Term	\$\$\$	GEMA/FEMA, HUD, Army Corps	Planned Rock Revetment	Constructed Dune w/ drive-over subsurface barrier; Nearshore Placement
GI18N	General: Beach Access	Near-Term	\$\$\$	GEMA/FEMA, HUD, Army Corps	Constructed Dune w/ drive-over subsurface barrier	Temporary Barrier; Nearshore Placement
GI8	5th St & Beachview Access	Near-Term	\$\$\$	GEMA/FEMA, HUD, Army Corps	Planned Rock Revetment	Constructed Dune w/ drive-over subsurface barrier; Nearshore Placement
GI16	SSI Gateway Flooding	Near-Term	\$\$\$	GEMA/FEMA, HUD, Army Corps	Elevate Intersection	Relocate Road
GI23	Fort Frederica	Near-Term	\$\$	GEMA/FEMA, HUD, Army Corps, NPS	Living Shoreline	Stream Restoration; Rip Rap
GI2	King & Prince Erosion	Near-Term	\$\$\$\$	GEMA/FEMA, HUD, Army Corps	Repair Rock Revetment and/or Sea Wall	Nearshore Placement
GI4	15th St & Ocean	Near-Term	\$\$	GEMA/FEMA, Army Corps	Green Infrastructure; Tide Gate	Elevate Roadway
GI5	3rd St & Ocean	Near-Term	\$\$	GEMA/FEMA, Army Corps	Green Infrastructure; Tide Gate	Elevate Roadway
GI22	Neptune Park	Near-Term	\$\$\$\$	GEMA/FEMA, HUD, Army Corps	Planned Rock Revetment	Sea Wall; Nearshore Placement
GI1	Torras Causeway Flooding (Current low points)	Intermediate	\$\$\$	GDOT, Army Corps, GEMA/FEMA	Raise Causeway (where needed)	N/A
GI3	Gould's Inlet	Intermediate	\$\$\$	GEMA/FEMA, HUD, Army Corps	Planned Rock Revetment	Constructed Dune w/ drive-over subsurface barrier
GI14	Ocean Blvd Headwall Erosion	Intermediate	\$	County	Living Shoreline	Expand headwall

Site ID	Site Description	Priority (Based on Rank)	Cost	Potential Partners / Project Lead	Proposed Solution	Alternates
GI24	Sea Island Causeway	Intermediate	\$\$\$\$	GEMA/FEMA, Army Corps, Sea Island Corp.	Raise Causeway	N/A
GI7	East Beach	Intermediate	\$\$\$	GEMA/FEMA, HUD, Army Corps	Constructed Dune	Sand / Dune Fencing
GI20N	General: SSI Marshfront Homes Flooding	Intermediate	\$\$\$\$	GEMA/FEMA, HUD, Army Corps	Living Shoreline	Elevate houses above BFE or Buy-outs
GI17	Barnes Plantation Pump	Intermediate	\$\$	GEMA/FEMA, HUD, Army Corps	Replace Tide Gate	Elevate houses above BFE or Buy-outs
GI15N	General Flooding: South & East of Ocean Blvd	Intermediate	\$\$\$\$	GEMA/FEMA, HUD, Army Corps	Tide Control; Regional SW Mgmt / Green Infrastructure	Elevate houses above BFE or Buy-outs
GI11	Massengale Park	Intermediate	\$\$	GEMA/FEMA, HUD, Army Corps	Constructed Dune w/ drive-over subsurface barrier	Temporary Barrier
GI12	Ocean Blvd Erosion near Tide Gate	Long-Term	Spring 2020 Update: New headwall and tide flap were installed (<i>erosion addressed</i>)			
GI13	Ocean Blvd Sidewalk Erosion	Long-Term	\$	County	Living Shoreline	Rip Rap
GI19	Alabama-Forest Park Flooding	Long-Term	\$\$\$	GEMA/FEMA, HUD, Army Corps	Elevate houses above BFE or Buy-outs	Green Infrastructure / Regional SW Mgmt
GI25	Dunbar Creek WWTP	Long-Term	\$\$\$\$	BGJWSC, HUD, GEFA, GEMA/FEMA	Sea wall / bulk head	Relocate structure
GI9N	General Stormwater: Glynn Haven	Long-Term	\$\$\$\$	County	Stormwater Masterplan/ H&H Modeling; Tide Gates	Green Infrastructure / Regional SW Mgmt
GI21N	General Stormwater: Sea Palms	Long-Term	\$\$\$	County	Stormwater System Maintenance (grading ditches)	Green Infrastructure / Regional SW Mgmt
GI10N	General Stormwater: Harrington Rd	Long-Term	\$\$\$\$	County	Purchase Easements/Legal Investigation; Stormwater System Maintenance	Tide Control; Regional SW Mgmt / Green Infrastructure

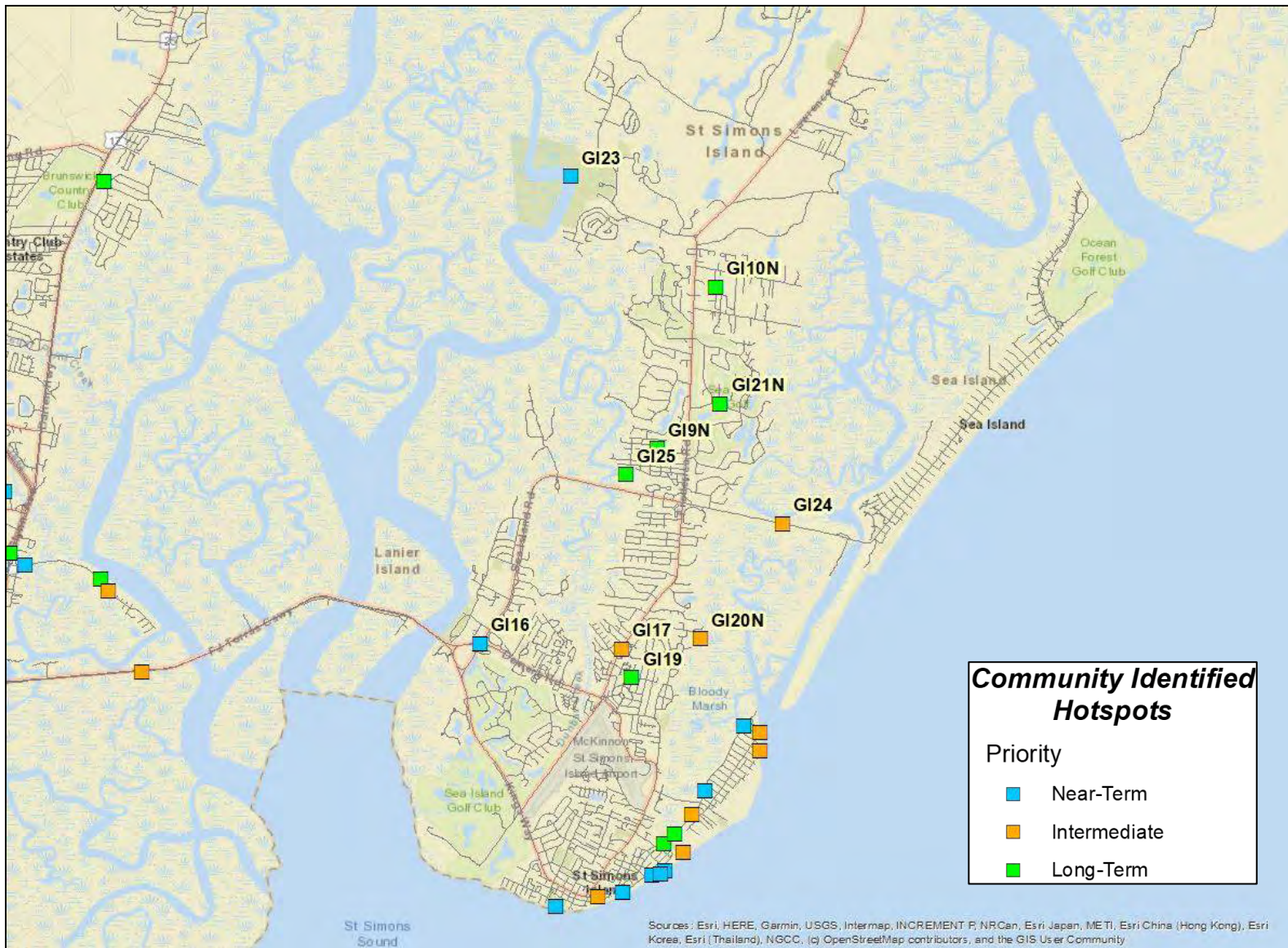


Figure 4.5: Map of Project Locations in Central and Northern Sections of St. Simons Island (GI).

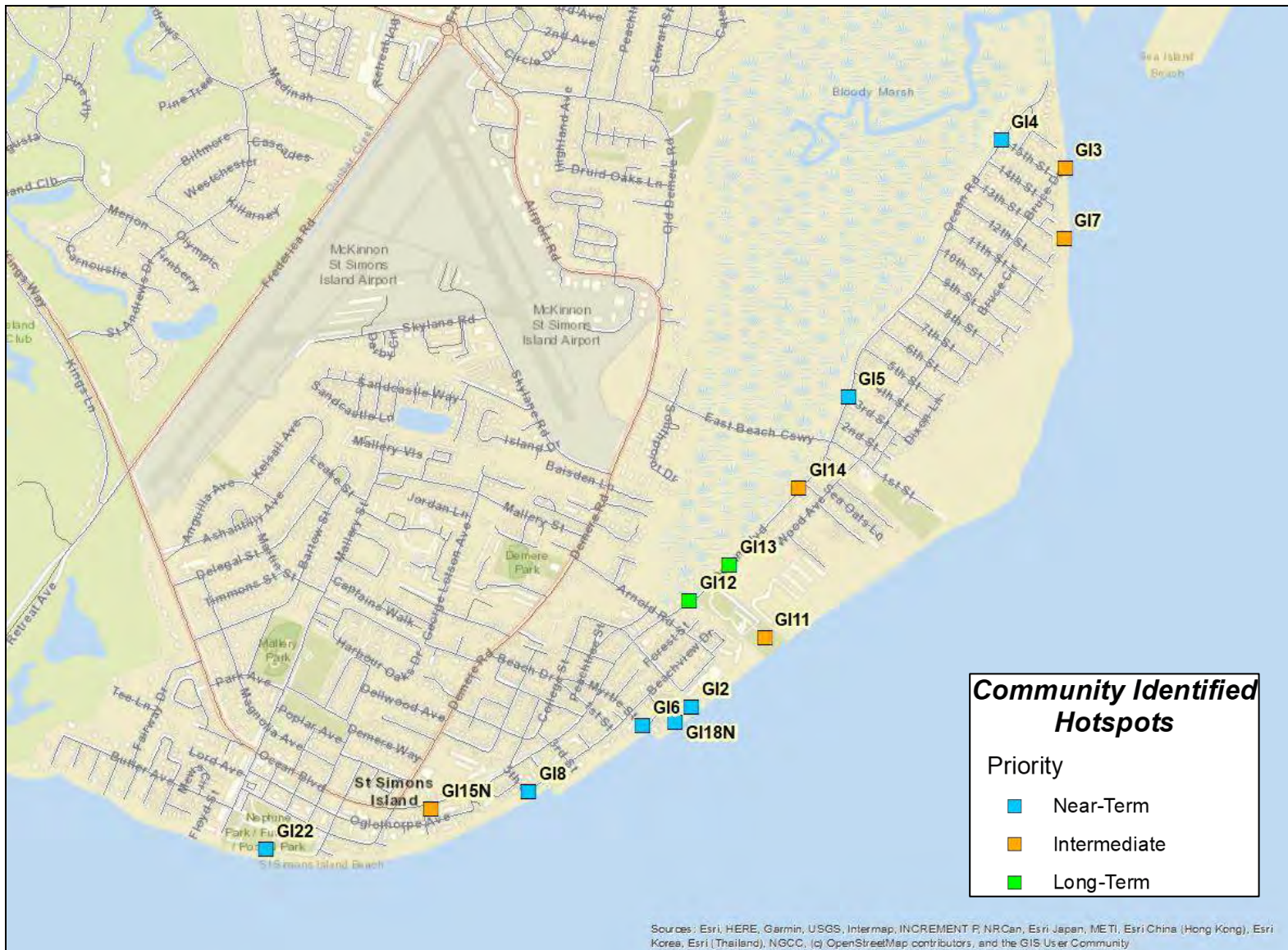


Figure 4.6: Map of Project Locations in Southern Section of St. Simons Island (GI).

Table 4.5: Jekyll Island Project List – Shoreline Assessment and Implementation Resiliency Plan.

Site ID	Site Description	Priority (Based on Rank)	Cost	Potential Partners / Project Lead	Proposed Solution	Alternates
J7-J9	North Loop Trail (Pier to Driftwood Access)	Near-Term	\$\$\$\$	GEMA/FEMA, Army Corps	Elevate trail; full-span bridge	Constructed Dune; relocate recreation facilities; abandon a maintained bike path
J4	Cemetery near Horton House	Near-Term	\$\$	JIA, CRD/EPD	Living shoreline & Green Stormwater Infrastructure	Other Stream Restoration; Rip Rap
J9-J11	North End Shoreline Restoration (Sand Motor)	Near-Term	\$\$\$\$	GEMA/FEMA, Army Corps	Nearshore Placement ("Sand Motor")	Constructed Dune
J3	Brewery Site	Near-Term	\$\$\$	JIA, CRD/EPD	1st Priority - Preserve Historical Structure in Place	Living Shoreline; other stream restoration; sheet piles
J5-J6	Road to Fishing Pier & Parking Lot	Near-Term	\$\$\$	GEMA/FEMA, Army Corps	Elevate roadway / parking lot	Relocate recreation facilities / parking lot
J17	Roadway to Sole Public Boatramp	Intermediate	\$	JIA	H&H analysis and remove pipe if able	Install headwall at pipe
J25	Stable Road & Riverview Drive Outfall	Intermediate	\$\$	GEMA/FEMA, JIA, CRD/EPD	Rip Rap	Living shoreline & Green Stormwater Infrastructure
J20	Jekyll Island Electrical Substation	Intermediate	\$\$\$\$	GA Power, GEMA/FEMA, Army Corps	Elevate structure	Sea wall / bulk head
J21	JIA WWTP	Intermediate	\$\$\$\$	GEMA/FEMA, HUD, GEFA, Army Corps	Flood wall	Relocate structure
J1	Edge of Sea Wall Erosion	Intermediate	\$	JIA, CRD/EPD	Living shoreline	Rip Rap
J16	St Andrews Beach	Long-Term	\$\$\$	JIA, GEMA/FEMA, Army Corps	Current: Sand / Dune Fencing (\$)	Future: Constructed Dune (\$\$\$)
J22	Drainageway North of Golf Course	Long-Term	\$\$\$	Army Corps, GEMA/FEMA	Stream restoration / wetland restoration	Rip Rap

Site ID	Site Description	Priority (Based on Rank)	Cost	Potential Partners / Project Lead	Proposed Solution	Alternates
J12	Cpt Wylly Rd & Beachview	Long-Term	\$\$\$	JIA, GEMA/FEMA, Army Corps	Current: Sand / Dune Fencing (\$)	Future: Constructed Dune (\$\$\$)
J13	Vehicle Beach Access near Conference Center	Long-Term	\$	GEMA/FEMA, Army Corps	Constructed Dune w/ drive-over subsurface barrier	Temporary Barrier

¹ Combines multiple projects, to be designed as one, but phased as funding is available, score is based on more severe sections

² Highest impact from matrix is effect on recreation (will have secondary items addressed in J11 Beach Access to Driftwood - vulnerability) and extra protection for recent revetment

³ 2,000 feet from Holiday Inn to Oceanview; need for dune rebuilding as secondary backstop and to control flow down Captain Wylly Rd

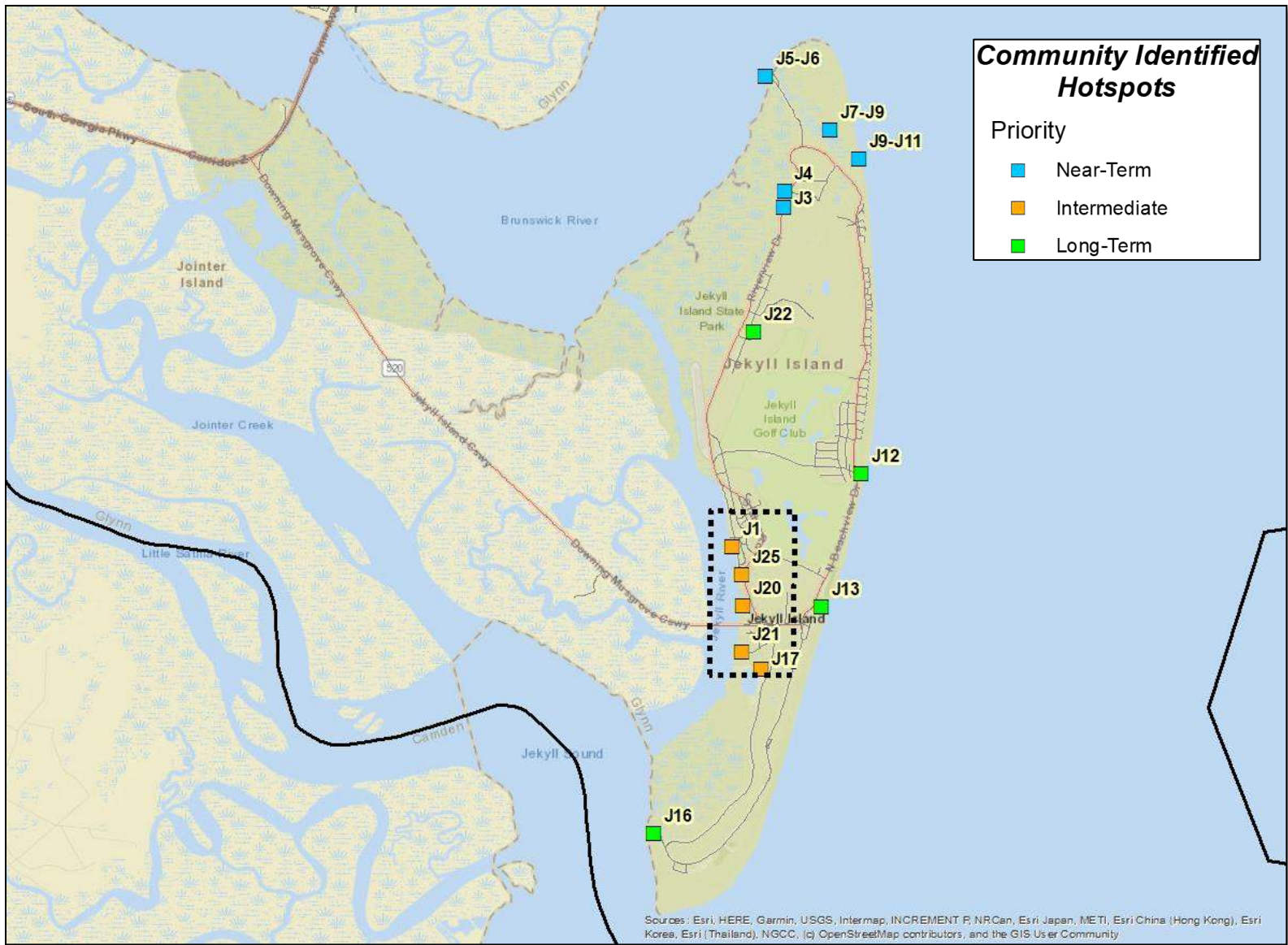


Figure 4.7: Map of Project Locations on Jekyll Island (J).

5. Beach Management

A secondary goal of this project was to incorporate components of a Beach Management Plan in order to be eligible for grants and programs from FEMA or Army Corps for mitigation efforts on the public beaches in Glynn County. Of the three jurisdictions in this plan and project, only Glynn County and Jekyll Island have ocean-facing beaches, so the focus of this next section will be St. Simons Island and Jekyll Island. However, some background information is included for the other two barrier islands in Glynn County that are privately-owned – Sea Island and Little St. Simons Island.

Georgia has defined "beach" in the Shore Protection Act (O.C.G.A. 12-5-230, et seq.) as "a zone of unconsolidated material that extends landward from the ordinary low-water mark to the line of permanent vegetation." Management consideration of public beaches and other public areas within the purview of the Georgia Coastal Management Program provides a planning framework for shorefront access and protection. This section will describe a planning process for the protection of, and access to, public beaches and other public coastal areas of environmental, recreational, historical, aesthetic, ecological or cultural value.

5.1. Background/History

Shorelines naturally move and shift due to the constant energy forces from water and wind, as well as the deposit of materials along the land/water interface. These accretion and erosion cycles can be affected by both natural events and human activities. In turn, the cycles affect structures, property values, flood hazards, nesting areas, and other social and ecological factors.

The total length of coastal Georgia's shoreline has been estimated at 2,344 miles, which ranks 11th of the 36 coastal states and territories. Georgia's ocean-front beaches constitute approximately 88 linear miles of the total shoreline. Georgia's beaches are located on the seaward side of barrier islands, of which only four are readily accessible by automobile (Tybee Island, St. Simons Island, Sea Island, and Jekyll Island). These four barrier islands contain about 19 miles of ocean beaches. Due to their automobile accessibility, these four barrier islands are also Georgia's only islands where development has substantially impacted the beach's natural sand-sharing system and dynamic sand dune fields. Coastal Georgia's less accessible barrier islands have retained their dynamic sand dune fields and natural cycle of beach erosion and accretion.

The majority of coastal Georgia's 2,344 miles of shoreline is contained within the hundreds of saltwater rivers and creeks that intertwine the 378,000 acres of salt marsh lying between the barrier islands and the mainland. Georgia's coastal marshes comprise approximately one-third of the remaining salt marshes on the Atlantic Coast. All major elements of the island-marsh-tidal system are interrelated: sand beaches and dunes protect the islands from erosion and flooding; the islands protect the marshes from the force of storms; and the marshes provide feeding and nursery grounds for aquatic life.

St. Simons Island has the largest human population of Georgia's barrier islands, with 16,365 permanent residents in 2018 (U.S. Census ACS, 2018). Jekyll Island is State-owned and is operated

by the Jekyll Island Authority, and it has a resident population of 568 (U.S. Census ACS, 2018). Both islands experience much larger daytime populations during festivals, large events/holidays, and in the summertime. Both islands are accessible from the mainland via a causeway, or by air or boat. More details on public beach access points and other facilities are described in Section 5.3.

Little St. Simons Island is only accessible by boat, and tours and lodging are available by reservation. Sea Island is accessible by automobile via a causeway from St. Simons Island and by boat. Sea Island has no land-side access to public beaches, except the areas associated with the Cloister Hotel, which is available to hotel guests only. Sea Island has no public parking areas and no access to beaches from the public thoroughfares.

5.1.1. Historical Beach Management

Shoreline erosion of beaches in coastal Georgia is of paramount concern on only about 19 miles out of the total 88 miles of beach due to most of the islands being uninhabited or very sparsely populated. Jekyll Island has approximately eight miles of beach that has never undergone engineered sand nourishment. St. Simons Island has approximately 3.8 miles of beaches that are maintained by the Glynn County government, and they have never undergone engineered sand nourishment. Shore stabilization structures (e.g., rock revetments) are prevalent on St. Simons Island's and Jekyll Island's beaches near development. In the 1960s, "Johnson Rocks" were installed following Hurricane Dora in 1964, when most of the primary dunes were lost in the storm. Revetment construction on Jekyll Island continued into the mid-1970s.

Sea Island is operated by the Sea Island Company as a residential resort community, and it has about 4.7 miles of beach which underwent privately-funded re-nourishment projects in 1986, 1990, and 1997. The re-nourishment volume for these projects was approximately 192,000, 2.0 million, and 350,000 cubic yards (CY), respectively. Sea Island Company completed a permit that was approved in 2018 to re-nourish up to 2.5 million CY in 2018-2019. The project was met with opposition and a legal battle, but re-nourishment took place in Summer 2020.

5.2. Beach Profile Inventory

A beach profile describes a cross-section of the topography and bathymetry (the measurement of depth of water in oceans, seas, or lakes) of the land surface along the dry beach and nearshore/sand bar regions. By surveying the same line routinely, scientists can measure the change in sand volume or shoreline position. Beach profiles have been measured on St. Simons Island and Jekyll Island since 2008 and 2014, respectively. The profiles were measured roughly two times per year. St. Simons Island beaches have been surveyed 20 times from October 2008 to June 2019, and Jekyll Island beaches have been surveyed 10 times from 2014 to 2019. Overall, there are 16 sites on St. Simons Island (Figure 5.1) and 32 sites on Jekyll Island (Figure 5.2).

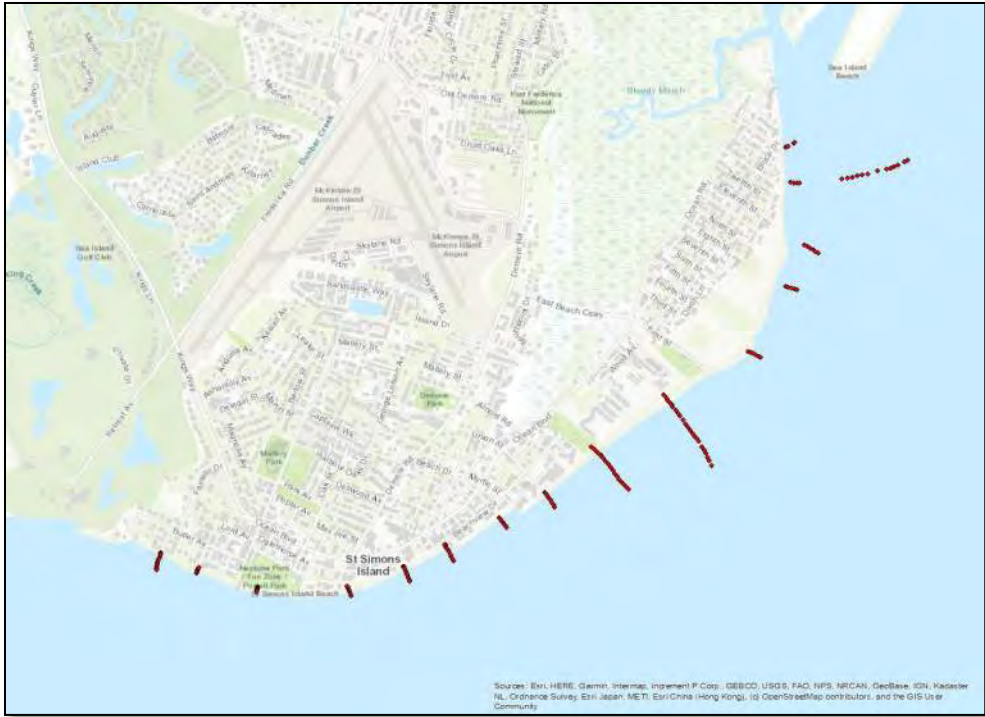


Figure 5.1: Beach Profile Locations on St. Simons Island.



Figure 5.2: Beach Profile Locations on Jekyll Island.

These surveys have a lot of good information on the change in shoreline position over the years, especially from recent hurricanes in 2016 and 2017; however, they do not have the same exact starting location and bearing, making analysis very tedious and time-consuming. As a result, two representative profiles were calculated for an area near Projects GI-6 (Myrtle Street Beach Access) in Figure 5.3 and GI-8 (5th Street Beach Access) in Figure 5.4. The Myrtle Street Beach Access profile is about 350 feet southwest of the Johnson Rocks, rock revetment, where the 5th Street Beach Access profile is approximately 50 to 70 feet southwest of the Johnson Rocks.



Figure 5.3: Map of St. Simons Island Beach Profile near Myrtle Street Beach Access (Project GI-6).



Figure 5.4: Map of St. Simons Island Beach Profile near 5th Street Beach Access (Project GI-8).

The profile data from 20 survey dates were reviewed in ArcGIS, and locations where survey points overlapped across dates were established as “shot” locations to compare progression with time. If a survey date did not have a survey point at that shot, the elevation was interpolated from available points. If date-to-date had little change in the beach profile, they were averaged together to present graphically and minimize the number of lines/profiles. The beach profile results from 2008 to 2019 are presented in Figure 5.5 for Myrtle Street Beach Access and Figure 5.6 for 5th Street Beach Access. Profiles conducted immediately before or after Hurricane Matthew and Irma are noted as separate lines/profiles since these were significant storms. While there was considerable sand movement from these events, a Nor’easter system in 2014 to 2015, ahead of Hurricane Matthew added a large volume of sand to extend the beach at these locations. Overall, there was very little movement of the beach profile from 2008 to 2014, and substantial accretion in 2014 and 2015. At Myrtle Street Beach Access and an elevation 0’, the beach grew approximately 200 feet from 2013 to 2017 (post-Irma), but it has since receded approximately 100 feet by June 2019, for a net gain of 100 feet. At 5th Street Beach Access and an elevation 0’, the beach grew approximately 200 feet from 2014 to 2017 (post-Irma), and it has maintained the profile at this distance through June 2019. A higher ridge, 100-feet from the origin (Shot #1), has grown from an elevation of 3 feet to 5.5 feet. In comparing these beach profiles showing accretion in the last decade to the Shoreline Change Rate from the Georgia Coastal Hazards Portal, the results are contradictory. This is due to the period when the data was collected – 1930s to 2000 and 2008 to 2019. The Shoreline Change Rate data, from the 1930s to 2000, showed -0.60 to -0.80 m/year (-2.0 to -2.6 feet/year) erosion at Myrtle Street and 0.00 to -0.20 m/year (0.0 to -0.7 feet/year) erosion at 5th Street.

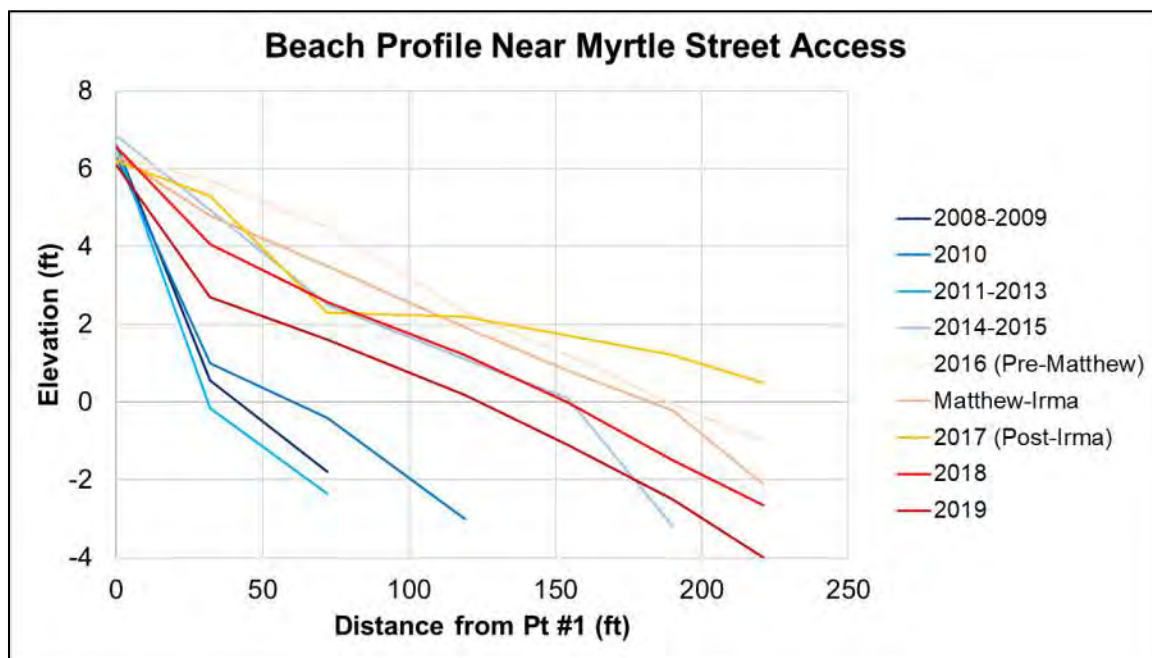


Figure 5.5: Beach Profile Progression near Myrtle Street Beach Access (Project GI-6).

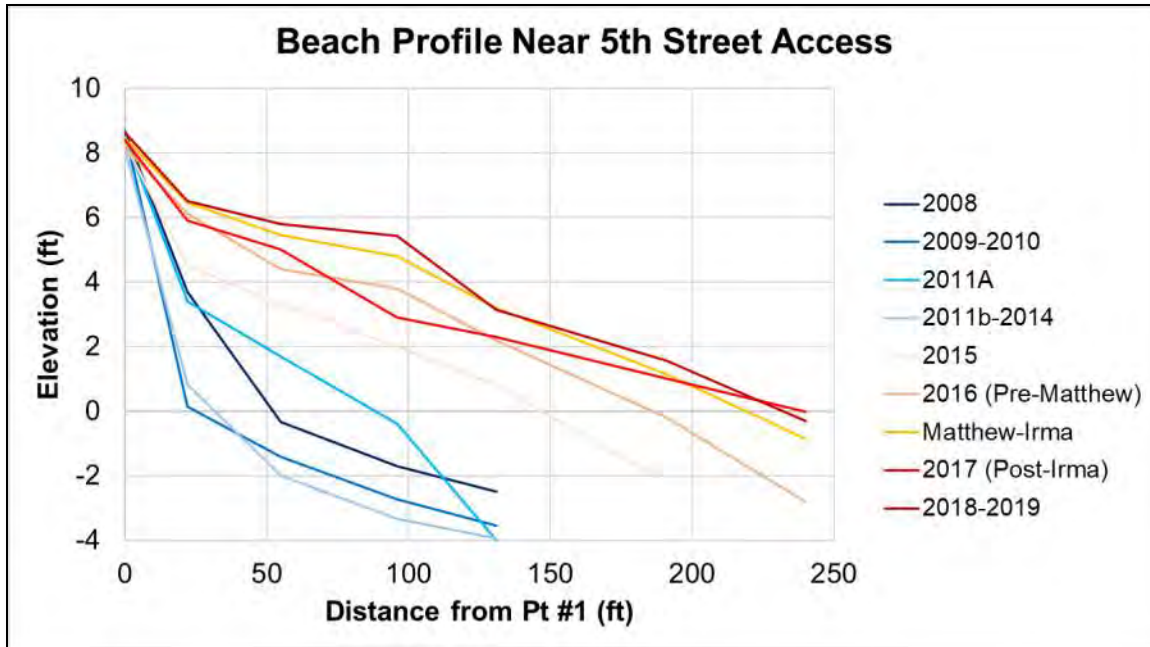


Figure 5.6: Beach Profile Progression near 5th Street Beach Access (Project GI-8).

The beach profile dataset is very useful and informative. However, as this dataset continues to grow, it is recommended to modify the approach to simplify analysis and data management. The City of Folly Beach created permanent beach profile monuments to serve as survey benchmarks. These benchmarks are permanent metal disks in the ground with information stamped on the face that marks a specific point that can consistently be reoccupied. For Glynn County, it is recommended to establish a benchmark for the origin of each profile and give each profile and measurement a unique ID#, so that the point can be reoccupied each time. It is also recommended to set a bearing for each profile to consistently survey the same location.

5.3. Public Beach Access

5.3.1. St. Simons Island

The County maintains beach access and facilities at Massengale Park and the Coast Guard Station at East Beach. Additionally, the County maintains 41 beach access locations throughout St. Simons Island, as depicted in Figure 5.7. Beach access points at Massengale Park (#24), Driftwood Drive (#25), and Coast Guard Station (#27) have ADA accessible mats. Massengale Park also has restroom facilities, picnic tables, grills, and a playground. Coast Guard Station also has restroom facilities and a seasonal concession facility.



Figure 5.7: St. Simons Island Public Beach Access Map.

An additional topic on public beach use on St. Simons Island are lifeguards and safety. Lifeguards are stationed at and between Coast Guard Beach and Massengale Beach from Memorial Day through Labor Day from 11:00 am to 6:00 pm, except during inclement weather. Glynn County also operates a beach warning flag system on St. Simons Island, where:

- Double Red - Water closed to public use
- Red – High Hazard (rough conditions such as strong surf and/or currents)
- Yellow – Medium Hazard (light surf or currents)
- Green – Low Hazard (calm conditions)
- Purple – Marine Pest (jellyfish, stingrays, and dangerous fish)

5.3.2. Jekyll Island

There are 21 public beach access points on Jekyll Island (Figure 5.8). Three public beach access points are currently accessible to people with disabilities, and they are listed below.

- Oceanview Beach Park, crossover #26
- Great Dunes Park, crossover #32
- St. Andrews Beach, crossover #67

The Oceanview Beach Park features a wheelchair-accessible observation deck with two ADA-accessible benches. The ramp at St. Andrews Beach provides access directly to the hard-pack sand on the shore. Due to large tidal differentials and shifting dunes, the mats at crossover #32 may not always reach the hard-pack sand.



Figure 5.8: Public Access Points on Jekyll Island.

Per the Jekyll Island Carrying Capacity & Infrastructure Assessment, there are 860 parking spaces available at the beach-only locations (August 2017 data). There are additional parking spaces available with beach access in the following land uses: village, residential, hotel, historical, and facility. Excluding parking associated with residences, the total count of parking stalls on Jekyll Island in August 2017 was 5,769. From North to South, locations with large parking areas and public beach access include: Jekyll Island Fishing Pier, Driftwood Beach Parking (on Beach View Drive), Oceanview Beach Park, The Beach Pavilion, Great Dunes Park, The Village, Ocean Club, 4-H Center / Soccer Complex, and St. Andrews Picnic Area.

5.3.3. Countywide Boat Ramps and Water Access

The County, City, DNR, and other private entities have facilities to provide water access at 33 locations across the County. This list, in Table 5.1, includes boat ramps, marinas, fishing piers, and fishing bridges.

Table 5.1: Water Access in Glynn County.

Name	Location	River Access	Usage
Lanier Boat Ramp	Brunswick	Brunswick River	Boat Ramp
Altamaha Regional Park	Glynn County	Altamaha River	Boat Ramp
Turtle River Boat Ramp (GA Hwy 303)	Glynn County	Turtle River	Boat Ramp
Upper Turtle River (GA Hwy 99) Boat Ramp	Glynn County	Turtle River	Boat Ramp
Blythe Island Regional Park	Glynn County	South Brunswick River	Boat Ramp
South Brunswick River Boat Ramp	Glynn County	South Brunswick River	Boat Ramp
Blythe Island Beach Drive Park	Glynn County	Turtle River	Boat Ramp
Village Creek (Harrington) Boat Ramp	St. Simons Island	Village Creek	Boat Ramp
MacKay River Boat Ramp	St. Simons Island	MacKay River	Boat Ramp
Jekyll Creek Boat Ramp	Jekyll Island	Jekyll Creek	Boat Ramp
Lanier Bridge Fishing Pier	Brunswick	Brunswick River	Fishing Pier
Overlook Park Fishing Pier	Brunswick	Terry Creek	Fishing Pier
Altamaha Regional Park Pier	Glynn County	Altamaha River	Fishing Pier
Blythe Island Regional Park Fishing Pier	Glynn County	South Brunswick River	Fishing Pier
Little River Bridge Fishing Catwalk	St. Simons Island	Little River	Fishing Bridge
Mackay River Fishing Pier	St. Simons Island	Mackay River	Fishing Pier
Gascoigne Bluff Fishing Pier	St. Simons Island	Frederica River	Fishing Pier
Gould's Inlet Fishing Pier	St. Simons Island	Goulds Inlet	Fishing Pier
St. Simons Island Fishing Pier	St. Simons Island	St. Simons Island Sound	Fishing Pier
Back River Fishing Piers	St. Simons Island	Back River	Fishing Pier
Clam Creek Fishing Bridge	Jekyll Island	Jekyll Creek	Fishing Bridge

Name	Location	River Access	Usage
Jekyll Pier	Jekyll Island	St. Simons Island Sound	Fishing Pier
Jekyll Creek Bridge Fishing Piers	Jekyll Island	Jekyll Creek	Fishing Pier
Tidelands Pond	Jekyll Island	Tidelands Pond	Fishing Pier
Brunswick Landing Marina	Brunswick	East River	Marina
Hidden Harbor Yacht Club	Glynn County	Troupe Creek	Marina
Blythe Island Regional Park	Glynn County	South Brunswick River	Marina
Two-Way Fish Camp	Glynn County	South Altamaha River	Marina
St. Simons Island Marina (St. Simons Boating and Fishing Club)	St. Simons Island	Frederica River	Marina
Morningstar Marina – Golden Isles	St. Simons Island	Frederica River	Marina
Hampton River Marina	St. Simons Island	Hampton River	Marina
Jekyll Harbor Marina	Jekyll Island	Jekyll Creek	Marina
Jekyll Wharf Marina	Jekyll Island	Jekyll Creek	Marina

Data Source: Georgia Coastal and Marine Planner (G-CAMP) – “Coastal Water Access Points”

5.4. Policies and Laws

There are a number of state and local policies that regulate activities near shorelines and on beaches. These are presented for Georgia in Section 5.4.1, Glynn County in 5.4.2, and Jekyll Island in Section 5.4.3.

5.4.1. State

The primary State management authority for shoreline stabilization and beach erosion control is embodied in the Shore Protection Act of 1979 (O.C.G.A. 12-5-230, et seq.). The Shore Protection Act is the primary legal authority for protection and management of Georgia’s shoreline features including sand dunes, beaches, sand bars and shoals. Its jurisdiction includes the submerged shoreline lands out to the three-mile limit of State ownership, the sand beaches to ordinary high-water mark, and the dynamic dune field.

GADNR-CRD, through the Shore Protection Committee, issues permits for any shoreline engineering activity or land alteration on beaches, sand dunes, bars, or submerged shoreline lands. The Shore Protection Act contains provisions for two distinct alternatives in addressing shoreline erosion. The first alternative, erosion control activities, includes beach restoration and re-nourishment, artificial dune construction, and construction and maintenance of groins and jetties. The second alternative, shoreline stabilization, includes construction of revetments.

In addition to shoreline erosion, natural processes such as storms and hurricanes can result in hazards to people and property through resulting wind, waves, and rising and falling water. There are two approaches to reducing damage from storms and hurricanes: engineering solutions and land-use planning. Engineering solutions may be directed at the environment (e.g., jetties, sea walls)

or at structures (e.g., stilts, break-away walls). Many engineering modifications of the environment, however, can result in problems elsewhere on the coastline. Thus, the Shore Protection Act limits structures on Georgia's beaches. Land-use planning recognizes that certain areas (e.g., inlets, beaches) are more hazardous than others (e.g., areas protected by dunes and vegetation). Through policies such as the Shore Protection Act, which recognizes that coastal sand dunes, beaches, sandbars, and shoals help protect "real and personal property and natural resources," and the Marsh Protection Act, which recognizes that marshes "provide a great buffer against flooding and erosion," Georgia addresses coastal hazards. While land-use planning is the responsibility of local governments, through the Georgia Coastal Management Program, GADNR-CRD can assist with hazard mitigation planning by providing technical assistance and pass-through funding for planning efforts.

The Coastal Marshlands Protection Act (O.C.G.A. 12-5-280, et seq.) provides GADNR-CRD with the authority to protect tidal wetlands. The CMPA manages certain activities and structures in marsh areas and requires permits for other activities and structures. Erecting structures, dredging, or filling marsh area requires a Marshlands Protection Committee Permit administered through GADNR-CRD. In cases where the proposed activity involves construction on a State-owned tidal water bottom, a Revocable License issued by the CRD may also be required. The estuarine area is defined as all tidally influenced waters, marshes, and marshlands lying within a tide elevation range from 5.6 feet above mean tide level and below. The jurisdiction of the Coastal Marshlands Protection Act includes marshlands, intertidal areas, mudflats, tidal water bottoms, and salt marsh areas within estuarine areas of the state.

The Georgia Coastal Management Program joined the Federal Coastal Zone Management Program (CMP) in 1998. Georgia's federally-approved CMP allows the state to:

- Provide technical assistance and Coastal Incentive Grants to local governments for projects in coastal area communities
- Provide public education about coastal resources
- Simplify the permitting process and improve compliance with issued permits
- Exercise more control over federal projects in the coastal area through federal consistency review
- Improve environmental monitoring efforts to ensure the health of our coastal ecosystems

Developed through an extensive public process; the Georgia Coastal Management Program is an integrated, networked program which uses existing state laws to manage Georgia's critical coastal resources. State resource policies, such as the Coastal Marshlands Protection Act and the Shore Protection Act, protect critical natural areas but do not provide a coordinated, comprehensive management framework with which to address the above issues. The Georgia Coastal Management Program provides such a framework.

The people of the State of Georgia are dependent upon the rivers, streams, lakes, and subsurface waters of the state for public and private water supply and for agricultural, industrial, and recreational uses. Through the Georgia Water Quality Control Act (O.C.G.A. 12-5-20, et seq.), the water resources of the state shall be utilized prudently for the maximum benefit of the people, in

order to restore and maintain a reasonable degree of purity in the waters of the state and an adequate supply of such waters, and to require where necessary reasonable usage of the waters of the state and reasonable treatment of sewage, industrial wastes, and other wastes prior to their discharge into such waters.

5.4.2. Glynn County

In reviewing the Glynn County Code of Ordinances, the following ordinances pertain to beach-related activities.

- Chapter 2-11 Parks and Recreation, Article I, Park Use Ordinance
- Chapter 2-11 Parks and Recreation, Article III, Beach Control
 - 2-11-14: Jurisdiction of Ordinance
 - 2-11-15: Permit Required (to sell any products or to light a fire)
 - 2-11-16: Driving or Parking on Beaches (unlawful to drive on beaches or dune area without a permit; unlawful to park or store boats/sailboats/motorized vehicles or any equipment overnight on beach or in dune area)
 - 2-11-16.1: Obstructions and Unattended Personal Property on Beaches (unlawful to leave personal property on beach between 9 p.m. and 7 a.m.)
 - 2-11-17: Prohibition as to certain Type of Containers: (no glass)
 - 2-11-18: Receptacles to be Provided (Department responsible to establish and maintain receptacles for litter)
 - 2-11-19: Police Patrols (power for County Police Department to enforce ordinance)
 - 2-11-20: Use of Beaches for Commercial Purposes (unlawful without a permit)
 - 2-11-21: boating safety zones (within 1,000 feet from the high-water mark)
- Chapter 2-11 Parks and Recreation, Article IV, Boat Safety
- Chapter 2-27 Water Resources Protection Ordinance
 - Stormwater Management Ordinance
- Chapter 2-5 Building and Construction, Article VII Soil Erosion and Sedimentation Control
 - Soil Erosion, Sedimentation, and Pollution Control Ordinance (covers buffers, coastal marshland and ESPCPs)
 - 2-5-100 to 2-5-110
- Chapter 2-5 Building and Construction, Article VIII Flood Damage Control
 - 2-5-120 to 2-5-146
- Chapter 2-23 Natural Resources, Article 1, Habitat Protection
 - Beachfront lighting specifications to not disturb or disorient nesting or hatching sea turtles
- Chapter 2-16-231 Clean Community Ordinance
 - 2-16-240: Litter in Parks (unlawful to deposit litter in any park except in public receptacles)
 - 2-16-241: Litter in Oceans, Streams and Rivers, etc. (unlawful to deposit litter in any ocean, river or stream, bay, marsh, or any body of water)
- Section 722 CP Conservation Preservation District

- Section 727 Beach and Dune Protection District

Additionally, it is posted at beach access points that pets are not allowed on St. Simons Island beaches during the hours of 9 a.m. to 6 p.m. between the Saturday before Memorial Day and Labor Day. This applies to areas between 16th Street (#41, East Beach South) and Mallery St. (SSI Pier).

Related to litter control, Glynn County began implementing a new solid waste management strategy of trash-free beaches on St. Simons Island in 2017. Trash-free beaches involve removing trash and recycling receptacles from the beach area and relocating those receptacles to the parking lot areas to encourage all visitors to help maintain clean beaches, reduce solid waste on the beach, and embrace the ideas of reduce, reuse, and recycle. This new initiative places all beach areas under the same “carry in, carry out” policy.

5.4.3. Jekyll Island

In reviewing the JIA Code of Ordinances, the following ordinances pertain to beach-related activities.

- Chapter 4-6 Pets on beaches and in Dunes
- Chapter 10 Environment, Article IV Beach Lighting
 - Sec 10-78 to 10-85 (to protect sea turtles from adverse effects of artificial lighting)
- Chapter 14 Flood Prevention, Article III Provisions for Flood Hazard Reduction
 - Sec 14-89 to 14-96
- Chapter 18 Offenses and Miscellaneous Provisions
 - Sec 18-13 Dumping into creeks, rivers, etc.
 - Sec 18-16: Use of state beaches
 - Sec 18-17: Fireworks (unlawful to use in the State Park unless authorized by JIA)

Local Ordinance 18-16 outlines rules and regulations of using the public beaches, structures erected thereon, of the Jekyll Island State Park. A few sections have been condensed slightly for length.

1. *Swimming.* Signage at all public entrance points properly notify all persons there are no lifeguards on duty at the Jekyll Island State Park. All persons entering the water off the public beaches are doing so at their own risk.
2. *Placement of litter.* It shall be unlawful to throw, place, deposit, sweep or scatter, or cause to be thrown, placed, deposited, swept, or scattered, any paper, food, cigarette butts, bottles, cans, trash, fruit peelings or other refuse upon the beaches or structures erected thereon. Beach goers must have their trash in a container at all times.
3. *Glass or breakable containers.* It shall be unlawful for any person to take or carry upon the beaches or structures erected thereon any glass or breakable containers.
4. *Disturbing dune vegetation.* It shall be unlawful or any person to pick, gather, remove, walk in the dunes, or otherwise disturb the vegetation present on sand dunes, including sea oats. Further, it is prohibited for any person to enter in any area that has been marked by GADNR as an area designated for the protection of nesting sea turtles and shorebirds.
5. *Pets.* It shall be prohibited for pets to be off leash or running free on the beaches and dunes of Jekyll Island at any time. To protect nesting sea turtles and shorebirds, it is further

prohibited for a pet, whether leashed or unleashed or otherwise, to be on the beaches or in the dunes of Jekyll Island from the boardwalk at the south dunes picnic area (latitude 31.031854, longitude -81.415358) south and around the southern tip of the island north to a point (latitude 31.015594, longitude -81.433926) or equivalent to 2,000 feet south of the St. Andrews picnic area.

6. *Horseback riding.* It shall be prohibited for any person to bring or in any way allow a horse to be on the beaches and dunes of Jekyll Island at any time. Excluded from this prohibition are licensed vendors of the Jekyll Island Authority who have received written permission from the authority to engage in any activity involving the use of horses on the beaches of Jekyll Island.
7. *Motorized vehicles.* It shall be unlawful for any person to take any motorized vehicle on to the beaches or structures erected thereon. This includes automobiles, trucks, motorcycles, all-terrain-vehicles and similar motor driven vehicles and craft. This does not include properly marked emergency vehicles while in the course of an emergency operation, or maintenance/utility vehicles in the employ of the Jekyll Island Authority or similar governmental entity and engaged in a legitimate operation.
8. *Motorized watercraft.* It shall be unlawful for any person to operate any motorized watercraft, such as a jet ski, motorboat, and/or any similar craft in violation of the rules and regulations as maintained and enforced by the U.S. Coast Guard and GADNR.
9. *Wind-powered crafts.* To protect nesting sea turtles and shorebirds, it is prohibited for any person to use or operate a kite buggy, beach-capable wind surfer or any other wind-powered transport on the beaches or in the dunes of Jekyll Island from the boardwalk at the south dunes picnic area (latitude 31.031854, longitude -81.415358) south and around the southern tip of the island north to a point (latitude 31.015594, longitude -81.433926) or equivalent to 2,000 feet south of the St. Andrews picnic area.
10. *Fires.* It shall be unlawful for any person to build or maintain any type of open fire on the beach, including any type of charcoal or gas fire, whether or not in a grill or similar container.
11. *Disorderly conduct; endangerment of self or others.* It shall be unlawful for any person to come upon the beaches or structures erected thereon, and individually or in concert with others, do any act or create any condition which does or is calculated to encourage, aid, abet, or start a riot, public disorder or disturbance of the peace; and it shall not be necessary to prove that that person was solely responsible for that riot, public disorder or disturbance of the peace, but only that his appearance, manner, conduct, attire, condition, status or general demeanor was a motivating factor that resulted in the riot, public disorder or disturbance of the peace.
12. *Nudity.* No nudity on beaches.
13. *Beer kegs.* The presence of beer kegs on the beach is often associated with underage drinking, littering, public intoxication and disorderly conduct and because such activities are in direct conflict with family recreation, such containers and similar devices for dispensing of large quantities of alcoholic beverages are expressly prohibited.
14. *Jumping or diving from pier or public structure.* It shall be unlawful for any person to jump or dive from any pier or public structure except those that might be specifically built for

that purpose and as may be specifically authorized in connection with a properly authorized special event.

15. *Walking or climbing on rocks.* It shall be unlawful to walk or climb upon the rocks, or other natural formations. Walking on existing beach trails that traverse through the rocks is allowed.
16. *Lanterns and flashlights.* To protect nesting turtles and shorebirds, and in accordance with Jekyll Island Authority Ordinance, section 10-81 regulating beach lighting, the use of lanterns or flashlights on the nesting beaches is limited to lanterns and flashlights that produce light of 580 nm or longer wavelength (true red).

5.5. Shoreline Protection Ordinance Review

Glynn County's "Beach and Dune Protection District Ordinance, Section 727" includes some contradictory language regarding setbacks. The following observations were made after reviewing the current ordinance:

- The Shore Protection Act establishes the jurisdictional area of the State related to the beach and dune system, and it includes the area from 3 miles offshore to the landward (western) boundary of the dynamic dune field. They actually define the landward boundary of the dynamic dune field based on live native trees that are 20' or larger or structures that predate July 1, 1979. GA DNR staff have to identify the jurisdictional line in the field.
- Any land disturbance in this jurisdictional area needs either a permit or a letter of permission from the Shore Protection Committee.
- Any projects permitted by the Shore Protection Committee must comply with local zoning, and local governments are permitted to have stricter requirements than the State. So, the State could allow for an activity or use that the local government does not, and the Shoreline Protection Committee would not be able to issue a permit in this case.
- Glynn County has established an additional "setback" to the State's jurisdictional area and restricts uses in the setback area.
- The County establishes the setback area, not based on the Jurisdictional line, but rather based on the toe of the dune or the highwater mark, meaning that your setback line could cross back and forth across the jurisdictional line.
- Tybee also has a setback for the dunes that is also based on the toe of the dune. But Tybee's setback is only 10 feet whereas Glynn County's setback is 40 feet. The only uses that the Tybee ordinance contemplates in their setback are beach crossovers, but Glynn County has more conditional uses.

Based on these observations, there are several issues that the County could consider addressing:

- Does the County wish to regulate uses within the jurisdictional area to a higher/stricter level than the State? For example, does Glynn County want to prevent homebuilding in this area?
- Does the County wish to establish a setback from the jurisdictional line where uses are more restrictive than the underlying zoning? If so, this setback line should likely be set from the

State Jurisdictional line, as opposed to having a line based on the toe of the dune or any other natural feature that is different than the jurisdiction line established by the State

These observations and issues were conveyed to the County's Zoning Update consultant, Tunnel-Spangler and Associates (TSW). Based on their complete review, they prepared a draft of potential policy solutions to consider that will be presented to the Board of Commissioners. This topic on environmental regulations reads as follows:

Existing environmental regulations protect beaches and dunes but do not go beyond state requirements for stream or marsh setbacks, allow shorelines and marshes to migrate over time, or otherwise address the impacts of flooding and sea level rise.

- *Potential solution A:* Adopt the 50-foot marsh setback language from state law (which is currently not enforced) as a county requirement.
- *Potential solution B:* Increase the existing 25-foot marsh setback from state law (the section that is currently enforced) to 50 feet, and reduce or remove exemptions for lots platted prior to 2015, lots on which more than 18% of the area falls in the buffer, and other exemptions.
- *Potential solution C:* Prohibit the construction of sea walls in the marsh buffer, but provide standards for "living shorelines" that would provide natural protection from erosion.
- *Potential solution D:* Increase the stream setback from the state-mandated 25 feet to a total of 75 feet average, with a 50-foot minimum width and a 150-foot maximum width.
- *Potential solution E:* Clarify that the Beach and Dune Protection overlay district still applies, and align its requirements with the Georgia Shore Protection Act.
- *Potential solution F:* Establish building regulations for the Coastal High Hazard Area (the area closest to the coast and subject to wave action during storms).
- *Potential solution G:* Adopt coastal setbacks or other standards that increase or expand over future decades, to allow time for property owners and developers to adapt, and to respond to rising sea or flood levels.
- *Potential solution H:* Adopt a setback from wetlands.
- *Potential solution I:* Rezone sensitive coastal or environmental areas to CP Conservation Preservation.
- *Potential solution J:* Establish a coastal overlay zone to regulate uses, land disturbance, setbacks, pervious cover, finished floor elevation, and other aspects of development near the coast or in sensitive areas.
- *Potential solution K:* No change.

5.6. Environmental Considerations

The environmental section of this document details water quality monitoring (5.6.1), wildlife considerations (5.6.2), and stormwater management (5.6.3). Within the wildlife section, shorebirds, sea turtles, and pets on beaches are the primary topics.

5.6.1. Beach Water Quality Monitoring

The GADNR-CRD, Beach Monitoring Program was developed to protect swimmer health. Starting in 1999, CRD monitored the swimming beaches in Glynn County for the presence of fecal coliform bacteria. Fecal coliform is an indicator bacterium, which when found in the water indicates the presence of human or animal fecal matter. Fecal matter can contain pathogens (bacteria, virus, etc.), which can cause human illness.

Passage of an amendment to the federal Clean Water Act known as the Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000 (PL 106-284) addresses significant new swimmer protection provisions. The BEACH Act requires states to adopt water quality criteria utilizing enterococcus bacteria as the standard indicator for salt-water recreational beaches. The Act also requires states to develop procedures for notifying the swimming public when high levels of bacteria are found.

In April 2004, CRD entered a new phase of beach monitoring and public notification based on the Environmental Protection Agency's recommended levels of enterococcus bacteria for marine recreational waters. Enterococcus, like fecal coliform, is an indicator bacterium. Research has shown the enterococcus is a better indicator of the presence of fecal matter in salt water. EPA has finalized a new standard for bacterial water quality: a single sample maximum of 104 enterococcus CFU per 100ml or a geometric mean of 35 enterococcus CFU per 100ml. CRD has worked in partnership with Glynn County and the Glynn County Health Department to develop procedures to notify the public. Public advisory signage has been installed at beach access points on St. Simons Island and Jekyll Island. The Coastal Health District have prepared templates for press releases to issue health advisories in the event of high bacteria levels.

CRD tests the beaches on St. Simons Island and Jekyll Island once per week from April to October and every other week from November to March, at five locations on St. Simons Island and six locations on Jekyll Island. These include the following locations:

- St. Simons Island Beach Monitoring Locations
 - SSI North – Goulds Inlet, from 15th Street to 10th Street
 - SSI East Beach Old Coast Guard, from 10th Street to Driftwood Drive
 - SSI Massengale Park, from Driftwood Drive to Cedar Street
 - SSI 5th St. Crossover, from Cedar Street to 9th Street
 - SSI Lighthouse, from 9th Street to Pier
- Jekyll Island Beach Monitoring Locations
 - Driftwood, from Beach Kilometer Marker 1 to Tallu Fish Lane
 - Jekyll North, from Old Picnic Area to Brice Lane
 - Jekyll Capt. Wylly, from Brice Lane to Beach Pavilion
 - Jekyll Convention Center, from Beach Pavilion to Beach Deck
 - Jekyll South Dunes, from Beach Deck to South Water Tower
 - Jekyll 4-H Camp, from South Water Tower to Macy Lane

CRD tests the beaches that are under permanent advisory once per quarter, and this includes two locations on Jekyll Island: (1) Jekyll Clam Creek from Clam Creek to Old North Picnic Area and (2)

Jekyll St. Andrews from St. Andrews Picnic Area to Macy Lane. CRD also tests beaches on Sea Island at two locations (Sea Island North and Sea Island South) on a monthly basis from April to October, as well as the Blythe Island Regional Park Sandbar at this frequency.

When elevated levels of bacteria are found, CRD notifies the Health Department. The Health Department notifies Glynn County or the JIA and issues a press release notifying the public of the swimming advisory, and it is posted on the Coastal Health Department's webpage at: https://www.gachd.org/programs-services/environmental-health-2/beach_water_testing/. Then, the County or the JIA activates the advisory signs in the affected area of beach, and the Environmental Protection Division (EPD) will investigate to find the source. CRD continues to test the affected beach until the bacteria levels drop to an acceptable level. The Health Department then lifts the swimming advisory and the County or the JIA de-activates the advisory signs. CRD has placed beach information on their website at: <https://coastalgadnr.org/HealthyBeaches>, as well as current conditions. Visitors can also subscribe to an e-mail notification system, as a free service, to receive an e-mail each time there is a beach swimming advisory.

5.6.2. *Wildlife*

There are two important groups of wildlife directly using the beach environment for food, shelter and reproduction – shorebirds and sea turtles. Both will be addressed in detail in this section. Information for other groups of wildlife such as neo-tropical migrants, diamondback terrapins, wood storks, alligators, right whales and bottlenose dolphins can be found at the UGA Marine Extension and Georgia Sea Grant Brunswick Station, the GA DNR-CRD Office, or the U.S. Fish & Wildlife Service (USFWS) Coastal Refuges Office.

Jekyll Island and St. Simons Island are important to wintering sea birds and shorebirds, and occasionally nesting sea birds. Beach-nesting birds are a high conservation priority for the Wildlife Resources Division of the DNR (DNR-WRD). Glynn County and the JIA should coordinate with the DNR-WRD to protect the areas where birds are nesting, to achieve mutual conservation goals. State nongame biologists can assist in sign placement and rope barriers to keep the public away from beach nesting birds.

Dogs can disrupt and harass birds on the beach. The JIA has a requirement in their Code of Ordinances that it is prohibited for pets to be on beaches or in the dunes from the boardwalk at South Dunes Picnic Area south and around the southern tip of the island north to a point that is 2,000 feet south of the St. Andrews Picnic Area due to nesting shorebirds and sea turtles. Glynn County should consider a similar modification to their ordinance in the area from just north of Coast Guard Station to Gould's Inlet, as this is a similar critical habitat.

Nesting sea turtles are an important part of beach ecosystems in the Southeast. In case of future beach projects, the GADNR-WRD and Non-Game Program provide beach nourishment guidelines. The protection and maintenance of nesting habitat is considered a high priority in the USFWS/National Marine Fisheries Service (NMFS) Recovery Plan for the loggerhead turtle, *Caretta caretta*. The purpose of these guidelines is to minimize the effects of beach nourishment or other beach projects on sea turtle reproduction and to ensure nourished beaches are

compatible with native beaches. The following are general guidelines for beach nourishment projects:

- Construction shall be allowed primarily outside the loggerhead turtle nesting and hatching season (May 1-October 31). Deviations from this provision will require coordination with the GADNR and approval prior to the initiation of construction.
- Sediment grain size of fill material shall be free of construction debris, rocks, or other foreign matter and shall not contain, on average, greater than 10% fines (i.e. silt and clay, passing through a #200 sieve, approximately 0.075 mm) and shall not contain, on average, greater than 5% coarse gravel or cobbles (retained by #4 sieve, approx. 4.5 mm). Sand-grain size on Georgia beaches is generally between 0.15 and 0.3 mm.
- The sediment composition of Georgia beaches is generally fine-grained silica sand (>90%) with very little fragmented shell. Shell content should remain below 15% of total volume.
- Sediment color should be between 10Yr6.5/1 and 10Yr7.0/1 on the Munsell soil color chart.
- Sand compaction should be measured at a maximum of 500 ft. intervals along the fill area. Compaction will be measured at 3 stations along three transects corresponding to the landward, middle and seaward portion of the fill berm. At each measurement station, a cone penetrometer shall be pushed to depths of 6, 12, and 18 inches three times (3 replicates) and the compaction readings will be averaged to produce a final reading at each depth for each station. If the average value for any depth exceeds 500 cone penetrometer units (cpu) for any 2 or more adjacent stations, then that area will be cross-tilled from the high tide wave rush to the seaward toe of the dune prior to May 1. If a dune feature is constructed as part of the project, the dune feature should be tested for compaction prior to the planting of vegetation or sand fence construction. If compaction readings are greater than 500 cpu at any of the test depths (6", 12", 18") for 2 consecutive stations, the dune feature should be tilled prior to May 1. The DNR is responsible for performing the compaction testing and informing the local jurisdiction if and where there is a need for tilling on the beach for turtle habitat.
- The constructed beach profile should be gradually sloping rather than an elevated flat terrace to reduce scarping. The beach should be monitored for scarping prior to the nesting season. Escarpments in excess of 18" extending more than 100 ft should be mechanically leveled to natural beach contour prior to May 1.
- Sand fence construction will be in accordance with GADNR guidelines. GADNR Sand Fence Guidelines are designed to allow marine turtle access to nesting habitat and prevent trapping of marine turtles as they return to the sea following nesting.

Both Glynn County and the JIA have beach lighting provisions in their ordinances to address beach front lighting during nesting and hatching season. Because egg-laying females are disturbed by lights, and sea turtle hatchlings orient toward the bright horizon to be able to find their way to the ocean, they can become easily disoriented by artificial sources of lights, such as street and porch lights.

GADNR is responsible for managing and protecting sea turtles in the state, and GADNR's Sea Turtle Conservation Program has several components including management, monitoring, research, and

education. Cooperators locate and protect sea turtle nests, document strandings (compromised sea turtles that are either dead, sick, or injured), perform necropsies on dead strandings, work with the Georgia Sea Turtle Center (GSTC), which is housed on Jekyll Island and operated by the JIA, to provide rehabilitation for live strandings, conduct research, provide technical expertise on anthropogenic activities that have the potential to impact sea turtles (i.e., nourishment, dredging), and conduct education and outreach activities. The GSTC collaborates with GADNR to maintain and produce data for Jekyll Island's sea turtle nesting, and it has substantial capacity.

Nesting sea turtles have been studied on Jekyll Island since 1955. Loggerhead Sea Turtles are the primary species that nest on Jekyll Island, but Green Sea Turtles and Leatherback Sea Turtles have also been observed. Sea turtle nest monitoring and research on Jekyll Island follows statewide management protocols, which involve identifying nests, protecting them from predators with wire mesh, and monitoring incubation period and hatching success. The GSTC also performs overnight patrols to identify and tag as many nesting females as possible. In collaboration with a regional study led by University of Georgia researchers, one egg from every nest and one skin biopsy from every nesting female are collected to genetically assign nests to individual females. Additional sea turtle research led by the GSTC includes collaborations to study injury rates, environmental contaminants, behavior following abandoned nesting attempts, nest incubation temperature, disease monitoring, and a variety of other veterinary and health related topics.

Sea turtle nesting monitoring data is available through the Sea Turtle Nest Monitoring System website (<http://www.seaturtle.org/nestdb/?view=3>), and it includes information dating back to 2009. The numbers of nests and false crawls and the percentage of relocated nests are described in Table 5.2 for the four barrier Islands in Glynn County. On average, over the last decade, Jekyll Island had the most nests per year at 157.4 and St. Simons Island had the least at 5.6. On average 287.6 false crawls were experienced on Jekyll Island, but only 19% of their nests over the last decade had to be relocated. Nearly three-quarters of the nests on St. Simons Island have been relocated over the last decade, due to turtles nesting in less ideal conditions. The number of reported false crawls on St. Simons Island was also the smallest of the four Glynn County barrier islands.

Table 5.2: Summary of Sea Turtle Nesting in Glynn County during the 2010s.

Year	Nests				False Crawls				Relocated (%)			
	Jekyll	LSSI	SI	SSI	Jekyll	LSSI	SI	SSI	Jekyll	LSSI	SI	SSI
2010	140	111	87	5	270	151	52	3	14%	40%	55%	100%
2011	177	97	61	1	238	124	51	1	17%	38%	62%	100%
2012	197	116	102	6	356	158	126	6	47%	60%	42%	67%
2013	174	123	87	5	357	133	75	5	5%	53%	70%	40%
2014	107	53	41	1	163	45	18	8	5%	51%	61%	100%
2015	160	124	111	4	261	121	81	6	10%	38%	35%	100%
2016	170	223	110	13	416	268	132	13	11%	14%	35%	54%
2017	129	110	68	7	258	100	50	6	26%	16%	31%	100%
2018	121	106	70	8	216	112	47	7	31%	13%	37%	50%
2019	199	237	114	6	341	193	93	13	22%	21%	42%	33%
Average	157.4	130	85.1	5.6	287.6	140.5	72.5	6.8	19%	34%	47%	74%

Note: JI = Jekyll Island, LSSI = Little St. Simons Island, SI = Sea Island, and SSI = St. Simons Island

Data Source: Sea Turtle Monitoring System, <http://www.seaturtle.org/nestdb/?view=3>

Jekyll Island and Little St. Simons Island are the two most common nesting islands in Glynn County, so additional information on their habitat and monitoring capabilities are presented. The beach on Jekyll Island extends about 14.7 km. The northern section, or 'Driftwood Beach' (~2 km) has limited nesting habitat. Due to tidal flow, there is limited access to this section of beach. The middle third of the beach has rock armoring extending approximately 3-4 km and no suitable nesting habitat. In this area, there are a number of false crawls along this rock wall, and occasionally a nest that is then relocated. The rest of the beach (8-9 km) provides decent nesting habitat for sea turtles. Little St. Simons Island has prime coastal habitat that provides vital nesting and foraging stopover grounds for over 280 species of birds, including some that are endangered or threatened. The 7 miles of undeveloped beaches provides high quality nesting habitat for Loggerhead Sea Turtles. The beach is growing through accretion at an average rate of 2-3 feet per year. Since 1987, LSSI has worked with GADNR non-game conservation program to monitor the beaches for sea turtle activity. A DNR technician is stationed on the island and works with island staff throughout the sea turtle nesting season to monitor the beach.

5.6.3. Storm Water Management

Stormwater management on St. Simons Island and Jekyll Island directly affect beach water quality. Glynn County is currently working to adopt and implement the Coastal Stormwater Supplement (CSS) to the Georgia Stormwater Management Manual (GSMM) by December 6, 2020, per their municipal separate storm sewer system (MS4) permit. The update to the County's Water Resources Protection Ordinance will require green infrastructure and low impact development (GI/LID) stormwater management practices, such as bioretention, bioswales, and permeable pavement, to address water quality for new development and redevelopment. The function of GI/LID practices is to infiltrate stormwater and improve water quality. There are several examples of bioretention, permeable pavement, and constructed stormwater wetlands at beach access points on both on St. Simons Island and Jekyll Island. St. Simons Island has approximately 26,000 square feet of permeable pavement at Neptune Park, near the St. Simons Island Fishing Pier; an example is shown in Figure 5.9. Bioswales or bioretention are located on Jekyll Island at each of the new or renovated hotels, as well as Oceanview Beach Park, The Beach Pavilion, Great Dunes Park, and Ocean Club. A constructed stormwater wetland was also installed at Oceanview Beach Park includes bioretention, pervious concrete, and a constructed wetland, as shown in Figure 5.10.



Figure 5.9: Permeable Pavement at Neptune Park, near St. Simons Island Fishing Pier.



Figure 5.10: Oceanview Beach Park GI/LID Practices – Bioretention with Pervious Concrete Border (left) and Constructed Stormwater Wetland (right).

5.7. Current and Future Beach Management Practices

5.7.1. St. Simons Island Rock Revetment – Designed

On March 9, 2018, Governor Deal signed House Bill 683 which designated \$10 million to the OneGeorgia Authority for beach re-nourishment projects. OneGeorgia is the funding mechanism for the Georgia Department of Community Affairs, and they sought to issue a one-time grant in an amount up to \$2.5 million to Glynn County. Funds allocated could be used for necessary studies, planning/consulting/engineering activities, obtaining necessary state and/or federal permits, construction or reconstruction of beaches and/or dunes (including dredging and placement of sand), location-appropriate natural vegetation necessary to maintain dunes, construction/reconstruction of dunes, installation of rock revetments, or other activities deemed appropriate by

the OneGeorgia Authority. The agreement was extended to April 30, 2021, at which time the County has to be complete with all work or forfeit the balance of funds. As of July 2020, the project has been designed and contractor selected, but they are awaiting permit approval from Army Corps and GADNR, as well as turtle nesting season to be over.

When the “Johnson Rocks” were originally designed and installed in the 1960s, they were at an elevation of +7.5’ NAVD88. Over the past five decades, the revetment has been subject to settlement, beach erosion, overtopping, and direct storm effects. Large sections of the revetment were dislodged during hurricanes Matthew and Irma. Glynn County identified the need to conduct maintenance and repairs along 9,280 linear feet for the purpose of coastal storm protection. The new design has a proposed crest elevation of +8.5’ NAVD88, which is one additional foot greater than the original design. The additional elevation will increase the resiliency of the structure by accounting for sea level rise since original construction, as well as providing additional coastal storm protection. Copies of design plan sheets are available in Appendix F. Due to funding availability and private property coordination, the project is divided up into five phases, where Phase 1 will be the focus of the OneGeorgia grant. Phase 1 includes rehabilitating revetments fronting public property only, which covers Neptune Park and beach access points from #1 Wyley Street to #23 Arnold Road (Figure 5.7). Phase 1 will address 2,695 linear feet of the total length, which is nearly 30%. This project will require approximately 5,200 tons of rock.



Figure 5.11: Photos of Johnson Rocks at Neptune Park (left, low tide; right, high tide)

5.7.2. Jekyll Island Rock Revetment – Completed

The JIA recently completed a large rock revetment project on the mid-northern section of the island. A new rock revetment was constructed at an elevation of 9.5’ NAVD88 at the landward end of the revetment and sloping up to 10.0’ NAVD88 at the landward limit. One of the more vulnerable sections near Villa by the Sea, The Cottages, and extending south to King Avenue had a 9,800 continuous linear foot section (Figure 5.12). Moving south, a few other segments that needed repair due to erosion were also addressed and patched. Overall, the total length of construction was approximately 16,000 linear feet.



Figure 5.12: Recently Completed Rock Revetment Project on Jekyll Island.

5.7.3. Jekyll Island North End Shoreline Restoration (“Sand Motor”) – Conceptual Design

At the 2019 Georgia Environmental Conference on Jekyll Island, Heath Hansell, Coastal Engineer at ATM and Ben Carswell, JIA Director of Conservation, presented a talk “Engineering with Nature: Jekyll Island’s Vision for North End Shoreline Restoration.” This project outlined the history and sand dynamics how the northern tip, at Driftwood Beach, is actively eroding. Looking into a holistic approach with the northern end of the island and to engineer with nature, the concept of a “Sand Motor” approach was presented. The channel into the St. Simons Island Sound and erosion at the northern end of Jekyll Island resembles the dynamics at Holden Beach, NC, where strategic nearshore placement of sand allowed for an engineered shoal attachment. This provides numerous habitat and ecosystem benefits to migrate and spread sand naturally. A visualization is presented in Figure 5.13.



Figure 5.13: "Sand Motor" Project Visualization – Nearshore Placement

Important next steps are to pursue grant funding sources, conduct stakeholder/partnership engagement, and start with preliminary studies to find quality material through sand source investigations and studying coastal wave-sediment transport. Due to the interest in this project, and general interest to explore nearshore placement on either island, it is important to start developing plans to mitigate future disasters and to engage with Army Corps with these plans to pursue assistance whether as a technical resource or potential funding opportunities. Without these plans in place, and identified projects, Glynn County is missing out on an opportunity to participate in the Army Corps' sand sharing projects.

5.7.4 South Atlantic Coastal Study (SACS) – Plan Under Development

The South Atlantic Coastal Study (SACS) is a four-year federal study led by the U.S. Army Corps of Engineers that began in 2018 and is expected to have a final report, and accompanying technical reports by August 2022. SACS is a coastal risk assessment that analyzes risks from storms and sea level rise along 65,000 miles of tidally-influenced shorelines in six states, including NC, SC, GA, FL, AL and MS, and the territories of Puerto Rico and the U.S. Virgin Islands. Brunswick/Glynn County is one of the SACS' focus areas. This study discusses rising seas, a more aggressive storm future, and how best to manage the risk posed to the region's most vulnerable resources, and it is modeled closely after the North Atlantic Coast Comprehensive Study (NACCS), which was a Congressional response and precedent-setting vulnerability and flood risk-reduction study completed for the north Atlantic coastline following Hurricane Sandy. SACS will conduct regional analyses of coastal risk and identify initial measures/costs that can address vulnerabilities with emphasis on regional sediment management (RSM) as an actionable strategy to sustainably maintain or enhance current levels of coastal storm risk reduction.

SACS will not develop project-specific recommendations for Congressional authorization, but it will include a suite of recommendations founded on the concept of shared responsibility for risk reduction and highlight high risk areas that are candidates for further consideration and action. The complete list of goals from the U.S. Army Corps of Engineers includes:

1. Provide a Common Operating Picture of Coastal Risk
 - Provide decision-makers at all levels with a comprehensive and consistent regional assessment of coastal risk.
2. Identify High-Risk Locations and Focus Current and Future Resources
 - Enable resources to be focused on the most vulnerable areas.
3. Identify and Assess Risk Reduction Actions
 - Assess actions that would reduce risk to vulnerable coastal populations.
4. Promote and Support Resilient Coastal Communities
 - Ensure a sustainable coastal landscape system, considering future sea level rise scenarios and climate change.
 - Provide information to stakeholders to optimize existing efforts to reduce risk.
5. Promote Sustainable Projects and Programs
 - Develop and provide consistent foundational elements to support coastal studies and projects.
 - Regionally manage projects through Regional Sediment Management and other opportunities.
6. Leverage Supplemental Actions
 - Multiple supplemental studies and construction efforts will inform, and be informed by, the SACS.

Task Force members have been engaged in SACS, and it is recommended to maintain involvement in this study to ensure this region (Brunswick, Glynn County, and Jekyll Island) is well represented and included in the final products created as part of the SACS.

6. Summary and Recommendations for Implementation

The plan represents the assessment phase in which projects to protect shorelines were identified and prioritized. This sets the stage to pursue grant funds to design/permit and implement the near-term and some intermediate priority projects. With some grant sources, more funds are available if the assessment/planning stage, that is included in this plan, has already been completed.

Once the projects identified in this plan begin to get implemented, it is important to focus on some “quick hits” to show successes and get public buy-in, especially if it is a new or different management practice (e.g., living shorelines vs. bulkheads). Additionally, there may be some aspects or design features that need to be adjusted for local conditions, so it will allow for local designers and contractors to learn by doing. Small, successful projects will establish a “proof of concept” and “demonstration site” so that local governments can springboard to pursue implementing multiple, grouped projects that will provide a larger, regional impact. With any project, it is important to plan ahead for the application and permitting timelines.

The overall results and recommendations to address areas with shoreline vulnerabilities are detailed in the tables and figures in Section 4.2. This prioritized list of projects was created through combining the matrix approach described in Section 3.1, analysis of best management practices from Section 2.3, and potential funding sources and partners from Section 4.1. Some projects are individual, stand-alone, and will have little impact on other projects. There are several that could be combined based on geography, cascading effects, or having similar proposed solutions to utilize one permit. It is recommended to combine projects for design/permitting when able, but this might not always be possible due to availability of funds and timelines for implementation.

In some cases, multiple vulnerabilities were combined into one project (e.g., ‘J7-J9’ and ‘J9-J11’) because fixing one issue will not address the root cause or long-term accessibility/resource; therefore, it is recommended to seek funding to design the entire project and implement the most vulnerable segments first, as funding is available. Another unique case was larger neighborhood projects or regional issues, and these are noted as ‘General’ and includes an ‘N’ in the Site ID# (e.g., ‘B1N’, ‘B7N’, ‘GM11N’, ‘G118N’, and ‘G120N’). These projects were prioritized based on the most vulnerable locations in the region/neighborhood. It is likely with many of these projects that as the most vulnerable location is addressed there will be other vulnerable low points, so it is important that a full assessment and design for the area considers cascading impacts. Similar to the previous example, it may be likely that funding for implementation might only be available to address the most vulnerable locations, but it is important to design with the whole area in mind.

Section 5 is primarily a repository of facts for beach management history and practices. However, there are a few important recommendations from this section that are reiterated below:

- The beach profile methodology for data collection should be revisited to allow for streamlined analysis and data management. It is recommended to establish a benchmark for the origin of each profile and give each profile and measurement a unique ID#, so that the point can be reoccupied each time. It is also recommended to set a bearing for each profile to consistently survey the same location.

- Glynn County's "Beach and Dune Protection District Ordinance, Section 727" includes some contradictory language regarding setbacks, and it should be updated.
- Per a review of Glynn County's ordinances, existing environmental regulations protect beaches and dunes but do not go beyond state requirements for stream or marsh setbacks, allow shorelines and marshes to migrate over time, or otherwise address the impacts of flooding and sea level rise. These impacts should be considered when updating the Zoning and Subdivision Ordinance. The County's Zoning Update consultant, Tunnel-Spangler and Associates (TSW), has compiled and presented several alternatives to go beyond state requirements that are included in Section 5.5.
- It is recommended for staff to remain engaged in the U.S. Army Corps of Engineers' South Atlantic Coastal Study (SACS) to ensure this region (Brunswick, Glynn County, and Jekyll Island) is well represented and included in the final products created as part of the SACS.

Appendix A – Matrix Results for Shoreline Vulnerability Projects

As a supplement to the tables presented in Section 4, the detailed list of matrix results for each project are presented in the following tables by jurisdiction.

- Table A.1: Brunswick Shoreline Vulnerability Projects: Matrix Results, pg. 75
- Table A.2: Glynn County Shoreline Vulnerability Projects: Matrix Results, pgs. 76-77
- Table A.3: Jekyll Island Shoreline Vulnerability Projects: Matrix Results, pg. 78

Table A.1. Brunswick Shoreline Vulnerability Projects: Matrix Results

ID#	Site Description	Shoreline Change	Infrast. Type	Infrast. Proximity	Vulner. Population	Ownership	Habitat/Veg	SLR	Flood Zone	Frequent flooding	Erosion	Total Score	Rank	Priority
		Multiplier	Score	Score	Score	Score	Score	Score	Score	Score	Score			<i>Based on Rank</i>
B1N	Riverside Drive Neighborhood Flooding	7	7	3	0	0	3	5	3	3	0	168	13	Long-Term
B2	Flooding on Hwy 17 at Torras Causeway	7	10	0	0	2	0	5	3	5	0	175	12	Long-Term
B3	Palmetto Cemetery Erosion	7	10	10	5	5	5	3	3	0	5	322	1	Near-Term
B4	Greenwood Cemetery Erosion	7	10	5	5	5	0	3	3	0	1	224	7	Intermediate
B5	T Street Outfall at Academy Creek	7	10	10	5	5	0	3	3	0	3	273	4	Near-Term
B6	Brunswick Landing Marina Sediment Accumulation	7	5	10	5	0	0	5	3	0	0	196	9	Intermediate
B7N	General: Flooding South of 4th Ave	7	7	0	5	0	0	5	3	3	0	161	14	Long-Term
B8	Howard Coffin Park Ditch Erosion	7	3	10	3	5	5	3	3	5	5	294	3	Near-Term
B9	Marshside Grill Erosion and Flooding	7	5	10	3	5	3	7	5	5	3	322	1	Near-Term
B10	Riverside Drive Causeway	7	7	5	0	5	3	7	5	5	0	259	6	Near-Term
B11	Riverside Drive Overtopping	7	7	3	0	0	3	7	3	5	0	196	9	Intermediate
B12	Lanier Blvd Flooding	7	10	1	3	2	3	3	3	5	0	210	8	Intermediate
B13N	Downtown Flooding	7	10	0	0	0	0	1	3	3	0	119	16	Long-Term
B14	Flooding on Hwy 17 south of Redwood Street	7	10	1	0	2	0	1	3	5	0	154	15	Long-Term
B15	Flooding on Hwy 17 at Lanier Plaza	7	10	10	0	2	3	5	3	5	0	266	5	Near-Term
B16	Academy Creek WWTP	7	10	7	5	2	0	1	3	0	0	196	9	Intermediate

Table A.2. Glynn County Shoreline Vulnerability Projects: Matrix Results

ID#	Site Description	Shore-line Change	Infrast. Type	Infrast. Proximity	Vulner. Population	Ownership	Habitat/Veg	SLR	Flood Zone	Frequent flooding	Erosion	Total Score	Rank	Priority
		Mult.	Score	Score	Score	Score	Score	Score	Score	Score	Score			Based on Rank
Glynn - Mainland														
GM1	Belle Point Parkway	7	7	0	0	0	3	5	3	3	0	147	29	Long-Term
GM2	Turtle Creek Bridge	7	10	0	0	2	3	3	3	3	0	168	24	Intermediate
GM3	Blythe Island Erosion	7	1	7	0	2	3	0	3	3	5	168	24	Intermediate
GM4	Blythe Island / I-95 Erosion	7	7	5	0	2	3	1	3	3	1	175	22	Intermediate
GM5	Turtle River Park Boat Ramps	7	3	10	0	5	3	3	5	3	1	231	7	Near-Term
GM6	River Ridge Rd Flooding	7	7	1	0	0	0	1	1	5	1	112	35	Long-Term
GM7	Choke Point at Oak Grove Island Road	7	7	3	0	5	3	5	3	3	0	203	17	Intermediate
GM8	Hutchinson Ditch	7	7	1	0	0	3	1	3	5	0	140	30	Long-Term
GM9	Altamaha Park Flooding	7	7	10	0	5	5	1	0	5	0	231	7	Near-Term
GM10	Pennick Road	7	7	0	0	5	5	1	1	5	0	168	24	Intermediate
GM11N	Dolphin/Trout/Bream/Pike/Bass Neighborhood Flooding	7	7	5	5	0	3	5	3	5	0	231	7	Near-Term
GM-12N	End of Crispen Blvd	7	7	5	0	0	0	1	1	3	3	140	30	Long-Term
Glynn - Islands														
GI1	Torras Cswy Flooding (Current low points)	7	10	1	0	2	3	5	5	3	3	224	13	Intermediate
GI2	King & Prince Erosion	7	7	10	0	0	5	1	5	3	3	238	6	Near-Term
GI3	Gould's Inlet	7	7	10	0	5	3	1	3	3	0	224	13	Intermediate
GI4	15th St & Ocean	7	7	7	0	5	3	5	3	3	0	231	7	Near-Term
GI5	3rd St & Ocean	7	7	7	0	5	3	5	3	3	0	231	7	Near-Term
GI6	Myrtle & Postell Beach Access	7	7	10	0	5	5	3	3	3	5	287	1	Near-Term

ID#	Site Description	Shore-line Change	Infrast. Type	Infrast. Proximity	Vulner. Population	Ownership	Habitat/Veg	SLR	Flood Zone	Frequent flooding	Erosion	Total Score	Rank	Priority
GI7	East Beach	7	7	5	0	0	5	1	5	3	3	203	17	Intermediate
GI8	5th St & Beachview Access	7	7	10	0	5	5	3	3	3	1	259	3	Near-Term
GI9N	Gen. Stormwater: Glynn Haven	7	7	0	0	0	0	5	1	5	0	126	34	Long-Term
GI10N	Gen. Stormwater: Harrington's	7	7	0	0	0	0	1	1	5	0	98	37	Long-Term
GI11	Massengale Park	7	3	5	0	5	5	1	3	3	0	175	22	Intermediate
GI12	Ocean Blvd Erosion near Tide Gate	7	3	10	0	0	3	3	3	0	1	161	27	Long-Term
GI13	Ocean Blvd Sidewalk Erosion	7	3	10	0	0	3	3	3	0	1	161	27	Long-Term
GI14	Ocean Blvd Headwall Erosion	7	7	10	0	0	3	5	3	0	3	217	15	Intermediate
GI15N	Gen. Flooding: S&E of Ocean Blvd	7	10	7	0	0	0	3	3	3	1	189	21	Intermediate
GI16	SSI Gateway Flooding	7	10	7	0	5	3	5	3	3	0	252	4	Near-Term
GI17	Barnes Plantation Pump	7	7	5	0	0	3	7	3	3	0	196	20	Intermediate
GI18N	Gen. Beach Access	7	7	10	0	5	5	3	5	3	3	287	1	Near-Term
GI19	Alabama-Forest Park Flooding	7	7	5	0	0	0	0	3	5	0	140	30	Long-Term
GI20N	Gen. SSI Marshfront Homes Flooding	7	7	5	0	0	3	5	3	3	3	203	17	Intermediate
GI21N	Gen. Stormwater: Sea Palms	7	7	0	0	0	0	3	0	5	0	105	36	Long-Term
GI22	Neptune Park	7	3	10	0	5	5	3	3	3	1	231	7	Near-Term
GI23	Fort Frederica	7	10	10	0	2	3	3	3	3	1	245	5	Near-Term
GI24	Sea Island Cswy	7	10	5	0	0	3	5	5	3	0	217	15	Intermediate
GI25	Dunbar Creek WWTP	7	10	5	0	2	0	1	1	0	0	133	33	Long-Term

Note: GI12 – A new headwall and tide flap were added in spring 2020, so the previous erosion issue has been addressed.

Table A.3. Jekyll Island Shoreline Vulnerability Projects: Matrix Results

ID#	Site Description	Shoreline Change	Infrast. Type	Infrast. Proximity	Vulner. Population	Ownership	Habitat/Veg	SLR	Flood Zone	Frequent flooding	Erosion	Total Score	Rank	Priority
		Multiplier	Score	Score	Score	Score	Score	Score	Score	Score	Score			<i>Based on Rank</i>
J1	Edge of Sea Wall Erosion	7	5	10	0	5	3	1	3	0	3	210	10	Intermediate
J3	Brewery Site	7	10	10	0	5	0	5	5	0	7	294	4	Near-Term
J4	Cemetery near Horton House	7	10	10	0	5	0	7	5	5	5	329	2	Near-Term
J5-J6	Road to Fishing Pier & Parking Lot	7	3	10	0	5	3	7	3	5	5	287	5	Near-Term
J7-J9	North Loop Trail (Pier to Driftwood Access)	7	3	10	0	5	5	10	3	5	7	336	1	Near-Term
J9-J11	North End Shoreline Restoration (Sand Motor)	7	3	10	0	5	5	10	3	5	5	322	3	Near-Term
J12	Cpt Wylly Rd & Beachview	7	10	3	0	5	0	1	0	0	0	133	13	Long-Term
J13	Vehicle Beach Access near Conference Center	7	10	1	0	5	0	1	0	0	0	119	14	Long-Term
J16	St Andrews Beach	7	3	5	0	5	0	3	3	3	1	161	11	Long-Term
J17	Roadway to Sole Public Boatramp	7	3	10	0	5	3	7	3	3	3	259	6	Intermediate
J20	Jekyll Island Electrical Substation	7	10	5	0	5	3	5	3	3	1	245	8	Intermediate
J21	JIA WWTP	7	10	5	0	5	3	3	3	3	1	231	9	Intermediate
J22	Drainageway North of Golf Course	7	7	5	0	5	0	1	1	0	1	140	12	Long-Term
J25	Stable Road & Riverview Drive Outfall	7	10	10	0	5	0	1	3	3	5	259	6	Intermediate

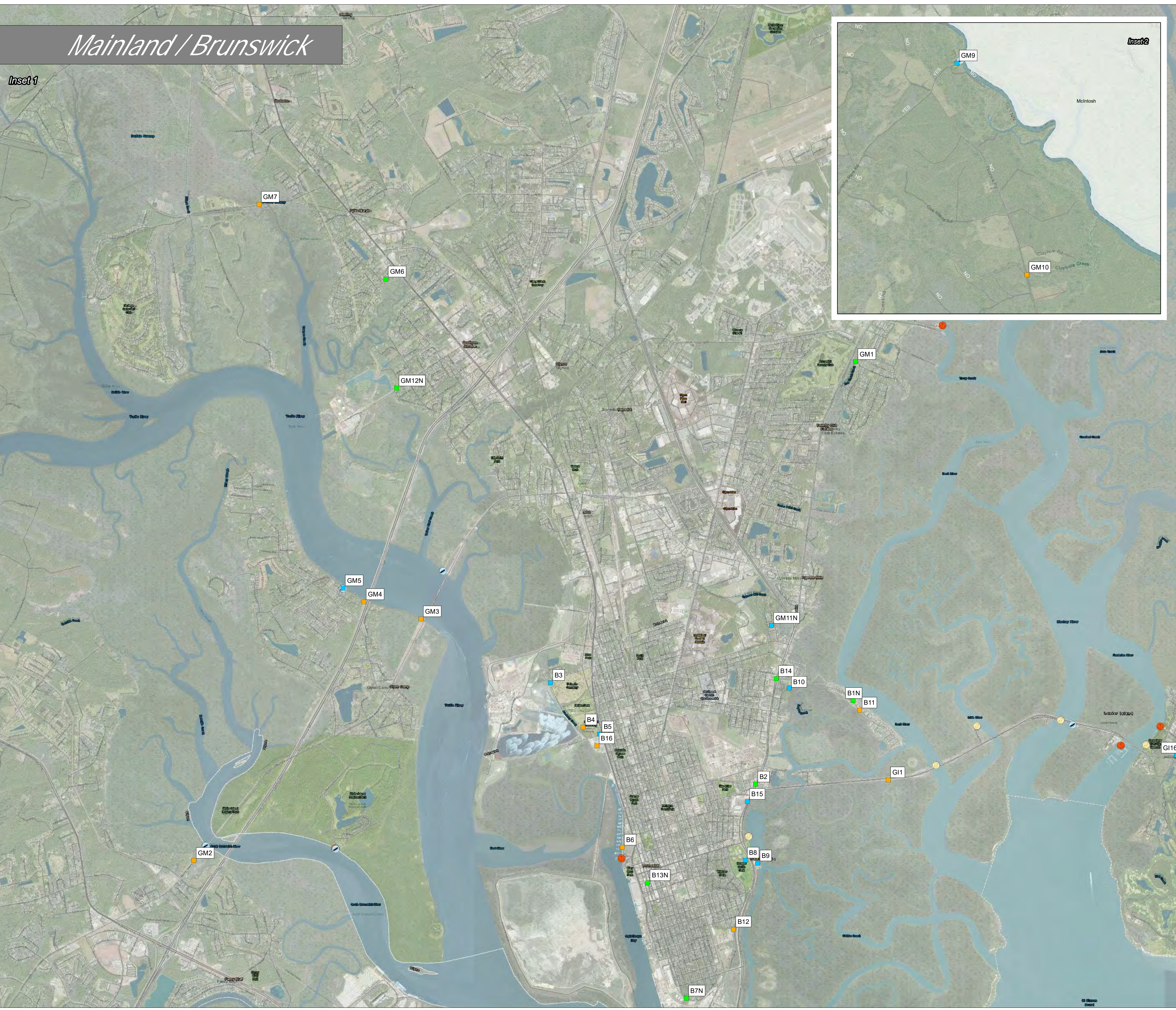
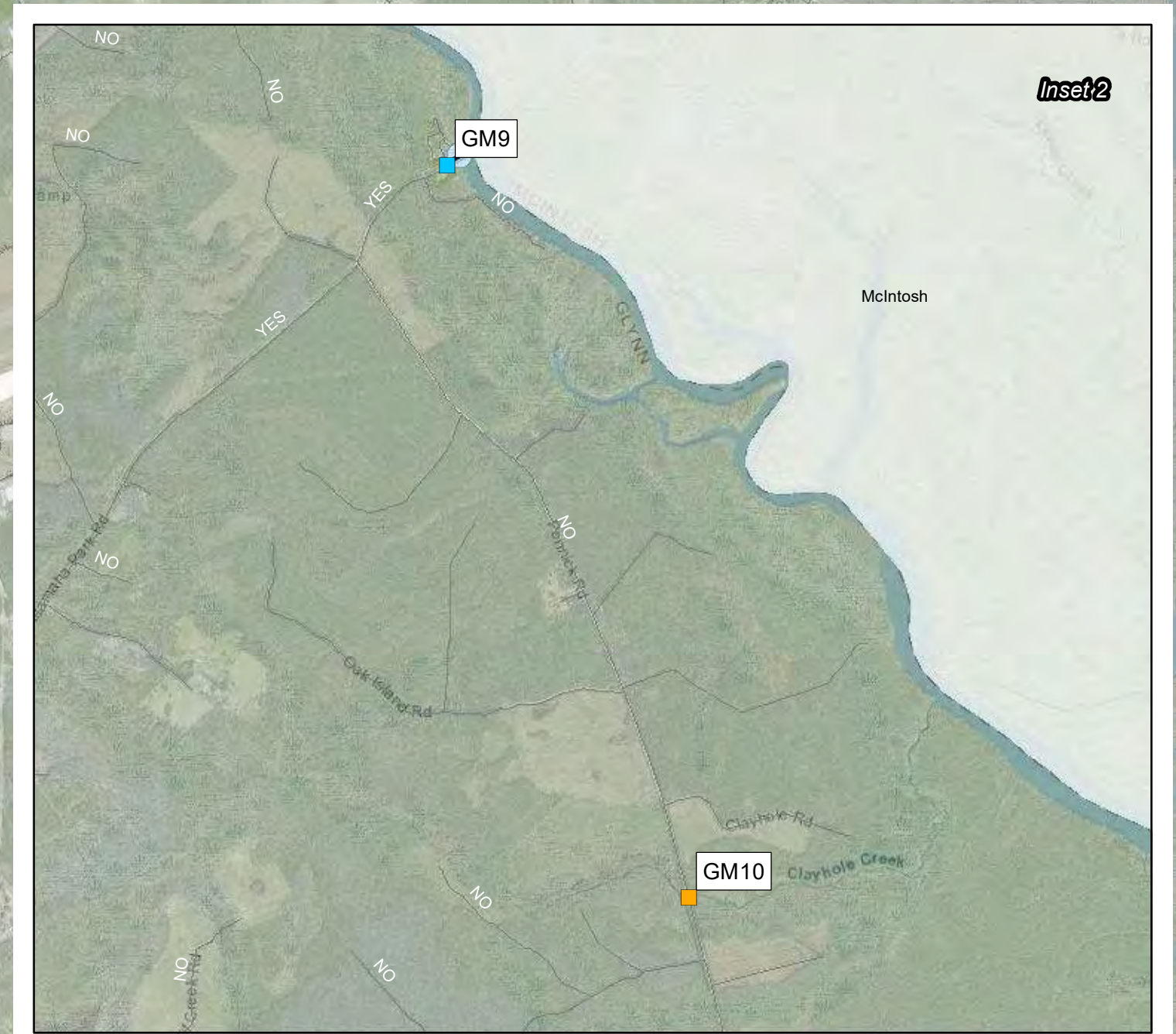
Appendix B – Full-Size Maps of Shoreline Vulnerability Projects

In addition to the tables and figures presented in Section 4, full-size (36" x 24") versions of the maps depicting the shoreline vulnerability projects were created for the three major sections of the County. Each map includes a table depicting the score calculated from the matrix, project rank, prioritization level, and relative cost. These maps also present public access points for boat ramps, fishing piers, marinas, and public beach access. The maps are presented as follows:

- **Mainland Glynn County** (includes City of Brunswick and Mainland Sections of Unincorporated Glynn County)
- **St. Simons Island**
- **Jekyll Island**

Mainland / Brunswick

Inset 1



Shoreline Vulnerability in Glynn County Georgia

Community Identified Hotspots

Priority

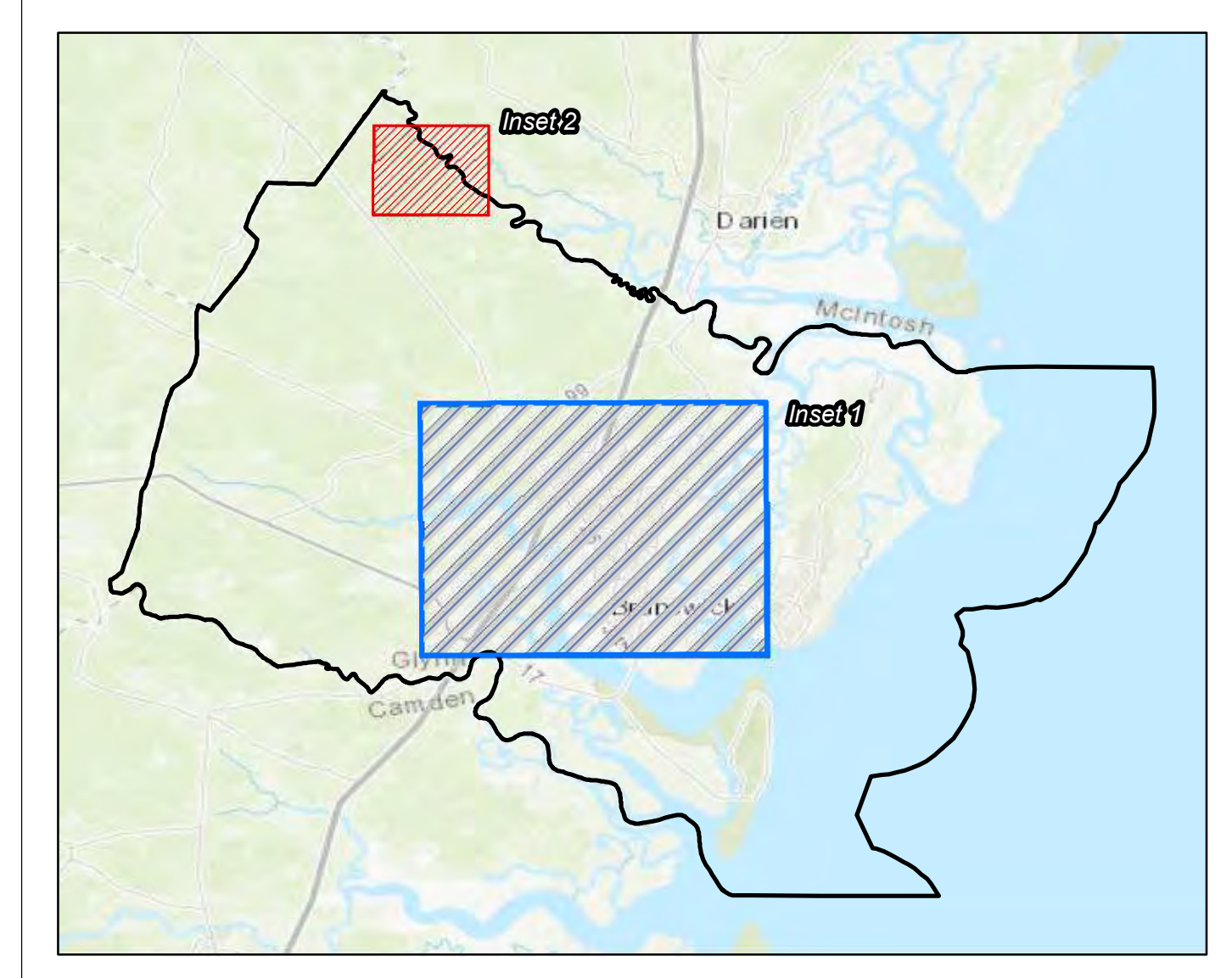
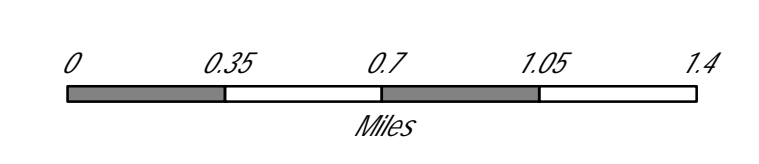
- Near-Term
- Intermediate
- Long-Term

Public Access Points

- Boat Ramps
- Fishing Piers
- Marinas
- Public Beach Access

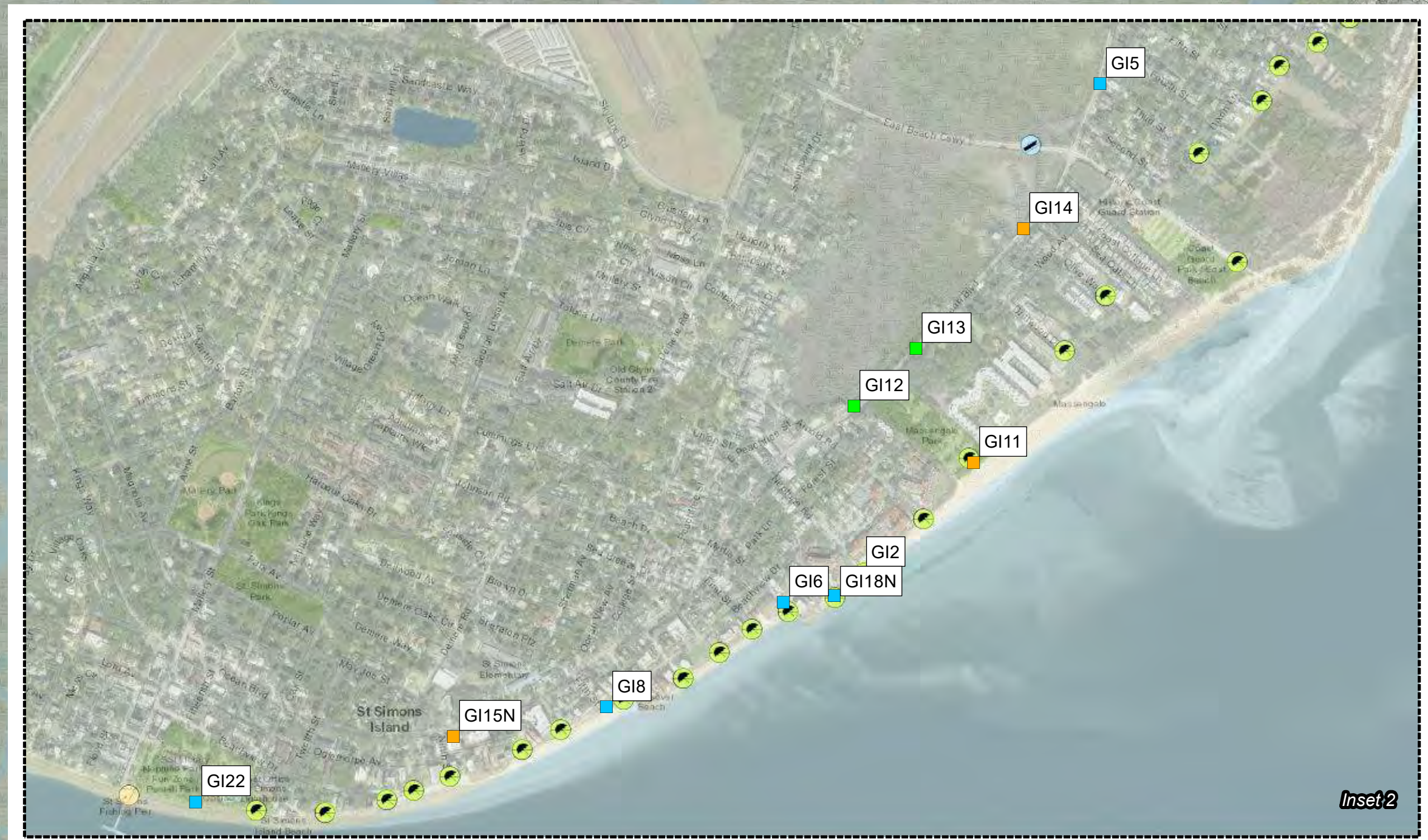
Map ID	Score	Rank	Priority	Cost
GM1	147	29	Long-Term	\$5
GM2	168	24	Intermediate	\$55
GM3	168	24	Intermediate	\$
GM4	175	22	Intermediate	\$55
GM5	231	7	Near-Term	\$5
GM6	112	35	Long-Term	\$
GM7	203	17	Intermediate	\$5
GM8	140	30	Long-Term	\$55
GM9	231	7	Near-Term	\$55
GM10	168	24	Intermediate	\$5
GM11N	231	7	Near-Term	\$55
GM12N	140	30	Long-Term	\$55
G1	224	13	Intermediate	\$55
G2	238	6	Near-Term	\$55
G3	224	13	Intermediate	\$55
G4	231	7	Near-Term	\$5
G5	231	7	Near-Term	\$5
G6	287	1	Near-Term	\$55
G7	203	17	Intermediate	\$55
G8	259	3	Near-Term	\$55
G9N	126	34	Long-Term	\$55
G10N	98	37	Long-Term	\$55
G11	175	22	Intermediate	\$5
G12	161	27	Long-Term	\$
G13	161	27	Long-Term	\$
G14	217	15	Intermediate	\$
G15N	189	21	Intermediate	\$55
G16	252	4	Near-Term	\$55
G17	196	20	Intermediate	\$5
G18N	287	1	Near-Term	\$55
G19	140	30	Long-Term	\$55
G20N	203	17	Intermediate	\$55
G21N	105	36	Long-Term	\$55
G22	231	7	Near-Term	\$55
G23	245	5	Near-Term	\$5
G24	217	15	Intermediate	\$55
G25	133	33	Long-Term	\$55
J1	210	30	Intermediate	\$
J3	294	4	Near-Term	\$55
J4	329	2	Near-Term	\$5
J5	189	21	Long-Term	\$55
J6	287	1	Near-Term	\$5
J7-J9	336	1	Near-Term	\$55
J9-111	322	3	Near-Term	\$55
J12	133	34	Long-Term	\$55
J13	119	35	Long-Term	\$
J16	161	32	Long-Term	\$55
J17	259	6	Intermediate	\$
J20	245	8	Intermediate	\$55
J21	231	9	Intermediate	\$55
J22	140	33	Long-Term	\$55
J25	259	6	Intermediate	\$5
B1N	168	24	Long-Term	\$55
B2	175	22	Long-Term	\$55
B3	322	1	Near-Term	\$5
B4	224	7	Intermediate	\$
B5	273	4	Near-Term	\$5
B6	196	9	Intermediate	\$55
B7N	161	34	Long-Term	\$55
B8	294	3	Near-Term	\$
B9	322	1	Near-Term	\$5
B10	259	6	Near-Term	\$55
B11	196	9	Intermediate	\$55
B12	210	8	Intermediate	\$55
B13N	119	36	Long-Term	\$55
B14	154	35	Long-Term	\$5
B15	266	5	Near-Term	\$55
B16	196	9	Intermediate	\$55

Project Partners:

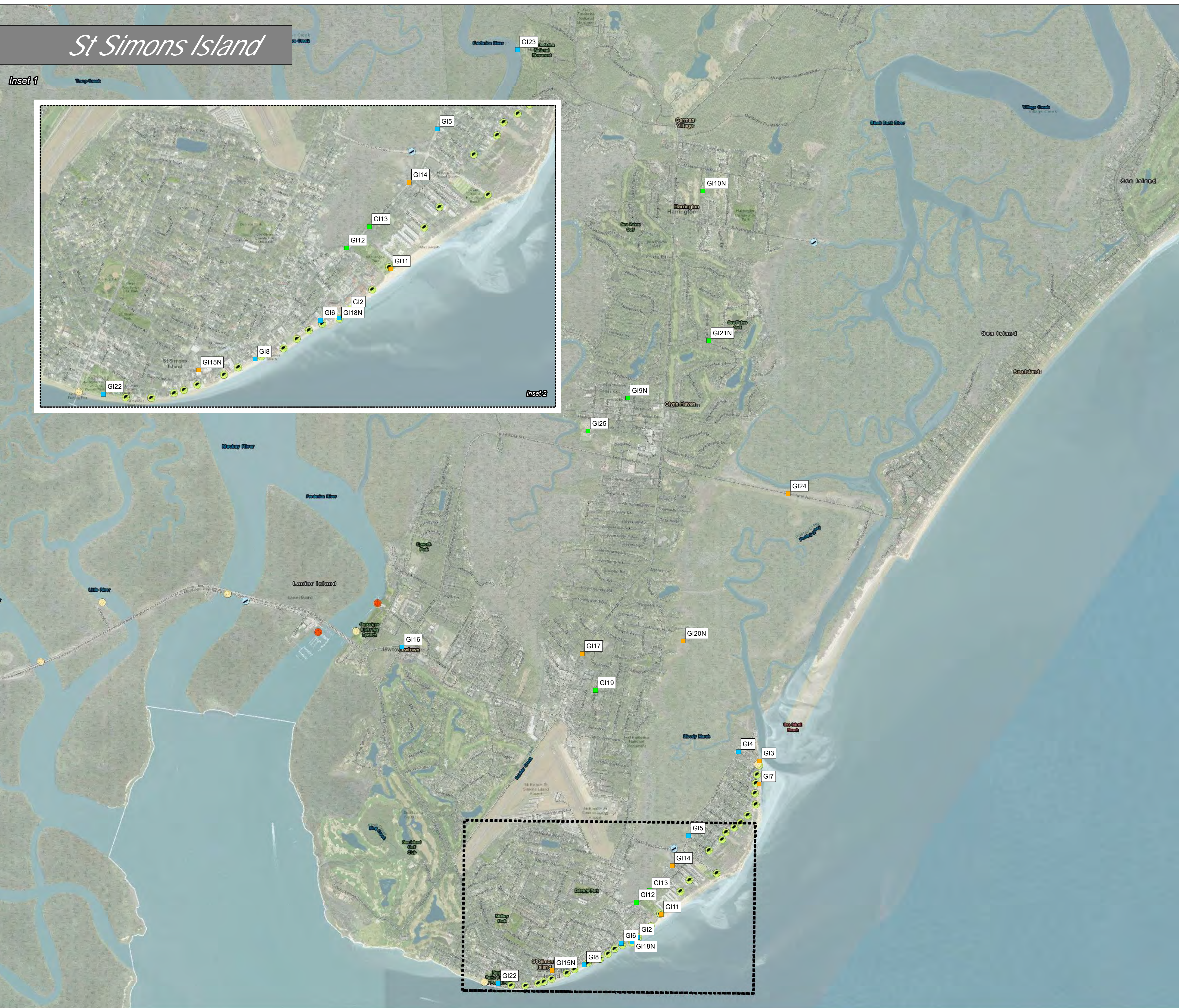


St Simons Island

Inset 1



Inset 2



Shoreline Vulnerability in Glynn County Georgia

Community Identified Hotspots

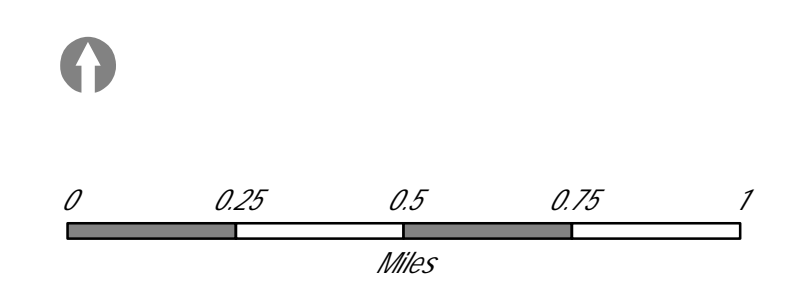
Priority

- Near-Term
- Intermediate
- Long-Term

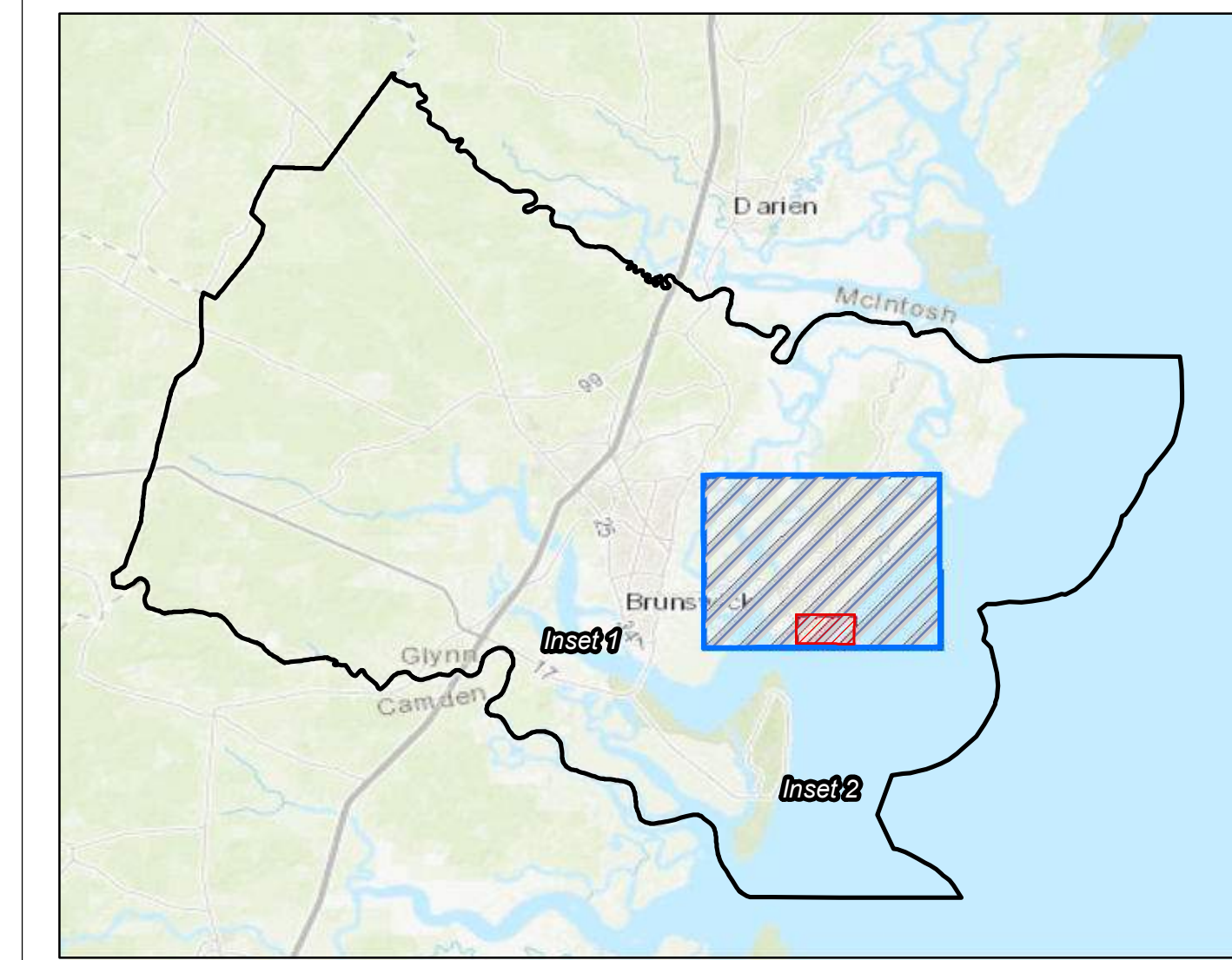
Public Access Points

- Boat Ramps
- Fishing Piers
- Marinas
- Public Beach Access

Project Partners:

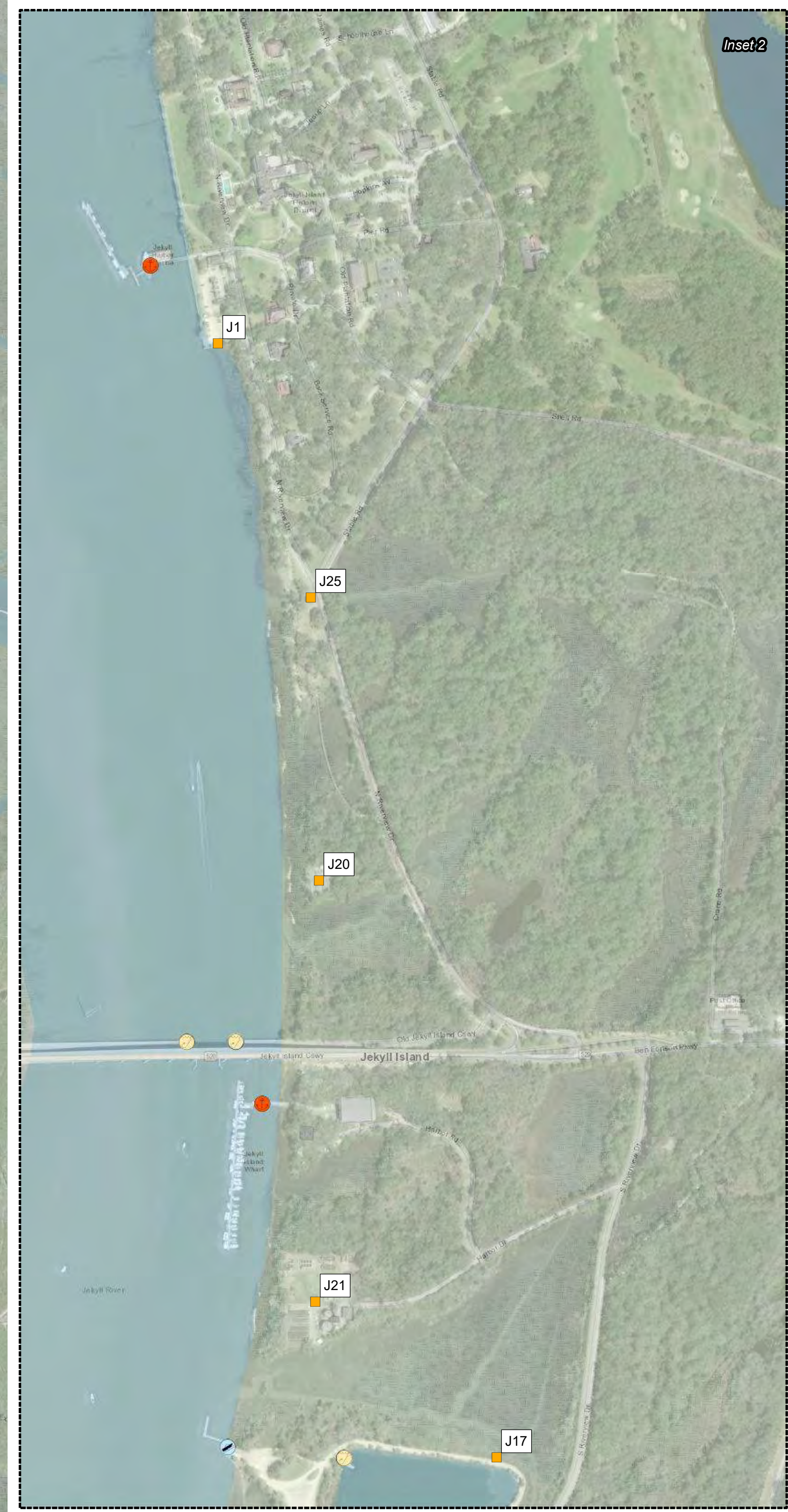


Map ID	Score	Rank	Priority	Cost
GM1	147	29	Long-Term	\$5
GM2	168	24	Intermediate	\$55
GM3	168	24	Intermediate	\$
GMA	175	22	Intermediate	\$55
GM5	231	7	Near-Term	\$5
GM6	112	35	Long-Term	\$
GM7	203	17	Intermediate	\$5
GM8	140	30	Long-Term	\$55
GM9	231	7	Near-Term	\$55
GM10	168	24	Intermediate	\$5
GM11N	231	7	Near-Term	\$555
GM12N	140	30	Long-Term	\$55
GI1	224	13	Intermediate	\$55
GI2	238	6	Near-Term	\$555
GI3	224	13	Intermediate	\$55
GI4	231	7	Near-Term	\$5
GI5	231	7	Near-Term	\$5
GI6	287	1	Near-Term	\$55
GI7	203	17	Intermediate	\$55
GI8	259	3	Near-Term	\$55
GI9A	126	34	Long-Term	\$555
GI10N	98	37	Long-Term	\$555
GI11	175	22	Intermediate	\$5
GI12	161	27	Long-Term	\$
GI13	161	27	Long-Term	\$
GI14	217	15	Intermediate	\$
GI15N	189	21	Intermediate	\$555
GI16	252	4	Near-Term	\$55
GI17	196	20	Intermediate	\$5
GI18N	287	1	Near-Term	\$55
GI19	140	30	Long-Term	\$55
GI20N	203	17	Intermediate	\$555
GI21N	105	36	Long-Term	\$55
GI22	231	7	Near-Term	\$555
GI23	245	5	Near-Term	\$5
GI24	217	15	Intermediate	\$555
GI25	133	33	Long-Term	\$555
J1	210	30	Intermediate	\$
J3	294	4	Near-Term	\$55
J4	329	2	Near-Term	\$5
J5	189	11	Long-Term	\$55
J6	287	5	Near-Term	\$5
J7-J9	336	1	Near-Term	\$555
J9-111	322	3	Near-Term	\$555
J12	133	34	Long-Term	\$55
J13	119	35	Long-Term	\$
J16	161	12	Long-Term	\$55
J17	259	6	Intermediate	\$
J20	245	8	Intermediate	\$555
J21	231	9	Intermediate	\$555
J22	140	33	Long-Term	\$55
J25	259	6	Intermediate	\$5
B1N	168	13	Long-Term	\$555
B2	175	12	Long-Term	\$55
B3	322	1	Near-Term	\$5
B4	224	7	Intermediate	\$
B5	273	4	Near-Term	\$5
B6	196	9	Intermediate	\$55
B7N	161	14	Long-Term	\$555
B8	294	3	Near-Term	\$
B9	322	1	Near-Term	\$5
B10	259	6	Near-Term	\$55
B11	196	9	Intermediate	\$55
B12	210	8	Intermediate	\$55
B13N	119	16	Long-Term	\$555
B14	154	15	Long-Term	\$5
B15	266	5	Near-Term	\$55
B16	196	9	Intermediate	\$555



Jekyll Island

Inset 1



Inset 2



Shoreline Vulnerability in Glynn County Georgia

Community Identified Hotspots

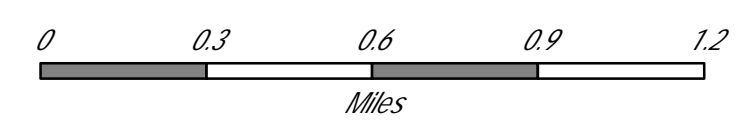
Priority

- Near-Term
- Intermediate
- Long-Term

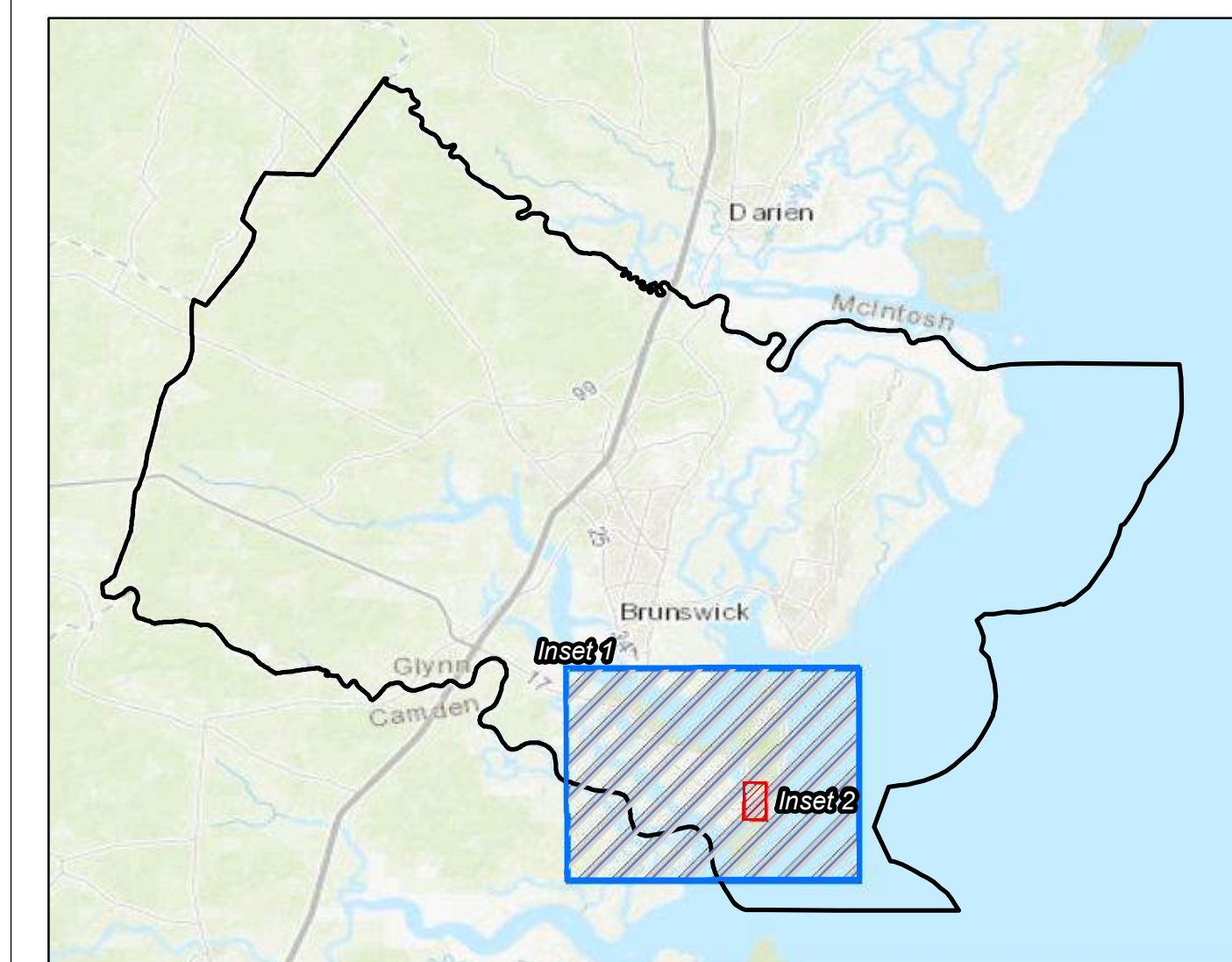
Public Access Points

- Boat Ramps
- Fishing Piers
- Marinas
- Public Beach Access

Project Partners:



Map ID	Score	Rank	Priority	Cost
GM1	147	29	Long-Term	\$5
GM2	168	24	Intermediate	\$55
GM3	168	24	Intermediate	5
GM4	175	22	Intermediate	\$55
GM5	231	7	Near-Term	\$5
GM6	112	35	Long-Term	5
GM7	203	17	Intermediate	\$5
GM8	140	30	Long-Term	\$55
GM9	231	7	Near-Term	\$55
GM10	168	24	Intermediate	\$5
GM11N	231	7	Near-Term	\$55
GM12N	140	30	Long-Term	\$55
G1	224	13	Intermediate	\$55
G2	258	6	Near-Term	\$555
G3	224	13	Intermediate	\$55
G4	231	7	Near-Term	\$5
G5	231	7	Near-Term	\$5
G6	287	1	Near-Term	\$55
G7	203	17	Intermediate	\$55
G8	259	3	Near-Term	\$55
G9N	126	34	Long-Term	\$555
G10N	98	37	Long-Term	\$555
G11	175	22	Intermediate	\$5
G12	161	27	Long-Term	5
G13	161	27	Long-Term	5
G14	217	15	Intermediate	5
G15N	189	21	Intermediate	\$555
G16	252	4	Near-Term	\$55
G17	196	20	Intermediate	\$5
G18N	287	1	Near-Term	\$55
G19	140	30	Long-Term	\$55
G20N	203	17	Intermediate	\$555
G21N	105	36	Long-Term	\$55
G22	231	7	Near-Term	\$555
G23	245	5	Near-Term	\$5
G24	217	15	Intermediate	\$555
G25	133	33	Long-Term	\$555
J1	210	10	Intermediate	5
J3	294	4	Near-Term	\$55
J4	329	2	Near-Term	\$5
J5-J6	287	5	Near-Term	\$55
J7-J9	336	1	Near-Term	\$555
J9-J11	322	3	Near-Term	\$555
J12	133	13	Long-Term	\$55
J13	119	14	Long-Term	5
J16	161	11	Long-Term	\$55
J17	259	6	Intermediate	5
J20	245	8	Intermediate	\$555
J21	231	9	Intermediate	\$555
J22	140	12	Long-Term	\$55
J25	259	6	Intermediate	\$5
B1N	168	13	Long-Term	\$555
B2	175	12	Long-Term	\$55
B3	322	1	Near-Term	\$5
B4	224	7	Intermediate	5
B5	273	4	Near-Term	\$5
B6	196	9	Intermediate	\$55
B7N	161	14	Long-Term	\$555
B8	294	3	Near-Term	5
B9	322	1	Near-Term	\$5
B10	259	6	Near-Term	\$55
B11	196	9	Intermediate	\$55
B12	210	8	Intermediate	\$55
B13N	119	16	Long-Term	\$555
B14	154	15	Long-Term	\$5
B15	266	5	Near-Term	\$55
B16	196	9	Intermediate	\$555



Appendix C: Photos from Projects with Erosion Issues

During field visits with staff or following meetings with staff, GMC took photographs at most potential project locations or areas with issues. Field visits were conducted in November and December 2019. All sites with erosion concerns were photographed, and representative photos of the conditions at each site are presented in Appendix C. The photos are organized by jurisdiction and presented chronologically based on the Project ID#:

- City of Brunswick – pgs. 83-85
- Glynn County (Mainland) – pg. 86
- Glynn County (Islands) – pgs. 87-90
- Jekyll Island – pgs. 91-93

C.1. City of Brunswick Projects

ID: #B-3 – Brunswick, Palmetto Cemetery Erosion



ID: #B-4 – Brunswick, Greenwood Cemetery Erosion



ID: #B-5 – Brunswick, T Street Outfall at Academy Creek WWTP



ID: #B-8 – Brunswick, Howard Coffin Park Ditch Erosion



ID: #B-9 – Brunswick, Marshside Grill Erosion & Flooding



C.2. Glynn County Projects – Mainland

ID: #GM-3 – Blythe Island Erosion, End of Former Hwy 303 Bridge



ID: #GM-5 – Blythe Island, Turtle River Park Boat Ramps



C.3. Glynn County Projects – St. Simons Island

ID: #GI-2 – St. Simons Island, King & Prince Erosion



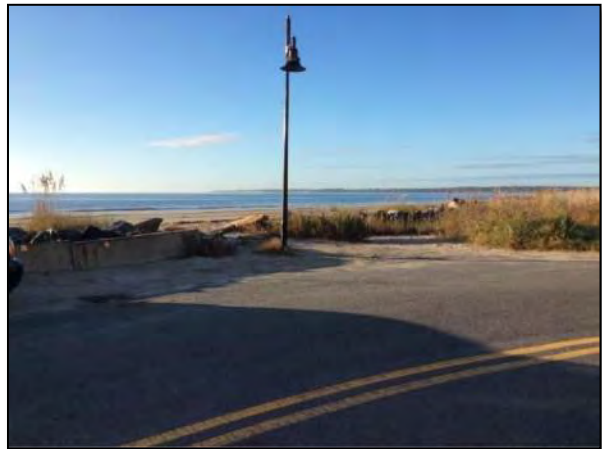
ID: #GI-3 – St. Simons Island, Gould's Inlet



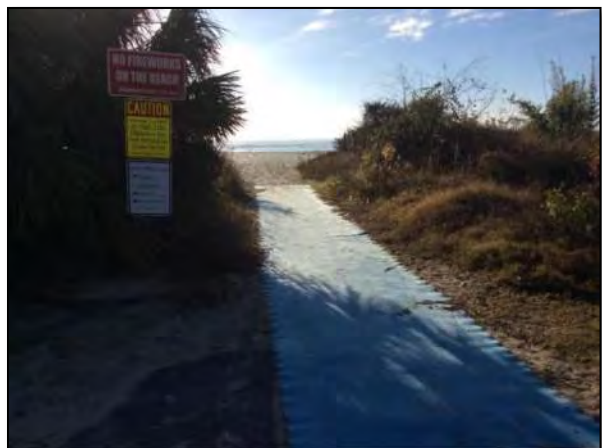
ID: #GI-6 – St. Simons Island, Myrtle & Postell Beach Access



ID: #GI-8 – St. Simons Island, 5th Street & Beachview Access



ID: #GI-11 – St. Simons Island, Massengale Park



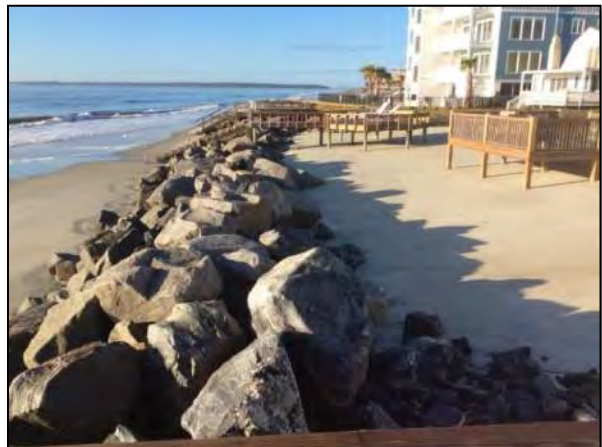
ID: #GI-13 – St. Simons Island, Ocean Blvd. Sidewalk Erosion



ID: #GI-14 – St. Simons Island, Ocean Blvd. Headwall Erosion



ID: #GI-18N – St. Simons Island, General Beach Access (10 beach access bridges were rebuilt from last storms)



ID: #GI-22 – St. Simons Island, Neptune Park



C.4. Jekyll Island Projects

ID: #J-1 – Jekyll Island, Edge of Sea Wall Erosion



ID: #J-3 – Jekyll Island, Historical Brewery Site



ID: #J-4 – Jekyll Island, Historical Cemetery near Horton House



ID: #J-9 – Jekyll Island, North Loop Trail, Blowout (Irma)



ID: #J-10 – Jekyll Island, North Loop Trail, Dune Regeneration (Irma)



ID: #J-16 – Jekyll Island, St. Andrews Beach



ID: #J-17 – Jekyll Island, Roadway to Sole Public Boatramp



ID: #J-22 – Jekyll Island, Primary Ditch from Golf Courses



Appendix D – Task Force Meeting Summaries

This appendix includes the meeting summaries from each Task Force Meeting, as well as a meeting summary from the Consultant Kickoff Meeting with the Project Team. The meeting summaries included in the appendix are as follows:

- Task Force, Kickoff Meeting, January 25, 2019, pg 95-96
- Project Team, Consultant Kickoff Meeting, August 6, 2019, pg 97-99
- Task Force, Meeting #2, August 6, 2019, pg 100-102
- Task Force, Meeting #3 (Workshop/"Stations"), January 6, 2020, pg 103-113
- Task Force, Meeting #4, February 28, 2020, pg 114-115
- Task Force Meeting #5, August 28, 2020, pg 116-117

Coastal Incentive Grant

Shoreline Protection Implementation Plan, Year 1

Meeting Minutes

January 25, 2019

In attendance: Jay Sellers – BGJWSC, Jay Wiggins – GC EMA, Alec Eaton – GC EMA, John Centeno – GC GIS, Bob Nyers – GC GIS, Andrew Strickland – GC GIS, Noel Jensen – JIA, Paul Andrews – GC CD, Pamela Thompson – GC CD, James Drumm – COB Manager, Beatrice Soler – COB Management Analyst, Bren White-Diass – COB Planner, Dave Austin – GC PW, Alan Ours – GC Manager, Ben Carswell – JIA, Jan Mackinnon – Coastal Resource Division DNR, Jennifer Kline - Coastal Resource Division DNR, Kathryn Downs – GC Assistant Manager, Matthew Kent- GC PIO, Chester W. Jackson Jr., PhD. (presenter), and Monica Hardin – GC Finance.

- Introduction by Jay Wiggins, stressed the importance of the Shoreline Protection Implementation Plan and the relevance to all stakeholders' jurisdictions: Glynn County, City of Brunswick, Jekyll Island, and Brunswick-Glynn Joint Water and Sewer Commission.
- Attendees introduced themselves – please see above.
- History and background of project, by Kathryn Downs,
 - The need to have a plan in place due to:
 - Hurricanes Matthew and Irma and their impact on southeast Georgia's coast line
 - No other document to assist in case of another event
 - Opportunity to submit a Coastal Incentive Grant to help offset project costs
 - Shoreline Protection Plan aligns with the County's five-year strategic plan
 - Overview of the Project's Year 1 and 2 tasks
 - The need to form a Shoreline Protection Implementation Task Force to develop the plan.
- Housekeeping/Grant overview items done by Monica Hardin
 - Grant funds are federal dollars
 - Grant will help support a consultant to help create the plan for year 1 and 2.
 - Glynn County will follow federal procurement and release the Request for Qualifications soon
 - The Shoreline Implementation Plan is a multi-Jurisdictional project involving Glynn County, City of Brunswick, Jekyll Island and BG Joint Water and Sewer.
 - Grant requires a dollar for dollar match. Project match will be met with in kind labor. Ms. Hardin stressed the need to keep track of time and document with attached labor tacking sheet.

- Presentation by Dr. Chester W. Jackson, Jr. (C.J.), Georgia Southern University. Power Point will be forthcoming. Presentation highlights:
 - Benefits of sand dunes
 - Need to stabilize a dune through vegetation
 - Pros and cons of block barriers
 - Consider doing a Standardized Sand Study for Glynn County (places the importance of placing compatible sand in the area)
 - All data and maps available at the Georgia Coastal Hazards Portal gchp.skiio.usg.edu
 - Project Partners will need to consider the following factors of concern for all three jurisdictions:
 - Tidal inundation
 - Storms
 - Inlet dynamics
 - Human Activity
 - Sea Level Dynamics
- Next Steps, by Monica Hardin
 - The need to release the Request for Qualifications soon
 - Request to have representation from all stakeholders during the selection process of the consultant/firm. Please forward names to Jay Wiggins within the next two weeks.
- Closing Remarks by Jay Wiggins

Meeting start time: 10:06 a.m.

Meeting adjourned at 11:15 a.m.

Meeting minutes respectfully submitted by Monica Hardin



“Shoreline Protection Implementation Plan”

Coastal Incentive Grant (DNR-CRD / NOAA)

Glynn County Project Team / Consultant Kickoff Meeting

August 6, 2019, 10:30 AM – 12:00 PM

Glynn County Pate Building

MEETING NOTES

Attendees: Glynn County (Jay Wiggins, Pamela Thompson, Paul Andrews, Monica Hardin, Kathryn Downs, Alec Eaton), DNR-CRD (Jennifer Kline), GMC (Courtney Reich, Ed DiTommaso, Rob Brown)

I. **Review of Ongoing Work and Previous Meetings Associated with this CIG**

- There has been one meeting with the larger group on January 25th, in which Dr. Chester Jackson (CJ) from Georgia Southern University made a presentation.
 - Monica has sent the meeting summary and stakeholder list, but CJ did not provide a PowerPoint of his presentation.
- There have been 2-3 Project Team level meetings
- There was an initial meeting prior to the grant to discuss goals

II. **Discussion of Project Scope and Roles for County, GMC, and “Shoreline Task Force”**

- GMC walked through the Approach and Methodology sheet from their Proposal. A hard copy was provided to those in attendance.
- The group was on board with the tasks presented and approach. A few points of discussion and suggested changes are listed below:
 - A 6-month extension has officially been requested for the grant, so the end date for Year #1 is officially March 31, 2020.
 - Based on the time of award and contract being signed, the schedule will be more condensed in Year #1 (August 2019 to March 31, 2020 – 8 months).
 - This plan should function as a Beach Management Plan that is FEMA compliant and will make the County eligible for FEMA dollars for mitigation actions. Should also consider Tybee Island’s Beach Management Plan as they have received funding from ACOE and FEMA.
 - For the recommendations listed in this plan, CRD suggested to separate them based on pre-storm vs. post-storm actions as it deals with how the local governments will implement them.
 - The County is currently working with TSW to update their codes. They would prefer that we provide recommendations for code updates and let TSW handle the actual ordinance development and adoption.
 - In Year #2, there is a task for “Building and Zoning Code Review.” Based on a current project by the County, it would be preferred to get these

recommendations in Jan-March timeframe to incorporate in updated codes.

- Public Education Plan
 - The County stated that one activity was needed per year.
 - GMC proposed a Community Survey. There was discussion on how to promote it and whether the Community Task Force would lead and facilitate or if this would be done by GMC. It was added as an agenda item to the afternoon meeting.
 - Other options included: (1) Webpage, (2) participation in CoastFest by having a map where people can dot their erosion locations and have tablets for surveys.
 - Pam is talking to architects and realtor groups in the coming weeks and asked if we can produce a few slides to help staff get the word out about this project.
- Additional Post-Meeting Comment via Email from CRD:
 - This project is important to DNR and we would like to see not only the protection of people but also the preservation of natural resources as a top priority. So, while looking at solutions for vulnerable areas, dune enhancements, living shorelines, and other alternatives should be exhausted first before other hard engineering practices are recommended.

III. Review “Shoreline Task Force” member list

- Current Stakeholders:
 - Glynn County
 - City of Brunswick
 - Jekyll Island Authority
 - DNR-CRD
 - BGJWSC
- Additional Stakeholders to Consider/Add:
 - Sea Island
 - They have a consultant out of SC that helped develop a Sea Level Rise Adaptation Plan.
 - CJ, Georgia Southern / Clarke Alexander, SKIO
 - Consider engaging Jason Evans for student labor
 - Coast Guard
 - Chamber
 - ACOE
 - GPA and Railroads, good stakeholders for year 2.

IV. What are the County's goals for this project/grant?

- This project will serve as a starting point to be more resilient post-disaster and better prepared pre-disaster.
- Part of the purpose is establishing a better management plan for getting reimbursement and funding from FEMA.
- The County currently has a \$2.5 Million "One Georgia Grant" to raise the Johnson Rocks (to 8.5'). County is looking for additional funding to raise the entire structure. Currently only able to fund the area bordering residential properties. Want to do the entire structure and some dune restoration with any remaining funds.
- While the "One Georgia Grant" is strictly for the ocean-facing shoreline, the Coastal Incentive Grant will be to look westward at all interior shorelines and plan for the ocean-facing shoreline.
 - Current approaches are reactionary. An example was provided for work on Beachview Drive.
- The development of a maintenance plan will assist with future budgeting and identifying potential funding sources. A maintenance plan should address the following:
 - Plan should address preservation of dunes and hard approaches.
 - Priority is protecting the uplands.
 - Pre-storm and post-storm considerations.

V. General Action Items/Data Needs

- Jennifer Kline to track down and share input from DRRP exercise where people identified erosion and flooding issues (Hagerty has this information/maps/notes).
- Get a list of existing projects completed by County to address erosion and shoreline change issues (i.e., Beachview Drive near East Beach).
- County GIS has beach profiles, GMC to contact County GIS Department.
- GMC to request data (SLAMM Model) from Mike Robinson/Clark Alexander.
- Dave Austin should have a list of flooding hot spots
- Develop a choke points/hotspots layer in GIS based on public works info.
- Pam already provided County's CRS scoring sheet (*received*).
- County Project Team to discuss with GIS Department to ground truth King Tide this fall with drones (especially for City of Brunswick areas).



“Shoreline Protection Implementation Plan”

Coastal Incentive Grant (DNR-CRD / NOAA)

Shoreline Task Force Meeting

August 6, 2019, 2:00-3:30 PM

Glynn County Pate Building

MEETING NOTES

I. Review Grant/Project Scope, Schedule, and “Shoreline Task Force” Role

- Grant/Project Scope
 - GMC reviewed the scope of work and activities for Year #1 of the Grant (August 2019 to March 31, 2020).
 - Focus of Year #1 is a “Shoreline Assessment and Implementation Resiliency Plan.”
 - Year #2 will explore Sea Level Rise for critical facilities and impacts of sea level rise to create a “Sea Level Rise Response and Implementation Plan.”
- Glynn County’s current activities
 - One Georgia Grant for adding to the Johnson Rocks
 - County is working on a Zoning Ordinance update. GMC will provide “Shore Protection Zone” and Building Code recommended changes for the County’s consideration and use by the County’s consultant during the ordinance update.
- Project Goals
 - Improve access to FEMA money and other funding mechanisms
 - Pre-storm and Post-storm recommendations
 - Maximize CRS points (where possible)
- Shoreline Task Force (those in attendance at today’s meeting)
 - GMC proposed quarterly stakeholder meetings.
 - Role: help guide the planning process and to be a sounding board
 - Discussion of others not present today that should be involved:
 - Georgia Power (current local position is vacant)
 - Okefenokee Co-op (Jay Wiggins has contact)
 - Clarke Alexander (UGA Skidaway) and Chester Jackson (GA Southern)
 - Army Corps
 - Georgia Ports Authority
 - Georgia DOT
 - Cable (Comcast/Xfinity)
 - Telecom
 - Sea Island
 - Golden Isles Convention and Visitors Bureau (Scott McQuade)
- Other areas to focus on and consider:
 - Focus on vulnerable areas, mainly in the coastal flooding zone.

- Altamaha Park is another area to include, as it has some issues with flooding (riverine).
- Information from Georgia Power to see infrastructure they have that's vulnerable?

II. Discussion of Project Goals for Participants

- BGJWSC: System resiliency. Being able to stand up services quick and harden facilities. They have GIS data from CREAT tool of flooding data and a study/report on sea level rise that was created through the DRRP. Lift stations, water facilities, etc. datasets are prioritized, and it looks at vulnerability from sea level rise and storm surge. EPA requires public utilities to complete a self-assessment (VSAT) every 5 years, next is 2021.
- City of Brunswick Engineering & Admin: Infrastructure related, understanding where the vulnerable areas are and how to be better prepared. CRS benefit is a bonus. They can get a list of flooding areas, and they are currently working on mitigation projects (working with program for College Park and property acquisition).
- DNR-CRD: Here to support the project. They facilitate projects through the permitting process, so they can share knowledge from other coastal clients/projects.
- Glynn County Admin: The county has a lot of land impacted land by flooding, shoreline erosion, tides, and sea level rise. They are looking to protect County assets (infrastructure) and develop a more thorough and comprehensive understanding of issues county-wide.
- Glynn County Admin: Understands importance of using this data to help with future planning. Grandchildren have the potential to experience the next century and actually be impacted by current sea level rise projections. Wants a plan that can be used to leverage grant funding to implement projects.
- Glynn County Admin. Disseminate information.
- Glynn County Community Development: This was a major element of the County's Comprehensive Plan workplan. It is good for budgeting for capital projects and updating codes to help mitigate near shorelines.
- Glynn County EMA: The coast of Glynn is one of the biggest natural resources and it should be protected. Looking for ways to mitigate the impacts of storms and avoid property loss.
- Glynn County Engineering: Used as first step to having an ongoing management plan. It will help to guide the CIPs that are far off but important.
- Glynn County GIS: Role is to provide information to support the process. Surveying beaches on SSI since 2008 and they have beach profiles. Jekyll beach surveys since 2014. They also have post-hurricane data on high water marks and king tide data. Most of the data is county-wide.
- Glynn County Public Works: Wants to make sure feasibility and common sense is taken into consideration when making recommendations. There are a few choke points, but they are not currently mapped. At one time the County had a list developed by staff, but maintenance now is so routine that it has not been updated. Can provide a list of known flooding areas.

- Jekyll Island Authority: Want to be good partners in the process and willing to help and share information as needed. They have a lot of data that could be useful (Beach Management Plan and a revetment that is under construction). They have water and sewer that is independent of BGJWSC, and they have identified vulnerable infrastructure feature types for a similar study from the DRRP.

III. Discussion of Online Survey/Community Engagement Process

- Public Outreach
 - Survey – give people the opportunity to provide feedback on erosion areas, flooding hotspots, king tides, etc.
 - Group decided to hold off on survey. Might be value in having survey after assessing all the existing data to see if there are gaps that could be filled with feedback.
 - Plan for booth at CoastFest to educate the public through photos and data (presentation of facts).
 - Setup website for the project, similar to Revetment Project Website to act as a clearinghouse for information <https://glynncounty.org/1989/Revetment-Project>
 - Highlight that this project is looking at areas with shoreline vulnerability and king tide flooding.

IV. Plans for Next Meeting(s) & Data/Information Sharing

- Next Meeting: early November
- GMC or Glynn County will reach out regarding data requests, but if you have anything pertinent to share, please email Rob Brown at rob.brown@gmcnetwork.com



“Shoreline Protection Implementation Plan”

Coastal Incentive Grant (DNR-CRD / NOAA)

Shoreline Task Force Meeting

January 6, 2020, 10:00 -12:00

Glynn County Pate Building, 2nd Floor

Meeting Notes

I. Update on Recent Project Activities – Presentation

- *PowerPoint Slides attached as “ShorelineTaskForceMtg_200106-PPT.pdf”*
- Reviewed progress since previous meeting. General data gathering efforts include:
 - Various GIS Datasets were gathered from County, JIA, City, BGJWSC, and CRD.
 - NOAA Sea Level Rise, Flood Zones, Shoreline Change, SLAMM, Critical Facilities (Structures, Buildings, Lift Stations, etc), and Beach Profiles.
 - Identification of Coastal Erosion, King Tide Flooding, and Sea Level Rise Vulnerabilities
 - A total of 69 projects and issues were identified through field visits and meetings with City, County, and JIA Staff (58 were specific projects and 11 were general projects/problem areas).
 - Spatially, 24 were on St. Simons, 21 on Jekyll Island, 13 in City of Brunswick, and 11 in Mainland Unincorporated Glynn County.
 - 27 locations with King Tide Flooding and Coastal Erosion were identified by the general public at the County’s Coastfest Booth on October 5th. Most were confirmed with local staff.

II. Task Force “Stations”

Detailed notes from each station are on Pages 3-11, brief summary of highlights is listed below.

1. Hot Spots and Vulnerable Areas

- There was a request to define “Hot Spot” in the report
- Nine additional locations were identified as having flooding or erosion concerns, and another 4 locations identified as important areas to protect.
- Locations with only input from the public at Coastfest were reviewed. One was confirmed (Bell Pointe), and one location was removed for erosion

(Gould's Inlet). Gould's Inlet is experiencing accretion and not erosion, likely listed because it is a very dynamic system. The addition of sand has actually made this area now a critical habitat for birds.

2. Background Data (GIS Datasets)

- There were additional datasets suggested to include: damage layer, repetitive loss areas, vulnerable populations, cultural/historical areas
- Cost and feasibility to implement were important factors when prioritizing areas.
- A few items to consider for prioritizing projects included higher levels when it has both flooding and erosion, and higher levels for ocean-facing than inland projects.

3. Management Practice Preference Survey

- There was a general interest in natural practices.
- There was interest in living shorelines, but these have permitting challenges.
- There is cascading effects of a bulkhead in one area because then future development wants to use it. Education is needed.
- There was discussion to mention nearshore shoaling and re-nourishment in this plan to allow for potential use later.

4. General Discussion: Partners/Funding Sources/Grant Opportunities/Permitting Issues

- Glynn County has set aside some funding in the 2020 SPLOST List.
- At least 12 funding sources/grants/foundations were identified.
- Other federal partners include Army Corps of Engineers and FLETC.
- Sea Island and King and Prince were listed as other partners because Sea Island already has a shoreline protection plan in place and anything we do to the shoreline will affect King and Prince.
- Main issues with permitting were length of time and that natural structures were harder to permit than hardened ones.
- For permitting, timelines are important. There were several recommendations to improve permitting process, including a pre-application meeting.

Station 1 – Hot Spots and Vulnerable Areas

General Comments

- Define “Hot Spot” in the report.
- St. Simons Causeway: GDOT is planning to do some mitigation during repaving project this spring (raising areas that are more prone to flooding); not sure of specifics
- The first phase of implementation of the County’s Rock Revetment project is focused on public areas, including beach access points and Neptune Park.

Important Areas to Protect (not already on lists)

- Causeways: Jekyll Island & Sea Island (St. Simons & Riverside Drive already on lists)
- Airport: Jekyll Island (lowest airport in the County ~11 ft)
- Colonel’s Island, where railyard meets, power to Jekyll Island can be cut off here.

Erosion Concerns

- Jekyll Island Causeway: concern due to vegetation removal from Georgia Power Project
- Jekyll Island, corner of Stable Rd and Riverview Dr, streambank lost ~10 ft in recent storms

Flooding Concerns

- Flooding off of the Spur at Venture Drive / Capital Square Drive (by LaQuinta) due to stormwater from this area not being allowed to flow into GDOT system
- There are low elevation houses on the west side of Hwy 17 & 4th Street (Dolphin/Trout/Bream/Pike/Bass).
- End of Crispen Blvd at old Plant McManus (during hurricanes)
- Stormwater backs up into the dorms at FLETC

Review of Projects ID’ed by the Public (Coastfest)

- General flooding concerns on Hwy 17
 - Location at Torras Causeway is already noted, but suggested to add at Lanier Plaza, by Chapel Crossing Road, and just south of Redwood Street (by JPs)
- Belle Point
 - Observed flooding at entrance on north end, at Belle Point Parkway
- Gould’s Inlet
 - There is actually growth of sand (accretion) in this area. It might have been listed by the public because they see this as a very dynamic system. The additional sand has actually created critical habitat for plovers and birds, so the County’s Rock Revetment project in this area has been pushed off to a Phase 2 because of the additional permitting requirements from the new habitat created.

Station 2 – Background Data (GIS)

General Comments:

- The focus on this phase (Year #1) should be on shoreline protection
- Erosion
 - Tends to be more of a short-term problem.
 - Very location specific
 - Easier to address
 - Less costly
- Flooding
 - Flood issues are more difficult to define
 - Has a more severe impact on a larger geographic area
 - Impacts more people
 - Not always related to natural systems. Flooding can be related to issues with infrastructure
 - Can be tidally influenced (might be subject to flooding at high tide, but not at low tide)
 - More costly to address



Datasets that are missing (these additional datasets should be used to assist with prioritizing projects)




- Roads and traffic flow.
- Using Census and parcel data to estimate the number of people impacted by a certain condition
- Using parcel building value data to determine property impacted. Conversely, this can also be used with Census data to identify vulnerable populations
- Add in Repetitive Loss Areas from County and Brunswick CRS programs
- Storm Damage Points layer from County GIS
- Use parcel ownership to identify Board of Education Sites for existing school parcels as well as future site considerations
- Lift Station service areas
- Site of historic and/or cultural significance
- High water marks




Consideration for prioritizing projects




- Higher priority for ocean-facing versus inland projects
- When reviewing critical facilities and infrastructure, need to consider alternatives. Can the infrastructure can be moved, are there alternatives that can address the issues, etc.?
- Higher priority for projects that result in the protection of community interests and/or features versus projects related to private property
- Higher ranking for projects that address both erosion and flooding
- Consider funding and cost as part of the prioritization process
- Consider the feasibility of implementation
- Consider long-term maintenance


Station 3 – Management Practices

Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos
<p>1. Living Shorelines</p> <p>Scale: shoreline Context: coastal; rural to urban</p> <p>Description: bioengineering combined with native vegetation; adjacent to estuarine waters. In Georgia, this typically includes oyster reef creation.</p>	<ul style="list-style-type: none"> • Public acceptance and interest is high. • Allows natural connections between aquatic environment and adjacent upland; preserves tidal exchange; sediment conservation; allows for marsh migration. • Permitting challenges are significant. It is easier to permit bulkheads than living shorelines. • Currently construction is more expensive than bulkheads. • There is a need for high-profile demonstration projects that the public can access. • Projects can be complex. 	 <p>Source: GADNR-CRD</p>
<p>2. Bulkheads / Sea Wall</p> <p>Scale: shoreline Context: coastal; suburban to urban</p> <p>Description: hard armoring of the shoreline. Can often be wood, concrete, or other hard building material. A wall is created at the upland/marsh interface and backfilled to raise upland.</p>	<ul style="list-style-type: none"> • People feel safer, they want a static shoreline. • Hardened shorelines disrupt sediment movement and transport patterns. • Causes erosion on subject and neighboring properties. • Starts a “chain” effect where once one property has a bulkhead, neighboring properties want the same. • Contractors often recommend this solution – education is needed. • Use allowed adjacent to the marsh, i.e. pools and patios, often require a bulkhead and fill. • Are exempted in the Marshland Protection Act, which incentivizes this over other solutions. 	

Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos
<p>3. Rock Revetments & Jetties</p> <p>Scale: shoreline, beach</p> <p>Context: coastal; suburban to urban</p> <p>Description: hard armoring, expensive, designed to absorb wave energy and to reduce erosion. Can disrupt natural sediment transport.</p>	<ul style="list-style-type: none"> • Two major rock revetments: Johnson Rocks and Jekyll Island. • County is proposing an expansion of the kneewall at Neptune Park from the Pier to the Lighthouse as part of SPLOST 2020. • Politically popular because the public can see the solution. • County is primarily interested in maintaining what they have, not building new ones. • Sea Island just installed a jetty at the bottom of the island which will have an impact on sand transport to St. Simons. 	
<p>4. Rip Rap</p> <p>Scale: Shoreline, channels</p> <p>Context: coastal and upland; rural to urban</p> <p>Description: deploying smaller rocks of varying sizes to slow flow and stabilize eroding banks.</p>	<ul style="list-style-type: none"> • Very common technique. • Allows for some natural vegetative growth. • Less expensive option • Used to stabilize Blythe Island 	
<p>5. Temporary Beach Access (w/ Barrier)</p> <p>Scale: shoreline</p> <p>Context: coastal; suburban to urban</p> <p>Description: mechanism to block flow of water through a low-lying beach access point. This involves local stockpiling of materials near the entrance that can be quickly mobilized for the creation of a temporary barrier when a storm or high tide is forecasted.</p>	<ul style="list-style-type: none"> • Only requires a Letter of Permission (LOP) • For emergency flood mitigation during hurricane season. • This requires the availability of beach quality sand. • Public Works was supportive of this option. 	

Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos
<p>6. Constructed Dunes Scale: shoreline Context: coastal; suburban to urban</p> <p>Description: restore dunes and block flow from low-lying beach access points, hardened structure beneath dunes.</p>	<ul style="list-style-type: none"> • Temporary dunes (less than 6 months) require an LOP only. Permanent Dunes must have a SPA permit. • If you are going to go through the trouble of building, they should be permanent. • Proprietary company “Permashield” has contacted the County regarding their product for this purpose. • Pedestrian access can be allowed over the dune, and vehicle access can be too, if designed accordingly. 	
<p>7. Sand / Dune Fencing Scale: shoreline Context: coastal; rural to urban</p> <p>Description: fencing used to force windblown sand to accumulate in a desired place and build up the dune, also used to prevent foot traffic from damaging the dune system</p>	<ul style="list-style-type: none"> • Has already been successfully deployed in Glynn County. • Inexpensive and more natural way to build dunes, but the timeframe for a mature dune is much longer. • It is an effective way of keeping foot traffic out of the dunes. • It is politically popular as a measure. 	
<p>8. Beach Renourishment Scale: shoreline Context: coastal; suburban to urban</p> <p>Description: process by which sand lost through erosion is replaced from other sources, typically a repetitive process because it does not remove the physical forces but mitigates their effects</p>	<ul style="list-style-type: none"> • Glynn County attempted to permit a beach renourishment project in the 1990s, and it was met with a lot of resistance. • It is likely that this would still be publicly unpopular. The County could conduct a survey to gauge public acceptance. • Glynn County is missing out on an opportunity to participate in the ACOE Sand Sharing project because no projects are identified. • There are eroding beaches on Jekyll and St. Simons Island. 	 <p>Source: WTOC 11</p>

Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos
<p>9. Nearshore Placement <i>Scale:</i> shoreline <i>Context:</i> coastal; suburban to urban</p> <p><i>Description:</i> placement of sand near-shore, but not directly on the beach to buffer wave energy and to allow natural shoaling processes to deposit additional sand and build the beach.</p>	<ul style="list-style-type: none"> • This option may have more public acceptance as it mimics natural processes. • There is interest in modeling this BMP to determine where it would be appropriate. • Has already been successful on Ft. Pulaski which is subject to erosion from shipping channel waves. • Was also used on Tybee Island as part of their Beach Management Plan. 	
<p>10. Land Preservation <i>Scale:</i> landscape, watershed, community, shoreline <i>Context:</i> coastal and upland; rural to urban</p> <p><i>Practices:</i> natural land and open space preservation, conservation easements, establishing parks and greenways</p>	<ul style="list-style-type: none"> • This is popular but an expensive option. • The County should prioritize preservation of natural lands that will allow for marsh migration as sea levels rise. • The Nature Conservancy’s SLAMM model data that identifies marsh migration potential could be used to identify areas the County can target for conservation. • Provides a lot of CRS credit. 	
<p>11. Green Stormwater Infrastructure <i>Scale:</i> community, site <i>Context:</i> coastal and upland; suburban to urban</p> <p><i>Practices:</i> bioretention, bioswales, rain gardens, permeable pavement, stormwater planters</p>	<ul style="list-style-type: none"> • This is becoming a popular option. There are active projects already in the County, on Jekyll and in Brunswick. • Maintenance is challenging. • Public acceptance is high. • Promotes infiltration and water quality treatment, reduces impervious surfaces and stormwater runoff, provides ecological services. 	

Description	Issues & Opportunities (Input from Shoreline Task Force)	Photos
<p>12. Streambank Stabilization <i>Scale:</i> community, site <i>Context:</i> coastal and upland; suburban to urban</p> <p><i>Practices:</i> Geo-textiles, staking, log structures, rip rap, stone structures.</p>	<ul style="list-style-type: none"> • More pleasing “natural” look. • Can often use on-site materials. • Designed for habitat. • County is interested in this option. • Maintenance is an issue because private property owners often resist vegetation in ditches. There is the misconception that the vegetation slows flow, causes flooding and harbors snakes and mosquitos. • Education is needed. • Permitting may be an issue where this is used to stabilize natural channels. • Jekyll Island completed a project using Filtrex (picture to right). 	
<p>13. Policy Changes <i>Scale:</i> community <i>Context:</i> planning & development</p> <p><i>Practices:</i> Shoreline Protection Act, Permitting, Buffers</p>	<ul style="list-style-type: none"> • Create buffers around land use • Address permitting difficulties with Living Shoreline and the inherent “incentive” the MPA exemption for bulkheads creates. Consider creation of a “Nationwide”- type permit for Living Shorelines. • Address conflicts between SPA jurisdictional line determination and the Glynn County Shoreline Protection ordinance. • Review uses allowed in the County Shoreline Protection buffer to see if they are appropriate. 	

Station 4 – General Discussion

Additional funding sources/grants:

- Glynn County has set aside “some” funds for implementation in the 2020 SPLOST
- CDBG-DR; CDBG to entitled communities; CDBG to non-entitled communities
- 319(h) Grant through DNR-EPD (U.S. EPA)
- Coastal Incentive Grant through DNR-CRD (NOAA)
- Army Corps of Engineers might have some additional funds/grant opportunities
- National Fish and Wildlife Foundation
- Communities of Coastal Georgia Foundation
- FEMA Public Assistance after a storm
- FEMA BRICK Program, created to assist with resiliency (program is still underway with FEMA)
- NOAA funding to assist with resiliency
- Include the private sector to fund part of project(s)
- Creation of a Tax Allocation District (TAD) to fund part of the project
- National League of Cities

Other partners not at the table:

- Army Corps of Engineers
- FLETC – they might have additional funding sources available and if not, at least they should be involved in the conversations since they are heavily involved in re-entry and recovery processes
- Private organizations and/or businesses
- Pinova
- King and Prince Hotel – shoreline projects/activities will have a direct impact on them.
- Sea Island – They already have a shoreline protection plan in place; the intent is to have their plan reflect our goals and objectives.
- Tybee Island because they have been through some of these processes
- Invite members of heavily flooded neighborhoods or representatives from HOA’s
- Conservation groups
- One Hundred Miles

Issues with permitting:

- It is easier to permit a project with hardened structures than natural structures (e.g., living shorelines).
 - Living shoreline permitting is by far more difficult than hardened permitting.
- Length of time for permitting
 - The internal process is too long
 - Federal permitting is long and tedious
 - DNR Committee’s process is too long, and at times, it can hold up the process for a very long time.

- Other issues:
 - Shoreline Protection local Committee was mentioned as a primary issue.
 - Communication issues between multiple agencies (Army Corp, NOAA and DNR)
 - Timelines – having projects in a plan but not mapping out the timing of the permitting and making sure that if any “construction” is not scheduled during any nesting season or otherwise related.
- Comments from DNR permitting representative
 - Timing depends on the size of the project. Anything under 0.1 acre, the permit does not have to go to the DNR local Committee, whereas, anything above that, it will need to go to the committee and abide or follow whatever requirements or condition they impose.
 - Suggested to make note of the changes to the Marshland Protection Act that became effective January 1, 2020.

Recommendations:

- Expand the state’s permitting process and not rely so much on the Committee
- Setup a pre-application permitting meeting with DNR. This will allow for timely feedback from DNR staff and possible suggestions to ease the process
- Early in the process, list all projects with related timelines. During the creation of this list, make sure to include all permitting requirements, agencies and time restrictions.
- Map out potential supplies and vendors with a related timeline (from making the order, receiving the supplies, to paying out the vendors, etc.).



“Shoreline Protection Implementation Plan”

Coastal Incentive Grant (DNR-CRD / NOAA)

Shoreline Task Force Meeting

February 28, 2020, 10:00 AM

Glynn County Pate Building, 2nd Floor (1725 Reynolds Street, Brunswick)

Meeting Summary

- I. Matrix to Rank/Prioritize Individual Projects
 - There was a question regarding the use of CJ’s data to look at erosion rates since it predates the two hurricanes. GMC address this issue by visiting all identified projects in the field with staff to visually confirm the presence of erosion.
 - There was concern regarding the use of coastal marshlands in the sensitive habitat criteria because it is likely that most erosion is happening in marsh areas since they boarder the water. GMC will remove coastal marshlands from this ranking criteria and just use turtle/piping plover habitat and freshwater wetlands from the NWI database. There was a request that GMC also use maritime forest as a vulnerable habitat. If a participating project partner can provide that data in GIS format, then that will be included too.

- II. Presentation of Matrix on Countywide-Scale using GIS to identify vulnerable shoreline segments.
 - There was a question regarding Sea Island’s participation in this project, and Glynn County provided Sea Island’s Beach Management Plan to GMC staff.

- III. Example Beach Profile Data
 - GMC presented the Glynn County beach profiles that have been analyzed, and also showed an example from Folly Beach, SC.
 - GMC made recommendation for ways that Glynn County GIS, if the resources are available to them, could make data collection and analysis of the beach profiles easier in the future.

- IV. Discussion of Next Steps
 - Report: “Shoreline Assessment and Implementation Resiliency Plan” will be completed in draft by the 3/30/20 deadline, but the final version must be completed by April 15, 2020. A draft of this plan will also be provided for review to the partners for their review and edits, prior to being finalized.

- Joint Presentation (City, County, JIA), March 17th
 - Important items to communicate include:
 - No action will be taken at this meeting
 - It is a working plan and a working project list, so it will be amended and edited in the future.
 - All projects are included, even those that are not priorities so that if funding does become available at some point in the future, that project will be eligible.
 - This presentation should focus on the background of the project and the process to get to where we are now.
 - Pam will introduce the plan and project, but Rob will create those slides for her. Rob & Courtney will then run through our process and answer questions.
 - Action items
 - Rob will meet with each partner to review the matrix and the projects that are included.
 - Rob will put a power point together and provide it to the partners for their review.
 - Rob will provide an updated project list to the County so it can be distributed to the elected and appointed officials prior to the meeting.
 - Rob will complete a draft of the plan prior to March 30, 2020 and provide it to the partners for their review.



“Shoreline Protection Implementation Plan”

Coastal Incentive Grant (DNR-CRD / NOAA)

Shoreline Task Force Meeting

August 28, 2020, 10:00-10:30 AM

via video through Microsoft Teams (19 individuals present)

MEETING NOTES

- I. *General grant administration housekeeping (e.g., timesheets)*
 - Please send your timesheets with any time spent on this project to Monica Hardin (mhardin@glynncounty-ga.gov).

- II. *Summary of general updates from comments on Draft Plan:*
 - Tables 4.2 to 4.5 – Project List
 - Sorted list from Near-Term to Long-Term
 - Sea Turtles
 - Updated end of Loggerhead Turtle nesting season to Oct 31st (previously listed as 15th and 31st)
 - Added more details on Georgia Sea Turtle Center and the practices and research on sea turtles on Jekyll Island
 - “Table 5.1: Water Access in Glynn County” – Ownership Questions/Updates
 - Changed column listing ownership to jurisdiction location since there were some ownership questions from data source
 - Jekyll Island
 - Updated details on original Johnson Rocks construction on Jekyll Island – continued into the 1970s.
 - *Will plan to update Jekyll Island Beach Access list and details when received*
 - Other
 - Added Executive Summary & Section 6 (Summary and Recommendations)
 - Updated proper naming conventions for St. Simons Island and Jekyll Island vs. JIA
 - Corrected a few grammatical items or missing words
 - In the “Introduction” section, it noted sea level rise was predicted to be 1 m by 2100, which is low end of spectrum. This was language from the original grant application. The reference to a specific depth was removed as the context is that future hurricanes with sea level rise will have greater impacts. The scenario to use will be a topic in the 2nd Phase of the project.
 - Section 5.1 – deleted sentence referencing boating safety zone as it only applies seasonally (reference to ordinance still noted in Section 5.4.2).
 - Updated date for Sea Island re-nourishment to summer 2020.
 - When describing that neither Jekyll Island nor St. Simons Island has ever undergone beach re-nourishment, changed this to “has never undergone engineered sand nourishment” because neither has even been nourished.

- Added a short description for South Atlantic Coastal Study in Section 5.7.
- Updated planned adoption date of Coastal Stormwater Supplement in City and County Stormwater Ordinances as December 2020 (per NPDES MS4 Permit requirement)

III. *Schedule/Timeline to complete Phase #1 of grant:*

- Sept 1st: Updated Draft sent to Task Force
- Sept 4th: Any remaining comments due
- Sept 8th: Final Draft will be sent to City/County/JIA
- Presentations to Councils/Commissions in September
 - Target is 15 minutes (*slightly shortened version from copy already reviewed for presentation planned for March 17th – copies of these presentations will be sent for review the week of August 31st*).
 - Scheduled Presentation Timeslots
 - Glynn County – Sept 15th 2PM (Work Session) & 17th 6PM (Commission Mtg)
 - City of Brunswick – Sept 16th, 6PM
 - City Manager sent GMC form to fill out for presentation
 - Jekyll Island Authority – next meeting is Sept 15th, but the agenda is getting full – will look to see if it can be added.
 - *Note: Grant period ends on September 30th, so match can only be counted for meetings/presentations held in September.*

IV. *Year #2 – Sea Level Rise Response & Implementation Plan:*

- Review Phase #2 Schedule
 - Each organization expressed that they would be comfortable meeting in person if we are following proper social distancing protocols. The space available at the Brunswick Library seems suitable for sufficient space and distancing.
 - Kickoff Meeting to be scheduled in early October – look out for Doodle Poll to select date
- Glynn County planning to accept the Plan from Year #1 (1st Phase) now, and adopt and update the DRRP after Year #2 (2nd Phase)
 - Jennifer recommended to Alec to update RSF-6 in the intermediate time, so that it can be included in the next DRRP update
- CRD has 1-m & 2-m Sea Level Rise scenarios and suggested GMC to reach out to access those data
- CRD also suggested to review BGJWSC's Climate Resilience Adaptation Report when looking at public facilities, as well as the DRRP RSF's #1, #5 & #6.
- Although outside of the grant period, the Georgia Climate Conference is April 28/29 at the Jekyll Convention Center, and Jennifer requested Kathryn to make a presentation if she is available.

Appendix E – Beach Management Resources

This section includes various beach management resources used in the Beach Management Plan for Tybee Island, and some of the guidance is specifically from Georgia DNR. The various sections of Appendix E are described below:

- E.1. Scrub-Shrub Trimming Guidelines for Areas Within Georgia Shore Protection Act Jurisdiction, pg 119-121
- E.2. Georgia DNR Guidance on Maintaining and Establishing Dune Paths, pg 122
- E.3. Georgia DNR Sand Fence Guidelines, pg 123-124

E.1. Scrub-Shrub Trimming Guidelines for Areas Within Georgia Shore Protection Act Jurisdiction

Source: Tybee Island Beach Management Plan, 2014

The goal of this proposal is to summarize data from numerous sources and to propose guidelines for granting Georgia Department of Natural Resources Shore Protection Act Permits for vegetation trimming or landscaping within State Shore Jurisdiction areas. Though derived from the known habitat needs of the Painted bunting (*Passerina ciris*), a species of concern in Georgia, these guidelines are intended to apply to all scrub-shrub habitats within Shore Protection Act jurisdiction. Successful management of habitat requires the protection of existing habitat. Breeding habitat loss is generally considered to be the greatest threat to the painted bunting species (Muehter 1998, Lowther et al. 1999). A major concern for Atlantic coast populations of painted buntings is the transformation of valuable wetland and scrub-shrub habitats into intensive residential development. This is especially well documented along the Atlantic coast. Current management practices can be modified or initiated to enhance the population of this declining species. The goal of this plan is to identify:

- Habitat Management Goals specific to each site
- Habitat Management Considerations to be identified for each site
- Planning Tools to be utilized in Habitat Management

Habitat Management Goals:

Along the coast, natural beach dunes and scrub-shrub and grassy habitat are maintained by storms, salt spray, and drought. In developed areas near coastal marshes, habitat should be maintained as naturally as possible, with special attention paid to the grass to shrub ratio found so that it emulated the same ratio found in naturally occurring open savannah-like forests. Mowed lawns are not conducive to the painted bunting, and in critical habitat areas, should be discouraged. Wetlands, even those less than ½ acres in size, should be protected as important feeding areas for nesting buntings and their young (Meyers 1999).

Active management may enhance nesting habitat. The maintenance of scrub-shrub grasslands in transition areas such as beach dune habitats is critical. Areas that are vegetated primarily with waxed myrtle (*Myrica cerifera*), rattan vine (*Berchemia scandens*) as well as native muhly grass (*Muhlenbergia filipes*) provide for painted bunting and other bird species nesting and feeding habitat. Painted buntings use some areas if grasses and scrub-shrub habitat are allowed to cover the area for four to five years and have successfully produced young in this habitat in coastal Georgia (Meyers 1999).

Habitat Management Considerations:

Known breeding habitat for the eastern populations of painted bunting must maintain early to mid-succession vegetation, with an emphasis on retaining a mix of open and wooded or shrubby

components. In the southeast, protecting beach scrub-shrub and coastal wetland habitats is important, not just for painted bunting habitat but for a wide variety of bird species known to utilize this habitat year-round and is best accomplished by being left alone (Sykes 2004).

Ideally, nesting habitat could be enhanced by using a template modeled after successful nesting habitat on other barrier islands such as Nanny Goat Beach, Sapelo Island. The template could be designed using aerial photographs of Nanny Goat Beach to roughly establish a ratio of grassland to scrub-shrub that is present in known nesting habitat. An overlay would create habitat that is approximately 50% grasses and 50% scrub-shrub.

On developed barrier islands, a dense shrub perimeter no less than 25' along adjacent property lines would be maintained to afford protection to the emergent grassland habitat within the proposed cutting area. The objective would be to incorporate view shed corridors for adjacent properties when identifying selected areas of *Myrica cerifera* to be removed. A proposal could include the selective removal of *Myrica cerifera* followed by monitoring for the natural succession of *Muhlenbergia filipes*, *Berchemia scandens* and *Sageretia minutiflora*. Additionally, the removal of known invasive species such as Chinese tallow (*Sapium sebiferum*) should be a mandatory component of any proposed vegetation plan.

Additionally, in an effort to enhance the value of the habitat, feral cats should be trapped in a humane manner and be permanently removed from the area.

Planning Tools:

Using aerial photographs and detailed surveys of specific locations, templates could be designed to emulate known nesting habitat while considering view shed corridors for adjacent property owners. The plan would emphasize cutting a pattern that simulated the heterogeneous clumps of shrubs as seen on Sapelo's Nannygoat beach. Long straight lines of shrubs would not be recommended, because predator search patterns focus on and easily follow this type of edge habitat. Clumps of heterogeneously spaced shrubs cannot be searched as easily by predators. A customized plan would identify specific stands of *Myrica cerifera* for removal through selective cutting and the minimal application of localized herbicide. Early March is the best time to maintain grassy areas. Mowing of grassy areas should be conducted no more frequently than every other year.

Bibliography and References:

Lanyon, S.M., and C.F. Thompson. 1986. Site fidelity and habitat quality as determinants of settlement pattern in male painted buntings. *Condor* 88:206-210.

Meyers, J.M. 1999. Effects of landscape changes on the Painted /Bunting populations in the southeastern United States from 1966-1996 (progress report). US Geological Survey, Biological Resources Division, Reston, VA.

Meyers, J.M., D.H. White, and C.B. Kepler. 1999. Habitat selection, productivity and survival of scrub-shrub neotropical migratory birds in the southeastern United States (progress report). US Geological Survey, Biological Resources Division, Reston, VA

Muehter, V.R. 1998. WatchList Website, National Audubon Society, Version 97.12. Online.

Available: <http://cristel.nal.usda.gov>. Nature Conservancy 2002, Species Management abstract for Painted Bunting; Online. Available: <http://www.pwrc.usgs.gov/pabu/h/weknow.html>.

Sauer, J.R., J.E. Hines, G. Gough, I. Thomas, And B.G. Peterjohn. 1997. The North American Breeding Bird Survey Results and Analysis. Version 96.3 Online. Patuxent Wildlife Research Center, Laurel, MD. Available: <http://www.mbr.nbs.gov/bbs/bbs.html>.

Sykes, P.W., Jr., and J.M. Meyers. 1999. Annual survival in the southeastern coastal breeding population of the Painted Bunting (progress report). US Geological Survey, Biological Resources Division, Reston, VA. URL=<http://cristel.nal.usda.gov>.

E.2. Georgia DNR Guidance on Maintaining and Establishing Dune Paths

The Department of Natural Resources Coastal Resources Division may allow the use of a path through the state's jurisdiction under the Shore Protection Act. O.C.G.A. 12-5-230 et. Seq. The purpose of a path is to provide pedestrian access through the vegetated dune area of the dry sand beach in areas of low traffic where public access does not exist and the functionality of the dune system will not be degraded. The dune area is a fragile and important habitat for many birds and other wildlife. A path may be recommended instead of a crossover through areas with thick vegetative growth and presence of wildlife. The path should meander through the vegetation avoiding significant trees and habitat and allowing for the growth of a canopy over the path and is generally approvable if not greater than 3 feet wide and 7 feet high.

The Department requires that paths be maintained using hand tools only. No heavy equipment may be used. No vehicular access is authorized. The Department requires that staff be on site to flag the footprint of the path before maintenance begins.

No alterations of the location or dimensions of the path may be done without prior approval from the state. You must use all appropriate best management practices to protect the habitat and dune system. All debris must be removed from jurisdictional areas. Any incidental impacts associated with projects must be rectified by fully restoring areas to their preconstruction topographic and vegetative states. If sand is needed to restore the project site, it must be of beach quality obtained from an upland source rather than from the beach or dune system. You may be required to demonstrate proof of upland sand acquisition.

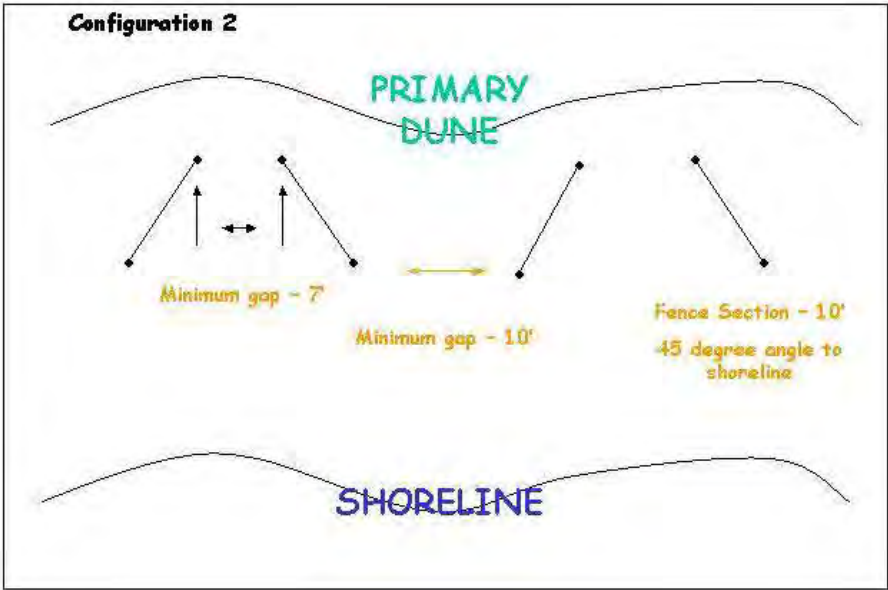
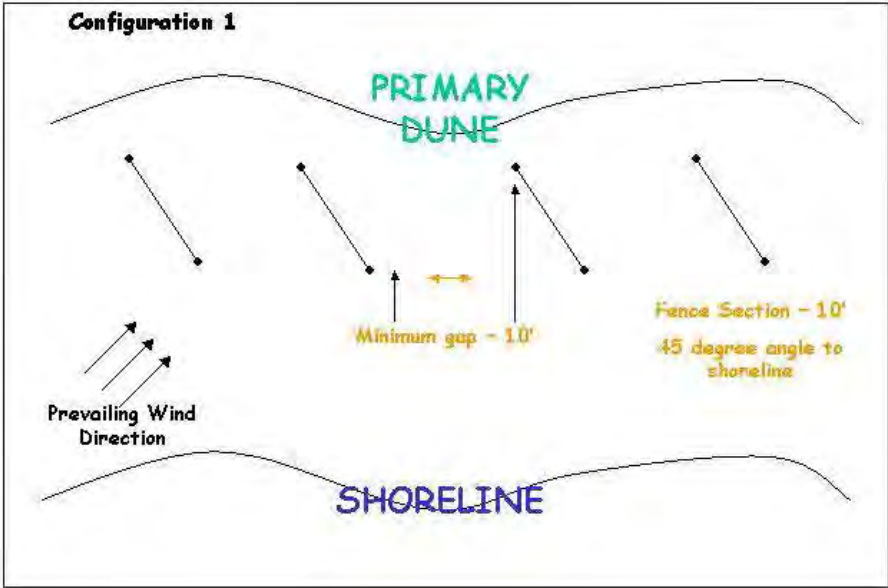
The Department must be notified prior to planning a dune path. Once staff has met on-site to assess the request, a Letter of Permission (LOP) may be issued outlining specifications. Each project must comply with all other Federal, State, and local statutes, ordinances and regulations.

E.3. Georgia DNR Sand Fence Guidelines

Sand fencing is used extensively along the Atlantic Coast to build and stabilize dune fields and control human access to the beach. Unfortunately, some sand fence configurations have been shown to restrict or inhibit sea turtle nesting. The **Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia** (II, B, 2, C) stipulates that “fencing must be placed so as not to deter turtles’ access to nesting areas, and arranged to prevent trapping nesting turtles”. The following sand fence guidelines are designed to provide good dune building and stabilization performance, while minimizing impacts to sea turtles. Standard sand fencing consists of 4’ wooden slats wired together with spaces between the slats. Woven fabric type fencing has also been successfully used in dune restoration projects. However, it is important that fabric fencing have a 40% to 60% open to closed space ratio to be effective. Fabric fencing is susceptible to ultraviolet degradation causing it to sag and lose its original shape. With sufficient maintenance, this problem may be avoided.

Guidelines for Sand Fence Placement:





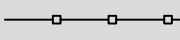
1. Installation and repositioning of sand fences shall be conducted outside the marine turtle nesting season (May 1 – October 31) unless approved by the USFWS or GADNR Nongame-Endangered Wildlife Program.
2. Sand fence shall be installed in a temporary manner in accordance with the attached conceptual drawing. Configuration 1 consists of 10-foot sections of fence spaced at a minimum of 10 feet on a diagonal alignment to the shoreline (facing the prevailing wind). Configuration 2 consists of two 10-foot sections placed in an “open V” shape with the wider end facing the shoreline. Minimum space between ends of the “V” is 10 feet, and minimum width between the close ends of the “V” is 7 feet. For both configurations, the approximate angle of the fence to the shoreline is 45 degrees.
3. Sand Fence shall not be placed in the inter-tidal zone. Sand Fence must be placed above the highest spring high tide line, preferably adjacent to the primary dune.
4. Sand Fence shall not be placed within 7’ of a beach scarp.
5. Sand Fence shall not be placed in front of an existing fence until the existing fence is completely buried.
6. Sand fences shall not be placed to control pedestrian traffic seaward of the secondary dunes. A post and rope fence may be used to restrict pedestrian access without impacting nesting marine turtles.
7. If fence material is damaged, debris must be removed from the beach area by the owner in an expeditious manner.



Appendix F – Plans for “Johnson Rocks” Rehabilitation on St. Simons Island

This appendix contains two plan sheets for the “Johnson Rocks” rehabilitation project. The first page depicts the full design for all five phases. The second page presents the scope for Phase 1 only, which will be completed as part of the One Georgia grant.

LEGEND

-  PHASE 1 - REVETMENT FRONTING PUBLIC PROPERTY ONLY
-  PHASE 2 - GOULDS INLET (PUBLIC PROPERTY)
-  PHASE 3 - REVETMENT ON PUBLIC PROPERTY FRONTING PRIVATE PROPERTY
-  PHASE 4 - REVETMENT ON PRIVATE PROPERTY
-  PHASE 5 - SAND FENCING

**PHASE 2
GOULDS INLET
PARKING AREA**
~490'

**PHASE 5
SAND FENCING FROM COAST GUARD
BEACH ACCESS TO MASSENGALE PARK**
~2,510'

**PHASES 1, 3, & 4
MASSENGALE PARK TO GOULD STREET**
~9,280'



**ST. SIMONS
SOUND**

NWP3 DRAWING EXHIBITS

<p>Project Name: St. Simons Revetment Maintenance Latitude: 31° 8'2.55"N</p> <p>Waterbody: Atlantic Ocean Longitude: 81°23'48.16"W</p> <p>County: Glynn Applicant: Glynn County</p> <p>State: Georgia Agent: Applied Technology & Management</p>	<p><u>PROJECT OVERVIEW</u></p>	<p>Revision:</p> <p>Date: April 1, 2019</p>
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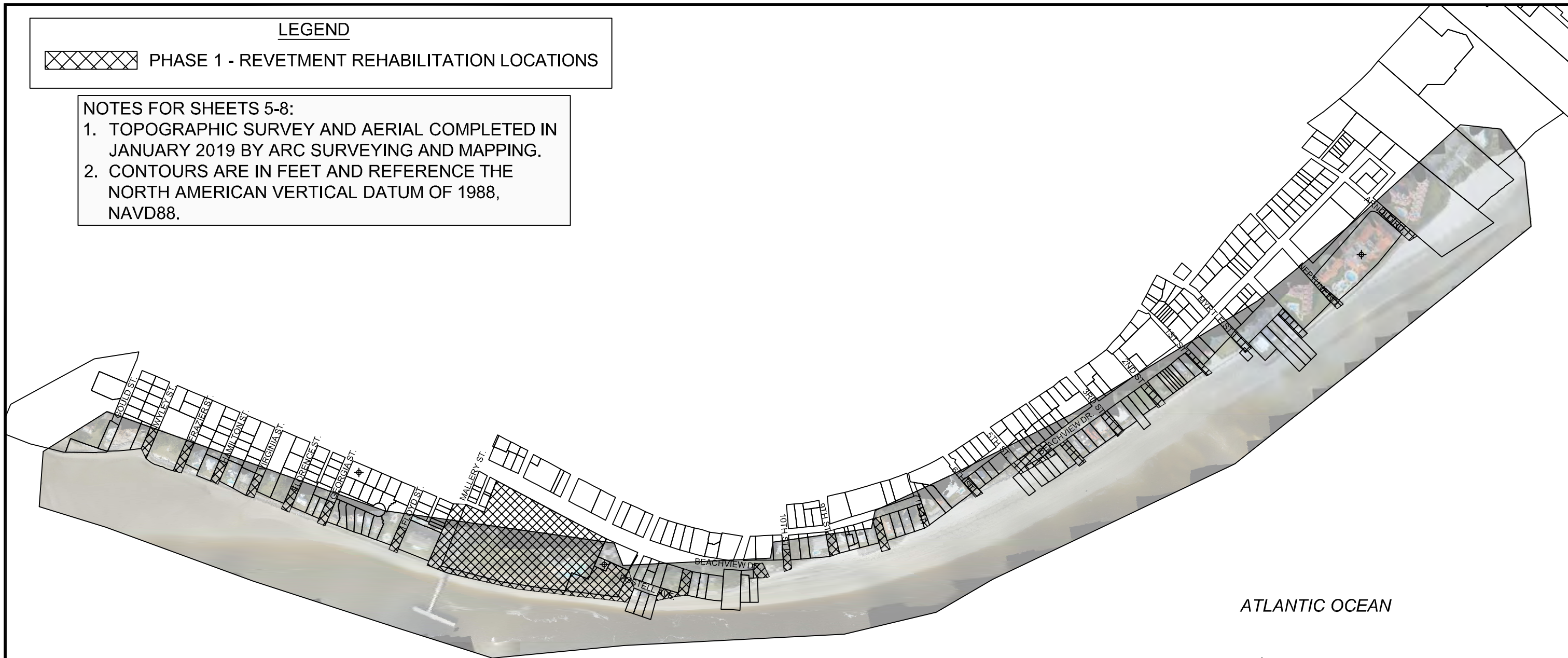


LEGEND

☒ PHASE 1 - REVETMENT REHABILITATION LOCATIONS

NOTES FOR SHEETS 5-8:

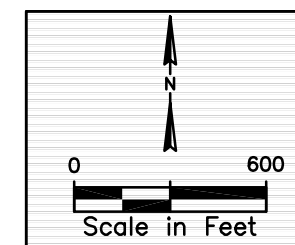
1. TOPOGRAPHIC SURVEY AND AERIAL COMPLETED IN JANUARY 2019 BY ARC SURVEYING AND MAPPING.
2. CONTOURS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988, NAVD88.



PHASE 1
 REVETMENT FRONTING PUBLIC PROPERTY ONLY
 (~2,695 LINEAR FEET OF REVETMENT REHABILITATION,
 ~5,200 TONS OF ROCK REQUIRED)

ST. SIMONS
 SOUND

ATLANTIC OCEAN



NWP3 DRAWING EXHIBITS

Project Name: St. Simons Revetment Maintenance
 Waterbody: Atlantic Ocean
 County: Glynn
 State: Georgia

Latitude: 31° 8'2.55"N
 Longitude: 81°23'48.16"W
 Applicant: Glynn County
 Agent: Applied Technology & Management

PHASE 1 OVERVIEW

Revision:
 Date: April 1, 2019



SHORELINE ASSESSMENT & IMPLEMENTATION RESILIENCY PLAN

Glynn County
Board of Commissioners
Work Session

Rob Brown, Ph.D., P.E.
Goodwyn Mills & Cawood

September 15, 2020

ACKNOWLEDGEMENT

GMC

- *This report was prepared by Glynn County under grant award #NA18NOS4190146 to the Georgia Department of Natural Resources from the Office for Coastal Management, National Oceanic and Atmospheric Administration. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of DNR, OCM or NOAA.*



TIMELINE OF EVENTS: HISTORY



Hurricane
Matthew

Hurricane
Irma



Source: The Florida-Georgia Star

2016

2017

2018

2019

2020

2021

2022

Source: Brunswick Public Works Dept.



TIMELINE OF EVENTS: GRANT BACKGROUND



Hurricane
Matthew

Hurricane
Irma

- Opportunity to submit a CIG to DNR-CRD to develop a Shoreline Protection Plan to address problem areas before the next major storm
- Shoreline Protection Plan aligns with County's 5-year Strategic Plan

2016

2017

2018

2019

2020

2021

2022

Coastal Incentive
Grant (CIG)
Application Period

COASTAL INCENTIVE GRANT OVERVIEW



1. “Shoreline Assessment & Implementation Resiliency Plan”

–Objectives:

- Gather shoreline related data (beaches, marshes, and rivers)
- Evaluate exposed shoreline to determine vulnerability
- Explore preventative measures and remediation solutions
 - Emphasis on minimal armoring, but to include beach sand control alternatives
 - Consider regulation of shoreline development; ordinance review



2. “Sea Level Rise Response and Implementation Plan”

PROJECT PARTNERS & TASK FORCE PARTICIPANTS



• Grantee:



Glynn County
GEORGIA

• Other Task Force Members:



• Project Partners:

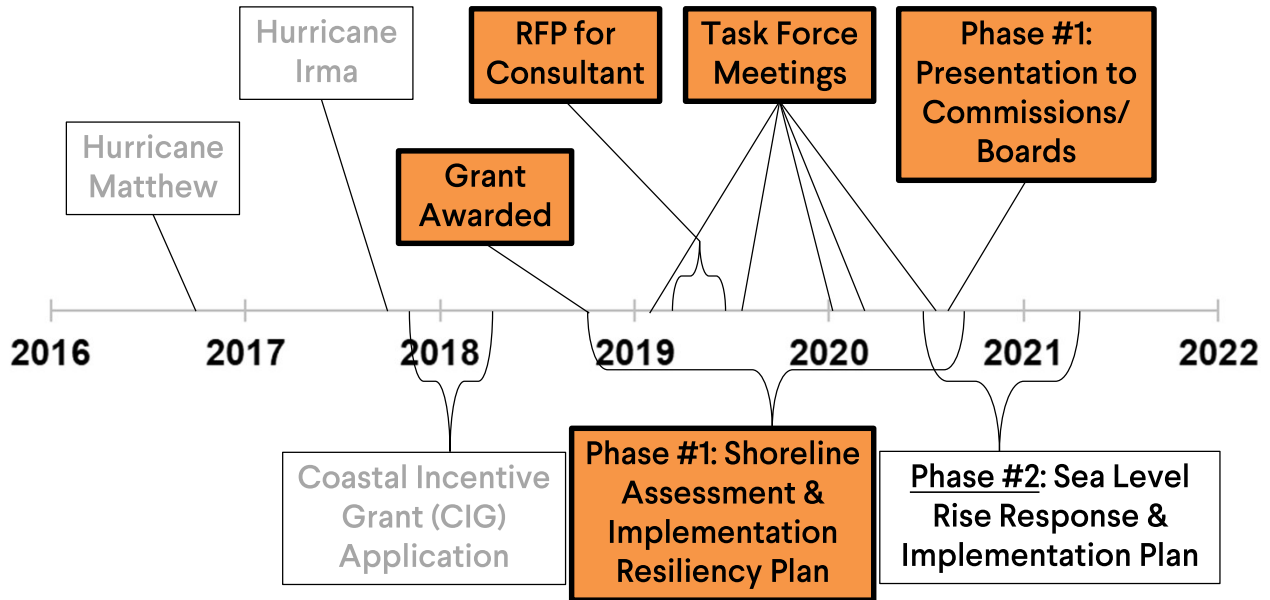


• Consultant:

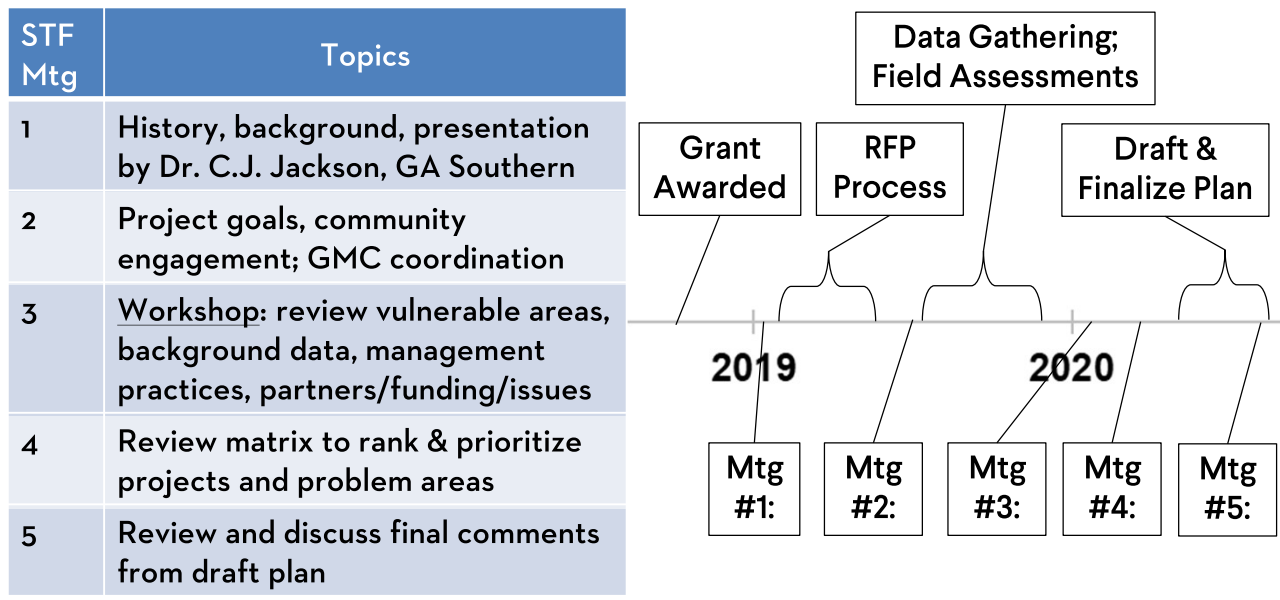


Goodwyn Mills Cawood

TIMELINE OF EVENTS: PHASE #1



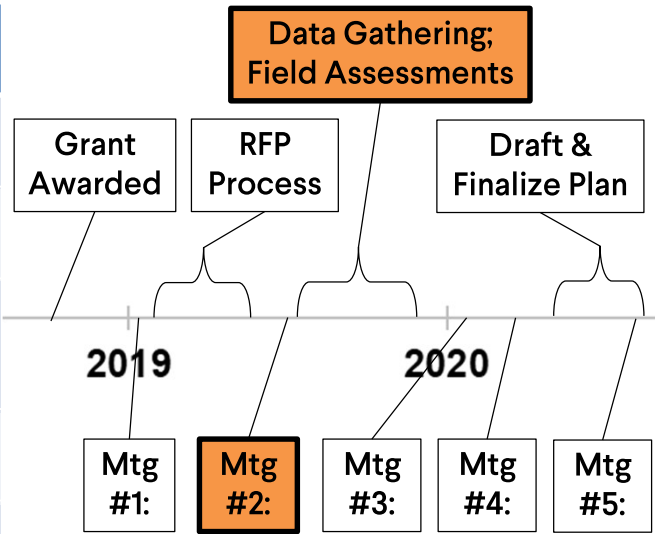
PHASE #1 TIMELINE: SHORELINE TASK FORCE (STF) MEETINGS



PHASE #1 TIMELINE: SHORELINE TASK FORCE (STF) MEETINGS



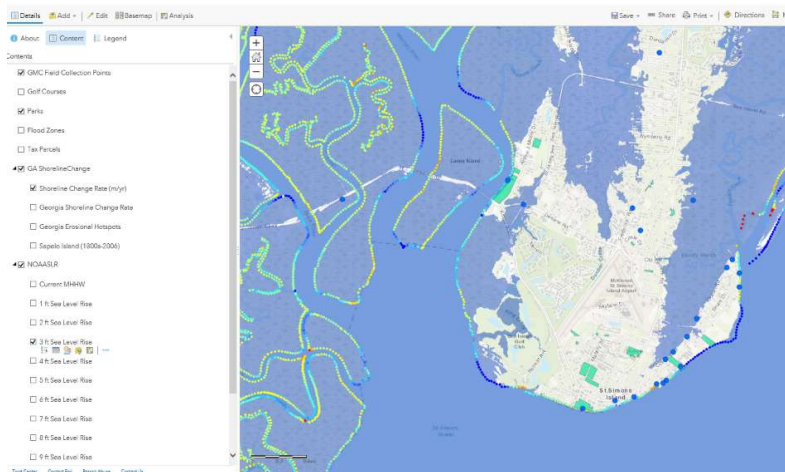
STF Mtg	Topics
1	History, background, presentation by Dr. C.J. Jackson, GA Southern
2	Project goals, community engagement; GMC coordination
3	Workshop: review vulnerable areas, background data, management practices, partners/funding/issues
4	Review matrix to rank & prioritize projects and problem areas
5	Review and discuss final comments from draft plan



GIS DATASETS



- Data Sources: County, JIA, City, BGJWSC, CRD, GA Southern
- NOAA Sea Level Rise
- Flood Zones
- Shoreline Change
- SLAMM
- Critical Facilities
- Beach Profiles
- Potential Projects



COMMUNITY ENGAGEMENT: COASTFEST BOOTH (10/5/2019)



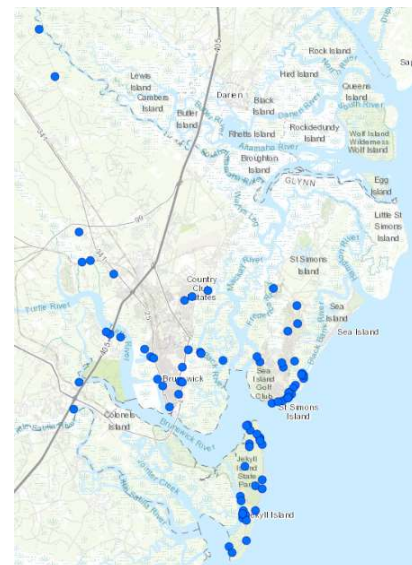
- Public Input for areas with
 - Coastal Erosion
 - King Tide Flooding
- 27 locations identified
 - Many were confirmed with local staff



FIELD VISITS WITH LOCAL STAFF (JIA, CITY, & COUNTY)



- Field visits and meetings to identify:
 - Coastal erosion
 - King Tide / flood prone areas
 - Vulnerable areas
- Information Collected
 - Issue (flooding, erosion, both)
 - Primary/Secondary Threat
 - General description and detailed comments



FIELD VISITS WITH LOCAL STAFF (Example Erosion Photos)



OTHER ACTIVITIES: Environmental Academy Presentation (10/8/2019)



- House & Senate Natural Resources & Environment Committees

–Academy was facilitated by Carl Vinson Institute of Government

- Kathryn Downs & Rob Brown presented the project description, progress and planned activities

–Better informed for 2020 Legislative Session



House of Representatives
State Senate

LYNN W. SMITH
REPRESENTATIVE, DISTRICT 73
225 State Capitol
Atlanta, GA 30333
Phone: 404/457-7148
E-MAIL: lynn.smith@house.ga.gov

TYLER HARPER
SENATOR, DISTRICT 7
301-D Capitol Building (7th Floor)
Atlanta, GA 30333
Phone: 404/457-5300
E-MAIL: tyler.harper@senate.ga.gov

November 6, 2019

Rob Brown, Ph.D., P.E.
Senior Water Resources Engineer, Brunswick Office Manager
GMC
Via Email: rob.brown@gmnetwork.com

Dear Dr. Brown (Rob):

On behalf of the House and Senate Natural Resources & Environment Committees, please accept our sincere appreciation for your contributions of the Environmental Academy held on the Georgia coast and facilitated by the Carl Vinson Institute of Government.

The information provided was very interesting and informative. We gained a lot of knowledge and are extremely grateful for all that you did to make this event such a huge success.

As we approach the upcoming 2020 Legislative Session, we are sure the NR&E Committees will be subjected to some of the issues that were addressed at the academy. Due to your efforts, we will be better equipped to make decisions.

If ever we can be of assistance to you, please do not hesitate to call our offices.

Sincerely,

Lynn W. Smith
Chairman Lynn Smith

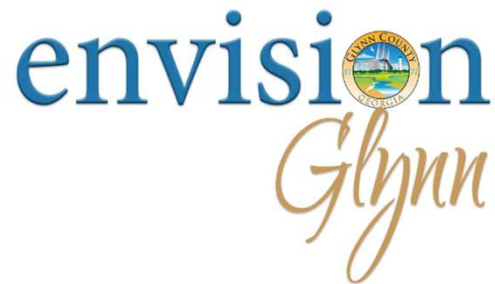
Tyler Harper

Chairman Tyler Harper

**DEVELOPMENT/ORDINANCE REVIEW:
Coordination with County's Zoning Update**



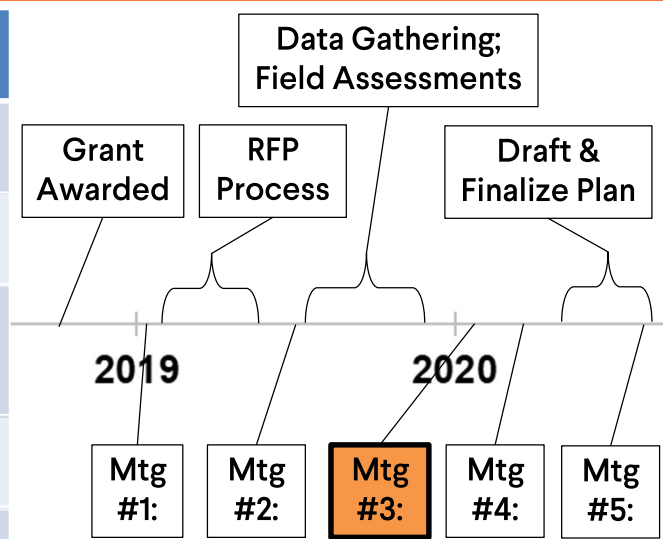
- Tunnel-Spangler & Associates (TSW) is conducting a zoning update for the County
- GMC coordinated with County and TSW on ordinances/zoning related to Shoreline Protection Act and Beach and Dune Protection District Ordinance



**PHASE #1 TIMELINE:
SHORELINE TASK FORCE (STF) MEETINGS**



STF Mtg	Topics
1	History, background, presentation by Dr. C.J. Jackson, GA Southern
2	Project goals, community engagement; GMC coordination
3	Workshop: review vulnerable areas, background data, management practices, partners/funding/issues
4	Review matrix to rank & prioritize projects and problem areas
5	Review and discuss final comments from draft plan



SAND/DUNE FENCING, GREEN INFRASTRUCTURE, BULKHEADS/SEA WALLS, TIDE CONTROL, RIP RAP



OTHER MANAGEMENT PRACTICES



- Policy Change
- Land Preservation
- Temporary Barrier
- Elevate Houses / Buy Outs
- Elevate / Relocate Roads
- Nearshore Placement / Renourishment
- Modeling
 - Nearshore processes
 - Stormwater H&H

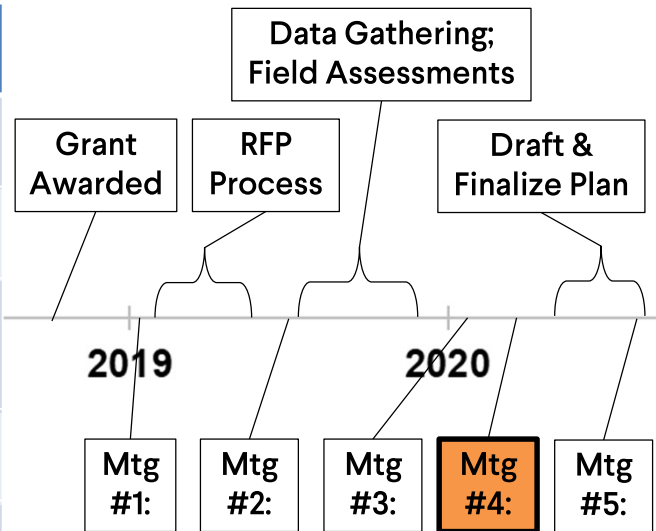


Source: WTOC 11

PHASE #1 TIMELINE: SHORELINE TASK FORCE (STF) MEETINGS



STF Mtg	Topics
1	History, background, presentation by Dr. C.J. Jackson, GA Southern
2	Project goals, community engagement; GMC coordination
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4	Review matrix to rank & prioritize projects and problem areas
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INTRODUCTION TO THE MATRIX



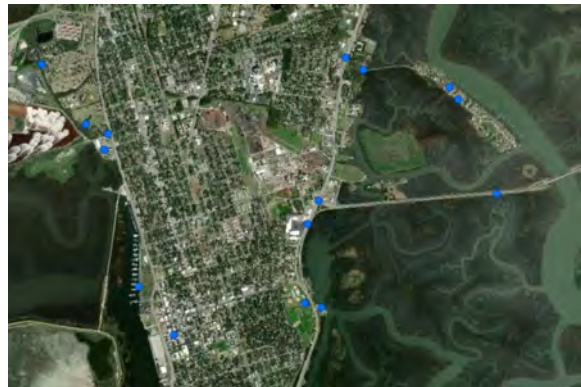
- 10 Factors
- Factors and weighting based on previous meetings
- Used for prioritization
- Additional Output:
 - Cost (relative; \$ to \$\$\$\$)
 - Proposed Solutions & Alternates
 - Potential Partners / Project Leads
 - Tied to funding opportunities and ownership

New ID	Shoreline Change	Infra-structure	Infrast Prox	Vulner Pop	Ownership	Habitat/Veg	SLR	Flood Zone	Frequent Flooding	Erosion	Total Score	Rank
Glynn -	Multiplier	Score	Score	Score	Score	Score	Score	Score	Score	Score		
GM1	7	7	0	0	0	3	5	3	3	0	147	29
GM2	7	10	0	0	2	3	3	3	3	0	168	27
GM3	7	1	7	0	2	5	0	3	3	5	182	23
GM4	7	7	5	0	2	5	1	3	3	1	189	21
GM5	7	3	10	0	5	5	3	5	3	1	245	6
GM6	7	7	1	0	0	0	1	1	5	1	112	34
GM7	7	7	3	0	5	3	5	3	3	0	203	18
GM8	7	7	1	0	0	3	1	3	5	0	140	30
GM9	7	7	10	0	5	3	1	0	5	0	217	15
GM10	7	7	0	0	5	3	1	1	5	0	154	28

FACTORS



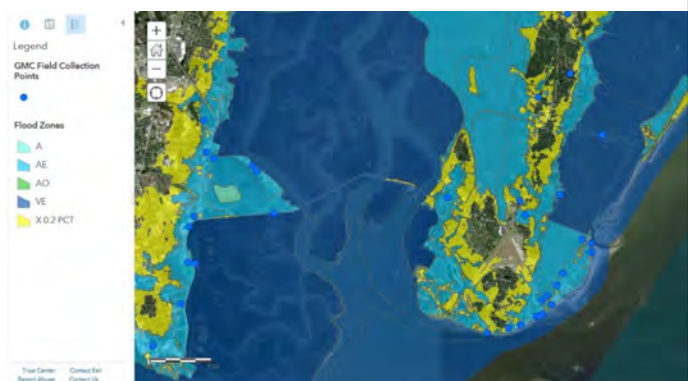
1. Projects ID'ed & vetted by staff
2. Type of Infrastructure (10)
3. Proximity to Infrastructure (10)
4. Sea Level Rise (10)
 - Shorelines shift from rising sea level and not just erosion



FACTORS



5. Vulnerable Populations (5)
 - HUD Exchange
 - Eligibility for CDBG funding
6. Ownership of Parcel (5)
 - Ease of Construction
7. Special Habitat (5)
8. Flood Zone (5)
9. Previous Flooding Area (5)
 - Hurricane damage or more frequently

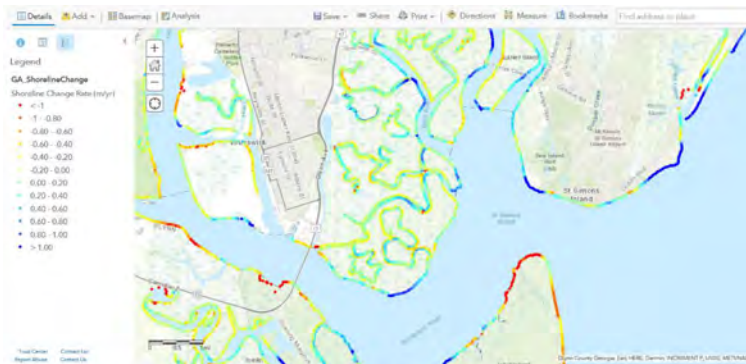


FACTORS

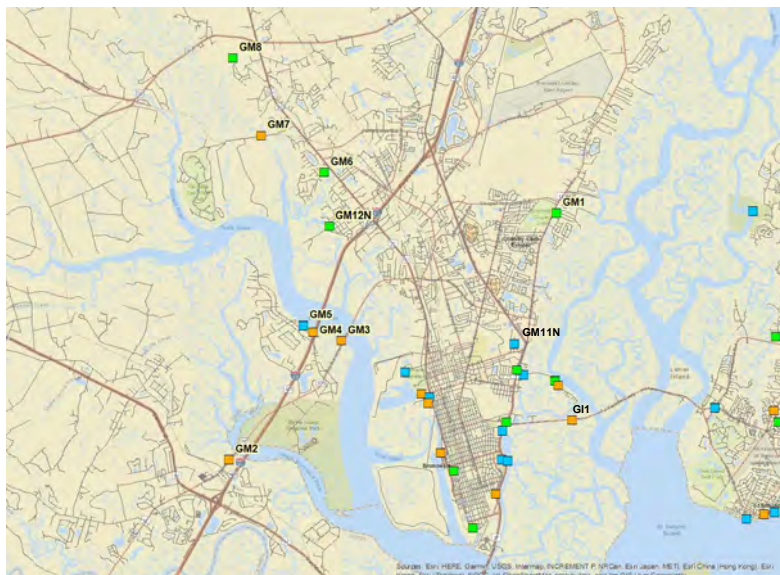


10. Presence of Erosion & Rate (7)

- Provide more weight if subject to both erosion and flooding
- GA Southern Data or Visual Assessment



PROJECT LIST: MAINLAND GLYNN COUNTY



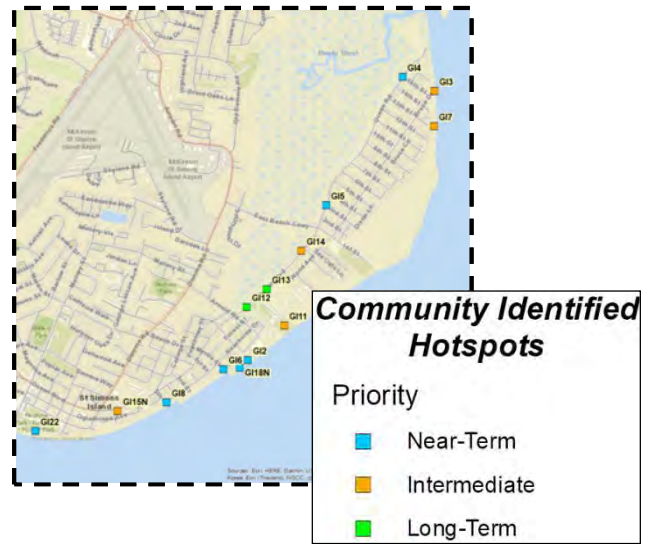
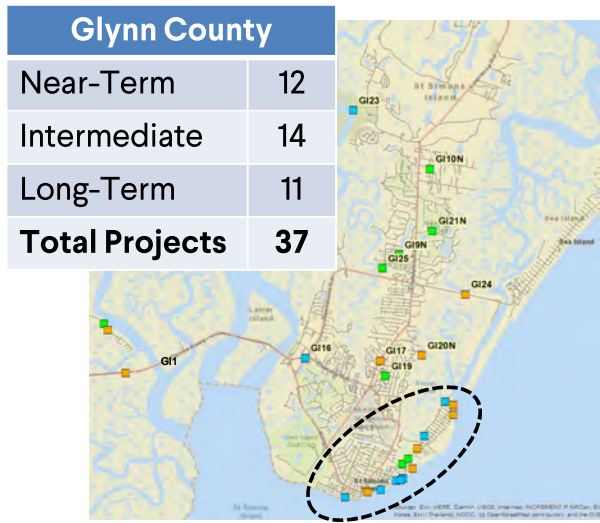
Community Identified Hotspots

Priority

- Near-Term
- Intermediate
- Long-Term



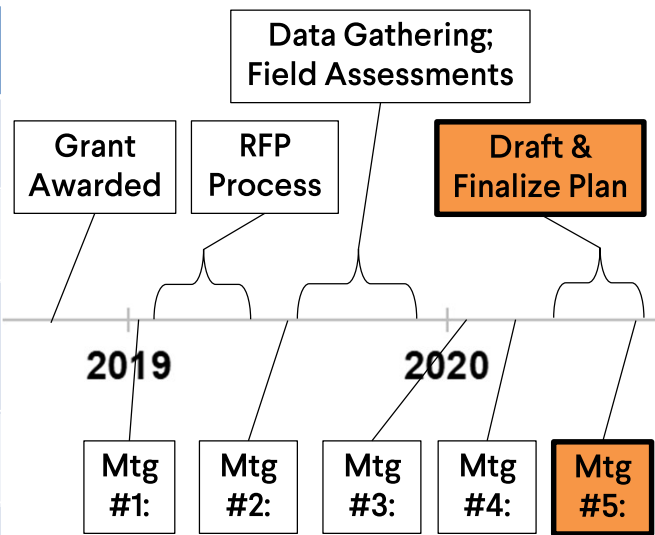
PROJECT LIST: ST. SIMONS ISLAND



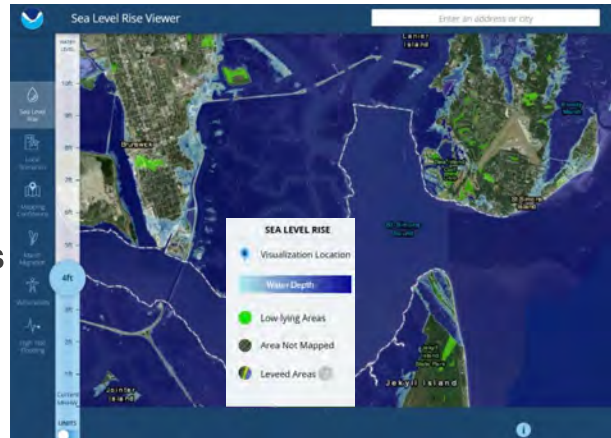
PHASE #1 TIMELINE: SHORELINE TASK FORCE (STF) MEETINGS



STF Mtg	Topics
1	History, background, presentation by Dr. C.J. Jackson, GA Southern
2	Project goals, community engagement; GMC coordination
3	Workshop: review vulnerable areas, background data, management practices, partners/funding/issues
4	Review matrix to rank & prioritize projects and problem areas
5	Review and discuss final comments from draft plan



- *“Sea Level Rise Response and Implementation Plan”*
- Objectives:
 - Examine data on SLR and its related intermediate and long-term hazards
 - Analyze recent sea level rise changes
 - Critical facility inventory and relocation plan
 - Incorporate short-term & long-term goals and objectives from DRRP
- Timeline: Aug. 2020 – March 2021





APPENDIX Q

SOUTH ATLANTIC COASTAL STUDY (SACS)

Georgia Appendix

FINAL REPORT
AUGUST 2022





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Wetland Photo Source: USACE, Savannah District, J.F. Gregory Park in Richmond Hill, Georgia

Beach Photo Source: USACE by Airborne Response, Jacksonville District

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SECTION 1

Introduction

The South Atlantic Coastal Study (SACS) Main Report examines the SACS study area at a regional scale and applies the Coastal Storm Risk Management (CSRМ) Framework (the Framework) developed by the North Atlantic Coast Comprehensive Study (NACCS). The eight SACS state and territory appendices execute the Framework and provide a more tailored analysis by considering specific conditions for each state or territory, including problems and opportunities, risk assessment, and comprehensive CSRМ strategies. This Appendix provides details on the state of Georgia.

The Framework is a three-tiered evaluation defined by different scales, objectives to address risk, and input from stakeholders. The Tier 1 and Tier 2 analysis are completed as part of the SACS while Tier 3 efforts would be completed as follow-on analyses, either by the U.S. Army Corps of Engineers (USACE) or other agencies and stakeholders. By completing a tiered analysis, assumptions and data requirements become more refined with each tier as described:

- Tier 1 presents a large-scale application of the Framework in the evaluation of exposure, hazards, vulnerability, and potential risk for the study area. For consistency across state and territory boundaries, national datasets were used to complete the Tier 1 analysis. The Main Report describes Tier 1 methods and general output. Georgia-specific Tier 1 information is provided in this appendix.
- The Tier 2 analysis for Georgia is provided in this appendix. Additional state and regional data sources are used to refine potential risk areas identified in Tier 1. Focus areas were selected from the highest risk locations, and detailed Focus Area Action Strategies (FAAS) (which are attached to this appendix) were developed to serve as examples of how to develop strategies that lower risk in populated areas, areas of concentrated economic development, and areas with vulnerable environmental and cultural resources.
- Tier 3 (not completed by the SACS) will be a local-scale analysis incorporating in-depth analysis and benefit-cost evaluations of CSRМ plans in support of plan formation and project design.

The purpose of this appendix is to provide Georgia stakeholders with useful information and resources. The organization of this appendix and alignment with the Framework is shown in **Table 1-1**.

Table 1-1: Appendix Organization and Alignment with the Coastal Storm Risk Management Framework

Report Section	Content	CSRM Framework Step
Section 1: Introduction	Objective of the document and organization of the report	Step 1: Initiate Analysis
Section 2: Agency Coordination and Collaboration	Overview of the collaborative efforts of the SACS study including stakeholder engagement, workshops, informational sessions, and federal partners	Step 1: Initiate Analysis
Section 3: Overview of Existing and Future Conditions	Provides geographic, climatic, and political context for the analysis and an overview of existing and expected future conditions	Step 2: Characterize Conditions
Section 4: Risk Assessment	Application of the Tier 1 Risk Assessment and development of the Georgia-specific Tier 2 analysis used to identify high-risk areas	Step 3: Analyze Risk and Vulnerability
Section 5: Managing Risk	Overview of resources to support Georgia resiliency efforts, including federal directives, resources, and funding to help communities better leverage needed resources	Step 4: Identify Possible Solutions
Section 6: Institutional and Other Barriers	Identification of institutional and other barriers impeding further risk management efforts	Step 4: Identify Possible Solutions
Section 7: Recommendations to Address Risks	Recommendations of actions to address the risks identified in Section 4	Step 5: Evaluate and compare solutions

SECTION 2

Agency Coordination and Collaboration

The SACS was conducted in coordination with other federal agencies and applicable state, local, and tribal officials to ensure that all information, observations, and recommendations are consistent with other plans to be developed. Agency coordination and collaboration occurred in tasks documented in all preceding sections of this report.

2.1 Field Workshops

Initial coordination and collaboration for Planning Reach GA_05 began on February 1, 2019, with the regional SACS Vision Meeting that was held to introduce the SACS to a diverse attendee list representing federal, state, local, and non-government interests. Following this introductory meeting, as the Tier 1 Risk Assessment data was further developed, Vision meetings were held on May 10, 2019 and June 17, 2019 to update stakeholders on the progression of SACS, gather local knowledge and feedback, and discuss problems and opportunities within the planning reach. On October 30, 2019, the in-person Georgia Field Workshop was held in Tybee Island, Georgia. Participants were divided into breakout sessions focused on the following topics: (1) existing/future conditions, problems, and opportunities, (2) draft focus areas, (3) existing/planned risk management strategies and projects, and (4) institutional and other barriers to reducing risk. Stakeholders provided input via written questionnaires and facilitated discussion.

2.2 Focus Area Visioning Meetings

Stakeholder engagement for the Chatham County and Glynn County Focus Areas were primarily facilitated through a series of three virtual workshops. Focus Area Kick-off Webinars were held for Chatham County on July 14, 2020 and Glynn County on July 13, 2020 to develop a shared vision statement for the focus area, refine problem statements and focus area boundaries, and prepare stakeholders for the strategy development workshop. Focus Area Strategy Development Webinars were held on August 19, 2020 for Chatham County and August 21, 2020 for Glynn County to overview questionnaire feedback, present results from the Tier 2 Economic Risk Assessment, conduct breakout session technical discussions, and develop integrated risk management strategies. The Focus Area Wrap-up Webinars were held for Chatham County on November 2, 2020 and Glynn County on November 19, 2020 and presented an overview of the overall strategy and gathered additional input before finalization. There were pre-meetings and post-meetings associated with each workshop to ensure objectives were in alignment with stakeholders. Numerous engagements occurred through one-on-one communication with key stakeholders to gain insight on existing and planned projects in the planning reach, as well as potential partnership opportunities during the development of the FAAS and the Georgia Appendix.

2.3 Additional Stakeholder Coordination

Throughout the development of the state and territory appendices and FAAS, USACE held additional virtual workshops to engage specific subgroups of stakeholders, including two SACS Environmental Webinars, a SACS Cultural Stakeholder Webinar, and a SACS Military Installation Webinar. These workshops were intended to further enhance the outreach and risk communication that the SACS tool can provide to all agencies outside of USACE. The USACE Command Team and District Project Managers also held quarterly webinar updates for stakeholders to provide information on various SACS products and answer stakeholder questions.

The USACE Savannah District team engaged key federal, state, and local government stakeholders, as well as several state universities and non-governmental organizations (NGOs) as part of the agency coordination and collaboration associated with the development of the Georgia State Appendix and FAAS. Federal engagement included: Federal Emergency Management Agency (FEMA), U.S. Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey (USGS), U.S. Fish and Wildlife Service (USFWS), and U.S. National Park Service (NPS). State engagement included: Georgia Department of Natural Resources (GADNR)-Coastal Resources Division (CRD), GADNR-Environmental Protection Division (EPD), GADNR-Historic Preservation Division (HPD), Georgia Department of Transportation, Georgia Department of Community Affairs, Georgia Ports Authority (GPA), Jekyll Island Authority, and South Carolina Department of Health Environmental Control. Local government engagement included: Chatham County, Glynn County, City of Savannah, City of Tybee Island, and the City of Brunswick. State university engagement included: Georgia Southern University, Savannah State University, and the University of Georgia. NGO engagement included: Coastal States Organization, One Hundred Miles, Manomet, The Nature Conservancy (TNC), Coastal Georgia Historical Society, Gullah Geechee Corridor, and the Savannah River Keeper.

SECTION 3

Overview of Existing and Future Conditions

3.1 Study Area

Georgia has approximately 110 miles of coastline extending from the Savannah River inlet in the north to the St. Mary's River inlet in the south. The Georgia coast is typified by rough parallel barrier island shores and their associated ebb-tidal delta, nearshore sand shoal, inlet, estuary, and expansive salt marsh environments, which provide a protective barrier to the mainland. Major river estuaries within the study area include (from north to south) the Savannah, Ogeechee, Altamaha, Satilla, and St. Mary's Rivers. Georgia's coastal marshlands encompass approximately 378,000 acres in a 4- to 6-mile band behind the barrier islands, which makes up nearly one-third of all remaining salt marsh on the eastern United States coast (GADNR n.d.-a). Thriving in the waters of the estuaries, the marshes have been identified as one of the most extensive and productive marshland systems in the United States and serve as a buffer between the mainland and the ocean's impacts from wind and storm events. The urban Savannah harbor and industrial Brunswick harbor stand out against the largely undeveloped expanses of coastal Georgia.

The Georgia coast is in the approximate center of the inward curved coastline known as the Georgia Bight, which extends from Cape Fear, North Carolina to Cape Canaveral, Florida. At high tide, water is pushed toward the center of the Georgia Bight, forcing the water to pile up and increase in elevation along the Georgia coastline. This creates unique tidal extremes in Georgia, with high and low tidal change of 6 to 10 feet. In comparison, 2-foot tides are common within southern Florida and northern North Carolina (University of Georgia [UGA] n.d.).

The primary barrier islands in Georgia from north to south include Tybee, Little Tybee, Wassaw, Ossabaw, St. Catherines, Blackbeard, Sapelo, Wolf, Little St. Simons, Sea, St. Simons, Jekyll, Little Cumberland, and Cumberland Islands (**Figure 3-1**). This region is unique because its barrier islands lack commercial development. Access to the islands has been historically limited because of the lateral and vertical extent of the estuarine marshes. Of the 14 islands listed above, only four—Tybee, Sea, St. Simons, and Jekyll Islands—are significantly developed and accessible to vehicle traffic. All or part of the 14 barrier islands receive special protection from the federal government by their designation as units in the USFWS Coastal Barrier Resources System. Wassaw, Blackbeard, Wolf, and Egg Islands are National Wildlife Refuges (NWRs). Little Tybee and Ossabaw Islands are owned by the state of Georgia and are managed as heritage trusts. Most of Sapelo Island is owned by the state of Georgia, and a portion is designated the Sapelo Island National Estuarine Research Reserve. Wolf and Egg Islands are, in addition to NWRs, designated as National Wilderness Areas and managed by the USFWS. Jekyll Island is administered as a Georgia state park, with restrictions on private development. Cumberland Island is designated a national seashore and is managed by the NPS (USACE 2013a).

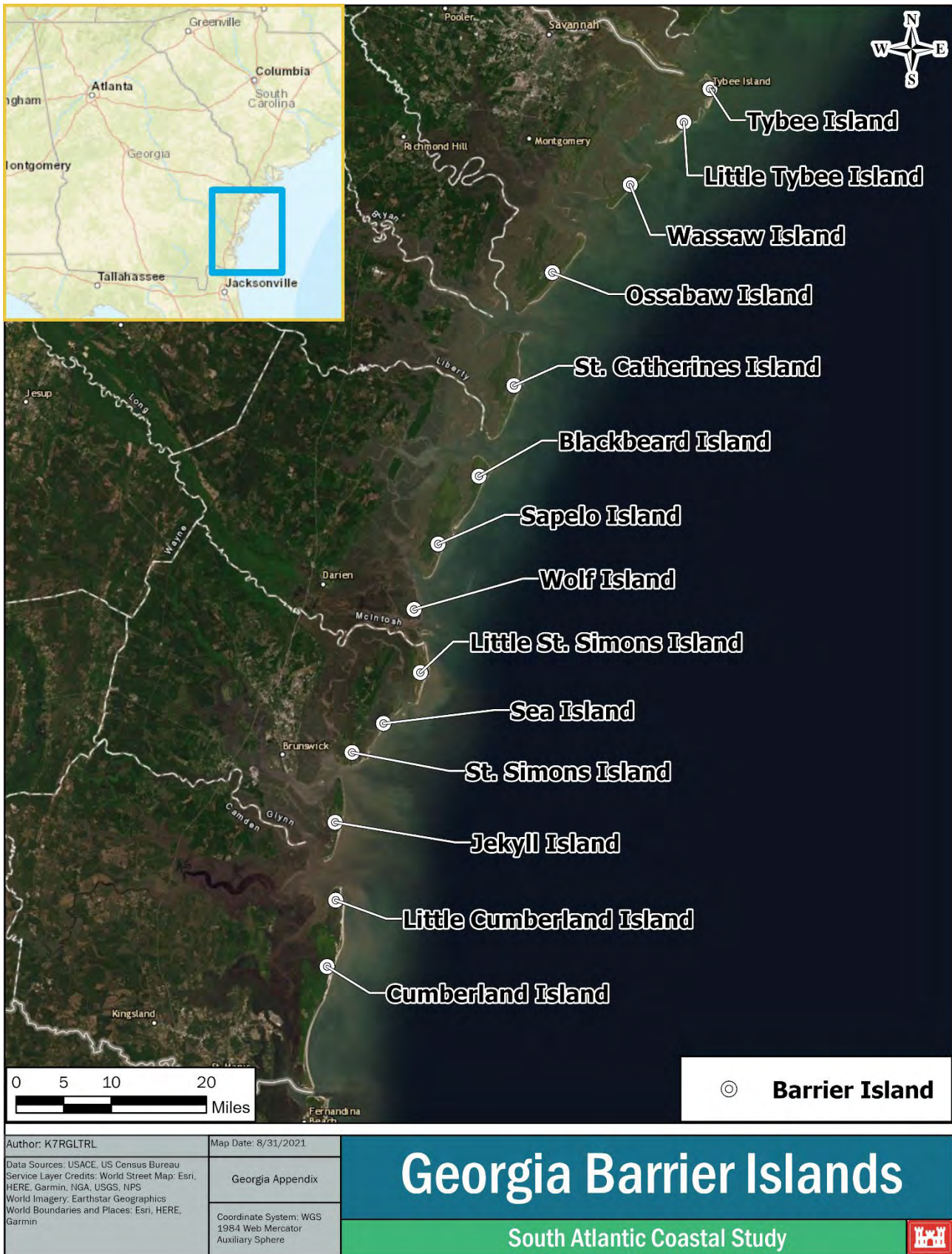


Figure 3-1: Georgia Coastal Barrier Islands

Tybee Island is the only Georgia barrier island or coastal beach that is authorized as a federal CSRSM project. The project provides periodic beach renourishment within the limits of the federal project to protect property and infrastructure on the island from hurricane and storm damage. A supplemental renourishment was conducted in 2018 to add material that was lost because of Hurricane Matthew in 2016 and Hurricane Irma in 2017. After these storms, multiple areas of the dune complex were completely eroded and left susceptible to future storms. In spring 2019, the City of Tybee Island replaced and enhanced portions of these eroded dune fields. In early 2020, a full template beach renourishment incorporating resilience features was completed, with the City of Tybee Island repairing the remaining dune field with advanced renourishment material.

3.2 Problems and Opportunities Overview

Identifying problems and opportunities is a key initial step in the planning process. The problems and opportunities statements within this section encompass both current and future conditions and are not meant to preclude the consideration of any alternatives to solve the problems and achieve the opportunities.

Stakeholder input, project delivery team experience, district leadership input, and the tiered SACS analyses guided the development of broad problem statements related to the state's coastal vulnerabilities to increased hurricane and storm damage as a result of sea level rise, as well as opportunities to address those problems. Throughout multiple meetings and workshops beginning in the Spring of 2019, USACE engaged with federal, state, and local government officials, local experts from universities, and nonprofit organizations to discuss problems and opportunities throughout the Georgia study area. These statements are based on information gained through these collaborative efforts.

3.2.1 Problems

All problems listed are expected to increase in both intensity and magnitude as sea levels rise, depending on the vulnerability and resilience of the exposed population, infrastructure, and environmental and cultural resources. Problems were identified by SACS stakeholders, including:

- Coastal storm damages (from inundation, erosion, and wave attack) are increasing in populated areas, areas of concentrated economic development, areas with natural features providing environmental benefits and natural attenuation of coastal storm risk, and areas with socially vulnerable populations.
- Critical infrastructure, such as water and wastewater treatment plants, hospitals, schools, and roads, are at risk from storm-related hazards and compound flooding, putting people and property at risk.
- Population and development are increasing in coastal Georgia, leading to loss of natural buffers in areas exposed to coastal storm hazards.
- Unaddressed erosional damages from previous coastal storms are exacerbated over time resulting in continual and increasing risk to people and property.

- Nationally important cultural resources and natural habitats are being negatively impacted from coastal-storm driven inundation and erosion.

3.2.2 Opportunities

Resilience is the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions (EP 1100-1-5 [USACE 2020a]). Preparing for potential future circumstances is the first step to developing a resilient community. Opportunities to increase resilience were identified by SACS stakeholders, including:

- Identify gaps in current coastal resilience efforts.
- Gather additional data on coastal processes to inform CSRM efforts.
- Prioritize regional management of projects through Regional Sediment Management (RSM) and other opportunities that support conservation of natural and fiscal resources.
- Promote a range of potential measures, including structural, nonstructural, nature-based, and state and local ordinances which incorporate future sea level rise.
- Leverage studies being conducted by cities, counties, and the state. Studies conducted at the local level provide local knowledge of coastal storm risk to communities. Using these studies to help identify priorities of key stakeholders will support successful implementation of strategies in the SACS.
- Reduce the loss of coastal wetlands, beach, and dune systems that promote natural storm damage reduction and provide wildlife habitat.

3.3 Political Boundaries

There are 13 congressional districts within the state of Georgia that are based on decennial census population counts and population parity of approximately 710,000 individuals for each district. Two congressional districts (Districts 1 and 12) are partially located within Planning Reach GA_05. Except for Bulloch and Effingham Counties, the planning reach is largely represented by Georgia District 1 (**Figure 3-2**).

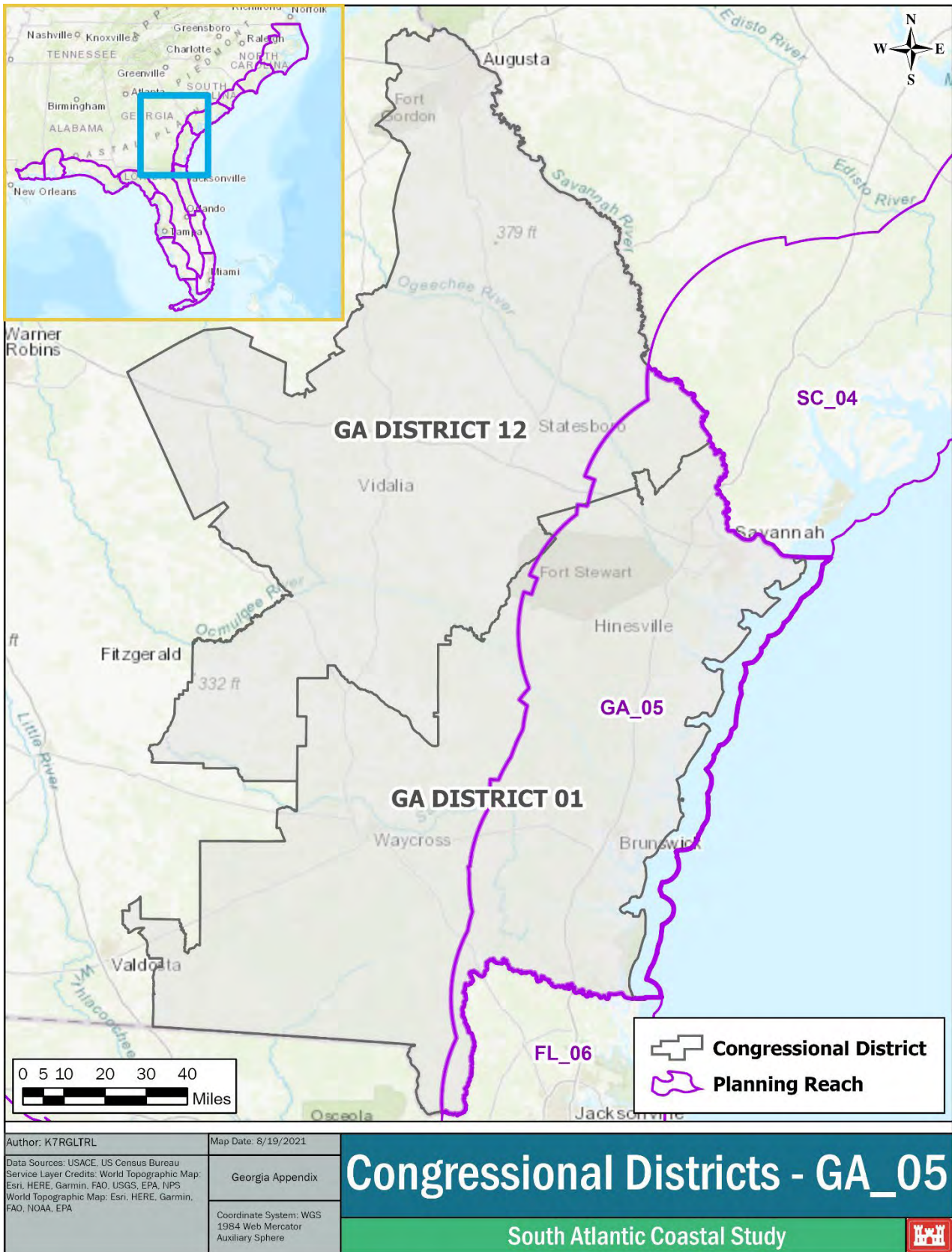


Figure 3-2: Georgia Congressional Districts

3.3.1 State Agencies

The state of Georgia has multiple governmental agencies and initiatives related to CSRM. The primary state agency working on coastal resources preservation and development permitting is the GADNR-CRD. The Georgia Emergency Management and Homeland Security Agency is the primary state agency working on planning for response to coastal storm events. The agency's missions and relation to CSRM is described below. At the regional and city level, non-governmental organizations, academia, as well as county and city governmental agencies serve at the forefront of CSRM within the state of Georgia.

- **GADNR Coastal Resources Division:** The mission of the GADNR-CRD is to balance coastal development and protection of the coast's natural assets, sociocultural heritage, and recreational resources for the benefit of present and future generations. The GADNR-CRD uses three main mechanisms of authority for activities in the jurisdictional marsh and shore areas and to regulate structures and activities that impact public trust lands that fall under jurisdiction of these regulations. The Coastal Marshlands Protection Act regulates activities and water-dependent structures in jurisdictional marshlands. The Shore Protection Act regulates activities and structures in jurisdictional beach and shore areas. The Revocable License authority of the state of Georgia allows for structures to occupy public trust lands' water bottoms.

The Georgia Coastal Management Program (GCMP) was approved by NOAA in 1998, with the GADNR-CRD, serving as the lead agency to determine federal consistency with the Coastal Zone Management Act (CZMA) and the enforceable policies of the GCMP. The GCMP mission is to balance economic development in Georgia's coastal zone with preservation of natural, environmental, historic, archeological, and recreational resources for the benefit of Georgia's present and future generations. The GCMP also provides technical assistance to local governments, property owners, developers, and the public to provide expertise on coastal issues, minimize environmental impacts, clarify regulatory requirements, and identify agency contacts. The GCMP and Federal Consistency provisions are applicable in the counties of Brantley, Bryan, Camden, Charlton, Chatham, Effingham, Glynn, Liberty, Long, McIntosh, and Wayne.

- **Georgia Emergency Management and Homeland Security Agency:** The mission of the Georgia Emergency Management and Homeland Security Agency is to protect life and property against man-made and natural disasters by directing the state's efforts in the areas of prevention, preparedness, mitigation, response, and recovery. The agency works with local, state, federal, volunteer, and private agencies to respond to disasters or emergencies that require a coordinated response. Georgia Emergency Management and Homeland Security Agency also helps develop comprehensive hazard mitigation plans and projects to protect people and property from exposure to natural hazards.

3.4 Planning Reaches

SACS planning reaches were derived from three datasets and visual edits based on coastal geomorphology and professional judgment. These three datasets include:

1. TNC ecoregions, which are areas that TNC prioritized for conservation.
2. State and county boundaries.
3. Category 5 Sea, Lake, and Overland Surges from Hurricanes (SLOSH) Maximum of Maximum (MOM) inland limit of inundation (Zachry et al. 2015; Jelesnianski et al. 1992).

The overall SACS effort has multiple planning reaches, which are lengths of coastline that were evaluated as part of the study. Planning Reach GA_05 is the focus of this Georgia Appendix (**Figure 3-3**).

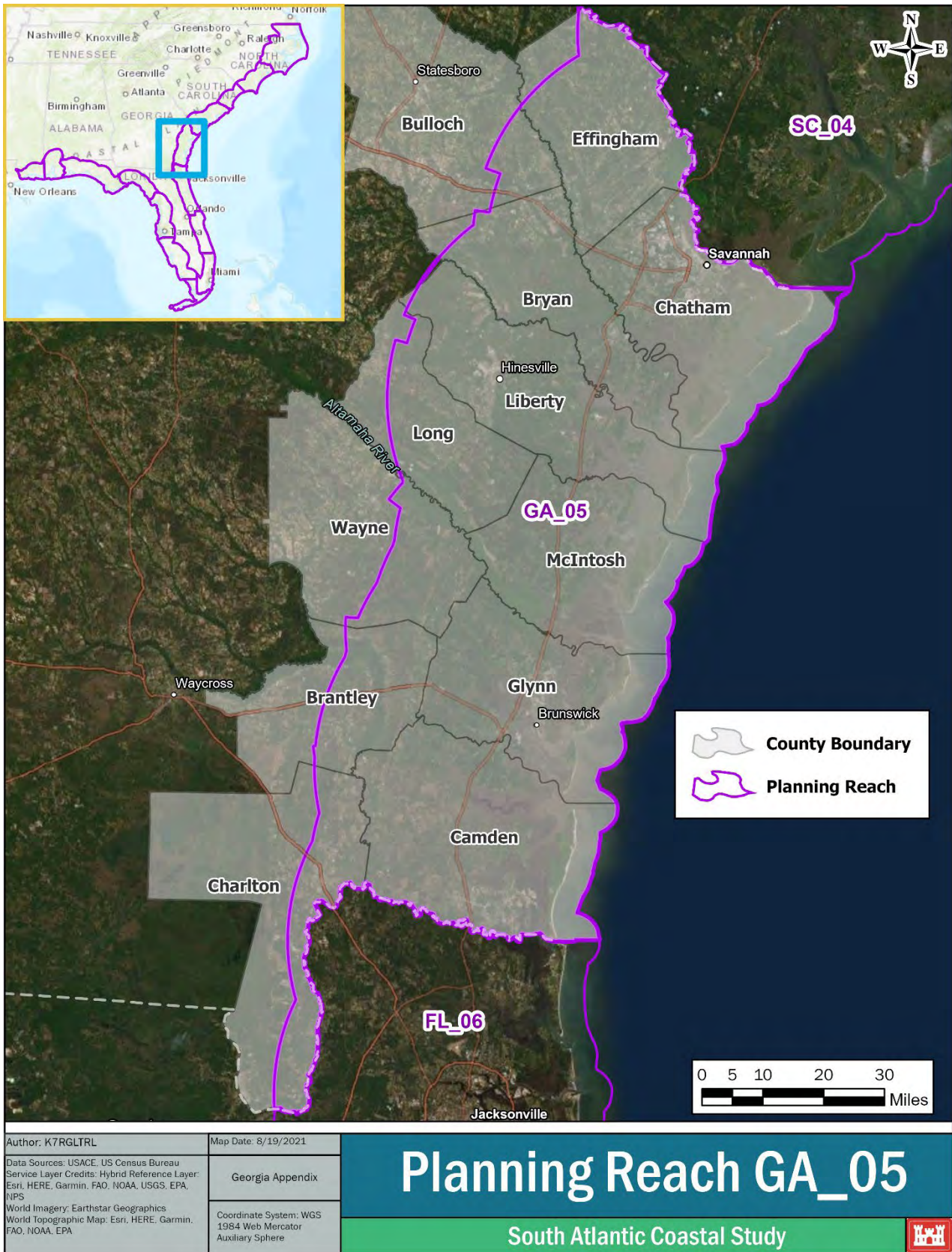


Figure 3-3: Planning Reach GA_05

3.5 Counties and Population within Planning Reach

Planning Reach GA_05 fully encompasses six coastal counties (Chatham, Bryan, Liberty, McIntosh, Glynn, and Camden Counties) and partially encompasses six inland counties (Effingham, Bulloch, Long, Wayne, Brantley, and Charlton Counties). There are two metropolitan statistical areas within coastal Georgia (Savannah and Brunswick) and one micropolitan statistical area (St. Marys).

Metropolitan and micropolitan statistical areas are areas with a substantial population center and adjacent communities with a high degree of economic and social integration to that population center. Metropolitan statistical areas have a principal urban area with a population of at least 50,000, while micropolitan statistical areas have an urban cluster with a population of at least 10,000 but less than 50,000 (OMB 2010).

The principal urban area in the Savannah metropolitan statistical area is the city of Savannah, Georgia, and includes Bryan, Chatham, and Effingham Counties. The principal urban area in the Brunswick metropolitan statistical area is the city of Brunswick, Georgia, and includes Glynn, Brantley, and McIntosh Counties.

The Georgia Governor's Office of Planning and Budget estimates that the population within Planning Reach GA_05 has increased from approximately 700,900 to 777,400 from 2010 to 2020, an increase of approximately 10.9 percent (**Table 3-1**). Future projections show that there could be a population increase of 44 percent between 2020 and 2065 for the coastal counties.

Table 3-1: Population Change Estimates for Coastal Georgia

County	Population in 2010 ¹	Population in 2020 ²	Percent Change (2010 to 2020)	Percent Change (2010 to 2018)	Population in 2065 ²	Population Change (2020 to 2065)	Percent Change (2020 to 2065)
Brantley County	18,411	19,344	5.1%	2.6%	26,152	6,808	35.2%
Bryan County	30,233	40,443	33.8%	26.1%	91,573	51,130	126.4%
Bulloch County	70,217	80,592	14.8%	10.1%	140,013	59,421	73.7%
Camden County	50,513	54,975	8.8%	6.3%	67,506	12,531	22.8%
Charlton County	12,171	13,385	10.0%	6.5%	16,710	3,325	24.8%
Chatham County	265,128	290,550	9.6%	9.1%	373,753	83,203	28.6%
Effingham County	52,250	65,869	26.1%	19.0%	155,084	89,215	135.4%
Glynn County	79,626	86,002	8.0%	7.0%	104,510	18,508	21.5%
Liberty County	63,453	61,771	-2.7%	-3.1%	60,932	-839	-1.4%
Long County	14,464	19,846	37.2%	31.3%	32,503	12,657	63.8%

County	Population in 2010 ¹	Population in 2020 ²	Percent Change (2010 to 2020)	Percent Change (2010 to 2018)	Population in 2065 ²	Population Change (2020 to 2065)	Percent Change (2020 to 2065)
McIntosh County	14,333	14,585	1.8%	0.0%	19,710	5,125	35.1%
Wayne County	30,099	29,988	-0.4%	-1.0%	31,550	1,562	5.2%
Total	700,898	777,350	10.9%	8.75%	886,592	342,646	44.1%

¹ 2010 Census Bureau decennial census data.

² 2020 and 2065 population estimates are provided by the Georgia Governor's Office of Planning and Budget.

3.6 Watersheds within Planning Reach

A watershed is defined as the geographic area within the boundary of a drainage divide. The hydrologic unit code (HUC) 8 watershed identifies the watershed boundary at the subbasin level, similar to medium-sized river basins. Planning Reach GA_05 includes all or portions of nine HUC-8 watersheds that drain east to the Atlantic Ocean (**Figure 3-4**). From north to south, the planning reach includes the Lower Savannah, Lower Ogeechee, Canoochee, Ogeechee Coastal, Altamaha, Little Satilla, Cumberland-St. Simons, Satilla, and St. Marys HUC-8 watersheds.

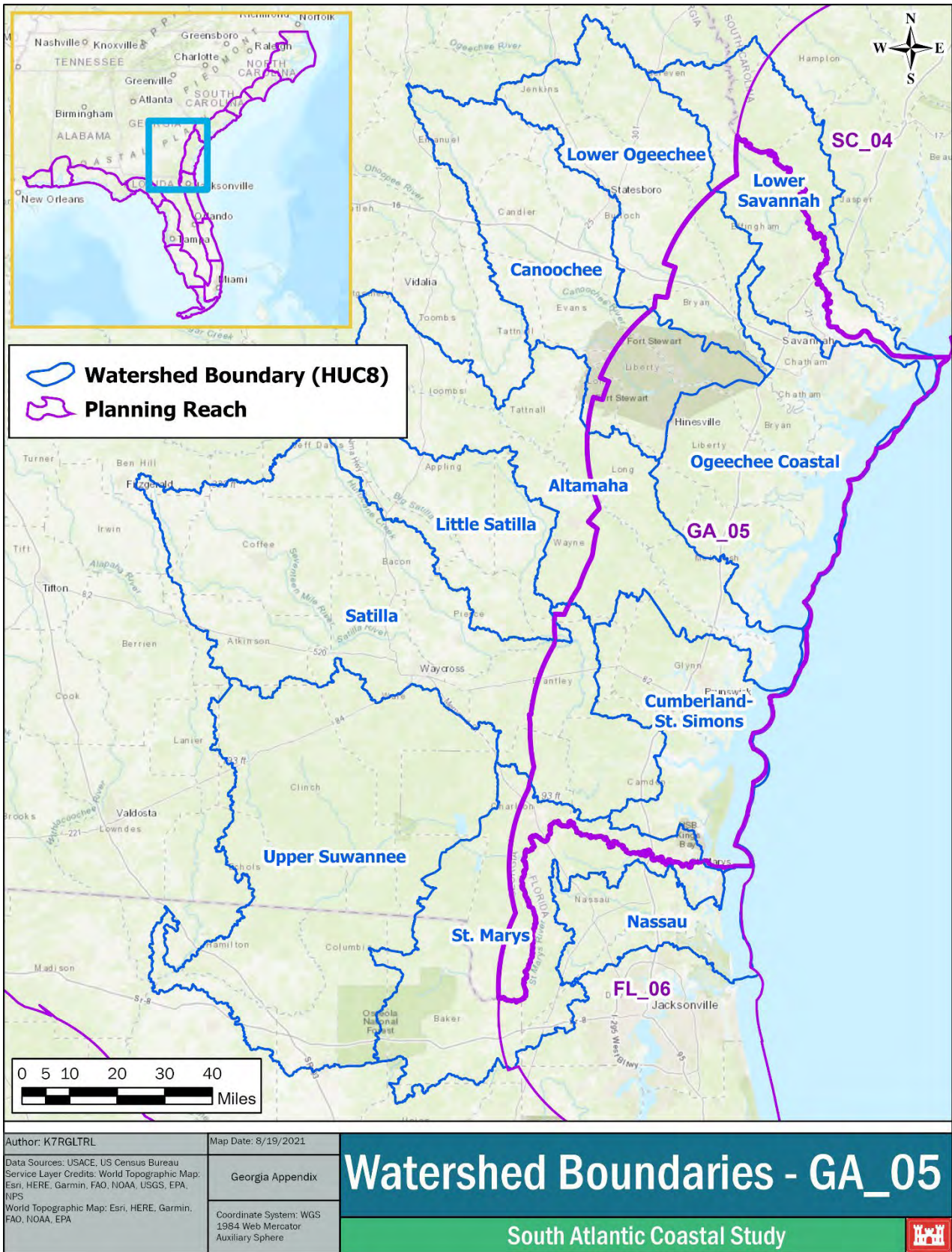


Figure 3-4: Georgia Watershed Boundaries

3.7 Shoreline Characteristics

Based on the NOAA Environmental Sensitivity Index (ESI) guidelines, USACE developed a grouping of generalized shoreline types to support coastal planning applications. The list of USACE generalized shoreline types aggregated from NOAA’s ESI guidelines is in **Table 3-2**. Of the 10 USACE generalized shoreline types used in the analysis for the SACS, nine are found in Georgia.

Table 3-2: USACE and National Oceanic and Atmospheric Administration Environmental Sensitivity Index Shoreline Types

Number	USACE Generalized Shoreline Type	NOAA ESI Shoreline Types	Found In Georgia?
1	Mangroves	Mangroves	No
2	Manmade Structures (Exposed)	Exposed, Solid Man-Made Structures and Riprap	Yes
3	Manmade Structures (Sheltered)	Sheltered, Permeable, Rocky Shores and Sheltered Riprap	Yes
4	Rocky Shores (Exposed)	Exposed, Rocky Shores, Gravel Beaches, and Boulder Rubble	Yes
5	Rocky Shores (Sheltered)	Sheltered Scarps (Bedrock/Mud/Clay) and Sheltered, Rocky, Rubble Shores	Yes
6	Sandy Beaches (Exposed)	Fine to Medium Grained Sand Beaches, Coarse Grained Sand Beaches, Mixed Sand and Gravel Beaches, and Exposed Tidal Flats	Yes
7	Sandy Beaches (Sheltered)	Sheltered Tidal Flats	Yes
8	Scarps and Steep Slopes	Scarps and Steep Slopes (Sand)	Yes
9	Wetland/Marshes/Swamps (Exposed)	Exposed, Wave-Cut Platforms (Bedrock/Mud/Clay) and Exposed Scarps and Steep Slopes (Clay)	Yes
10	Wetlands/Marshes/Swamps (Sheltered)	Vegetated Low Banks, Hyper-Saline Tidal Flats, Salt and Brackish Water Marshes, Freshwater Marshes, Swamps, and Scrub and Shrub Wetlands	Yes

The shoreline type analysis identified the length and percentage for each type of shoreline found within Planning Reach GA_05. All shorelines, including wetlands along and into river floodplains, were captured in this characterization (**Figure 3-5**). “Sheltered” is defined as low-energy shorelines sheltered from wave and tidal energy, except during unusual or infrequent events, and “exposed” is defined as shorelines regularly exposed to large waves or strong tidal currents during all seasons. This analysis shows that the Georgia shoreline consists predominantly of sheltered wetlands (94 percent), two percent of exposed sandy beaches, and the remainder of shoreline types each contribute about one percent or less to the total shoreline composition (**Table 3-3**).

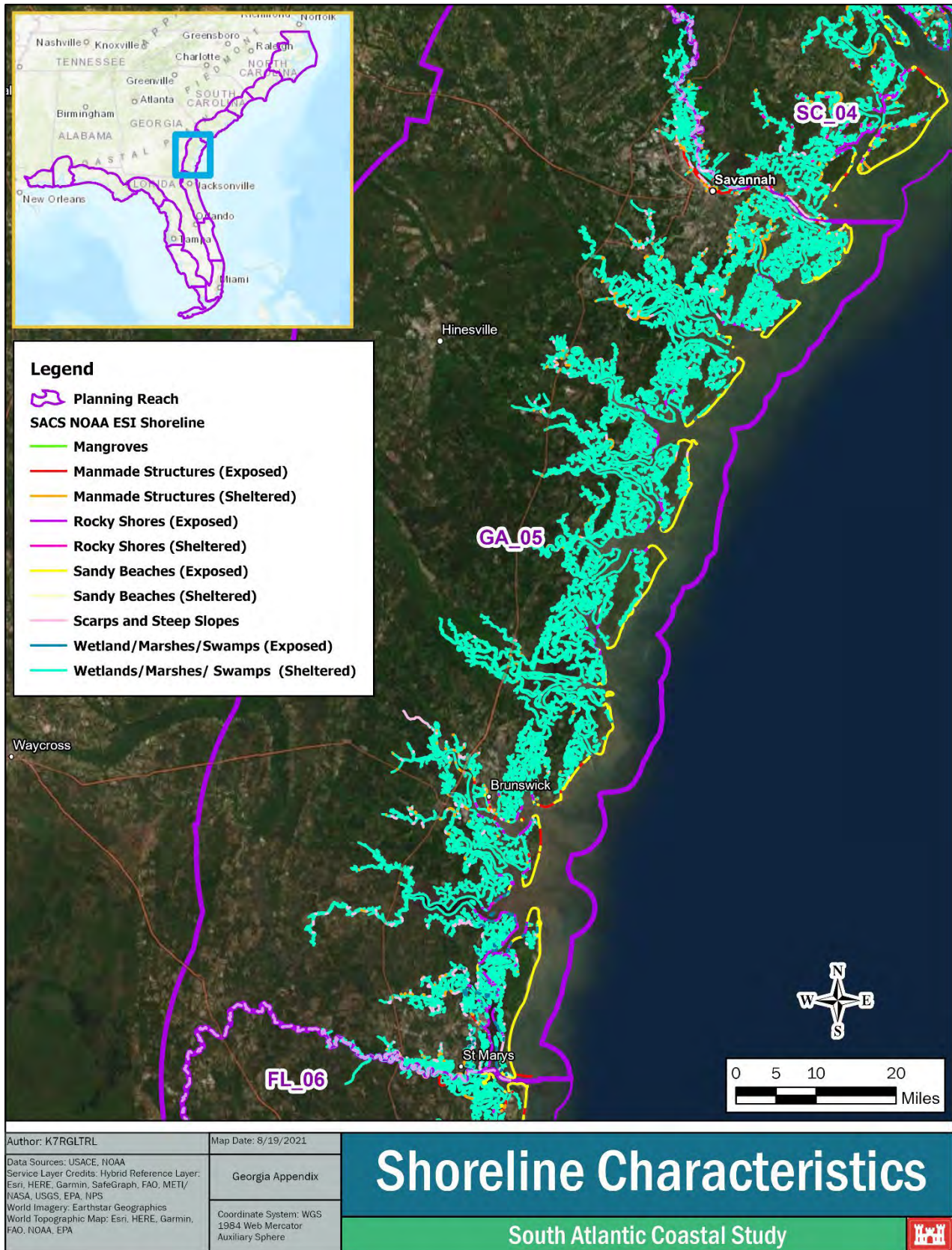


Figure 3-5: Shoreline Characteristics

Table 3-3: National Oceanic and Atmospheric Administration Environmental Sensitivity Index Aggregated Shoreline Characteristics for Planning Reach GA_05

Shoreline Type	Length (Miles)	Percent of Georgia Shoreline
Mangroves	0	0.00%
Manmade Structures (Exposed)	36.3	0.50%
Manmade Structures (Sheltered)	73.31	1.02%
Rocky Shores (Exposed)	74.57	1.04%
Rocky Shores (Sheltered)	0.72	0.01%
Sandy Beaches (Exposed)	144.16	2.01%
Sandy Beaches (Sheltered)	0.55	0.01%
Scarps and Steep Slopes (Sand)	71.07	0.99%
Wetland/Marshes/Swamps (Exposed)	30.14	0.42%
Wetlands/Marshes/Swamps (Sheltered)	6755.94	94.00%

In addition to the USACE shoreline classification efforts, the coastal rivers and estuaries in Georgia have been characterized by the University of Georgia's Skidaway Institute of Oceanography. These data are available through the Georgia Coastal Hazards Portal, a web-based interactive tool to assess specific exposure to coastal hazards (Skidaway Institute of Oceanography n.d.). This characterization includes the Atlantic Intracoastal Waterway (AIWW); the Satilla, St. Marys, Altamaha, Ogeechee, Crooked, and Savannah Rivers; White Oak Creek; and the Brunswick, Sapelo, South New Port, Medway, Little Ogeechee, and Wilmington Estuaries. University of Georgia analysis of shoreline characteristics shows a combination of low-lying marsh with occasional mudflat and oyster habitat with man-made development and shoreline armoring located in populated areas such as Savannah, Brunswick, St. Simons, and Jekyll Island.

Georgia Coastal Hazards Portal:
<https://gchp.skio.uga.edu/>

3.8 Overview of Storm History and Sea Level Rise Projections

3.8.1 Storm History

The Georgia coastline is influenced predominantly by tropical systems that occur during the summer and fall. Nor'easters during the late fall, winter, and spring also have an effect, but to a lesser degree. Although hurricanes typically generate larger waves and storm surge, Nor'easters impact the shoreline because of their longer duration and higher frequency of occurrence.

Georgia is in an area of significant hurricane activity. **Figure 3-6** and **Figure 3-7** show historical tracks of hurricanes and tropical storms from 1852 to 2020, as recorded by the National Hurricane Center (NHC) and is available from NOAA (NOAA 2021). The shaded circles in **Figure 3-6** and **Figure 3-7** indicate a 200-mile radius drawn from the center of the state and a 50-mile radius drawn from the center of the coastline, respectively. Based on NHC records, 212 hurricanes and tropical storms have

passed within the 200-mile state radius over the 168-year period of record and 90 hurricanes and tropical storms have passed within a 50-mile radius of the central Georgia coastline (**Table 3-4**). While storms passing near the coast have the most direct impact, strong storms at greater distances are still capable of producing significant wind and flooding damage.

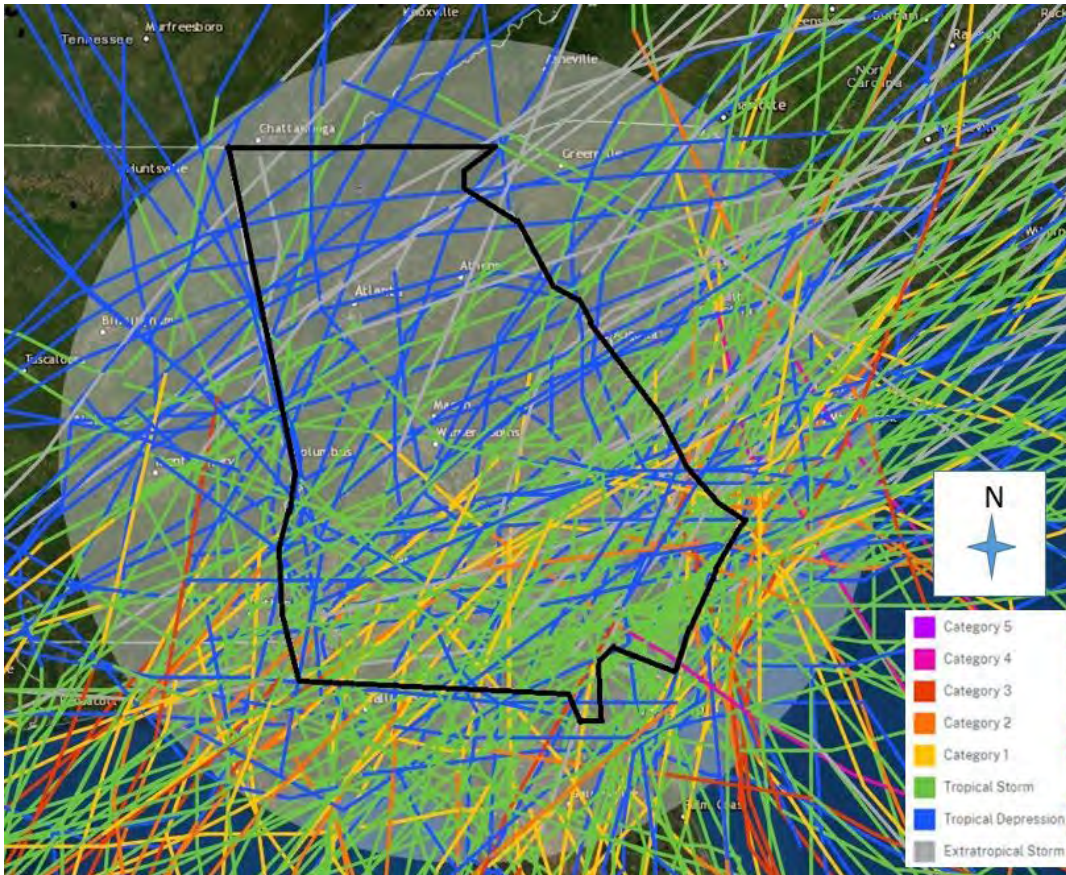


Figure 3-6: Historical Storm Tracks from 1852 – 2020 – Hurricanes and Tropical Storms (200-mile radius – not to scale) (NOAA 2021)

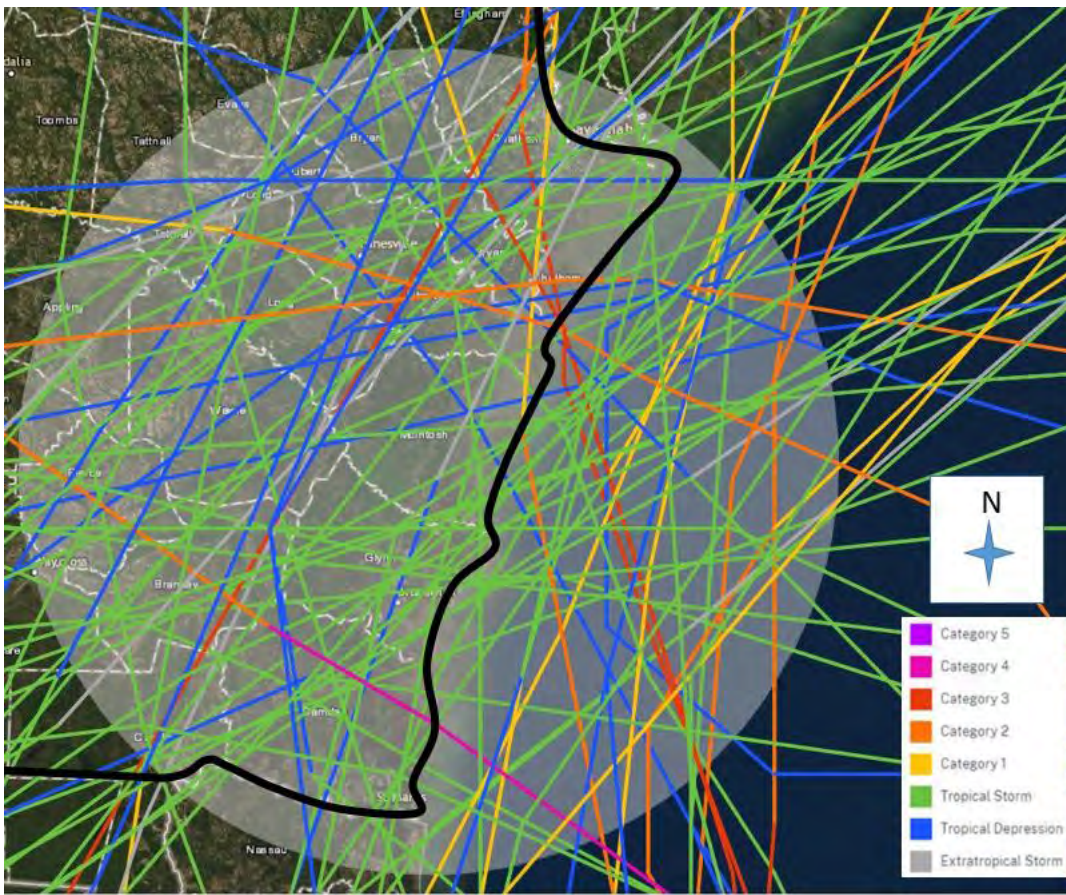


Figure 3-7: Historical Coastal Storm Tracks from 1852 - 2020 – Hurricanes and Tropical Storms (50-mile radius – not to scale) (NOAA 2021)

Typically, tropical storms are generated during the summer and fall seasons. Hurricane season extends from June 1 through November 30. Georgia’s historical tropical storms (as defined in **Table 3-4**) follow this typical pattern with a few exceptions of storms occurring in May. **Figure 3-8** shows the historical distribution of storms by month from May through November. Historically, tropical storms and tropical depressions are the most prevalent storm types impacting coastal Georgia, accounting for 73 percent of recorded events. Tropical storm occurrence peaks between August and October. Tropical depressions occur throughout the May to November timeframe, with the majority occurring (historically) in September. Hurricanes, accounting for 20 percent of recorded storm events, peak between August and October. No tropical storms of record occurred outside of the May through November seasonal window. Several extratropical (ET) storms are also recorded, accounting for seven percent of storm events. These are storms that typically originate as tropical events but have downgraded to non-tropical events with characteristics such as a cold air core that are more aligned with Nor’easters than hurricanes. September is statistically the most active month for (tropically originating) Extratropical Storms, Tropical Depressions, Tropical Storms, and Category 1 Hurricanes in Georgia. Nor’easters generally occur during winter and early spring. There is currently no available database that records these storms, even though these long duration storm events are capable of producing heavy precipitation, damaging winds, and large high energy waves.

Table 3-4: Historical Coastal Georgia Storms 1853 to 2020

Year	Month	Name	Type ¹	Year	Month	Name	Type	Year	Month	Name	Type
1853	Oct	Unnamed	H2	1911	Aug	Unnamed	TD	1972	Sep	Dawn	TD
1854	Sep	Unnamed	H3	1912	Jul	Unnamed	TS	1976	May	Unnamed	TS
1860	Aug	Unnamed	TS	1912	Sep	Unnamed	TD	1976	Sep	Unnamed	TS
1868	Oct	Unnamed	TS	1915	Aug	Unnamed	TS	1979	Sep	David	H1
1871	Aug	Unnamed	TS	1916	May	Unnamed	TS	1981	Jul	Unnamed	TD
1871	Oct	Unnamed	TS	1916	Oct	Unnamed	TS	1981	Aug	Unnamed	TS
1873	Jun	Unnamed	TS	1919	Oct	Unnamed	TS	1984	Sep	Isidore	TS
1873	Sep	Unnamed	TS	1923	Jun	Unnamed	TD	1985	Oct	Isabel	TS
1874	Sep	Unnamed	H1	1924	Sep	Unnamed	TS	1988	Aug	Chris	TS
1877	Sep	Unnamed	TS	1924	Sep	Unnamed	ET	1994	Nov	Gordon	TD
1878	Oct	Unnamed	TS	1928	Sep	Unnamed	H1	1996	Oct	Josephine	ET
1880	Sep	Unnamed	TS	1932	Sep	Unnamed	TS	2000	Sep	Gordon	TD
1881	Aug	Unnamed	H2	1944	Oct	Unnamed	TS	2002	Oct	Kyle	TS
1882	Oct	Unnamed	TS	1945	Sep	Unnamed	TS	2003	Jul	Unnamed	TD
1884	Sep	Unnamed	TS	1946	Oct	Unnamed	TS	2004	Aug	Bonnie	TD
1885	Aug	Unnamed	TS	1947	Sep	Unnamed	ET	2007	Jun	Barry	TD
1885	Aug	Unnamed	H2	1947	Oct	Unnamed	TS	2012	May	Beryl	TD
1885	Sep	Unnamed	TS	1947	Oct	Unnamed	H2	2013	Jun	Andrea	TS
1888	Sep	Unnamed	TS	1950	Oct	Love	TD	2016	Jun	Colin	TS
1888	Oct	Unnamed	H1	1953	Sep	Unnamed	TD	2016	Sep	Hermine	TS
1893	Jun	Unnamed	TS	1953	Sep	Florence	ET	2016	Sep	Julia	TS
1893	Aug	Unnamed	H3	1954	Jul	Unnamed	TS	2016	Oct	Matthew	H2
1894	Sep	Unnamed	H1	1957	Jun	Unnamed	TS	2017	Aug	Unnamed	TS
1896	Sep	Unnamed	H2	1960	Jul	Brenda	TS	2018	Sep	Florence	H1
1898	Oct	Unnamed	H4	1964	Aug	Cleo	TS	2018	Oct	Michael	H4
1900	Oct	Unnamed	ET	1966	Jun	Alma	TS	2019	Aug	Dorian	H3
1906	Oct	Unnamed	TS	1968	Jun	Abby	TS	2019	Oct	Nestor	ET
1907	Jun	Unnamed	TS	1968	Sep	Unnamed	TD	2020	May	Bertha	TS
1907	Sep	Unnamed	TS	1970	May	Alma	TD	2020	Jul	Fay	TD
1910	Oct	Unnamed	TS	1972	May	Alpha	TS	2020	Aug	Isaias	H1

¹ TD – Tropical Depression, TS – Tropical Storm, ET – Extratropical Storm, H1 – Category 1 Hurricane, H2 – Category 2 Hurricane, H3 – Category 3 Hurricane, H4 – Category 4 Hurricane

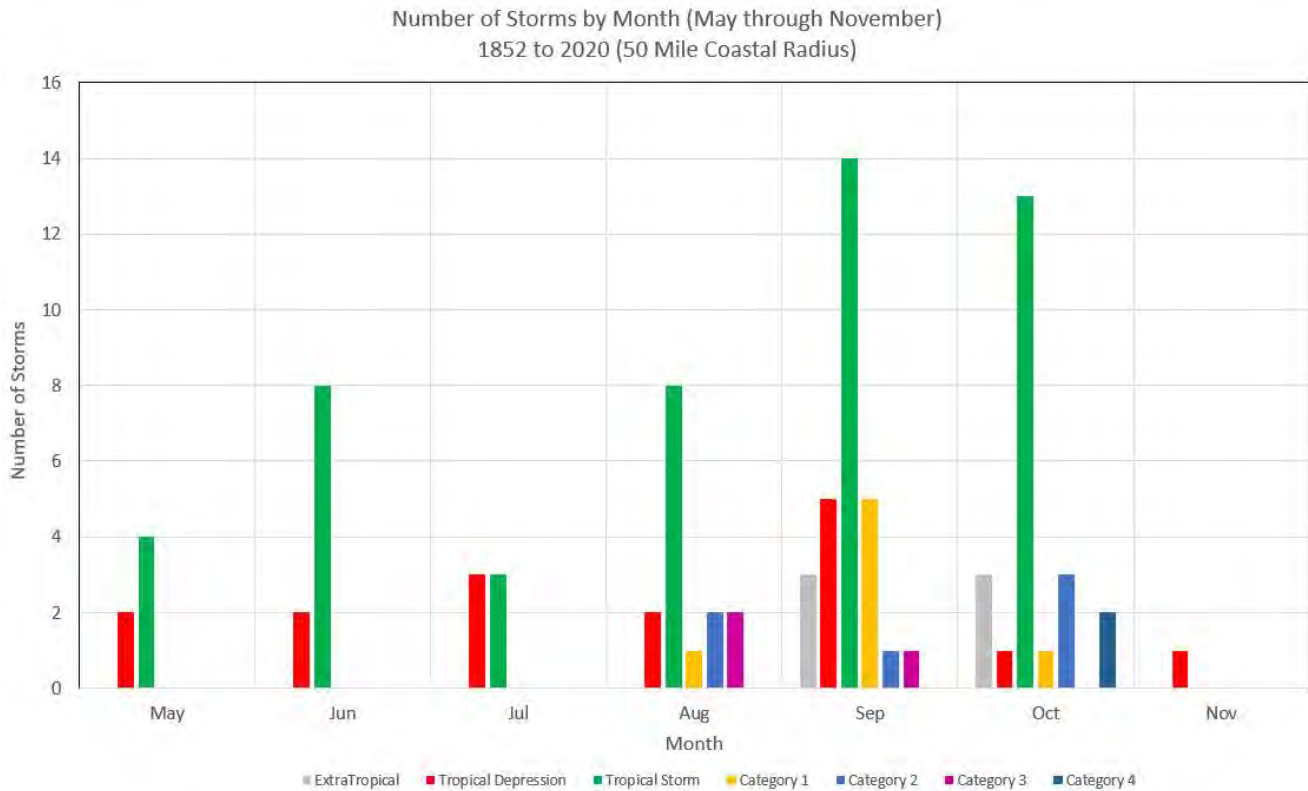


Figure 3-8: Historical Coastal Storm Distribution by Month

3.8.1.1 Storm Surge

Storm surge is defined as the rise of the ocean surface above its astronomical tide level due to storm forces. Surges occur primarily because of atmospheric pressure gradients and surface stresses created by wind blowing over a water surface. Strong onshore winds pile up water near the shoreline, resulting in super-elevated water levels along the coastal region and inland waterways. In addition, the lower atmospheric pressure that accompanies storms contributes to a rise in water surface elevation. Extremely high wind velocities coupled with low barometric pressures (such as those experienced in tropical storms, hurricanes, and very strong Nor'easters) can produce very high, damaging water levels. In addition to wind speed, direction, and duration, storm surge is influenced by water depth, length of fetch (distance over water), and frictional characteristics of the nearshore sea bottom. An increase in water depth may increase the potential for coastal flooding and allow larger storm waves to attack the shore.

During intense storm activity, waves erode sediment from shorelines, beaches, and dune systems, and storm surge can flood coastal and inland properties. The higher the storm surge elevation, the more flooding (and subsequently, more erosion, wave, and flood damage) is expected to occur.

The Georgia coastline has an average elevation of approximately 10.0 to 12.0 feet North American Vertical Datum of 1988 (NAVD88). FEMA has completed a Flood Insurance Study (FIS) for each of the coastal counties in Georgia, which provides storm surge elevations for 0.2-, 1-, 2-, and 10-percent annual exceedance probability (AEP) storms (FEMA 2018a, FEMA 2018b, FEMA 2018c, FEMA 2018d,

FEMA 2018e, FEMA 2017). **Table 3-5** provides surge levels versus storm frequency for Georgia’s coastal counties. FEMA determines surge along multiple transects for each county. Values presented here represent county averages. The storm surge elevations presented include the effects of astronomical high tide and wave setup. The storm tide consists of the actual level of sea water resulting from the normal high tide combined with the storm surge.

Table 3-5: Georgia Storm Tide Elevations

Annual Exceedance Probability	Total Storm Tide Level (Feet NAVD88)					
	Chatham	Bryan	Liberty	McIntosh	Glynn	Camden
10%	6.1	6.0	6.0	5.9	5.7	5.7
2%	8.4	8.3	8.3	8.1	7.8	7.8
1%	9.6	9.4	9.4	9.2	8.9	8.9
0.2%	11.8	11.6	11.6	11.3	10.9	10.9

3.8.1.2 Mean Tide Range

NOAA operates and maintains one active tide gauge (Fort Pulaski) and a database of 21 additional historical tide gauges with datum information along coastal Georgia (**Table 3-6**). Mean tide range (the difference between mean high water and mean low water), varies little along the coast, including in sounds, rivers, and tributaries. The minimum mean tide range is 5.9 feet (St. Marys River located in Camden County), and the maximum mean tide range is 8.0 feet (Turtle River in Glynn County). St. Simons and Jekyll Islands are located at the inward-most point of the Georgia Bight and experience the most severe tidal ranges. On average, the mean tide range for coastal Georgia is 6.9 feet.

Table 3-6: Tide Gauges and Datums: Georgia Coastline

Station ID	Station Name	Mean Higher High Water (feet)	Mean High Water (feet)	Mean Tide Level (feet)	Mean Sea Level (feet)	Mean Low Water (feet)	Mean Lower Low Water (feet)	NAVD 88 (feet)
8670870	Ft. Pulaski	7.50	7.13	3.67	3.82	0.21	0.00	4.05
8671314	Halfmoon Reef, Halfmoon River	7.60	7.20	3.71	3.80	0.22	0.00	---
8671315	Priest Landing, Wilmington River	7.90	7.51	3.87	3.99	0.23	0.00	---
8671086	Skidaway Institute, Skidaway River	8.37	7.97	4.11	4.27	0.24	0.00	---
8672667	Range A Light, Bear River	7.94	7.57	3.89	4.14	0.21	0.00	---
8672875	Sunbury, Sunbury Channel	7.86	7.51	3.87	4.24	0.22	0.00	---
8673171	South Ossabaw Island, Bear River	7.51	7.16	3.67	3.83	0.19	0.00	---
8673381	Halfmoon Colonels Island, Timmons River	7.95	7.58	3.91	4.39	0.23	0.00	---
8674301	Daymark No. 135, South Newport River	7.47	7.11	3.66	3.79	0.21	0.00	---
8674975	Daymark No. 156, Head of Mud River	8.11	7.72	3.97	4.20	0.22	0.00	---
8675622	Old Tower, Sapelo Island, Doboy Sound	7.43	7.04	3.63	3.67	0.21	0.00	---
8675761	Daymark No. 185, Rockdedundy River Entrance	7.51	7.14	3.68	3.75	0.21	0.00	---
8676329	Mackay River, Intracoastal Waterway, Buttermilk Sound	7.43	7.11	3.68	3.94	0.24	0.00	---
8677344	St. Simons Island	7.20	6.83	3.52	3.57	0.21	0.00	---
8677406	Howe Street Pier, Brunswick	7.72	7.35	3.79	4.01	0.22	0.00	---
8676808	Crispen Island, Turtle River	8.48	8.14	4.16	4.56	0.19	0.00	---
8678124	Raccoon Key Spit	7.12	6.77	3.49	3.56	0.21	0.00	---
8678322	Bailey Cut, Satilla River	7.31	7.02	3.62	3.93	0.23	0.00	---
8679511	Kings Bay	7.01	6.64	3.43	3.56	0.21	0.00	---
8679758	Dungeness, Seacamp Dock	6.78	6.43	3.31	3.43	0.20	0.00	---
8679945	Beach Creek	6.47	6.10	3.14	3.20	0.18	0.00	---
8679964	St. Marys, St. Marys River	6.39	6.06	3.13	3.30	0.20	0.00	---

3.8.2 Sea Level Rise

The SACS addresses sea level change in accordance with the guidance document USACE Engineering Regulation (ER) 1100-2-8162, Incorporating Sea Level Change in Civil Works Programs (USACE 2019a). This guidance document refers to “sea level change” (rather than sea level rise) because of its applicability throughout the nation, including locations where sea levels are falling are a result of land uplift. Within the entire SACS study area, sea levels are rising. Therefore, the SACS products refer to “sea level rise” to clearly communicate the sea level change trend occurring throughout the SACS study area. Rates were calculated for compliant gauges within Georgia and the adjacent Florida coast using the USACE Sea Level Change Curve Calculator Version 2021.12 (USACE 2021). This calculator uses the methodology described in Engineer Regulation (ER) 1100-2-8162, Incorporating Sea Level Changes in Civil Works Programs (USACE 2019a).

To incorporate the direct and indirect physical effects of projected future sea level change on design, construction, operation, and maintenance of coastal projects, the USACE has provided guidance in ER 1100-2-8162 and Engineering Pamphlet (EP) 1100-2-1 (USACE 2019a). ER 1100-2-8162 provides both a methodology and a procedure for determining a range of sea level change (SLC) estimates based on global sea level change rates, the local historic sea level change rate, the construction (base) year of the project, and the design life of the project. Three estimates are required by the guidance, a Low (Baseline) estimate representing the minimum expected sea level change, an Intermediate estimate, and a High estimate representing the maximum expected sea level change. These estimates are referenced to the midpoint of the latest National Tidal Datum epoch, 1992. ER 1100-2-8162 provides a detailed explanation of the procedure, equations employed, and variables included to account for the eustatic change, as well as site specific uplift or subsidence to develop corrected rates.

The state of Georgia has one National Ocean Service (NOS) gauge (Fort Pulaski, Georgia) with a data record that is compliant with USACE guidance (>40 years) which is located at the Georgia and South Carolina border (**Figure 3-9**). A compliant gauge is also available at Fernandina Beach, Florida near the Florida and Georgia border. **Table 3-7** summarizes the sea level trends at these two gauges. The historical trend of the mean sea level (MSL) from NOAA based on data through 2020 along with the 95 percent confidence interval and the equivalent change over 100 years are displayed along with the USACE Sea Level Calculator estimates for the year 2120 for the Low, Intermediate, and High sea level change scenarios (in feet, NAVD88). Sea level change values for the USACE scenarios have an origin year of 1992 and use the 2020 NOAA sea level change rates. The observed rates vary between 0.0072 feet/year (2.18 millimeters/year) at Fernandina Beach, Florida to 0.0111 feet/year (3.39 millimeters/year) at Fort Pulaski, Georgia.

Output from the USACE Sea Level Change Curve Calculator for Fernandina Beach, Florida and Fort Pulaski, Georgia are shown in **Figure 3-10** and **Figure 3-11**, respectively. These two gauges bound the expected range of sea level change in the state. Estimates for 2120 at Fernandina Beach, Florida are 0.39, 1.84, and 6.46 feet NAVD88 under the USACE Low, Intermediate, and High sea level change scenarios. For the same scenarios the estimates at Fort Pulaski, Georgia are 1.19, 2.65, and 7.27 feet NAVD88 demonstrating some of the variation in estimates across the state. **Figure 3-12** and **Figure 3-13** show tidal datums and extreme water levels for Fernandina Beach, Florida and Fort Pulaski, Georgia, respectively. Included in these figures are return period estimates based on an extreme value analysis of observed water levels at the gauge location computed by NOAA.

Table 3-7: USACE Sea Level Calculator Summary for Compliant Georgia Area Gauges

	Gauge 8670870	Gauge 8720030
Location	Fort Pulaski	Fernandina Beach
Period of Record	1935 - 2020	1897 – 2020
National Oceanic and Atmospheric Administration (NOAA) 2020 Relative Sea Level (RSL) Trend (feet/year)	0.0111	0.0072
NOAA 2020 95% Confidence Interval (feet/year)	0.00089	0.00056
Equivalent Change over 100 years (feet)	1.11	0.72
USACE Low Scenario 2120 (ft, NAVD88)	1.19	0.39
USACE Intermediate Scenario 2120 (ft, NAVD88)	2.65	1.84
USACE High Scenario 2120 (ft, NAVD88)	7.27	6.46
Conversion NAVD88 ft to 1992 MSL ft	0.23	0.53



Figure 3-9: Georgia Area National Ocean Service Gauges (USACE 2021)

Gauge Status: Active and compliant tide gauge
 Epoch: 1983 to 2001
 8720030, Fernandina Beach, FL
 User Defined Rate: 0.00715 feet/yr

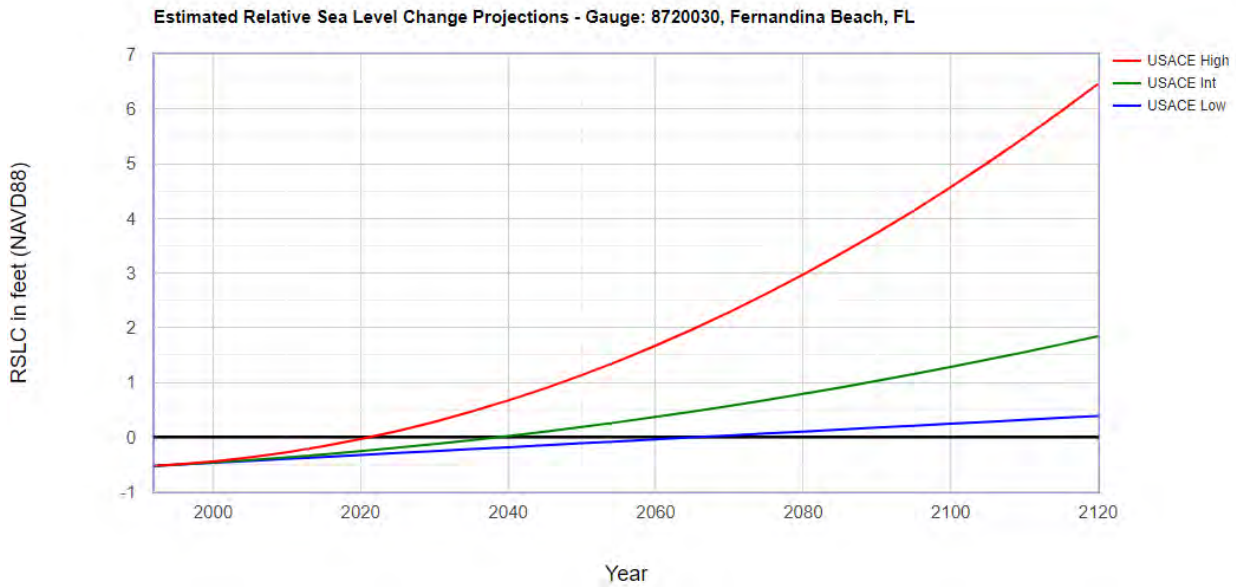


Figure 3-10: Sea Level Change Curve Calculator Output for Fernandina Beach, Florida, Showing Three USACE Scenarios

Gauge Status: Active and compliant tide gauge
 Epoch: 1983 to 2001
 8670870, Fort Pulaski, GA
 User Defined Rate: 0.01112 feet/yr

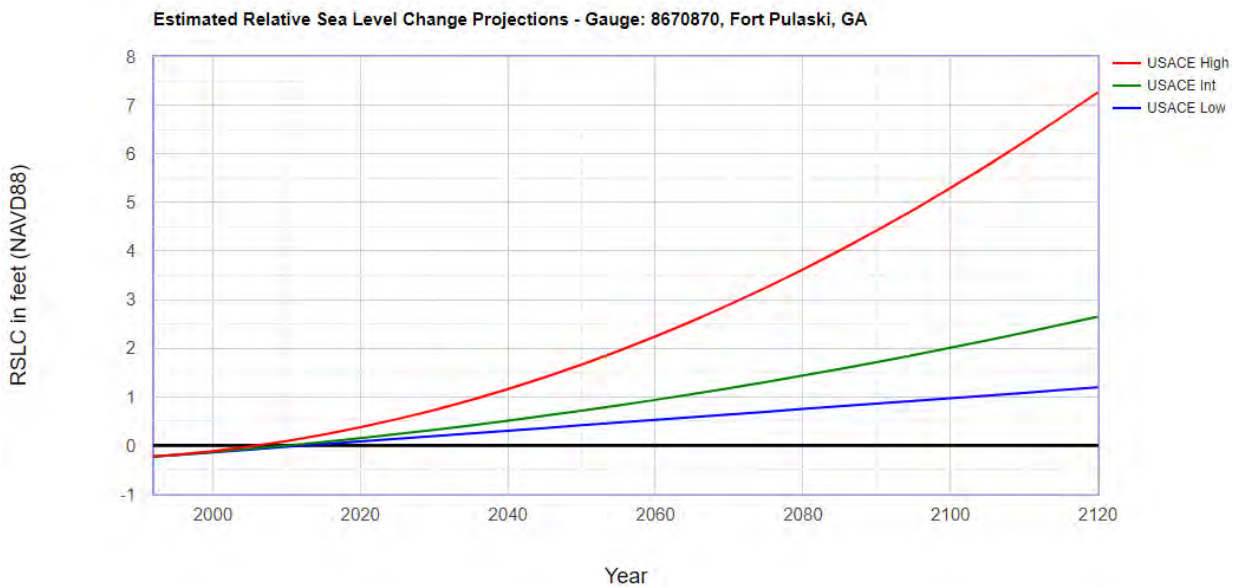


Figure 3-11: Sea Level Change Curve Calculator Output for Fort Pulaski, Georgia, Showing Three USACE Scenarios

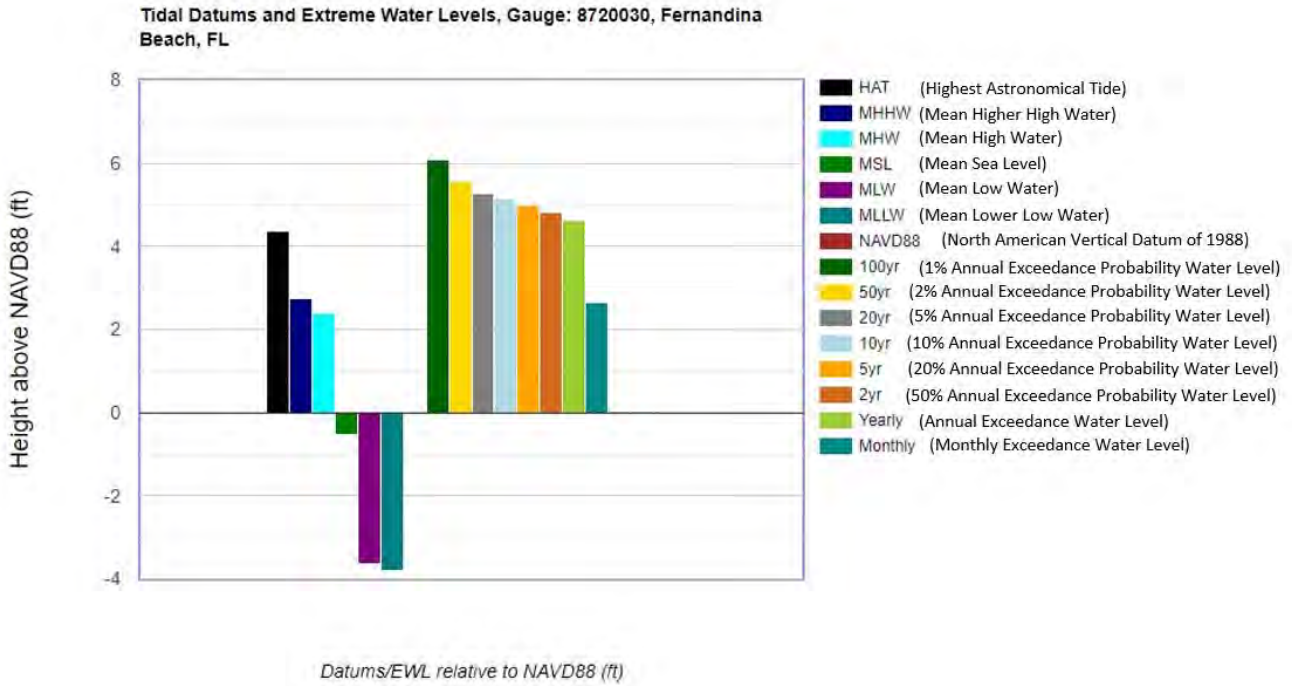


Figure 3-12: Sea Level Change Curve Calculator output for Fernandina Beach, Florida, showing Tidal Datums and Extreme Water Levels

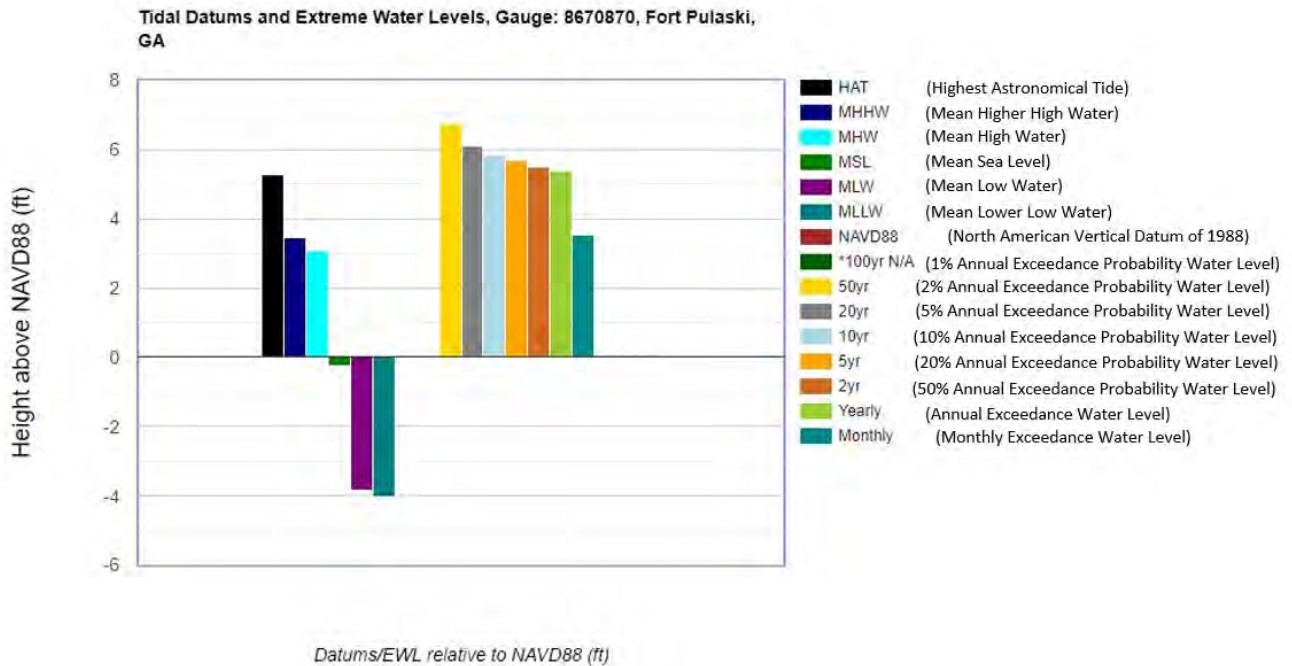


Figure 3-13: Sea Level Change Curve Calculator Output for Fort Pulaski, Georgia, Showing Tidal Datums and Extreme Water Levels

3.8.3 Sea Level Tracker

The USACE Sea Level Tracker tool allows users to view trends in historic sea level change at compliant gauge locations. Actual mean sea level at the gauge location can be visualized and compared with the three USACE sea level change scenarios presented above. The Sea Level Tracker plots for the two gauge locations previously discussed, Fernandina Beach, Florida and Fort Pulaski, Georgia, are shown in **Figure 3-14** and **Figure 3-15** using the same scenarios and rates discussed in the previous section. For both locations the 19-year moving average (dark blue) is tracking along the USACE Intermediate scenario while the shorter period 5-year moving average (light blue) is tracking between the Intermediate and the High scenarios. As shown in the below figures, historically there has been considerable short-term variability in measured sea levels. Therefore, the 19-year moving average, covering a long period of measurements is typically considered to be the most representative of the long-term sea level trend. USACE guidance considers all sea level change scenarios equally probable.

Sea Level Rise with USACE SLC Scenarios for Fernandina Beach, FL (8720030)

Active and compliant tide gauge

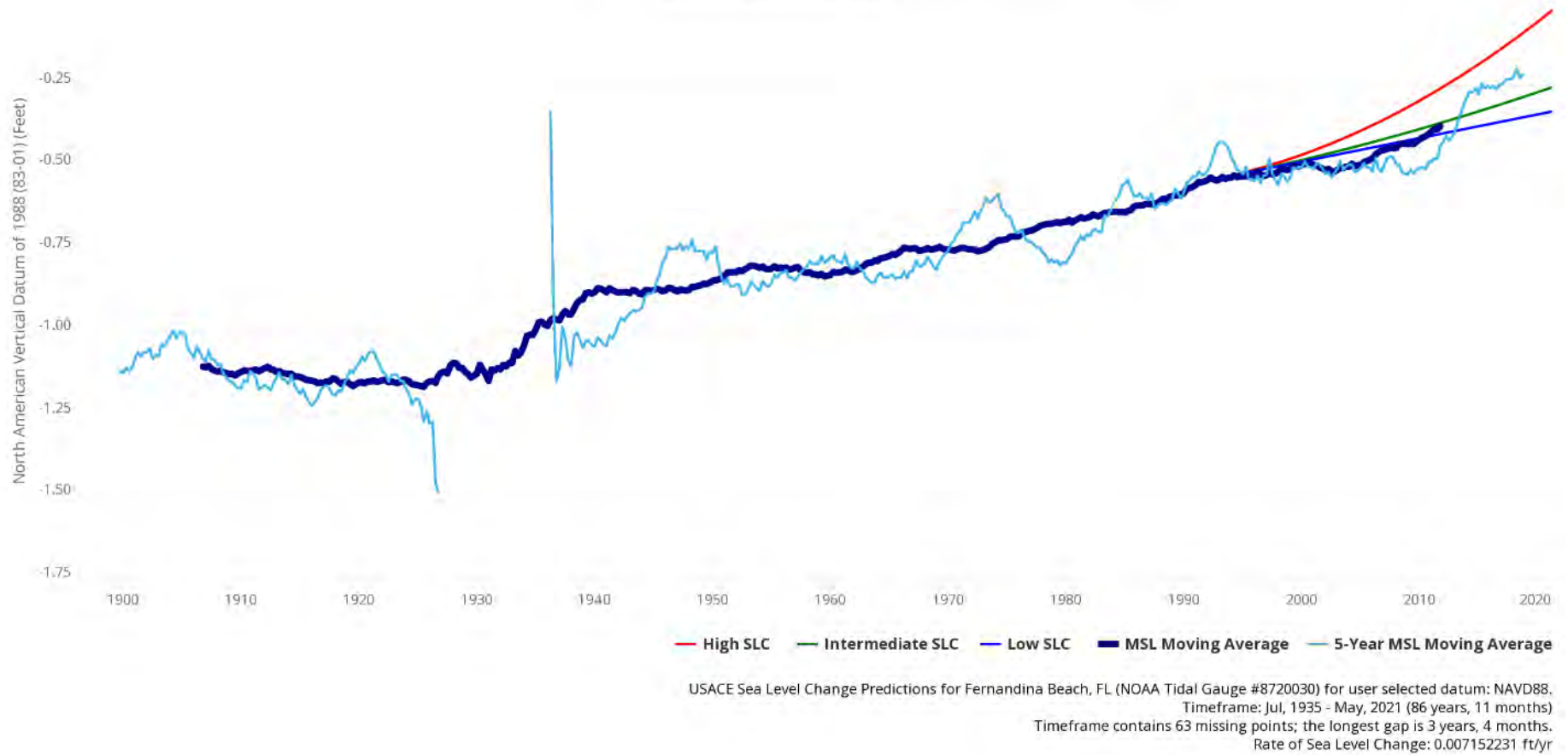
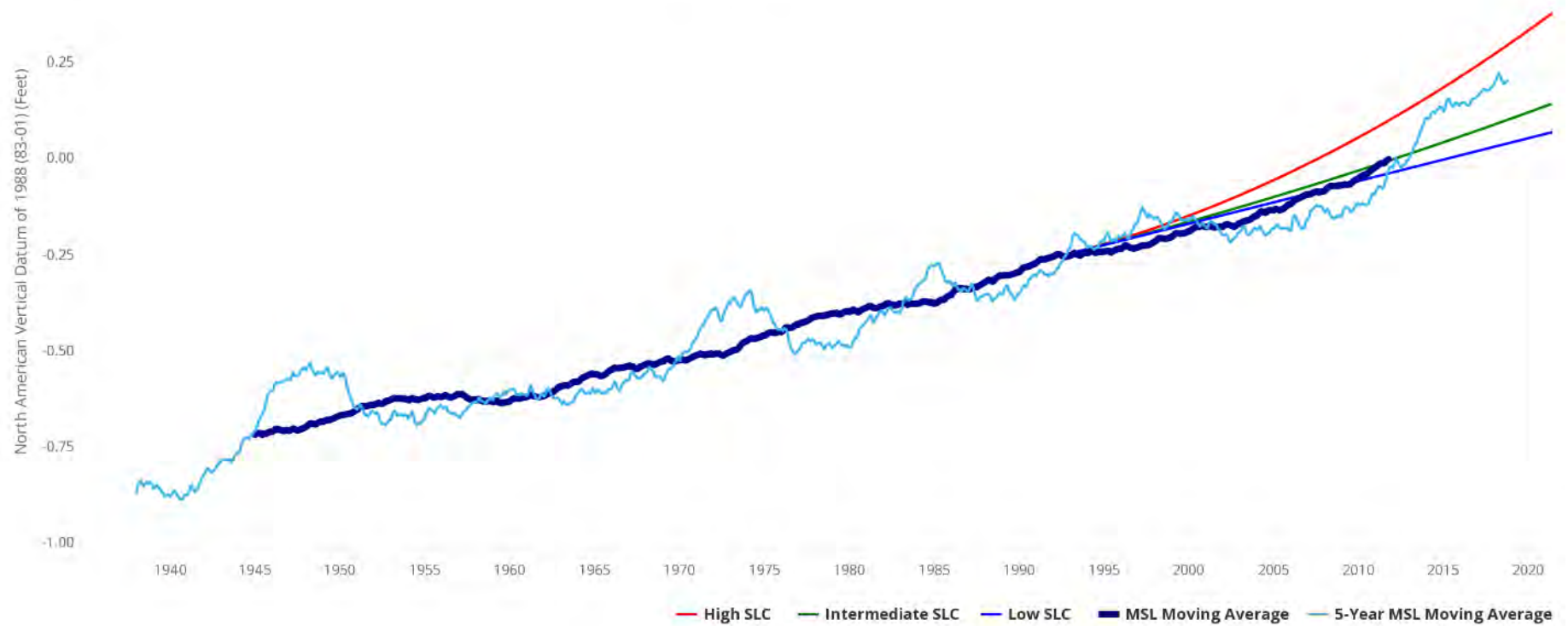


Figure 3-14: Sea Level Tracker for Fernandina Beach, Florida

Sea Level Rise with USACE SLC Scenarios for Fort Pulaski, GA (8670870)

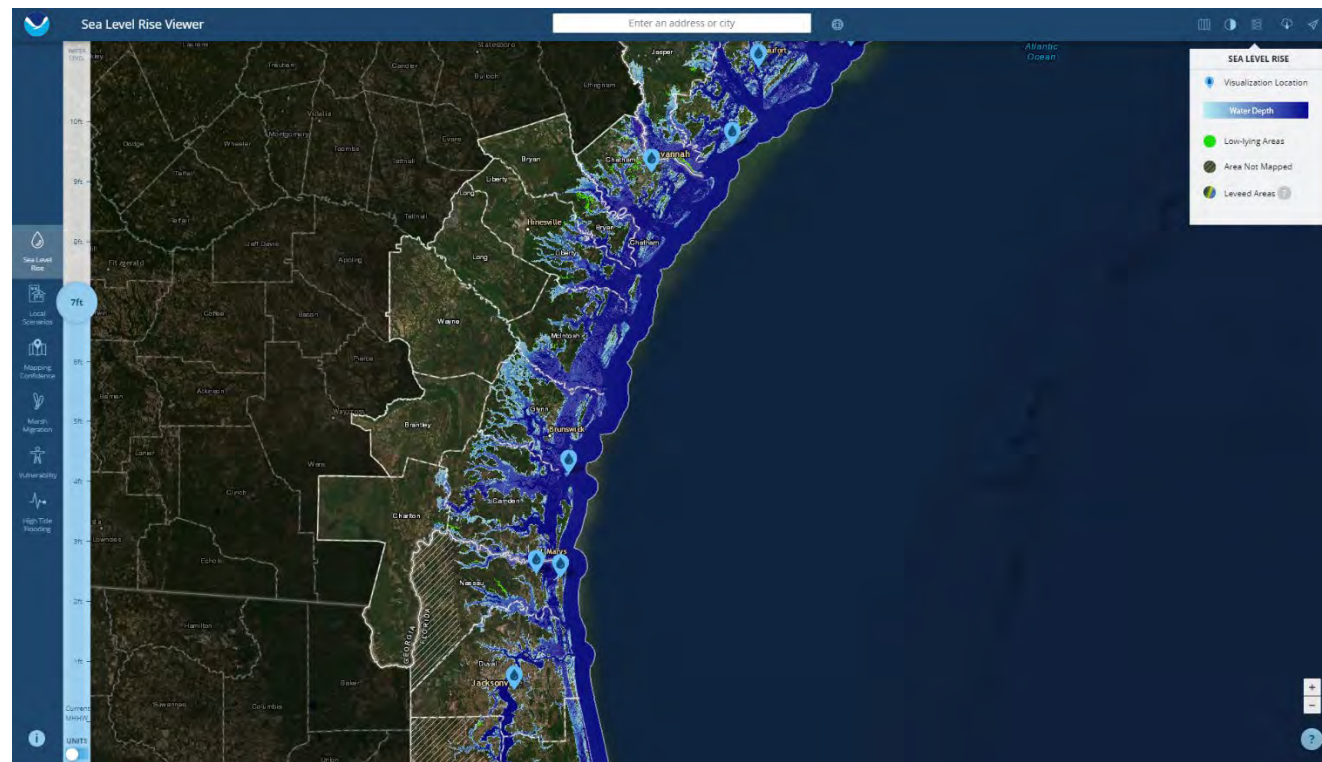
Active and compliant tide gauge

USACE Sea Level Change Predictions for Fort Pulaski, GA (NOAA Tidal Gauge #8670870) for user selected datum: NAVD88.
 Timeframe: Jan, 1901 - May, 2021 (120 years, 5 months)
 Timeframe contains 433 missing points; the longest gap is 1 years, 10 months.
 Rate of Sea Level Change: 0.011122047 ft/yr

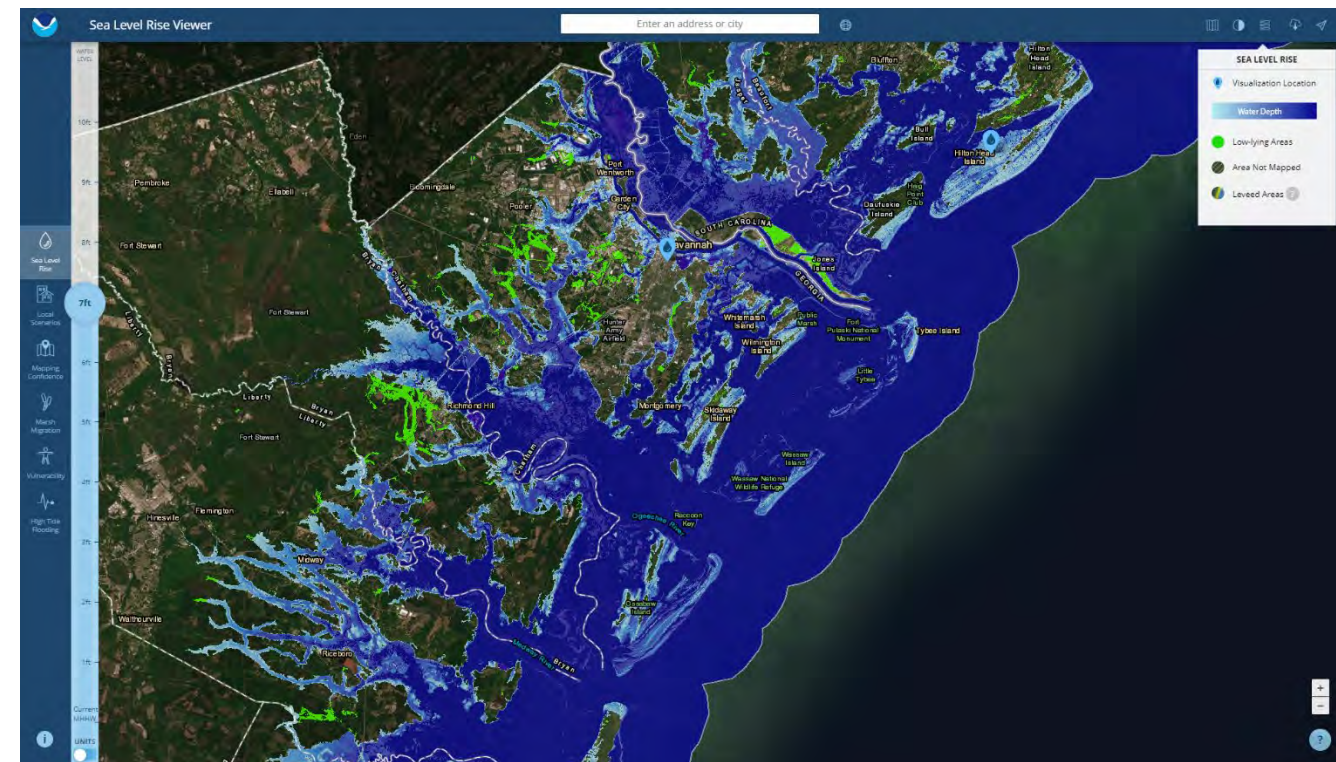
Figure 3-15: Sea Level Tracker for Fort Pulaski, Georgia

3.8.4 NOAA Sea Level Rise Viewer

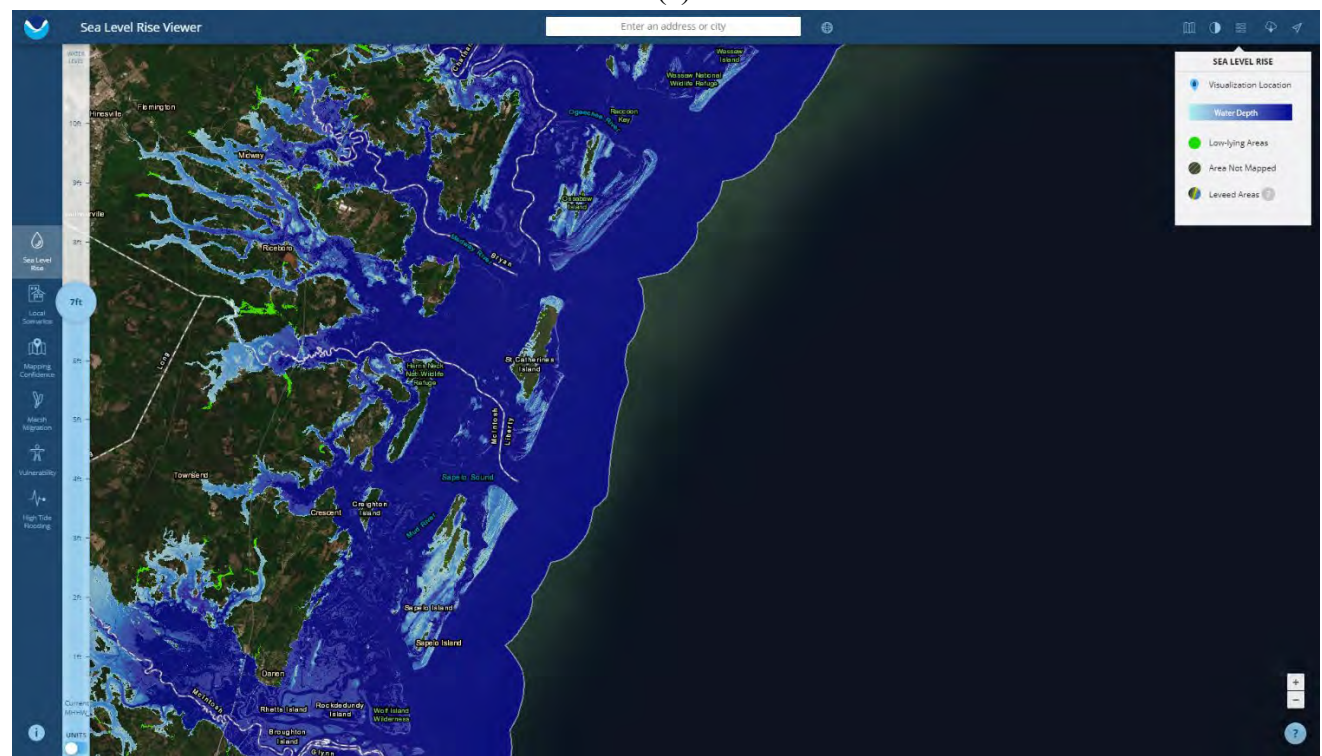
The NOAA Sea Level Rise Viewer is a tool used to simulate the inundation footprint due to elevated sea levels relative to local mean higher high water. Based on the USACE Sea Level Change Curve Calculator, the expected sea level rise using the USACE High Scenario is between about 6.5 and 7.5 feet in 2120. The NOAA Sea Level Rise Viewer tool was used at multiple locations across the state of Georgia to demonstrate the potential impacts of the USACE High Scenario estimate on coastal communities by applying 7 feet of sea level rise. The results for all of coastal Georgia, the Savannah area on the north coast, the central coast, and the Brunswick area and south coast are provided as examples in **Figure 3-16**. This figure shows that under the USACE High Scenario, the extent of the inundation footprint varies across the state, but it covers many highly populated areas as well as cultural and environmental resources. Also, of note is that there is large scale inundation of many of the barrier islands making the entire coast more susceptible to other hazards like storm surge and wave attack.



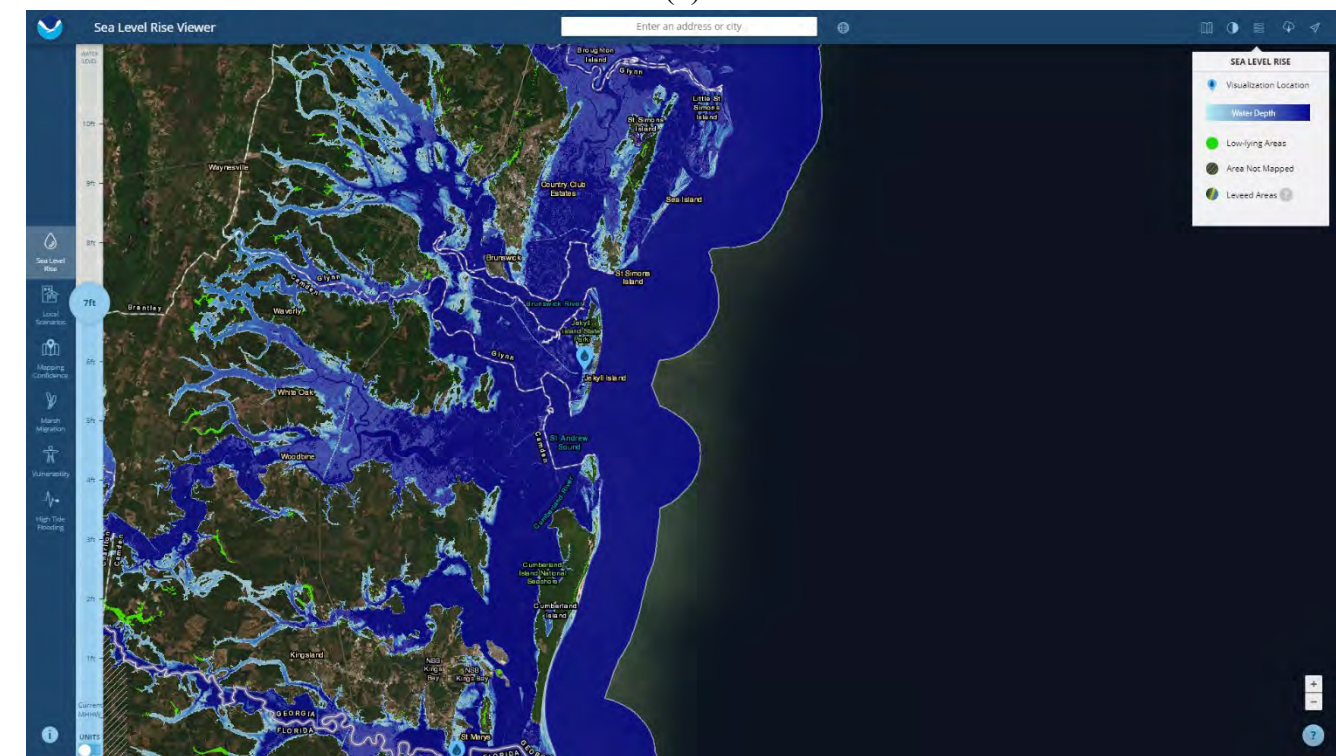
(a)



(b)



(c)



(d)

Figure 3-16: National Oceanic Atmospheric Administration Sea Level Rise Viewer Shown for all of (a) Coastal Georgia, (b) Savannah and the North Coast, (c) the Central Coast, and (d) Brunswick and the Southern Coast, with an Estimated 7-Foot Sea Level Rise Relative to Mean Higher High Water

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SECTION 4

Risk Assessment

The following sections detail hazard, exposure, and vulnerability information used to complete Tier 1 and Tier 2 Risk Assessments for Planning Reach GA_05. The goal of the Tier 1 Risk Assessment was to broadly identify locations where coastal storm flooding causes risk under existing conditions and where that risk is expected to increase by sea level rise using national-level datasets. The Tier 2 Risk Assessment provides additional detail of the flood risk using state- and local-level datasets and by adding quantified damages estimates for infrastructure using FEMA’s Hazus Flood Model, which is a standardized methodology that is used to estimate physical, economic, and social impacts of disasters and allows for the visualization of spatial relationships between populations and infrastructure and the hazard being modeled. The analysis included only coastal flooding and omitted any riverine flooding contributions to flood water elevations.

The SACS refers to risk and vulnerability as defined in Engineering Regulation (ER) 1105-2-101. The ER clearly states that flood risk can be conceptualized as a function of the hazard, performance, exposure, vulnerability, and consequences, as depicted in **Figure 4-1**. As such, risk can be reduced by modifying these components (i.e., by reducing vulnerability or exposure).

ER 1105-2-101 broadly defines risk as a situation or event in which something of value is at stake, and its gain or loss is uncertain. Risk is typically expressed as a combination of the likelihood and consequence of an event. Consequences are measured in terms of harm to people, cost, time, environment, property, and other metrics.

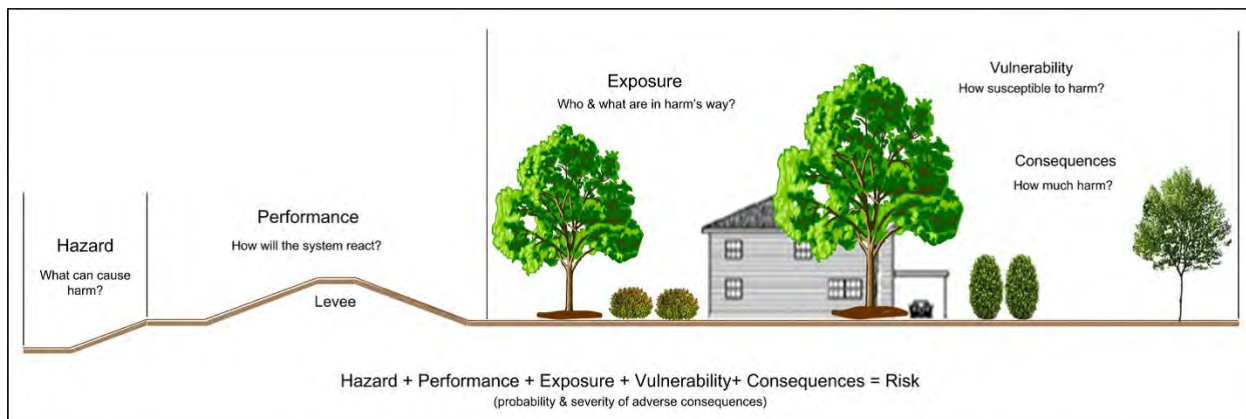


Figure 4-1: Risk Conceptualized

Definitions of risk components as utilized in the SACS include:

Hazard – In a general sense, hazard is anything that is a potential source of harm to a valued asset (human, animal, natural, economic, and social) (USACE 2014).

Performance – System’s reaction to the hazard, and its features and the capability to contain or manage the hazard for the full range of possible events. In the context of the SACS, performance can include multiple built or natural environments that contribute to how well the system reacts to a hazard.

Exposure – Describes who and what may be harmed by the flood hazard. Exposure incorporates a description of where the flooding occurs at a given frequency, and what assets exist in that area.

Vulnerability – Susceptibility of harm to human beings, property, and the environment when exposed to a hazard. Depth-damage functions, depth-mortality functions, and other similar relationships can be used to describe vulnerability.

Consequence – Harm that results from a single occurrence of the hazard. Consequences are measured in metrics such as economic damage, acreage of habitat lost, value of crops damaged, and lives lost.

Risk – Combination of likelihood and harm to people, property, infrastructure, and other assets.



This icon will serve as a guide through the Risk Assessment sub-sections. A red color indicates the risk component currently being assessed for a given Planning Reach.

In addition to planning reaches and county designations, several results from Tier 1 and Tier 2 analyses are reported by geographic types defined by the U.S. Census Bureau, mainly census places and census blocks. The following description of these areas is sourced from the University of Pittsburgh’s census information guide (University of Pittsburgh 2020) (**Figure 4-2**).

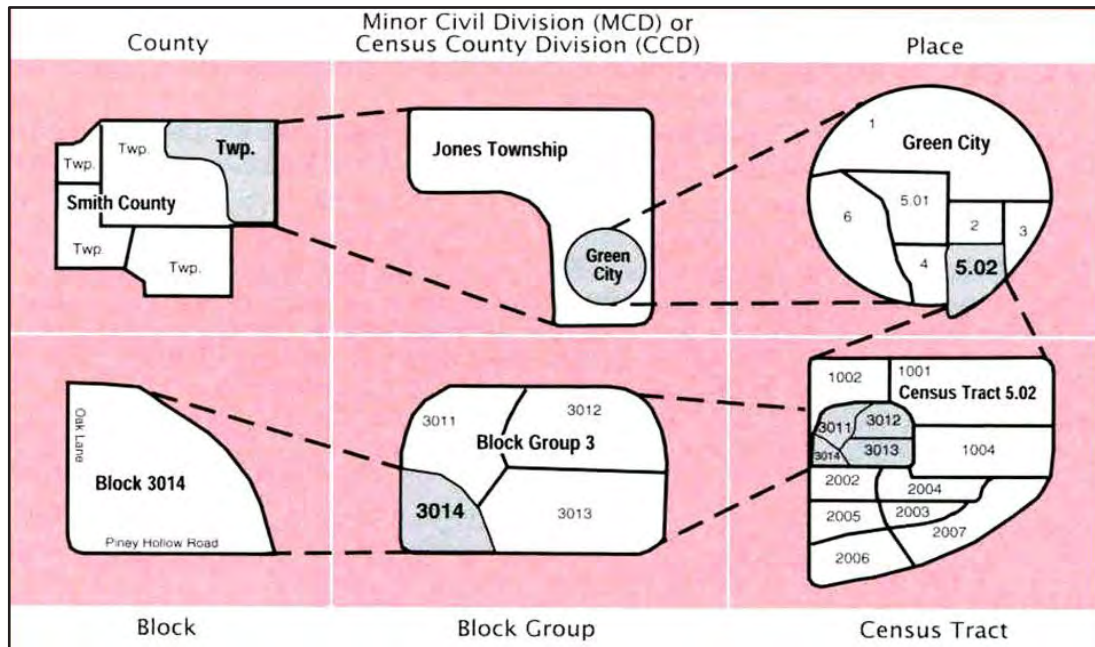


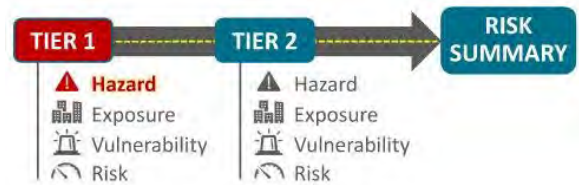
Figure 4-2: Understanding the Relationship Among U.S. Census Bureau Geographic Entities (University of Pittsburgh 2020)

- **Counties** and equivalent areas are the primary divisions of most states, Puerto Rico, and the island areas. They include counties in 48 states; parishes in Louisiana; boroughs and census areas in Alaska; municipios in Puerto Rico; independent cities in Maryland, Missouri, Nevada, and Virginia; and other entities in the island areas.
- **Census places** are concentrations of population, such as cities that have legally prescribed boundaries, powers, and functions.
- **Census tracts** generally contain between 1,000 and 8,000 people with an optimum size of 4,000 people. Census tract boundaries are delineated with the intention of being stable over many decades, so they generally follow relatively permanent visible features. However, they may follow governmental unit boundaries and other invisible features in some instances. The boundary of a state or county is always a census tract boundary.
- **Census blocks** are statistical areas bounded by visible features, such as streets, roads, streams, and railroad tracks, and by invisible boundaries, such as selected property lines and city, township, school district, and county limits and short line-of-sight extensions of streets and roads.

4.1 Planning Reach GA_05 Risk Assessment

4.1.1 Tier 1 Hazards

In a general sense, a “hazard” is anything that is a potential source of harm to a valued asset (human, animal, natural, economic, and social) (USACE 2014a). The Tier 1 Risk Assessment provides a consistent regional assessment of coastal flood risk caused by storm surge and sea level rise for the SACS study area scale. This is because, of all coastal storm hazards, storm surge inundation has the greatest potential to negatively impact populations and infrastructure. FEMA states that, “Floods are the most common and costly national disasters in the United States.” (FEMA 2019a).



Tier 1 flood hazards include the following list of water levels. Additional descriptions are provided in the Geospatial Appendix.

- 10-percent AEP water levels from the U.S. Army Engineer Research and Development Center Coastal and Hydraulics Laboratory (ERDC/CHL).
- 1-percent AEP water levels imported from the FEMA National Flood Hazard Layer (NFHL).
- Category 5 Hurricane Maximum of Maximum (MOM) hazard from NOAA’s Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model (Zachry et al. 2015; Jelesnianski et al. 1992).

In Tier 1, 3 feet of sea level rise was added to the 1-percent and 10-percent AEP flood hazard layers to simulate future flooding events. Three feet of sea level rise was not added to the Category 5 MOM due to the uncertainty of SLOSH modeling for such major events, as well as the extremely low probability of occurrence. The spatial extent of the 1-percent and 10-percent AEP events plus 3 feet of sea level rise fall within the bounds of spatial extent of the Category 5 MOM.

The timeframe of when 3 feet of sea level rise is projected to occur is dependent on the projection scenario and specific location within the SACS study area. **Figure 4-3** shows projected sea level change relative to a start year of 2020. The average of all active and compliant gauges (record lengths of greater than 40 years) throughout the SACS study area is plotted as the solid-colored line for each scenario. The shaded areas around each line show the variability range across the SACS study area.

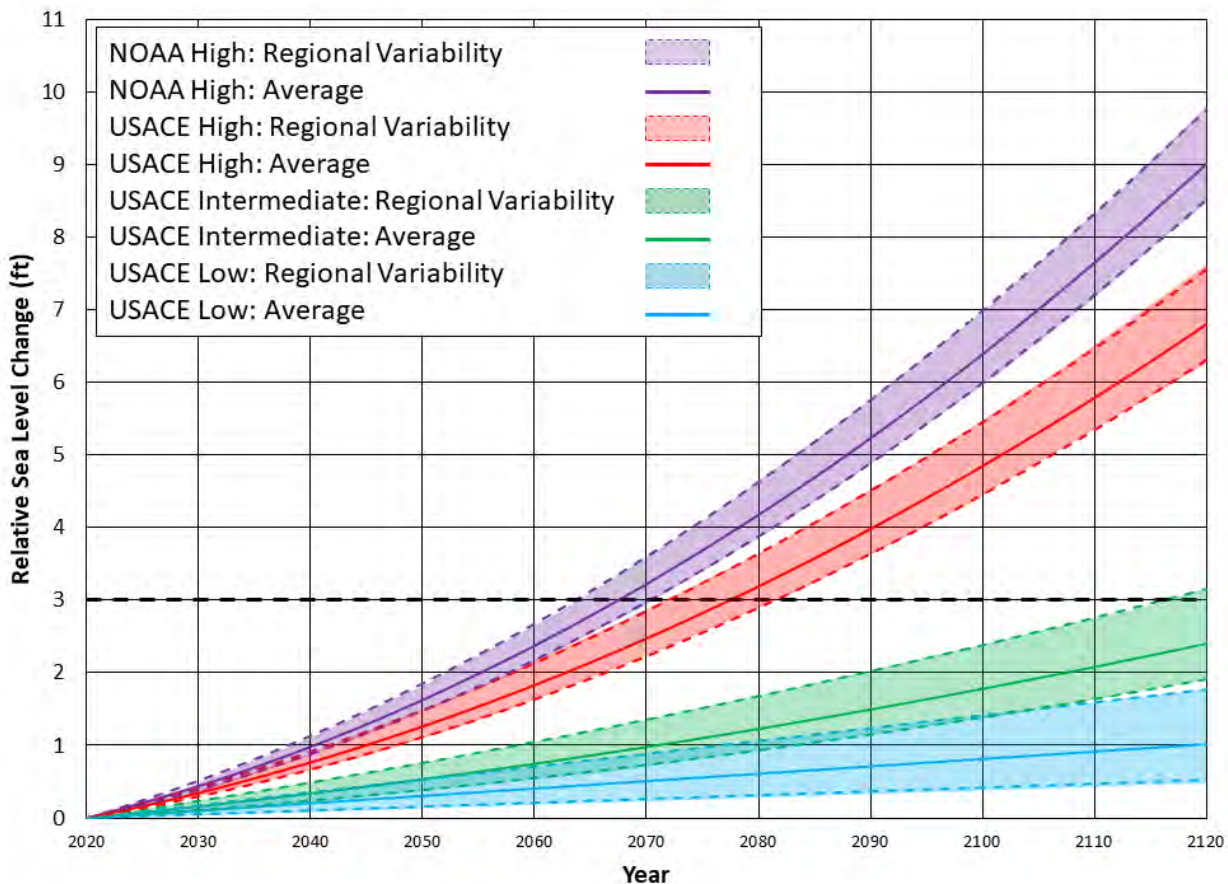


Figure 4-3: Mean Regional Sea Level Rise Projections for All Compliant Gauges Relative to 2020 Throughout the SACS Study Area

Figure 4-4 displays the existing (2020) and future flood hazards for Planning Reach GA_05, which includes the 10-percent AEP flood, the 1-percent AEP flood, and the Category 5 MOM. The Georgia coastline is dominated by low lying barrier islands and undeveloped marsh. Current flooding significantly impacts the barrier islands along the exposed Atlantic shoreline and extends into the back bay regions via channels and rivers. Marsh regions between and behind islands are typically inundated by flood events that exceed the 10-percent AEP flood level. Roadways and developed regions in low lying parts of the barrier islands and along channels and rivers begin to experience extensive flooding for events that exceed the 25-percent AEP flood level.

In the future condition with 3 feet of sea level rise, the inundation extent is increased in many of the coastal, back bay, and riverine areas showing the extent to which sea level rise would exacerbate existing coastal flooding hazards. It is expected that under the future condition, developed portions of the barrier islands would flood extensively for events that exceed the 10-percent AEP flood level. Coastal and inland flooding would increase significantly for all flood levels, particularly in the undeveloped regions that dominate the central coastline of the state and riverine areas. The extent of flooding is expected to vary significantly depending on natural topography as well as developed areas that may be elevated or include flood prevention measures.

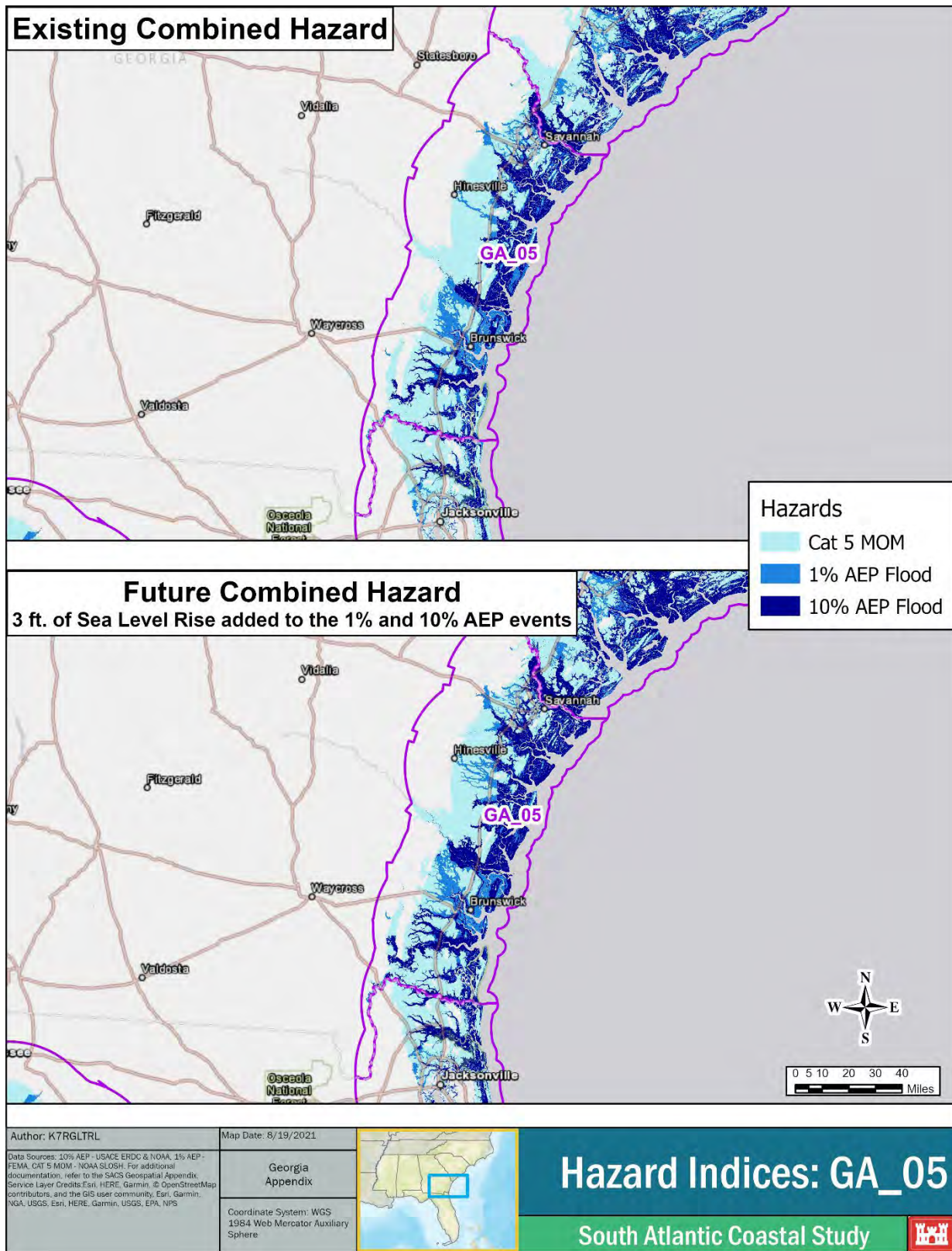
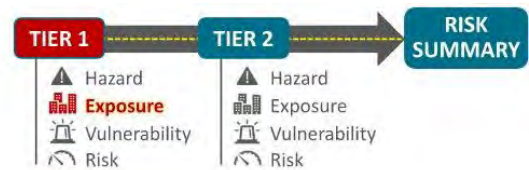


Figure 4-4: Existing and Future Hazard Indices for Planning Reach GA_05 from the 10-Percent Annual Exceedance Probability Flood, the 1-Percent Annual Exceedance Probability Flood, and the Category 5 Maximum of Maximum

4.1.2 Tier 1 Exposure

Exposure describes who and what may be harmed by the flood hazard. Exposure incorporates a description of where the flooding occurs at a given frequency and what exists in that area (ER 1105-2-101). At the broad Tier 1 scale, exposure was defined by the study area and not by individual hazard footprints. The Tier 1 analysis focused on the following categories and criteria to define exposure indices:



- **Population and Infrastructure Exposure Index:** Population density includes the number of people within an aerial extent across the study area. Infrastructure includes the critical infrastructure that supports the population and communities. These factors were combined to reflect overall exposure of the built environment.
- **Environmental and Cultural Resources Exposure Index:** This exposure index captures important habitat and selected cultural resources that would be affected by storm surge. Cultural resources were selected through both quantitative means, such as determining which cultural resources were located in areas of greater exposure, and qualitative means, such as literature review and stakeholder input.
- **Social Vulnerability Exposure Index:** Social vulnerability characterization includes certain segments of the population that may have more difficulty preparing for and responding to coastal flood events. Although this category is related to the vulnerability of the population within the study area, rather than actual exposure given the definition above, this category was maintained as an exposure index to maintain consistency with the NACCS.

The methodology and data used are described in the Main Report, Tier 1 Risk Assessment Viewer Overview tab, and the Geospatial Appendix. The three independent exposure indices identify the relative density of populations, infrastructure, environmental and cultural resources, and socially vulnerable populations within the existing condition. This information is important because it provides a better understanding of where there are facilities, populations and resources that could be exposed to harm by flood hazards.

The three independent exposure indices were weighted and added together to develop one Composite Exposure Index (CEI) to convey overall exposure. Weighting used in the NACCS methodology was 80/10/10 (80-percent population and infrastructure; 10-percent environmental and cultural resources; and 10-percent social vulnerability). The SACS weighting was modified from the NACCS to 60/30/10 (60-percent population and infrastructure; 30-percent environmental and cultural resources; 10-percent social vulnerability). This revised weighting better reflects the study authority and conditions in the study area for the following reasons:

- Lowering the weight of the Population and Infrastructure Exposure Index to 60 percent better reflects demographic differences in the coastal zone from the northeast. The southeast has lower urban population and development densities regionally and overall.

- Increasing the weight of the Environmental and Cultural Resources Exposure Index to 30 percent is consistent with authorizing language and better reflects the potential risk to vulnerable environmental resources that provide significant coastal storm risk management.

Figure 4-5 provides a visual overview of the three individual Tier 1 exposure indices for Planning Reach GA_05, as well as the CEI. Areas of red and amber indicate higher densities of populations, infrastructure, environmental and cultural resources, habitat, and socially vulnerable populations. Results of the specific exposure indices that contribute to the CEI are discussed in further detail in Sections 4.1.2.1 through 4.1.2.4.

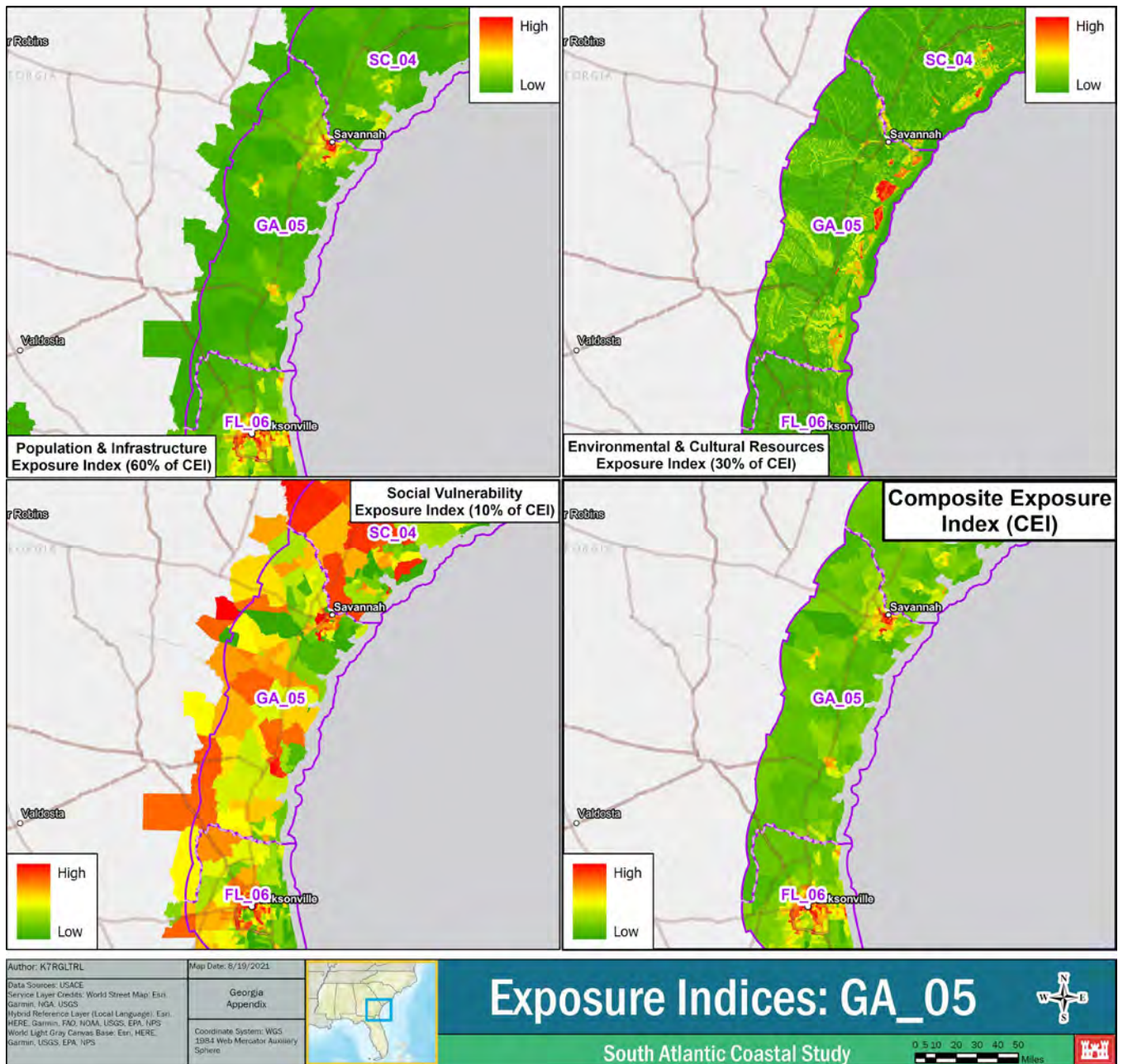


Figure 4-5: Exposure Indices in Planning Reach GA_05: Population and Infrastructure Exposure (Top Left), Environmental, Cultural, and Habitat (Top Right), Social Vulnerability (Bottom Left), and Composite Exposure (Bottom Right) under Current Conditions

4.1.2.1 Population and Infrastructure Exposure

The Tier 1 Population and Infrastructure Exposure Index used publicly available national and regional population and infrastructure datasets to reflect overall exposure of the built environment from coastal flood risk within the existing condition. The Population and Infrastructure Exposure Index datasets are detailed in Section 2.2.1 of the Geospatial Appendix. The population and infrastructure features were combined to reflect overall exposure from coastal flood risks as identified in **Figure 4-5**. **Figure 4-6** displays the Tier 1 individual Population (left) and Infrastructure (right) Exposure Indices for the planning reach. Population density includes the number of persons within an aerial extent across the study area; while infrastructure includes critical infrastructure that supports the population and communities. Areas of red and amber indicate areas of higher population density and infrastructure, while green indicates relatively low densities of population and infrastructure.

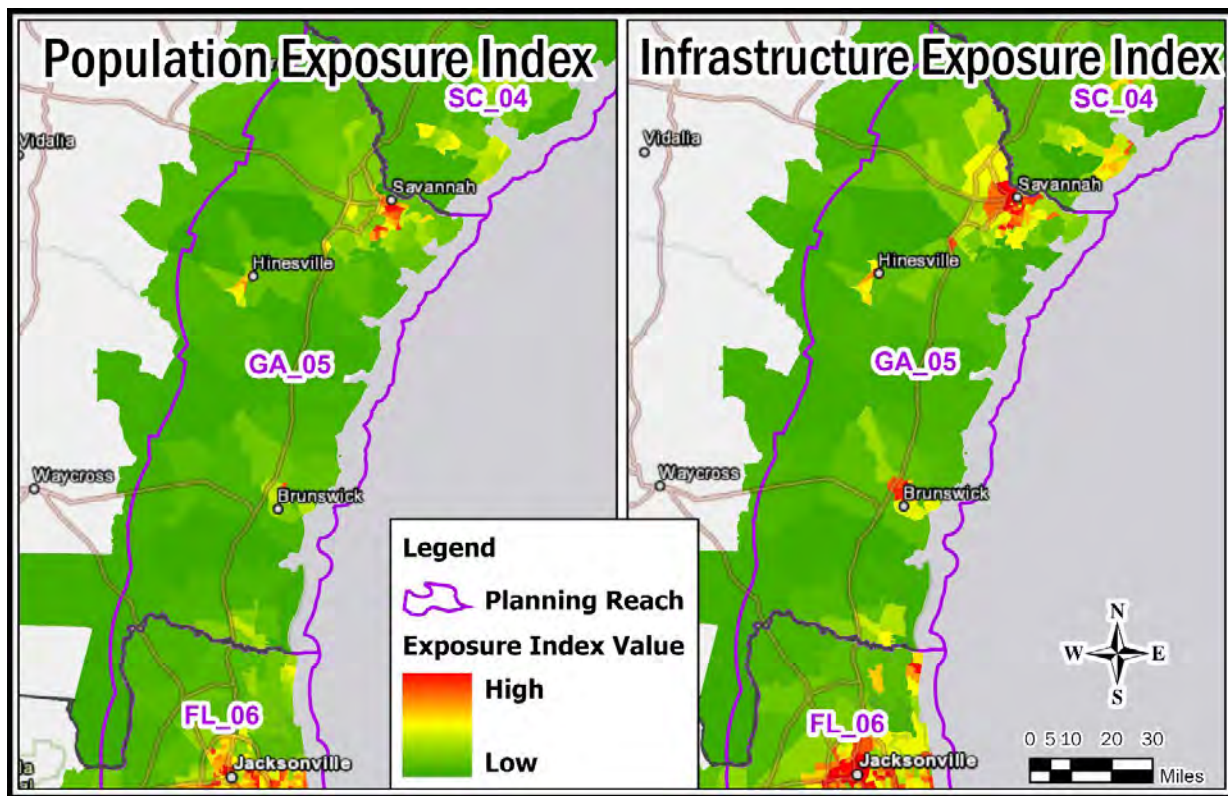


Figure 4-6: Tier 1 Population (left) and Infrastructure (right) Exposure Indices for Planning Reach GA_05 Under Existing Conditions

Based on the population and infrastructure exposure analysis, several hotspots of dense populations and infrastructure were identified within both coastal and inland areas. The city of Savannah in Chatham County has the highest population and supporting infrastructure within the planning reach, with corresponding high-exposure ratings identified in the Population and Infrastructure Exposure Index. Portions of unincorporated and adjacent Chatham County communities such as Garden City, Skidaway Island, White Bluff, Whitmarsh Island, and Wilmington Island were also classified as medium to high exposure, indicating denser populations and critical infrastructure potentially exposed from coastal flood risks caused by storm surge and sea level rise. Within the Savannah

metropolitan statistical area, the city of Richmond Hill in Bryan County was identified as having medium-high exposure. Approximately 80 miles south of Savannah, portions of the city of Brunswick and unincorporated and adjacent communities such as Dock Junction and Country Club Estates within Glynn County were identified as areas with medium to medium-high exposure. The planning reach includes major ports in Savannah and Brunswick, with the Port of Savannah located in an area identified as medium to high exposure and Port of Brunswick in an area of lower exposure.

4.1.2.2 Environmental Exposure

The Tier 1 Environmental and Habitat Exposure Index used publicly available national and regional datasets to capture important habitat that would be affected by storm surge within the existing condition. The Environmental and Habitat Exposure Index datasets are detailed in Section 2.2.2 of the Geospatial Appendix. The habitat, environmental, and cultural features were combined to reflect overall exposure from coastal flood risks as identified in **Figure 4-5**. **Figure 4-7** displays the Tier 1 individual Environmental (left) and Habitat (right) Exposure Indices for the planning reach.

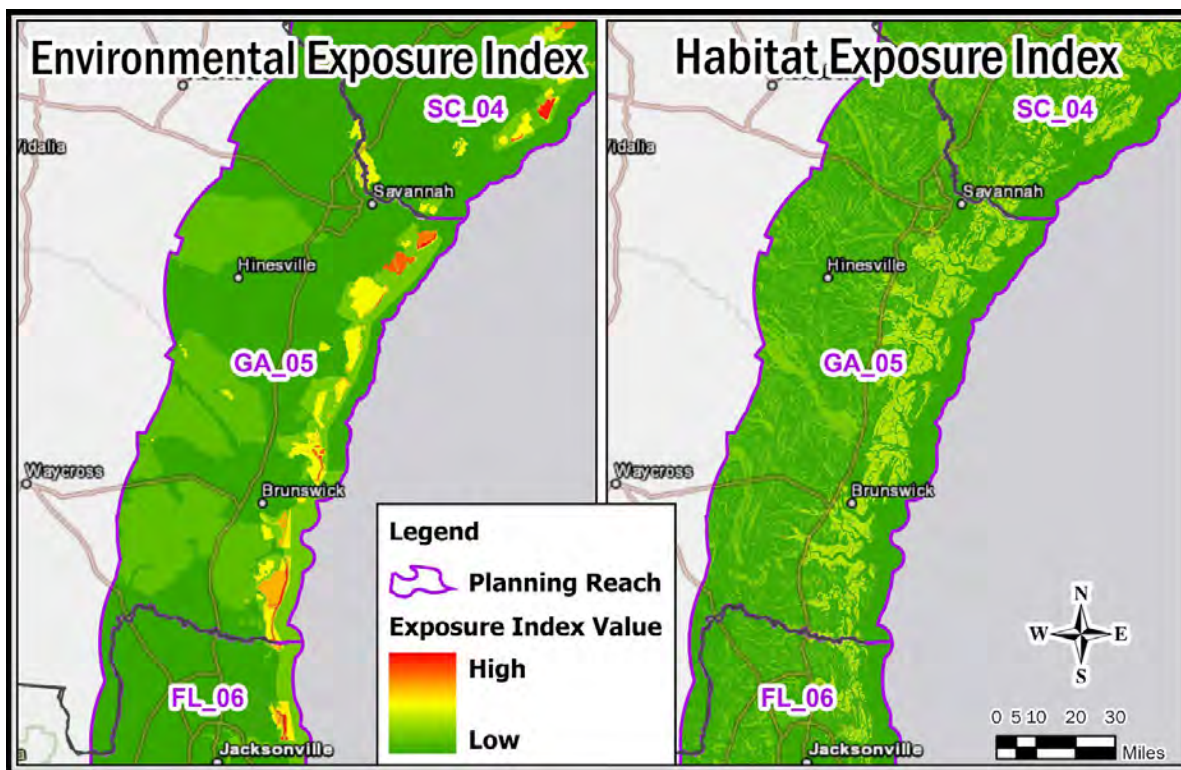


Figure 4-7: Tier 1 Environmental (Left) and Habitat (Right) Exposure Indices for Planning Reach GA_05 Under Existing Conditions

Notable densities of environmental resources, (indicated by red, amber, and yellow) are found in the barrier islands along Georgia’s coast that consist of high marsh and hammocks (habitats not routinely inundated by tides), intertidal beaches, and coastal inlets (**Figure 4-7**). Reduction in this protective buffer would subsequently have direct impacts to successional wetlands and marshes (fresh and saltwater), those species dependent on barrier island habitats.

As shown in **Table 4-1**, many of the areas identified as medium-high to high exposure are barrier islands along the coastline, which contains a mixture of valuable habitat such as mudflats, low-lying saltmarsh, hammocks, high marsh, and maritime forests. The Georgia barrier islands provide valuable habitat for a wide range of fish and wildlife species as well as containing designated critical habitat for protected species including piping plover, loggerhead sea turtles, and West Indian manatees. Inundation exposure from coastal flood risks caused by storm surge and sea level rise can impact currently designated critical habitat for species such as the piping plover and the loggerhead sea turtle, by causing a loss of available nesting and foraging habitat.

Table 4-1: Tier 1 Environmental and Cultural Resources Exposure Index High to Medium Exposure Locations Under Existing Conditions

County	Designated Critical Habitat	High	Medium-High	Medium
Chatham	Little Tybee Island beach: piping plover	Little Tybee Island, Wassaw Island	–	Little Tybee Island, Wassaw Island
Bryan	–	–	–	Ossabaw Island
Liberty	St. Catherines Island beach	–	St. Catherines Island	N/A
McIntosh	Certain beaches: piping plover and loggerhead sea turtles	–	Blackbeard Island	Sapelo Island Wolf/Egg/Little Egg Islands
Glynn	Certain beaches: piping plover	Little St. Simons Island Jekyll Island	Little St. Simons Island Jekyll Island	–
Camden	Certain beaches: piping plover, loggerhead sea turtles, and West Indian manatee (nearshore)	–	Cumberland Island	Cumberland Island

4.1.2.3 Cultural Resource Exposure

The Tier 1 Cultural Resources Exposure Index used publicly available national and regional data sets, such as the National Register of Historic Places (NRHP) national database and Georgia’s Natural, Archaeological and Historic Resources Geographic Information System (GNAHRGIS), to capture selected cultural resources that would be affected by storm surge within the existing condition. The Cultural Resources Exposure Index datasets are detailed in Section 2.2.2 of the Geospatial Appendix. Cultural resources were selected based on qualitative means (i.e., were located in areas of higher exposure) and quantitative means (i.e., stakeholder input). The habitat, environmental, and cultural features were combined to reflect overall exposure from storm surge as identified in **Figure 4-5**. **Figure 4-8** displays the Tier 1 individual Cultural Resource Exposure Index for the planning reach.

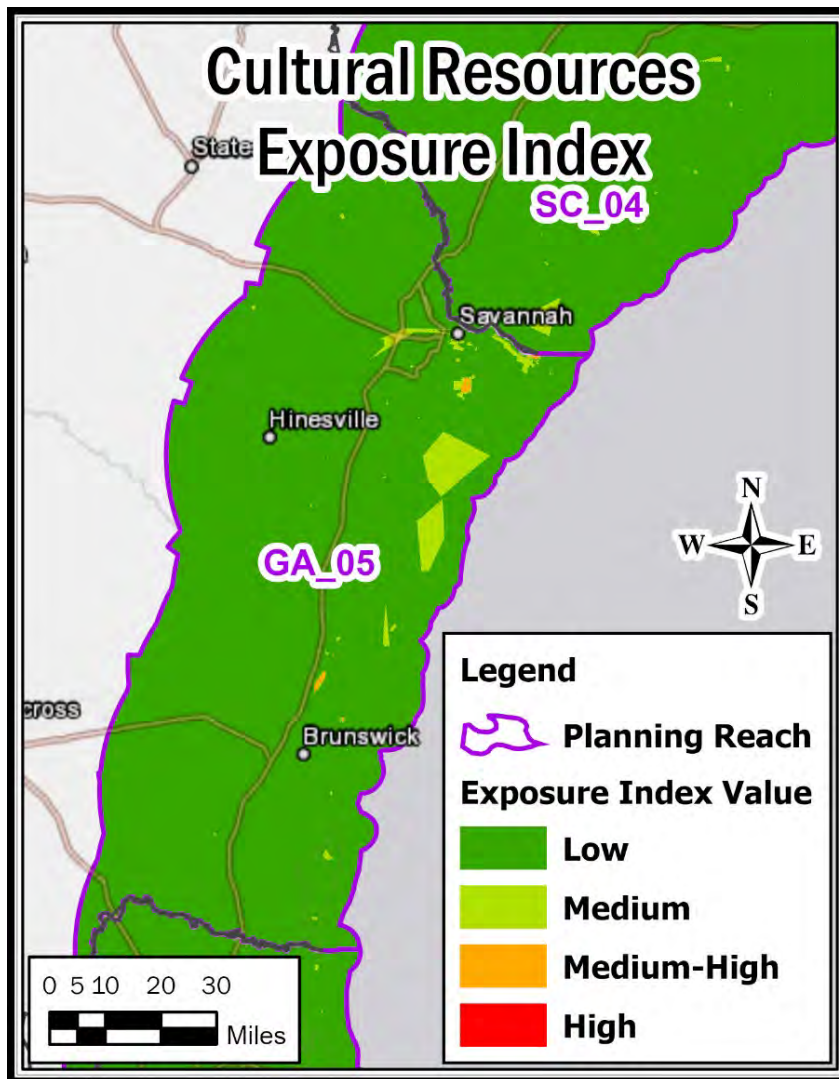


Figure 4-8: Tier 1 Cultural Resources Exposure Index for Planning Reach GA_05 Under Existing Conditions

Results of the Cultural Resource Exposure Index analysis shows that this planning reach holds several areas with medium to low densities of cultural resources throughout the planning reach (**Table 4-2**). Resources that have low to medium cultural resource exposure include prehistoric and historic archeological sites/structures within several of the coastal counties, as well as national monuments, a historical plantation, and historic districts. All of these cultural resources have the potential to be exposed within the future conditions by the projected 3 feet of sea level rise, threatening to negatively impact historically significant archeological sites and historic districts within the planning reach. The table below is not all-inclusive. Selected cultural resources located in these areas are included to serve as examples of the types of resources that may be present. The selection of these resources was based on a qualitative assessment of stakeholder feedback and the significance assigned to these historic resources and archaeological sites (typically National Register eligibility).

Table 4-2: Tier 1 Low to Medium Exposure Cultural Resources Locations Under Existing Conditions

County	Medium	Low
Chatham	Ft. Pulaski National Monument (north of Tybee Island)	Savannah Historic District; Savannah’s historic cemetery; Ossabaw Island Historic District—39 square miles of prehistoric and historic archeological sites
Bryan	–	Fort McAllister
Liberty	–	St. Catherines Island Historic District—35 square miles of prehistoric and historic archeological sites; a 94-acre historic plantation
McIntosh	–	Sapelo, a 427-acre historic district; a post-Civil War African American settlement; Gullah Geechee Cultural Heritage Corridor; Ft. King George Historic Site
Glynn	Ft. Frederica Hofwyl-Broadfield Plantation	Colonial Brunswick (289 acres); Jekyll Island Club historic structures
Camden	–	Cumberland Island (700 acres) historic district; 21 buildings; nine archeological sites

4.1.2.4 Social Vulnerability Exposure

The Tier 1 exposure analysis helped identify areas with relatively high social vulnerability within the Planning Reach GA_05 in both coastal and inland areas as identified in red and orange in **Figure 4-9**. The primary data set used for the Social Vulnerability Exposure Index is the Centers for Disease Control (CDC) Social Vulnerability Index (SVI). The Social Vulnerability Index datasets are detailed in Section 2.2.3 of the Geospatial Appendix. The CDC uses 15 census-derived factors on a percentile index to create a generalized SVI at the census tract level. The SVI groups the 15 census-derived factors into four themes (socioeconomics, household composition/disability, minority/language, and housing/transportation) that summarize the extent to which the area is socially vulnerable to disaster. The 15 census-derived factors and their groupings are:

- Socioeconomic status (below poverty, unemployed, income, no high school diploma).
- Household composition and disability (aged 65 or older, aged 17 or younger, older than age 5 with a disability, single-parent households).
- Minority status and language (minority, speak English “less than well”).
- Housing type and transportation (multi-unit structures, mobile homes, crowding, no vehicle, group quarters).

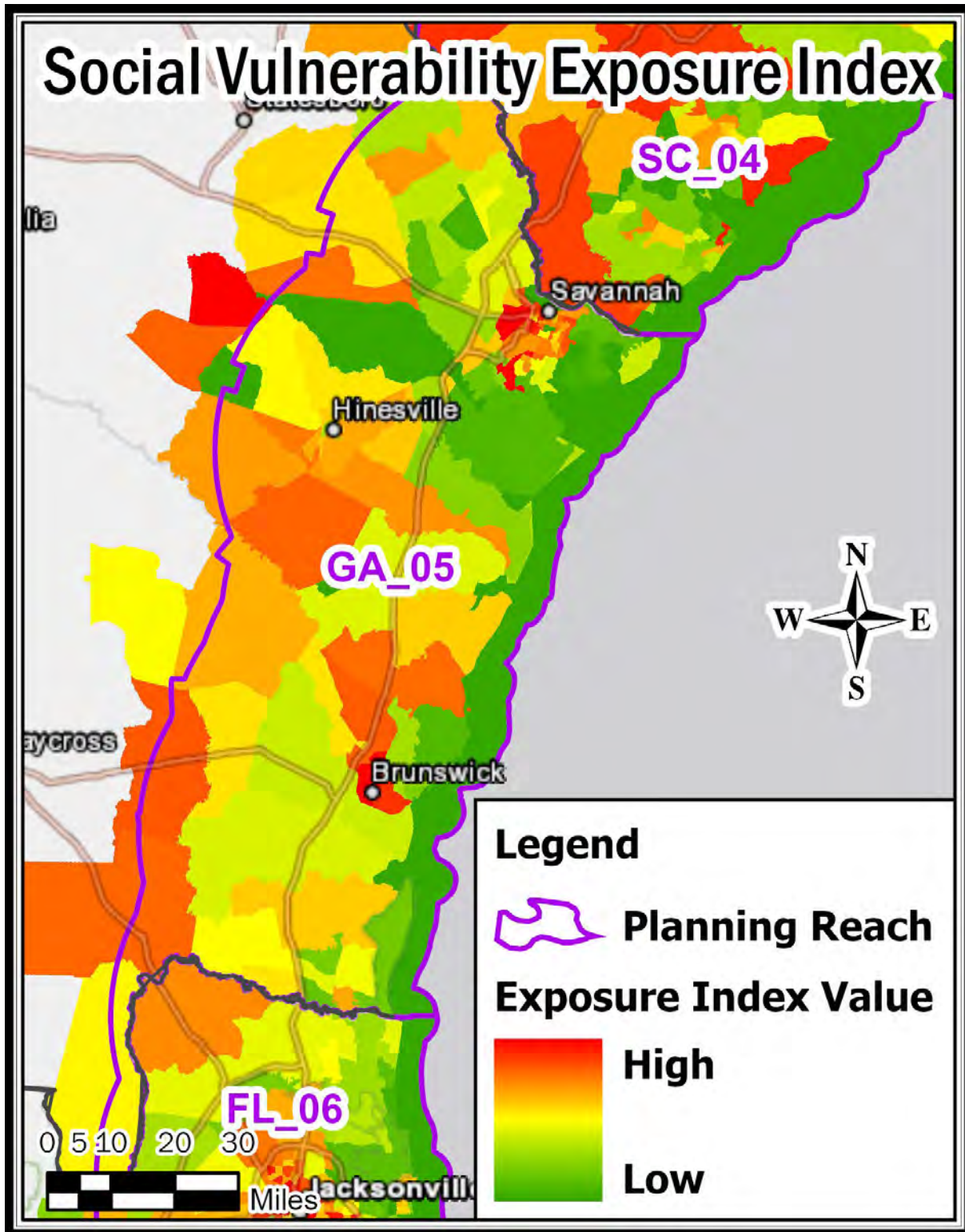


Figure 4-9: Tier 1 Social Vulnerability Exposure Index for Planning Reach GA_05 Under Existing Conditions

Within the coastal counties, areas identified with high social vulnerability are predominately located in Chatham and Glynn Counties, medium-high in McIntosh County, and medium in Camden County. As identified in **Figure 4-9**, the highest exposure values (shown in red) correlated with the more densely populated cities of Savannah and Brunswick. Notably, many barrier island communities are identified as having lower social vulnerability, while inland communities approaching the western terminus of the planning reach are largely within the moderate to moderate-high range.

An overall SVI score is calculated at the county level with possible scores ranging from 0 (lowest vulnerability) to 1 (highest vulnerability). Except for Bryan County, the overall scores for the Georgia coastal counties indicate a moderate to high level of social vulnerability. The major factors contributing to high vulnerability within these counties was further assessed by the scoring of the four themes identified in **Table 4-3** in conjunction with the 2010 Census demographic data.

Table 4-3: Centers for Disease Control Social Vulnerability Index Ranking for Coastal Counties

CDC SVI Score	Chatham County	Bryan County	Liberty County	McIntosh County	Glynn County	Camden County
Overall	0.6858	0.3403	0.8106	0.5817	0.7851	0.5540
Socioeconomic	0.5349	0.3833	0.7170	0.7650	0.5294	0.4798
Household Composition/Disability	0.2639	0.4979	0.6323	0.8691	0.8389	0.4467
Minority/Language	0.8526	0.6441	0.8599	0.505	0.8147	0.5842
Housing/Transportation	0.8424	0.1480	0.6988	0.0958	0.8045	0.6523

Socioeconomic aspects of particular concern that may affect a community's ability to mitigate, evacuate, and recover from coastal flood hazards include mobile home residents, age, household income, vehicle availability, and crowded households.

Table 4-4 compares 2010 Census-derived demographic data for Planning Reach GA_05 to the national average. Excluding Chatham County, Georgia's coastal counties have significantly higher percentage of mobile home residents than the state and national averages. McIntosh County has a CDC housing/transportation SVI Score of nearly 1, with approximately 40 percent of the county's residents residing in mobile homes. These highly vulnerable residents may need help locating and securing safe shelter for themselves and their families in the event of a coastal storm.

Most coastal counties have poverty levels above the national average except for Bryan County. The low-income segment of the population may not have access to the physical or fiscal resources necessary to facilitate an evacuation. In Chatham County, a significant portion of the population (approximately 9 percent) does not own a vehicle, which may also necessitate transportation assistance to evacuate.

The age breakdown of the population reflects a larger number of people over age 65 living in McIntosh and Glynn Counties. With age comes the potential for prior hurricane experience, depending on the length of residence in the area. This experience could positively or negatively impact their evacuation decision making and behavior. Past behavioral studies have shown that persons over 65 are more reluctant to evacuate than younger populations (USACE 2013b).

Table 4-4: Demographics by Coastal County (U.S. Census Bureau 2021, USACE 2013c)

Category	Demographics of Coastal Counties	National Average	Chatham County	Bryan County	Liberty County	McIntosh County	Glynn County	Camden County
Population	Population	308,745,538	265,128	30,233	63,453	14,333	79,626	50,513
Density	Persons per Square Mile	88.4	621.7	69.3	129.5	33.8	189.7	82.4
Age	Median Age	37.2	34.0	35.7	27.9	44.4	39.4	33.5
Age	Persons Under 18 Years	24.0%	22.6%	29.3%	30.2%	21.5%	24.2%	27.0%
Age	Persons Over 65 Years	13.0%	12.4%	9.0%	6.3%	17.3%	15.0%	9.0%
Race	White	72.4%	52.8%	80.2%	47.1%	61.5%	67.6%	74.7%
Race	African American	12.6%	40.1%	14.2%	42.2%	35.9%	26.0%	19.4%
Race	Asian	4.8%	2.4%	1.6%	2.0%	0.3%	1.2%	1.4%
Race	American Indian and Alaska Native	0.9%	0.3%	0.3%	0.6%	0.4%	0.3%	0.5%
Race	Native Hawaiian and Pacific Islander	0.2%	0.1%	0.1%	0.6%	0.1%	0.1%	0.2%
Race	Other	6.2%	2.2%	1.1%	2.9%	0.6%	3.0%	1.1%
Race	Two or More Races	2.9%	2.1%	2.5%	4.7%	1.2%	1.8%	3.0%
Housing Status	Occupied	88.6%	86.4%	90.7%	82.9%	64.8%	78.0%	85.5%
Housing Status	Owner-Occupied	65.1%	57.7%	75.0%	54.2%	78.4%	63.5%	65.4%
Housing Status	Renter-Occupied	34.9%	42.3%	25.0%	45.8%	21.6%	36.5%	34.6%
Housing Status	Vacant	11.4%	13.6%	9.3%	17.1%	35.2%	22.0%	14.5%
Income	Persons Below Poverty Level	15.3%	16.6%	11.0%	17.8%	16.6%	15.2%	15.3%
Income	Unemployed	10.8%	6.9%	5.8%	11.3%	8.1%	7.2%	9.5%
Other	High School Education or Higher	85.6%	87.4%	88.4%	88.7%	75.1%	86.1%	89.1%
Other	Households Without Vehicles	9.1%	8.6%	3.9%	5.9%	5.4%	6.2%	4.5%
Other	Mobile Home Residents	6.6%	4.7%	16.3%	19.7%	39.2%	11.5%	15.6%

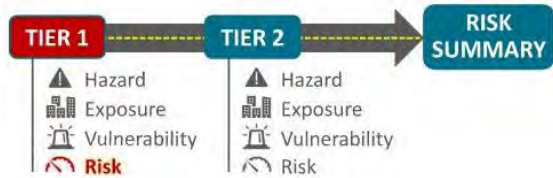
4.1.3 Tier 1 Vulnerability

Vulnerability is the susceptibility of harm to human beings, property, and the natural environment when exposed to a hazard. For example, a structure made of cardboard is vulnerable when it comes in contact with an inch of water, but a brick structure isn't; that brick structure is not vulnerable (to damage) under that level of flooding. As the Tier 1 Risk Assessment relies on national level datasets and requires a consistent approach, the broad assumption made regarding vulnerability is that any exposed resources impacted by a flood hazard are vulnerable. That is, any asset, populations, or resources that are touched by the Tier 1 hazard footprint are considered vulnerable to a negative impact. While this is a broad assumption, it is relevant to the Tier 1 purpose, which provides an understanding of where the vulnerable 'hotspots' may be located across the region and where the likelihood may increase with sea level rise.



4.1.4 Tier 1 High-Risk Locations

The CEI and coastal flood inundation hazards were used to identify potential areas at risk. The Framework defines risk as a function of exposure and probability of hazard occurrence. The Tier 1 Risk Assessment involved applying what was learned from the Tier 1 Hazard analysis and the identification of where the exposed assets, populations, and resources are located, and considering how probable the conditions will be to actually cause harm. The outputs of this assessment were used to define risk. The Geospatial Appendix describes how each of the inundation hazards (Category 5 MOM, 1-percent AEP flood, 10-percent AEP flood) and sea level rise were combined with the CEI to generate potential risk data presented in the Tier 1 Risk Assessment.



Tier 1 Risk Assessment Viewer:

<https://sacs.maps.arcgis.com/apps/MapSeries/index.html?appid=c54beb5072a04632958f2373eb1151cf>

To identify Tier 1 high-risk locations, the Composite Risk Index (CRI) was intersected with U.S. Census Bureau place boundaries using zonal statistics. U.S. Census Bureau census places were used to define the boundaries of high-risk locations. Two thresholds were applied to determine if a census place exhibited potential high risk in either the existing condition, future condition with sea level rise, or both. The combination of medium-high and high composite risk needed to cover at least:

1. 50 acres of the census place for the continental U.S. This is a conservative threshold, approximately equal to an area extending 1 mile along a shoreline and two blocks inland.
2. 0.5 percent of the total area of a census place.

If a census place met both thresholds, the area was considered to be potentially at high-risk. Twenty-three census places in five counties (Chatham, Bryan, McIntosh, Glynn, and Camden) met those criteria. Fifteen census places are in Chatham County, one in Bryan County, one in McIntosh County, four in Glynn County, and two in Camden County. Tier 1 high-risk locations for the entire Planning Reach GA_05 are summarized in **Table 4-5** and the existing and future conditions (3 feet of sea level rise) CRI results are displayed in **Figure 4-10**.

Table 4-5: Planning Reach GA_05 Tier 1 High-Risk Locations (Census Places)

County	Census Place	Identified as Existing Condition High-Risk Location	Identified as Future Condition High-Risk Location
Bryan	Richmond Hill	X	X
Camden	Kingsland	X	X
Camden	St. Marys	X	X
Chatham	Dutch Island	X	X
Chatham	Garden City	X	X
Chatham	Georgetown	X	X
Chatham	Isle of Hope	X	X
Chatham	Montgomery	X	X
Chatham	Pooler	X	X
Chatham	Port Wentworth	X	X
Chatham	Savannah	X	X
Chatham	Skidaway Island	X	X
Chatham	Talahi Island	X	X
Chatham	Thunderbolt	X	X
Chatham	Tybee Island	X	X
Chatham	Vernonburg	N/A	X
Chatham	Whitemarsh Island	X	X
Chatham	Wilmington Island	X	X
Glynn	Brunswick	X	X
Glynn	Country Club Estates	X	X
Glynn	Dock Junction	X	X
Glynn	St. Simons	X	X
McIntosh	Darien	X	X

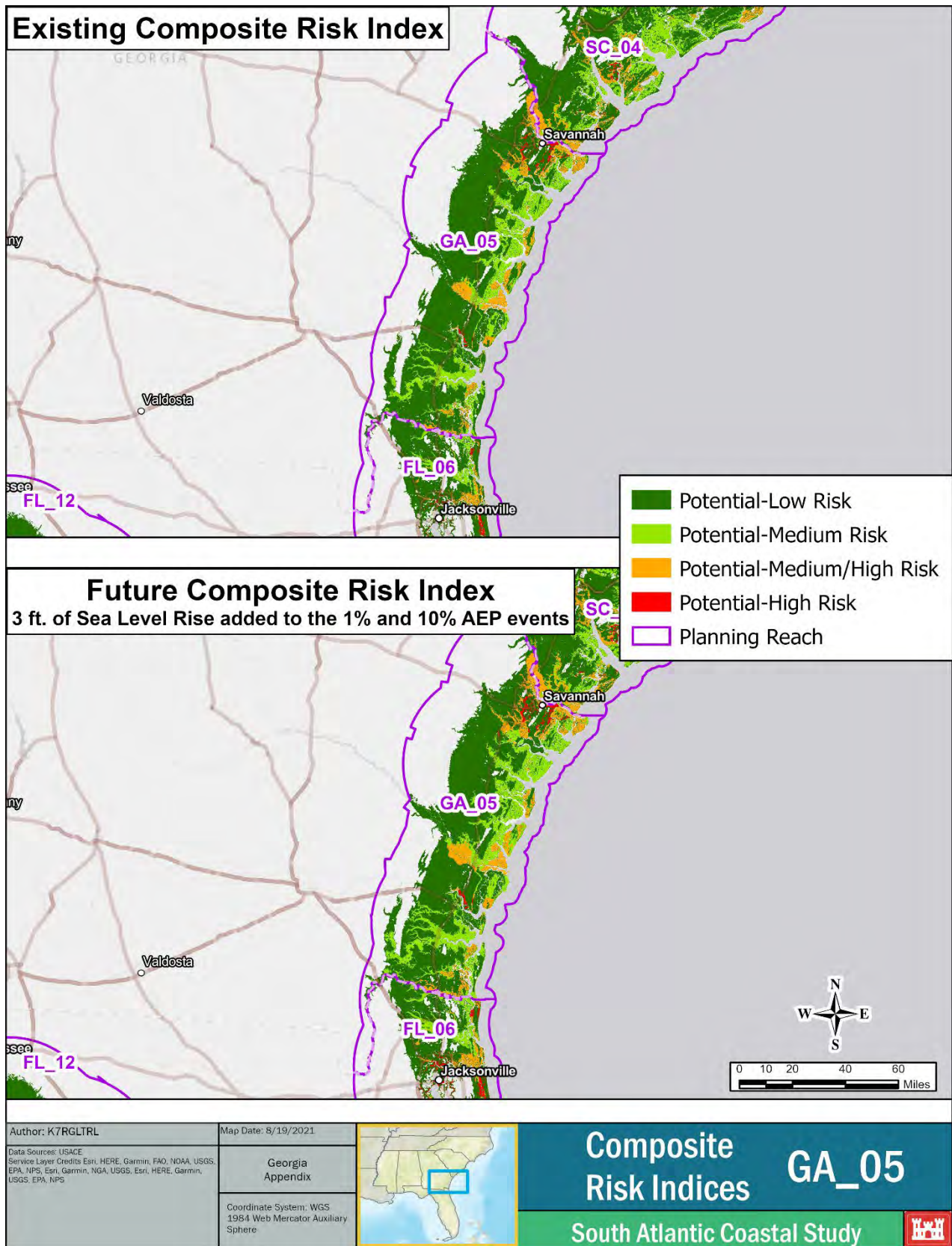


Figure 4-10: Existing and Future Composite Risk Indices for Planning Reach GA_05

When viewed at a larger scale, more detail can be observed when assessing the change in risk between the existing and future condition. As identified in the Chatham County example below, with the addition of 3 feet of sea level rise in the future condition, the expansion of medium-high (amber) and high (red) composite risk areas are notable adjacent to the riverine channels of the Savannah, Little Ogeechee and Skidaway Rivers and their numerous tributaries (**Figure 4-11**).

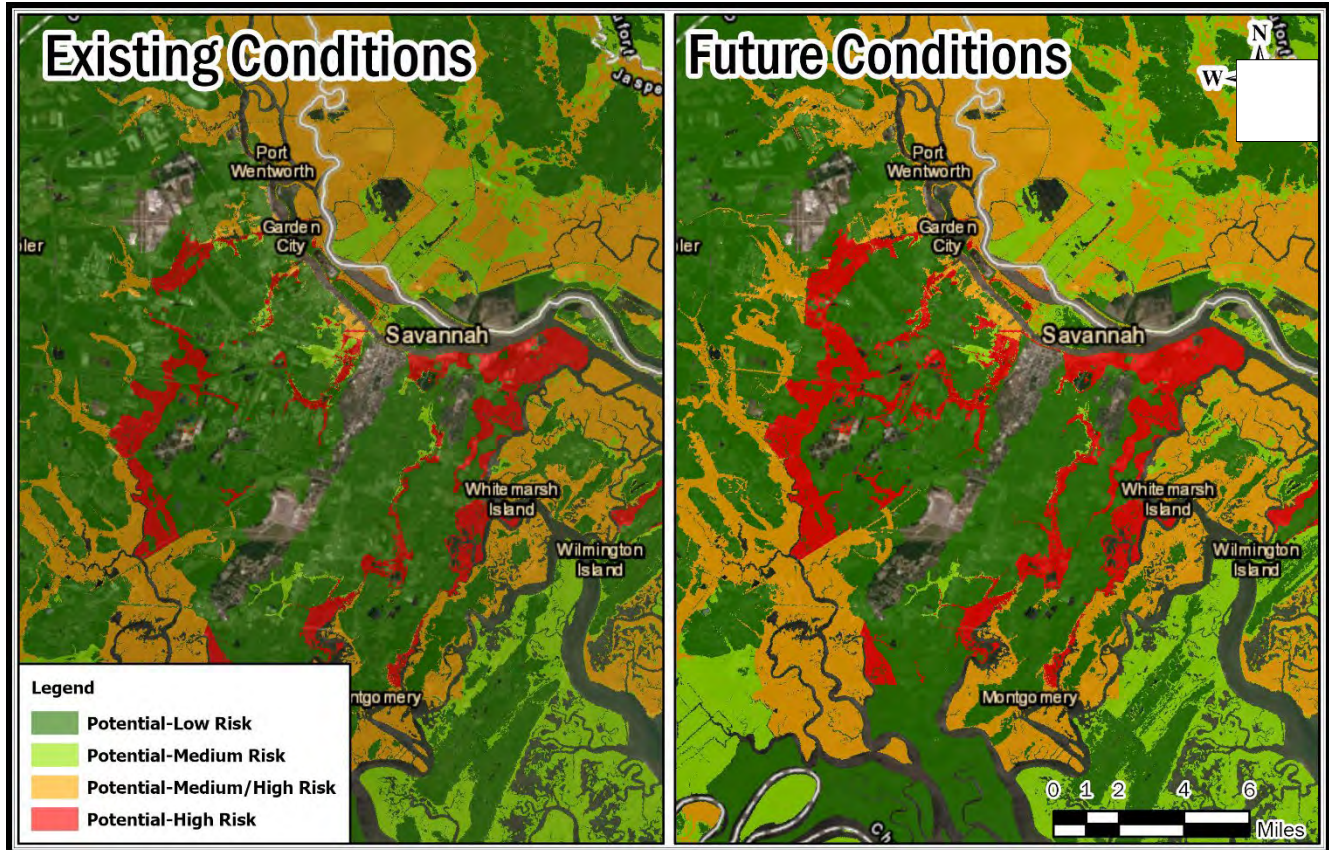


Figure 4-11: Existing and Future Composite Risk Indices for Chatham County

The mean CRI and the area of a place exhibiting potential medium-high- and high-risk are both important factors. Additionally, significant CRI increases with 3 feet of sea level rise in the future condition are important considerations. These factors represent different ways of approximating the existing and future potential risk within each census place.

Figure 4-12 displays the existing and future mean CRI ratings for medium-high- and high-risk locations per census place in Planning Reach GA_05. The mean CRI indicates the relative risk from inundation to populations, infrastructure, and environmental and cultural resources. With sea level rise, Vernonburg meets the high-risk thresholds described above. All other locations identified as high-risk in the future condition were also classified as high-risk within the existing condition.

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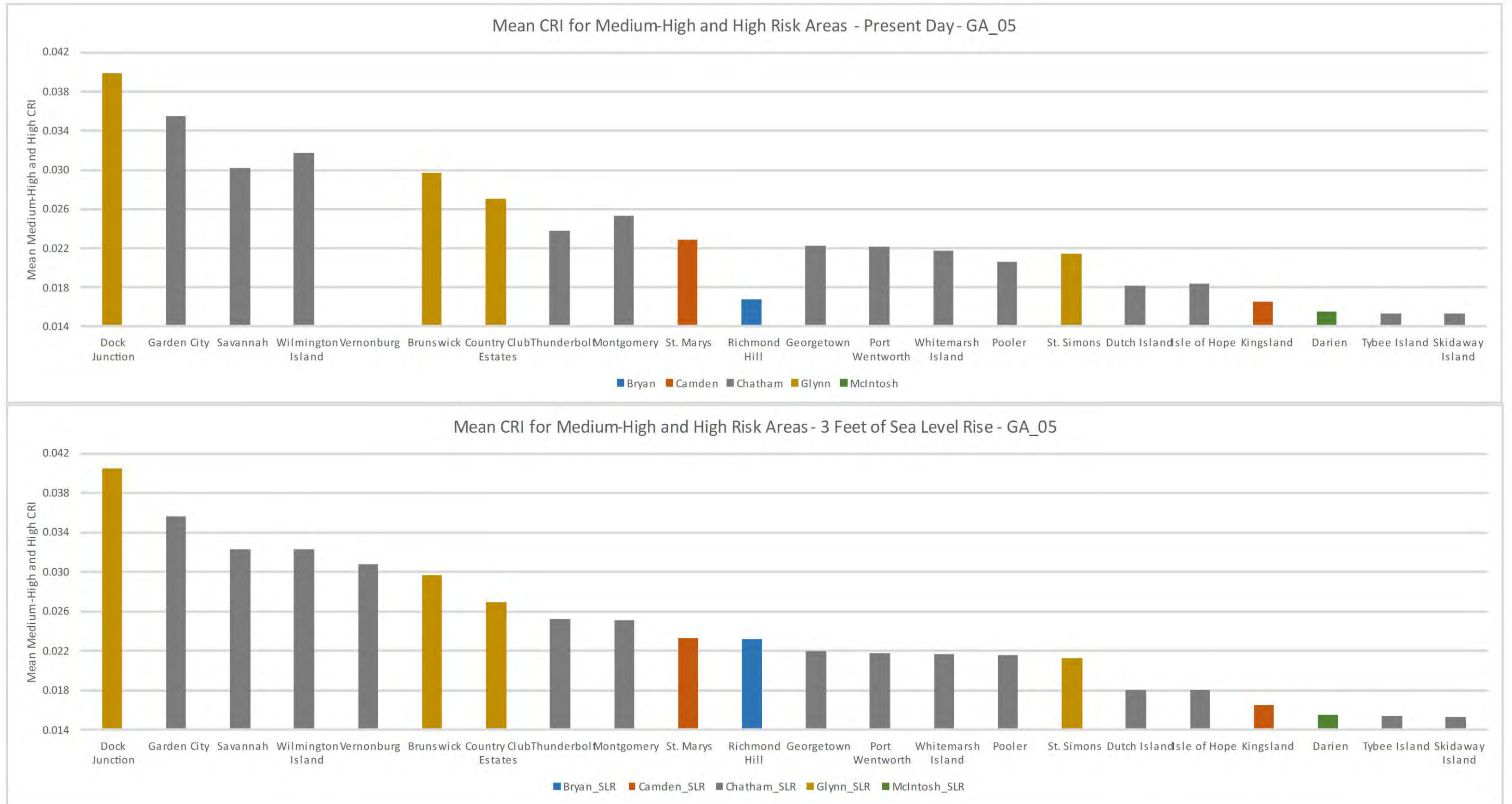


Figure 4-12: Planning Reach GA_05 Existing (top) and Future (bottom) Mean Composite Risk Index for Medium-High and High-Risk Areas

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The mean CRI provides information on the potential risk of storm surge inundation to populations, infrastructure, and environmental and cultural resources. However, it is also important to understand the acreage that is of medium-high- and high-risk to understand the spatial scale of the potential risk in the existing and future conditions. **Figure 4-13** displays the acres of medium-high- and high-risk locations per census place with the future risk displayed in a lighter shade. With sea level rise, the number of medium-high- and high-risk census places increases from 22 to 23, as Vernonburg has more than 50 acres that are medium-high- and high-risk projected under future conditions. As shown in **Table 4-6**, the increase in acreage of medium-high- and high-risk area under future conditions ranges from 4 to 3,143 acres per census place. Census places with greater than a 51 percent increase in acreage are highlighted in light blue in **Table 4-6**.

Table 4-6: Tier 1 – Change in Acreage for Medium-High and High-Risk Composite Risk Index

Census Places	Total Acres	No Sea Level Rise (Acres)	With Sea level Rise (Acres)	Change (Acres)	Percent Change
Dock Junction	6,766	929	1,606	677	72.87%
Garden City	9,267	2,185	3,593	1,408	64.44%
Wilmington Island	6,100	855	1,019	164	19.18%
Savannah	69,501	6,568	9,711	3,143	47.85%
Brunswick	16,169	1,454	1,968	514	35.35%
Country Club Estates	3,043	195	289	94	48.21%
Montgomery	3,894	1,739	1,998	259	14.89%
Thunderbolt	1,020	402	489	87	21.64%
St. Marys	15,998	2,727	3,768	1,040	38.17%
Georgetown	5,658	1,897	2,429	532	28.04%
Port Wentworth	10,520	1,343	2,338	995	74.09%
Whitemarsh Island	4,258	1,842	2,313	471	25.57%
St. Simons	11,208	4,036	5,037	1,001	24.80%
Pooler	17,836	561	1,592	1,031	183.78%
Isle of Hope	1,459	424	669	246	57.78%
Dutch Island	1,960	1,149	1,248	98	8.62%
Richmond Hill	10,460	750	1,120	370	49.33%
Kingsland	28,688	287	599	312	108.71%
Darien	15,378	2,789	2,803	14	0.50%
Tybee Island	1,951	465	509	44	9.46%
Skidaway Island	11,436	83	87	4	4.82%
Talahi Island	939	213	220	7	3.29%
Vernonburg	269	0	65	65	N/A ¹

¹Percent change is undefined and base condition is 0.

It is important to consider the area of a census place potentially at risk relative to the total area because census places represent population centers and areas of economic activity. For example, the total acreage at risk may be relatively small, but if a large percentage of a census place is at risk from storm surge inundation, the ability of that census place to support populations and economic activity may also be at risk without adequate planning and actions. **Figure 4-14** displays the percentage of the entire census place location covered by medium-high- and high-risk acreage for Planning Reach GA_05 with the future risk displayed in a lighter shade.

For Planning Risk GA_05, three census places (Montgomery, Whitemarsh Island, and Dutch Island) have over 50 percent of their area rated as medium-high- and/or high- potential future risk, all of which are located within Chatham County. Four additional census places have over 40 percent of their area rated as medium-high and/or high potential risk in the future risk, three of which are in Chatham County (Thunderbolt, Georgetown, and Isle of Hope), and one in Glynn County (St. Simons).

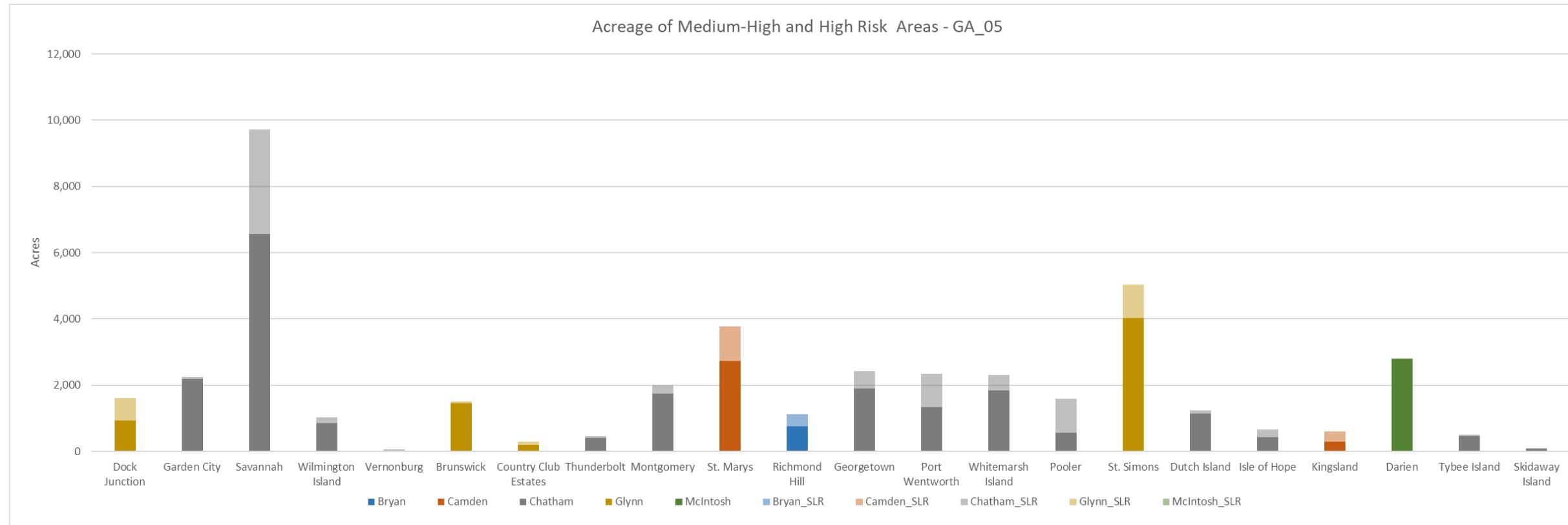


Figure 4-13: Planning Reach GA_05 Existing and Future Acreage with Potential Medium-High and High-Risk; Sea Level Rise Indicates the Future Condition, Which Includes 3 Feet of Sea Level Rise (SLR)

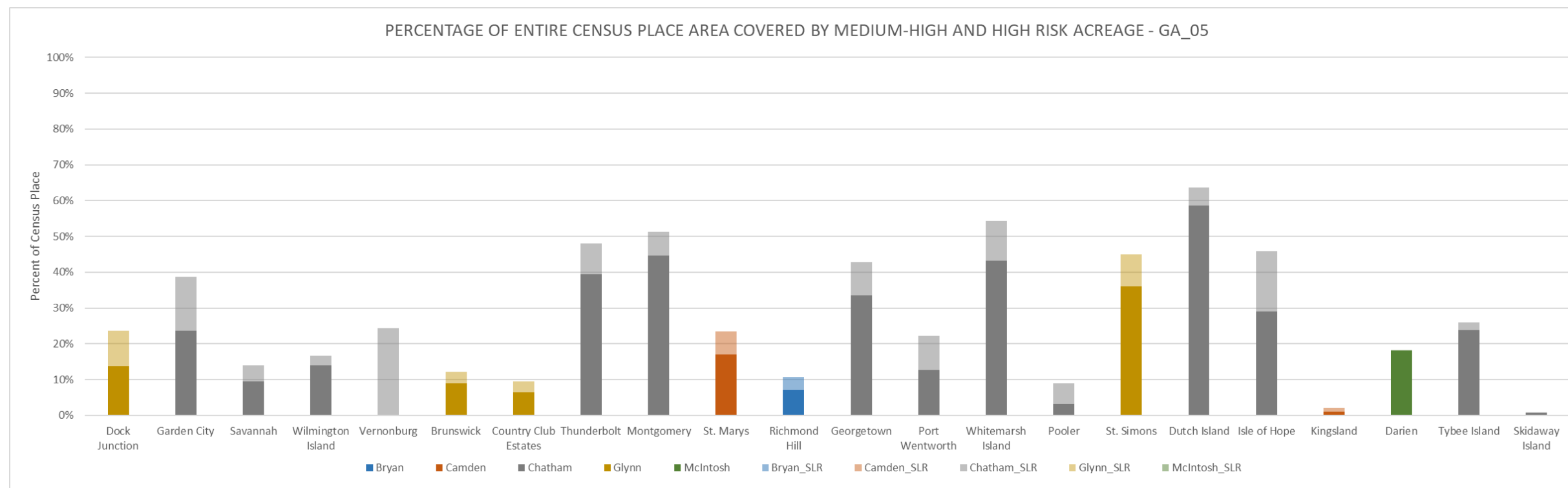
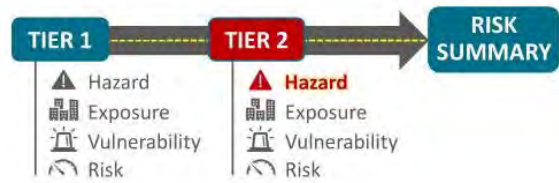


Figure 4-14: Planning Reach GA_05 Existing and Future Percentages of Census Place Areas Rated as Medium-High and/or High-Risk; Sea Level Rise Indicates the Future Condition, Which Includes 3 Feet of Sea Level Rise (SLR)

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4.1.5 Tier 2 Hazards

The Tier 2 Risk Assessment includes additional data sources to further refine potential risk areas identified in Tier 1. This includes state-level data with additional or more refined flood data, shoreline erosion data, and other information relevant to specific areas (**Table 4-7**). The following sections describe the primary hazards (inundation, erosion, and wave attack) for the Tier 2 analysis.



Secondary hazards that will be discussed but are not considered in detail as part of the Tier 2 analysis include wind, compound flooding, saltwater inundation, and saltwater intrusion.

Table 4-7: Summary of Tier 2 Hazards

Primary Hazards	Description of Hazard	Tier 1	Tier 2
Inundation	Inundation was assessed in Tier 1 but was re-examined using FEMA's Hazus Flood Model data and preliminary Flood Insurance Rate Maps for the annual exceedance probability inundation in Tier 2.	X	X
Wave Attack	Wave attack is the impact of waves on shorelines that can be hazardous to natural shorelines, engineered structures, and cultural resources.		X
Erosion	Coastal erosion is hazardous to natural shorelines such as marshes and sandy beaches. Erosion can lead to increased susceptibility of cultural and environmental resources, and infrastructure.		X
Secondary Hazards	Description of Hazard	Tier 1	Tier 2
Wind	High winds during hurricanes can damage both infrastructure and environmental resources.		X
Compound Flooding	Compound flooding is a combination of hazards that create greater impacts. A combination of inundation, precipitation, nuisance flooding, and high groundwater table elevations can create greater flooding than storm surge alone.		X
Saltwater Inundation and Intrusion	Saltwater inundation and intrusion can degrade environmental resources and freshwater sources.		X

4.1.5.1 Inundation

Inundation refers to flooding due to the overflow of water onto land that would otherwise remain dry. Inundation can be caused by tidal flooding, also known as sunny day or nuisance flooding, or by storm surge which is a rise in coastal water levels due to low-pressure weather systems such as tropical storms and hurricanes. Inundation of low-lying areas can lead to flooding of streets, residential buildings, and commercial properties, resulting in significant structural and monetary damage and in extreme cases loss of life. Such flooding can undermine foundations of critical infrastructure, inhibit gravity-based drainage systems, disrupt utilities including electrical and communication services, and spread chemical or other contaminants. Inundation impacts can be exacerbated by changing geography such as subsidence, poorly planned development, and sea level rise. Most of the coastal communities in the Eastern Seaboard and along the Gulf Coast are vulnerable to inundation.

For the Tier 2 Risk Assessment, the inundation hazard was further assessed using the FEMA Hazus Flood Model to develop a more refined outlook of the potential damages caused by inundation in both the existing and future conditions. Water level data from FEMA's FIS reports for coastal counties in Georgia was used as input to the FEMA Hazus Flood Model. The FIS is a county-wide study that investigates the existence and severity of flood hazards within local communities. For the existing condition, infrastructure damages are based on the 10-, 2-, 1-, and 0.2-percent AEP storm events. For the future condition damages, 3 feet of sea level rise is added to these events. For additional information regarding the application of the FEMA Hazus Flood Model, please see the SACS Tier 2 Economic Risk Assessment report.

In addition to FEMA data, data at defined save points throughout the study area are available from the USACE Coastal Hazards System (CHS) web portal. CHS is a national coastal storm hazard data resource for probabilistic coastal hazard assessment results and statistics, storing numerical and probabilistic modeling results including storm surge, astronomical tide, waves, currents, and wind. At each defined point, hydrodynamic and wave model results are available for all of the simulated storms that make up the probabilistic storm suite for the study along with AEP curves for water level, wave height, and wave period. While dense in spatial coverage for typical model output, the save point locations correspond with a small fraction of the overall hydrodynamic model mesh nodes. The unstructured grid model resolution varies but approaches a minimum of approximately 30 meters (approximately 98 feet) to best resolve coastal features. Timeseries output for a given storm event is typically not saved at all mesh nodes due to data limitations; however, data necessary to define the stillwater level AEP such as peak water level for each storm is saved. For SACS, the AEP stillwater levels at the model mesh nodes were computed to allow for a higher resolution and better visualization of the values throughout the state. The inundation depth at the hydrodynamic model mesh nodes were calculated for various AEPs, present day, and two sea level change scenarios (SLC0 = 0.00 feet, SLC1 = 2.73 feet and SLC2 = 7.35 feet) imposed on the 1-percent AEP event, shown in **Figure 4-15** through **Figure 4-17**.

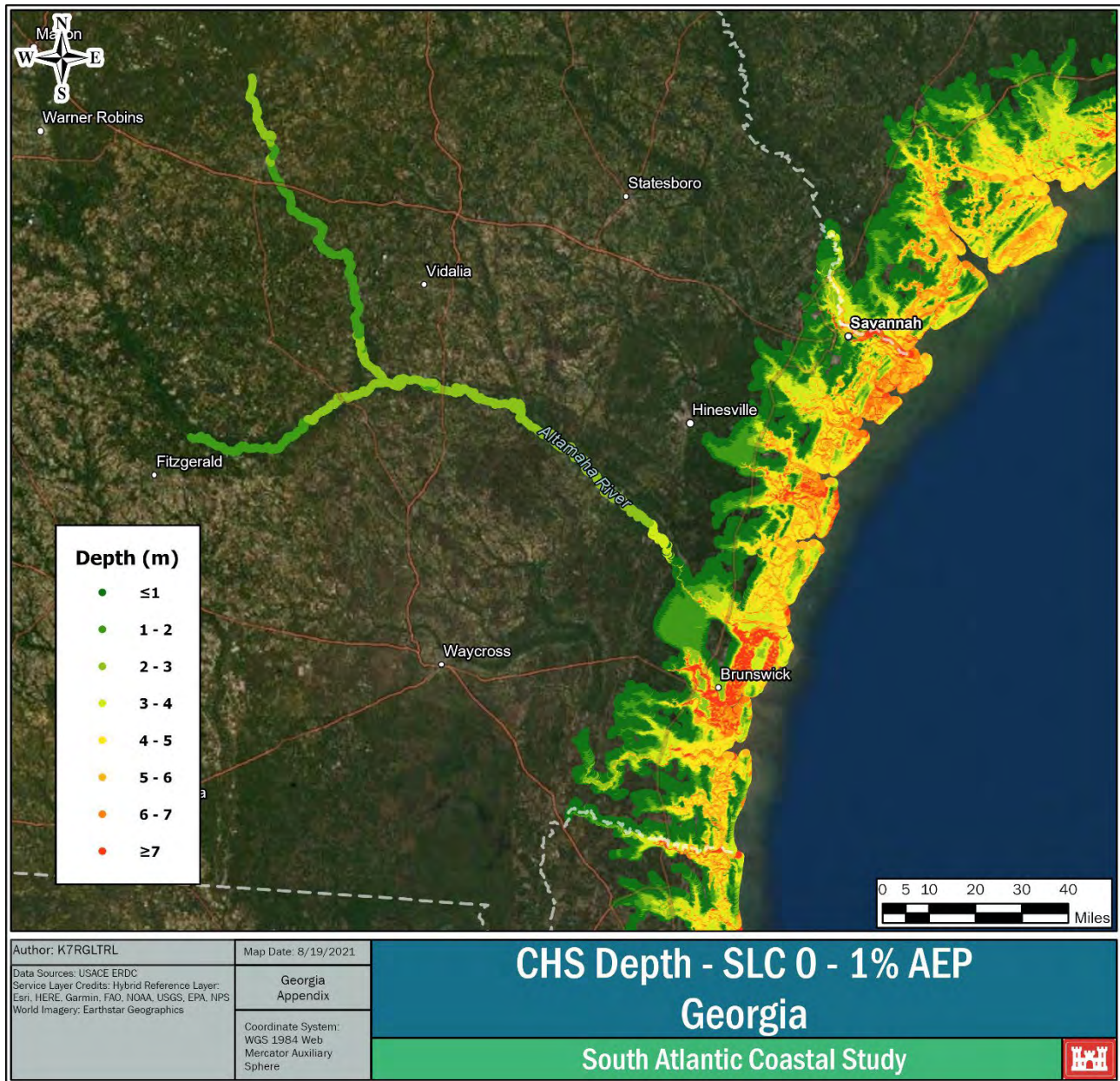


Figure 4-15: Coastal Hazards System 1-Percent Annual Exceedance Probability Stillwater Level (SLC0)

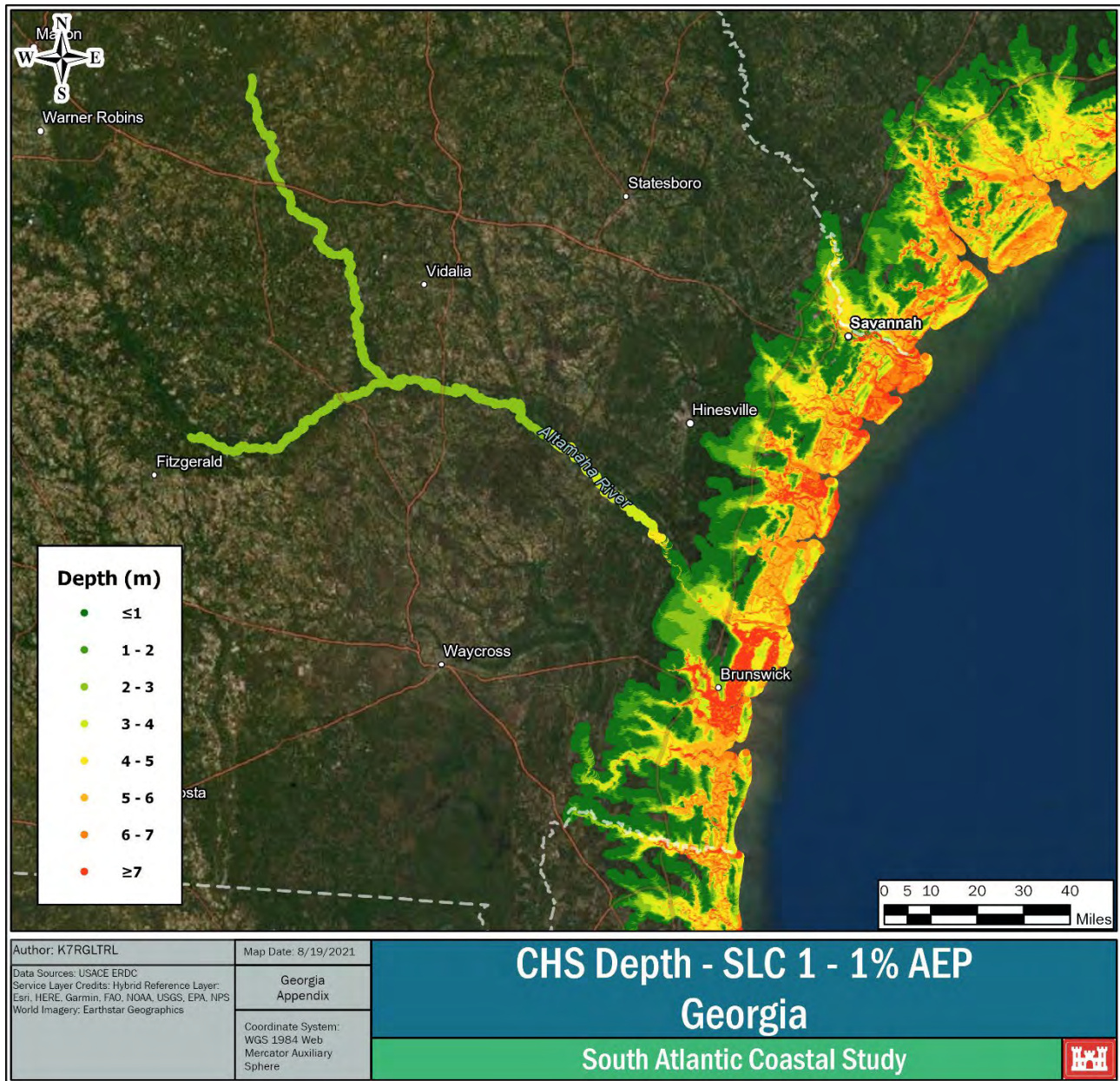


Figure 4-16: Coastal Hazards System 1-Percent Annual Exceedance Probability Stillwater Level with 2.73 Feet of Sea Level Rise (SLC1)

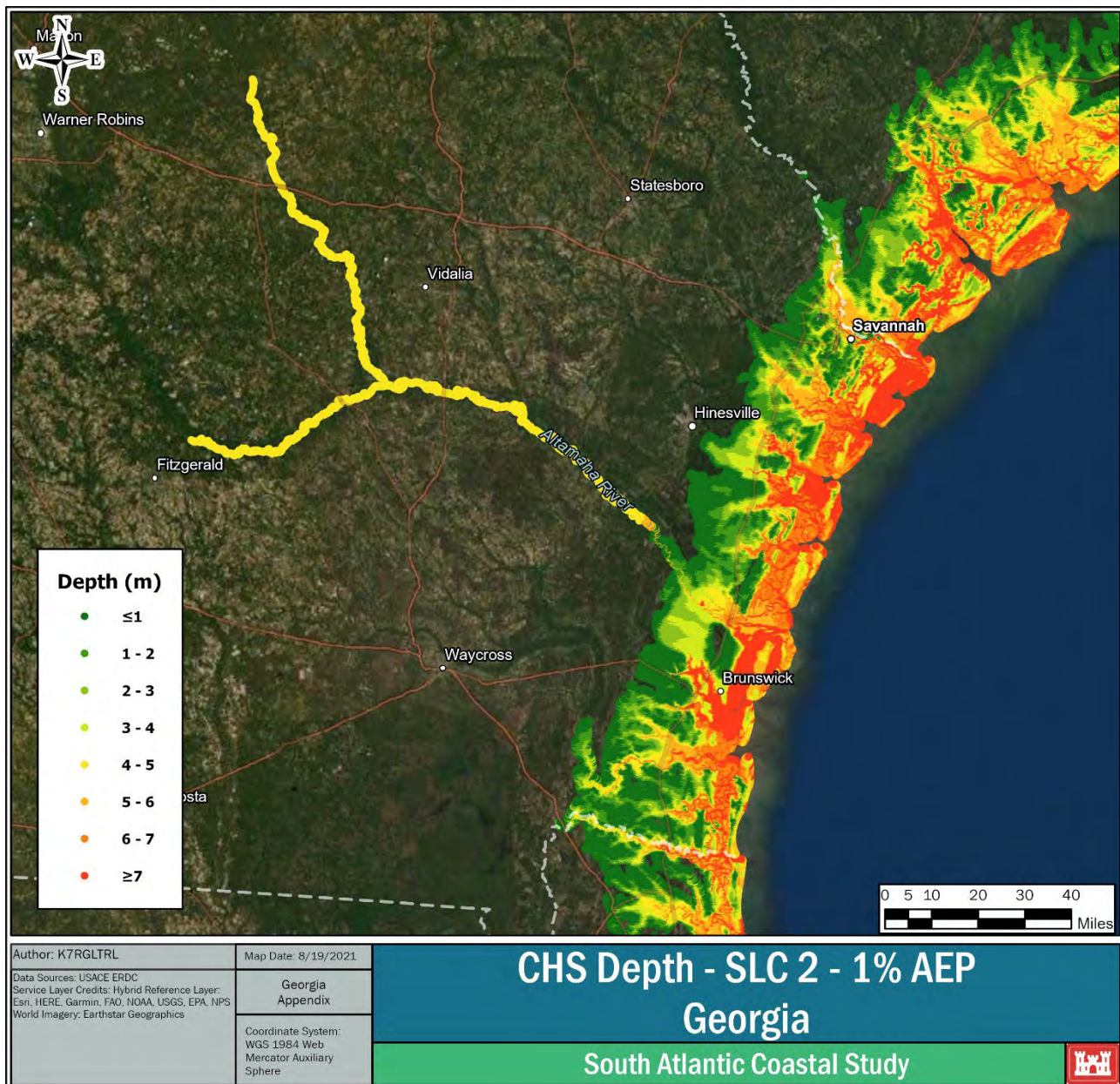


Figure 4-17: Coastal Hazards System 1-Percent Annual Exceedance Probability Stillwater Level with 7.35 Feet of Sea Level Rise (SLC2)

Another source of coastal storm inundation data used is the 2013 Coastal Georgia Hurricane Evacuation Study (USACE 2013c). The Coastal Georgia Hurricane Evacuation Study provides the lateral extent of inundation for a tropical storm through the Category 5 MOM within the Georgia coastal counties and the potential threat to populations and infrastructure. Impacts of inundation can also cause potential threats to cultural resources, such as inaccessibility and damage to archaeological sites and potentially significant water damage to historic properties. More information about the Coastal Georgia Hurricane Evacuation Study can be found in Section 5.2, Hurricane Evacuation Planning.

4.1.5.2 Wave Attack

Wave attack is the impact of waves on the shoreline and is considered one of the main coastal damage mechanisms. The repeated impact of waves on shorelines or structures can create damage over time under normal wave conditions and is exacerbated during storm conditions when waves become larger and more frequent. Wave attack is a hazard for all coastal regions but is a greater threat for areas with prominent infrastructure and population, or cultural and environmental resources. It can damage or destroy engineered structures such as seawalls, revetments, or bulkheads through direct wave impacts on a structure or by scouring the foot of the structure and undermining it. Wave attack can cause significant damage to archaeological sites through erosion and the uprooting of trees, as well as structural damage and flooding to historic properties. Wave attack also damages nonstructured shorelines such as beaches and marshes by causing erosion of the sediment that makes up these coastal environments. On beaches, wave attack can erode berm and dune systems.

In addition to frontal erosion, wave attack can lead to wave run-up and overtopping on dunes and coastal structures, which can scour the backside of dunes or structures and cause them to fail. Wave attack can also damage or destroy dune and marsh grasses, which anchor their respective systems in place, and leave the remaining system more susceptible to additional erosion. As sea level rises, wave attack can be exacerbated in some areas. Wave heights are a direct function of water depth. As the water depth increases, larger waves are able to form. Areas of natural shorelines with sufficient room to migrate and adapt will not likely see additional impacts from wave attacks as sea level rises because the shoreline will naturally adapt but in areas with permanent shorelines (seawalls, revetments, etc.) increased depths could see wave heights and damages increase. Structures that are sufficient to withstand current conditions may no longer be able to withstand future wave conditions and may need to be replaced.

The energy dissipation that occurs as waves enter the nearshore zone and break is an important component of sediment transport along the shoreline. Incident waves, in combination with tides and storm surge, are important factors influencing the behavior of the shoreline. Wave data are obtainable from the long-term USACE Wave Information Studies (WIS) hindcast database for the Atlantic coast of the U.S. (Hubertz 1992). This 35-year record extends from 1980 through 2014 and consists of a time-series of wave events at 3-hour intervals for stations located along the east and west coasts of the U.S. as well as the Gulf of Mexico and Great Lakes. Average offshore wave heights sorted by wave direction for the Georgia coast are presented in **Table 4-8**. These average wave heights represent wave conditions along the open coast. Because of sheltering, wave heights in the back bay, marsh regions, sounds, and rivers are substantially smaller, on the order of 1 foot or less (excluding extreme storm events). Overall, the barrier islands are highly susceptible to damage from waves as sea levels rise. The back bays and tidally influenced river systems are also susceptible, but to a lesser degree.

Table 4-8: Mean Wave Heights: Georgia Coastline

Wave Direction (from)	WIS Station No. 63368 (1980–2014)	
	Percentage Occurrence (%)	Average Significant Wave Height ¹ (feet)
North	1.4	3.1
Northeast	3.1	3.5
East	44.3	3.7
Southeast	41.8	3.3
South	5.0	3.4
Southwest	1.5	3.5
West	1.3	3.5
Northwest	1.7	3.3

¹Significant Wave Height: As defined by NOAA, is approximately equal to the average of the highest one-third of the waves, as measured from the trough to the crest of the waves.

High wave energy can result in accelerated erosion, and wave overtopping of coastal features and can extend inundation inland. The Coastal Hazards System (CHS) analysis developed by USACE models wave heights for a range of storm events for both existing and future conditions. **Figure 4-18** shows modeled wave heights for the 1-percent AEP event at the Georgia coastline and a comparison between existing and increase in wave heights caused by sea level rise. Along the coast, modeled 1-percent AEP wave heights average 0–6.6 feet (0–2 meters), but offshore wave heights average 6.6–19.9 feet (2–6 meters) with instances of greater than 19.9 feet (6 meters). Sea level rise is anticipated to cause an increase in wave heights throughout the county’s coastal communities. This increase translates to an increased likelihood and severity of erosion and wave runup and overtopping.

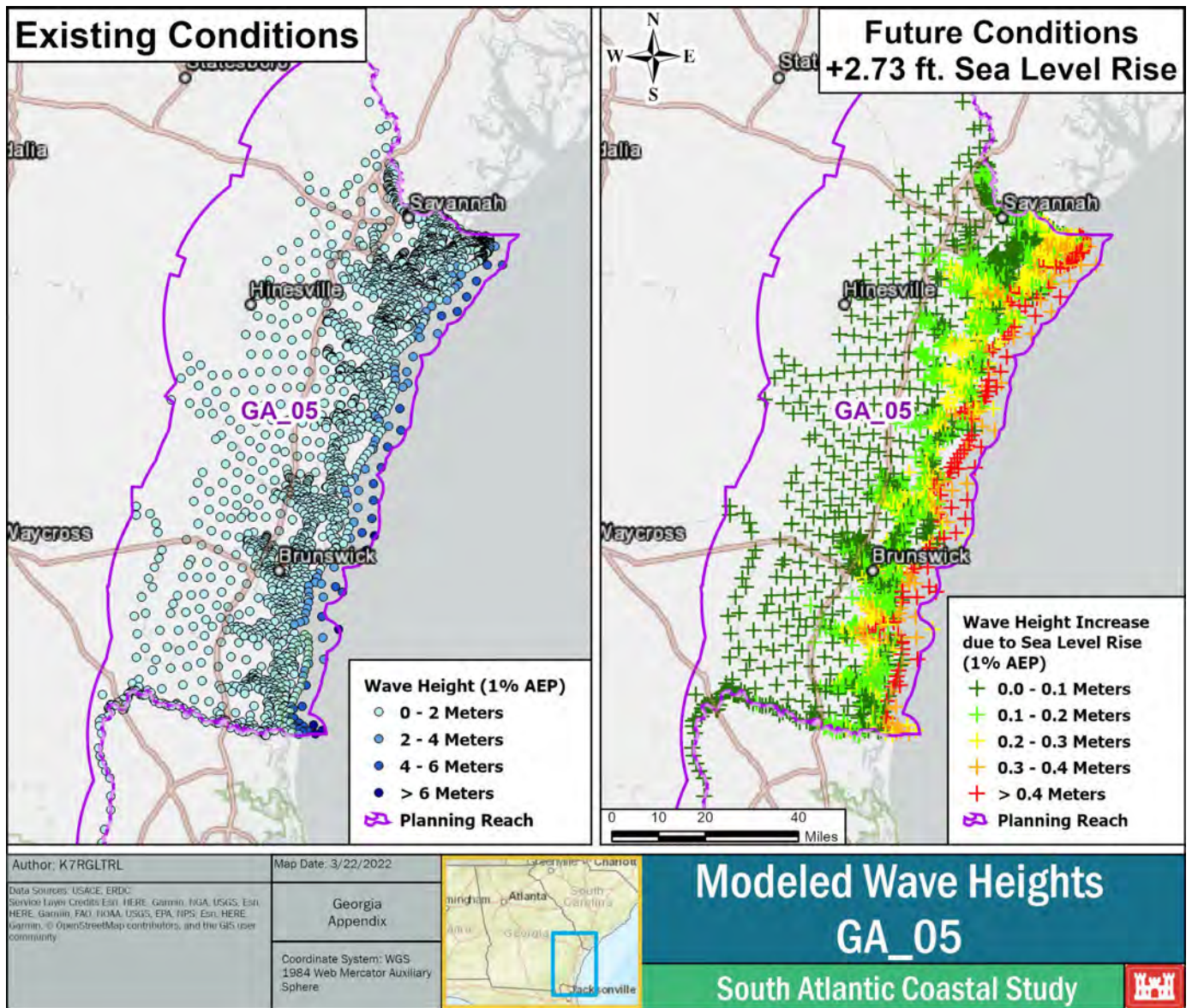


Figure 4-18: Coastal Hazards System Evaluation of Wave Heights for the 1-Percent Annual Exceedance Probability Event

4.1.5.3 Erosion and Shoreline Change

Coastal erosion is a threat to coastal environments, cultural and environmental resources, and infrastructure. Coastal Georgia is made up almost entirely of barrier beaches, sand beaches, salt marsh, mud flats, and deltas. This composition makes the Georgia coastline highly susceptible to impacts due to sea level rise. Shoreline profiles along the Georgia barrier islands are similar in both dune and foreshore dimensions. On average, dunes are characterized by seaward slopes of approximately 0.1 (1 vertical:10 horizontal) and foreshore slopes of approximately 0.05 (1 vertical:20 horizontal). Shoreline change along coastal Georgia is typical of barrier islands of the Atlantic Coast, with areas of erosion and accretion varying over relatively short distances.

Long-term shoreline change for the Atlantic coast is available graphically on the USGS Coastal Change Hazards Portal (USGS n.d.), which displays the long-term change rates discussed below.

- Chatham County (Figure 4-19a):** At the north end of the state, the barrier islands of Chatham County (Tybee, Little Tybee, Wassaw, and Ossabaw) show long-term accretion, predominantly at the ends of the island, with stretches of central shoreline that are generally stable or accretional. Erosion on these islands occurs in hot spots to the north or south of the central shore. Hot spot erosion can be more than -6.6 feet per year (-2 meters per year). Much of the general stability of Tybee Island may be attributed to the presence of a federal beach renourishment project.
- Bryan County (Figure 4-20a):** Bryan County shoreline consists of the marshland bordering St. Catherines Sound. While sedimentation varies in the adjacent inlet that separates the barrier islands of Chatham County to the north and Liberty County to the south, the marsh shoreline remains relatively stable because of the presence of vegetation.
- Liberty County (Figure 4-20a):** Liberty County shoreline is dominated by St. Catherines Island. Unlike the barrier islands to the north, St. Catherines Island experiences significant erosion over the majority of its shoreline with only small areas of stability or accretion at the northern end and near the central shoreline. Long-term erosion along north St. Catherines Island and at the southern tip of the island is greater than -6.6 feet (-2 meters) per year. South St. Catherines Island is characterized by slightly more moderate long-term erosion rates between -3.3 feet (-1 meter) and -6.6 feet (-2 meters) per year.
- McIntosh County (Figure 4-20b):** McIntosh County shoreline is dominated by Sapelo Island to the north with the much smaller Wolf Island to the south. Sapelo Island shows patterns of long-term erosion that are similar to the barrier islands of Chatham County. The north and south ends of the island are accretional at a rate of greater than +6 feet (+2 meters) per year. The central portion of the island is mildly accretional at a rate of between +3.3 feet (+1 meter) to +6.6 feet (+2 meters) per year in some areas and stable (-3.3 feet to +3.3 feet) in others. An erosional hot spot (-3.3 to -6.6 feet per year) occurs along the shoreline just south of the island's centerline. Wolf Island, located between Deboy Sound to the north and Altamaha Sound to the south, is highly erosional over its entire shoreline with erosion rates of greater than -6.6 feet (-2 meters) per year.
- Glynn County (Figure 4-20b):** Glynn County shoreline is comprised of three barrier islands: Little St. Simons Island, St. Simons Island, and Jekyll Island. Little St. Simons is the northernmost island in the county and has a long-term pattern of accretion (greater than +6.6 feet per year) over most of its shoreline. The north end shows mild (-3.3 feet per year) to moderate (-3.3 to -6.6 feet per year) erosion in the long-term. A hot spot of high erosion, losing more than -6.6 feet (-2 meters) per year, is just south of the island's central shoreline. St. Simons Island, which has a developed shoreline, has a pattern of erosion that is mildly erosional with regions of accretion over the length of the island. Two hot spots of high erosion are documented at

USGS Coastal Change Hazards Portal:
<https://marine.usgs.gov/coastalchangehazardsportal/>

the northern tip of the island and the south end of the island at the entrance to St. Simons Sound. Jekyll Island, also developed, shows mild long-term erosion over the length of the island with accretion of +3.3 feet (+1 meter) to +6.6 feet (+2 meters) per year at the southern tip. The development of St. Simons and Jekyll Island has resulted in local efforts to stabilize the shoreline and reduce erosion impacts.

- **Camden County (Figure 4-20c):** Bordering the state of Florida, the Camden County shoreline is dominated by Cumberland Island. Undeveloped, Cumberland Island is generally stable (-3.3 feet to +3.3 feet) to accretional (+3.3 feet to +6.6 feet per year) over most of the shoreline with a significant erosional hot spot (greater than -6 feet per year) at the north end and moderate erosion localized at the central shoreline.

Long-term shoreline change rates are reflective of changes to shoreline position over an extended period. **Figure 4-20** shows graphically how the developed barrier island shorelines of Tybee, Sea, St. Simons, and Jekyll Islands have changed in the past century. With few exceptions, development typically results in a more stable shoreline position. To protect infrastructure, the position of the shoreline is often held either directly with structures such as seawalls and revetments or indirectly with jetties, groins, and beach renourishment meant to control the amount of erosion to a localized area. However, preventing shoreline retreat beyond a certain point does not necessarily maintain a healthy dune system or beach berm. This can create negative impacts to wildlife habitat. Additionally, interrupting the natural sediment transport regime in one area can exacerbate erosion in downdrift areas as the flow of sediment is reduced or cut off. Developed shorelines must be managed to minimize the negative impacts while still maintaining a suitable level of protection to the local community. Erosion poses significant threats to historic properties and cultural resources, especially on barrier islands. Shoreline changes may aid in the preservation of cultural resources, but it can also lead to the loss of site integrity.

The USGS has determined probabilities of long-term shoreline change due to sea level rise. This probability is calculated using information about rates of relative sea level rise, wave height, tidal range, coastal geomorphology, coastal slope, and historical rates of shoreline change (Gutierrez et. al. 2014). In this instance, probability of shoreline retreat is defined by three categories: high shoreline retreat (greater than -6.6 feet per year), medium shoreline retreat (between -3.3 and -6.6 feet per year), and stable shoreline change (between -3.3 feet and +3.3 feet of shoreline change per year). **Figure 4-21** shows graphically the probabilities of each category of shoreline retreat for the Georgia coastline. Probability of shoreline retreat is relatively constant along the Georgia coastline, with a slight elevation in probability occurring near the southern border of the state. The magnitude of shoreline retreat (stable, medium, high) shares nearly equal probability for any given region, making an accurate estimate difficult without additional information. In general, there is significant chance of high shoreline retreat along the Georgia coastline, particularly in the vicinity of Camden County.

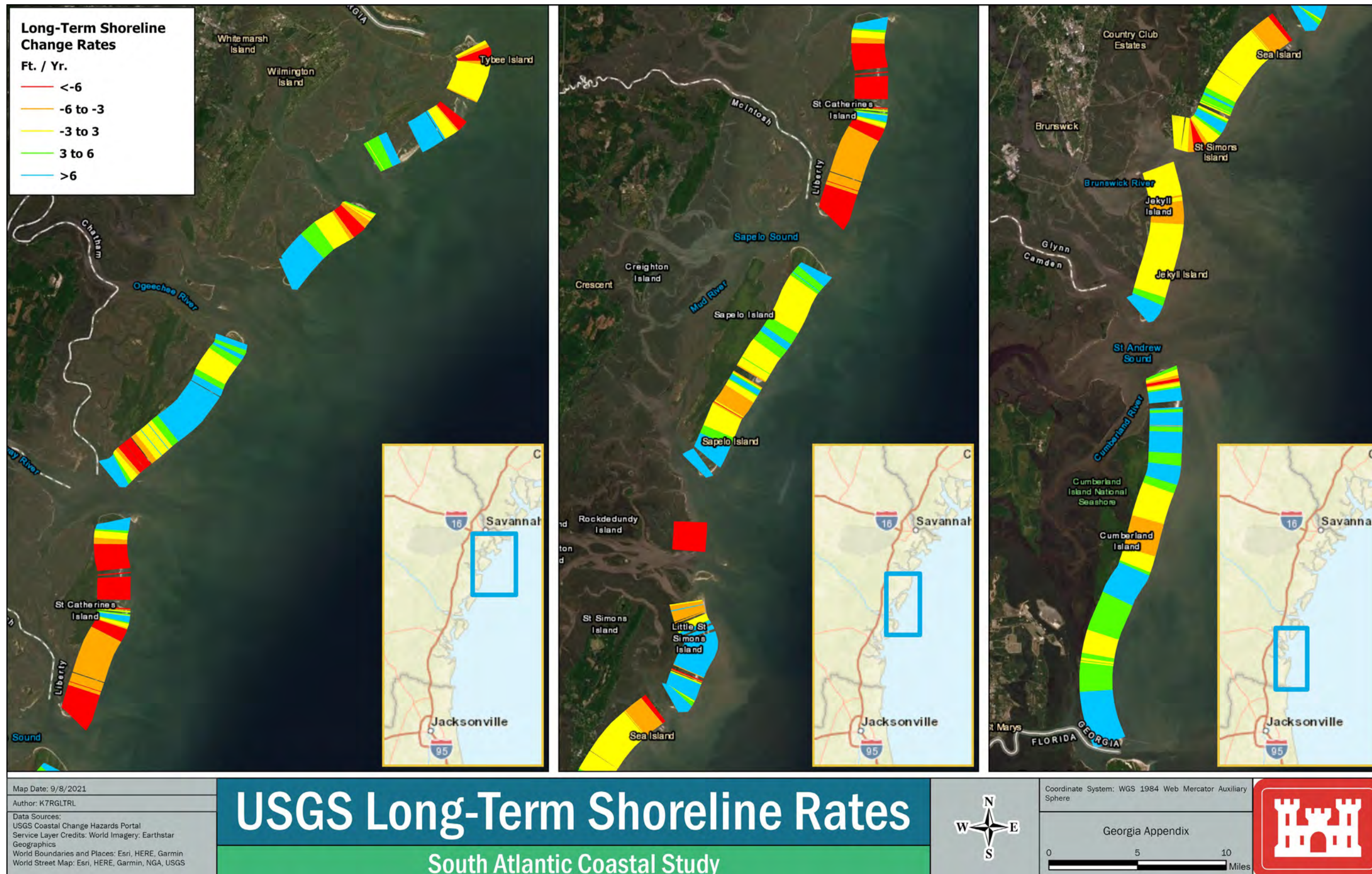


Figure 4-19: Long-Term Shoreline Change Rates: for (a) Left Image – Chatham, Bryan, and Liberty Counties (b) Middle Image – McIntosh and Glynn Counties (c) Right Image Camden County (USGS n.d.; Coastal Change Hazards Portal)



Figure 4-20: Historical Shoreline Positions for (a) Left Image – Tybee Island (b) Middle Image – St. Simons and Sea Island (c) Right Image – Jekyll Island (USGS n.d.; Coastal Change Hazards Portal)

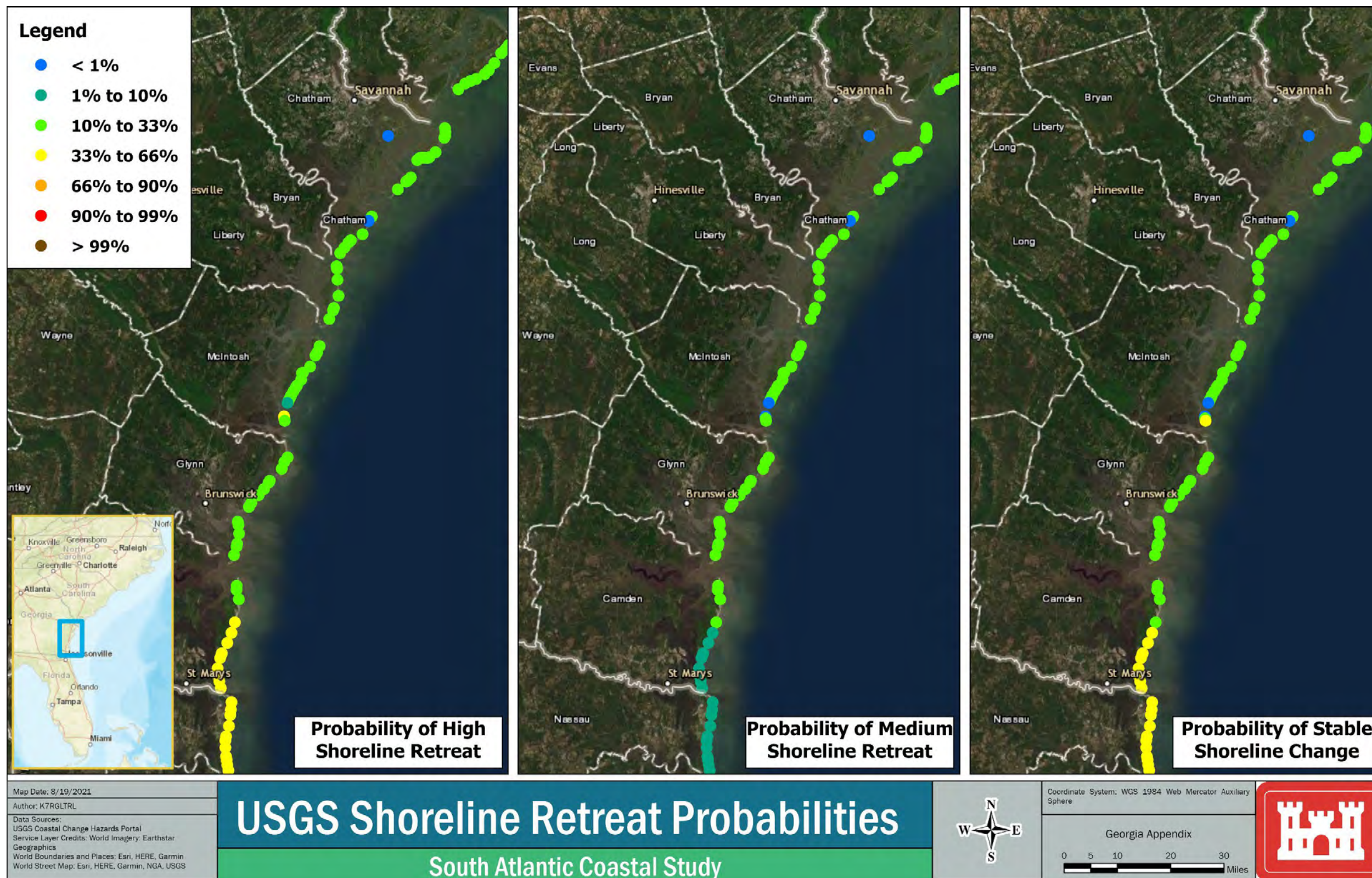


Figure 4-21: Probability of (a) Left Image – High Shoreline Retreat (b) Middle Image – Medium Shoreline Retreat (c) Right Image – Stable Shoreline Change (USGS n.d.; Coastal Change Hazards Portal)

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4.1.5.4 Wind

In Georgia, high winds during tropical systems can severely damage infrastructure, including roofs, mobile homes, and, if strong enough, entire buildings. High winds can also impact environmental resources and cultural resources by downing and defoliating trees and other vegetation and contribute to wave attack on both natural and engineered structures, including historic structures. **Table 4-9** describes some of the potential damages associated with tropical systems based on the Saffir-Simpson scale for wind speeds. **Figure 4-22** shows wind speed building codes for Atlantic and Gulf Coasts, which includes the Planning Reach GA_05. Structures within the state are required to follow the wind design criteria based on the zone where they are located.

Table 4-9: Damage Description Based on Wind Speeds

Tropical System Category Saffir-Simpson Scale	Wind Speeds (miles per hour)	Typical Damage Description
Tropical Depression	>39	Heavy rains and strong winds can cause minor flooding and property damage.
Tropical Storm	39–73	Minor damage will occur to many mobile homes. Framed homes may sustain mostly minor damage to roof shingles and siding.
Category 1 Hurricane	74–95	Primarily shrubbery and trees are damaged, unanchored mobile homes are damaged, some signs are damaged, and no real damage is done to structures.
Category 2 Hurricane	96–110	Some trees are toppled, some roof coverings are damaged, and major damage is done to mobile homes.
Category 3 Hurricane	111–129	Large trees are toppled, some structural damage is done to roofs, mobile homes are destroyed, and structural damage is done to small homes and utility buildings.
Category 4 Hurricane	130–156	Extensive damage is done to roofs, windows, and doors; roof systems on small buildings completely fail; and some curtain walls fail.
Category 5 Hurricane	>156	Roof damage is considerable and widespread, window and door damage is severe, there are extensive glass failures, and some complete buildings fail.

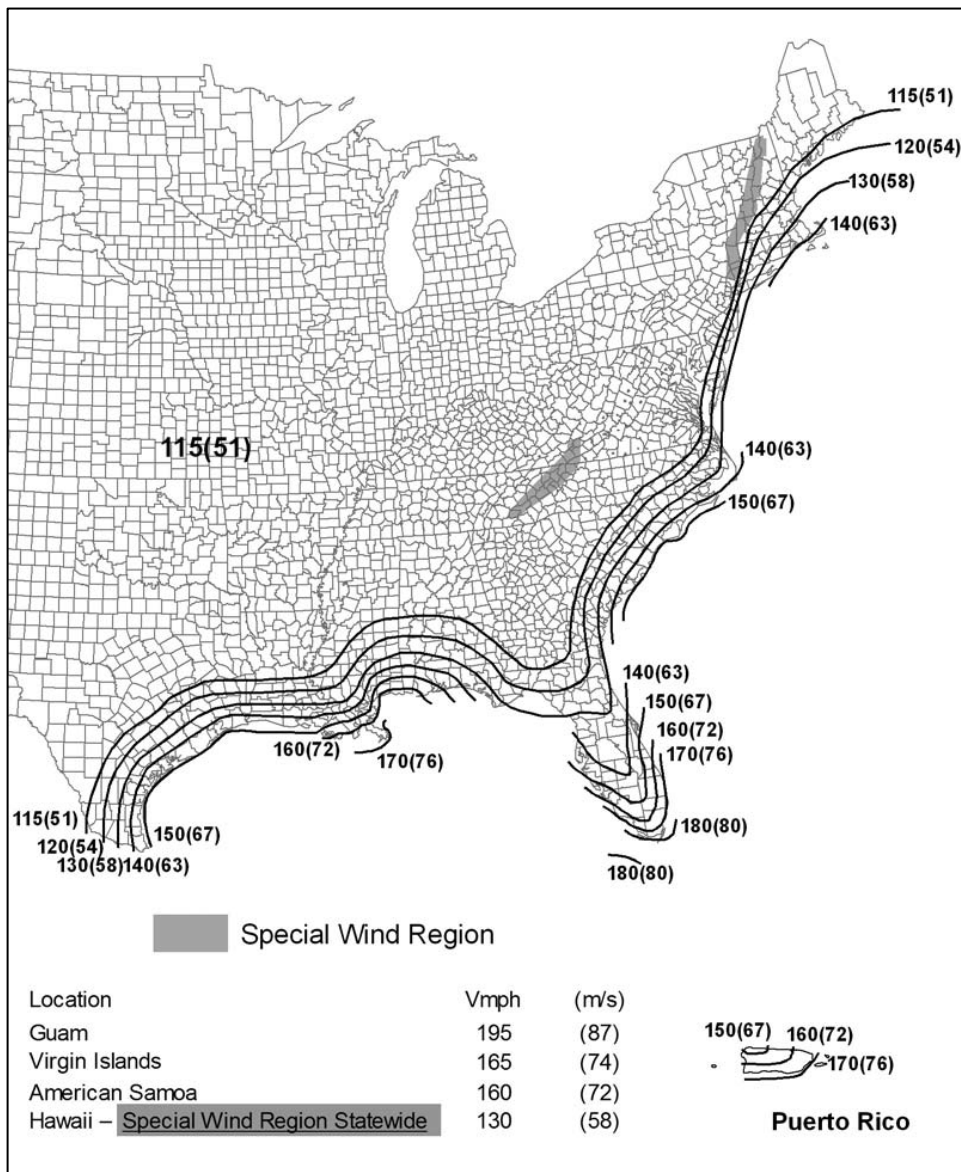


Figure 4-22: Basic Wind Speeds for Occupancy Category II Building and Other Structures (American Society of Civil Engineers 2010)

4.1.5.5 Compound Flooding

Compound flooding occurs when a combination of inundation, precipitation, astronomical tides, and high groundwater table elevations occur simultaneously, resulting in potentially greater impacts, as shown in **Figure 4-23**. The interplay between these hazards was apparent in the cities of Savannah and Brunswick and their adjacent barrier island communities during Hurricane Irma (2017) when elevated water levels in the rivers and streams due to heavy upstream precipitation and excessive overland flows occurred simultaneously with multiple high tide cycles and storm surge from prolonged onshore winds. The combination of these factors resulted in catastrophic flooding in many coastal Georgia towns and cities. Chatham and Glynn Counties are particularly prone to a

combination of these hazards because of the high population density among the principal cities and adjacent communities, high groundwater table elevation, bisecting riverine systems, low-lying barrier islands, and aging storm water and sewer control structures. Cultural resources and historic properties are not always considered as essential resources to protect during these types of storm events due to the focus on human life and safety. Flooding can be especially damaging to historic properties and associated artifacts.

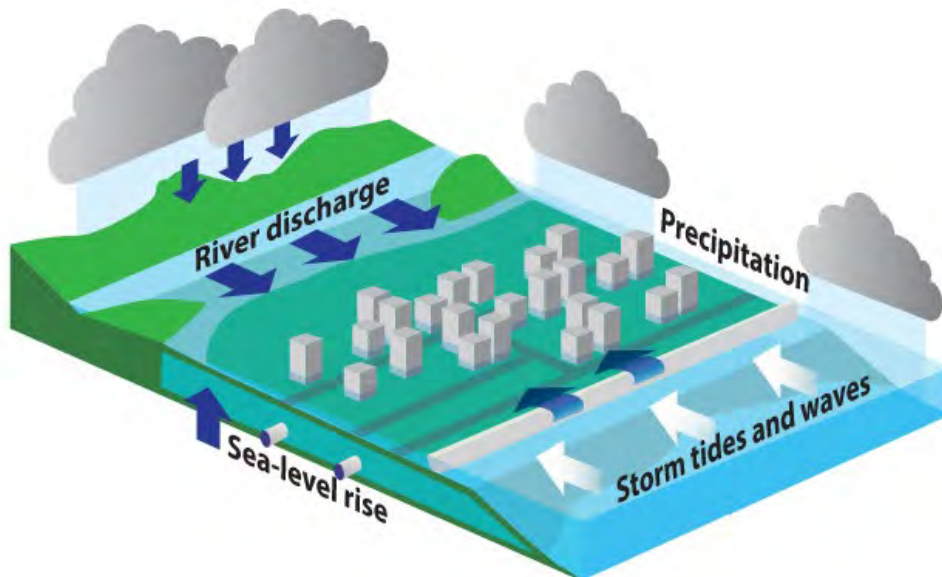


Figure 4-23: Components of Compound Flooding

4.1.5.6 Saltwater Inundation and Intrusion

Saltwater inundation is the movement of saltwater onto land or freshwater resources from storm surges or high tides that submerge areas low in elevation for a short duration of time. Salinity stress has been observed to cause major mortalities within coastal forests and freshwater wetlands by a single inundation event. During Hurricane Matthew in 2016, storm surge pushed into river inlets and low-lying areas near Savannah, inundating and causing saltwater damage to many estuaries and bird refuges in and around the Savannah NWR (Stewart 2017). Impacts from saltwater intrusion to environments and economies will continue to increase over time because of sea level rise.

Salinity and inundation are primary factors in controlling plant composition of coastal marshes. Without active management, freshwater tidal wetlands affected by saltwater intrusion are expected to transition to oligohaline or brackish tidal marsh (Tully et al. 2019). The ability of existing wetlands to adapt to sea level rise will depend mostly on the topography of the coastal zone and the amount of space landward that has not been developed and is available for wetland migration. Many cultural and historic resources are also located in and/or protected by coastal marshes that provide a buffer from other threats that may cause harm, such as wave attack. The loss of these marshes causes greater exposure to various resources.

Saltwater intrusion has been documented in coastal regions across the globe including the Georgia coastal plain. A total of 24 counties in southeast Georgia are subject to the Coastal Georgia Water and Wastewater Permitting Plan for Managing Salt Water Intrusion (GADNR 2006). Groundwater pumping or withdrawals in coastal regions can lead to saltwater intrusion. As a result of hydrogeological studies focused on saltwater intrusion, the Coastal Permitting Plan placed restrictions on groundwater withdrawals from the Upper Floridan aquifer, particularly for permit holders in the coastal counties of Chatham, Bryan, Liberty, Glynn (City of Brunswick T-shaped zone), and parts of Effingham County that are most susceptible to saltwater intrusion. The restrictions are zonal and include three subregions in addition to red zones that identify locations with the most extreme restrictions, as identified in **Figure 4-24** (GADNR 2006). While groundwater development was a primary driver of saltwater intrusion in the Upper Floridan aquifer, the downward saltwater migration from surficial sources through the upper confining units pose a future threat to the aquifer that is projected to increase with sea level rise.

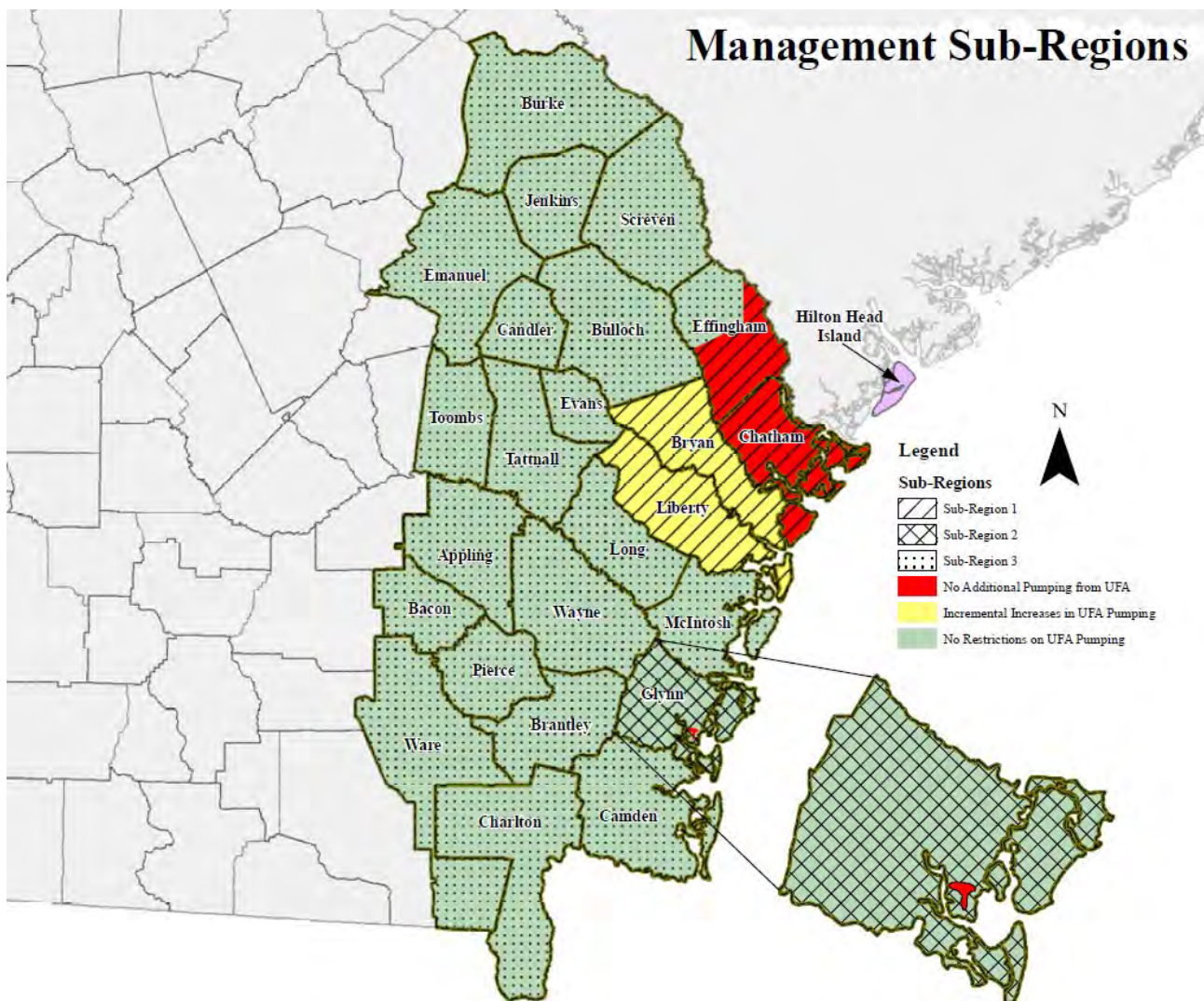
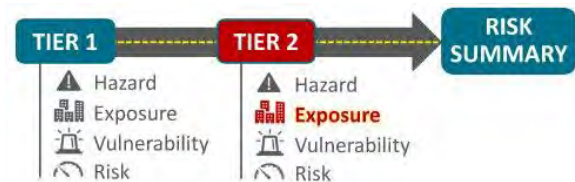


Figure 4-24: Sub-Regions Associated with the Coastal Georgia Water & Wastewater Permitting Plan for Managing Salt Water Intrusion into The Upper Floridan Aquifer (GADNR 2006)

4.1.6 Tier 2 Exposure

Exposure to coastal storm hazards was further assessed in Tier 2 in terms of population and infrastructure, environmental, and cultural resources. The Tier 2 analysis for population and infrastructure used data from the USACE National Structure Inventory, the EPA Integrated Climate and Land Use Scenario (ICLUS), and the 2013 Coastal Georgia Hurricane Evacuation Study to develop a more refined outlook of the potential population and infrastructure exposed to hazards for the existing and future conditions.



The Tier 2 environmental exposure assessment identified and described the natural areas within Planning Reach GA_05 potentially exposed to the Tier 2 coastal flood hazards. The GADNR's Wetlands of Coastal Georgia – Results of the National Wetlands Inventory and Landscape-level Functional Assessment (GADNR 2012) and the Natural Environments of Georgia (Wharton 1978) were used to inform exposure of environmental resources. The Environmental Technical Report contains exposure tables of upland and wetland natural areas in Georgia with rare species and critical habitat present.

The Tier 2 Resources Addendum used the Georgia Natural, Archaeological, and Historic Resources Geographic Information System (GNAHRGIS) and stakeholder input to refine exposure due to flood hazards in the 1-percent and 10-percent AEP flood scenarios in the current and future conditions with 3 feet of sea level rise.

4.1.6.1 Population and Infrastructure Exposure

Tier 2 population and infrastructure exposure was first assessed using data from the National Structure Inventory, developed by the USACE Hydrologic Engineering Center and FEMA. **Figure 4-25** displays infrastructure data from the USACE National Structure Inventory that is within the footprint of the 0.2-percent AEP event floodplains with 3 feet of sea level rise (USACE n.d.-a). The pie chart in **Figure 4-25** shows the proportional relationship in value between the general infrastructure types.

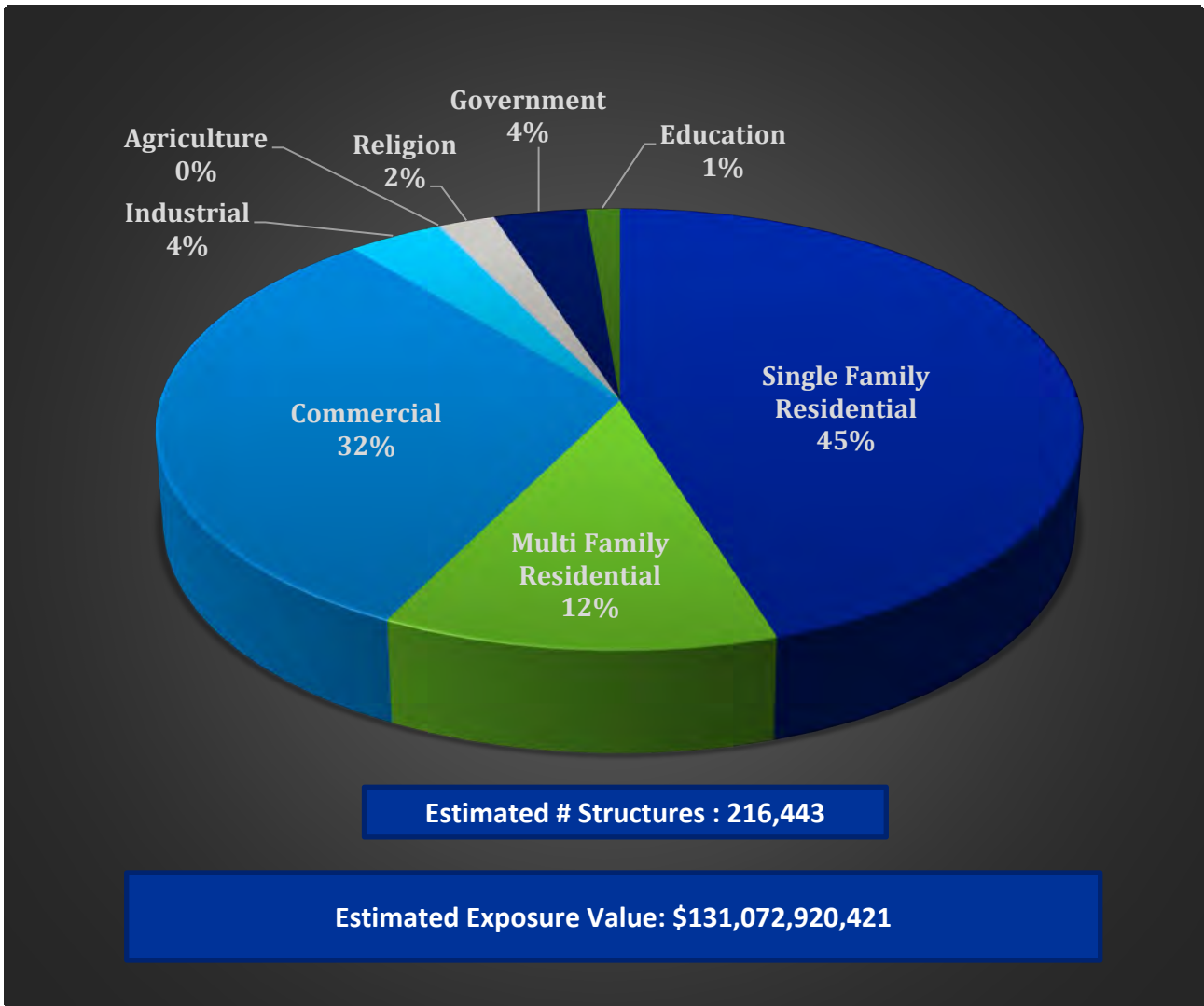


Figure 4-25: Planning Reach GA_05 Estimated Exposure Value (USACE n.d.-a)

The estimated average exposed population is approximately 550,000 people and there are approximately 216,000 structures exposed, with an estimated exposure value of over \$131 billion. The greatest value is estimated to be single-family and multi-family residential infrastructure, consisting of approximately 190,300 structures with an exposure value of \$75.2 billion dollars (Table 4-10).

Table 4-10: Planning Reach GA_05 Exposure by General Occupancy

General Occupancy	Number of Structures	Percent of Structures	Estimated Exposure Value (\$ Million)	Percent of Exposed Value
Single-Family Residential	174,646	81%	59,210	45%
Multi-Family Residential	15,717	7%	15,999	12%
Commercial	19,512	9%	41,396	32%
Industrial	3,029	1%	4,902	4%
Agriculture	448	0%	190	0%
Religion	1,673	1%	2,833	2%
Government	961	0%	4,789	4%
Education	457	0%	1,755	1%
All	216,443	100%	131,073	100.0%

Within the current condition, the total permanent population potentially exposed from a Category 5 MOM hurricane surge in the coastal counties is approximately 404,000, while 99,000 are not projected to be exposed. Eighty-seven percent of Chatham County, 68 percent of Bryan County, 24 percent of Liberty County, 90 percent of McIntosh County, 97 percent of Glynn County, and 94 percent of Camden County are potentially exposed to a Category 5 MOM hurricane surge (**Figure 4-26**) (USACE 2013c). Within the top bar chart in **Figure 4-26**, light blue identifies the number of permanent residents not exposed to a Category 5 MOM surge.

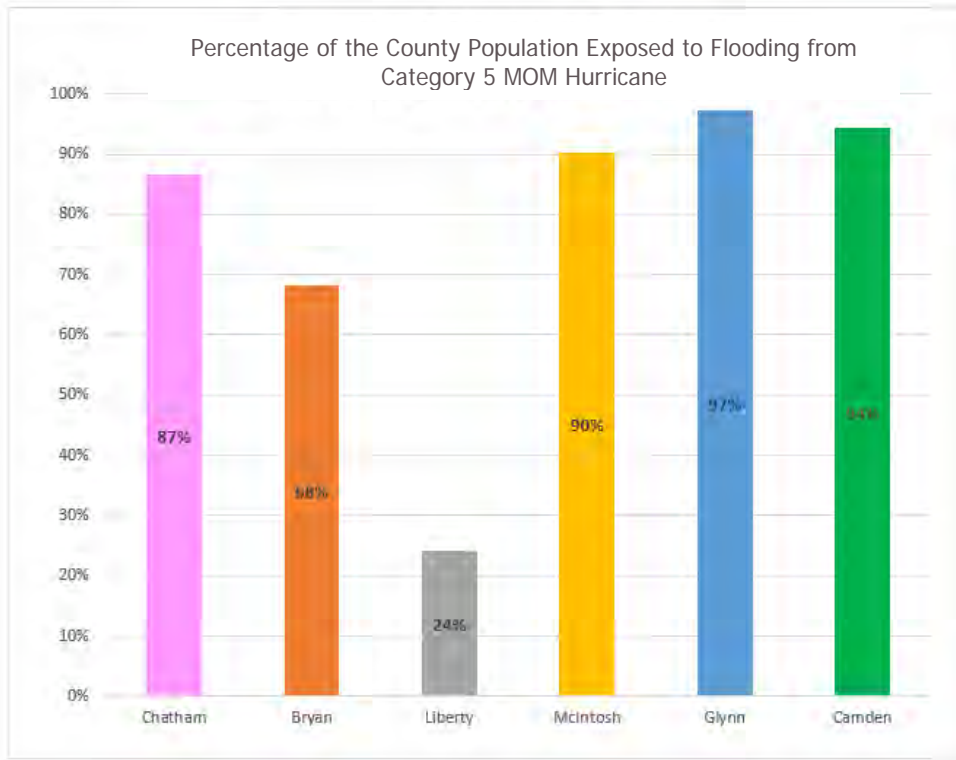
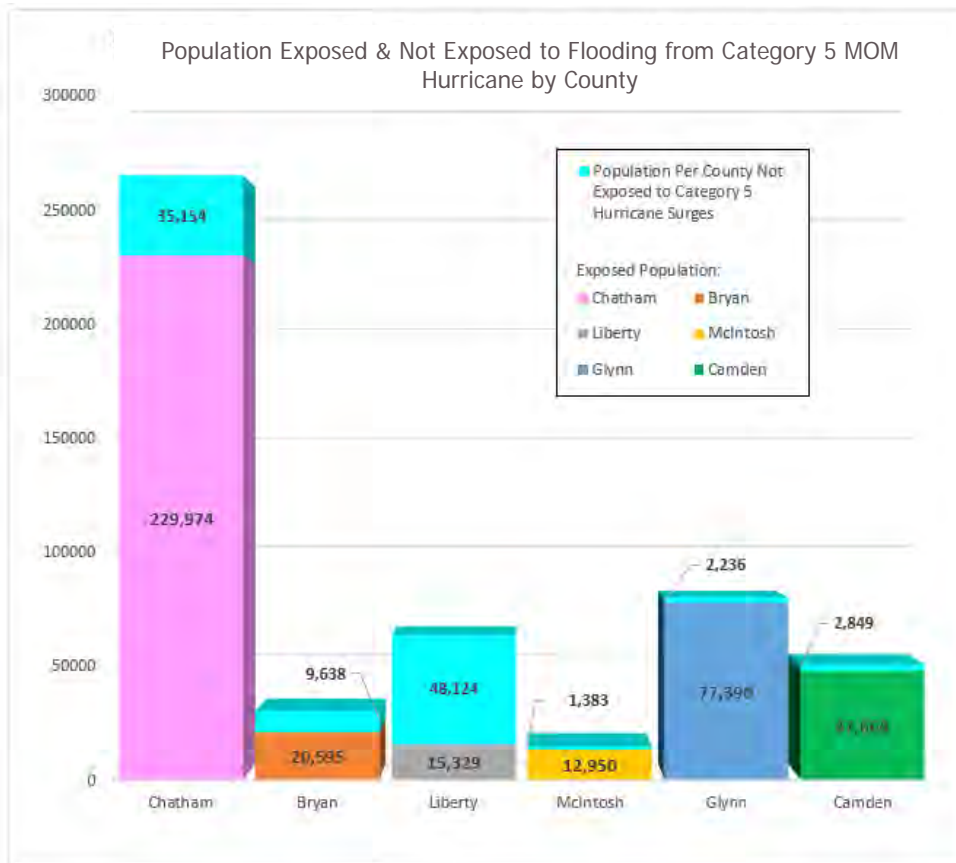


Figure 4-26: Population Exposed to Category 5 Maximum of Maximum Hurricane Surges (USACE 2013c)

Approximately 57 percent of the exposed population along the Georgia coast resides in Chatham County (265,128), where 87 percent of residents (229,974) are exposed to coastal storm surge resulting from a Category 5 MOM hurricane. With the projected increases in population and housing density and with the inclusion of 3 feet of sea level rise, the exposed population in the coastal counties are likely to rise from 2020 to 2100.

Assessing future growth trends in population can indicate whether there will be an increase in people and associated infrastructure exposed to future hazard conditions. Forecasted population and housing density data were used to evaluate growth trends in coastal Georgia for this study.

EPA's ICLUS database analyzes and produces spatially explicit projections of population and land use based on various climate change scenarios. The project incorporates a variety of modeling factors, including migration, immigration, fertility, land use changes, transportation networks, and climate scenarios. ICLUS provides a variety of spatial data outputs that can be used to better understand the impacts of climate change as well as assess the impacts and dynamics of land use and population changes across the continental U.S. landscape. ICLUS version 2 was used for population projections across the continental portion of the SACS study area. These data were published in 2018 and are based on 2010 Census data. ICLUS used fertility, mortality, and immigration rates to project population on a decadal basis out to 2100 (U.S. Environmental Protection Agency 2021). For the SACS, the conservative climate change scenario Shared Socioeconomic Pathways (SSP)2 was used, and population percentage changes from 2020 to 2100 were calculated. In the SSP2 scenario, the U.S. experiences a medium level ("Middle of the Road"), of population growth, driven by medium levels of fertility, mortality, and international migration. The ICLUS project aggregated these projections to either the metropolitan statistical area, micropolitan statistical area, or county boundary.

Figure 4-27 displays the expected population percentage change by metropolitan and micropolitan statistical areas for 2020 to 2100 for Planning Reach GA_05. Results from the ICLUS scenario SSP2 population projection for 2020 to 2100 show a greater than 100 percent increase in population in the Hinesville-Ft. Stewart and Brunswick, Georgia metropolitan areas, a 50 percent to 75 percent increase in population for the St. Marys and Jesup, Georgia, micropolitan statistical areas, and a 25 percent to 50 percent increase in the Savannah, Georgia metropolitan statistical area.

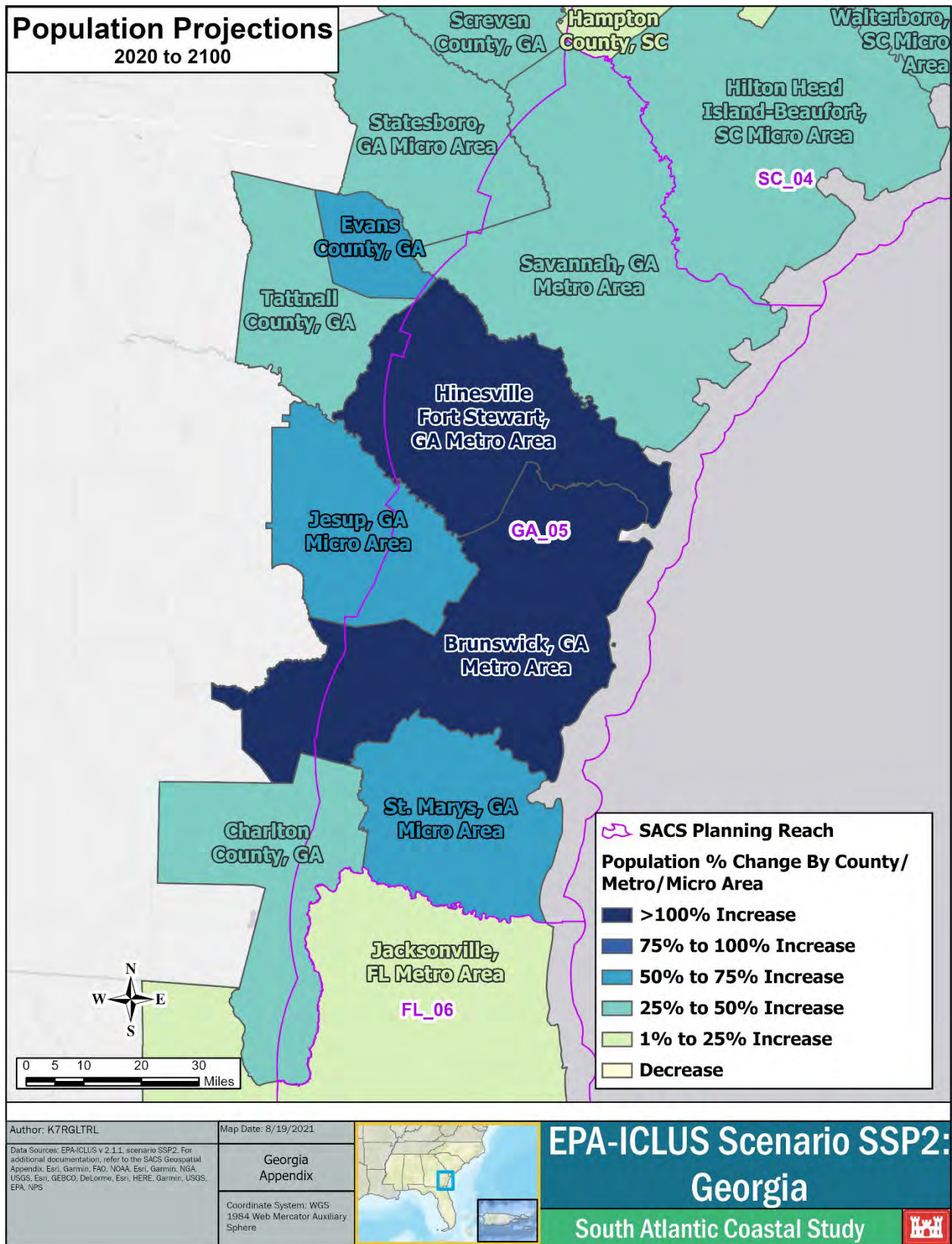


Figure 4-27: Integrated Climate and Land Use Scenarios: Projected Population Percentage Change from 2020 to 2100 for Planning Reach GA_05

Figure 4-28 shows the forecasted increase in development derived from ICLUS data for Georgia using the B2 scenario for housing density increase from 2020 to 2100. The B2 scenario is adapted from the Intergovernmental Panel on Climate Change (IPCC) Special Report on Emissions Scenarios (SRES 2000). Within the SRES B2 scenario, fertility, mortality, and migration rates are assumed to be moderate. The “B” scenarios place more emphasis on environmental protection and the “2” scenario places assumes intermediate levels of economic development and less rapid and more diverse technological change. Housing density data are based on open, undeveloped space. ICLUS data were computed at a national level and do not include all local land use or planning/development considerations. As a result, some residential density increases may be shown in areas of open space that are not developable, as designated by the ICLUS model input parameters, such as a cemetery or other green space. The housing density projections provide useful insight into general trends of increased population and development density in coastal areas, serving as a starting point for more refined analyses at a smaller scale. The USACE 1-percent and 10-percent AEP flood scenarios with 3 feet of sea level rise inundation were added to demonstrate the exposure from coastal storm inundation and sea level rise to future development by 2100. Areas of clustered deep red can be identified within the Savannah and Brunswick, Georgia metropolitan statistical areas as well as the St. Marys, Georgia micropolitan statistical area, which correspond to projected future development and population density.

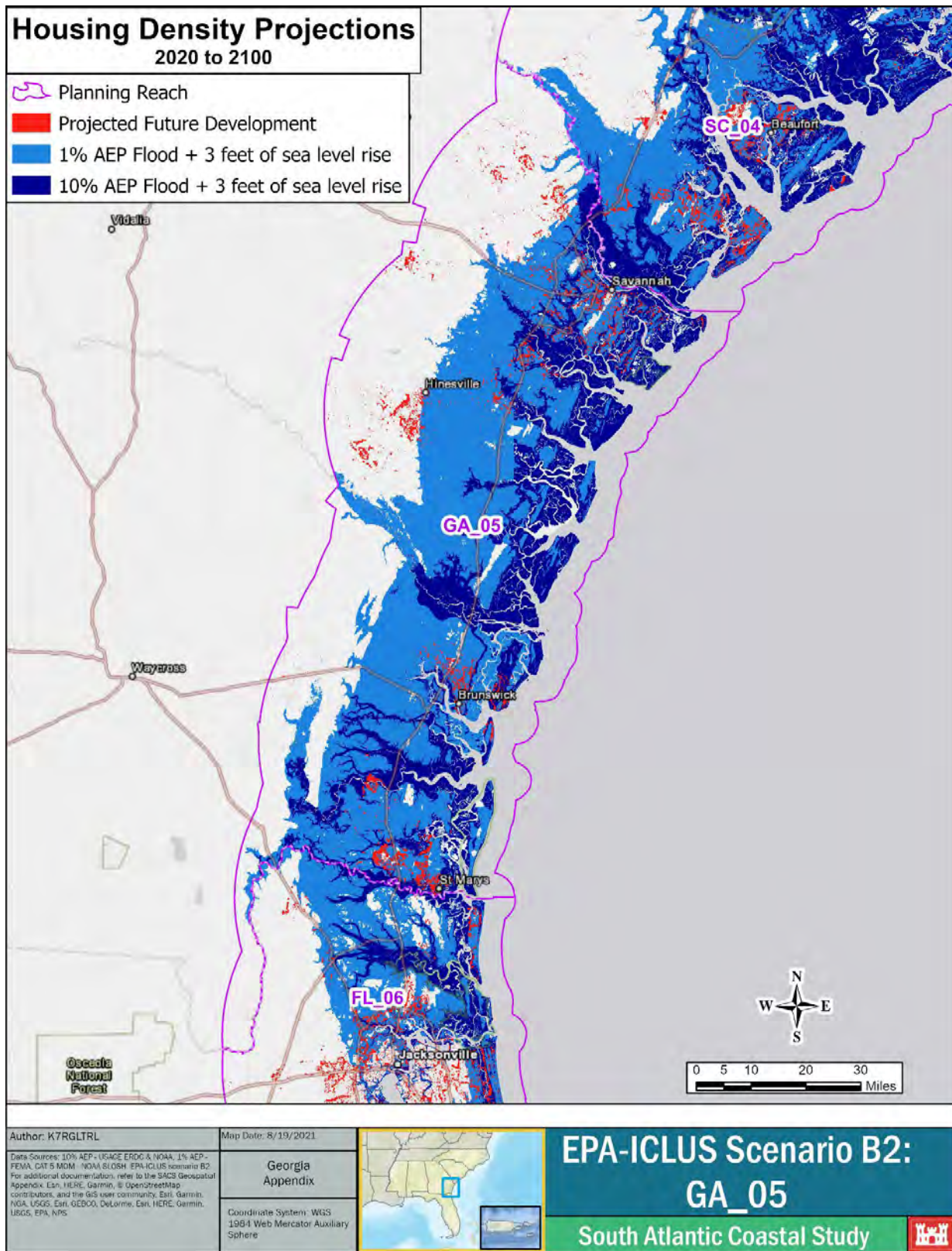


Figure 4-28: Integrated Climate and Land Use Scenarios: Projected Housing Density Projections from 2020 to 2100 for Planning Reach GA_05

4.1.6.2 Environmental Exposure

The Tier 2 Exposure Overview (Section 4.1.6) provides information on the data used to identify natural areas that may be exposed to coastal storm hazards and sea level rise within the planning reach. This data was used as part of the Priority Environmental Area (PEA) selection process, with the majority of identified natural areas located within federal, state, private, and local municipal conservation parcels, parks, preserves, and refuges.

A Natural Areas Exposure Table (SACS Environmental Technical Report, Appendix A) was developed for each county within coastal Georgia that identifies the natural area types, provides a brief description of the natural areas, lists any federal and state protected species that the natural area could support, and identifies whether the natural area is designated critical habitat by USFWS, the location of the critical habitat, and the species the critical habitat is designated for. Identification of the natural areas was based on the Georgia Department of Natural Resources-Wetlands of Coastal Georgia-Results of the National Wetlands Inventory and Landscape-level Functional Assessment (GADNR 2012) and The Natural Environments of Georgia (Wharton 1978). The SACS Environmental Technical Report provides more details on environmental exposure.

Within the GA_05 Planning Reach, estuarine emergent wetlands (e.g., saltmarsh and oyster flats/beds), and palustrine forested wetlands (e.g., forested freshwater wetlands), were identified as the most prevalent land cover types exposed to hazards in this reach. Estuarine emergent wetlands are prevalent within the back bay areas of Tybee, Jekyll, St. Simons, Cumberland, and several other barrier islands, from Chatham County to Camden County, as well as bordering the majority of the AIWW through the reach. Palustrine (freshwater) forested wetlands found within several natural areas including Blue Sky Preserve, Harris Neck NWR and Altamaha Wildlife Management Area (WMA), as well as other natural areas lying landward of bordering estuarine wetlands, are also prevalent from Chatham County to Camden County. Additional natural areas exposed to the Tier 2 hazards within this reach include east-facing unconsolidated shorelines, palustrine scrub-shrub and emergent vegetation habitat and estuarine scrub-shrub wetlands and forested wetland habitat. They also include upland communities such as grassland/herbaceous, scrub-shrub, evergreen forest, mixed forest, and deciduous forest communities.

A more detailed description of the Tier 2 natural resources exposure characterization for Planning Reach GA_05 can be found in the Environmental Technical Report.

4.1.6.3 Cultural Resource Exposure

Exposed cultural resources were broadly defined as being within the 1-percent and 10-percent AEP flood zone because of the potential impacts of repeated and frequent inundation. Geospatial analysis of several datasets determined which cultural resources were located in the 1-percent and 10-percent AEP flood zone. Exposure of cultural resources to coastal storm hazards was evaluated using information and datasets from the NPS, the USGS, and the GNAHRGIS. While the same datasets were used to identify a broad expanse of exposed cultural resources in Tier 1, these datasets were used in Tier 2 to pinpoint the resources located in these areas that are characterized as presenting higher exposure rates.

- **National Register of Historic Places (NRHP):** The data were developed by the NPS to protect historic and archeological resources (U.S. National Parks Service 2020). The NRHP has a comprehensive inventory of cultural resources that are deemed worthy of preservation. The data is available in GNAHRGIS and can provide spatial data of where historic points and historic places (polygons) occur relative to different types of hazards.
- **Geographic Names Information System Historical Features:** The data were developed by the USGS to maintain uniform feature name usage throughout the government. The Geographic Names Information System contains information about historical features and cultural resources (U.S. Geological Survey 2021). The data are available in Georgia’s Natural, Archeological and Historic Resources Geographic Information System (detailed below) and provide spatial data of where physical, cultural, political, and historical points occur relative to different types of shorelines and hazards.
- **Georgia’s Natural, Archeological and Historic Resources Geographic Information System (GNAHRGIS):** Additional cultural resources data from GNAHRGIS was used to refine exposure for cultural resources in Tier 2. GNAHRGIS is comprised of two databases (Georgia Archeological Site File at the University of Georgia and the Georgia Department of Natural Resources n.d.).
 - Georgia Archeological Site File data
 - GADNR-HPD Historic Resources Survey data

GNAHRGIS combines data from the state’s archaeological and built environment (i.e., historic resources) to provide researchers with an online source for cultural resources information. This dataset identifies known historic resources (buildings, structures, archaeological sites, landscape features, and districts) that are eligible for listing, but not listed on the NRHP; resources that require additional evaluation for NRHP eligibility; and resources that are not eligible for listing on the NRHP that would be exposed to hazards. Archaeological sites (historic and prehistoric) that would be exposed due to hazards are also identified using this dataset.

The SACS future 1-percent and 10-percent AEP combined hazard layer (existing AEP hazard plus 3 feet of sea level rise) was used to demonstrate the exposure from coastal storm inundation and sea level rise in the future condition (**Table 4-11, Table 4-12**). Cultural and historic resources located within these hazard areas are categorized as being at a higher exposure value than resources located outside of these defined boundaries. Exposed cultural resource areas identified within the state appendices are not meant to be all-inclusive. Publicly available data for historic resources are discussed below and within the FAAS reports. Specific archaeological site information is not publicly reportable but was analyzed to determine the volume of sites located in areas subject to inundation in the existing and future conditions with the addition of 3 feet of sea level rise. The publicly available data and confidential data are sometimes reported separately in the reports, which is primarily due to how the data is reported in the different databases. The figures will only contain locational information for publicly available data (i.e., no archaeological site locational information).

Table 4-11: Exposed Archaeological Sites (Confidential Locational Data)

County	Existing Exposure Number of Sites			Future Exposure (3-Foot Sea Level Rise) Number of Sites		
	1-Percent Annual Exceedance Probability (AEP)	10-Percent AEP	10-Percent and 1-Percent AEP Totals (per county)	1-Percent AEP	10-Percent AEP	10-Percent and 1-Percent AEP Totals (per county)
Camden	157	76	233	61	208	269
Chatham	340	573	913	187	761	948
Glynn	210	90	300	165	143	308
Liberty	86	131	217	84	152	236
McIntosh	98	122	220	51	191	242
Total	891	992	1,883	548	1,455	2,003

Table 4-12: Exposed Historic Resources Sites (Publicly Available Data)

County	Existing Exposure Number of Sites			Future Exposure (3-Foot Sea Level Rise) Number of Sites		
	1-Percent Annual Exceedance Probability (AEP)	10-Percent AEP	10-Percent and 1-Percent AEP Totals (per county)	1-Percent AEP	10-Percent AEP	10-Percent and 1-Percent AEP Totals (per county)
Camden	92	22	114	23	119	142
Chatham	461	157	618	281	353	634
Glynn	2,523	285	2,808	2,292	591	2,883
Liberty	12	0	12	12	6	18
McIntosh	8	13	21	7	14	21
Total	3,096	477	3,573	2,615	1,083	3,698

In the current conditions, 3,573 historic resources were identified within the 1-percent and 10-percent AEP flood zones. With the addition of 3 feet of sea level rise, an additional 125 resources are potentially exposed for a total of 3,698 historic resources. **Figure 4-29** compares existing and future conditions, showing that the future conditions lead to a higher exposure for cultural resources. In the current conditions, 1,883 archaeological sites were identified within the 1-percent and 10-percent AEP flood zones. With the addition of 3 feet of sea level rise, an additional 120 archaeological sites are potentially exposed for a total of 2,003 archaeological sites.

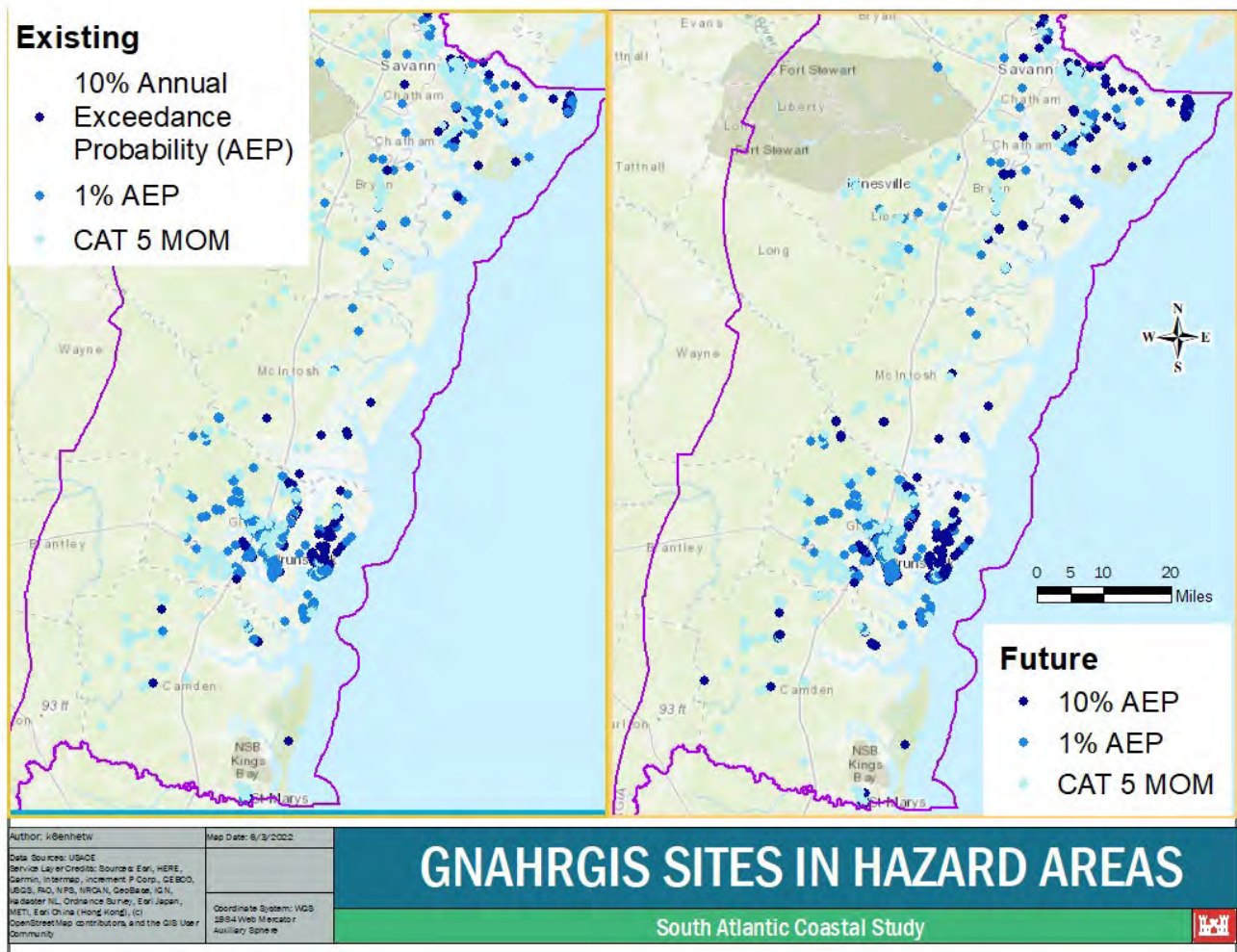


Figure 4-29: Publicly Available Data for Historic Resources Recorded in the Georgia Natural, Archaeological, and Historic Resources Geographic Information System Located in the Existing (left) and Future Conditions (right) 1-Percent and 10-Percent Flood Scenarios (With 3-Foot Sea Level Rise)

The existing and future exposure for archaeological and historic resources for all coastal counties are discussed in greater detail below, as these counties are deemed to have higher exposure due to their proximity to the coast and exposure to coastal storm surge. Specific cultural resource areas are categorized by county in **Table 4-13**. It is important to note that this table is not all-inclusive and is meant to communicate the types of cultural resources that may be found in these areas. A selection of historic properties and districts are highlighted due to their National Register status and stakeholder input regarding their historical significance and concern for continued preservation due to their higher exposure rating. General information is also included regarding the presence of archaeological sites in areas of higher exposure.

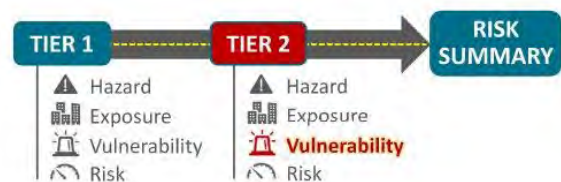
Table 4-13: Exposed Cultural Resources Areas by County

County	Location	Exposed Cultural Resource Area
Bryan	Richmond Hill	Ft. McAllister
Camden	Cumberland Island	Cumberland Island, Dungeness Historic District, Little Cumberland Island, Duck House, and historic and prehistoric archaeological sites subject to erosion (Crooked River State Park)
Chatham	Moon River District	Pin Point Gullah Geechee Community
Chatham	Cockspur Island	Ft. Pulaski National Monument, Cockspur Island Lighthouse, and historic and prehistoric archaeological sites subject to erosion
Chatham	Tybee Island	Back River Historic District, Tybee Island Strand Cottages Historic District, Ft. Screven Historic District, and historic and prehistoric archaeological sites subject to erosion. Includes Little Tybee.
Chatham	Ossabaw Island	Historic and prehistoric archaeological sites subject to erosion
Chatham	Savannah	Savannah Historic District (River Street)
Chatham	Isle of Hope	Wormsloe Plantation, Isle of Hope Historic District, Gullah-Geechee sites, and historic and prehistoric archaeological sites subject to erosion
Glynn	St. Simons	Ft. Frederica National Monument, St. Simons Lighthouse and Lighthouse Keepers' Building, U.S. Coast Guard Station at St. Simons Island, Hamilton Plantation slave cabins, and historic and prehistoric archaeological sites subject to erosion
Glynn	Brunswick	Brunswick Old Town Historic District, Hofwyl-Broadfield Plantation
Glynn	Jekyll Island	Jekyll Island Historic District and National Historic Landmark, Jekyll Island Club, Indian Mound Cottage (Rockefeller Cottage), Faith Chapel, and historic and prehistoric archaeological sites subject to erosion
Liberty	Midway	Ft. Morris
Liberty	St. Catherines Island	National Historic Landmark and historic and prehistoric archaeological sites subject to erosion
McIntosh	Darien	Ashantilly, Ft. King George
McIntosh	Sapelo Island	Sapelo Island Lighthouse, Hog Hammock, and historic and prehistoric archaeological sites subject to erosion
McIntosh	Blackbeard Island	Historic and prehistoric archaeological sites subject to erosion

4.1.7 Tier 2 Vulnerability

Vulnerability in Planning Reach GA_05 was refined during the Tier 2 analysis using the USGS Coastal Vulnerability Index and a refined environmental and cultural resources analysis. The USGS Coastal

Vulnerability Index was used to help show which areas within the coastal counties of Georgia were most vulnerable to sea level rise and to what degree (very low, low, moderate, high, and very high). The USGS Coastal Vulnerability Index is a measure of the relative vulnerability of the coastline to changes due to future changes in sea level. This method does not produce results that can be directly equated to physical effects but does highlight regions where various effects of sea level rise (inundation, erosion, and waves) are expected to be greatest.



A Tier 2 Environmental Resources Vulnerability Analysis was conducted to determine the degree to which natural areas are susceptible to loss or degradation when exposed to coastal storm hazards and sea level rise. Please see the Environmental Technical Report for more information.

A qualitative assessment of cultural resource vulnerability was conducted for historic structures located on barrier islands, along the coast, and in low lying areas due to Tier 2 hazards (storm surge inundation, erosion, and wave attack).

4.1.7.1 U.S. Geological Survey Coastal Vulnerability Index

The USGS Coastal Vulnerability Index characterization used in this assessment ranks coastal vulnerability based on six quantifiable physical variables: geomorphology, coastal slope, relative sea level rise, shoreline erosion/accretion, mean tidal range, and mean wave height (Thieler and Hammar-Klose 1999).

Table 4-14 shows the six physical variables ranked on a linear scale from 1 to 5 in order of increasing vulnerability due to changing sea level. Values are presented in metric units. The databases include both quantitative and qualitative information, resulting in a vulnerability ranking based on data value ranges and non-numerical

Details of the analysis are available from the USGS at <https://pubs.usgs.gov/of/1999/of99-593/>.

geomorphology (ranked according to relative resistance to erosion). Coastal Vulnerability Index characterizations for the Atlantic coast, developed from Thieler and Hammar-Klose, can be accessed graphically online through the USGS Coastal Change Hazards Portal (USGS n.d.).

Table 4-14: Ranking of Coastal Vulnerability Index (Thieler and Hammar-Klose, 1999)

Metric	Very Low	Low	Moderate	High	Very High
Geomorphology	<ul style="list-style-type: none"> Rocky, cliffed coasts Fiords Fiards 	<ul style="list-style-type: none"> Medium cliffs Indented coasts 	<ul style="list-style-type: none"> Low cliff Glacial drift Alluvial plains 	<ul style="list-style-type: none"> Cobble beaches Estuary Lagoon 	<ul style="list-style-type: none"> Barrier beaches Sand beaches Salt marsh Mud flats Deltas Mangrove Coral reefs
Coastal Slope	> .2	.2 - .07	.07 - .04	.04 - .025	< .025
Relative seal-level change (meters/year [m/yr])	< 1.8	1.8 – 2.5	2.5 – 2.95	2.95 – 3.16	> 3.16
Shoreline erosion/accretion rate (m/yr)	> 2.0	1.0 – 2.0	-1.0 – +1.0	-1.1 – -2.0	< -2.0
Shoreline erosion/accretion	Accretion	Accretion	Stable	Erosion	Erosion
Mean ride range (m)	> 6.0	4.1 – 6.0	2.0 – 4.0	1.0 – 1.9	< 1.0
Mean wave height (m)	< .55	.55 - .85	.85 – 1.05	1.05 – 1.25	> 1.25

Figure 4-30 to Figure 4-32 show the Coastal Vulnerability Index for the Georgia coastline along the six coastal counties (north to south): Chatham and Bryan (**Figure 4-30**), Liberty and McIntosh (**Figure 4-31**), and Glynn and Camden (**Figure 4-32**). **Table 4-15** tabulates these data by county and region. A region may contain shorelines with one or more Coastal Vulnerability Index rankings.

The areas with the highest vulnerability are generally high-energy coastlines where the regional coastal slope is low, typically where the shoreline type is a barrier island. The barrier islands of Georgia are predominantly characterized as having moderate to high Coastal Vulnerability Index rankings, while inlets, sounds, and rivers are characterized as having low to high Coastal Vulnerability Index rankings. Tybee Island, St. Catherine Island, parts of St. Simons Island, and parts of Cumberland Island are particularly vulnerable and are characterized as having a very high Coastal Vulnerability Index. In these locations, the predominant variable is the geomorphology, but local coastal slope and exposure to high energy waves also contribute to their high vulnerability. In general, all coastal areas of Georgia should be considered as vulnerable to sea level rise.

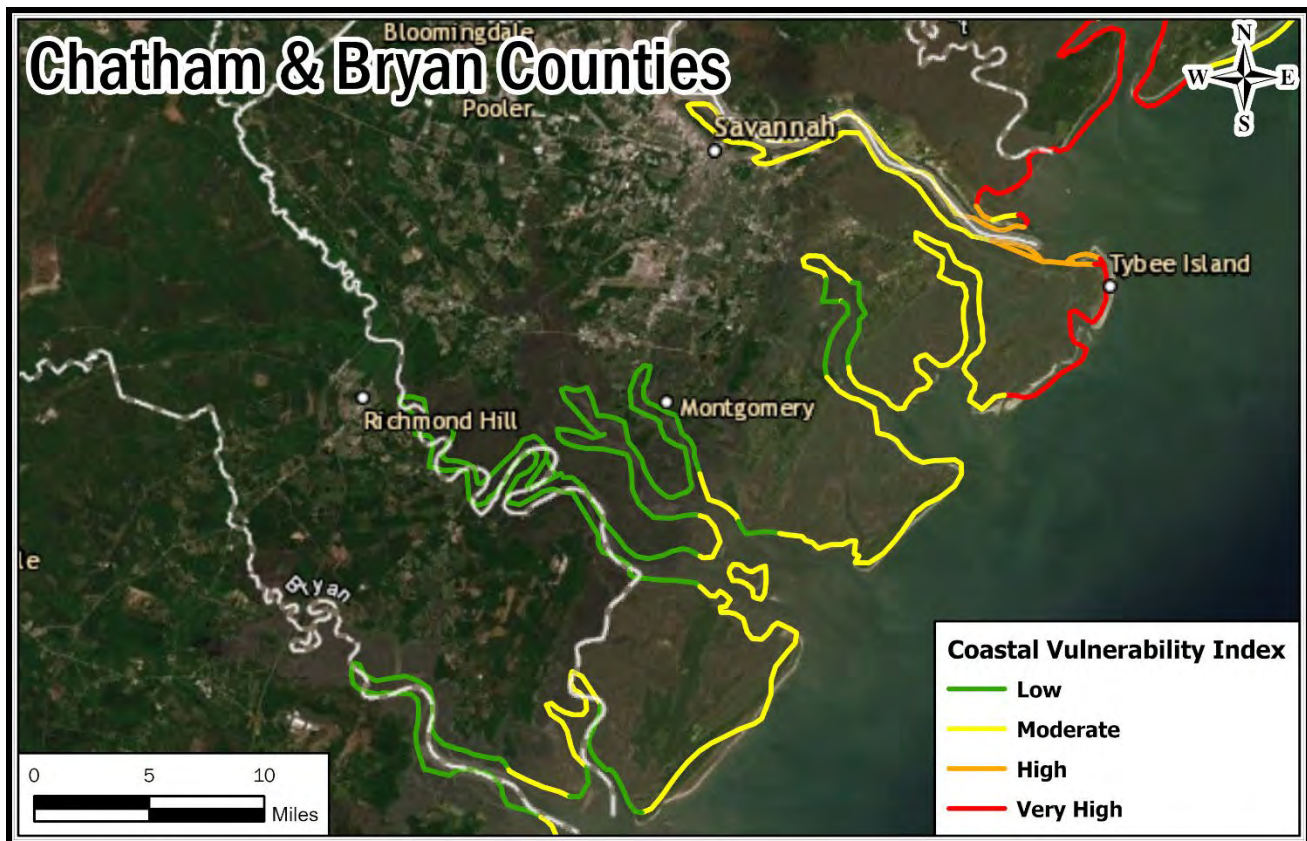


Figure 4-30: Coastal Vulnerability Index (Chatham and Bryan Counties) (USGS n.d.; Coastal Change Hazards Portal)

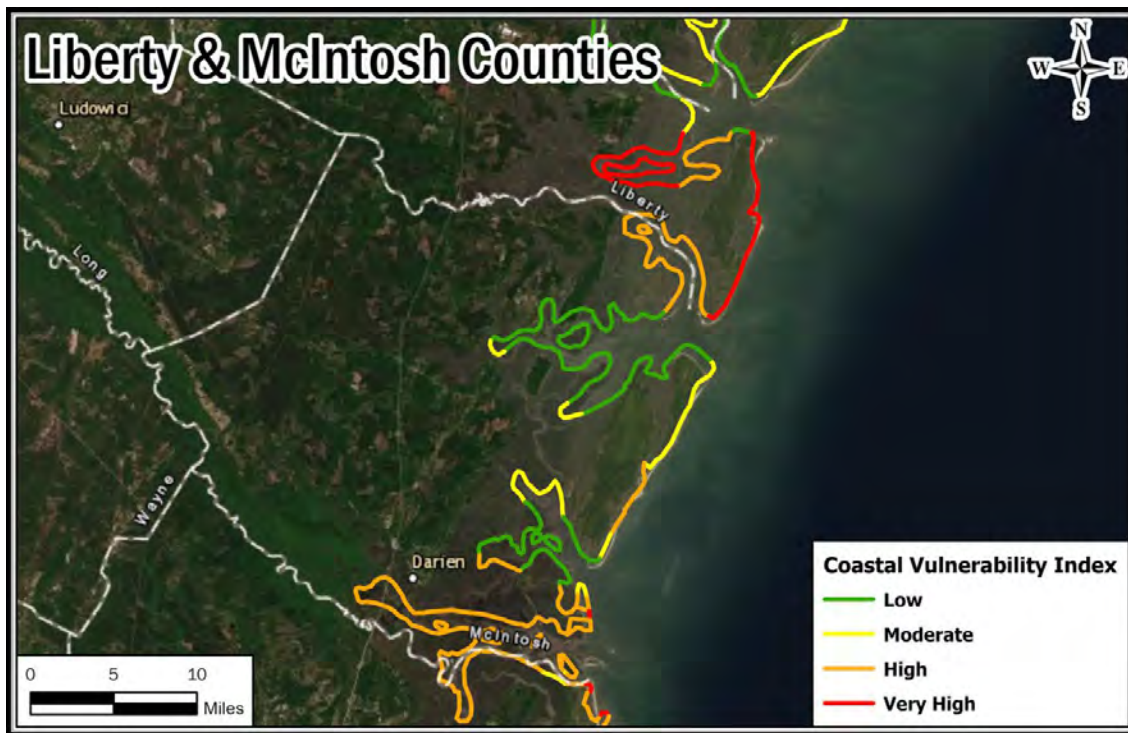


Figure 4-31: Coastal Vulnerability Index (Liberty and McIntosh Counties) (USGS n.d.; Coastal Change Hazards Portal)

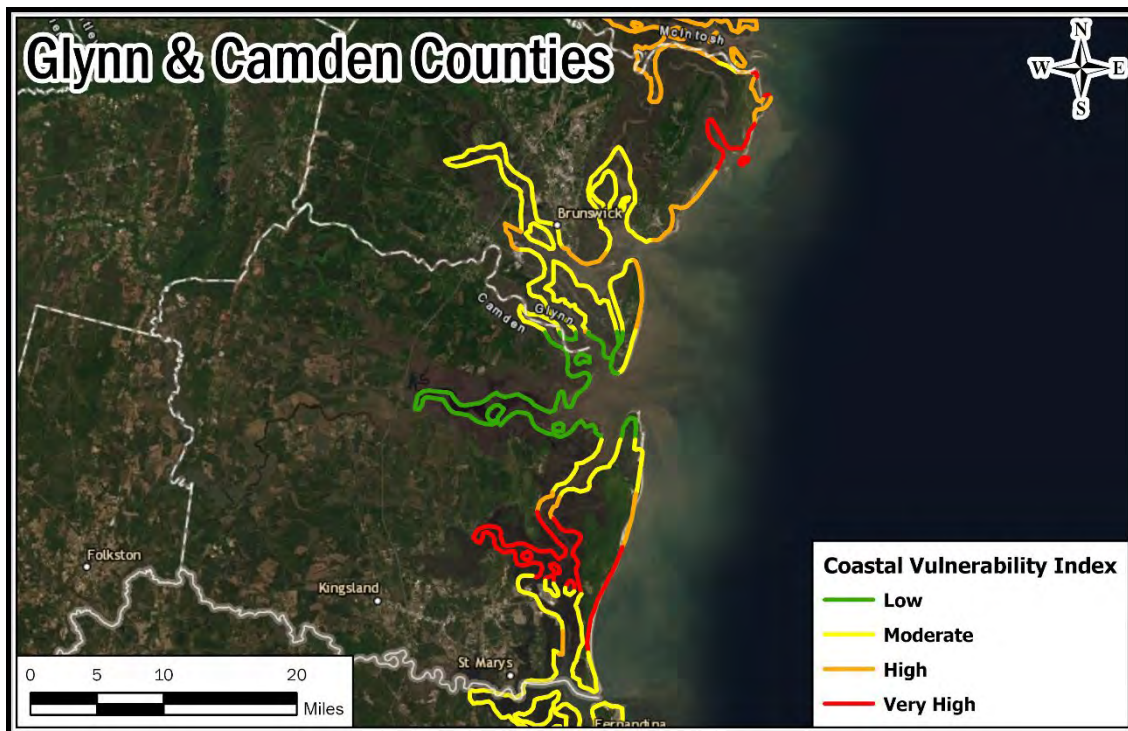


Figure 4-32: Coastal Vulnerability Index (Glynn and Camden Counties) (USGS n.d.; Coastal Change Hazards Portal)

Table 4-15: Coastal Vulnerability Index – All Coastal Counties

County	Region Description	Vulnerability to Sea Level Rise				
		Very Low	Low	Moderate	High	Very High
Chatham	Savannah River			X	X	
	Tybee Island					X
	Little Tybee					X
	Wassaw Sound		X	X		
	Wassaw Island			X		
	Ogeechee River			X		
	Ossabaw Island			X		
Bryan	St. Catherines Sound		X	X		
	Bear River		X	X		
	Medway River		X	X		
Liberty	Timmons River				X	X
	North Newport River				X	X
	St. Catherines Island					X
	South Newport River				X	X
McIntosh	Sapelo Sound and tributaries		X			
	Sapelo Island			X	X	
	Deboy Sound		X	X		X
	Wolfe Island			X	X	X
	Altamaha Sound and River				X	
Glynn	Little St. Simons Island				X	X
	Hampton River					X
	St. Simons Island					X
	St. Simons Sound			X		X
	Brunswick River			X	X	
	Jekyll Island			X	X	
	Jekyll Sound			X		
Camden	St. Andrew Sound		X			
	Satilla River		X			
	Cumberland River			X	X	X
	Cumberland Island			X	X	X
	Cumberland Sound			X		

4.1.7.2 Environmental Resources Vulnerability

For the Tier 2 Environmental Resources Vulnerability Analysis, several factors were used to evaluate natural resources and habitat and their vulnerability to coastal storm hazards and sea level rise. The natural areas identified as part of the Tier 2 exposure analysis were categorized across the study area using NOAA's Coastal Change Analysis Program (C-CAP) classes that best characterized each natural area. The vulnerability of each C-CAP class located within the planning reach was assessed to the hazards of sea level rise, storm surge inundation, saltwater intrusion, erosion, and wind.

Vulnerability scores were assigned to each C-CAP class in Georgia. A weighted scoring system was developed to rate the vulnerability of each C-CAP class to the hazards, and a formula was developed to numerically classify the total vulnerability of each C-CAP class (1 - low, 2 - medium, or 3 - high). The results of the Tier 2 Environmental Resources Vulnerability Analysis for Planning Reach GA_05 can be found in **Figure 4-33**.

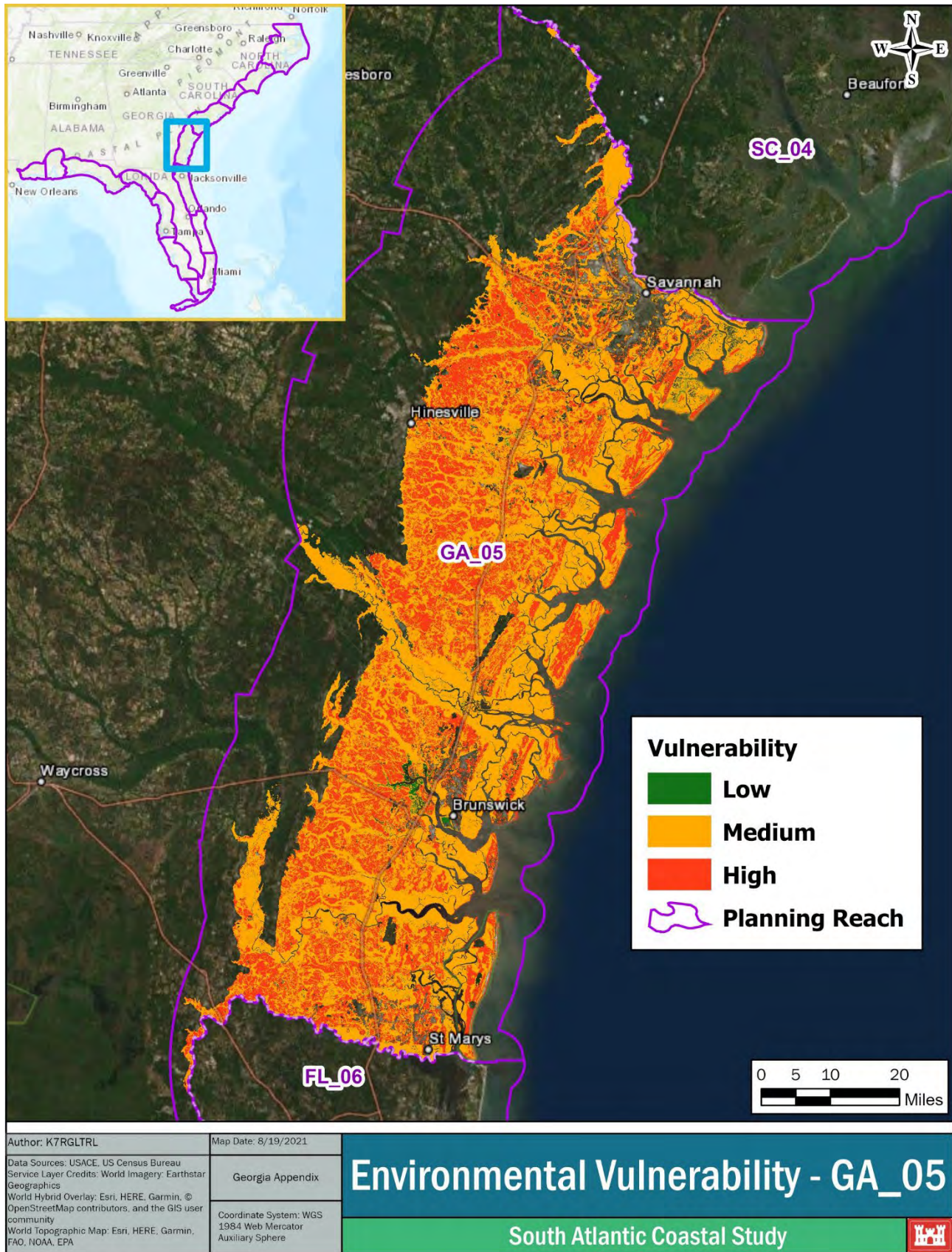


Figure 4-33: Tier 2 Environmental Resources Vulnerability in the GA_05 Planning Reach.

The following C-CAP natural areas were the most vulnerable:

- **Unconsolidated Shore:** This includes Georgia’s beaches, dunes, barrier islands, intertidal mudflats, and non-vegetated mudflats. Environmental consequences include loss of foraging, refuge, and nursery habitat due to sea level rise and erosion for commercially important essential fish habitats (snapper-grouper, shrimp), other invertebrates (blue crabs, oyster), as well as a loss of foraging and refuge habitat for wading birds (wood stork, eastern black rail). For example, the stretch of beach on the southern end of Cumberland Island was considered high vulnerability.
- **Evergreen Forest:** This includes bottomland hardwood forest and dry coniferous forest and mixed hardwood. Environmental consequences from sea level rise and erosion include the permanent conversion of habitat, reduction in species diversity, invasive species recruitment, and increased fragmenting of habitat. For example, the western interior of Sapelo Island contains areas that are considered as high vulnerability.
- **Deciduous Forest:** This includes maritime forest and coastal hardwood. Environmental consequences from sea level rise and erosion include the permanent conversion of habitat, reduction in species diversity, invasive species recruitment, and increased fragmenting of habitat. For example, the western section of Guale Preserve contains several areas that are considered as high vulnerability.

A detailed list of vulnerability scores and descriptions of the methodology used to identify the level of vulnerability of environmental resources are available in the SACS Environmental Technical Report.

4.1.7.3 Cultural Resource Vulnerability

Based on a qualitative assessment of vulnerability, historic structures and archaeological sites located on barrier islands face vulnerability due to storm surge inundation, erosion, and wave attack (See **Table 4-16**). Storm surge inundation along the coast and reaching up rivers to low lying areas will flood historic properties and damage buildings. Damage may include, but is not limited to, structural damage and destruction of historic materials (e.g., furniture, textiles, archives). The aftermath of a storm can pose long-term issues, such as the development of mold, mildew, and other potentially toxic residues. Erosion and wave attack pose threats to historic properties and both terrestrial and submerged archaeological sites. Significant structural damage can be caused to historic properties by wave attack. Erosion can eliminate surface evidence of archaeological sites, wear away site layers, and displace materials from various cultural layers making recovery and interpretation challenging if not impossible. Erosion will impact features more severely due to the disturbed nature of the soil, while leaving intact topographic layers less damaged. Strong currents cause hydrographic change that can displace submerged cultural resources, including historic wrecks, as well as obscure or damage these resources due to storm debris. Currents and even wind can uproot trees and other vegetation, which can serve as a major source of disturbance and destruction for both historic properties and archaeological sites.

Table 4-16 below indicates if the exposed cultural resource area is vulnerable to the Tier 2 hazard. This table is not all-inclusive and is meant to communicate the types of cultural resources that may be found in these areas and the types of vulnerability that they may face. A selection of historic properties and districts are highlighted due to their National Register status and stakeholder input regarding their historical significance and concern for continued preservation due to their higher exposure rating. General information is also included regarding the presence of archaeological sites in areas of higher exposure.

Table 4-16: Vulnerability of Exposed Cultural Resources Areas to the Tier 2 Hazards for the Georgia Planning Reach

Exposed Cultural Resource Area		Tier 2 Hazards		
		Storm Surge Inundation	Erosion	Wave Attack
Richmond Hill	Ft. McAllister	Y	Y	Y
Cumberland Island	Cumberland Island	Y	Y	Y
Cumberland Island	Dungeness Historic District	Y	Y	N
Cumberland Island	Little Cumberland Island	Y	Y	Y
Cumberland Island	Duck House	Y	Y	N
Cumberland Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y
Moon River District	Pin Point Gullah Geechee Community	Y	Y	N
Cockspur Island	Ft. Pulaski National Monument	Y	Y	Y
Cockspur Island	Cockspur Island Lighthouse	Y	Y	Y
Cockspur Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y
Tybee Island	Back River Historic District	Y	Y	Y
Tybee Island	Tybee Island Strand Cottages Historic District	Y	Y	Y
Tybee Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y
Ossabaw Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y
Savannah	Savannah Historic District (River Street)	Y	Y	Y
Isle of Hope	Wormsloe Plantation	N	Y	N
Isle of Hope	Isle of Hope Historic District	Y	Y	N
Isle of Hope	Gullah-Geechee sites	Y	Y	N
Isle of Hope	Historic and Prehistoric Archaeological Sites	Y	Y	N
St. Simons	Ft. Frederica National Monument	Y	Y	N
St. Simons	St. Simons Lighthouse and Lighthouse Keepers' Building	Y	Y	Y
St. Simons	U.S. Coast Guard Station at St. Simons Island	Y	Y	Y
St. Simons	Hamilton Plantation slave cabins	Y	Y	N
St. Simons	Historic and Prehistoric Archaeological Sites	Y	Y	Y
Brunswick	Brunswick Old Town Historic District	Y	Y	N
Brunswick	Hofwyl-Broadfield Plantation	Y	Y	N
Jekyll Island	Jekyll Island Historic District and National Historic Landmark	Y	Y	N
Jekyll Island	Jekyll Island Club	Y	Y	N
Jekyll Island	Indian Mound Cottage (Rockefeller Cottage)	Y	Y	N
Jekyll Island	Faith Chapel	Y	Y	N
Jekyll Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y

Exposed Cultural Resource Area		Tier 2 Hazards		
		Storm Surge Inundation	Erosion	Wave Attack
Midway	Ft. Morris	Y	Y	N
St. Catherines Island	National Historic Landmark	Y	Y	Y
St. Catherines Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y
Darien	Ashantilly	Y	Y	N
Darien	Ft. King George	Y	Y	N
Sapelo Island	Sapelo Island Lighthouse	Y	Y	Y
Sapelo Island	Hog Hammock	Y	Y	N
Sapelo Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y
Blackbeard Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y

Within this planning reach, there are several historic districts, historic forts, plantation sites, historic lighthouses, and archaeological sites along the coast and on barrier islands that are susceptible to damages from coastal storm hazards, including storm surge inundation, erosion, and wave attack. The most susceptible is Ft. Pulaski National Monument and all associated features on Cockspur Island, as well as the historic lighthouses. While some historic districts have protections, such as sea walls, in place to minimize vulnerability, many of the historic structures are vulnerable to storm surge inundation and the associated damage that it brings. Cumberland Island, Savannah, and Isle of Hope are a few examples of historic districts that could be severely impacted by storm surge inundation, especially if protection measures fail or are not sufficient to protect against more extreme storm episodes. Damage caused by storm surge inundation in these areas may result in significant economic damage, as historic tourism is a primary economic driver in areas such as this. Historic and archaeological sites on barrier islands such as Cumberland, Cockspur, Tybee, St. Simons, Jekyll, St. Catherines, Sapelo, and Blackbeard Islands are susceptible to damages primarily from erosion and wave attack. Previous studies by the GADNR Historic Preservation Division (HPD) and Skidaway Institute of Oceanography have documented archaeological sites that are in danger of, or are presently, being lost to erosion within Georgia's barrier islands (Skidaway Institute of Oceanography 2017). Vulnerable sites identified by the GADNR HPD included prehistoric Indian shell middens, prehistoric Indian artifact and shell scatter, and burial sites, among other archaeological sites subject to erosion.

4.1.8 Tier 2 High-Risk Locations Overview

Risk can be assessed after determining hazards, exposure, and vulnerability. High-risk locations were developed from data presented in the hazard, exposure, and vulnerability sections of this appendix. The Tier 2 Risk Assessment identified other potential high-risk areas that were not identified during the Tier 1 Risk Assessment as well as reaffirmed and better defined the risk picture for many previously identified Tier 1 high-risk locations.



Tier 2 high-risk areas in Georgia were determined through a set of specific screening criteria. To be considered high-risk, a location must meet at least one of the following criteria:

1. A location with a future FEMA Hazus Flood Model flood damage rating of medium- to high-risk.
2. Identified as a Priority Environmental Area (PEA).
3. Identified as a location with at-risk Cultural Resources.
4. A shoreline location with a long-term erosional trend greater than -6.6 feet per year.

4.1.8.1 Tier 2 Economic Risk Assessment

The Tier 2 Economic Risk Assessment is an estimate of storm surge inundation risk to public and private property and some critical infrastructure within Planning Reach GA_05. This includes all coastal and riverine areas within the zone of tidal influence in Georgia. The risk is expressed as the expected annual damages (EAD) to structures and their contents described in dollars under existing sea level conditions (low) and the EAD assuming up to 3 feet of sea level rise (high). EAD are presented in a geospatial format that can be aggregated to the census block, census tract, census place, county, SACS planning reach, and state level. For detailed descriptions of the FEMA Hazus Flood Model methodology used for this assessment, please see the SACS Tier 2 Economic Risk Assessment report.

The SACS Tier 2 Economic Risk Assessment web application can be accessed at:
(<https://sacs.maps.arcgis.com/apps/opsdashboard/index.html#/b488a3f8a07442fd82ee1947c0020709>)

Figure 4-34 provides a snapshot of the Tier 2 Economic Risk Assessment for Georgia. Each red circle on the map denotes separate census places. The map included in **Figure 4-34** displays the distribution of economic risk from low to high by census place. The bar charts highlight the census places with the greatest economic risk in Georgia, with quantifications of the existing (green shading) and future risks, including sea level rise (black shading) and the change (i.e., delta) between the two (red shading). Economic risks displayed are not cumulative. The distribution of existing and future economic risks is further broken down by census block, counties with the greatest risk, population center category (i.e., rural, census place, or estate), and focus areas. The total EAD for the Planning Reach GA_05 are approximately \$134 million in the existing condition and \$383 million in the future conditions with 3 feet of sea level rise. The Tier 2 Economic Risk Assessment indicates that most estimated existing and projected future economic risk within Planning Reach GA_05 is within Chatham and Glynn County, representing greater than 80 percent of estimated EAD. **Figure 4-34** depicts the dispersion of damages between the census places that are described in greater detail below.

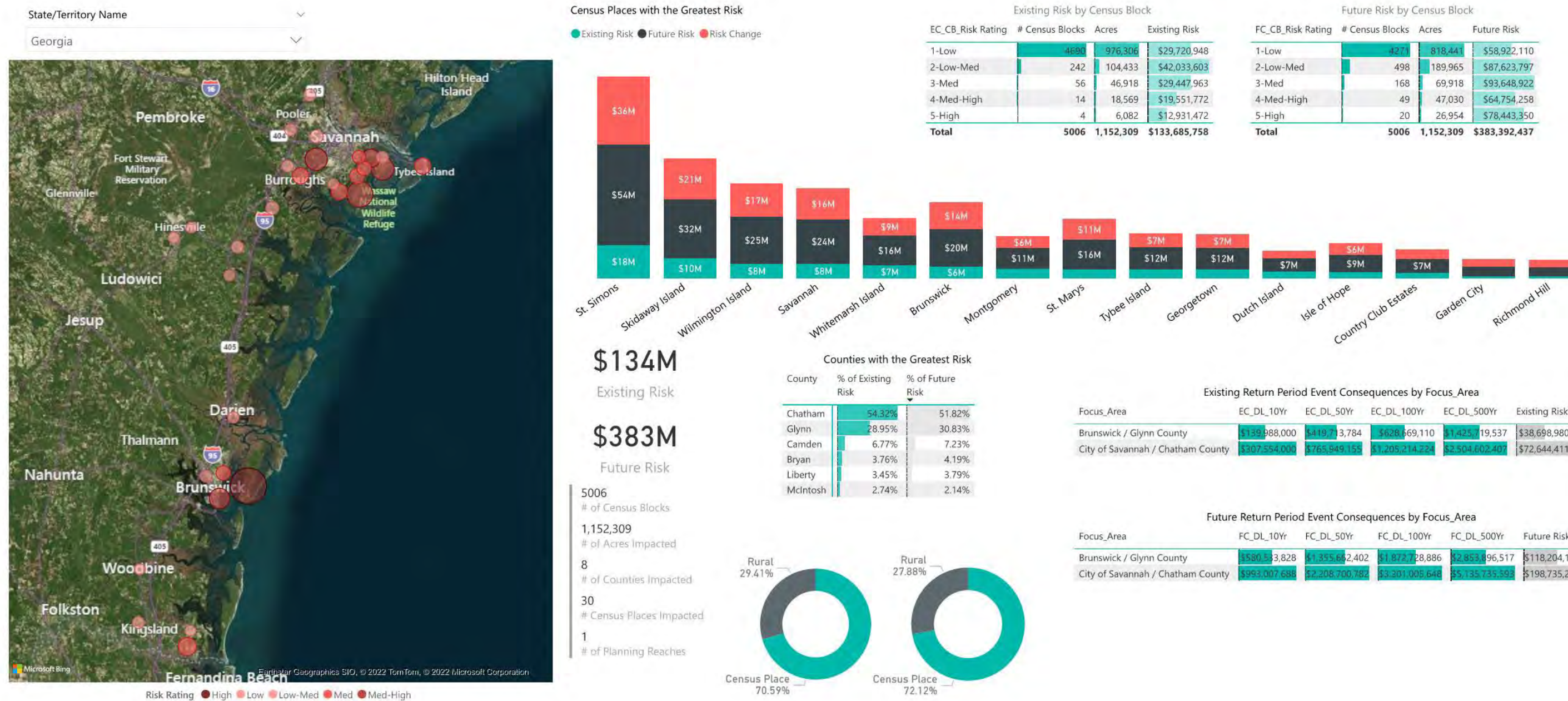


Figure 4-34: Tier 2 Economic Risk Assessment Dashboard

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The risk classification thresholds identified in **Table 4-17** were based on the Planning Reach GA_05 specific lower and upper bounds of the FEMA Hazus Flood Model-derived damages. The damage range was statistically classified into five classes (low, low-medium, medium, medium-high, high) using the Jenks optimization method, also referred to as the Jenks natural breaks classification method. For Planning Reach GA_05, a risk classification of high was defined as a census place with EAD above approximately \$10,455,000, medium-high above approximately \$5,072,000, and medium above approximately \$1,156,700.00.

Table 4-17: Federal Emergency Management Agency Hazus Flood Model Risk Classification Thresholds for Planning Reach GA_05

Risk Classification	Lower Bound	Upper Bound
Low	\$0	\$405,404
Low-Med	\$405,405	\$1,156,700
Med	\$1,156,701	\$5,071,574
Med-High	\$5,071,575	\$10,455,369
High	\$10,455,370	\$17,655,097

Table 4-18 displays the county distribution of locations identified with a risk rating of medium to high in the future conditions, considering 3 feet of sea level rise. Understanding the spatial distribution of economic risk from coastal floods under existing and future sea level rise conditions can help inform communities on which potential actions should be implemented to mitigate the potential economic risks.

Table 4-18: Tier 2 Economic Risk Assessment Medium, Medium-High, and High-Risk Locations in the Future Condition Categorized by County

County	Census Place	Existing EAD	Existing Risk Rating	Future EAD	Future Risk Rating	Percent Increase in EAD in Future Condition
Bryan	Richmond Hill (East of Keller) ¹	\$2,407,000	Medium	\$8,382,000	Medium-High	248.23%
Bryan	Richmond Hill	\$1,079,000	Low-Medium	\$4,790,000	Medium	343.93%
Camden	St. Marys	\$4,797,000	Medium	\$15,688,000	High	227.04%
Camden	Kingsland	\$569,000	Low-Medium	\$2,115,000	Medium	271.70%
Chatham	Skidaway Island	\$10,455,000	Medium-High	\$31,769,000	High	203.86%
Chatham	Wilmington Island	\$7,724,000	Medium-High	\$25,118,000	High	225.19%
Chatham	Savannah	\$7,635,000	Medium-High	\$23,912,000	High	213.19%
Chatham	Whitemarsh Island	\$6,766,000	Medium-High	\$15,976,000	High	136.12%
Chatham	Montgomery	\$5,072,000	Medium	\$11,070,000	High	118.26%
Chatham	Tybee Island	\$4,768,000	Medium	\$11,867,000	High	148.89%
Chatham	Georgetown	\$4,725,000	Medium-High	\$11,615,000	High	145.82%
Chatham	Dutch Island	\$3,481,000	Medium	\$7,251,000	Medium-High	108.30%
Chatham	Isle of Hope	\$3,111,000	Medium	\$9,201,000	Medium-High	195.76%

County	Census Place	Existing EAD	Existing Risk Rating	Future EAD	Future Risk Rating	Percent Increase in EAD in Future Condition
Chatham	Henderson	\$355,000	Low	\$1,816,000	Medium	411.55%
Chatham	Pooler	\$259,000	Low	\$2,047,000	Medium	690.35%
Chatham	Garden City	\$1,157,000	Low-Medium	\$4,885,000	Medium	322.21%
Chatham	Port Wentworth	\$749,000	Low-Medium	\$2,838,000	Medium	278.91%
Chatham	Talahi Island	\$748,000	Low-Medium	\$1,938,000	Medium	159.09%
Chatham	Thunderbolt	\$2,426,000	Medium	\$4,542,000	Medium	87.22%
Glynn	St. Simons	\$17,655,000	High	\$53,731,000	High	204.34%
Glynn	Brunswick	\$6,219,000	Medium-High	\$20,107,000	High	223.32%
Glynn	Country Club Estates	\$2,887,000	Medium	\$7,460,000	Medium-High	158.40%
Glynn	St. Simons (North Frederica area) ¹	\$2,653,000	Medium	\$8,907,000	Medium-High	235.73%
Glynn	Dock Junction	\$811,000	Low-Medium	\$2,301,000	Medium-High	183.72%
Liberty	Midway – (East of Interstate 95) ¹	\$2,334,000	Medium	\$3,969,000	Medium-High	70.05%
Liberty	Midway	\$348,000	Medium	\$2,814,000	Medium-High	70.05%

¹Identifies unincorporated locations that are not classified under existing census places but project significant EAD as part of the Tier 2 Economic Risk Assessment.

St. Simons Island was exclusively identified as high-risk under the existing conditions. St. Simons Island was also notably projected as having the highest economic risk within Planning Reach GA_05, with EAD of \$18 million in the existing condition and \$54 million in the future condition. Based on these projections, this area appears to be particularly susceptible to coastal storm risks and sea level rise.

In the future condition with 3 feet of sea level rise, all of the existing medium-high- to high-risk areas more than double in EAD, with many places tripling in projected economic risk (St. Marys, Skidaway Island, Savannah, St. Simons, Brunswick). Many of the areas that were classified as medium risk in the existing condition, now become medium-high- to high-risk locations, while medium-high-risk areas largely transition to high-risk with the addition of a 3-foot sea level rise. The increase in risk within the future condition is not exclusive to the coastline. Located in northwestern Chatham County, Pooler is projected to have the highest percent increase in EAD in the future condition within Planning Reach GA_05, a nearly sevenfold increase in EAD.

As identified in **Table 4-18** and displayed **Figure 4-35**, most future medium- to high-risk locations are located within the greater Savannah and Brunswick metropolitan statistical areas. Chatham County encompasses fifteen of the twenty-six locations with a projected future risk rating of medium to high, Glynn County has five medium- to high-risk locations, while Bryan, Camden, and Liberty Counties each contain two medium- to high-risk locations. These places largely correlate with areas identified as high-risk under the Tier 1 Risk Assessment and identify locations that may require additional analysis and studies to identify CSRM measures that can reduce the vulnerability of the infrastructure to coastal storm risks and sea level rise.

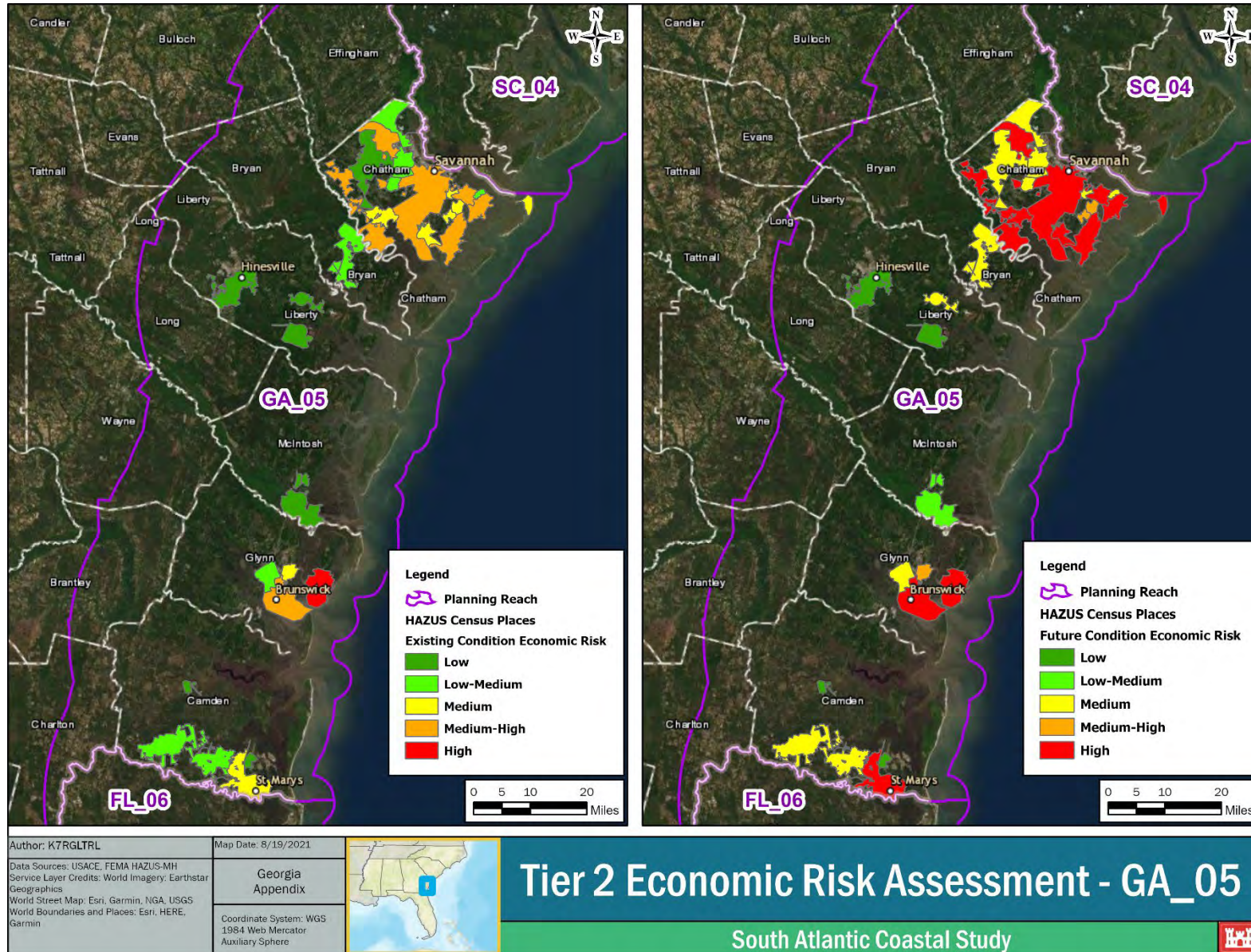


Figure 4-35: Tier 2 Economic Risk Assessment – Existing Risk Locations (left) and Future Risk Locations with a 3-Foot Sea Level Rise (right)

4.1.8.2 Priority Environmental Areas

The Tier 2 Risk Assessment affirmed many of the high- and medium-high-risk natural resource areas identified for Planning Reach GA_05 in the Tier 1 Risk Assessment, while providing more specificity of the resources at risk. For example, the Tier 2 Risk Assessment indicates that the saltmarsh, intertidal flats, wetlands, and maritime forest of the Altamaha Wildlife Management Area and the maritime forests, coastal hardwood forest, and saltmarsh of Harris Neck NWR are at risk (**Figure 4-36**). These areas and several more are included in the full list of PEAs for the Planning Reach GA_05 (**Table 4-19**).

The SACS Environmental Analysis StoryMap and Geoportal explains the methodology used to determine exposure, vulnerability, and risk to these environmental resources.

<https://sacs.maps.arcgis.com/apps/MapSeries/index.html?appid=f0aa02dd2aa54b4aab34b4bccea3c3d5>

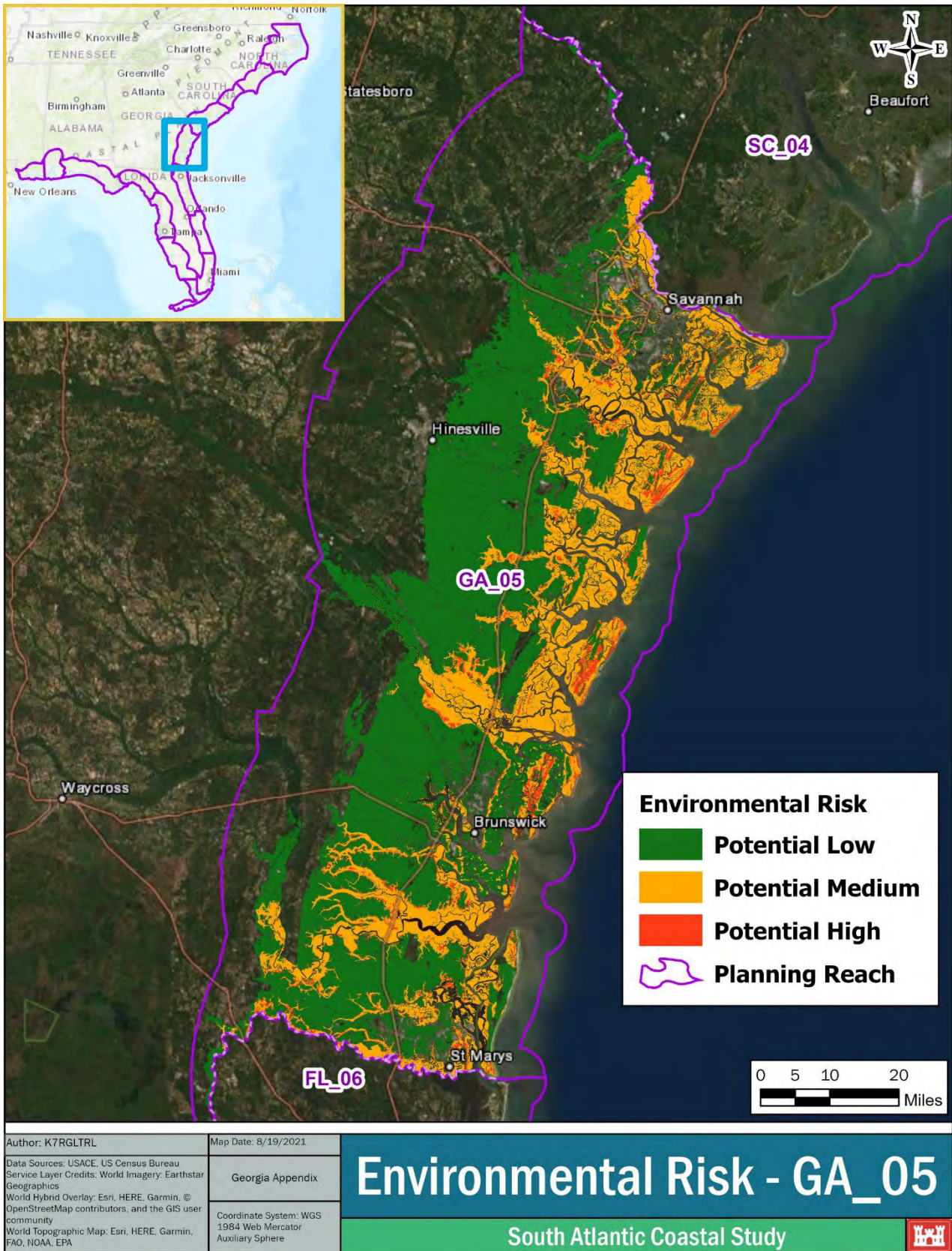


Figure 4-36: Tier 2 Environmental Resources Inundation Risk in GA_05

Table 4-19: Planning Reach GA_05 Priority Environmental Areas

Priority Environmental Area	County	Priority Environmental Area	County
Blythe Island City Park	Glynn	Ft. McCallister State Park	Bryan
Jekyll Island State Park	Glynn	JF Gregory Park	Bryan
Little St. Simons Island	Glynn	Ft. Morris State Historic Site	Liberty
St. Simons Island- Sea Island	Glynn	St. Catherines Island	Liberty
Canons Point/Guale Preserve	Glynn	Cay Creek Wetlands Center	Liberty
Hofwyl Plantation State Park	Glynn	Harris Neck National Wildlife Refuge	McIntosh
Tybee Island North Beach	Chatham	Blackbeard Island NWR	McIntosh
Little Tybee Island	Chatham	Sapelo Island/ National Estuarine Research Reserve	McIntosh
Skidaway Island State Park	Chatham	Altamaha Waterfowl Management Area	McIntosh
Ossabaw Island	Chatham	Wolf Island/Egg National Wildlife Refuge	McIntosh
Wassaw Island National Wildlife Refuge	Chatham	Crooked River State Park	Camden
Blue Sky Preserve	Chatham	Cumberland Island National Seashore	Camden
Ogeechee Canal	Chatham		

The PEAs are natural areas or features at medium- to high-risk to storm surge inundation and sea level rise. PEAs support priority biological resources (defined in the USFWS SACS Planning Aid Report as federally listed threatened and endangered species, waterbird nesting colonies, breeding and wintering shorebirds, or other managed species) and are considered high priorities for others including state and federal agencies and non-governmental organizations (for example, USFWS critical habitats or national wildlife refuges, Audubon Important Bird Areas, state heritage preserves and wildlife management areas, areas of national and state environmental significance, etc.). These areas can be considered by stakeholders when looking for environmental resources to conserve and/or manage. Designation as a PEA by USACE does not create a special legal protection or status of the area and does not change how the area is regulated under federal and state laws.

PEAs were identified throughout Planning Reach GA_05 as shown in **Figure 4-37**. The methodology used to identify the PEAs and a description of coastal Georgia's 24 PEAs are described in the SACS Environmental Technical Report.

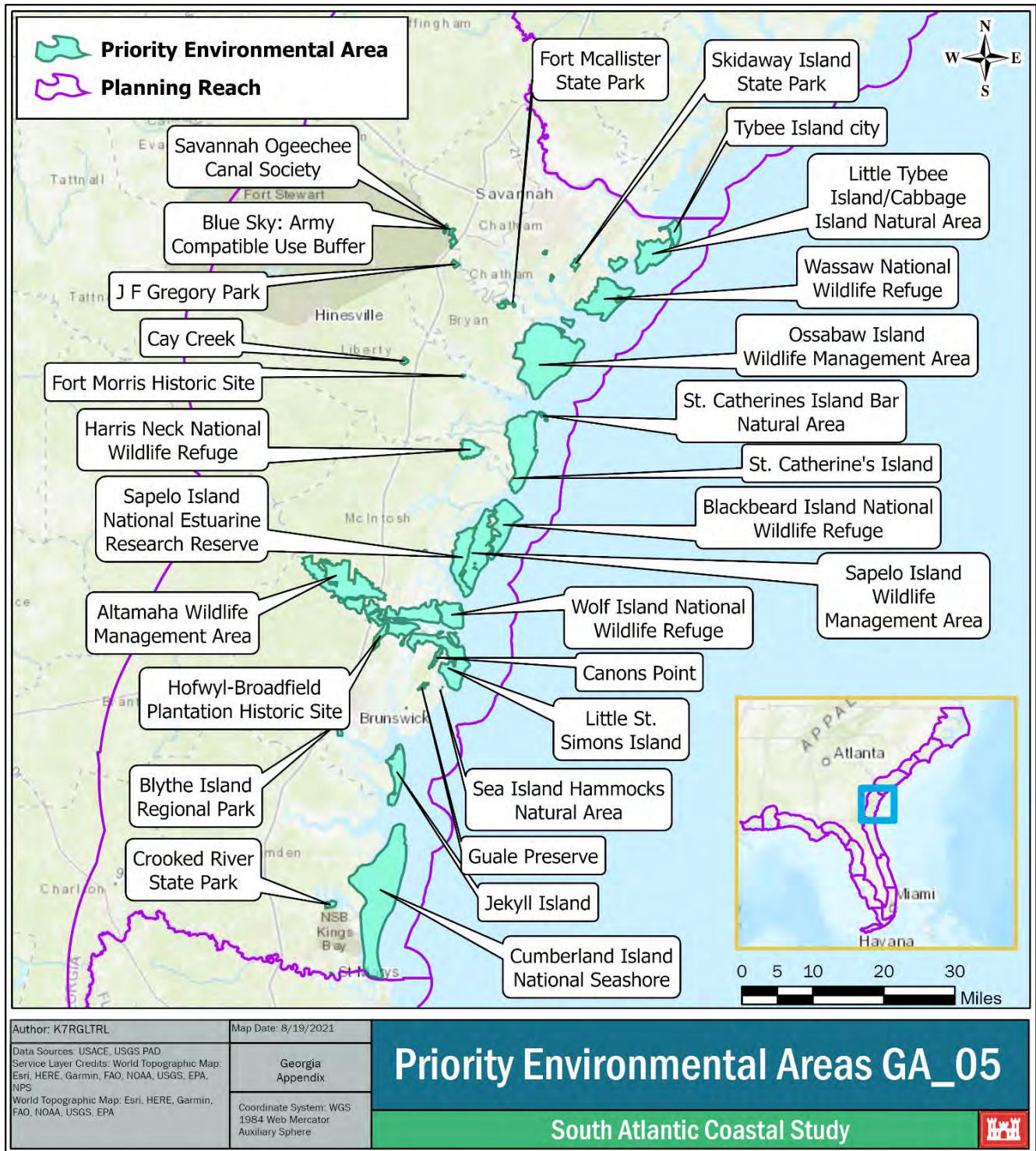


Figure 4-37: Map of Planning Reach GA_05 Priority Environmental Areas

4.1.8.3 At-Risk Cultural Resource Areas

Based on a qualitative assessment of risk, historic resources and archaeological sites on barrier islands and in low lying areas are highly susceptible to damage from storm surge inundation, erosion, and wave attack, especially as the risk for sea levels rise increases. These areas are considered as at-risk cultural resources areas due to the fact that all structures would be vulnerable to the hazards and are therefore considered to be most at risk. The northern and southern tips of barrier islands tend to be hot spots for erosion, so any historic properties and/or archaeological sites in these areas would be at most risk of damage and destruction from storm surge inundation, erosion, and wave attack.

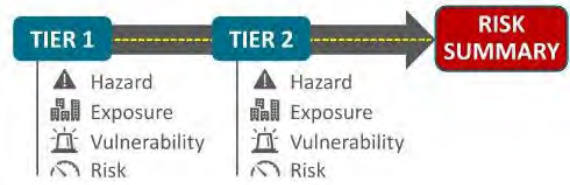
While threats may be posed to cultural resources, including historic resources and archaeological sites, due to development on barrier islands, such as Tybee, St. Simons, and Jekyll Islands, storm protection measures that are put in place to protect those developed areas can aid in the protection of archaeological sites. For example, cultural resources on Tybee Island benefit from periodic beach renourishment and other projects aimed at protecting property and infrastructure from storm damage. Storm events pose a greater risk on lesser developed barrier islands, such as Blackbeard, Cumberland, Ossabaw, Sapelo, and St. Catherines Islands, that have limited or no protective measures present. Undeveloped marsh regions between and behind islands where many resources are located are typically inundated by flood events that exceed the 10-percent AEP flood level.

Damage to historic properties can sometimes be repaired, but this can be costly and may lack support if more essential recovery efforts are needed in the area to restore infrastructure. Archaeological sites are non-renewable resources that cannot be replaced once lost. Loss of historic properties and archaeological sites not only means a loss to the historical record that helps us to understand and explain past lifeways, but it can also mean a loss to local tourism. Visitors are drawn to this planning reach due to the many historical districts and historic forts. Damage caused by storms has in some instances meant the complete loss of all or portions of historic properties. Years of costly repairs can close these sites indefinitely until the site can be restored and are deemed safe for visitors. The loss of archaeological sites could pose a significant hit to the academic community and thereby limiting research into and interpretation of prehistoric and historic sites in this reach.

4.1.8.4 Shoreline Retreat Areas (Erosional Hotspots)

As identified in Section 4.1.5.3, the USGS Coastal Change Hazards Portal was utilized to identify long term erosional hotspots along the coastline of Planning Reach GA_05. Specific hotspot locations, which were classified by above average erosional rates (greater than -6.6 feet (-2 meters) per year) were located in portions of the barrier islands in the following coastal counties: Chatham (Tybee, Little Tybee, Wassaw, Ossabaw), Liberty (St. Catherines), McIntosh (Wolfe), Glynn (St. Simons, Little St. Simons) and Camden (Cumberland).

Erosional rates and potential impacts are highly localized. Only hot spot locations in Chatham County (Tybee Island) and Glynn County (St. Simons Island) corresponded with barrier islands with significant development and population centers, where increased erosion can directly impact infrastructure and threaten coastal communities. A unique characteristic of the Georgia coastline is the expansive network of coastal wetlands and undeveloped barrier islands. Undeveloped barrier island coastlines are unconstrained and subject to natural accretional and erosional patterns, and coastal wetland systems are able to naturally migrate as the island's morphology changes. Most at risk from erosion in these undeveloped barrier islands are archaeological resources and nesting habitats.



4.1.9 Summary of Georgia High-Risk Locations

Table 4-20 displays the Planning Reach GA_05 high-risk locations identified through the Tier 1 and Tier 2 analyses. The table notes in which tier the location was identified as at risk, EAD from flooding hazards as projected by FEMA's Hazus Flood Model, and results of the Tier 2 environmental resources, cultural resources, and erosional analyses.

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Table 4-20: Tier 1 and 2 High-Risk Locations

Planning Reach GA_05		Tier 1		Tier 2				Tier 2		Tier 2		Tier 2
		Tier 1 Risk Assessment		Tier 2 Economic Risk Assessment				At-Risk Cultural Resource Areas		At-Risk Environmental Resources		Shoreline Retreat Areas (Erosional hotspots)
County	Census Place or Location Name	Identified as Existing High-Risk Location	Identified as Future High-Risk Location	Existing Economic Risk (Expected Annual Damages, FY18 dollars)	Tier 2 Economic Risk Assessment Rating	Future Economic Risk (Expected Annual Damages, FY18 dollars)	Tier 2 Economic Risk Assessment Rating	Identified as Area with Cultural Resource at Risk	Cultural Resource Name	Identified as Area with Priority Environmental Area or Resource at Risk	Environmental Resource Name	Erosional hotspot Location (Barrier Island coastlines with long term erosional rates greater than -6.6 feet per year)
Bryan	Richmond Hill	X	X	\$1,079,000	Low-Medium	\$4,790,000	Medium					
Bryan	Richmond Hill (Keller East) ¹			\$2,407,000	Medium	\$8,382,000	Medium-High	X	Ft. McAllister	X	Ft. McAllister State Park	
Camden	Cumberland Island			\$0	Low	\$0	Low	X	Dungeness Historic District, Little Cumberland Island Lighthouse, Duck House, and historic and prehistoric archaeological sites, including Crooked River State Park (9CM118)	X	Cumberland Island National Seashore	Northern portion of Cumberland Island shoreline
Camden	Kingsland	X	X	\$569,000	Low-Medium	\$2,115,000	Medium					
Camden	St. Marys	X	X	\$4,797,000	Medium	\$15,688,000	High			X	Crooker River State Park	
Chatham	Cockspur Island			\$0	Low	\$0	Low	X	Ft. Pulaski, Cockspur Island Lighthouse, and historic and prehistoric archaeological sites			
Chatham	Wassaw Island ¹			\$0	Low	\$0	Low			X	Wassaw Island	Northern portion of Wassaw shoreline
Chatham	Little Tybee Island ¹			\$0	Low	\$0	Low			X	Little Tybee Island	Northern portion of Little Tybee shoreline
Chatham	Vernonburg		X	\$34,000	Low	\$133,000	Low					
Chatham	Henderson			\$355,000	Low	\$1,816,000	Medium					
Chatham	Ossabaw Island ¹			\$14,000	Low	\$27,000	Low	X	Historic and prehistoric archaeological sites at risk of erosion	X	Ossabaw Island	Northern portion of Wassaw shoreline
Chatham	Pooler	X	X	\$259,000	Low	\$2,047,000	Medium					
Chatham	Garden City	X	X	\$1,157,000	Low-Medium	\$4,885,000	Medium					
Chatham	Port Wentworth	X	X	\$749,000	Low-Medium	\$2,838,000	Medium					
Chatham	Talahi Island	X	X	\$748,000	Low-Medium	\$1,938,000	Medium					
Chatham	Georgetown	X	X	\$4,725,000	Medium	\$11,615,000	High					
Chatham	Wilmington Island	X	X	\$7,724,000	Medium-High	\$25,118,000	High					

Planning Reach GA_05		Tier 1		Tier 2								
		Tier 1 Risk Assessment		Tier 2 Economic Risk Assessment				At-Risk Cultural Resource Areas		At-Risk Environmental Resources		Shoreline Retreat Areas (Erosional hotspots)
County	Census Place or Location Name	Identified as Existing High-Risk Location	Identified as Future High-Risk Location	Existing Economic Risk (Expected Annual Damages, FY18 dollars)	Tier 2 Economic Risk Assessment Rating	Future Economic Risk (Expected Annual Damages, FY18 dollars)	Tier 2 Economic Risk Assessment Rating	Identified as Area with Cultural Resource at Risk	Cultural Resource Name	Identified as Area with Priority Environmental Area or Resource at Risk	Environmental Resource Name	Erosional hotspot Location (Barrier Island coastlines with long term erosional rates greater than -6.6 feet per year)
Chatham	Whitemarsh Island	X	X	\$6,766,000	Medium-High	\$15,976,000	High					
Chatham	Thunderbolt	X	X	\$2,426,000	Medium	\$4,542,000	Medium					
Chatham	Dutch Island	X	X	\$3,481,000	Medium	\$7,251,000	Medium-High					
Chatham	Montgomery	X	X	\$5,072,000	Medium	\$11,070,000	High	X	Pin Point Gullah Geechee Community			
Chatham	Skidaway Island	X	X	\$10,455,000	Medium-High	\$31,769,000	High			X	Skidaway Island State Park	
Chatham	Isle of Hope	X	X	\$3,111,000	Medium	\$9,201,000	Medium-High	X	Wormsloe Plantation, Isle of Hope Historic District, Gullah Geechee sites, and historic and prehistoric archaeological sites			
Chatham	Tybee Island	X	X	\$4,768,000	Medium	\$11,867,000	High	X	Tybee Island Back River Historic District, Tybee Island Strand Cottages Historic District, Ft. Screven Historic District, and historic and prehistoric archaeological sites	X	Tybee North Beach	Northern portion of Tybee shoreline
Chatham	Savannah	X	X	\$7,636,000	Medium-High	\$23,915,000	High	X	Savannah Historic District (River Street)	X	Blue Sky Preserve and Savannah-Ogeechee Canal Museum and Nature Center	
Glynn	Little St. Simons ¹			\$12,000	Low	\$13,000	Low			X	Little St. Simons	Portion of shoreline south of Little St. Simons center line
Glynn	Sea Island ¹			\$650,000	Low-Medium	\$1,136,000	Low-Medium			X	Sea Island/Sea Island Spit	
Glynn	Jekyll Island ¹			\$174,000	Low	\$705,000	Low-Medium	X	Jekyll Island Historic District and National Historic Landmark, Jekyll Island Club, Indian Mound Cottage (Rockefeller Cottage), Faith Chapel, and historic and prehistoric archaeological sites		Jekyll Island – north, mid, and south sections of island	
Glynn	Dock Junction	X	X	\$811,000	Low-Medium	\$2,301,000	Medium					

Planning Reach GA_05		Tier 1		Tier 2								
		Tier 1 Risk Assessment		Tier 2 Economic Risk Assessment				At-Risk Cultural Resource Areas		At-Risk Environmental Resources		Shoreline Retreat Areas (Erosional hotspots)
County	Census Place or Location Name	Identified as Existing High-Risk Location	Identified as Future High-Risk Location	Existing Economic Risk (Expected Annual Damages, FY18 dollars)	Tier 2 Economic Risk Assessment Rating	Future Economic Risk (Expected Annual Damages, FY18 dollars)	Tier 2 Economic Risk Assessment Rating	Identified as Area with Cultural Resource at Risk	Cultural Resource Name	Identified as Area with Priority Environmental Area or Resource at Risk	Environmental Resource Name	Erosional hotspot Location (Barrier Island coastlines with long term erosional rates greater than -6.6 feet per year)
Glynn	Country Club Estates	X	X	\$2,887,000	Medium	\$7,460,000	Medium-High					
Glynn	St. Simons (N Frederica) ¹			\$2,653,000	Medium	\$8,907,000	Medium-High	X	Ft. Frederica National Monument, archaeological sites at risk of erosion		Cannon's Point/Guale Preserve	
Glynn	St. Simons	X	X	\$17,655,000	High	\$53,731,000	High	X	St. Simons Lighthouse and Lighthouse Keepers' Building, U.S. Coast Guard Station at St. Simons Island, Hamilton Plantation slave cabins, and historic and prehistoric archaeological sites		St. Simons Island	Shorelines at northern tip and south end of St. Simons Island
Glynn	Brunswick	X	X	\$6,219,000	Medium-High	\$20,107,000	High	X	Brunswick Old Town Historic District, Hofwyl-Broadfield Plantation, and historic and prehistoric archaeological sites		Blythe Island County Park and Hofwyl-Broadfield Plantation Historic Site	
Liberty	Midway			\$348,000	Low	\$2,814,000	Medium					
Liberty	St. Catherines Island			\$0	Low	\$0	Low	X	St. Catherines Island National Historic Landmark and historic and prehistoric archaeological sites		St. Catherines Island	Majority of St. Catherines Island shoreline
Liberty	Midway (East of Interstate 95) ¹			\$2,334,000	Medium	\$3,969,000	Medium-High	X	Ft. Morris			
McIntosh	Townsend			\$0	Low	\$0	Low				Harris Neck NWR	
McIntosh	Darien	X	X	\$405,000	Low	\$848,000	Low-Medium	X	Ashantilly, Ft. King George		Altamaha Wildlife Management Area	
McIntosh	Sapelo Island ¹			\$578,000	Low-Medium	\$1,446,000	Low-Medium	X	Sapelo Island Lighthouse, Hog Hammock, and historic and prehistoric archaeological sites		Sapelo Island National Estuarine Research Reserve	Portion of shoreline south of Sapelo Islands center line
McIntosh	Wolf Island ¹			\$0	Low	\$0	Low				Wolf Island National Wildlife Refuge	Majority of Wolf Island shoreline
McIntosh	Blackbeard Island ¹			\$0	Low	\$0	Low	X	Historic and prehistoric archaeological sites at risk of erosion		Blackbeard Island NWR	

¹ Unincorporated places (not associated with a census place) that met the criteria of high-risk

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SECTION 5

Managing Risk

5.1 Coastal Program Guide – Georgia

The SACS Coastal Program Guide (CPG) provides information on broad federal directives, resources, and funding opportunities to help communities better leverage resources needed on a disaster-wide, state-/territory-wide, or community-wide basis (USACE 2022a). Many states and territories have additional resources available for local projects. While the CPG provides additional details, several resources specific to Georgia are described below:

- **Nonpoint Source Implementation Grant – Section 319(h):** GADNR-EPD administered competitive grant to fund eligible projects that propose to reduce pollutant loads and result in measurable water quality improvements to impaired waters throughout the State.
- **Coastal Incentives Grant Program:** GADNR-CRD cooperates with other agencies in implementing Georgia’s Coastal Management Program. The Coastal Incentive Grant program awards funding to qualified coastal county and municipal governments, regional commissions, state-affiliated research or educational institutions, or state agencies to support local projects and coastal research.
- **Georgia Heritage Grant Program:** GA-HPD administered grant program that provides seed money for the preservation of historic properties and archaeological sites throughout the state. The Program offers matching funds on a statewide competitive basis to local governments and nonprofit organizations for the preservation of Georgia Register-eligible historic properties. Currently, this grant program is funded solely from preservation license plate sales revenue.
- **Georgia Outdoor Stewardship Program:** GADNR administered program that offers funding to support parks and trails, and to protect and acquire lands critical to wildlife, clean water, and outdoor recreation.
- **Georgia Conservation Tax Credit Program:** GADNR administered financial incentive program for landowners interested in donating land or conservation easements to help protect Georgia’s natural resources.
- **Georgia Land & Water Conservation Fund:** GADNR administered grant program that helps state and local governments acquire and develop recreation lands and rehabilitate outdoor recreation facilities.
- **Georgia Sea Grant:** Sea Grant works with coastal communities across the U.S., Puerto Rico, the Virgin Islands, and Caribbean region to improve community resilience to coastal storms. Sea Grant projects include vulnerability assessments, resilience planning, and social science initiatives to learn from past storms and prepare for future storms.

- **OneGeorgia Authority:** Helps improve rural Georgia’s economic vitality by funding infrastructure development, land acquisition, and other projects that support economic development. Local governments, government authorities, lending institutions, and airport authorities are eligible to apply.

5.1.1 Continuing Authorities Program

The USACE Continuing Authorities Program (CAP) is a group of nine legislative authorities under which USACE can plan, design, and implement certain types of water resources projects without additional project-specific congressional authorization. The purpose of the CAP is to plan and implement projects of limited size, cost, scope, and complexity. **Table 5-1** lists the CAP authorities and their project purposes.

Table 5-1: USACE Continuing Authorities Program

Authority	Project Purpose
Section 14 , Flood Control Act of 1946, as amended	Protect public works and nonprofit public services from streambank and shoreline erosion
Section 103 , River and Harbor Act of 1962, as amended (amends Public Law 79-727)	Perform Coastal Storm Risk Management
Section 107 , River and Harbor Act of 1960, as amended	Improve navigation
Section 111 , River and Harbor Act of 1968, as amended	Prevent or mitigate shore damage caused by federal navigation projects
Section 204 , Water Resources Development Act of 1992, as amended	Beneficially use dredged material/ regional sediment management
Section 205 , Flood Control Act of 1948, as amended	Implement flood risk management
Section 206 , Water Resources Development Act of 1996, as amended	Restore aquatic ecosystem
Section 208 , Flood Control Act of 1954, as amended (amends Section 2, Flood Control Act of August 28, 1937)	Remove obstructions to clear channels for flood control
Section 1135 , Water Resources Development Act of 1986, as amended	Modify projects to improve the environment

5.1.2 Floodplain Management Services

Under the authority provided by Section 206 of the 1960 Flood Control Act (PL 86-645), as amended, USACE can provide the full range of technical services and planning guidance needed to support effective floodplain management. USACE has an opportunity under the Floodplain Management Services (FPMS) Program to request funds for the USACE to participate in interagency nonstructural FPMS projects that focus on reducing flood risk.

Table 5-2: Floodplain Management Services

Study Cost	Final Design/Construction Costs
Floodplain Management Services assistance to state, regional, local government, or Native American Indian tribes is 100-percent federally funded.	The program does not give USACE the authority to complete detailed final designs or construction activities.
Other federal agencies and private parties must pay 100 percent of the costs of all Floodplain Management Services efforts.	

USACE runs a program that establishes interagency flood risk management teams for states, known as the Silver Jackets. The Georgia Silver Jackets is an intergovernmental team of federal, state, and local agencies that collaborate on flood management issues and share information and resources related to flooding and mitigation, integrating mitigation and recovery efforts, and leveraging available resources.

The mission of the Georgia Silver Jackets team is to:

- Facilitate strategic, integrated life-cycle mitigation actions to reduce the threat, vulnerability, and consequences of flooding in the state of Georgia.
- Create or supplement a mechanism to collaboratively solve issues and implement or recommend solutions.
- Identify and implement ways to leverage available resources and information among agencies.
- Increase and improve flood risk communication and outreach.
- Inform the U.S. Army Corps of Engineers District Commander and state-level agency directors during response and recovery activities; and Integrate mitigation into recovery actions.

5.1.3 Planning Assistance to States

Under the authority provided by Section 22 of the Water Resources Development Act of 1974 (PL 93-251), as amended, USACE can help states, local governments, other non-federal entities, and eligible Native American tribes prepare comprehensive plans for the development, utilization, and conservation of water and related land resources. The Planning Assistance to States program is cost shared on a 50-percent federal, 50-percent non-federal basis up to \$500,000 annually.

5.2 Hurricane Evacuation Planning

HURREVAC, short for hurricane evacuation, is a web-based decision support tool developed by the NHP for use by local, state, and federal agencies. Emergency management officials use the tool to translate forecast data to chart the progress of a storm. HURREVAC provides real-time analysis of potential consequences of current storms to help emergency management officials make the difficult decisions when to issue evacuation orders based on clearance times from the onset of tropical storm force winds. The clearance time developed in the transportation analysis is the time it takes for every person to evacuate safely before the arrival of tropical storm force winds. HURREVAC provides “earliest likely” and “most reasonable” arrival time of tropical storm force winds, giving a range of times for emergency managers to plan and make decisions. HURREVAC also predicts wind arrival times.

HURREVAC can also predict the MOM of the hurricane and the Maximum Envelope of Water (MEOW) for multiple scenarios of the approaching storm based on hurricane category and direction of approach. These factors greatly influence the consequences of a hurricane event and the storm surge communities can expect. In addition to current storms, HURREVAC also houses information from past storms for post-storm evaluations and lessons learned.

The 2013 Coastal Georgia Hurricane Evacuation Study: Technical Data Report (USACE 2013c) is the culmination of a multi-year study effort by the National Hurricane Program, a partnership between FEMA, USACE, and the NOAA NHC to thoroughly identify the hurricane vulnerability, public behavior, and response timing parameters associated with potential hurricanes in Georgia. The Georgia TDR was developed to evaluate the major factors that must be considered in hurricane preparedness and to provide Georgia emergency management officials with information needed to support hurricane evacuation decision-making. State and county agencies can use the information presented in the TDR to supplement and/or revise their hurricane evacuation plans and operational procedures, enabling them to respond to future hurricane threats more effectively. The study area for the Georgia TDR is similar to Planning Reach GA_05 and focused on the coastal counties of Chatham, Bryan, Liberty, McIntosh, Glynn, and Camden and the inland coastal counties of Effingham, Long, Wayne, Brantley, and Charlton. The inland coastal counties of Effingham, Long, Wayne, Brantley, and Charlton were included as a part of the study area because small portions of these counties have the potential to be inundated by storm surge.

The Coastal Georgia Hurricane Evacuation Study is presently being updated based on new available datasets and information. The updated study will help counties update and revise their hurricane evacuation plans and develop operational procedures and guides for future hurricane threats.

5.3 Existing Coastal Storm Risk Management Projects and Programs

The SACS Sand Availability and Needs Determination (SAND) report (USACE 2020c) provides a list of federal and non-federal CSRMs within the state of Georgia. The sand needs analysis for the Savannah District includes one federal and two non-federal beach nourishment projects that meet the requirements for this study. In addition to the SAND report, USACE's Coastal Systems Portfolio Initiative provides a general list of federal projects and their current condition (USACE n.d.-b). A listing and brief description of these federal and non-federal projects are described in Sections 5.3.1 through 5.3.2 below. The SAND report also identified the 50-year sand needs and availability for all counties in Georgia with beach nourishment projects. Identifying potential sand deficits can aid in prioritizing further offshore sand investigations. **Figure 5-1** summarizes the 50-year sand needs and availability for the Savannah District area of responsibility. The "percentage of sand need available" in **Figure 5-1** illustrates the ratio of sand available compared to the sand needs for Chatham and Glynn counties. If this percentage is greater than 100 percent, it indicates a sand surplus; if less than 100 percent, a sand deficit is identified.

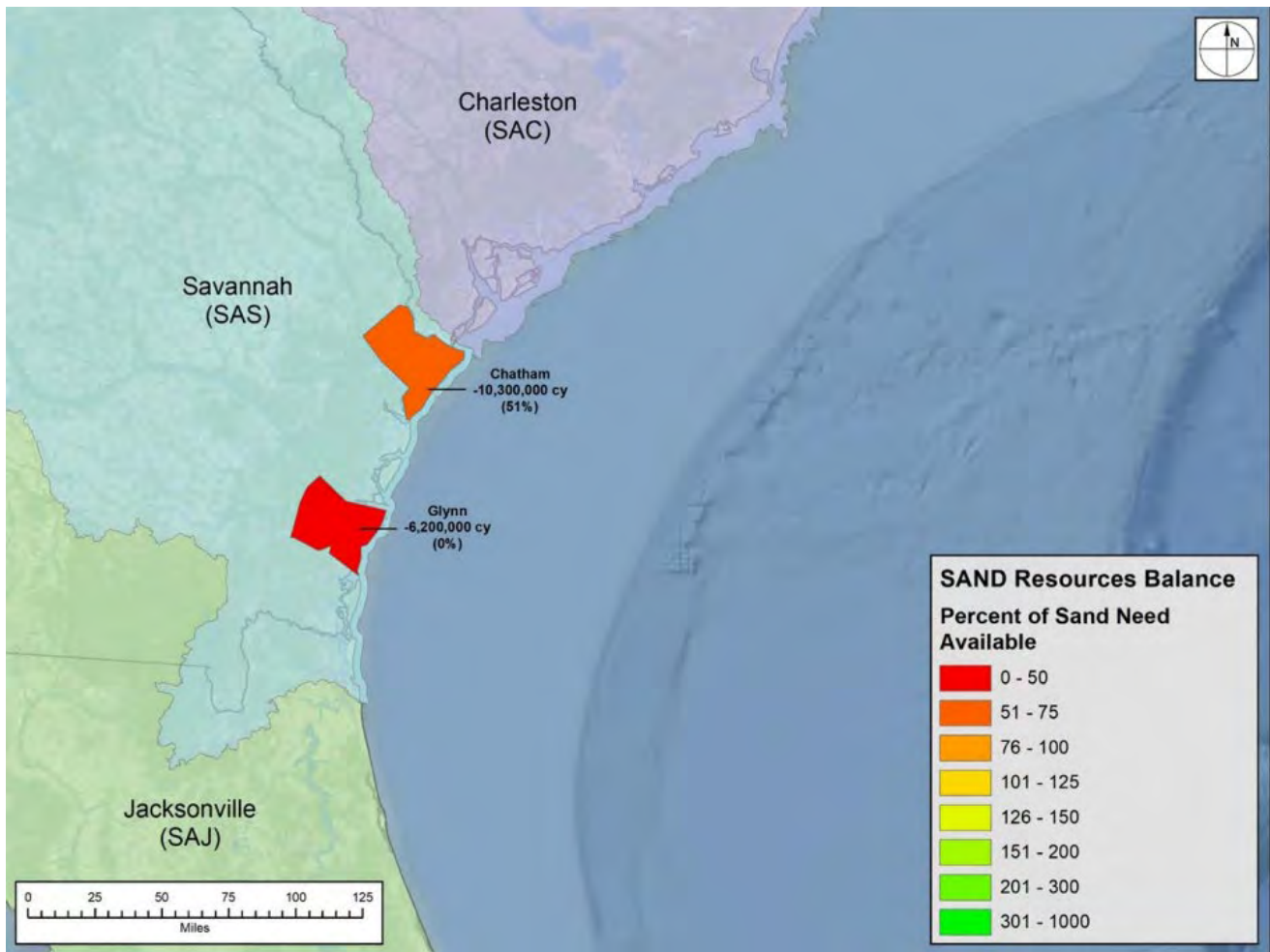


Figure 5-1: Savannah District Balance Volume and Percent of Sand Needs Available (USACE 2020c)

In addition to the list of projects provided in the most recent SAND report, the SACS effort included outreach to receive input from local officials, experts, and stakeholders through in-person and virtual workshops. A list of identified CSRSM projects, including those projects identified by local stakeholders during SACS workshops is provided in **Table 5-3**. Sections 5.3.1, 5.3.2, and 5.3.3 provide additional information on selected projects along the Georgia coast.

Table 5-3: Summary of Existing/Ongoing Federal and Non-federal Efforts to Support Coastal Storm Risk Management within Georgia

Project	Planning Reach	Project Area	Agency/Organization	Comments
Tybee Island Shoreline Protection Project	GA_05	Chatham County	U.S. Army Corps of Engineers (USACE), Georgia Ports Authority (GPA), City of Tybee Island, Academia, National Fish and Wildlife Foundation (NFWF)	Sand Availability and Needs Determination (SAND) Report verified sand need of 21,000,000 cubic yards along 3.5 miles of shoreline. Additional details are provided in Section 5.3.1.
McQueen’s Trail Continuing Authorities Program (CAP) Section 103 Coastal Storm Risk Management (CSR) Project	GA_05	Chatham County	Chatham County and USACE	Additional details in Section 5.3.2.
Georgia Hurricane Evacuation Study	GA_05	State of Georgia	USACE	–
Chatham County Stormwater System Sea Level Rise Vulnerability Assessment: Coastal Watershed Management Plan	GA_05	Chatham County	Chatham County and Georgia Department of Natural Resources (GADNR)	Additional detail provided in the Chatham County Focus Area report
Smart Sea Level Sensors Project	GA_05	Chatham County	Chatham County or City Governments	Chatham County uses approximately 46 sea level sensors to track tides and collect data for future city planning.
Fort Pulaski erosion protection berm maintenance and monitoring	GA_05	Long and Cockspur Islands	Fort Pulaski (FOPU), GADNR, USACE	USACE has placed beach-quality sand to build a berm, which is being monitored for longevity and effectiveness.
Fort Pulaski drainage improvements and structural assessment of existing stormwater infrastructure	GA_05	Long and Cockspur Islands	FOPU, USACE	Identification of sediment quantities and disposal areas as part of Phase 1 of the ongoing Fort Pulaski Drainage Improvement Project.
Tybee Island Repetitive Loss Structure Elevations	GA_05	Tybee Island	Chatham County or City Governments, Federal Emergency Management Agency (FEMA)	–
Tybee Island Back Bay Flooding Study	GA_05	Tybee Island	NFWF, Chatham County, Academia	–
North Beach Dune Construction and Beach Nourishment	GA_05	Tybee Island	Local Government, USACE, GPA	Sediment was obtained via regional sediment management practices for this effort.

Project	Planning Reach	Project Area	Agency/Organization	Comments
St. Simons Island Rock Revetment Maintenance Project (Johnson Rocks)	GA_05	Glynn County	Glynn County, St. Simons Island, OneGeorgia Authority	Additional details provided in Section 5.3.2
Sea Island	GA_05	Glynn County	Sea Island Acquisition, LLC	Additional details provided in Section 5.3.2
Jekyll Island Shoreline Rehabilitation	GA_05	Glynn County	Jekyll Island Authority (JIA)	Additional details provided in Section 5.3.2
Glynn County Critical Infrastructure Flood Risk Study and Mitigation Alternatives Development	GA_05	Glynn County Focus Area	Georgia Power, Georgia Emergency Management Agency (GEMA), FEMA, USACE, Jekyll Island Authority (JIA), Georgia Environmental Finance Authority	–
Glynn County Shoreline Assessment and Implementation Resiliency Plan	GA_05	Glynn County	Glynn County or City Governments	–
Jekyll Marsh Thin-Layer Placement (TLP) Pilot Program	GA_05	Jekyll Island	USACE (O&M), GPA, JIA, GADNR Coastal Resources Division (CRD), EPA, National Oceanic and Atmospheric Association (NOAA)	This pilot program leverages regional sediment management practices.
Northloop Trail and Historic District Repairs and Erosion Protection	GA_05	Jekyll Island	JIA, GADNR, USACE	–
Expand Back River Artificial Oyster Bed Project	GA_05	St. Simons Island	GADNR CRD	In May 2020, 3,700 bags of recycled shells were placed on the east bank of the Back River near the F.J. Torras Causeway.
Frederica Road Flood Study and Drainage Improvements	GA_05	St. Simons Island	Glynn County or City Governments	–
Gould's Inlet Armoring and Shoreline Protection Maintenance	GA_05	St. Simons Island	Glynn County or City Governments	–

5.3.1 Federal Projects

Tybee Island Shoreline Protection Project (Chatham County): With only one beach nourishment project, the total sand need for Chatham County is 21,000,000 cubic yards to support the 50-year sand needs. The primary federal CSRMP project in Georgia is the Tybee Island Shoreline Protection Project. This 3.5-mile-long project was initially constructed in 1974 with a 50-year project life and periodic nourishments to occur every seven years. The authorized project consists of nourishment of 13,200 linear feet of beach between two terminal groins (referred to as Oceanfront Beach); construction of a groin field along 1,100 linear feet of shoreline from the southern terminal groin around the south tip to the mouth of Tybee Creek (referred to as Back River) including periodic

nourishment (referred to as South Tip Beach); and construction of a groin field and nourishment of 1,800 linear feet of the eastern bank of Tybee Creek to the city fishing pier (referred to as Back River Beach). Over the past 20 years, Tybee was renourished four times with interim nourishments to account for storm damage. Additional detail and chronology of the renourishment efforts are described in **Table 5-4**. The project will reach the end of its 50-year project life at the end of 2024 and work is ongoing to determine whether the project will remain authorized beyond that time.

Table 5-4: Chronology of Recent Beach Renourishment and Erosion Control Efforts for Tybee Island

Year	Action
1975	800-foot north end terminal groin was constructed.
1975-1976	Initial nourishment was completed, which involved placing sand on the beach between north end terminal groin and 18th Street (13,200 linear feet).
1986-1987	600-foot south end terminal groin was constructed between 18th and 19th Street. North end terminal groin was rehabilitated. Sand was placed between the groins and on 1,400 linear feet of shoreline south of south end groin.
1993	Beach material was placed on the beach by USACE and Georgia Port Authority (GPA) from Savannah Harbor deepening. The source of sand was the navigation channel.
1994	South tip groin field was constructed by GPA with state of Georgia funds.
1995	Material was placed between South End Groin and 13th Street by GPA. Sand was placed within south tip groin field by GPA. The original borrow area was the source of sand.
2000	Back River groin field was constructed. Initial nourishment of Back River, renourishment of south tip, and renourishment of oceanfront were completed. The original borrow area was the source of sand.
2008	Oceanfront Beach and Back River were renourished with material from the borrow area extension (BAE) in 2008.
2015	Oceanfront Beach and Back River renourished with material from BAE in 2008.
2016	270,000 cubic yards of material were lost to erosion from Hurricane Matthew.
2017	156,000 cubic yards of material were lost to erosion from Hurricane Irma.
2018	Supplemental Oceanfront Beach renourishment with material from BAE in 2008 due to impacts from Hurricane Irma and Matthew.
2019-2020	Oceanfront Beach and Back River renourishment with material from BAE in 2019.

5.3.2 Non-Federal Projects

St. Simons Island (Glynn County): In 2020, USACE’s Regulatory Division verified use of a nationwide permit for Glynn County to perform maintenance on a rock revetment project from the 1960s and 1970s, which extends over 11,000 linear feet of shoreline. The rock revetment, known as the Johnson Rocks, is located on the beachfront from Gould Street to Massengale Park and adjacent to the Gould’s Inlet parking lot on St. Simons Island. The proposed project would raise the elevation of the revetment by one foot and maintain the existing project footprint. Construction commenced late 2020.

Sea Island (Glynn County): Originally constructed in 1968, Sea Island has a sand need of 3,500,000 cubic yards to support the 50-year sand needs. In 2018, USACE’s Regulatory Division issued a permit to a private developer on Sea Island to construct and maintain a new groin south of the existing southern groin and place sand along approximately 17,000 linear feet of beach located between an existing north groin and the new groin. The proposed nourishment plan would consist of approximately 1.3 million cubic yards of beach-quality sand from an offshore borrow area and would include creating an artificial dune system. Construction of the project was completed in 2019.

Jekyll Island Shoreline Rehabilitation (Glynn County): In 2019, Jekyll Island Authority completed construction of a shoreline rehabilitation project, which included rehabilitating the rock revetment and placing sand along approximately 16,000 feet of oceanfront from the Driftwood Beach access trail to approximately 2,000 feet south of Captain Wyly Road. The initial post-construction annual monitoring topographic survey was completed in June 2021 and the shoreline rehabilitation project remains in similar condition to final construction conditions documented in December 2019. The terrace berm has retained approximately 98-percent of material placed landward of the structure. The revetment structure remains at the same crest elevation and generally the same shape with no major settlement observed. A small net increase in the volume of sand seaward of the revetment was documented with no major scour events observed. The shoreline rehabilitation has maintained the uplands as designed with no recession of uplands behind the revetment as was common prior to Phase 1 completion.

5.3.3 Federal Project Performance Evaluation

CSRM projects typically do not provide a specific level of protection. As a result, many projects, particularly those that derive protection from beach nourishment, have a high-risk of exceeding design parameters (e.g., overtopping of a designed dune) during the project life cycle. This is because the greatest return on investment has typically been accomplished by eliminating or greatly reducing risk of coastal storm damages resulting from higher frequency storm events (e.g., more frequent than a 2.5-percent AEP event) and accepting moderately reduced risk of coastal storm damages from lower frequency major storm events.

As described in Section 5.3.1, the primary federal CSRM project in Georgia is the Tybee Island Shoreline Protection Project. The project performance was assessed and rated on how the project performed in relation to design conditions as well as low frequency major storm events.

Project Performance Rating Under Design Conditions:

1. **Failure:** No or minimal storm damage reduction benefits were derived.
2. **Average or above average design performance:** An acceptable number of expected storm damage reduction benefits were derived. Exemplifies acceptable or above average project design and performance.
3. **Well above average design performance:** Most expected storm damage reduction benefits were derived. Exemplifies exceptional project design and performance.

Given the criteria above, the overall project performance is rated as 2. During significant storm events, areas lacking dunes experienced localized flooding, increased erosion, and increased susceptibility to future storm events.

Project Performance Rating During Low Frequency Major Storms:

Low frequency storms referenced in this document may meet criteria provided in ER 500-1-1 (USACE 2001) for an extraordinary storm or, based on the professional judgment of USACE district engineers, are storms that exceeded project design criteria but may not have been evaluated for extraordinary storm designation or documented in Project Information Reports. Based on the analysis of recorded

water levels and wave heights, Hurricane Matthew was classified as an extraordinary storm event for Tybee Island, Georgia in terms of its potential to cause erosive damages.

- 1 to 2: **Failure:** No or minimal storm damage reduction benefits were derived. Hard structures were damaged because of design deficiency.
- 3 to 4: **Below average performance:** Minimal expected storm damage reduction benefits were derived. There was considerable-to-some damage to hard structures.
- 5: **Average performance:** An acceptable number of expected storm damage reduction benefits were derived. There was some damage to hard structures.
- 6 to 7: **Above average performance:** An acceptable amount of expected storm damage reduction benefits were derived. There was some-to-minimal damage to hard structures. Exemplifies acceptable performance.
- 8 to 9: **Well above average performance:** Most expected storm damage reduction benefits were derived. There was minimal damage to hard structures. Project provided incidental damage reduction.
- 10: **Exceptional:** All expected storm damage reduction benefits were derived. There was minimal or no damage to hard structures. Project provided incidental damage reduction. Exemplifies exceptional project performance.

Given the criteria above, the project performance during Hurricane Matthew is rated as 5, which indicates that there was an acceptable number of expected storm damage reduction benefits derived from the project.

5.4 Regional Sediment Management Strategies

RSM is a systematic approach to manage sediments in a manner that maximizes natural and economic efficiencies to contribute to sustainable water resource projects, environments, and communities. Economic value is demonstrated by integrating dredged material from navigation projects with other projects—for example, a navigation project using a CSR project as a dredged material placement area or an ecosystem restoration project using a navigation project’s dredged material as a sediment source.

The RSM Optimization Update (USACE 2020b) documents placement strategies for all routine navigation projects throughout the South Atlantic Division, including costs. This explains all RSM strategies that have been implemented in the South Atlantic Division to promote implementation and lessons learned from those strategies. Some of the specific projects are cited in FAAS documents and below. **Table 5-5** shows the federal navigation projects in the USACE Savannah District area of responsibility and value associated with RSM strategies.

Table 5-5: Total Dredge Volume and Value of Regional Sediment Management Implemented in Georgia (Navigation Projects) (USACE 2020b)

Project	¹ Total Dredged Volume (Cubic Yards)	Percent Managed by Regional Sediment Management Strategies	Annual Regional Sediment Management Value (\$ Million)
Savannah District Total	9,800,000	11%	\$800,000
Savannah Harbor	7,100,000	4%	\$400,000
Brunswick Harbor	1,800,000	0%	\$-
AIWW	900,000	89%	\$400,000

¹Total dredge volume calculated as the sum of all material dredged from the navigation project per dredge cycle

Over the last several years, USACE Savannah District has sought opportunities to apply RSM strategies and beneficially use dredged material from the Savannah Harbor Navigation Project, Brunswick Harbor Navigation Project, and the AIWW Project.

The placement of beach- and nearshore-quality material from the Savannah Harbor Navigation Project on Tybee Island has the potential to provide significant value. Implementing this RSM strategy could provide up to \$1.1 million in annual value to the Tybee Island CSR project and would likely eliminate or dramatically reduce the need for a traditional beach renourishment project. As identified in the SAND report, Jones Oysterbed Dredged Material Containment Area (DMCA), which contains an estimated 5.6 million cubic yards of beach quality material is suitable for multiple placement opportunities in Chatham County.

In Chatham County, opportunities for beneficial use of dredged material include placement at Ft. Pulaski National Monument as well as creating an offshore bird island. The Ft. Pulaski Shoreline Stabilization Project was completed in 2015 and consisted of restoring 1.5 miles of shoreline along the north shore of Cockspur Island using 0.27 million cubic yards of dredged material from the Savannah Harbor Navigation Project. This project provided up to \$2.0 million of shore protection value per placement opportunity to the NPS.

As part of mitigation requirements for continued maintenance dredging of federally-authorized navigation channels, Savannah District has created, and currently maintains, several bird islands both within the boundaries of the upland DMCA and offshore. In Chatham County, the creation of the Tomkins Bird Island, just north of the Savannah River, provides valuable bird habitat for a variety of species including the federally listed least tern. Following completion in 2005, over 35,000 nests were observed from brown pelicans, royal terns, sandwich terns, gull-billed terns, laughing gulls, and black skimmers over the succeeding 5 years of monitoring. Nests have continued to number in the thousands in subsequent years. The bird island also provides additional capacity at the existing Savannah Harbor DMCA as the bird island serves as a placement option.

In addition to these two major RSM focuses, additional opportunities exist for beneficial use of beach-quality and non-beach-quality dredged material. For example, non-beach-quality material could be used for ecosystem restoration purposes, including additional island habitat creation (bird islands) and thin-layer placement to enhance and restore marsh habitat.

In Glynn County, Hampton River Inlet Shoals and Black Banks River Shoals were previously used as RSM sources. However, both have been expended because they have filled in with silty material and were deemed unusable for a 2018 beach nourishment. As identified in the SAND report, there are currently no offshore sand sources or RSM sources with volume estimates in the county. While suitable beach quality material is limited in the area because of percent silt content, emerging RSM implementation strategies and pilot studies have been employed in Glynn County. A thin-layer placement pilot project was completed in 2019 at Jekyll Island. Approximately 5,000 cubic yards of non-beach-quality material was dredged from Jekyll Creek and placed over an adjacent 5-acre area of saltmarsh using a thin-layer spray technique. The goal of this pilot project is to enhance marsh resilience by raising the marsh elevation and promoting new growth of marsh grasses while combating marsh subsidence and sea level rise.

To support RSM strategies, several layers of data are available for viewing in the SACS Geoportal. These include the location of dredged material management areas, where maintenance dredging occurs, and potential placement areas. The SAND Borrow Areas layer identifies available sand resources and can be used to prioritize permitting and geotechnical testing of offshore borrow areas to maintain adequate sand supply. The borrow areas are separated based on different borrow categories, including proven borrow areas with a 90-percent confidence factor, potential borrow areas with a 70-percent confidence factor, and unverified plus sources with a confidence factor ranging from 5 to 30 percent. The unverified plus category areas are areas where beach-quality sand most likely exists, but additional geotechnical testing would be required. The unverified and unusable categories have a 0-percent confidence factor.

5.5 Coastal Storm Risk Management Measures and Costs

The SACS Measures and Cost Library (MCL) was developed in compliance with Section 1204 of the Water Resources Development Act of 2016 (WRDA 2016) and with implementation guidance released on November 16, 2017, which directs that the SACS shall include a framework to identify flood and CSRSM measures and the associated rough order of magnitude (ROM) cost estimates.

The MCL encompasses a range of planning reach-specific unit costs for different management measures. A management measure is a feature or activity at a site that addresses one or more of the planning objectives. A variety of measures should be considered in a CSRSM planning phase of a study. For the MCL, the user inputs additional information such as the location, site variability, length, and/or size of the measure to estimate the range of total costs and annualized life cycle costs. Descriptions of common CSRSM measures included in the MCL are:

- **Nonstructural:** Various nonstructural alternatives, including buyouts/relocations, elevating structures, and flood-proofing are all considered viable measures for the damage zones located along the coast of Georgia.

- **Structural:** Measures such as beach fills, breakwaters, groins, seawalls, and dikes may be examined. Constructing a structural feature prevents waters from reaching residential property, businesses, and roads. Analysis of a beach fill, wall, or dike system will focus on those areas with a population density or commercial activity level sufficient to allow economic justification.
- **Natural and Nature-Based Features (NNBF):** NNBF refer to the intentional use of natural and engineered features to produce engineering functions in combination with ecosystem services and social benefits. Natural coastal features take a variety of forms, including reefs (e.g., coral and oyster), barrier islands, dunes, beaches, wetlands, and maritime forests (e.g., mangroves).

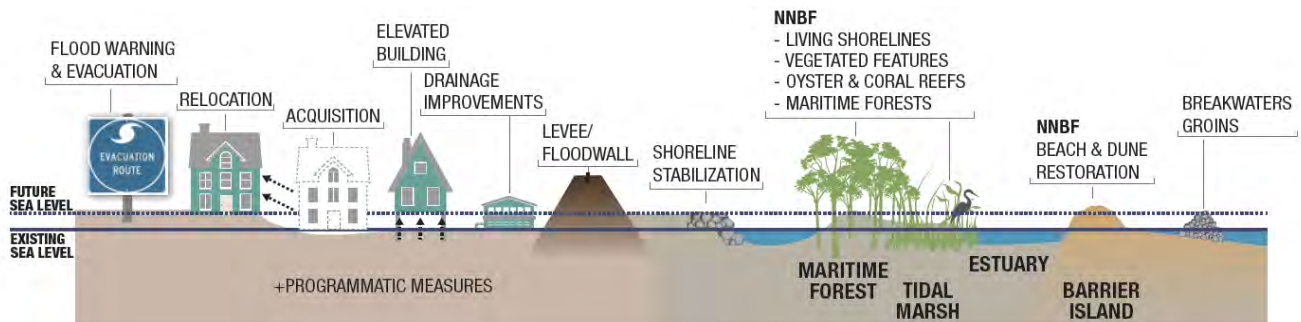


Figure 5-2: Measures to Improve Resilience and Sustainability in the Coastal Environment (USACE 2015b)

The following tables display ROM cost ranges based on unit inputs from the SACS MCL specific to Planning Reach GA_05. **Table 5-6** provides ROM cost ranges for structural coastal storm risk management measures, **Table 5-7** displays natural and natural-based features, and **Table 5-8** displays nonstructural measures. Detailed descriptions of each measure are located in the Measures & Cost Library Report (USACE 2022c).

Table 5-6: Structural Management Measures from the SACS Measures and Cost Library and Associated Annual Cost/Unit

Measure	Coastal Storm Risk Management Function	Applicability by Wave Energy	Unit	Total Mobilization and Demobilization Cost Range		Total Construction Cost Per Unit Range (\$/Unit)	
Groins	Primary - Erosion/ Secondary - Wave Attack	High Energy (Waves > 3 feet)	\$/LF	\$150,000	\$400,000	\$2,107	\$11,241
Seawall	Primary - Wave Attack/ Secondary - Inundation, Erosion	High Energy (Waves > 3 feet)	\$/LF	\$500,000	\$750,000	\$9,481	\$18,328

Measure	Coastal Storm Risk Management Function	Applicability by Wave Energy	Unit	Total Mobilization and Demobilization Cost Range		Total Construction Cost Per Unit Range (\$/Unit)	
Revetment	Primary - Wave Attack/ Secondary - Erosion	High Energy (Waves > 3 feet)	\$/LF	\$180,000	\$430,000	\$7,947	\$21,405
Bulkhead	Primary - Erosion/ Secondary - Wave Attack	Mixed Wave Energy (Waves 1.5 to 3 feet)	\$/LF	\$160,000	\$185,000	\$1,580	\$2,764
Breakwaters	Primary - Wave Attack/ Secondary - Erosion	High Energy (Waves > 3 feet)	\$/LF	\$400,000	\$1,200,000	\$5,966	\$24,762
Floodwalls	Primary - Inundation	Mixed Wave Energy (Waves 1.5 to 3 feet)	\$/LF	\$500,000	\$500,000	\$5,473	\$8,828
Deployable Floodwalls	Primary - Inundation	Low Wave Energy (Waves < 1.5 feet)	\$/LF	\$13,768	\$17,000	\$1,855	\$2,796
Levees/Dikes	Primary - Inundation	Mixed Wave Energy (Waves 1.5 to 3 feet)	\$/LF	\$181,000	\$226,150	\$735	\$2,175
Surge Barrier	Primary - Inundation	High Energy (Waves > 3 feet)	\$/LF	\$2,000,000	\$187,500,000	\$181,250	\$285,183
Beach Nourishment (Initial Construction)	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves > 3 feet)	\$/LF	\$2,500,000	\$6,000,000	\$1,258	\$7,050
Beach Nourishment (Renourishment)	Primary - Erosion/ Secondary - Wave Attack	High Energy (Waves > 3 feet)	\$/LF	\$2,500,000	\$6,000,000	\$628	\$3,375
Nearshore Nourishment	Primary - Inundation, Wave Attack	High Energy (Waves > 3 feet)	\$/LF	\$450,000	\$450,000	\$455	\$2,329
Road Elevation	Primary - Inundation, Wave Attack	High Energy (Waves > 3 feet)	\$/LF	\$10,000	\$150,000	\$7,565	\$13,909
Ringwalls	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves > 3 feet)	\$/LF	\$10,000	\$150,000	\$2,064	\$2,437

LF: linear foot

Table 5-7: Natural and Nature-Based Management Measures from the SACS Measures and Cost Library and Associated Annual Cost/Unit

Measure	Coastal Storm Risk Management Function	Applicability by Wave Energy	Unit	Total Mobilization and Demobilization Cost Range		Total Construction Cost Per Unit Range (\$/Unit)	
Barrier Island	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves >3 feet)	\$/AC	\$4,500,000	\$10,400,000	\$231,105	\$1,131,163
Tidal Flats	Primary - Erosion/ Secondary - Wave Attack	Mixed Wave Energy (Waves 1.5 to 3 feet)	\$/SF	\$400,000	\$500,000	\$96	\$235
Wetland	Primary - Wave Attack /Secondary - Erosion	Mixed Wave Energy (Waves 1.5 to 3 feet)	\$/AC	\$400,000	\$1,500,000	\$198,002	\$1,276,032
Maritime Forest	Primary - Wave Attack /Secondary - Erosion	Low Wave Energy (Waves <1.5 feet)	\$/AC	\$10,000	\$100,000	\$2,075	\$11,175
Wet Pine Savannah	Primary - Wave Attack/ Secondary - Erosion	Low Wave Energy (Waves <1.5 feet)	\$/AC	\$10,000	\$100,000	\$2,075	\$11,175
Mangroves	Primary – Wave Attack/ Secondary – Inundation, Erosion	Mixed Energy (Waves 1.5–3 feet)	\$/LF	\$10,000	\$150,000	\$1,895	\$3,088
Living Shoreline Vegetation	Primary - Erosion/ Secondary - Wave Attack	Low Wave Energy (Waves <1.5 feet)	\$/LF	\$10,000	\$150,000	\$22	\$2,234
Submerged Aquatic Vegetation	Primary - Erosion/ Secondary - Wave Attack	Low Wave Energy (Waves <1.5 feet)	\$/AC	\$100,000	\$300,000	\$173,000	\$585,500
Coral Reef Breakwater	Primary - Wave Attack/ Secondary - Erosion	Mixed Wave Energy (Waves 1.5 to 3 feet)	\$/LF	\$400,000	\$1,200,000	\$2,703	\$8,074
Oyster Reef Breakwater	Primary - Wave Attack/ Secondary - Erosion	Mixed Wave Energy (Waves 1.5 to 3 feet)	\$/LF	\$100,000	\$300,000	\$973	\$4,063
Living Shoreline Reefs	Primary - Wave Attack/ Secondary - Erosion	High Energy (Waves > 3 feet)	\$/LF	\$250,000	\$1,200,000	\$6,125	\$19,313
Living Shoreline Sills	Primary - Wave Attack/ Secondary - Erosion	Mixed Wave Energy (Waves 1.5 to 3 feet)	\$/LF	\$250,000	\$1,200,000	\$1,805	\$8,530

AC: acre

SF: square foot

LF: linear foot

Table 5-8: Nonstructural Management Measures from the SACS Measures and Cost Library and Associated Annual Cost/Unit

Measure	Coastal Storm Risk Management Function	Applicability by Wave Energy	Unit	Total Mobilization and Demobilization Cost Range		Total Construction Cost Per Unit Range (\$/Unit)	
Buyout & Acquisition	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves >3 feet)	\$/Asset	-	-	\$323,139	\$729,501
Building Elevation	Primary - Inundation	High Energy (Waves >3 feet)	\$/Asset	-	-	\$131,650	\$298,166
Dry Flood Proofing	Primary - Inundation	Low Wave Energy (Waves <1.5 feet)	\$/Asset	-	-	\$38,353	\$101,094
Wet Flood Proofing	Primary - Inundation	Low Wave Energy (Waves <1.5 feet)	\$/Asset	-	-	\$10,323	\$14,215
Relocation	Primary - Inundation	High Energy (Waves >3 feet)	\$/Asset	-	-	\$214,163	\$307,094
Flood Warning Systems	Primary - Inundation	High Energy (Waves >3 feet)	-	-	-	-	-
Flood Insurance	Primary - Inundation	High Energy (Waves >3 feet)	-	-	-	-	-
Floodplain Mapping	Primary - Inundation	High Energy (Waves >3 feet)	-	-	-	-	-
Flood Emergency Preparedness Plans	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves >3 feet)	-	-	-	-	-
Land Use Regulations	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves >3 feet)	-	-	-	-	-
Zoning	Primary - Inundation, Wave Attack	High Energy (Waves >3 feet)	-	-	-	-	-
Evacuation Plans	Primary - Inundation, Wave Attack	High Energy (Waves >3 feet)	-	-	-	-	-
Risk Communication	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves >3 feet)	-	-	-	-	-
Risk Analysis	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves >3 feet)	\$/Study	-	-	-	-
Land Conservation	Primary - Inundation, Wave Attack, Erosion	High Energy (Waves >3 feet)	-	-	-	-	-

5.6 Focus Area Selection

Focus areas are locations that are highly vulnerable to current and future storm damages and that warrant additional analysis in the appendix. The focus areas selected for Planning Reach GA_05 were Chatham County and Glynn County (**Figure 5-3**), which stand out as the highest-risk areas based on the Tier 1 and Tier 2 Risk Assessments. Stakeholders provided direct input on focus area selection during the 2019 Field Workshop and were engaged throughout the focus area selection process to maximize local knowledge in the area and to promote collaboration toward achieving coastal storm risk resilience. The geographic extent of the focus areas was the projected Category 5 MOM inundation extent in each county. The focus areas include a diverse range of high-risk locations that includes densely populated principal cities of metropolitan areas, ocean-facing shorelines, and back bay environments along rivers, bays, and tributaries.

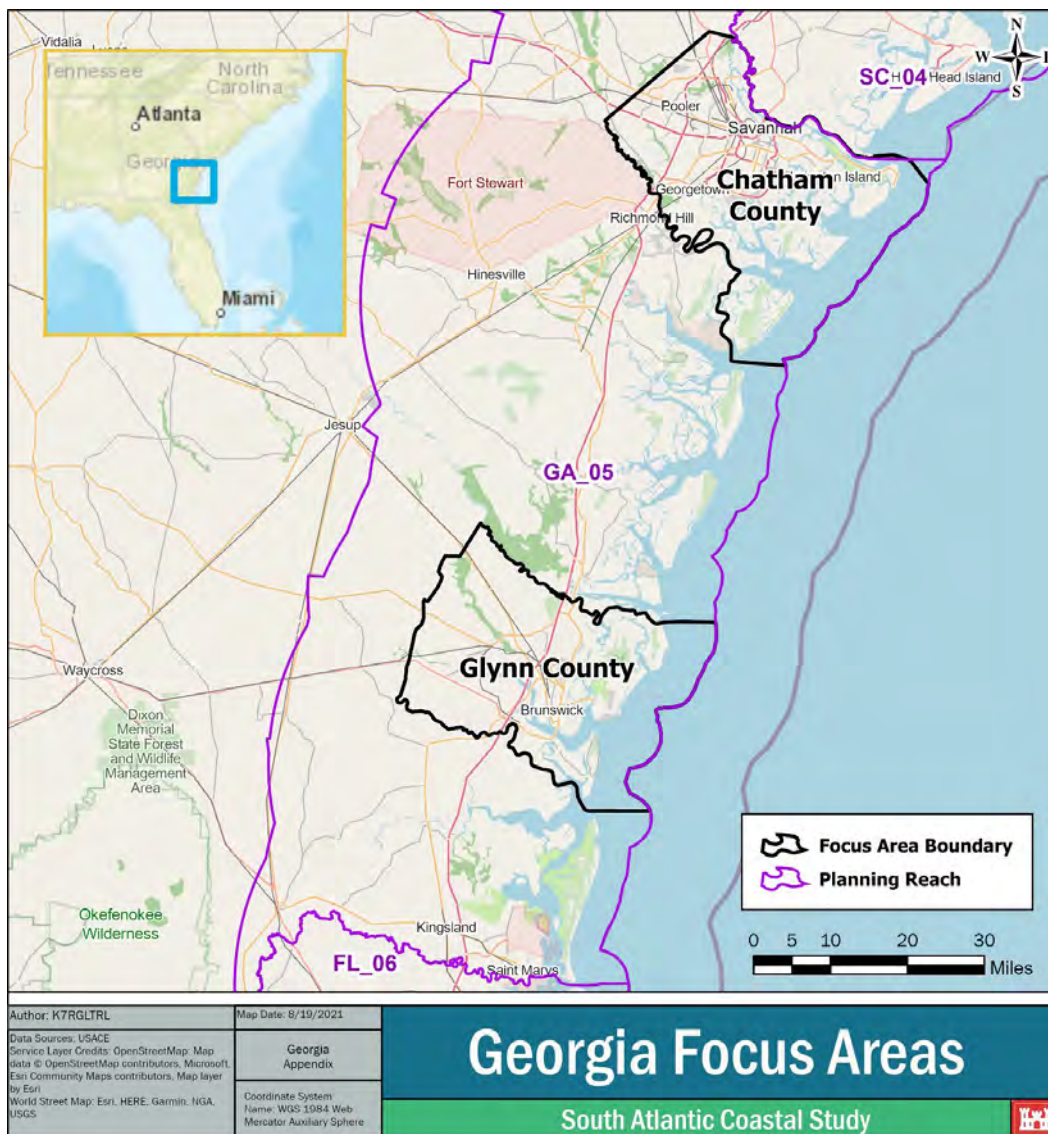


Figure 5-3: Planning Reach GA_05 Focus Area Locations

5.7 Focus Area Action Strategies

The FAAS for Chatham County and Glynn County use a “watershed approach” as per EC 1105-2-411 (USACE 2012b) and use a comprehensive strategy organized around a shared stakeholder vision to address problems.

A watershed approach:

- Works collaboratively with a broad range of stakeholders to help solve problems in an integrated and sustainable manner.
- Uses system approaches to understand the connection between natural and man-made systems.
- Analyzes water resources problems on larger geographic scales.
- Crosses diverse political, geographic, physical, institutional, technical, and stakeholder considerations.
- Seeks interdependent, long-term holistic solutions rather than piecemeal approaches and provides a blueprint for continued involvement in the watershed, regardless of the entity that might ultimately implement the proposed actions.

The FAAS were developed to exemplify how to develop strategies that lower risks in populated areas, areas of concentrated economic development, and areas with vulnerable environmental and cultural resources. Georgia’s two focus areas are briefly described. Detailed FAAS are included as attachments to this appendix.

5.7.1 Chatham County Focus Area

The Chatham County Focus Area is a distinctive region with national historic significance and high economic impacts. It is the northern-most of Georgia’s coastal counties and consists of 632 square miles bounded by the Atlantic Ocean to the east, the Savannah River to the northeast, and the Ogeechee River to the southwest. It includes the incorporated municipalities of Savannah, Tybee Island, Thunderbolt, Port Wentworth, Garden City, Pooler, and Bloomingdale and census-designated places including Dutch Island, Georgetown, Henderson, Isle of Hope, Montgomery, Skidaway Island, Talahi Island, Whitemarsh Island, and Wilmington Island.

Tier 1 analysis results indicated potential storm surge inundation risks to Chatham County that are expected to substantially increase as a result of sea level rise, within both the barrier island and inland communities. Infrastructure includes a major port facility and related commerce infrastructure, a U.S. Coastguard installation, a U.S. Army airfield, major medical facilities, and potentially exposed critical infrastructure including important hurricane evacuation routes. The Tier 1 Risk Assessment was used to identify 15 census places in Chatham County that showed the greatest existing and future risk. Overall, most high-risk Tier 1 analysis locations were identified within Chatham County, representing 15 of 23 high-risk census places. Based on the GHES 2013, approximately 57 percent of the exposed

population along the Georgia coast resides in Chatham County, where 87 percent of the county population resides within the Category 5 MOM hurricane storm surge area. Chatham County contains many nationally significant cultural resources (Ft. Pulaski, Ft. Jackson, Savannah Historic and Victorian Districts, and Wormsloe Historic Site) and draws millions of visitors each year to the city, which increases the potentially exposed population within the county.

The Tier 2 Economic Risk Assessment indicates that greater than 50 percent of the existing and future economic risk within Planning Reach GA_05 is expected in Chatham County.

Stakeholder engagement for the Chatham County Focus Area was primarily facilitated through three virtual Focus area Vision Meetings: the Focus Area Kick-off Webinar held on July 14, 2020; the Focus Area Strategy Development Webinar held on August 19, 2020, and the Focus Area Wrap-up Webinar held on November 2, 2020. Through the input and feedback from key stakeholders, a shared vision and actionable coastal storm risk management strategies were developed for the FAAS.

Specific actions to address problems and realize opportunities in Chatham County were developed in coordination with stakeholders. While these actions vary in scale and purpose, collectively, they advance the shared vision and include:

- Renewing federal participation in Tybee Island shore protection.
- Beneficially using dredged material on the north shore of Tybee Island.
- Beneficially using dredged material on McQueen’s Island Trail.
- Sustaining and increasing efforts to acquire and raise repetitive loss properties.
- Expanding the Smart Sea Level Sensors Project.
- Performing a comprehensive drainage improvements study in the City of Savannah.
- CSRM solutions should be evaluated for storm risk management benefits to cultural resources and socially vulnerable communities.

Each of these actions is described in more detail in the attached FAAS report.

5.7.2 Glynn County Focus Area

The Glynn County Focus Area is in southeastern Georgia and is home to the historic port city of Brunswick and the four barrier islands that make up the Golden Isles (Jekyll Island, St. Simons Island, Sea Island, and Little St. Simons Island). Glynn County has a total area of approximately 585 square miles and is bounded by the Atlantic Ocean to the east, the Altamaha River to the north, and the Little Satilla River to the south. St. Simons Island is the largest and most populous of the Golden Isles, and the most developed of Georgia’s barrier islands.

Similar to Chatham County, the Tier 1 analysis results indicated potential storm surge inundation risks to Glynn County that are expected to substantially increase as a result of sea level rise within both the barrier islands and inland communities. Infrastructure includes a major port facility and related commerce infrastructure, major medical facilities, and potentially exposed critical infrastructure that serves both the city of Brunswick and the Golden Isles. Overall, four high-risk Tier 1 CRI locations were identified within Glynn County, representing four of 23 census places identified as high-risk. The Golden Isles barrier islands have high tourist occupancy during hurricane season, which increases the potentially exposed population within the county.

The Tier 2 Economic Risk Assessment indicates that greater than 30 percent of the existing and future economic risk within Planning Reach GA_05 is expected in Glynn County. The census place with the highest economic risk within Planning Reach GA_05 was identified as St. Simons Island.

Stakeholder engagement for the Glynn County Focus Area was primarily facilitated through three virtual Focus Area Vision Meetings: the Focus Area Kick-off Webinar held on July 13, 2020, the Focus Area Strategy Development Webinar held on August 21, 2020, and the Focus Area Wrap-up Webinar held on November 19, 2020. Through the input and feedback from key stakeholders, a shared vision and actionable coastal storm risk management strategies were developed for the FAAS.

Like in Chatham County, specific priority actions to address problems and realize opportunities in Glynn County were developed in coordination with stakeholders. While these actions vary in scale and purpose, collectively, they advance the shared vision and include:

- Initiating federal participation in St. Simons Island coastal storm risk management.
- Performing a county-wide assessment of road flooding.
- Performing a comprehensive wastewater infrastructure improvements study.
- Sustaining and expanding a pilot-study to characterize beneficial use sediment in the AIWW.
- Improving risk communication.
- Expanding the CRS Open Spaces Explorer Application.
- Beneficially using dredged material from Brunswick Harbor on Jekyll Island.
- Protecting and preserving coastal wetlands.

Each of these actions is described in more detail in the attached FAAS report.

5.8 Strategies to Address Remaining High-Risk Areas

To ensure that all high-risk areas are considered for follow-on efforts, **Table 5-9** identifies the high-risk locations within the planning reach that were not included within the focus areas. The high-risk locations were based off the Tier 1 Risk Assessment, the Tier 2 Economic Risk Assessment, and include areas containing valuable environmental or cultural resources at risk from coastal storms as sea levels rise. Each X in the columns indicates the identified risk for each place listed in the table. The threshold values to identify risk for each column are detailed in Section 4.1.8 of this appendix.

Table 5-9: Remaining High-Risk Locations in Planning Reach GA_05

Remaining High-Risk Locations (Planning Reach GA_05)		Tier 1 Risk Assessment		Tier 2 Economic Risk Assessment		Tier 2- Cultural and Environmental Resources		Tier 2- Shoreline Retreat Areas
County	Census Place	Identified as Existing High-Risk Location	Identified as Future High-Risk Location	Existing Condition Tier 2 Economic Risk Assessment Rating	Future Condition Tier 2 Economic Risk Assessment Rating	At-Risk Cultural Resource Area	Priority Environmental Area	Erosional Hotspot
Bryan	Richmond Hill	X	X	Low-Medium	Medium			
Bryan	Richmond Hill (Keller East) ¹			Medium	Medium-High	X	X	
Camden	Cumberland Island			Low	Low	X	X	X
Camden	Kingsland	X	X	Low-Medium	Medium			
Camden	St. Marys	X	X	Medium	High		X	
Liberty	Midway			Low	Medium			
Liberty	St. Catherines Island			Low	Low	X	X	X
Liberty	Midway (East of Interstate 95) ¹			Medium	Medium-High	X		
McIntosh	Townsend			Low	Low		X	
McIntosh	Darien	X	X	Low	Low-Medium	X	X	
McIntosh	Sapelo Island ¹			Low-Medium	Low-Medium	X	X	X
McIntosh	Blackbeard Island ¹			Low	Low	X	X	
McIntosh	Wolf Island ¹			Low	Low	X	X	X

¹Unincorporated places (not associated with a census place) that met the criteria of high-risk

As identified in **Table 5-9**, portions of Camden, Bryan, Liberty, and McIntosh Counties were identified as high-risk in one or more category. These locations may be particularly susceptible to coastal storm hazards as a result of sea level rise. Within the St. Marys micropolitan area, the Tier 1 Risk Assessment and Tier 2 Economic Risk Assessments jointly identify St. Marys and Kingsland as high-risk locations. Of the remaining high-risk areas, St. Marys has the highest EAD in the future condition with the addition of 3 feet of sea level rise at approximately \$15,700,000.

The FAAS are intended to exemplify how to reduce risk for other high-risk areas within the SACS study area by developing tools and action strategies. The focus areas were selected based on characteristics that made them unique and applicable to other areas. Strategies to address these additional risk areas not addressed in the FAAS documents are:

1. Identify the problem

- Section 3.2 of this Appendix identifies problems and opportunities for the state of Georgia. These problems will exacerbate as sea levels rise. Understanding the most important problems for the area will help refine the action strategy development. When identifying the problem, it is important to specify who/what is impacted, the spatial extent of the impact, and the primary drivers of the impact. Identifying corresponding opportunities (i.e.: conditions, resources, and factors that could contribute favorably to a project) while addressing the problem is also part of this first step.

2. Identify the objectives

- Objectives are specific actions meant to alleviate the identified problems and take advantage of opportunities within a project. Action strategies are intended to meet the project's objectives while working within the constraints

3. Utilize exposure tools

- The SACS Geoportal has several exposure tools that can be used to assess potential risk to populations, infrastructure, and environmental and cultural resources from coastal storm hazards as sea levels rise. The data layers in the Geoportal include both products developed during the SACS, as well as products developed by other agencies/stakeholders. The exposure layers in the SACS Geoportal are listed below and their specific usage is detailed in Section 4.1 as part of the Planning Reach GA_05 Risk Assessment. Comprehensive layers can be used to view exposure to all resources.

Comprehensive layers:

- SACS Tier 1 CRI – broadly identifies locations where coastal storm flooding causes risk that will be increased by sea level rise.
- SACS Tier 1 Hazards – identifies the extent of storm surge hazards under existing and future conditions.
- SAND Needs, SAND RSM, SAND Borrow Areas – used to assess the future coastal resilience of beaches within the region and to develop long-term strategies for reducing damages from sea level rise effects.

Population and Infrastructure layers:

- SACS Tier 1 Population and Infrastructure Exposure Index – Identifies populations at-risk to coastal storm hazards and areas of concentrated economic development and infrastructure.
- SACS Tier 1 Social Vulnerability Exposure Index – Identifies social vulnerability at the census tract level based on 15 social factors, including poverty, lack of vehicle access, and crowded housing.
- ICLUS (EPA) – Identifies projections of populations and land-use based on climate change scenarios and pathways.
- SACS Tier 2 Economic Risk Assessment – Estimates economic risk from storm surge inundation to public and private property and some critical infrastructure under existing and future conditions.

Environmental and Cultural Resources layers:

- SACS Tier 1 Environmental and Cultural Resources Exposure Index – Identifies the density of habitat, environmental, and cultural features.
- NOAA C-CAP Land Cover Classifications – Identifies land cover for the coastal areas of the U.S.
- SACS NOAA ESI Shorelines – Identifies generalized shoreline types based on an understanding of the physical and biological character of the shoreline environment.
- SACS Environmental Resources Vulnerability – Provides a comprehensive regional assessment of vulnerability and risk to environmental resources across the SACS study area.
- SACS Environmental Resources Inundation Risk – Identifies the environmental resources potentially at risk from inundation in the future condition.
- NRHP (NPS) – Identifies the location of cultural resources on the list of the Nation’s historic places worthy of preservation.
- Geographic Names Information System Historical Features (USGS) – Identifies information about the official names for places, features, and areas in the U.S.

4. Develop array of alternatives

- After identifying the problem and planning objectives, and assessing potential risk based on exposure tools, alternatives can be developed to mitigate risks based on shoreline types, wave energy, exposure to resources at risk, and extent of acceptable residual risk in the future condition. Alternatives should include a no action alternative, a nonstructural alternative, a structural alternative, and a NNBF alternative. These different types of measures can be combined to create a final array of alternatives.

- **SAND Report:** The SAND Report data can be used to look at high-risk places along the Atlantic Ocean or Gulf-facing shorelines. If erosion and wave attack are damaging infrastructure or loss of habitat along exposed sandy beach shorelines, then beach and dune nourishment and creating a more robust berm and dune system can help mitigate these risks. The SAND Needs layer identifies areas that need future beach nourishment projects. Sand sources can be identified through the SAND RSM and SAND Borrow Areas layers to create a more resilient coastal system. Alternatives can include beach nourishment, dune enhancement, and accompanying RSM strategies.
- **Planning of Future Development:** Opportunities exist to improve land use planning to limit future infrastructure damages while conserving natural buffer areas for flood storage and providing environmental and cultural resource benefits. ICLUS, developed by EPA, is based on future population growth and open undeveloped space. The B2 housing density scenario increases from 2020 to 2100. The SRES B2 scenario represents a regionally-oriented world of moderate population growth. The ICLUS layer is available in the SACS Geoportal and can be compared to the combined hazard plus sea level rise layer from the Tier 1 Analysis where 3 feet of sea level rise was added to the existing 1-percent and 10-percent AEP floods. The dark blue color depicts the 10-percent AEP flood, which is the most important because of its high probability of occurrence. Three feet of sea level rise is projected to occur between 50 and 100 years based on USACE Intermediate and High Scenarios, so this is an appropriate time frame to project future development.

By making the base layer more transparent, or by turning layers on and off, we can identify areas where future development overlaps with the 10-percent AEP flood in the future condition. The tools discussed can be used to develop nonstructural alternatives such as NS-15 (Land Conservation), NS-11 (Zoning) and NS-10 (Land Use Regulations). The ICLUS data can help make future planning decisions; however, ICLUS data was computed at a national level and does not include all local land use or planning/development considerations.

- **Conservation and/or Restoration:** There are several data layers in the SACS Geoportal that can be used to identify environmental resources to target for land conservation and restoration. The opportunities include reducing the loss of important habitat to maintain natural storm damage reduction benefits and improve planning of future development. The SACS Environmental Resources Inundation Risk layer was created to identify the environmental resources potentially at risk from inundation in the future condition with 3 feet of sea level rise. The ICLUS layer can be compared to this layer to identify areas where projected future development may overlap with resilience hubs and at-risk environmental resources. These at-risk environmental resources are predicted to retreat landward, but future development could impede the landward migration as sea levels rise. These tools can be used to create alternatives for nonstructural measures regarding land conservation, zoning, and land use (NS-10, NS-11, NS-15); as well as NNBF for restoration purposes including NNBF-3 (Wetland), NNBF-6 (Mangroves), and NNBF-8 (SAV).

5. Evaluate and compare alternatives

- When evaluating alternatives, it is important to determine whether the measure addresses the problem while meeting the objectives of the project. Measures are often combined (nonstructural, structural, and NNBF) to meet the most objectives. The final alternatives should be compared to the no action alternative to determine if a project is feasible.
- **Tier 2 Economic Risk Assessment Dashboard:** The dashboard was created using the FEMA Hazus Flood Model to estimate annualized damages to infrastructure from coastal storm inundation. EAD were estimated in the existing condition and in the future condition by adding 3 feet of sea level rise to the model. The data is available at both the census place and census block level, but the census block level gives a higher resolution of data and allows the user to analyze the spatial extent of impact as a more refined level.

The map on the left of **Figure 5-4** shows the existing condition damages and the map on the right shows the future condition damages with 3 feet of sea level rise. The census blocks that correspond to the spatial extent of the problem should be selected within the mapper. The legend in the lower right-hand corner of the dashboard depicts the damage range per census block, with dark red indicating higher projected EAD to pale yellow for lower economic risk. The bar graphs under the existing and future EAD totals show the threshold of the dollar damage based on probabilistic storm events (10-, 2-, 1-, and 0.2-percent AEP storms).

- **SACS Geoportal:** There is a measurement function in the SACS Geoportal that can enable the user to determine the length or area required of a measure. Most structural measures and some NNBF measures have measurements in dollars per linear foot, some NNBF measures have measurements in dollars per acre or dollars per square foot, while nonstructural measures are assessed in dollars per asset. These measurements can be assessed from the length measurement function (linear feet or miles) or the area measurement function (acres or square feet). The measurements can be inputted into the MCL to get a cost range for the measure of interest.
- **MCL:** The overall purpose of the MCL is to match measures and cost to problems and opportunities. The MCL contains ROM costs that have been developed per unit for all structural and NNBF measures as well as some nonstructural measures. The costs are region-specific, so it is important to select the correct planning reach from the drop-down menu at the top of the tool (Planning Reach GA_05). The next step is to enter the measurements obtained from either the SACS Geoportal measurement functions discussed above, or from actual site reconnaissance visits. Once entered, the MCL will provide an annual cost range based over a 50-year period of analysis. Parameters within the tool can be revised by users with more site-specific knowledge, which allows users to reduce the uncertainty surrounding the estimate. **Figure 5-5** depicts the EAD after inputting the measurements for a variety of measures.



Figure 5-4: SACS Tier 2 Economic Risk Assessment Dashboard Depicting Annual Expected Damages Under Existing (Left) and Future (Right) Conditions in the City of St. Marys, Camden County

TABLE-1: Enter User Defined Parameters to Compute ROM Cost Ranges		
Select the planning reach and cost type from the drop down lists in column F.	Select the Planning Reach	GA_05
	Select the Type of Cost	Total First Construction Cost

TABLE-2: Enter User Defined Parameters to Compute ROM Cost Ranges		
Directions: Enter the units for the parameters in column F to estimate the ROM cost for the measures in table 3. The more parameters populated, the more cost ranges populated in Table-3.	Enter # assets to buyout:	
	Enter # assets to elevate:	
	Enter # assets to floodproof:	
	Enter # assets to relocate:	
	Enter length of road to elevate (LF):	1000
	Enter ringwall length (LF):	1000
	Enter groin length (LF):	2000
	Enter measure length (LF):	5000
	Enter breakwater length (LF):	2000
	Enter deployable wall length (LF):	500
	Enter surge barrier length (LF):	1000
	Enter measure area (AC):	70
Enter measure area (SF):	20000	
Enter # nourishments:	4	
Enter # events:	1	

TABLE-3: ROM MEASURE COST RANGES				
Measures & Categories			ROM Cost Range Based on User Input	
Measure Code	Measure Group Name	MeasureUnit	Total Cost Low	Total Cost High
S-1	Groins	\$/LF	\$4,240,000	\$22,295,347
S-2	Seawall	\$/LF	\$46,700,000	\$90,100,000
S-3	Revetment	\$/LF	\$38,900,000	\$105,000,000
S-4	Bulkhead	\$/LF	\$7,850,000	\$13,600,000
S-5	Breakwaters	\$/LF	\$12,000,000	\$49,400,000
S-6	Floodwalls	\$/LF	\$27,200,000	\$43,600,000
S-7	Deployable Floodwalls	\$/LF	\$914,000	\$1,380,000
S-8	Levees / Dikes	\$/LF	\$3,750,000	\$10,800,000
S-9	Surge Barrier	\$/LF	\$179,000,000	\$465,000,000
S-10	Beach Nourishment	\$/LF	\$25,100,000	\$107,000,000
S-11	Nearshore Nourishment	\$/LF	\$2,650,000	\$11,800,000
S-12	Road Elevation	\$/LF	\$7,390,000	\$13,700,000

Figure 5-5: Measures and Cost Library Example of Expected Annualized Damages Output Based on Measurements Entered

6. Action Strategy Development

- An action strategy should also consider prioritization and time frame of actions with identified lead stakeholders. Actions can be identified as needed, planned, or ongoing based on stakeholder input and knowledge and can range from supporting or expanding existing initiatives to identifying potential studies to address vulnerabilities to storm risks and sea level rise within the area. **Table 5-10** is an example of a basic action strategy table that could be developed for use with the remaining high-risk areas not addressed in the FAAS to guide the creation of the action strategy.

Table 5-10: Action Strategy Table Example

Focus Area – X Reach: GA_05 – Sub-area: Back Bay							
Measure/ Action	Measure/ Action status (Implemented/ planned/needed)	Location	Description	Responsible Stakeholder	Summary of Specific Actions Needed to Implement	Time Frame: (short-, mid-, long-term) ¹	Priority: (high, medium, low) ²
Buy-out Acquisition	Needed	Back bay A Beach	–	Property owners, city, FEMA, U.S. Department of Housing and Urban Development	–	Long	High
Outreach	Implemented	–	–	–	–	Short	High
Analysis: sea level rise scenario impacts	Needed	Back bay	–	–	Agreement on sea level rise scenario(s)	Short	–
Bulkhead	Implemented	Numerous private properties	–	Property owners, local government (City, County), USACE (regulatory)	–	NA	Medium
Bulkhead	Needed	City parks	–	Respective cities	–	Short, mid	High
Wetland Enhancement	Needed	Near marinas	Thin layer placement to increase marsh elevation	City planning council, marinas	–	Mid, long	Low
Living Shoreline Vegetation	Planned	Private Properties	–	–	–	Short	Low

¹ Time frame: short = <2 years; mid = 2–10 years; long = > 10 years¹ Time frame: short = <2 years; mid = 2–10 years; long = > 10 years

² Prioritization is the process of deciding the relative importance or urgency of the potential actions and is area and stakeholder specific. A general scale of prioritization may assess risk to life or infrastructure, where High = Urgent or critical need; Medium = Required eventually (Important but medium to low urgency); Low = Nice to have (low urgency, medium to low importance).

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SECTION 6

Institutional and Other Barriers

Institutional barriers are barriers posed by agency silos and overlapping or competing missions that inhibit necessary coordination and collaboration among agencies/levels of government, and/or that otherwise impede the attainment of the SACS goals.

Other barriers are laws, regulations, and agency guidance/programs at federal, state, or local levels that:

- Contribute to vulnerability of coastal populations, ecosystems, and/or infrastructure.
- Work at cross purposes with policies and measures that reduce risk and/or increase resilience.
- Increase flood risk in the coastal zone (tidally influenced).
- Conflict with the goals to improve coastal resilience or reduce risk.
- Expose federal investments or increase financial exposure of federal taxpayers.
- Are public/political obstacles impeding the ability of decision-makers, at all levels of community and political governance, to support or make hard decisions, pursue innovative solutions, or lead change supportive of SACS goals.

These barriers are discussed in detail the *SACS Institutional and Other Barriers Report* (USACE 2022b). In local context, stakeholders within the Chatham County and Glynn County Focus Areas were asked to identify institutional and other barriers that they perceived, and the primary themes were:

- Lack of funding which limits local/state level staffing capacity and ability to implement comprehensive CSRM solutions.
- Limited political support and leadership to make difficult decisions regarding long-term CSRM solutions at all levels of government.
- Difficulties of individuals and communities in understanding their risk.
- Various rules and policies regarding federal and non-federal cost-sharing requirements that make innovation difficult.
- A USACE Federal Standard for dredged material disposal that requires the “least cost” option that is environmentally acceptable and meets engineering standards is perceived to lead to missed opportunities for beach nourishment and other beneficial use.

6.1 Risk Communication

A critical method to reduce risk and create resilient communities is to communicate risk to the individuals, community leaders, and decision-makers who are responsible for proactive land use, evacuation planning, and implementing effective mitigation actions.

Public acceptance of risk management measures, difficulties of individuals and communities in understanding their risk, and lack of community engagement about risk management options were cited as obstacles during stakeholder discussion.

For example, some coastal communities, even though impacted by recent storm events, are reluctant to endorse CSRM measures that may increase recreational benefits and flood risk management measures to their shorelines. Concerns broadly vary from viewshed impacts to increased tourism as potential detrimental effects of CSRM measures.

6.2 Financial Ability of Sponsors

The issue of funding and resources was an often-repeated challenge identified during all avenues of stakeholder engagement, including the statewide planning reach-level meetings and the Focus Area Visioning Meetings. The consecutive impacts and damages from Hurricane Matthew in 2016 and Hurricane Irma in 2017 compounded the time and costs associated with full physical and economic restoration of coastal communities. To address immediate risks to people and infrastructure, including the associated costs of debris removal, budget and staff prioritization were necessary to meet these needs.

Beyond budgets and staffing, policies or authorities can cause unintended economic stressors, limit the ability to pool resources or incentivize good CSRM, or make executing programs difficult in a certain window of time or at a particular geographic scale. As described in Section 5.3, perceived least cost Federal Standard impedes potential opportunities for local, state, and federal collaboration.

6.3 Barriers to Implementing Regional Sediment Management

Stakeholders in Planning Reach GA_05 have noted that financial, institutional, and other barriers often prevent implementation of RSM strategies. While RSM practices can benefit the Georgia coastline, RSM practices are not currently maximized. Sediment quality has been identified by stakeholders as the largest issue regarding the potential use of operations and maintenance (O&M) dredged material for beach nourishment. Beach nourishment projects require suitable sand that mimics the natural beach. This serves two purposes: first, the public prefers sand that looks similar to what they are accustomed to seeing at their beach; and second, sediment characteristics including color and grain size can affect sea turtle nesting. Nearshore placement followed by natural migration of sand onto the beach is an alternative to direct beach placement, which should be further explored in Planning Reach GA_05. In addition, there is the perception among some stakeholders that the

USACE Federal Standard for dredged material requires the “least cost” option that is environmentally acceptable and meets engineering standards leads to missed opportunities for beneficial use. In reality, the policy allows for flexibility to consider a broader range of value as outlined in the Water Resources Development Act of 2020 (WRDA 2020), encourages beneficial use, and provides opportunities for stakeholders to pay the additional cost above the least cost option to execute other dredged material placement strategies. Stakeholders are encouraged to discuss potential beneficial uses with USACE.

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SECTION 7

Recommendations

The following recommendations (**Table 7-1**) result from the analyses detailed within this appendix and from coordination with stakeholders throughout Georgia. As part of the Tier 2 analysis, efforts were made to develop specific and detailed recommendations to address coastal storm risk within the selected focus areas as described in each FAAS. Importantly, several recommendations initially developed for focus areas are also applicable throughout all coastal areas of Georgia. Other high-risk areas not located within a focus area may also have had recommendations developed.

All recommendations for Georgia are shown in **Table 7-1** and represent important components of an overall regional strategy for the full SACS study area. As described in the Main Report, the SACS regional strategy focuses on maintaining and adapting projects and programs that are successfully addressing coastal storm risk while advancing emerging methods. The regional strategy also emphasizes the importance of advancing coordination and collaboration on complex issues, such as land use and development practices, to manage increased coastal storm risk as a result of sea level rise throughout the SACS study area. Recommendations are made for either multiagency action, USACE action, or consideration by the United States Congress (Congress) to advance specific actions resulting from analyses presented in this report and from coordination with stakeholders.

Recommendations are organized into six categories, as shown in **Figure 7-1**, and three implementation time frames (near-, mid-, and long-term). Importantly, follow-on study efforts should incorporate an integrated approach to the maximum extent practicable, including consideration of structural, nonstructural, and NNBF measures, as well as the shared responsibility of all stakeholders to contribute to coastal storm risk management. Implementation timing is influenced by the degree of stakeholder collaboration needed, technical complexity of the recommendation, current momentum toward implementation, and other factors needed to implement the recommendation. Implementation time frames include:

- **Near-Term Implementation (<5 years):** These recommendations are generally less complex and have significant stakeholder momentum toward implementation. The recommendations generally maintain and adapt actions that are recognized to successfully manage coastal storm risk.



Figure 7-1: Recommendation Categories

- **Mid-Term Implementation (5-10 years):** These recommendations may be more technically complex and/or require additional stakeholder coordination and collaboration for implementation. They advance ongoing and emerging efforts to address coastal storm risk.
- **Long-Term Implementation (>10 years):** These recommendations typically require significant stakeholder coordination and—from technical, political, or social perspectives—may be the most challenging to implement on a regional scale. Importantly, coordination and collaboration on these recommendations should not be delayed. The long-term time frame is reflective of the time to implementation based on lead time needed to advance these recommendations, which include complex issues such as land use, zoning, and building codes. Given the uncertainty surrounding impacts from sea level rise and other factors (e.g., development trends), long-term recommendations may require reconsideration prior to implementation.

Based on its shoreline length relative to other states and territories in the SACS study area, five priority recommendations were made for Georgia. Priority recommendations can manage a significant amount of risk and have a high implementation potential based on stakeholder interest and other factors. State and territory prioritization was heavily based on stakeholder coordination, assigning higher priority to recommendations that leveraged ongoing or planned actions to manage coastal storm risk, were supported by stakeholder consensus, and/or had an overall higher potential for implementation within Georgia.

Table 7-1: Recommendations for the State of Georgia (Priority Recommendations in Yellow)

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Activities and Areas Warranting Further Analysis	Near-Term (<5 years)	Multi-Agency Action	Improve risk communication in Glynn County	<p>Community-based education on coastal storm risks and sea level rise within the county should be promoted through increased public outreach. As part of the Focus Area Visioning Meetings, stakeholders identified that the proposed implementation of Coastal Storm Risk Management (CSRМ) measures such as beach nourishment has been a long-standing issue of contention within the Golden Isles. Without the support of the community, resiliency and risk management efforts are unlikely to be prioritized and progressed. Stakeholders are encouraged to use the publicly available SACS tools (e.g., Geoportal, Tier 2 Economic Risk Assessment) to assist in risk communication, and the SACS Coastal Program Guide to locate additional opportunities for funding. Potential lead stakeholders would include the Brunswick-Glynn County Emergency Management Agency and local governments.</p> <p>*This recommendation is applicable throughout all coastal counties within the planning reach.</p>	Stakeholder Collaboration
Activities and Areas Warranting Further Analysis	Near-Term (<5 years)	Multi-Agency Action	Expand the Community Rating System (CRS) Open Spaces Explorer Application	<p>The CRS Explorer Application should be expanded to Glynn County. The CRS Open Spaces Explorer identifies parcels that currently qualify for Open Space Preservation (OSP) credit and calculates the points they provide, assists in identifying future open space in the floodplain, and serves as a flood risk communication tool for residents and decision makers. Non-federal participants are encouraged to use the SACS Coastal Program Guide to locate additional opportunities to fund this effort. Potential lead stakeholders include The Nature Conservancy, local governments, and Georgia Department of Natural Resources (GADNR).</p> <p>*The CRS Explorer Application is presently in-use by Camden County. Expansion of, or similar efforts to the CRS Explorer Application are applicable and recommended throughout all coastal counties within the planning reach.</p>	Stakeholder Collaboration

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Activities and Areas Warranting Further Analysis	Near-Term (<5 years)	USACE	Floodplain Management Services (FPMS) (Silver Jackets) Camden County Coastal Hazards System (CHS) Study	<p>Continued support for an ongoing study utilizing CHS data and methods to generate water surface grids for National Oceanic and Atmospheric Administration (NOAA) Intermediate High Sea Level Rise projections for 2050, 2075, and 2100 for a 10-percent and 1-percent annual exceedance probability (AEP) event for Camden County, GA. The modeled data will better capture storm surge inundation in back bay areas than the current approaches. Risks to population, infrastructure, and environmental and cultural resources are expected to increase with projected population growth and sea level rise. Inundation data for 2050, 2075, and 2100 will be intersected with a variety of infrastructure data to identify highly vulnerable areas within the county.</p> <p>*Similar efforts can be conducted for other coastal counties within the planning reach to refine projected short- and long-term risks associated with sea level rise.</p>	Funding
Activities and Areas Warranting Further Analysis	Near-Term (<5 years)	USACE	Floodplain Management Services (FPMS) (Silver Jackets): Georgia Coastal Resilience Workshop	Conduct workshops for planners and engineers that will provide targeted training on tools developed by state and federal agencies to assess, communicate, and address risk to Georgia communities posed by coastal storm risk and sea level rise. Additional components of the workshops will include coastal permitting requirements and hazard mitigation grant and funding opportunities. The aim of the workshops is to maximize future use of SACS data and tools where applicable and improve coastal storm risk management through shared instruction with state and federal agencies.	Stakeholder Collaboration

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Activities and Areas Warranting Further Analysis	Mid-Term (5–10 years)	Multi-Agency Action	Expand the Smart Sea level Sensors project	<p>The Smart Sea Level Sensors project is an ongoing partnership between Chatham Emergency Management Agency, City of Savannah, and Georgia Tech. Chatham County uses approximately 46 sea level sensors to track tides and collect data for future city planning. The sea level sensor network should be expanded to refine projected short- and long-term risks associated with sea level rise throughout the focus area and provide real-time data on coastal flooding to assist with emergency planning and response. Non-federal stakeholders are encouraged to use the SACS Coastal Program Guide (CPG) to locate additional opportunities to fund this effort.</p> <p>*Expansion of, or similar efforts to the Sea Level Sensors Project are applicable and recommended throughout all coastal counties within the planning reach.</p>	Funding
Activities and Areas Warranting Further Analysis	Mid-Term (5–10 years)	Multi-Agency Action	Sustain and increase efforts to buyout/acquire and raise repetitive loss properties	<p>As part of the Chatham County Focus Area Visioning Meetings, the continued acquisition and raising (when possible) of repetitive loss properties was identified as a successful method to reduce vulnerability to populations and residential structures. A repetitive flood loss property is one for which two or more claims of \$1,000 or more have been paid by the National Flood Insurance Program (NFIP) within any 10-year period since 1978. Expanded eligibility of properties located within known flood hazards (not just with repetitive loss properties) is recommended. Non-federal participants are encouraged to use the SACS Coastal Program Guide to locate additional opportunities to fund these efforts.</p> <p>*This recommendation is applicable throughout all coastal counties within the planning reach.</p>	Funding

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Activities and Areas Warranting Further Analysis	Long-Term (>10 years)	Multi-Agency Action	Protect and preserve coastal wetlands	<p>Glynn County is situated on a low coastal plain with vast expanses of tidal marsh that surround most of the river corridors within the county. Continued preservation and legal protections of these natural features within the focus area will provide environmental benefits, reduce onshore storm impacts, and provide natural attenuation and infiltration of stormwater. Stricter local regulations on wetland development are encouraged. Potential lead stakeholders would include Glynn County, all local municipalities, and the GADNR.</p> <p>*This recommendation is applicable throughout all coastal counties within the planning reach.</p>	Guidance/Policy
Address Barriers Preventing Comprehensive Risk Management	Mid-Term (5–10 years)	Multi-Agency Action	Coastal Storm Risk Management (CSRМ) solutions should be evaluated for storm risk management benefits to cultural resources and socially vulnerable communities in accordance with Section 116 of the Water Resources Development Act (WRDA).	Pin Point Heritage Museum and adjacent properties in historical Gullah/Geechee neighborhood experiencing reoccurring flooding issues from storm surges, which will increase with sea level rise. According to January 2021 guidance requiring USACE to estimate benefits more equitably for Regional Economic Development (RED) and Other Social Effects (OSE), a study should be initiated to investigate CSRМ solutions to protect this socially vulnerable and historical community.	Identify Non-Federal Sponsor (USACE Study)

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Recommendations on Previously Authorized USACE Construction Projects	Near-Term (<5 years)	Congress	Renew federal participation in Tybee Island CSRM	The current authorization for federal participation in the Tybee Island Georgia Shore Protection Project is anticipated to end in 2024. Alternatives for continued protection of Tybee Island should be evaluated, including the potential to expand the current project footprint to include new areas at risk from coastal storms and sea level rise such as the North Beach, back bay areas, and U.S. Highway 80. This study would complement ongoing actions including a National Fish and Wildlife Foundation (NFWF)-sponsored grant to address the complicated flooding issues along the back bay portion of Tybee Island. To implement this recommendation, a non-federal sponsor (such as the City of Tybee Island) would need to request participation from USACE. Multi-stakeholder coordination and leveraging of applicable existing data would be required. Continued collaboration to discuss these opportunities is recommended.	Stakeholder Collaboration
Regional Sediment Management Practices	Near-Term (<5 years)	USACE	Sustain and expand Atlantic Intracoastal Waterway (AIWW) operation and maintenance efforts to characterize beneficial use material	Near-shore and non-beach quality dredged material within the focus area should be beneficially used when feasible. Current USACE Regional Sediment Management (RSM) efforts include a study to characterize shoaled material and identify appropriate beneficial uses of dredged sediment along the AIWW. A consistent inventory of material quality and suitability should be shared with stakeholders to promote beneficial use of the dredged material. Continued sediment characterization efforts and collaboration to discuss opportunities with stakeholders such as Jekyll Island and St. Simons Island is recommended. *Characterization efforts can be expanded throughout the AIWW to inform sediment suitability for beneficial use and to engage potential stakeholders.	Funding

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Regional Sediment Management Practices	Near-Term (<5 years)	USACE	Beneficially use dredged maintenance material from the Savannah Harbor on McQueen's Island Trail	Suitable dredged material should be placed on the McQueen's Trail shoreline to reduce erosion damage and restore recreational access to McQueen's Trail. The site is located adjacent to the Savannah Harbor navigation channel, which is routinely dredged for operations and maintenance (O&M). Chatham County is encouraged to continue coordinating with USACE on implementation and cost sharing requirements of this beneficial use action.	Funding
Regional Sediment Management Practices	Near-Term (<5 years)	USACE	Beneficially use dredged maintenance material from the Brunswick Harbor on northern shoreline, Jekyll Island	The northern portion of Jekyll Island has experienced severe damage from recent coastal storms while the central and southern portions of the island have been historically understudied in terms of beach and dune processes. There is potential for RSM to provide beneficial use of sediment to address erosion and storm damage. The Jekyll Island Authority is encouraged to continue coordinating with USACE on the feasibility of this action.	Funding
Regional Sediment Management Practices	Mid-Term (5–10 years)	USACE	Beneficially use dredged maintenance material from the Savannah Harbor on northern shoreline of Tybee Island	Beach and near-shore quality dredged material should be placed on the northern shoreline of Tybee Island to provide CSRSM and environmental benefits. The City of Tybee Island is encouraged to continue coordinating with USACE on implementation and cost sharing requirements of this action.	Funding
Study Efforts (follow-on USACE feasibility study)	Long-Term (>10 years)	Congress	Federal participation in St. Simons Island CSRSM	Alternatives for protection of St. Simons Island should be evaluated in a new study. This study would complement on-going studies and actions in the focus area, which includes a two-phase countywide Shoreline Assessment and Implementation Resiliency Plan and the repair of the historical ocean-facing rock revetment known as the Johnson Rocks. To implement this recommendation, a non-federal sponsor (such as Glynn County) would need to request participation from USACE. Multi-stakeholder coordination and leveraging of applicable existing data into follow-on actions would be required. Continued collaboration to discuss these opportunities is recommended.	New Study Authority

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Study Efforts (follow-on studies)	Long-Term (>10 years)	Multi-Agency Action	Perform a comprehensive drainage improvements study in the City of Savannah	<p>The city of Savannah has historically suffered from stormwater and compound flooding issues, which will increase with sea level rise. Many of the flood prone areas identified in the City of Savannah Flood Hazard Mitigation Plan are located outside of the special flood hazard zones. Federal Emergency Management Agency (FEMA) flood hazard maps do not typically account for flood hazards caused by small depressions in the terrain where stormwater collects; a situation that is exacerbated by impervious surfaces. While management of stormwater does not directly address coastal storm surge, it is a complementary activity. As highlighted by stakeholders, there is an opportunity to prioritize low impact development and green infrastructure retrofits to address these issues and prevent damage to existing and future populations and infrastructure as a result of coastal storms and sea level rise. Potential lead stakeholders would include the city of Savannah, Chatham Emergency Management Agency (CEMA), and the GADNR.</p> <p>*This recommendation is also applicable to other urban locations with aging infrastructure such as Brunswick and St. Marys.</p>	Identify Likely Lead Stakeholder(s)

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Study Efforts (follow-on studies)	Long-Term (>10 years)	Multi-Agency Action	Perform a comprehensive wastewater infrastructure improvements study in Glynn County	There are several areas where critical infrastructure, including water and wastewater systems, are exposed to coastal storm hazards and are vulnerable to sea level rise. Academy Creek wastewater treatment plant (WWTP) (Brunswick), Dunbar Creek WWTP (St. Simons Island), and Jekyll Island WWTP are examples of wastewater systems located in highly vulnerable locations that have been emphasized during stakeholder engagements. Adaptation options for water infrastructure should be further explored to identify applicable measures to address at-risk infrastructure. This study should leverage findings from the Brunswick-Glynn County Joint Water & Sewer Commission, 2017 Glynn County Climate Resilience Adaptation Report and the Glynn County Shoreline Assessment and Implementation Resiliency Plan. Continued collaboration to discuss these opportunities and identify potential partnerships and lead stakeholders is recommended.	Identify Likely Lead Stakeholder(s)
Study Efforts (follow-on studies)	Long-Term (>10 years)	Multi-Agency Action	Perform a countywide assessment of road flooding in Glynn County	<p>Many vital roadways located within the low-lying coastal floodplains are susceptible to flooding from riverine and tidal flooding. With respect to sea level rise projections, potential short-term and long-term measures and solutions should be identified to address these at-risk roadways. The F.J. Torras Causeway, Riverside Drive, Frederica Road, and Ocean Boulevard are examples of affected roads that have been emphasized during stakeholder engagements. This recommendation addresses the problem of nuisance flooding impacting roads in low-lying areas. Initial coordination should take place between stakeholders needed for engagement in this type of study. Potential lead stakeholders would include Georgia Department of Transportation (GDOT) and Glynn County. Continued collaboration to discuss these opportunities and identify potential partnerships is recommended.</p> <p>*This recommendation is applicable throughout all coastal counties within the planning reach.</p>	Identify Likely Lead Stakeholder(s)

SECTION 8

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SOUTH ATLANTIC COASTAL STUDY (SACS)

Glynn County Focus Area

FINAL REPORT

AUGUST 2022





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1. Introduction

This Focus Area Action Strategy (FAAS) identifies action strategies to reduce risk to coastal storms and increase resilience in the Glynn County area of Georgia. The South Atlantic Coastal Study (SACS) key products and analyses were leveraged to assess existing and future conditions and quantify existing and potential risks. Agency stakeholders were engaged throughout the development of the Glynn County FAAS to elicit feedback on problems and opportunities, identify and prioritize specific institutional and other barriers, and identify potential action strategies to improve resilience. The participating stakeholders included Federal agencies (United States Geological Survey [USGS], National Oceanic and Atmospheric Administration [NOAA], Fish and Wildlife Service [FWS]), State Agencies (Georgia Department of Transportation [GDOT], Georgia Environmental Protection Division [GA-EPD], Georgia Coastal Resources Division [GA-CRD], Georgia Emergency Management and Homeland Security Agency [GEMHSA], Georgia Department of Community Affairs), non-governmental organizations (NGO's) (Manomet, The Nature Conservancy [TNC]), academic institutions (University of Georgia Skidaway Oceanographic Institute, Georgia Southern University, Georgia Institute of Technology), county and local agencies within the focus area (City of Brunswick, Glynn County, Jekyll Island Authority, Georgia Ports Authority), and one historical society (Coastal Georgia Historical Society).

The FAAS was developed according to the Coastal Storm Risk Management (CSRM) Framework, an iterative process with three tiers of analysis that gains resolution each time it is implemented. Under the Tier 1 regional analysis, national datasets were utilized to assess potential risk across the entire SACS study area, as documented in the SACS Main Report. For the Tier 2 analysis, more refined data and analyses unique to each individual state or territory were incorporated. The Tier 2 analysis for Glynn County is documented within the Georgia Appendix. The FAAS is a refinement within the Tier 2 analysis of the SACS study framework, incorporating data and knowledge unique to the local area to identify risks to coastal storm events and develop potential strategies to address the risks.

This FAAS is carried out as part of SACS, which was authorized by Section 1204 of the Water Resources Development Act of 2016 as described in the Main Report. The FAAS refers to ongoing, planned, and needed actions to manage coastal storm risk based on stakeholder coordination conducted during Focus Area Vision Meetings, a series of interactive webinars held between July and December 2020. The status and description of actions provided in this report represents a snapshot in time, and specific actions may have been modified or the status may have been changed from the description provided. However, final recommendations resulting from stakeholder coordination on specific actions were updated to represent the most recent information as of June 2022.

1.1 Study Area

The Glynn County Focus Area is in southeastern Georgia and is home to the historic port city of Brunswick and the four barrier islands that make up the Golden Isles—Jekyll Island, St. Simons Island, Sea Island, and Little St. Simons Island, shown in **Figure 1**. Glynn County has a total area of approximately 585 square miles and is bounded by the Atlantic Ocean to the east, the Altamaha River to the north, and the Little Satilla River to the south. St. Simons Island is the largest and most populous of the Golden Isles and the most developed of Georgia's barrier islands.

This unique coastal setting includes public beach access on Jekyll Island and St. Simons, while Little St. Simons Island and Sea Island are privately owned with limited public access. Seasonal tourism continues to increase in Glynn County, with more than 2.5 million visitors annually and most visitors headed toward the Golden Isles. Georgia’s coast is designated as a landscape of hemispheric importance for shorebirds and the Western Hemisphere Shorebird Reserve Network declared it as a critical site for the survival of threatened shorebirds.

Focus areas were selected based on Tier 1 high-risk areas, stakeholder feedback and ensuring a range of environments and risk factors were represented across all 21 focus areas selected within the SACS. Draft focus areas were presented to stakeholders at the 2019 Georgia Field Workshop. Based on provided feedback and additional analysis, two focus areas were selected for Georgia: Chatham County and Glynn County.

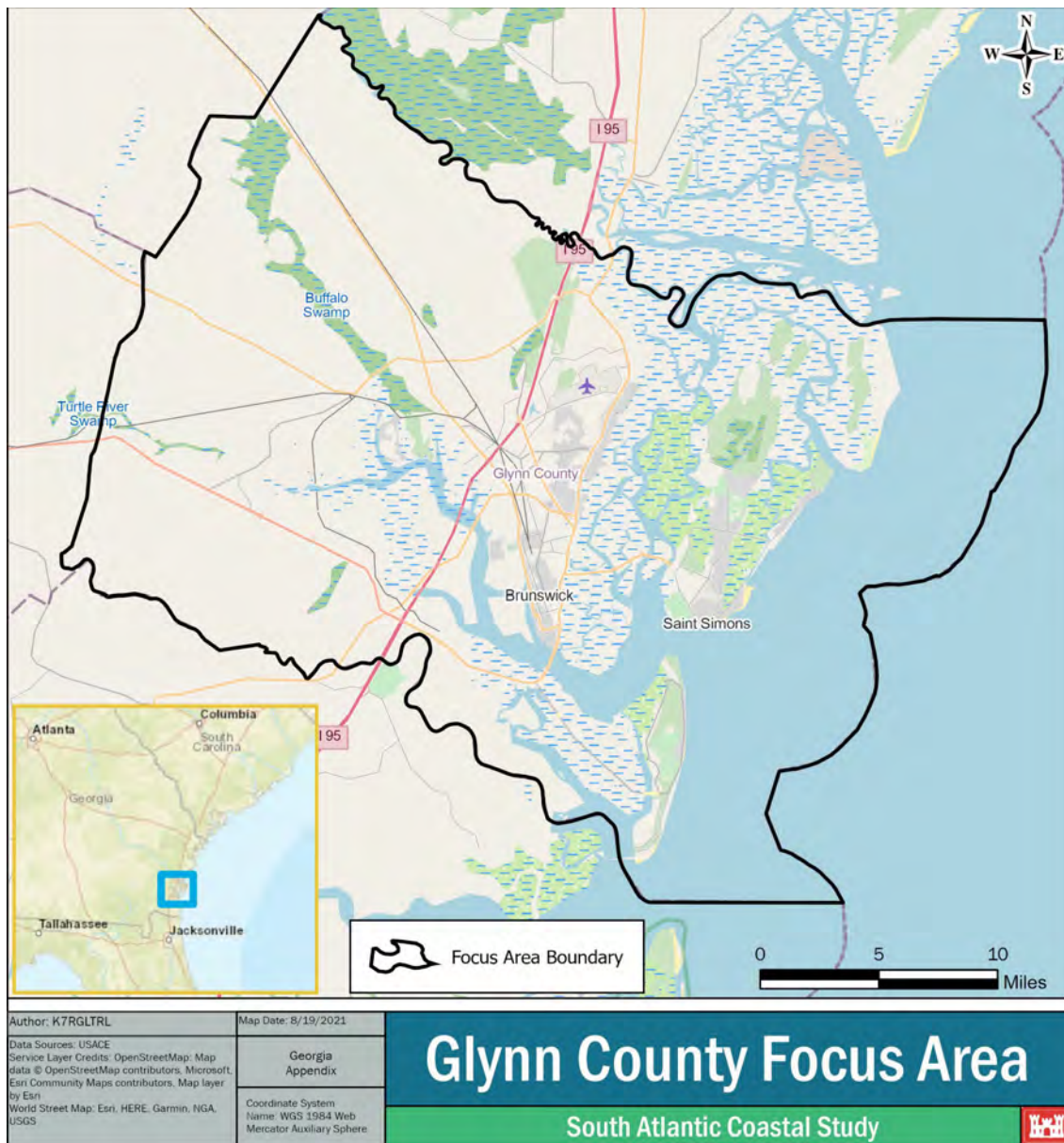


Figure 1: Glynn County Focus Area Boundary

1.2 Prior Reports and Efforts by Stakeholders within the Focus Area

Table 1 presents prior and ongoing stakeholder efforts within the Glynn County Focus Area to address coastal storm risks and impacts from sea level rise.

Table 1: Stakeholder Efforts in the Focus Area

Agency/Stakeholder	Report/Tool/Project	Year Completed
Glynn County	Shoreline Assessment and Implementation Resiliency Plan for Glynn County	Ongoing
Glynn County	County's Water Resources Protection Ordinance Update	Ongoing
USACE	Georgia Hurricane Evacuation Study	Ongoing
Jekyll Island	Jekyll Island Conservation Plan	Ongoing
Glynn County, St. Simons Island, OneGeorgia Authority	St. Simons Island Rock Revetment Maintenance Project (Johnson Rocks)	2021
Georgia Department of Natural Resources (GADNR) Coastal Resources Division (CRD)	Back River Artificial Oyster Bed Project	2020
Jekyll Island	Jekyll Island Shoreline Rehabilitation Project	2019
GADNR CRD/USACE	Jekyll Marsh Thin-Layer Placement Pilot Study (Regional Sediment Management [RSM])	2019
Federal Emergency Management Agency (FEMA)	Glynn County Flood Insurance Study	2018
FEMA	Glynn County Flood Insurance Rate Map (FIRM)	2018
University of Georgia (UGA), City of Brunswick	Howard Coffin Park Bioretention Cell Demonstration Project	2018
Glynn County	Comprehensive Plan	2018
Sea Island Acquisition, LLC	Sea Island groin construction and beach nourishment	2018
Glynn County	Disaster Recovery and Redevelopment Plan. Pre- and Post-Disaster Strategies for Managing Long-Term Recovery	2017
Glynn County	Climate Resilience Adaptation Report. Long-term Climate Resilience Adaptation Strategies for the Joint Water & Sewer Commission	2017
Glynn County	Glynn County Flood Mitigation Plan	2015
University of Georgia, Skidaway Institute of Oceanography/ Stetson University	Sea-Level Rise and Sub-County Population Projections in Coastal Georgia	2015
Coastal Regional Commission of Georgia	Hazard and Resilience Plan for the Coast of Georgia	2014
GADNR CRD	Post-Disaster Recovery and Redevelopment Planning: A Guide for Georgia Communities	2014
Georgia Conservancy/ Georgia Institute of Technology	Retreat. Adapt. Defend. Designing Community Responses to Sea Level Rise in Five Coastal Georgia Communities	2013
GADNR CRD, GADNR Historic Preservation Division (HPD)/ UGA, Skidaway Institute of Oceanography	Threatened Archaeological, Historic, and Cultural Resources of the Georgia Coast: Identification, Prioritization and Management Using GIS Technology	2008

Overall, these prior reports and on-going and completed projects provided the team with a baseline understanding of coastal storm risks and flood risk management within Glynn County. Stakeholder coordination highlighted several studies completed by USACE and other stakeholders that could be particularly valuable for ongoing and future efforts when addressing coastal storm risk.

1.3 Shared Vision

The shared vision statement was developed and edited using input from key stakeholders in the focus area. The overall goal of this Glynn County FAAS is to incrementally contribute to the shared vision statement developed for this watershed study:

“Glynn County stakeholders share a vision to work collaboratively mitigating coastal storm risks and sea level rise in order to provide for safe, healthy, and thriving communities while protecting and restoring the environment.”

The shared vision statement is broad enough to encompass various goals and objectives of individual partners and stakeholders, and with a detailed description to allow for subsequent development of specific planning objectives and associated metrics. The study framework and associated activities will support the shared vision.

2. Problems and Opportunities

Identifying problems and opportunities is a key initial step in the planning process. The problems and opportunities statements encompass both current and future conditions and are not meant to preclude the consideration of any alternatives to solve the problems and explore ways to unlock the opportunities.

2.1 Problems

The following problems were identified as the most significant throughout the focus area and may not be exhaustive of all problems. These problems will increase in both intensity and magnitude as sea levels rise depending on the vulnerability and resilience of the exposed population, infrastructure, and environmental resources. Example locations of where the problem is evident are listed. However, these are example locations and in general, the problems are evident throughout the focus area unless noted otherwise.

- Coastal storm damages (from inundation, erosion, and wave attack) are increasing in populated areas, areas of concentrated economic development, and areas with socially vulnerable populations. For example, reoccurring flooding affects communities located throughout the Brunswick peninsula as well as major transportation routes such as Glynn Avenue and Riverside Drive. Low-income housing and socially vulnerable populations can be at particular risk within the City of Brunswick.

- Critical infrastructure, such as water and wastewater treatment plants, hospitals, schools, and roads, are at risk from storm-related hazards and compound flooding, putting people and property at risk. For example, F.J. Torras Causeway, which is the only connection between St. Simons, Sea Island, and the mainland, has been inundated and impassable during major storm events such as Hurricanes Matthew and Irma. Critical infrastructure, including water and wastewater treatment plants, are at risk from storm damages and inundation throughout the focus area. Impacts to these systems could negatively affect economic and social functions as well as public health and safety.
- Nationally important cultural resources and natural habitats are being negatively impacted from coastal-storm driven inundation and erosion. For example, areas of high erosion have been identified within the barrier islands including St. Simons, Little St. Simons, Jekyll, and Sea Island spit. During high tide, the southern shoreline of St. Simons Island is regularly inundated up to the breakwater. At Ft. Frederica, shoreline erosion has claimed historical perimeter walls and active erosion along the shoreline of the Mackay River continues to threaten historic building foundations.
- Population and development are increasing in the focus area, leading to loss of natural buffers in areas exposed to coastal storm hazards. For example, residential construction in southern Glynn County and mixed-used development in the southern tip of the Brunswick peninsula have increased. Growth in tourism and seasonal populations in the Golden Isles increases annually. Development can reduce natural buffers and increase impervious surfaces, which can compound effects from storm surge inundation and precipitation during coastal storms.

2.1.1 Institutional and Other Barriers

As described in the *SACS Institutional and Other Barriers Report* (USACE 2022b), “Institutional and other barriers” impede the attainment of SACS goals and limit the ability to provide comprehensive CSRM. Several barriers were identified within the Glynn County Focus Area by agency stakeholders:

- Lack of funding which limits local/state level staffing capacity and ability to implement comprehensive CSRM solutions
- Limited political support to make difficult decisions regarding long-term CSRM solutions
- Difficulties of individuals and communities in understanding their risk
- Public acceptance of risk management measures

The most common barrier identified is lack of funding. Grant opportunities are detailed in another component of SACS, the Coastal Program Guide, which discusses funding opportunities at the national and state levels.

Table 14, later in this document, includes potential funding sources for identified measures.

2.2 Opportunities

While there are several coastal storm-related problems in the focus area, numerous opportunities exist to address them as exemplified by ongoing efforts within Glynn County. Stakeholders identified several opportunities that include conditions, resources, and factors to contribute favorably to the Glynn County Focus Area, including:

- Gather additional data on coastal hazards, exposure, and vulnerability to refine current and future CSRSM efforts.
- Build partnerships and strengthen relationships with Glynn County stakeholders.
- Enhance outreach and risk communication to all stakeholders in the focus area, including the public.
- Prioritize regional management of projects through RSM and other opportunities that support conservation of natural and fiscal resources in the focus area.
- Promote a range of potential measures, including structural, nonstructural, nature-based, and state and local ordinances that incorporate future sea level rise.
- Reduce the loss of coastal wetlands, beach, and dune systems that promote natural storm damage reduction and provide wildlife habitat.
- Align with and leverage studies being conducted by State and Glynn County stakeholders. Studies conducted at the local level provide local knowledge of coastal storm risks to communities. Using these studies to help identify priorities of key stakeholders will support successful implementation of strategies in the SACS.

3. Objectives and Constraints

Objectives are specific actions meant to alleviate the identified problems and take advantage of opportunities within a project. Constraints are conditions that limit the extent a project can meet its objectives, address the identified problems, and/or take advantage of opportunities. Action strategies formulated during this study are intended to meet the project's objectives while working within the constraints.

3.1 Objectives

Objectives were determined based on feedback from stakeholders, including responses to a questionnaire and participation in the Focus Area Strategy Development Webinar and reflect the shared vision statement from Section 1.3. The objectives listed here are 'umbrella' statements that refer to the specific problem types and areas noted in the Problems Section of this report. Objectives and goals of the FAAS are provided in this section.

Objective:

- The overall planning objective is to develop a strategy to manage coastal storm risk to people and economic, environmental, and cultural resources within the focus area.
- Reduce risk from coastal storm inundation, sea level rise, and erosion to populations, infrastructure, and environmental resources.

Goals:

- Identify the areas at highest risk from coastal storm hazards, which are exacerbated by sea level rise.
- Identify opportunities to manage coastal storm risks to people and infrastructure in the focus area.
- Coordinate with stakeholders to develop strategies that address coastal storm risks in the focus area, including the geographic location, timing, potential lead stakeholders, funding sources, and specific needed actions.

3.2 Constraints

A constraint limits the extent of the planning process. It is a statement of things or situation the alternative plans should avoid. Constraints are designed to avoid undesirable changes between expected future conditions without the proposed project and expected future conditions post project construction. Constraints include:


- To the maximum extent practicable, this analysis will minimize information, observations, and recommendations that may be inconsistent with coastal storm risk management plans developed by other federal and applicable state and local agencies and tribes in the study area.

4. Existing and Future Conditions

There are several organizations that are actively working to address the impacts of coastal storm hazards as sea levels rise in the Glynn County Focus Area (**Table 1**). This section focuses on the performance of existing projects and provides an inventory and forecast of current and future hazards, exposure, vulnerability, and risk in the focus area.

4.1 Hazards

In a general sense, a hazard is anything that is a potential source of harm to a valued asset (human, animal, natural, economic, and social) (USACE 2014). Hazards addressed by the SACS are predominantly storm related and are divided into two categories: primary and secondary. Primary hazards are those directly addressed in the SACS and include inundation, wave attack, and erosion. Secondary hazards are those that the SACS does not specifically address but are important in the



focus area. These include wind damages, saltwater intrusion, and compound flooding from a combination of storm surge, precipitation, astronomical tides, and a high-water table. Sea level rise can uniquely exacerbate other hazards, impacting the future of all coastal communities.

Recent storm events that have significantly impacted the focus area include Hurricane Matthew in 2016 and Hurricane Irma in 2017. Hurricane Matthew caused widespread power outages, an estimated \$500 million in damages, and three fatalities in Georgia. Within Glynn County, Hurricane Matthew produced significant rainfall, flooding, and coastal erosion, which caused an estimated \$11 million in damages. A historic peak water level of 3.18 feet above mean higher high water (MHHW) was recorded at the US Geological Survey (USGS) Brunswick River at St. Simons Island, Georgia gauge (No. 02226180). Note this gage was formerly the NOAA National Ocean Service (NOS) tide gauge at St. Simons Island Pier (No. 8677344). Flooding within the city of Brunswick rendered roads impassable and temporarily severed access to St. Simons Island along the F.J. Torras Causeway, which limited the ability for first responders and emergency management personnel to access barrier island communities in Glynn County.

Hurricane Irma produced nearly 10 inches of rain within southeast Georgia, which was compounded by a Nor'easter bringing heavy precipitation to the area just days prior. The previously held record at the USGS tide gauge (**Figure 2**), associated with Hurricane Matthew, was exceeded during Hurricane Irma, with a recorded peak water level of 3.93 feet above MHHW. The maximum storm surge (the height above normal tide levels) reached just over 6.9 feet at St. Simons Island Pier. Extensive coastal flooding occurred within St. Simons Island, Brunswick, and the communities along the Satilla River.



Figure 2: Brunswick River at St. Simons Island, Gauge No. 02226180 (not to scale) (USGS 2021a)

The frequency of storms contributes to the magnitude of the damage. Storms occurring in the same or consecutive seasons can impact ongoing recovery efforts from the previous storm, compounding the time and cost associated with full physical and economic restoration of the community.

4.1.1 Primary Hazards

Primary hazards are CSRM hazards that the SACS specifically addresses, including inundation, wave attack, and erosion. For the Glynn County Focus Area, the primary hazards are present and considered the most relevant to the study.

4.1.1.1 Inundation

Inundation is one of the primary hazards that affects the majority of the Glynn County Focus Area. The areas most likely to experience inundation hazards are the ocean-facing Golden Isle communities, back bay communities, and riverine communities, due to their proximity to the Atlantic Intracoastal Waterway (AIWW) and the coast, low elevation, and aged infrastructure. Inundation in the context of the SACS refers to flooding originating from the coast in the form of storm surge and does not include riverine flooding originating from the upland or inundation due to excessive rainfall.

Inundation predominantly occurs in the low-lying coastal portions of this region and is caused by storm surge from hurricanes and, to a lesser degree, long nor'easter events. Inundation occurs when waves, combined with storm surge, surpass dunes on the coast of St. Simons and Jekyll Islands. Inundation also occurs landward of the Golden Isles due to storm surge penetrating the inlets at St. Simons Sound, Jekyll Sound, and Altamaha Sound and flooding the marshlands.

The Category 5 Maximum of Maximum (MOM) hazard from NOAA's Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model shows that nearly the entire focus area is subject to inundation from a Category 5 hurricane (Zachry et al. 2015; Jelesnianski et al. 1992). Lesser storms are less impactful, but cause localized flooding in lower elevation natural, commercial, and residential areas. The lateral extent of the Category 5 MOM, 1-percent annual exceedance probability (AEP) flood, and 10-percent AEP flood is identified in **Figure 3**, while **Figure 4** shows FIS flood levels and measurement transects for Glynn County for a 1-percent AEP event. **Table 2** provides the county average storm surge elevations based on the FEMA Flood Insurance Study (FIS) for Glynn County (FEMA 2018).

Table 2: Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) Storm Surge Elevations for Glynn County. (North American Vertical Datum of 1988 [NAVD88]) (FEMA 2018)

Annual Exceedance Probability (AEP)	Storm Surge Elevation
10%	5.7 ft
2%	7.8 ft
1%	8.9 ft
0.2%	10.9 ft

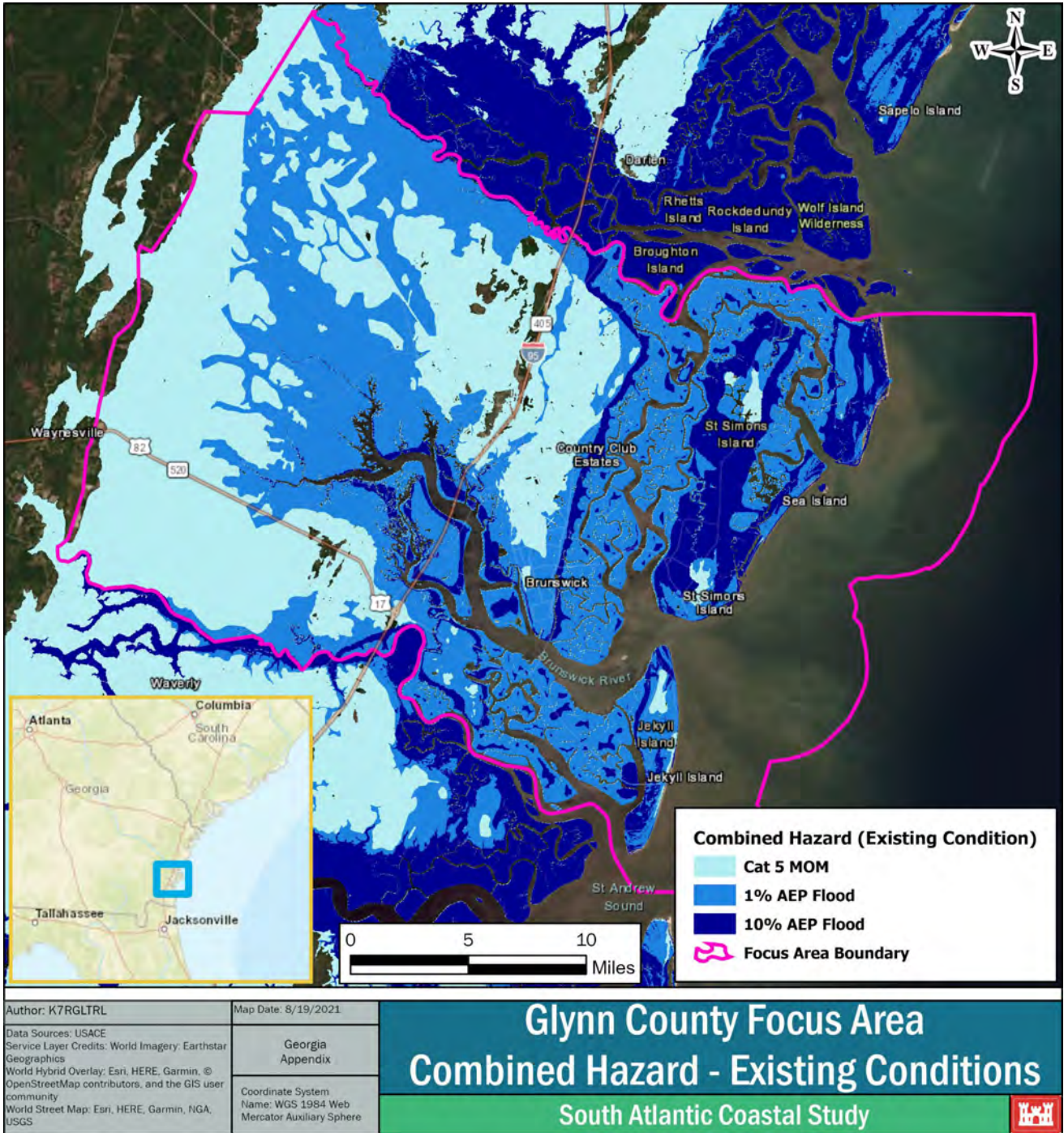


Figure 3: Combined Hazards Overlay for Glynn County (1-Percent Annual Exceedance Probability, 10-Percent Annual Exceedance Probability, and Category 5 Maximum of Maximum)

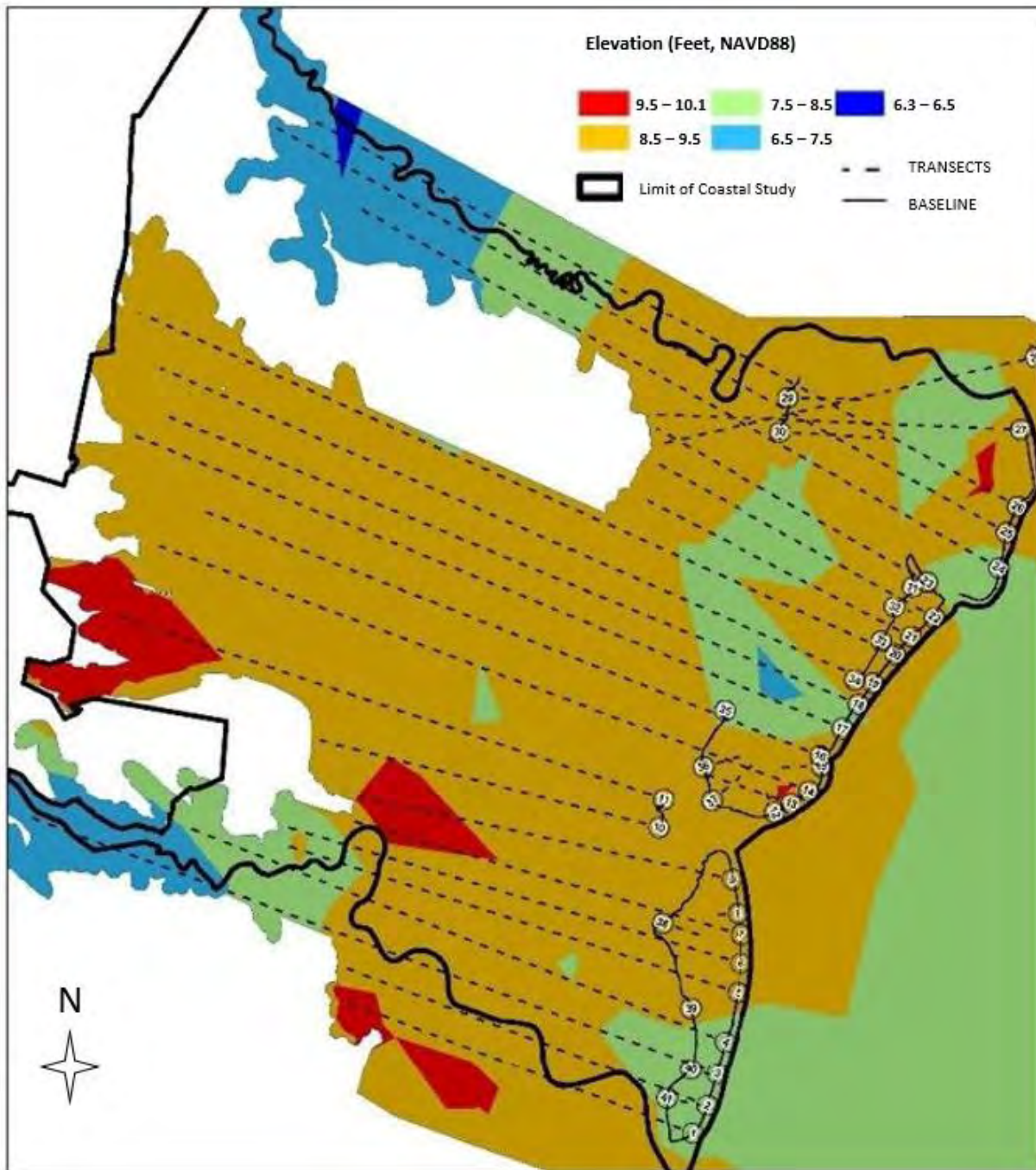


Figure 4: 1-Percent Annual Exceedance Probability Flood Levels, Glynn County (Federal Emergency Management Agency 2018) (Not to Scale)

4.1.1.2 Wave Attack

Waves cause damage through the force that they impart directly upon structures, habitats, and shorelines. Waves also generate alongshore and cross-shore currents at shorelines that can mobilize and erode sediment. In the context of the SACS, wave attack refers to the process of destructive waves impacting a shoreline and leading to increase erosion along that shoreline. Erosion is addressed in Section 4.1.1.3.

The highest wave energy occurs along St. Simons Island, Little St. Simons Island, Sea Island, and Jekyll Island where shorelines are exposed to the open ocean. The impact of waves on these shorelines can be hazardous to both natural shorelines and engineered structures. Southern St. Simons Island is particularly susceptible to wave attack because it lacks natural protections such as an expansive dune system. The USACE Wave Information Studies (WIS) provides hindcast data at locations along the Atlantic coast (Hubertz, 1992). Data derived from the WIS Station 63391, located 15 miles east of St. Simons Island (**Figure 5**), shows that typical deep-water waves at St. Simons Island average approximately 3.4 feet, with lower waves occurring in the summer (3.1 feet) and higher waves occurring in the fall and winter (4.6 feet). During storms, waves can be much higher (i.e., contain more energy). These high-energy waves can cause extensive shoreline erosion and, when carried on water levels elevated by storm surge, overtop dunes, and propagate landward to directly impact infrastructure.

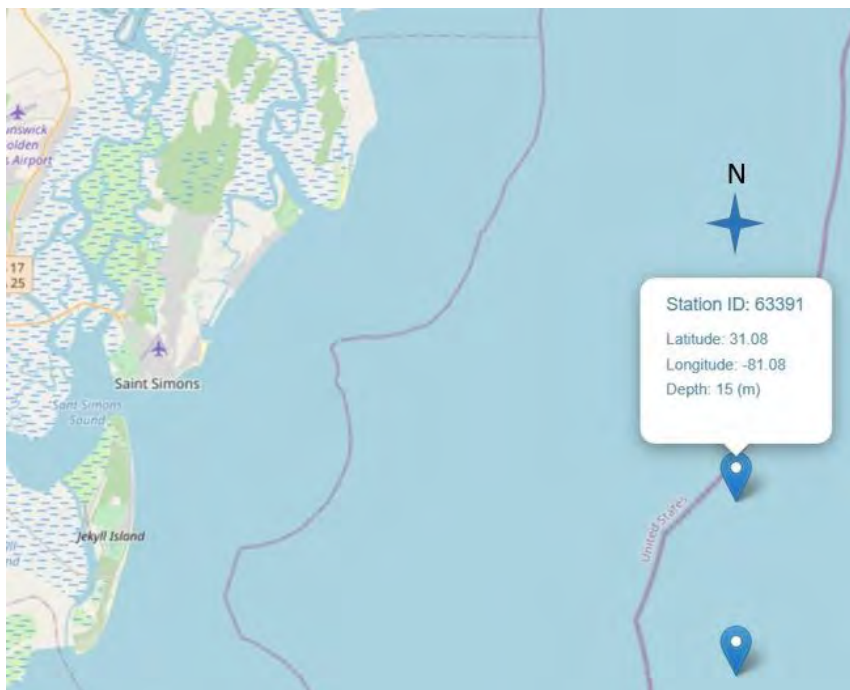


Figure 5: Wave Information Study Station 63391 (not to scale) (Hubertz 1992)

The Coastal Hazards System (CHS) analysis developed by USACE models wave heights for a range of storm events for both existing and future conditions (USACE 2020a). **Figure 6** shows modeled wave heights for the 1-percent AEP event in the Glynn County focus area in the existing and future condition with addition of 2.73 feet of sea level rise. Along the coast, modeled 1-percent AEP wave heights average 0–6.6 feet (0–2 meters), but offshore wave heights average 6.6–19.9 feet (2–6 meters). Open ocean waves do not currently penetrate far into the Brunswick River or the marsh channels north and south of the Brunswick peninsula. Some direct wave attack can occur at the eastern edge of the Brunswick peninsula from waves traveling westward through the inlet to St. Simons Sound. Currently, the highest, most frequent waves in the Brunswick River are ship wakes. While their impact is mostly erosional, repetitive loading from frequent ship passages can impact exposed infrastructure.

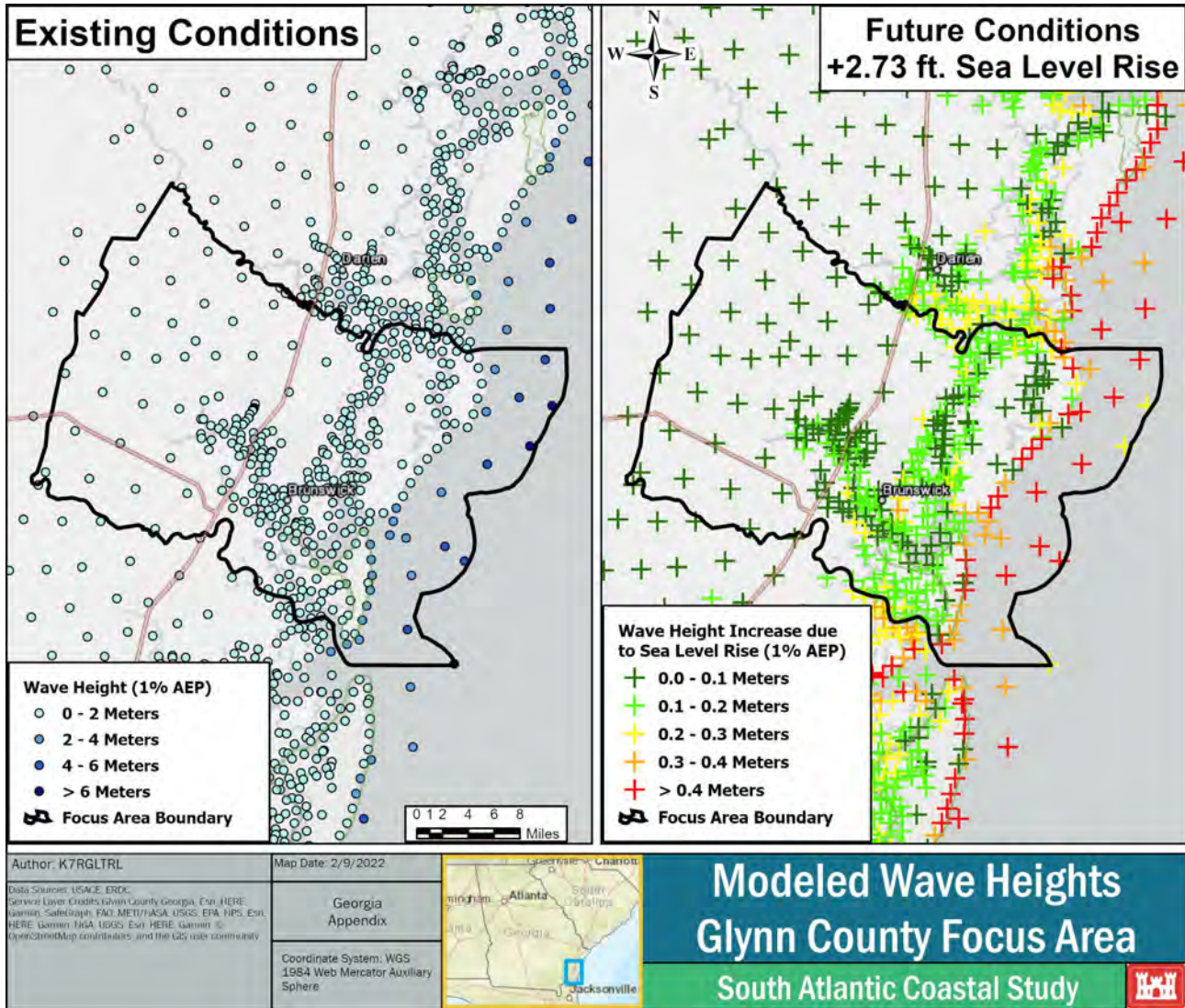


Figure 6: Coastal Hazards System Existing (Left) and Future Condition (Right) Wave Heights Increases for 1-Percent Annual Exceedance Probability Event

4.1.1.3 Erosion

Erosion occurs when waves and currents remove sediment from shorelines. It can increase vulnerability of cultural resources, environmental resources, and infrastructure.

At the open ocean, erosion along St. Simons and Jekyll Island shorelines is predominantly wave-driven in the form of longshore and cross-shore currents. Waves approach the shore at an angle break, dislodging sediment and transporting it alongshore. Sediment moves north and south along the shoreline daily, depending on the direction of the incident waves. During storm events, when waves have higher energy, sediment is transported offshore where it forms bars. Once the storm has passed, the bars dissipate, and sand migrates back to the shoreline. During extreme storm events, however, the force of the waves can remove sand far enough offshore that it is lost to the system entirely. This is typical of hurricanes and leads to unrecoverable erosion damage.

The Glynn County shoreline is comprised of four barrier islands (Little St. Simons Island, St. Simons Island, Sea Island, and Jekyll Island). The barrier islands do not erode uniformly from one part of the island to another as described below. Little St. Simons Island is the northern-most island in the county and has a long-term pattern of accretion (greater than +6.6 feet/year) over most of its shoreline (**Figure 7**). The north end shows mild (-3.3 feet per year) to moderate (-3.3 to - 6.6 feet per year) erosion in the long term. A hot spot of high erosion, losing more than -6.6 feet (-2 meters) per year, is just south of the island’s central shoreline. Sea Island and St. Simons Island, which have developed shorelines, have a mild erosion pattern with regions of accretion throughout the islands. Two hot spots of high erosion are at the northern tip of Sea Island and the south end of St. Simons Island at the entrance to St. Simons Sound. Jekyll Island shows mild long-term erosion throughout the island with accretion of +3.3 feet (+1 meter) to +6.6 feet (+2 meter) per year at the southern tip. The development of St. Simons and Jekyll Islands has resulted in local efforts to stabilize the shoreline and reduce erosional impacts.

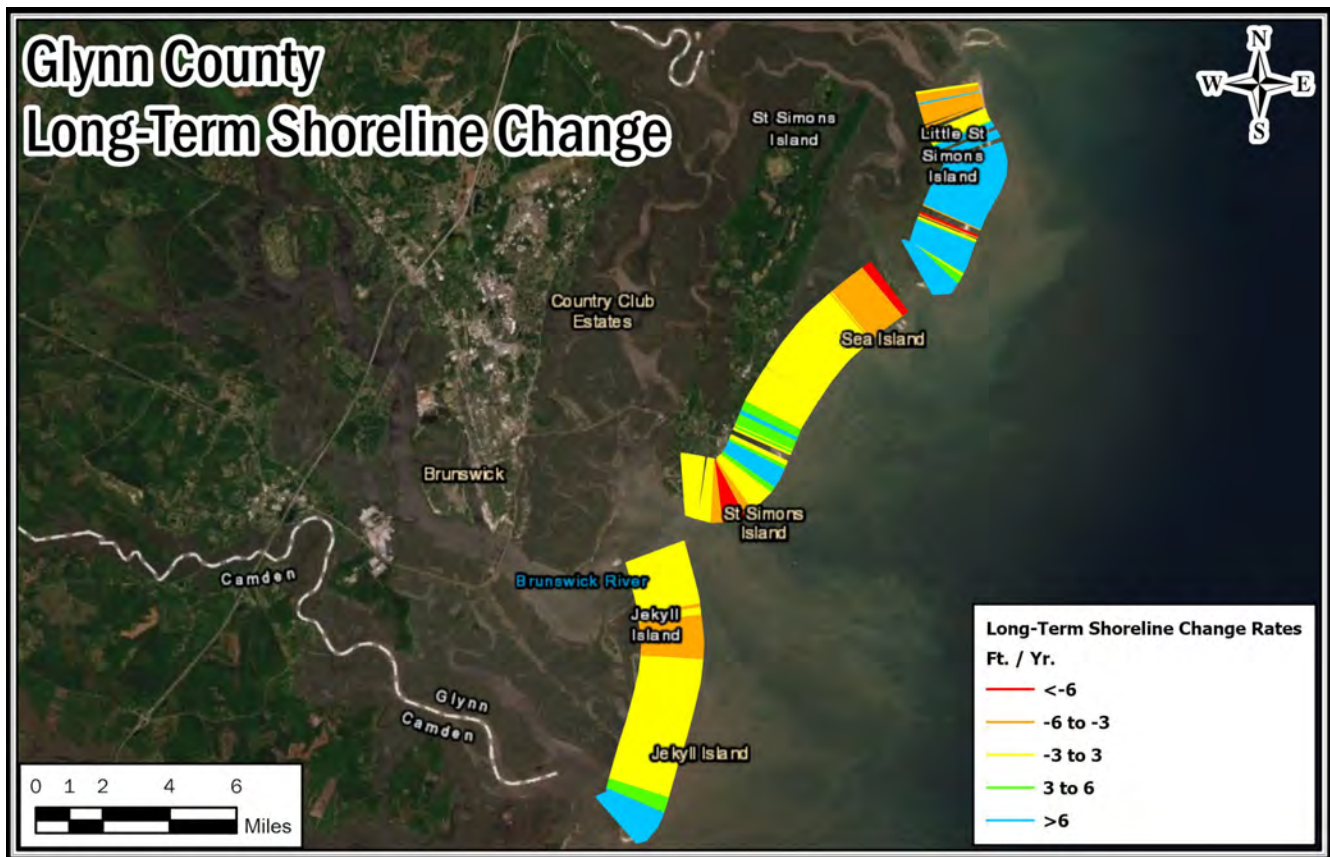


Figure 7: Long-Term Shoreline Change in Glynn County (USGS 2017)

In the back bay regions of Glynn County, erosion and accretion occur along riverbanks and marsh channels. Back bay shoreline change is predominantly caused by currents generated by flood and ebb tides. Regions that experience boat or ship traffic, such as the Brunswick River, also experience erosion due to ship wake from the frequent passage of vessels.

In 2008, GADNR commissioned a study of threatened archaeological, historical, and cultural resources of the Georgia coast (GADNR 2008). As part of this study, shoreline change along the bay side of coastal barrier islands was investigated. GADNR found that bay side coastlines are highly dynamic over time, showing patterns of both accretion and erosion. **Figure 8** represents these patterns for Glynn County. Mean rates of erosion and accretion are provided in **Table 3**.

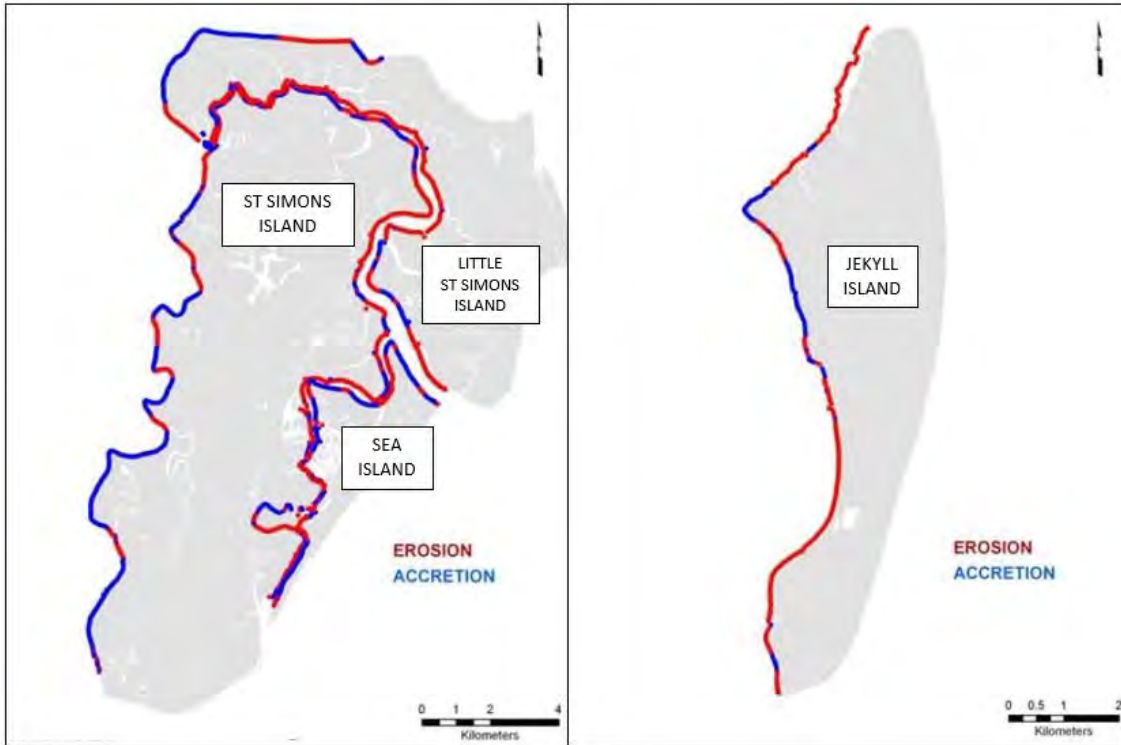


Figure 8: Back Bay Shoreline Change Patterns, Glynn County Barrier Islands (Georgia Department of Natural Resources 2008)

Table 3: Mean Back Bay Erosion and Accretion Rates, Glynn County Barrier Islands (Georgia Department of Natural Resources 2008)

Time Period of Analysis	Barrier Island	Mean Erosion (Feet per year)	Mean Accretion (Feet per year)
1869–2003	Little St. Simons Island	-1.8	6.5
1869–2003	Sea Island	-2.8	2.2
1869–2003	St. Simons Island	-1.1	1.2
1855–2003	Jekyll Island	-1.5	2.1

4.1.2 Secondary Hazards

Secondary hazards are CSRM hazards that the SACS does not specifically address, including wind damage, compound flooding, and saltwater inundation and intrusion. While the SACS does not specifically address these hazards, they are still important to discuss and can impact the focus areas. Nuisance, stormwater, and compound flooding are significant issues within the focus area. Many of these secondary hazards exacerbate the hazards of inundation, wave attack, and erosion.

4.1.2.1 Wind Damage

Typical daily winds in this region range from approximately 5 to 15 miles per hour and have no significant impact. During storm events, however, high winds can damage both infrastructure and environmental resources. Nor'easters typically produce gale force winds of 40 miles per hour or greater. Hurricanes can generate sustained windspeeds of 74 miles per hour (Category 1) to 157 miles per hour or greater (Category 5). Wind is a primary driver of storm surge, by pushing water toward the shore with the force of the winds moving cyclonically around the storm.

4.1.2.2 Compound Flooding

Compound flooding is a combination of hazards that create greater flooding impacts. In Glynn County, this can be a combination of storm surge, precipitation, high tides, stormwater, and high groundwater elevations. Storm surge and wind have been previously detailed as major components of compound flooding. The SACS did not evaluate other sources of inundation; however, precipitation, tides, and groundwater can contribute significantly to flooding through increased runoff volumes; the elevation of ocean, river, and groundwater levels above banks; containment structures and drainage systems; and the overwhelming of outflow systems. Within the city of Brunswick, development has greatly increased the impervious surface area, thus reducing the area where infiltration to groundwater can occur. Excessive surface and stormwater runoff further increases the flood hazards within the city.

4.1.2.3 Saltwater Inundation and Intrusion

Saltwater inundation is the movement of saltwater onto land from storm surges or high tides that submerge areas low in elevation for a short duration of time. Tidal marshes and estuaries experience short-term inundation events as part of the natural cycle and have minimal effect to local salt-tolerant vegetation under normal circumstances. However, with the addition of sea level rise, an increase in the frequency of short-term saltwater inundation events in tidal marshes and estuaries is predicted. Consequently, this may cause an increase in root zone salinization, which can degrade or ultimately kill less salt-tolerant species, such as cattails (*Typha latifolia*) and giant cutgrass (*Zizaniopsis millacea*). These species cannot survive in salinity concentrations greater than 0.5 parts per thousand (ppt) (USDA 2000). Within the low and middle marshes of Glynn County, *Spartina alterniflora* is the dominant salt-tolerant species, but growth becomes impaired if salinity levels exceed 33 ppt. In addition to salinity tolerances, water surface elevation and inundation can impair common high-marsh species found within the area, such as *Juncus roemerianus*, which has similar salt tolerance as *Spartina*; however, it cannot survive periods of regular inundation exceeding 1 hour (NPS 2005). The ability of existing wetlands to adapt to sea level rise will depend mostly on the topography of the coastal zone and the amount of space landward that has not been developed and is available for wetland migration. The loss of wetlands can exacerbate other hazards such as storm surge and wind damage because the frictional effects of the wetlands will be reduced.

Saltwater intrusion into freshwater aquifers can reduce freshwater supply for both the natural environment and the populations that depend on aquifers for their water supplies. The primary source of fresh water for industrial and public use in Glynn County is the Upper Floridan aquifer. Since the 1950s, saltwater intrusion has been identified and monitored within an area of several square miles in downtown Brunswick. In 2006, the GADNR Environmental Protection Division released the *Coastal Georgia Water and Wastewater Permitting Plan for Managing Salt Water Intrusion* (GADNR

2006). To halt further intrusion of saltwater into the Upper Floridan aquifer, locations with the highest potential for saltwater intrusion were delineated and placed within the red zone, where significant reductions and restrictions to withdrawals from the Upper Floridan aquifer are required. Within the city of Brunswick, the red zone restrictions encompass an approximately 2-mile saltwater-contaminated zone of the Upper Floridan aquifer. Additional restrictions for Glynn County include implementation of water conservation and reuse measures, and continued chloride monitoring efforts in wells throughout the area (GADNR 2006). While groundwater development was a primary driver in saltwater intrusion in the Upper Floridan aquifer, the downward saltwater migration from surficial sources through the upper confining units pose a threat to the aquifer that is projected to increase with sea level rise.

4.1.3 Sea Level Rise Effects on Coastal Hazards

Flood hazards due to sea level rise extends beyond areas exposed to the open ocean, encompassing much of low-lying regions of Glynn County. Much of the coastal, bay, and riverine shorelines of Glynn County are generally low-lying and moderate to densely populated, making the region highly susceptible to the potential effects of sea level rise. Without adaptation strategies, sea level rise is projected to enhance the effects of the previously discussed hazards. Sea level rise can increase the risk of inundation by increasing water surface elevation, including storm surges, and can reduce the natural buffers in the Glynn County Focus Area that protect infrastructure by drowning and eroding coastal wetlands.

It is projected that an average of 3 feet of sea level rise will occur throughout the entire SACS study area within 50 to 100 years, as determined by the USACE High and Intermediate scenarios, respectively. To represent this future condition, the Tier 1 analysis incorporated sea level rise by adding 3 feet to the storm surge hazards (1-percent and 10-percent AEP events). Similarly, future condition risk in the Tier 2 Economic Risk Assessment assumes 3 feet of future sea level rise in its expected annual damages and damages per AEP event projections.

While the addition represents sea level rise estimates, it must be emphasized that 3 feet of additional water could come from multiple sources, such as pluvial (rainfall) and fluvial (rivers and streams) flooding in combination with sea level rise. As such, this assessment is not meant to tie the future hazard to a specific year but to highlight the hazard when a surge event is added to the combined total water level of 3 feet.

The extent of flooding of the 1-percent and 10-percent AEP event expands inland with the addition of sea level rise. Rising seas can allow for larger waves to form closer to the shore and to penetrate further inland on flood waters, causing increasing damage to coastal shoreline and the overtopping of coastal features. As displayed in **Figure 6**, an increase in wave height is anticipated throughout the focus area within the future condition, with greater increases along the Golden Isles and estuaries

Sea level rise also exacerbates saltwater intrusion and lifts the water table closer to the ground surface. The rising water table takes up room in the soil and reduces the amount of available space in the ground to absorb runoff during storms. This can increase the amount of runoff that the sewer systems must handle, which can lead to drainage issues and increased flooding.

4.1.3.1 Relative Sea Level Change

NOAA Gauge No. 8670870 in Fort Pulaski, Georgia is the nearest gauge with open ocean exposure that documents sea level trend. Gauge No. 8670870 indicates a mean relative sea level trend of 3.25 millimeters per year, or 0.0107 feet per year, with a 95-percent confidence interval of +/- 0.27 millimeters per year, or 0.0009 feet per year, based on monthly mean sea level data over an 82-year record. When this trend is adjusted according to USACE guidance for Intermediate and High scenarios (see Section 2.7 of the Georgia Appendix for additional details), the trend becomes 7.48 millimeters per year, or 0.0245 feet per year, and 20.9 millimeters per year, or 0.0685 feet per year, respectively. Currently, sea level rise in the region is trending to the USACE Intermediate and High scenarios. A detailed discussion of relative sea level rise is provided in the Georgia Appendix.

Long-term predictions of sea level rise indicate that Glynn County will be highly susceptible to sea level-related hazards.

4.2 System Performance

After assessing the hazards affecting the Glynn County Focus Area, it is important to look at how existing projects are mitigating risk from coastal storm hazards.

Performance is the system's reaction to the hazard. The system performance refers to the system's features and the ability to contain/manage the flood hazard for all possible events. There are several shore protection projects and RSM projects that are improving the system performance throughout the Glynn County Focus Area.

4.2.1 Coastal Storm Risk Management Projects

CSRM projects, which include beach nourishment and shore protection structures, have better equipped the coast and barrier islands to reduce coastal storm damages and mitigate risk from sea level rise. Beach nourishments often require periodic maintenance to achieve adequate storm damage reduction benefits. A wide, nourished beach system, absorbs wave energy, protects upland areas from flooding, and mitigates erosion.

Glynn County has numerous public and private properties with armored shorelines. Most commonly, rock revetments or bulkheads are employed to combat tidal creek erosion. Approximately 37 percent of all parcels within the county abutting estuarine wetland or water habitat are armored, representing the highest percentage of armored parcels within Georgia's coastal counties (Peterson et al. 2019).

There are no active federal CSRM projects within the focus area; however, there are several non-federal CSRM projects, including beach nourishment on Sea Island, rock revetment repair and beach nourishment on Jekyll Island, and repair and improvement of rock revetment along the ocean-facing portion of St. Simons Island. A detailed description of these projects and other related federal and non-federal projects can be found in Section 5.3 of the Georgia Appendix. These projects demonstrate how shoreline protection projects perform under very dynamic conditions and often require significant maintenance, repair, and redesign to sufficiently reduce storm damage. It is important to consider sea level rise when designing these projects to ensure that they function as intended over the project lifecycle.

4.2.2 Regional Sediment Management Strategies

RSM strategies within the Glynn County Focus Area are described in the 2020 South Atlantic Division Regional Sediment Management Optimization Update (RSM Optimization Update). Additional data on RSM can also be found in the South Atlantic Division Sand Availability and Needs Determination (SAND) Summary Report (USACE 2020c). Borrow areas of proven and potential sand sources and RSM locations are in the SACS Geoportal and on the SAND Dashboard.

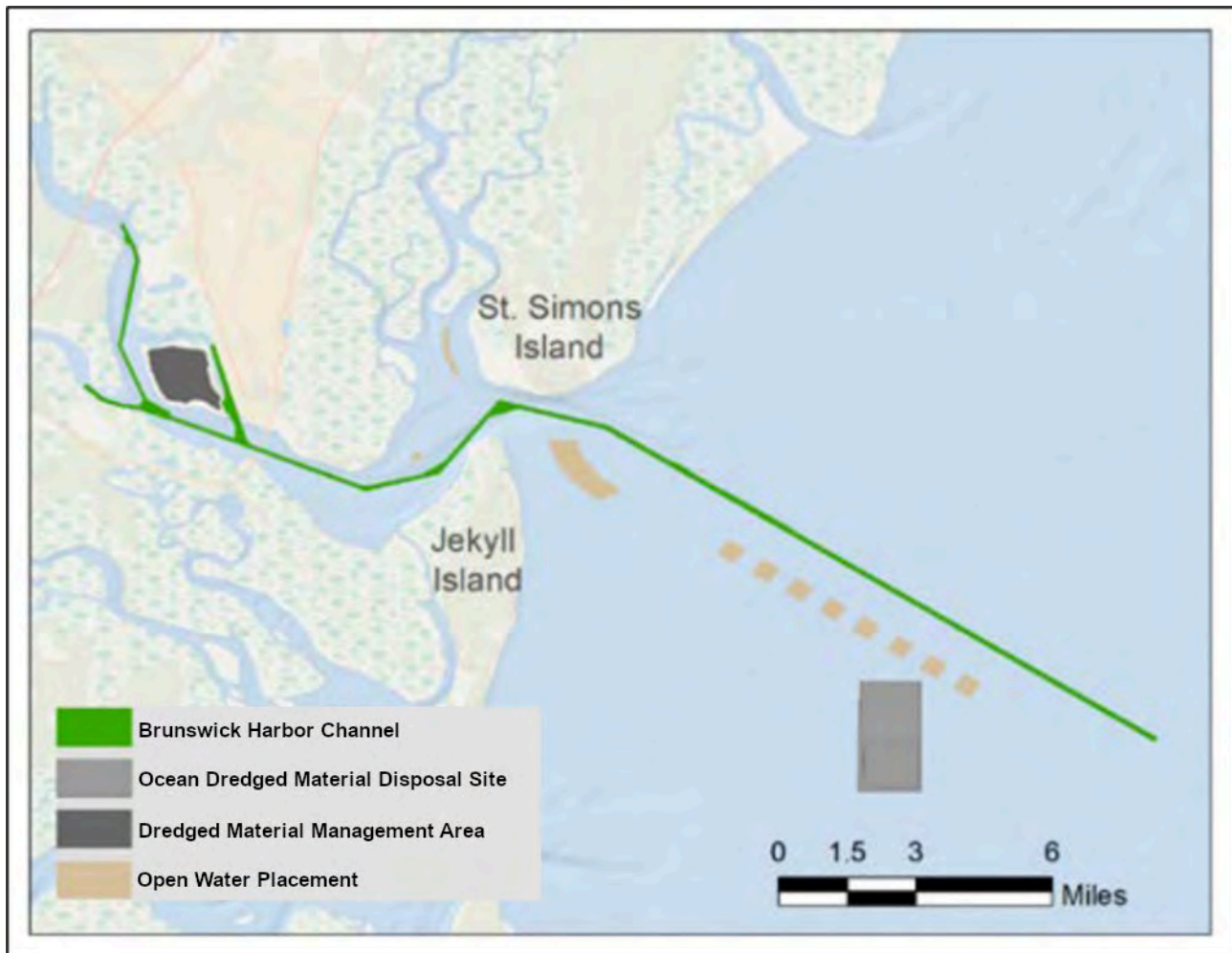


Figure 9: Map of Brunswick Harbor Channel and Material Placement Locations (USACE 2020b)

Within Glynn County, there are two federally maintained navigation channels: Brunswick Harbor Channel and the AIWW. For the Brunswick Harbor Navigation Project, all of the dredged material goes either to the dredged material management area (DMMA) or the offshore placement site (Figure 9).

While most of the 1.8 million cubic yards dredged from the Brunswick Harbor Navigation Project per dredge cycle (annually) is comprised mostly of silt and mud, a significant volume is suitable for nearshore placement. Approximately 1.5 million cubic yards of nearshore quality material is dredged from the Entrance Channel and placed at the Ocean Dredged Material Disposal Site (ODMDS) annually. Nearshore placement south of the project channel is a more cost-effective placement

option that does not use capacity at the dredged material management areas (DMMA) or the offshore placement site and provides sediment to the downdrift coastal system. As part of the Focus Area Visioning Meetings and subsequent stakeholder engagements, potential RSM opportunities were discussed and further analyzed for placement of beach- and nearshore-quality dredged material from the Brunswick Harbor Navigation Project on the north shoreline of Jekyll Island to provide flood risk and environmental benefits to the area. Placement of nearshore-quality material at the nearshore feeder berm could provide \$0.9 million in annual value to the USACE NAV program. If placed in the littoral zone, it could provide up to \$11.3 million in value to the erosional shoreline along the northern half of Jekyll Island.

Approximately 530,000 cubic yards from the Brunswick Harbor Navigation Project was used to create the Brunswick Bird Island in 2008. Placement at the island provided direct value to the navigation program based on pumping distance to the placement site and capacity saved at established dredged material management areas. Other opportunities for bird habitat development or other beneficial use projects with environmental and economic benefits should be explored in Glynn County as they are supported by stakeholders and resource management agencies.

A notable RSM effort within the focus area is the Jekyll Marsh Thin-Layer Placement Pilot Project. In 2019, approximately 5,000 cubic yards of non-beach quality material was dredged from Jekyll Creek and placed over an adjacent 5-acre area of salt marsh using a thin-layer spray technique. The goal of this pilot project is to enhance marsh resilience by raising the marsh elevation and promoting new growth of marsh grasses while combating marsh subsidence and sea level rise. This pilot project is currently being monitored by scientists from Georgia Southern University and the University of South Carolina over a three-year period to document how the thin-layer placement of sediments ultimately affects marsh health. If proven successful, thin-layer placement of dredged material in shallow, lower energy areas of rivers, estuaries, and marshes may provide a cost-effective and environmentally beneficial disposal method of this non-beach quality dredged material throughout the Georgia planning reach.

In addition to the thin-layer placement project completed in 2019, AIWW-dredged material was used for open water disposal which is another placement strategy. Open water dispersal is a technique designed to keep the dredged sediment in the active sediment system by releasing it in a high-energy environment that will support broad dispersal of sediment into the coastal system. Initial results suggest the two placement strategies were successful and could be implemented in other locations in the South Atlantic Division.

Additional opportunities exist for beneficial use of nearshore- and non-beach-quality dredged material within the focus area. Non-beach-quality material can be used for ecosystem restoration within the focus area, including island habitat creation, marsh creation, and additional restoration efforts using thin-layer placement. The nearshore-quality material can be used for shoreline protection and beach nourishment projects. Rough order of magnitude (ROM) costs, quantities of material, and qualities of material sources can be developed with stakeholder interest.

4.3 Exposure

Exposure describes who and what may be harmed by the hazard and may include population, infrastructure, and environmental and cultural resources. The following section identifies exposure in the focus area.

4.3.1 Exposed Population

The population of Glynn County is approximately 80,000, according to the 2010 U.S. Census data. Approximately 20 percent of the county population is located within the boundaries of the city of Brunswick, 16 percent within St. Simons Island, and the remainder are dispersed throughout the coastal and riverine communities of the county (**Figure 10**). The exposed population consists of all residents in a potential storm surge area, residents of mobile homes, and all tourists. Per data derived from the 2013 Coastal Georgia Hurricane Evacuation Study (**Table 4**), Glynn County has the highest proportion of its population located in a surge area of all of the coastal counties in Georgia. Approximately 97 percent of the county population is located within the Category 5 MOM surge area (77,000 people) and 69 percent (55,000 people) of the county population are located within the Category 2 surge area. The total number of seasonal visitors and tourists to Glynn County can increase the county population by 35 percent or more (USACE 2013a). Seasonal visitors and tourists are primarily located within the Golden Isles, where many coastal communities are within the potential tropical storm and Category 1 surge areas.

Table 4: Exposed Population in Glynn County (USACE 2013a)

Surge Area	Total Resident Population Exposure	Mobile Home Population (subset of total residential population) Exposure	Tourist Population (100-Percent Occupancy) Exposure	Total Resident Population and Tourists
Tropical Storm	10,456	571	1,752	12,208
Category 1	20,426	878	9,984	30,410
Category 2	55,105	4,017	19,884	74,989
Category 3	70,048	5,294	23,823	96,871
Category 4	73,914	4,285	24,543	98,457
Category 5 MOM	77,390	5,776	27,999	105,389
Outside of Surge Area	2,236	96	0	2,236

Assessing future growth trends in population can indicate whether there will be an increase in people and associated infrastructure exposed to future hazards. Results from the U.S. Environmental Protection Agency’s (EPA) Integrated Climate and Land Use Scenarios (ICLUS) projection for 2020 to 2100 project an increase in population within the Brunswick, Georgia metro area of more than 100 percent. Future population projections, developed by the Georgia Governor’s Office of Planning and Budget, project a more modest population increase of 21.5 percent from 2020 to 2065 for Glynn County. With the projected increase in population and sea level rise, the exposed population in Glynn County is expected to rise. More detail on exposed population can be found in the Georgia Appendix.

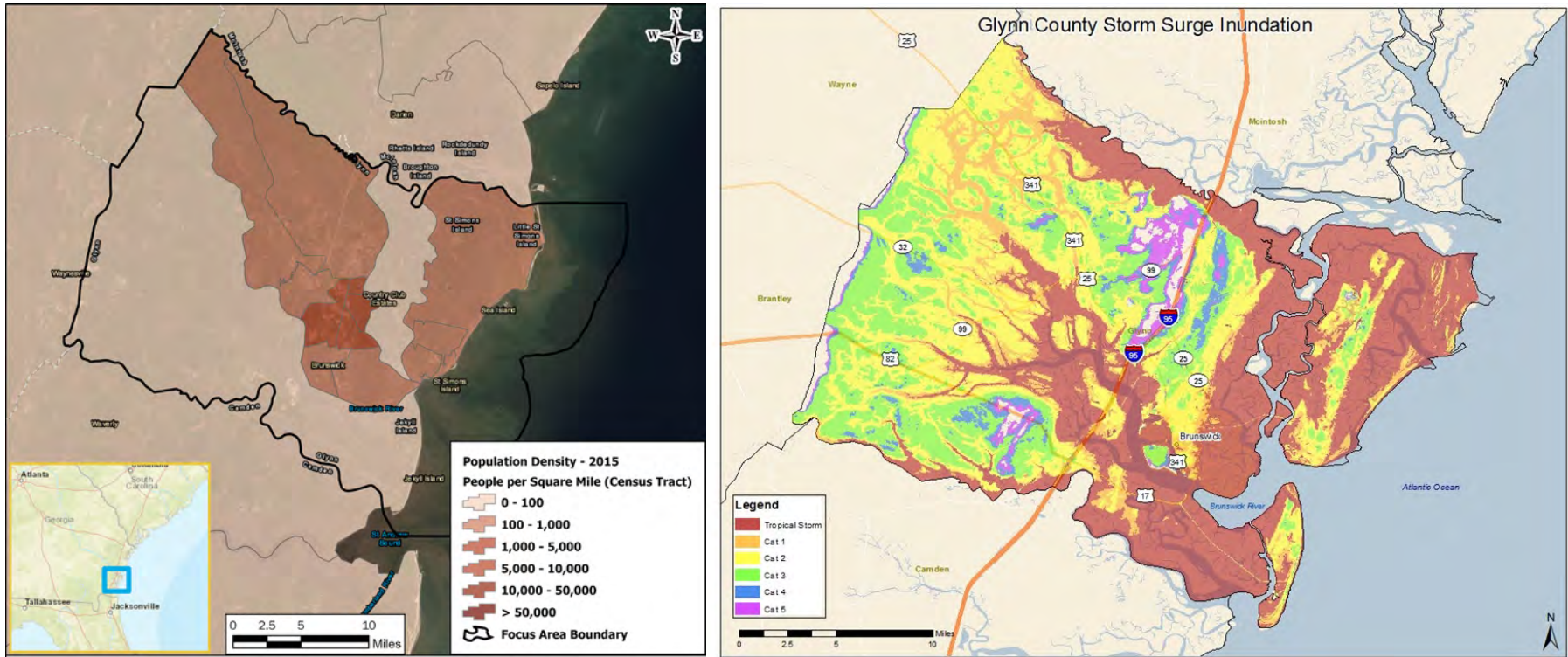


Figure 10: Glynn County Population by Census Block (2010 Census Bureau Decennial Census Data) along with a Storm Surge Inundation Map (Tropical Storm – Category 5 Maximum of Maximum) (USACE 2013a)

4.3.2 Exposed Infrastructure

Parcel data from the Glynn County tax assessor, local emergency management, and National Geospatial-Intelligence Agency NAVTEQ was used to determine the inventory of structures and critical facilities in the county that are exposed to a Category 5 MOM Storm Surge (USACE 2013a). The total number of exposed structures was estimated to be approximately 52,000 with the following breakdown by type, shown in **Table 5**.

Table 5: Exposed Infrastructure in Glynn County (USACE 2013a)

Structure Type	Total Number of Structures	Percent of Total Structures
Residential	34,907	67.8
Tourist	9,333	18.1
Commercial	4,841	9.4
Mobile Homes	2,348	4.6
Industrial	89	0.2

The exposure of critical facilities is concerning because they provide essential services and support functions that affect the livelihood of the community and are needed for emergency response activities before, during, and after an emergency. Critical facilities, according to FEMA, include hospitals, medical facilities, police stations, fire stations, primary communication facilities, shelters, emergency operations centers, power stations, and other utilities (FEMA 2017). Other critical facilities considered in the Glynn County exposure assessment include schools, nursing homes, hazardous materials (HAZMAT) locations, water/sewer treatment facilities, and local government offices. **Figure 11** identifies critical infrastructure elements within the projected tropical storm through the Category 5 MOM inundation area within Glynn County. This is not an inclusive list and only includes information provided by local governments and the above-referenced data sources. The following number and types of critical facilities are exposed to Category 5 MOM storm surge inundation in Glynn County, shown in **Table 6**.

Table 6: Exposed Critical Facilities in Glynn County (USACE 2013a)

Structure Type	Total Number of Facilities
Schools	35
Fire Stations	10
Medical	10
Police	7

Approximately 50 percent of the identified facilities are located within the 1-percent AEP flood zone, which highlights the impacts inundation hazards can have on the focus area. Glynn County has several roads that are low-lying and provide critical access to coastal communities. The most notable is F.J. Torras Causeway, which provides the only road access to St. Simons and Sea Island. Other examples include Riverside Drive, Ocean Highway 17 (**Figure 12**), Lanier Boulevard, and Crispin Boulevard.

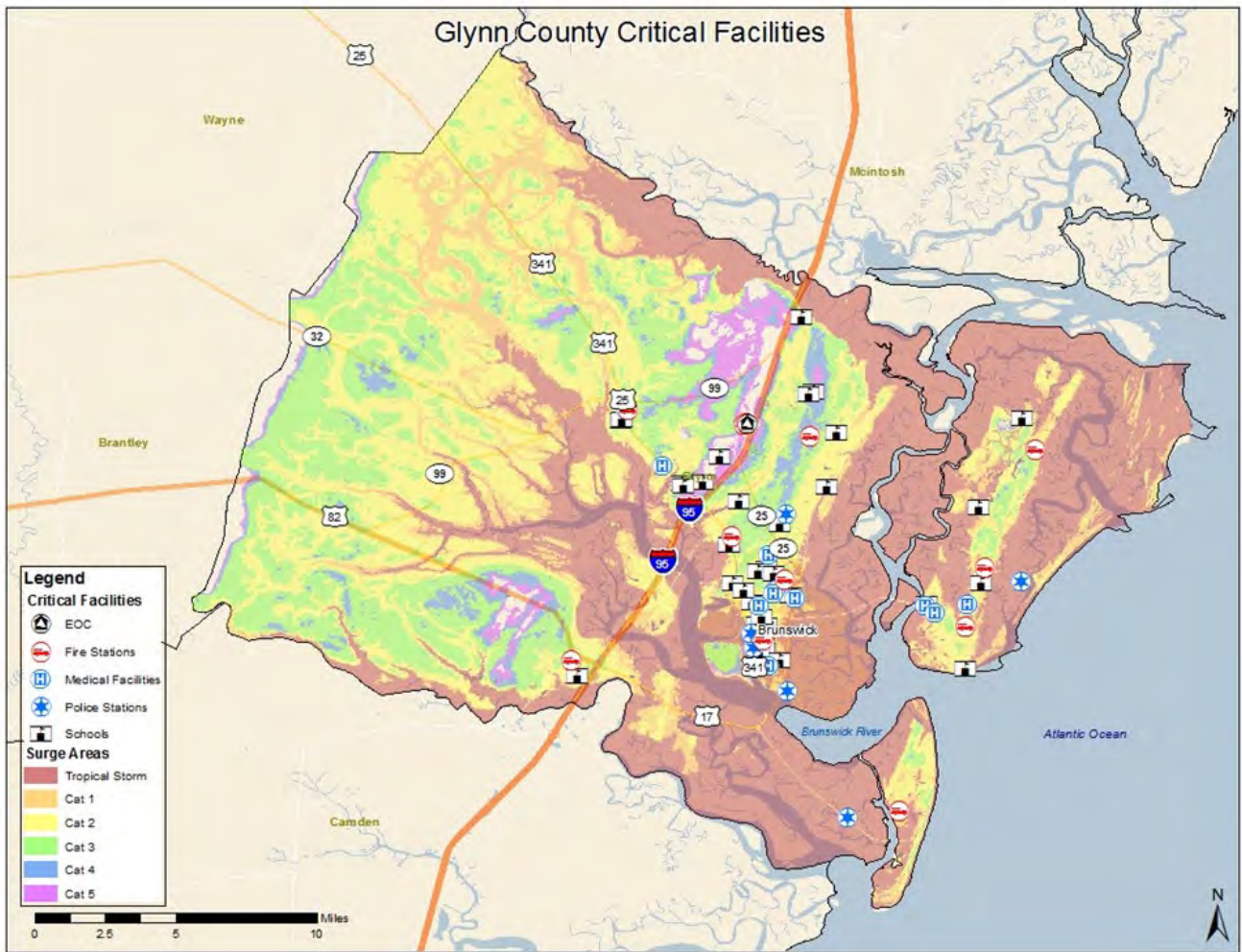


Figure 11: Glynn County Critical Facilities in Storm Surge Inundation Areas (Tropical Storm – Category 5 Maximum of Maximum) (USACE 2013a)



Figure 12: Highway 17 in Brunswick – Hurricane Irma (Adkison 2017)

4.3.3 Exposed Environmental and Cultural Resources

The Glynn County Focus Area is rich with Important and unique environmental and cultural resources. Plentiful food sources, multiple habitat types, tidal influence, and ocean access have resulted in rich biodiversity in coastal Georgia and a long history of human inhabitation. Important cultural resources are considered to be those that are listed or eligible for listing on the National Register of Historic Places. Coastal storms and sea level rise continue to expose environmental and cultural resources to alteration or loss.

Sections 4.3.3.1 and 4.3.3.2 summarize the environmental and cultural resources exposure identified in the Glynn County Focus Area. Potential CSRM measures to protect these resources are discussed in Section 5.1. Additional details can be found in the Georgia Appendix and Environmental Technical Report (USACE 2022a) and Tier 2 Cultural Resources Appendix.

4.3.3.1 Environmental Resources

Diverse habitats in the focus area located within the Category 5 Maximum inundation footprint include east-facing unconsolidated shorelines, dune habitat, palustrine and estuarine scrub-shrub wetlands, forested wetlands, emergent vegetation habitat, and salt marsh. They also include mixed hardwood and coastal hardwood communities. **Figure 13** identifies the approximate distribution of the primary habitats located within the focus area based on the NOAA Coastal Change Analysis Program (C-CAP) land cover classification system. Wetlands of Glynn County total approximately

125,000 acres and cover 42 percent of the county land area. The dominant wetland habitat type within the focus area is estuarine emergent wetland, which is found throughout the intertidal zone of the barrier islands and within and adjacent to the tidal waterways and estuarine environments (GADNR 2012).

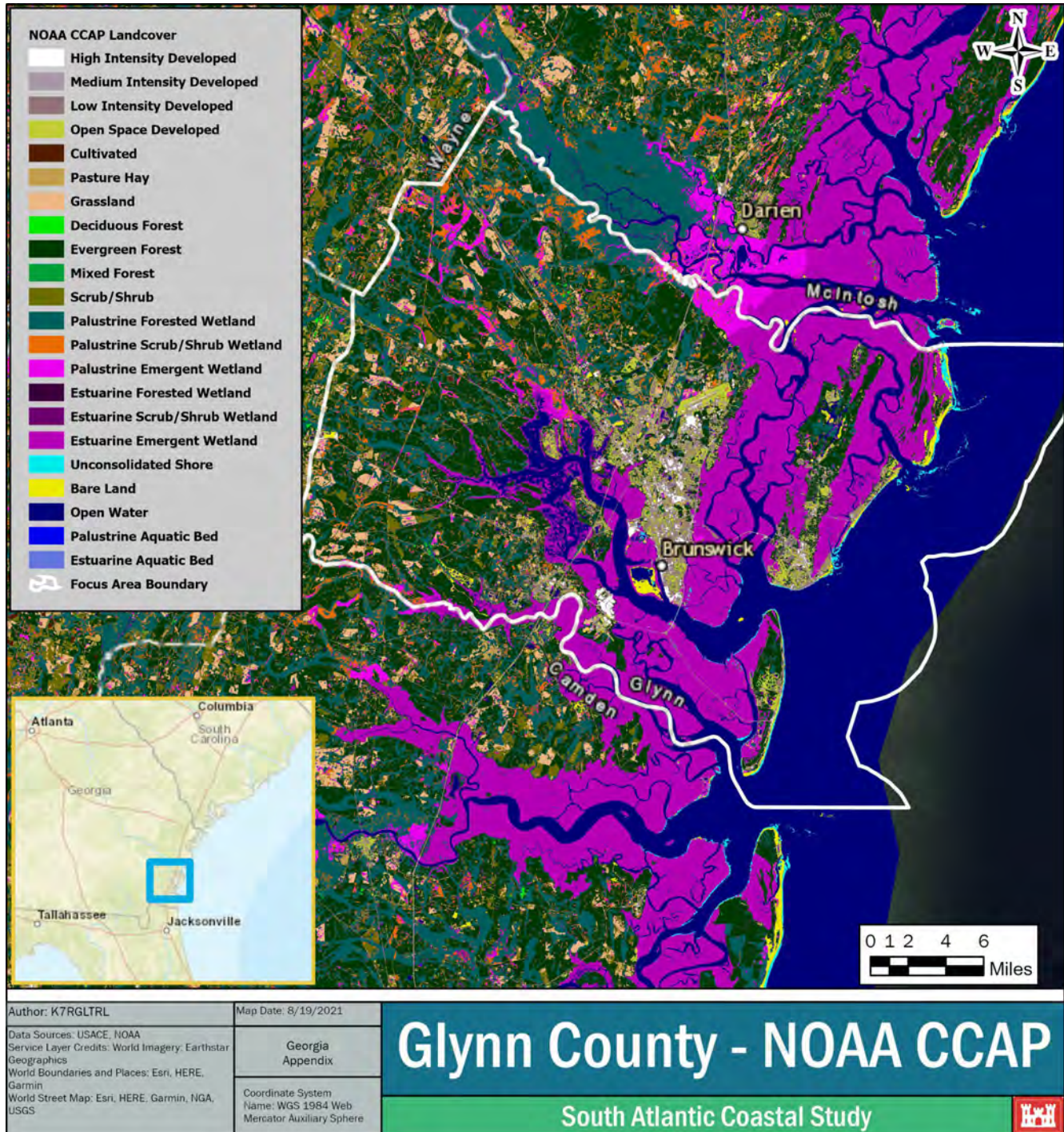


Figure 13: Coastal Change Analysis Program (C-CAP) Land Cover Classifications in Glynn County

Throughout the focus area vicinity, numerous environmental resources are exposed to increased coastal storm hazards as a result of sea level rise. While environmental resources have evolved with coastal storms, exposure due to sea level rise combined with other factors (e.g., development density and water quality impacts), create ongoing stresses to resources, thus making them more susceptible to the shocks of coastal storms. Critical habitat within the focus area is particularly susceptible to these inundation hazards as the physical or biological features are essential to conservation of the Endangered Species Act (ESA) listed species which are identified at the time of listing. Within Glynn County, coastal beach habitat along Little St. Simons, St. Simons, and Jekyll Island are designated by the U.S. Fish and Wildlife Service as foraging critical habitat for over-wintering piping plovers (ESA listing- threatened) **Figure 14** displays the critical habitat located within Glynn County.

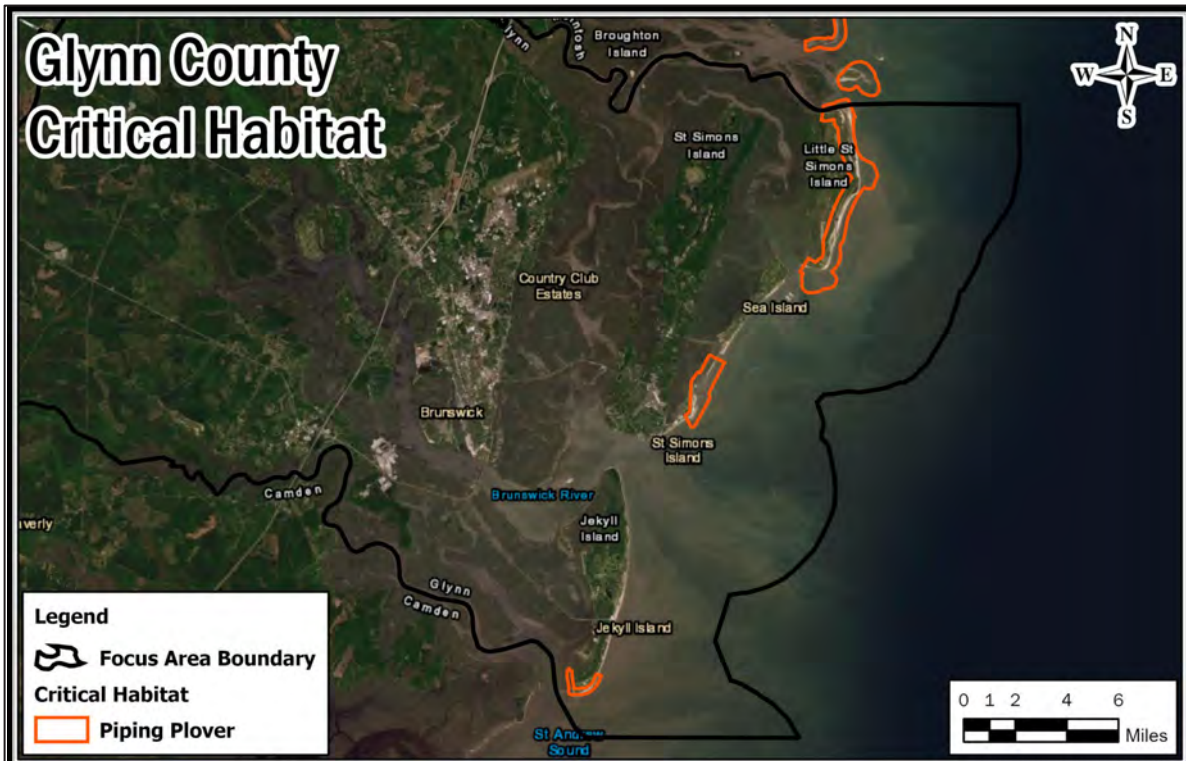


Figure 14: Critical Habitat for Loggerhead Sea Turtle and Piping Plover in the Glynn County Focus Area

4.3.3.2 Cultural Resources

Cultural resources were identified using information and datasets from the U.S. National Parks Service (NPS), the U.S. Geological Survey, and Georgia’s Natural, Archaeological and Historic Resources GIS (GNAHRGIS) (U.S. National Parks Service 2020, U.S. Geological Survey 2021, Georgia Archeological Site File at the University of Georgia, and the Georgia Department of Natural Resources n.d.). Data gathered from these databases are current as of June 2021, and any cultural resources added after that point will not be represented in this analysis throughout the report. A query of GNAHRGIS revealed that approximately 3,400 historic resources are listed for Glynn County, with high concentrations of the resources located near the coasts of St. Simons and Jekyll Islands and near Brunswick. Of these resources, approximately 3,200 are located in the future condition (3-foot sea level rise) 1-percent and 10-percent AEP flood zones and are therefore at a higher exposure level.

A selection of three cultural resource areas were identified within, or partially within, the Glynn County Focus Area, which were identified as high risk due to the hazards of inundation, erosion, and wave attack (See **Table 7**). These are St. Simons Island, Jekyll Island, and Brunswick. Cultural resources within those areas were selected through both quantitative means, such as determining which cultural resources were located in areas of greater exposure, and qualitative means, such as literature review and stakeholder input. The table below is not all-inclusive and is meant to communicate the types of cultural resources that may be found in these areas. A selection of historic properties and districts are highlighted due to their National Register status and stakeholder input regarding their historical significance and concern for continued preservation due to their higher exposure rating. General information is also included regarding the presence of archaeological sites in areas of higher exposure.

Table 7: Cultural Resources Areas Exposed to Storms and Sea Level Rise in the Glynn County Focus Area

Cultural Areas	Exposed Cultural Resources
St. Simons	Ft. Frederica National Monument, St. Simons Lighthouse and Lighthouse Keepers' Building, U.S. Coast Guard Station at St. Simons Island, Hamilton Plantation slave cabins, and approximately 82 historic and prehistoric archaeological sites subject to erosion.
Brunswick	Brunswick Old Town Historic District, Hofwyl-Broadfield Plantation, and approximately 19 historic and prehistoric archaeological sites subject to erosion.
Jekyll Island	Jekyll Island Historic District and National Historic Landmark, Jekyll Island Club, Indian Mound Cottage (Rockefeller Cottage), Faith Chapel, and approximately 52 historic and prehistoric archaeological sites subject to erosion.

These resources are discussed in greater detail below. Exposed cultural resource areas identified within the FAAS report are not meant to be all-inclusive. Publicly available data for historic resources are discussed below. Specific archaeological site information is not publicly reportable but was analyzed to determine if archaeological sites are exposed to coastal storm hazards.

St. Simons Island

Over 400 historic resources located on St. Simons Island were constructed from the 1700s to the 1960s. The Fort Frederica National Monument was listed in the NRHP in October 1966 and is a town and fort complex built between 1736 and 1748 that is now at risk due to erosion and inundation (NPS n.d.-b, n.d.-c). The St. Simons Lighthouse and Lighthouse Keeper’s Building (NRHP-listed April 1972) are located at the southern end of the island (NPS 1972). Originally built in 1872, the lighthouse is one of only five remaining lighthouses in Georgia and still actively assists ships navigating into the St. Simons Sound. Resources located along the perimeter of St. Simons Island and along the southern end of the island, such as the lighthouse, are subject to flooding during coastal storm surges. St. Simons Island also boasts a rich Gullah Geechee cultural history and is part of the Gullah Geechee Cultural Heritage Corridor (Holladay 2016). The current projections for sea level rise in that area could permanently inundate portions of the historic Gullah Geechee communities. Storm surges and flooding are a threat to many of the historic buildings on the island. Of the 88 archaeological sites located on St. Simons Island, approximately 82 are located in the 1-percent and 10-percent APE flood zones and are therefore at greater exposure to coastal storm hazards, including erosion and wave attack.

Jekyll Island

Jekyll Island is a barrier island that has undergone the least net change of Georgia's currently inhabited barrier islands since the mid-1800s (Crook 1985). The island was used seasonally by the Guale and Mocama tribes, as evidenced by extensive shell middens. The Jekyll Island Historic District (NRHP-listed January 1972) is a 240-acre site with 34 contributing properties, including the Jekyll Island Club (historic hotel), Indian Mound Cottage (also referred to as the Rockefeller Cottage), and Faith Chapel (NPS n.d.-e). While there has been little change in overall dimensions of the island, it has migrated southward through erosion on the northern end and accretion on the southern end (Crook 1985). Resources on the island are particularly threatened by incremental sea level rise leading to higher average tides, coupled with more intense storm events. Of the 55 archaeological sites located on St. Simons Island, approximately 52 are located in the 1-percent and 10-percent APE flood zones and are therefore at greater exposure to coastal storm hazards, including erosion and wave attack.

Brunswick

Brunswick is one of two deep water ports on the coast of Georgia, and the area contains two historic districts that have been impacted by storms and compound flooding. The Brunswick Old Town (NRHP-listed December 1974) and the Brunswick Old Town Historic District (NRHP-listed April 1979) are associated with the site of the colonial British town of Brunswick that was founded in 1771 (NPS n.d.-a). The town contains many historic residential and public structures dating to the late 1800s, including the Hazelhurst-Taylor House, Mahoney-McGarvey House, and the Old City Hall. The Dixville Historic District (NRHP-listed December 2019), located along the southern tip of the Brunswick peninsula, was a neighborhood established in 1875 that grew into a thriving African American community in the 1910s. This location is susceptible to storm surge and compound flooding. Brunswick features a rich Gullah Geechee cultural history and benefits from heritage tourism related to this history (Holladay 2016). Other notable historic properties in Brunswick include the Hofwyl-Broadfield Plantation (NRHP-listed July 1976), a rice plantation dating between 1800 and 1915 that is in the marshlands of the Altamaha River and is now a Georgia state historic site (NPS n.d.-d). Of the 26 archaeological sites located on St. Simons Island, approximately 19 are located in the 1-percent and 10-percent APE flood zones and are therefore at greater exposure to coastal storm hazards, including erosion and wave attack.

4.3.3.3 Environmental and Cultural Resource Uncertainty

There are multiple sea level rise scenarios for Georgia that suggest sea level rise will continue to increase, although specific scenarios will identify a variation of low-high sea level rise projections. Uncertainty reinforces the need for adaptable strategies and the importance of scenario planning, rather than using specific, deterministic single values for future sea level rise. If protective measures are not implemented, habitat types with limited tolerance to salinity may migrate inland, be displaced by others, or be lost due to inundation or erosion. Cultural resources may be subjected to increased erosive forces, increased saline conditions, and potential inundation due to of coastal storm damage and sea level rise.

4.4 Vulnerability

Vulnerability is the susceptibility of harm to human beings, property, the environment, and cultural resources when exposed to a hazard.

The SACS Main Report and Georgia Appendix describe how vulnerability was incorporated in Tier 1 and Tier 2 analyses. The following subsections summarize components that increase the vulnerability of the area and provide additional vulnerability information available for the focus area.

4.4.1 Social Vulnerability

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks.

4.4.1.1 Social Vulnerability Index

The Centers for Disease Control and Prevention Social Vulnerability Index (CDC SVI) was used to further evaluate social vulnerability within the focus area by assessing overall SVI percentile rankings at the census tract scale. The CDC SVI depicts the social vulnerability of communities by assigning an SVI percentile ranking that ranges from 0 (lowest vulnerability) to 1 (highest vulnerability) based on national comparisons. The overall CDC SVI ranking for Glynn County is 0.7851, which indicates a high level of vulnerability within the focus area. At a more refined scale, census tracts primarily encompassing the city of Brunswick and the census-designated place of Dock Junction to the north have significantly higher CDC SVI rankings (>.7501) than neighboring coastal communities in Jekyll and St. Simons Islands, indicating a high level of social vulnerability (**Figure 15**). Additional detail on the CDC SVI can be found in the Georgia Appendix.

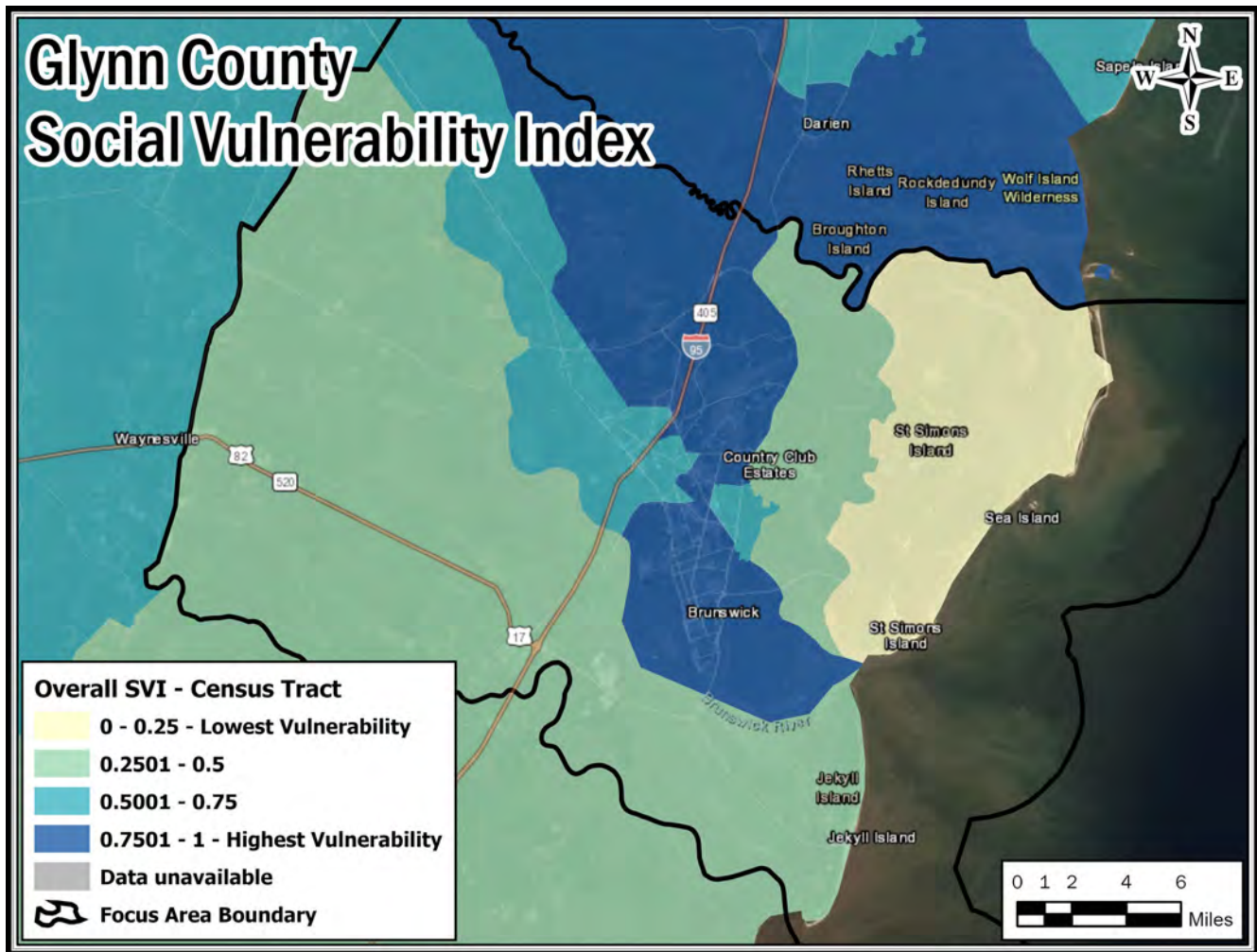


Figure 15: Glynn County Centers for Disease Control Social Vulnerability Index Ranking by Census Tract (CDC 2018)

4.4.1.2 Vulnerable Populations

The 2013 Coastal Georgia Hurricane Evacuation Study and 2010 Census Demographic Profile data provide a broad overview of demographics within the focus area. Compared to national averages, the population of Glynn County has more elderly residents (15 compared to 13.0 percent), similar children (24.2 compared to 24.0 percent), similar poverty level (15.2 compared to 15.3 percent), more mobile home residents (11.5 compared to 6.6 percent) and fewer households without vehicles (8.6 compared to 9.1 percent). Glynn County has a higher population density at 189.7 people per square mile, approximately twice the national average of 88.4. The racial profiles of Glynn County and the state are similar.

Socioeconomic aspects of concern that may affect a community’s ability to mitigate or evacuate from coastal storm hazards include mobile home residents, age, household income, vehicle availability, and crowded households. Within the City of Brunswick, more than 30 percent of residents are below the poverty level and 11.5 percent of the Glynn County population resides in mobile homes. These population groups are particularly vulnerable to coastal storm risks. The age breakdown of the population reflects a larger number of people over age 65 living in Glynn County (15 percent). The

number of residents over age 65 is significantly higher within the Golden Isles communities. Past behavioral studies have shown that the elderly residents are more reluctant to evacuate than younger populations (USACE 2013b).

4.4.1.3 Environmental Justice

USACE conducted an evaluation of Environmental Justice (EJ) by determining whether the study area contains a concentration of minority and/or low-income populations.

As defined in Executive Order 12898 and the Council on Environmental Quality (CEQ) guidance, a minority population occurs where one or both of the following conditions are met within a given geographic area:

- The American Indian, Alaskan Native, Asian, Pacific Islander, Black, or Hispanic population of the affected area exceeds 50 percent; or
- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

An affected geographic area is considered to consist of a low-income population where the percentage of low-income persons:

- is at least 50 percent of the total population; or
- is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis.

The EPA EJSCREEN is an environmental justice mapping and screening tool that provides EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators (EPA 2020). EJSCREEN users choose a geographic area; the tool then provides demographic and environmental information for that area. For the purposes of this evaluation, only demographic information was applied.

The low-income population is defined as the percent of a block group's population in households where the household income is less than or equal to twice the federal "poverty level."

The minority population is defined as the percent of individuals in a block group who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino. That is, all people other than non-Hispanic white-alone individuals. The word "alone" in this case indicates that the person is of a single race, not multiracial.

Using the EJScreen tool, the study area was user-defined (**Figure 16**) to calculate the average percentages for EJ criteria. The result is a population-weighted average, which equals the block group indicator values averaged over all residents who are estimated to be inside the study area. **Table 8** compares the average percentages for the study area, the State of Georgia, and the United States.

Based on the information provided by the EJScreen tool, the average minority population is approximately 36 percent of the total population and approximately 35 percent of the population in the study area are considered low-income. When assessed at a county level geographic scale, Glynn

County does not meet the EJ community minimum threshold because the minority population and low-income percentages are below 50 percent. It should be noted that 2019 Census Bureau estimates show greater than 50 percent of the City of Brunswick population is Black or African American, while demographics for unincorporated Glynn County, Jekyll Island, St. Simons Island, and Sea Island vary considerably.

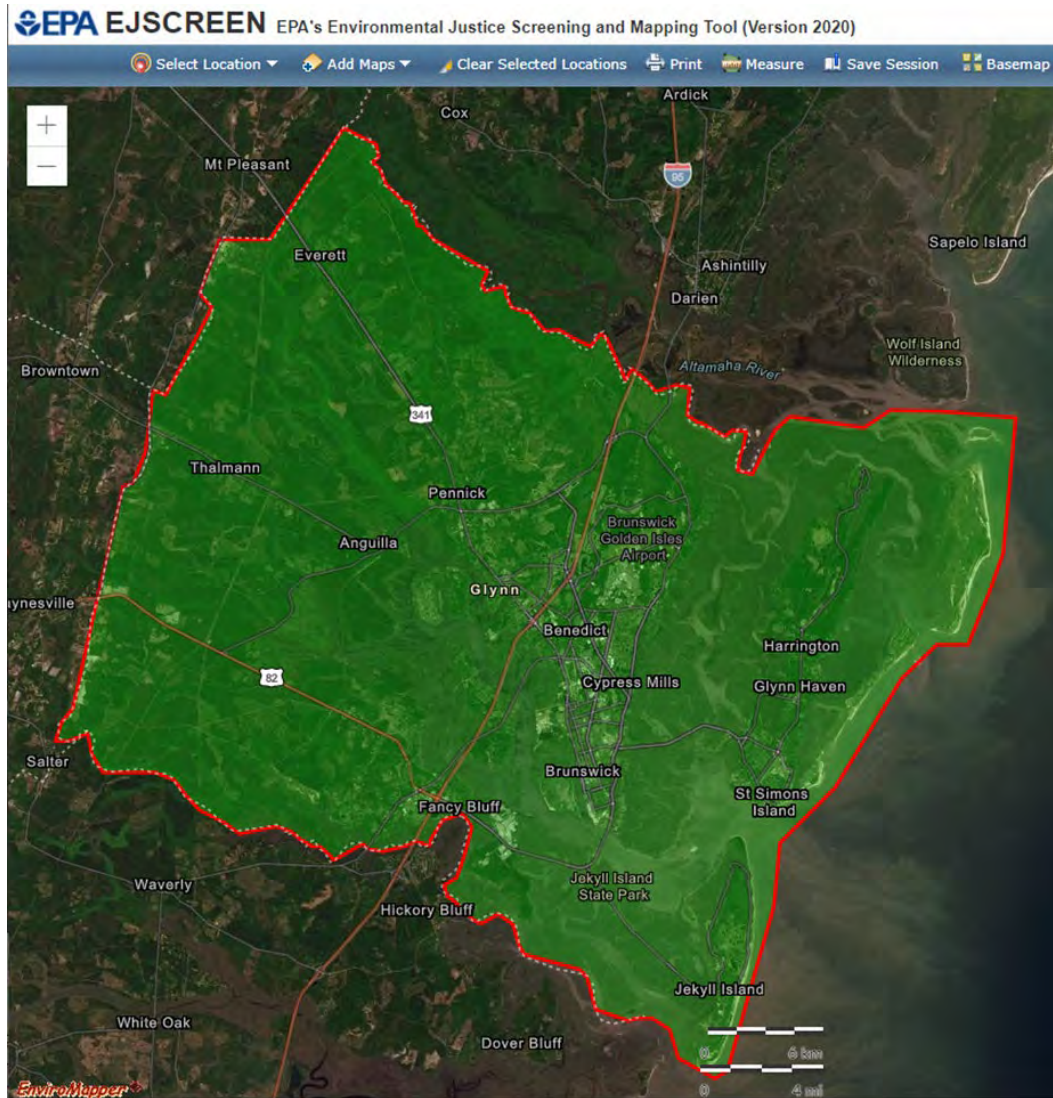


Figure 16: User-Defined U.S. Environmental Protection Agency (EPA) EJScreen Tool Analysis Boundary (EPA 2020)

Table 8: U.S. Environmental Protection Agency (EPA) EJScreen Tool Environmental Justice Criteria Percentages (EPA 2020)

Population Type	User Defined Project Area %	Georgia Average %	U.S. Average %
Minority Population	36	47	39
Low Income Population	38	36	33

4.4.2 Environmental Resources Vulnerability

A Tier 2 Environmental Resources Vulnerability Analysis was conducted for Planning Reach GA_05 to determine the degree to which natural areas are susceptible to loss or degradation when exposed to coastal storm hazards and sea level rise. From this analysis, a vulnerability table was created that assessed the numerical level of vulnerability of NOAA’s Coastal Change Analysis Program (C-CAP) named natural habitats against the hazards of sea level rise, storm surge inundation, saltwater intrusion, erosion, and wind damage. Based on the results of this assessment, a weighted formula was developed to assign a vulnerability rating of each C-CAP class (low, medium, or high) for each state and territory in the SACS study area (**Table 9**). **Figure 17** reflects the results of the vulnerability scoring for each C-CAP habitat that is found within the focus area.

Table 9: Coastal Change Analysis Program (C-CAP) Classes Vulnerability Rating

Coastal Change Analysis Program (C-Cap) Habitat	Vulnerability Rating
Estuarine scrub/shrub wetlands	Low
Open water (tidal/non-tidally influenced rivers, lakes & ponds).	Low
Mixed forest	Medium
Grassland/herbaceous	Medium
Scrub/shrub	Medium
Palustrine scrub-shrub wetlands	Medium
Palustrine emergent wetlands	Medium
Palustrine forested Wetlands	Medium
Estuarine emergent wetlands (salt marsh, oyster flats/beds)	Medium
Estuarine aquatic bed	Medium
Palustrine aquatic bed	Medium
Open space (rural open undeveloped uplands)	High
Evergreen forest	High
Deciduous forest	High
Unconsolidated shore (intertidal mudflats, non-vegetated mudflats, beaches/barrier islands)	High

In addition to rating the vulnerability of the natural habitats to the hazards identified above, the ability for the natural habitat to adapt to these conditions was also assessed. Low tolerances of certain habitats to water and soil chemistry changes due to saltwater inundation and intrusion and impediments to migration were identified as important vulnerability considerations. Anthropogenic activities, such as increased residential and commercial development in the coastal plain, and the construction of structural coastal storm risk management infrastructure (e.g., sea walls), can produce barriers that impede inland migration of natural resources.

Please see Appendix B of the Environmental Technical Report (USACE 2022a) for a more detailed summary of the resource vulnerability table and scoring criteria.

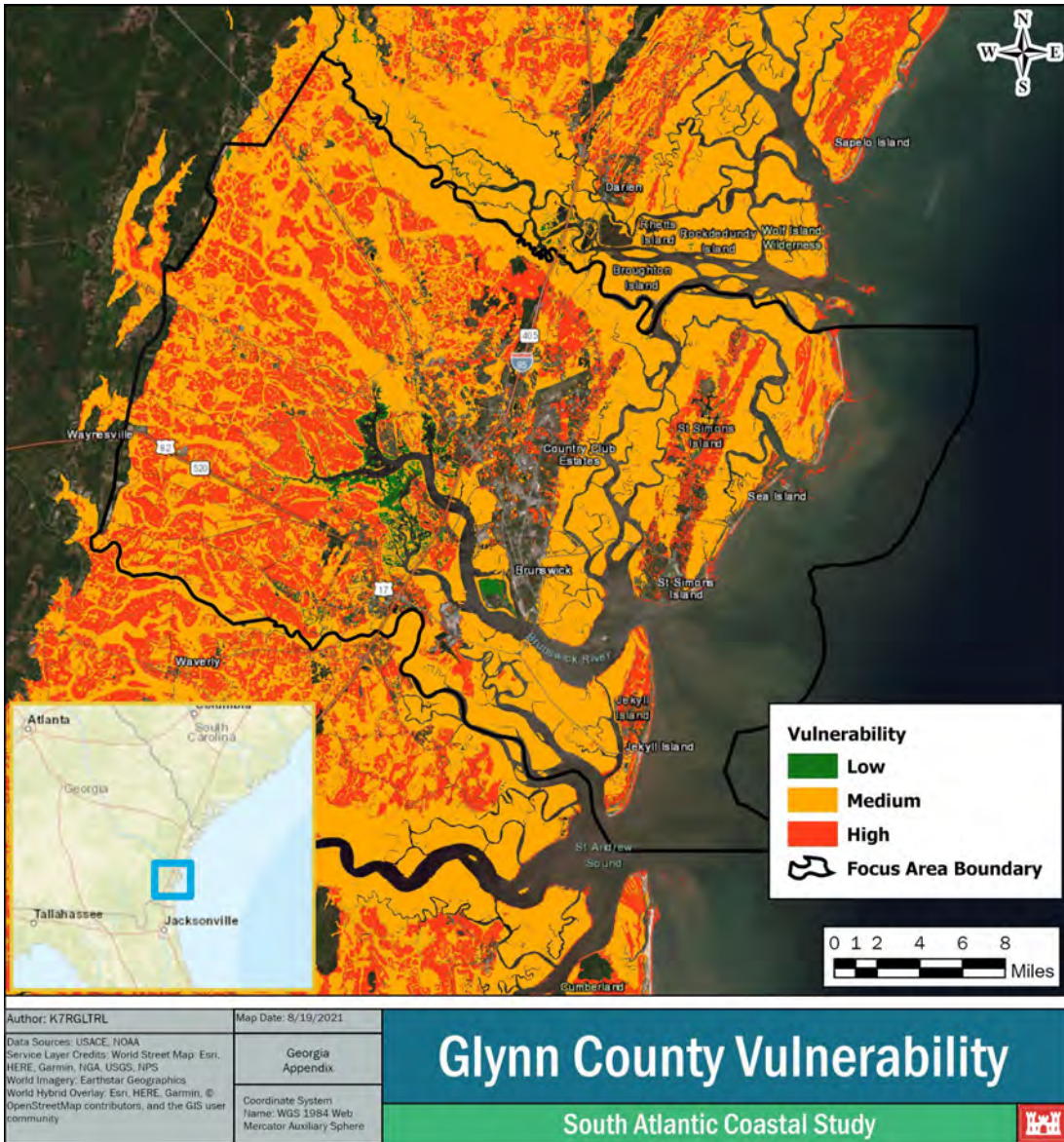


Figure 17: Glynn County Tier 2 Environmental Resources Vulnerability Rating for Coastal Change Analysis Program (C-CAP) Habitats

4.4.3 Cultural Resources Vulnerability

Based on a qualitative assessment of vulnerability, historic structures and archaeological sites located on barrier islands, along the coast, and in low lying areas face vulnerability due to storm surge inundation, erosion, and wave attack (Table 10). While other census areas in Glynn County contain cultural resources, the census areas of the St. Simons Island, Brunswick, and Jekyll Island were selected for closer review due to the number of significant resources (i.e., listed or eligible for listing on the National Register) and the greater exposure to hazards that may impact these resources. Storm surge inundation along the coast and reaching up rivers to low lying areas will flood historic properties and damage buildings. Damage may include, but is not limited to, structural damage and destruction of historic materials (e.g., furniture, textiles, archives). The aftermath of a storm can pose

long-term issues, such as the development of mold, mildew, and other potentially toxic residues. Erosion and wave attack pose threats to historic properties and both terrestrial and submerged archaeological sites. Significant structural damage can be caused to historic properties by wave attack. Erosion can eliminate surface evidence of archaeological sites, wear away site layers, and displace materials from various cultural layers making recovery and interpretation challenging if not impossible. Erosion will impact features more severely due to the disturbed nature of the soil, while leaving intact topographic layers less damaged. Strong currents cause hydrographic change that can displace submerged cultural resources, including historic wrecks, as well as obscure or damage these resources due to storm debris. Currents and wind can uproot trees and other vegetation, which can serve as a major source of disturbance and destruction for both historic properties and archaeological sites.

Table 10 below indicates if the exposed cultural resource area is vulnerable to the Tier 2 hazard. This table is not all-inclusive and is meant to communicate the types of cultural resources that may be found in these areas and the types of vulnerability that they may face. A selection of historic properties and districts are highlighted due to their National Register status and stakeholder input regarding their historical significance and concern for continued preservation due to their higher exposure rating. General information is also included regarding the presence of archaeological sites in areas of higher exposure.

Table 10: Vulnerability of Exposed Cultural Resources Areas to the Tier 2 Hazards for the Glynn County Focus Area

Exposed Cultural Resource Area		Tier 2 Hazards		
		Storm Surge Inundation	Erosion	Wave Attack
St. Simons	Ft. Frederica National Monument	Y	Y	N
St. Simons	St. Simons Lighthouse and Lighthouse Keepers' Building	Y	Y	Y
St. Simons	U.S. Coast Guard Station at St. Simons Island	Y	Y	Y
St. Simons	Hamilton Plantation Slave Cabins	Y	Y	N
St. Simons	Historic and Prehistoric Archaeological Sites	Y	Y	Y
Brunswick	Old Town Historic District	Y	Y	N
Brunswick	Hofwyl-Broadfield Plantation	Y	Y	N
Brunswick	Historic and Prehistoric Archaeological Sites	Y	Y	N
Jekyll Island	Jekyll Island Historic District and National Historic Landmark	Y	Y	N
Jekyll Island	Jekyll Island Club	Y	Y	N
Jekyll Island	Indian Mound Cottage (Rockefeller Cottage)	Y	Y	N
Jekyll Island	Faith Chapel	Y	Y	N
Jekyll Island	Historic and Prehistoric Archaeological Sites	Y	Y	Y

Within the Glynn County focus area, there are several historic districts, historic forts, plantation sites, historic lighthouses, and archaeological sites along the coast and on barrier islands that are susceptible to damages from coastal storm hazards, including storm surge inundation, erosion, and wave attack. The most susceptible is Ft. Frederica National Monument and the St. Simons Lighthouse. While some historic districts have protections, such as sea walls, in place to minimize vulnerability, many of the historic structures are vulnerable to storm surge inundation and the associated damage

that it brings. The Jekyll Island Historic District is an example of a historic district that could be severely impacted by storm surge inundation, especially if protection measures fail or are not sufficient to protect against more extreme storm episodes. Historic and archaeological sites on barrier islands within the focus area, such as St. Simons and Jekyll Islands, are susceptible to damages primarily from erosion and wave attack. Previous studies by the GADNR Historic Preservation Division (HPD) and Skidaway Institute of Oceanography have documented archaeological sites that are in danger of, or are presently, being lost to erosion within Georgia’s barrier islands (Skidaway Institute of Oceanography 2017). Vulnerable sites identified by the GADNR HPD included prehistoric Indian shell middens, prehistoric Indian artifact and shell scatters, and burial sites, among other archaeological sites subject to erosion.

4.5 Risk Assessment

Risk is broadly defined as a situation or event where something of value is at stake and its gain or loss is uncertain. Risk is typically expressed as a combination of the likelihood and consequence of an event. Consequences are measured in terms of harm to people, cost, time, environmental harm, property damage, and other metrics (USACE 2019).

Table 11 identifies the high-risk places in the Glynn County Focus Area based on the Tier 1 and Tier 2 Risk Assessments, which are detailed in the Georgia Appendix. The census places of Brunswick and St. Simons Island were identified as high risk for all criteria listed in **Table 11**. St. Simons Island was the only census place within the GA_05 Planning Reach identified as high risk under the existing condition Tier 2 Economic Risk Assessment. The rest of the locations were identified as high risk in one or more criteria, including environmental and cultural resources and the erosional analysis.

Table 11: High-Risk Census Places in the Glynn County Focus Area

Census Place or Location	Tier 1 Risk Assessment Future High-Risk Location	Tier 2 Economic Risk Assessment Future High-Risk Location	At-Risk Cultural Resource Area	At-Risk Priority Environmental Area	Shoreline Retreat Areas (Erosional Hotspots)
Brunswick	X	X	X	X	
Country Club Estates	X	X			
Dock Junction	X	X			
Jekyll Island			X	X	
Little St. Simons				X	X
St. Simons	X	X	X	X	X
St. Simons (North Frederica Area) ¹		X			

¹Unincorporated places (not associated with a census place) that met the criteria of high-risk

These locations were used as a starting point to develop action strategies to reduce existing and future risk from coastal storm hazards and their increase from sea level rise. This was further refined by a diverse group of stakeholders who identified specific areas within these census places with problems and needs. Action strategies were then developed for these areas.

4.5.1 Tier 1 Risk Assessment

The Tier 1 Risk Assessment used a composite index of national-level datasets to determine coastal storm and sea level rise risk on the southeast coast. The methodology of the Tier 1 Risk Assessment is described in the Main Report and in the Georgia Appendix. The Tier 1 Risk Assessment was used to identify four census places in Glynn County that showed the greatest existing and future composite risk (**Figure 18**). Among these census places, approximately 6,600 acres were either medium-high risk or high risk under existing conditions. With the addition of a 3-foot sea level rise, this number rose to 8,900 acres, an increase of 34.5 percent. The census place with the greatest portion of land at risk under future conditions is St. Simons Island (approximately 45 percent), while farther inland abutting the East River, Dock Junction showed the greatest percent change in risk from existing to future conditions (approximately a 73-percent increase). Census places exhibiting relatively low existing risk with a significant increase in future risk (e.g., Dock Junction) may be particularly susceptible to increased hurricane and storm damage due to sea level rise because residents may not be fully aware of or preparing for the potential future risk.

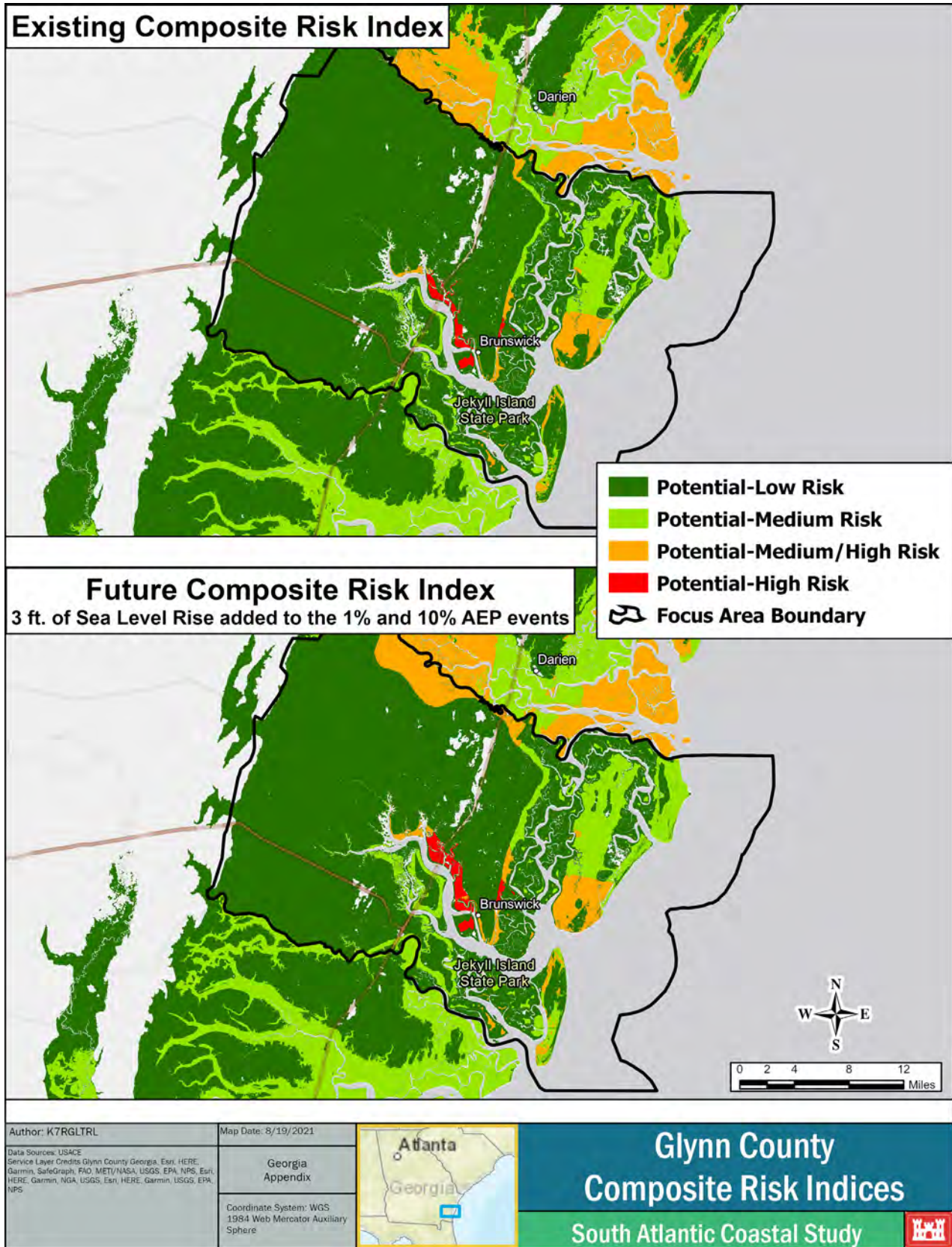


Figure 18: Existing and Future Condition Composite Risk in Glynn County

4.5.2 Tier 2 Economic Risk Assessment

As part of the Tier 2 Economic Risk Assessment, current and future expected annual damages (EAD) from coastal storm hazards were estimated using the FEMA Hazus Flood Model. The total EAD for the Glynn County Focus Area is approximately \$39 million in the existing condition, and approximately \$118 million in the future conditions with 3 feet of sea level rise. The Tier 2 Economic Risk Assessment indicates that the projected economic risks within Glynn County represent approximately 30 percent of the existing and future condition EAD within Planning Reach GA_05. **Figure 19** provides a snapshot of the Tier 2 Economic Risk Assessment for the focus area. Each circle on the map denotes separate census places and displays the distribution of economic risk from low to high. Bar charts on the figure highlight the census places with the greatest economic risk, with quantifications of the existing (green shading) and future risks, including sea level rise (black shading). Economic risks displayed are not cumulative. The data depicts where EAD are occurring as result of the hazard of inundation, and where the EAD are expected to increase in the future condition if no action is taken. The data can help inform communities on which potential actions should be implemented to mitigate the potential economic risks. The census place with the highest economic risk within Planning Reach GA_05 is St. Simons Island, with estimated EAD of \$18 million under the existing condition and a projected \$54 million under the future condition.

Figure 19 also contains the estimated damages from hazard events based on the event's AEP. For example, for the 1-percent AEP event (100 year event), estimated damages under existing conditions are approximately \$630 million, and under future conditions, estimated damages are approximately \$1.9 billion. These damage estimates include damages to physical structures and infrastructure caused by coastal inundation. These estimates do not include damages from flooding from inland runoff or compound flooding. The estimates also do not consider economic losses resulting from temporary or permanent business closures. Following a natural hazard event or impacts to the local economy from lost or reduced tourism, estimated damages under both existing and future conditions would be significantly higher.

For Planning Reach GA_05, a high-risk area included any location with a future risk rating of medium to high. A risk rating of high was defined as any location with estimated EAD above \$10,455,000, medium-high above approximately \$5,072,000, and medium above approximately \$1,157,000. The Tier 2 Economic Risk Assessment identified two locations within Glynn County with a future risk rating of high—St. Simons and Brunswick—and three locations, Country Club Estates, Dock Junction, and the North Frederica Area of St. Simons was identified with a future risk rating of medium-high.

Focus Area
 Brunswick / Glynn County
Brunswick / Glynn County
 \$38,698,980 Existing Risk (\$EAD)
 \$118,204,100 Future Risk (\$EAD)

Focus Area Risk by County

County	Existing Risk (\$)	Future Risk (\$)
Glynn	\$38,698,980	\$118,204,100
Total	\$38,698,980	\$118,204,100

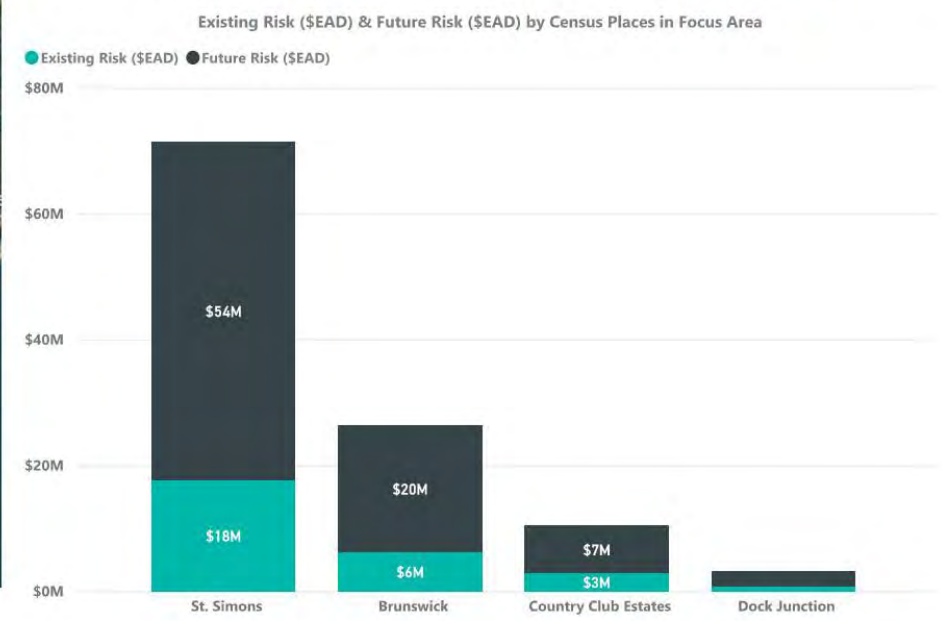
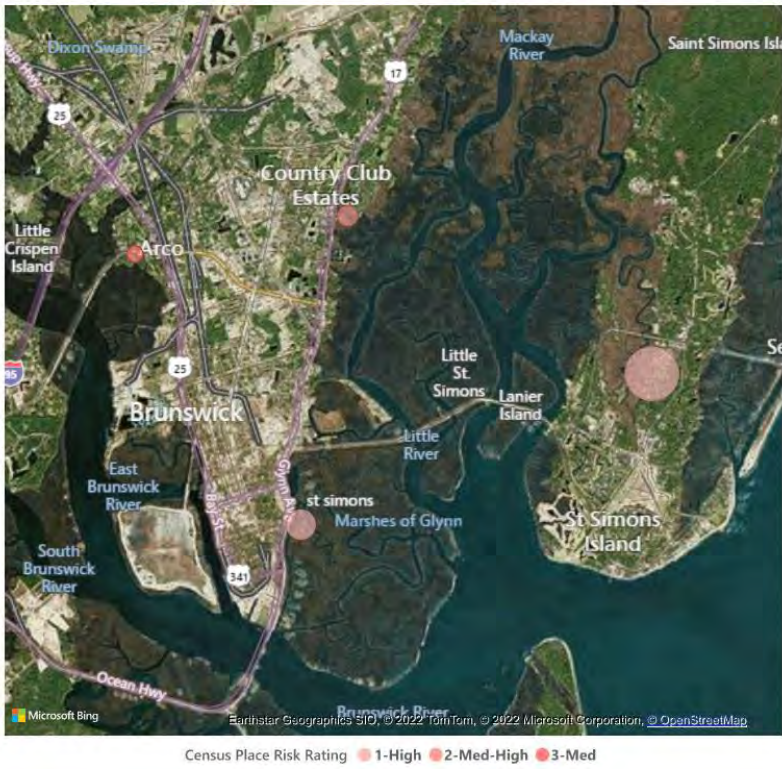


Figure 19: Tier 2 Economic Risk Assessment Dashboard

As part of the FAAS, the Tier 2 Economic Risk Assessment was further evaluated at the census block level to better understand the economic risk picture within the focus area (**Figure 20**). During the virtual Focus Area Visioning Meetings, stakeholders provided feedback on locations with projected high economic risks in the existing and future conditions. Areas of specific concern were identified within the city of Brunswick such as the Riverside Community and both ocean facing and back bay locations of St. Simons due to their projected EAD under the future condition with 3 feet of sea level rise. Data derived from the Tier 2 Economic Risk Assessment realizes the opportunity of gathering additional data on coastal hazards and vulnerability to refine current and future CSRM efforts. High risk locations identified above are directly correlated with problems within the focus area identified in Section 2.1. This information, in conjunction with the suite of SACS products and tools, was used to develop draft action strategies.

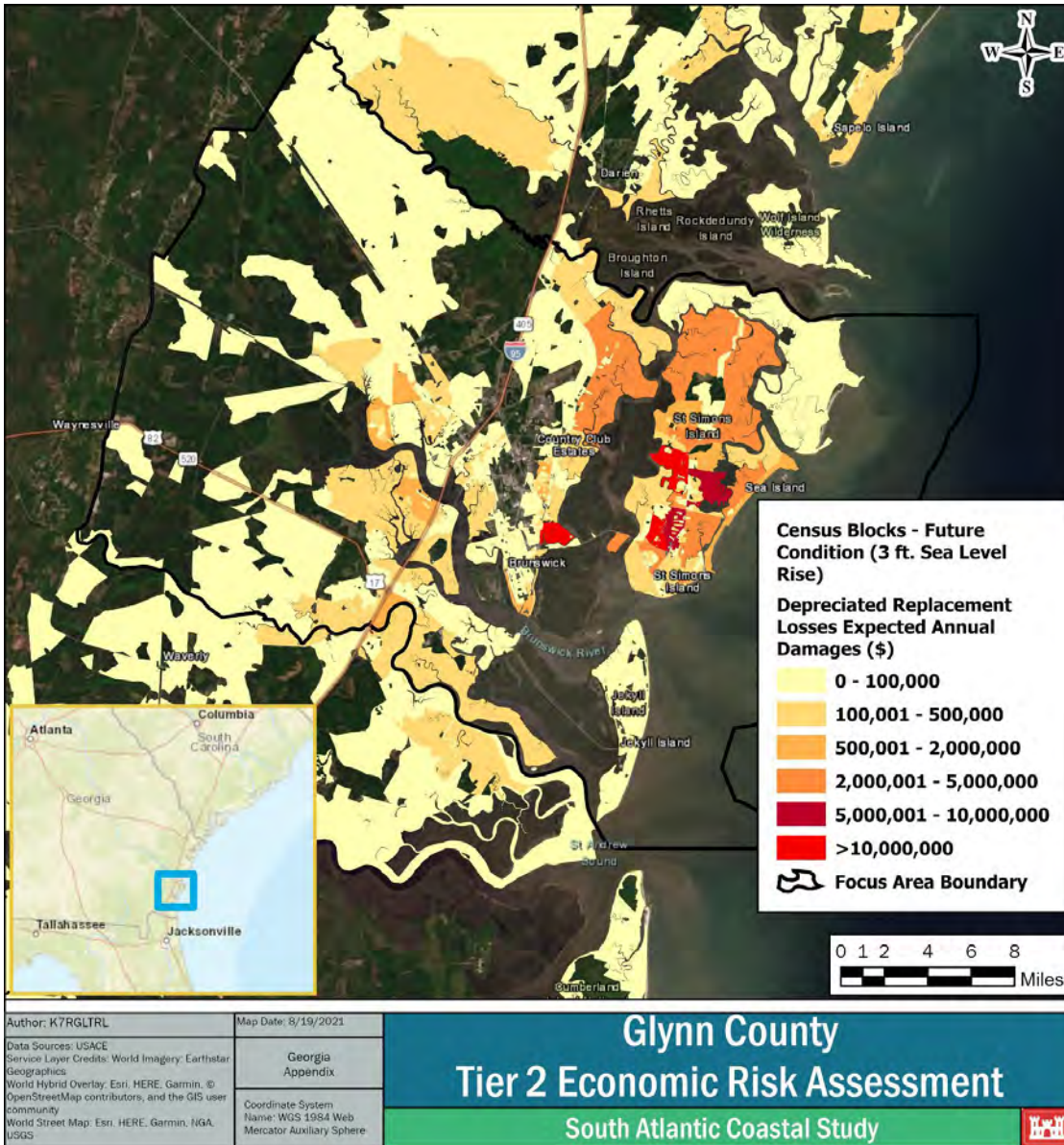


Figure 20: Tier 2 Economic Risk Assessment Future Risk Locations (Census Blocks) with 3-Foot Sea Level Rise in Glynn County

4.5.3 Priority Environmental Areas

A total of six priority environmental areas (PEAs) are identified within the Glynn County Focus Area. The PEA tables for each state and territory are located in the Environmental Technical Report (USACE 2022a). PEAs are natural areas or features at medium to high risk to storm surge inundation and sea level rise. PEAs support priority biological resources (defined in the U.S. Fish and Wildlife Service SACS Planning Aid Report as federally listed threatened and endangered species, waterbird nesting colonies, breeding and wintering shorebirds, or other managed species) and are considered high priorities for others including state and federal agencies and non-governmental organizations (for example, U.S. Fish and Wildlife Service critical habitats or national wildlife refuges, Audubon Important Bird Areas, state heritage preserves and wildlife management areas, areas of national and state environmental significance, etc.). These areas can be considered by stakeholders when looking for environmental resources to conserve and/or manage. Designation as a PEA by USACE does not create a special legal protection or status of the area and does not change how the area is regulated under federal and state laws. The following PEAs were identified for the Glynn County Focus Area.

Jekyll Island Park

Located just south of St. Simons Island and across St. Simons sound, Jekyll Island is the most southern-lying barrier island in Glynn County. It is 5,500 acres and contains approximately 10 miles of beach and shoreline. It is comprised of bottomland hardwood forest, scrub shrub, palustrine forested wetland, maritime forest/hammocks, estuarine scrub and marsh, freshwater marshes, tidal flats, and tidal wetlands.

This island provides important nesting habitat for the loggerhead sea turtle (*Caretta caretta*) and other sea turtle species. It also provides critical habitat for threatened piping plover (*Charadrius melodus*) on the south end. Several beach and dune areas also provide an important habitat for red knots, American oystercatchers and other wading birds and shorebirds. The salt marsh area directly to the west provides habitat for federally listed eastern black rail (*Laterallus jamaicensis*) and wood stork (*Mycteria americana*). Within the interior of the island, natural areas provide habitat for other animals, including the American alligator (*Alligator mississippiensis*), white-tailed deer (*Odocoileus virginianus*), and raccoon (*Procyon lotor*). Additionally, Jekyll Island provides habitat and management opportunities for several breeding wading bird species, breeding and migrating waterfowl, and other rare migratory birds, such as the painted bunting (*Passerina ciris*). This area is considered highly susceptible to coastal storm hazards and sea level rise.

Hofwyl-Broadfield Plantation State Historic Park

Located near historic Brunswick, this park lies on the northern section of Glynn County, bordering McIntosh County. Of the approximately 2,000 total acres, the park contains approximately 1,300 acres of longleaf pine savannah, bottomland hardwood, scrub shrub, and mixed forest with the remainder comprised of palustrine forested wetlands, palustrine scrub, emergent wetland, and tidal/non-tidal marsh. An extensive marsh system surrounds the northern sections and feeds into the south Altamaha River.

Managed by the GADNR, the park provides important habitat for the federally listed wood stork (*Mycteria americana*), eastern indigo snake (*Drymarchon couperi*) and the threatened and endangered candidate, the gopher tortoise (*Gopherus polyphemus*). Other animals include red-

headed woodpeckers (*Melanerpes erythrocephalus*), fox squirrel (*Sciurus niger*), American alligator (*Alligator mississippiensis*), white-tailed deer (*Odocoileus virginianus*), and raccoon (*Procyon lotor*). Additionally, the preserve provides habitat and management opportunities for several wading bird species, breeding and migrating waterfowl and other uncommon migratory birds, such as the painted bunting (*Passerina ciris*). Increased salinity from inundation could increase the die-off of freshwater wetland systems. Topsoil erosion from storm damage in scrub areas would increase die-off and depletion of plant and animal species.

Canons Point/Guale Preserve

Located on the north end of St. Simons Island, Cannon's Point Preserve is an approximately 600-acre wilderness preserve linked to the lower Altamaha River delta to the north. Of the 600 acres, the tract contains approximately 500 acres of extremely important mature maritime forest. Other habitats include bottomland hardwood, scrub shrub, interior freshwater ponds, palustrine forested wetlands, and non-tidal/tidal wetlands. Guale Preserve is an adjacent 250-acre tract of land to the southeast consisting of similar habitat. They are part of a peninsula system that has more than 6 miles of salt marsh, tidal creek, and river shoreline and contains the last intact maritime forest on the island.

Both preserves provide important habitat for the federally listed wood stork (*Mycteria americana*), eastern indigo snake (*Drymarchon couperi*) and the T&E candidate, the gopher tortoise (*Gopherus polyphemus*). Other animals include red-headed woodpeckers (*Melanerpes erythrocephalus*), American alligator (*Alligator mississippiensis*), white-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*). Additionally, the preserve provides habitat and management opportunities for several wading bird species, breeding and migrating waterfowl and other uncommon migratory birds, such as the painted bunting (*Passerina ciris*). Increased salinity from inundation could increase the die-off of freshwater wetland systems. Topsoil erosion from storm damage in scrub areas would increase die-off and depletion of plant and animal species.

St. Simons Island/Sea Island

St. Simons Island and Sea Island are connected by a causeway and together are 13 miles long and 4 miles wide. St. Simons Island is part of the city of Brunswick's metropolitan area and is the only of Georgia's larger barrier islands that has never been privately owned, whereas Sea Island is a privately owned beach resort with hotels, private cottages, and residences. St. Simons Island consists of 27,300 total acres, including the surrounding marsh. It has 3 miles of beach and 12,300 upland acres comprised of maritime forest, coastal hardwood, bottomland hardwood, pasture, grassland, scrub shrub, and slash pine/live oak stands. The remainder is comprised of palustrine forested wetlands, non-tidal/tidal marsh, sand dunes, and unconsolidated shoreline.

Sea Island has approximately 5 miles of beach and 2,000 total acres, including the marsh. Because of its private ownership, there is no public access to the beach from the mainland. With a total area of 1,200 upland acres, Sea Island habitat is similar to that of St. Simons Island.

Both islands provide important nesting habitat for the threatened loggerhead sea turtle (*Caretta caretta*) and also provide critical habitat for threatened piping plover (*Charadrius melodus*). The Gould's Inlet area, separating St. Simons and Sea Island by Postell Creek, also provides an important habitat for the threatened red knot (*Calidris canutus rufa*) and other wading birds and shorebirds. The Bloody Marsh area directly to the west also provides habitat for the threatened eastern black rail

(*Laterallus jamaicensis*) and wood stork (*Mycteria americana*). Within the interior of St. Simons and small sections of Sea Island, natural areas provide habitat for the threatened eastern indigo snake (*Drymarchon couperi*), and the T&E candidate, the gopher tortoise (*Gopherus polyphemus*). Other animals include American alligator (*Alligator mississippiensis*), white-tailed deer (*Odocoileus virginianus*), and raccoon (*Procyon lotor*). The refuge provides habitat and management opportunities for several shorebird species, breeding and migrating waterfowl and other rare migratory birds such as the Painted Bunting (*Passerina ciris*). This area is considered highly susceptible to coastal storm hazards and sea level rise.

Little St. Simons Island

Little St. Simons Island covers an area of 10,000 acres and contains 7 miles of shoreline. Little St. Simons Island is located slightly northeast of St. Simons Island and Sea Island. It is separated from these islands by the Hampton River and from the marshes of the mainland by Buttermilk Sound. The mouth of the Altamaha River opens directly north of the island. Most of the island's acreage is composed of salt marsh. The island also contains large stands of maritime and bottomland hardwood forest, pristine beach/dune habitat, and scattered interior freshwater ponds, which provide habitat for migrant passerines. The marsh shoreline is fringed by extensive mudflats that are in-part exposed at low tide.

This island is important nesting habitat for the threatened loggerhead sea turtle (*Caretta caretta*) and also provides critical habitat for threatened piping plover (*Charadrius melodus*). Several beach and dune areas provide an important habitat for the American oystercatcher (*Haematopus palliatus*), the threatened red knot (*Calidris canutus rufa*), and other wading birds and shorebirds. The salt marsh area directly to the west provides habitat for the threatened eastern black rail (*Laterallus jamaicensis*) and wood stork (*Mycteria americana*). Within the interior of the island, natural areas provide habitat for ESA-listed species, including the threatened eastern indigo snake (*Drymarchon couperi*), frosted flatwood salamander (*Ambystoma cingulatum*) and the T&E candidate, the gopher tortoise (*Gopherus polyphemus*). Other animals include the American alligator (*Alligator mississippiensis*), white-tailed deer (*Odocoileus virginianus*), and raccoon (*Procyon lotor*). Additionally, the refuge provides habitat and management opportunities for several shorebird species, breeding and migrating waterfowl, and other rare migratory birds, such as the painted bunting (*Passerina ciris*). This area is considered highly susceptible to coastal storm hazards and sea level rise.

Blythe Island Regional Park

Blythe Island Regional Park is a 1,100-acre public park located west of downtown Brunswick, St. Simons Island, and Jekyll Island, and is bordered by the South Brunswick River and the Turtle River. The park is comprised of maritime and bottomland hardwood forest, forested depressional wetlands, scrub shrub, scrub shrub wetlands, freshwater lake, freshwater tidal marsh, and tidal marsh.

The park provides habitat for ESA-listed species, including the protected bald eagle (protected by the Bald and Golden Eagle Protection Act), threatened eastern black rail (*Laterallus jamaicensis*), wood stork (*Mycteria americana*), eastern indigo snake (*Drymarchon couperi*), and the T&E candidate, the gopher tortoise (*Gopherus polyphemus*). Other animals include the great-horned owl (*Bubo virginianus*), American alligator (*Alligator mississippiensis*), white-tailed deer (*Odocoileus virginianus*), and raccoon (*Procyon lotor*). Additionally, the preserve provides habitat and management opportunities for several wading bird species, breeding and migrating waterfowl and other

uncommon migratory birds such as the painted bunting (*Passerina ciris*) and prothonotary warbler (*Protonotaria citrea*). This area is considered highly susceptible to coastal storm hazards and sea level rise.

4.5.4 At-Risk Cultural Resource Areas

Based on a qualitative assessment of risk, historic structures and archaeological sites on barrier islands and in low lying areas are highly susceptible to damage from storm surge inundation, erosion, and wave attack, especially as the risk from sea level rise increases. These areas are considered at-risk cultural resources areas due to the fact that all structures would be vulnerable to the hazards. The northern and southern tips of barrier islands tend to be hot spots for erosion, so any historic properties and/or archaeological sites in these areas would be at risk of damage and destruction from storm surge inundation, erosion, and wave attack.

While threats may be posed to cultural resources, such as historic resources and archaeological sites, due to development on barrier islands, storm protection measures that are put in place to protect those developed areas can aid in the protection of archaeological sites. For example, cultural resources on Jekyll Island benefit from periodic beach renourishment and other projects aimed at protecting property and infrastructure from storm damage, which in turn also protects cultural resources from erosion and wave attack. Storm events pose a greater risk on lesser developed barrier islands, such as St. Simons Island, that has limited or no protective measures present. Undeveloped marsh regions between and behind islands where many resources are located are typically inundated by flood events that exceed the 10-percent AEP flood level.

Damage to historic properties can sometimes be repaired, but this can be costly and may lack support if more essential recovery efforts are needed in the area to restore infrastructure. Archaeological sites are non-renewable resources that cannot be replaced once lost. Loss of historic properties and archaeological sites not only means a loss to the historical record that helps us to understand the past, but it can also mean a loss to local tourism. Visitors are drawn to this planning reach due to the many historical districts and historic forts. Damage caused by storms has in some instances meant the complete loss of all or portions of historic properties. Years of costly repairs can close these sites indefinitely until the site can be restored and are deemed safe for visitors. The loss of archaeological sites could pose a significant hit to the academic community and thereby limiting research into and interpretation of prehistoric and historic sites in this reach.

4.5.5 Shoreline Retreat Areas (Erosional hotspots)

As discussed in Section 4.1.1.3, the USGS Coastal Change Hazards Portal was utilized to identify long term erosional hotspots along the Glynn County coastline. Specific hotspot locations, which were classified by above average erosional rates (greater than -6.6 feet (-2 meters) per year) were located in portions of St. Simons and Little St. Simons Islands. St. Simons contains significant development and population centers, where increased erosion can directly impact infrastructure and threaten coastal communities. The undeveloped barrier island coastline of Little St. Simons is unconstrained by development and CSR measures and subject to natural accretional and erosional patterns.

5. Action Strategy Development

To address coastal storm risks, stakeholders participated in the Glynn County Focus Area Vision Meetings, a series of interactive webinars facilitated using SACS tools and products to identify completed, ongoing, and needed actions to address coastal storm risks within the focus area. The Vision Meetings in addition to one-on-one correspondence with key stakeholders led to a list of 36 potential actions related to coastal storm risk and sea level rise in the focus area. Actions were generally classified into the following themes to better organize and prioritize actions:

- Shoreline stabilization and protection (Supports problem statement 1,2 and 3)
- Land use, zoning, and policy (Supports problem statement 4)
- Drainage improvements (Supports problem statement 1,2, and 3)
- Land conservation and preservation (Supports problem statement 3 and 4)
- Risk communication (Supports all problem statements)
- Critical infrastructure protection (Supports problem statement 2)
- Cultural resource protection (Supports problem statement 3)
- Environmental resource protection (Supports problem statement 3 and 4)

In the following sections, the process and outcomes of identifying and screening possible solutions to these actions are identified, evaluated, and compared. Specific examples are used to illustrate the use of the CSRSM Framework and a complete table showing the FAAS is in Section 5.3.

5.1 Identify Possible Solutions

There are several SACS key products that can be used to help identify measures and possible solutions. The Measures and Cost Library (MCL) can be used to identify suitable measures based on wave energy, and planning level ROM cost estimates and the Tier 2 Economic Risk Assessment can be used to identify potential economic benefits. The 2020 RSM Optimization Update and SAND Report can be used to identify opportunities for RSM strategies and offshore sand borrow areas. In general, measures are organized into structural, nonstructural, and natural and nature-based features (NNBF). A detailed list of CSRSM measures, the function of CSRSM, and applicability by wave energy, can be found in Section 5.5 of the Georgia Appendix and the MCL report.

The broad measures identified herein (structural, nonstructural, and NNBF) could be further developed to target specific areas for CSRSM. Example environmental and cultural resource protection measures are identified at the end of **Table 12**. The goal of alternatives development is to achieve the objectives by combining one or more measures while avoiding constraints. Measures identified will be further evaluated, screened, and used in combination (as appropriate) to determine area-specific project viability to meet the planning objectives.

Table 12: General Focus Area Themes and Potential Coastal Storm Risk Management Measures

Glynn County Focus Area Themes	Potential Coastal Storm Risk Management (CSRM) Measures		
	Structural	Nonstructural	Natural and Nature-Based Features
Shoreline stabilization/protection	<ul style="list-style-type: none"> • Build seawall/revetment • Build detached Breakwaters • Build floodwalls and bulkheads • Perform beach nourishment 	<ul style="list-style-type: none"> • Relocate utilities and critical infrastructure • Implement building codes and zoning • Elevate structures • Retreat the shoreline 	<ul style="list-style-type: none"> • Build dunes • Create living shorelines (oyster sills, vegetation) • Restore wetland/marsh
Land use, zoning, and policy	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Revise building codes • Perform acquisition/buyouts • Conduct coastal zone management 	<ul style="list-style-type: none"> • N/A
Drainage improvements	<ul style="list-style-type: none"> • Improve stormwater system • Install portable floodwalls to flood/tide gates • Elevate roads 	<ul style="list-style-type: none"> • Floodproof structures • Increase storage • Redesign services and utilities • Conduct surface water/stormwater management 	<ul style="list-style-type: none"> • Perform green stormwater management
Land conservation and preservation	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Preservation (Coastal wetlands, Upland buffers) • Make a strategic Acquisition • Engage and educate the public 	<ul style="list-style-type: none"> • N/A
Risk communication	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Implement early warning Systems • Engage and educate the public • Prepare emergency plans/hazard mitigation plans • Resiliency studies 	<ul style="list-style-type: none"> • N/A
Critical infrastructure protection	<ul style="list-style-type: none"> • See Shoreline stabilization/protection measures 	<ul style="list-style-type: none"> • See Shoreline stabilization/protection measures 	<ul style="list-style-type: none"> • See Shoreline stabilization/protection measures
Cultural resource protection	<ul style="list-style-type: none"> • Build breakwater structures • Conduct RSM (erosional areas) 	<ul style="list-style-type: none"> • Elevate or relocate structures • Study/excavate sites 	<ul style="list-style-type: none"> • Create living shorelines
Environmental resource protection	<ul style="list-style-type: none"> • Perform beach nourishment (habitat protection and expansion) 	<ul style="list-style-type: none"> • Develop a stormwater management plan • Coastal wetland preservation • Conduct local permitting 	<ul style="list-style-type: none"> • Create living shorelines • Restore coastal wetlands • Conduct RSM (thin-layer placement – marsh resiliency)

Project-specific measures shown in Section 5.2 and 5.3 have been provided through stakeholder input or were derived from previous studies and engagement. Some measures may be beyond the authority of USACE to implement. However, it was important to consider all viable measures regardless of current authority of the lead organization. For example, nearby Camden County has developed a Community Rating System (CRS) Open Spaces Explorer Application which identifies areas that currently qualify for Open Space Preservation credit, calculates the points they provide, helps identify future open space in the floodplain, and serves as a flood risk communication tool for residents and decision-makers. Potential measures that could be evaluated as part of future study phases are also included.

5.2 Evaluation and Comparison of Solutions

After identifying the problem and creating an inventory and forecast of current and future hazards, exposure, vulnerability, and risk, project-specific alternatives can be developed to reduce or mitigate risks based on shoreline types, exposed resources, and extent of residual risk in the future condition. When evaluating alternatives, it is important to determine whether the measure addresses the problem while meeting the objectives of the project. A reconnaissance-level economic feasibility assessment can be conducted using the suite of SACS tools by providing stakeholders with management measures and costs to develop alternatives and strategies and comparing those costs to FEMA Hazus Flood Model-derived damages to evaluate measures. A FAAS-specific reconnaissance-level economic feasibility assessment can be found in Section 5.2.1.

5.2.1 Planning Level Cost Estimates

At-risk critical infrastructure and public facilities were identified as major problems during the Focus Area Visioning Meetings. The 2017 Glynn County Climate Resilience Adaptation Report provided resilience adaptation strategy recommendations for the Brunswick-Glynn County Joint Water & Sewer Commission's critical infrastructure of water and sewer assets (Glynn County 2017). The FAAS planning level cost estimate demonstrates how coastal hazards in other high-risk locations within the focus area can be assessed. In the focus area, there are several water treatment plants and wastewater treatment plants (WWTPs) that are exposed to coastal storm hazards and sea level rise. Similar CSRM measures are applicable at these locations. Specific facilities were identified within the City of Brunswick, St. Simons Island, and Jekyll Island.

The Dunbar Creek WWTP, located along the Dunbar Creek in St. Simons Island, was one of several critical infrastructure assets emphasized as high risk from stakeholder engagement and was rated as a Facility Priority 1 within the Glynn County Climate Resilience Adaptation Report (Glynn County 2017). The facility priority number corresponds to the type of hurricane surge vulnerability that a facility has; therefore, a facility with a priority rating of 1 is deemed vulnerable to a Category 1 hurricane. The MCL and Tier 2 Economic Risk Assessment tools were used to perform a reconnaissance-level economic feasibility analysis to evaluate flood and erosion reduction measures in an area with known flooding risks.

Specifically, the MCL tool was used to evaluate the potential measures costs, while the Tier 2 Economic Risk Analysis tool was used to evaluate potential economic benefits from the reduction of physical and economic losses within the area to structures and their contents (**Figure 21, Figure 22**). It is important to emphasize that the Tier 2 Economic Risk Assessment tool is a screening level tool for

stakeholders to identify areas for further investigation and does not account for nonphysical damages. Other Social Effects (OSE) benefits were also considered because of the threats to public health and safety from flooding associated with the interrupted conveyance and treatment of sewage. OSE are primarily impacts that can be quantified but cannot be assigned monetary value. As described in the MCL documentation, because of the regional nature of the data being developed it is impossible to address the full scope and site-specific issues prevalent in all CSRSM projects. The influence that combining measures may have on the effectiveness of the individual components is also not addressed. The MCL is intended as a starting point to identify applicable measures and their associated costs as part of developing conceptual alternatives. The alternatives identified using the MCL should be further explored in a detailed analysis. Expert opinion and detailed engineering investigation will be needed to determine the effectiveness of the MCL and if modification to the data is necessary to account for site-specific considerations.

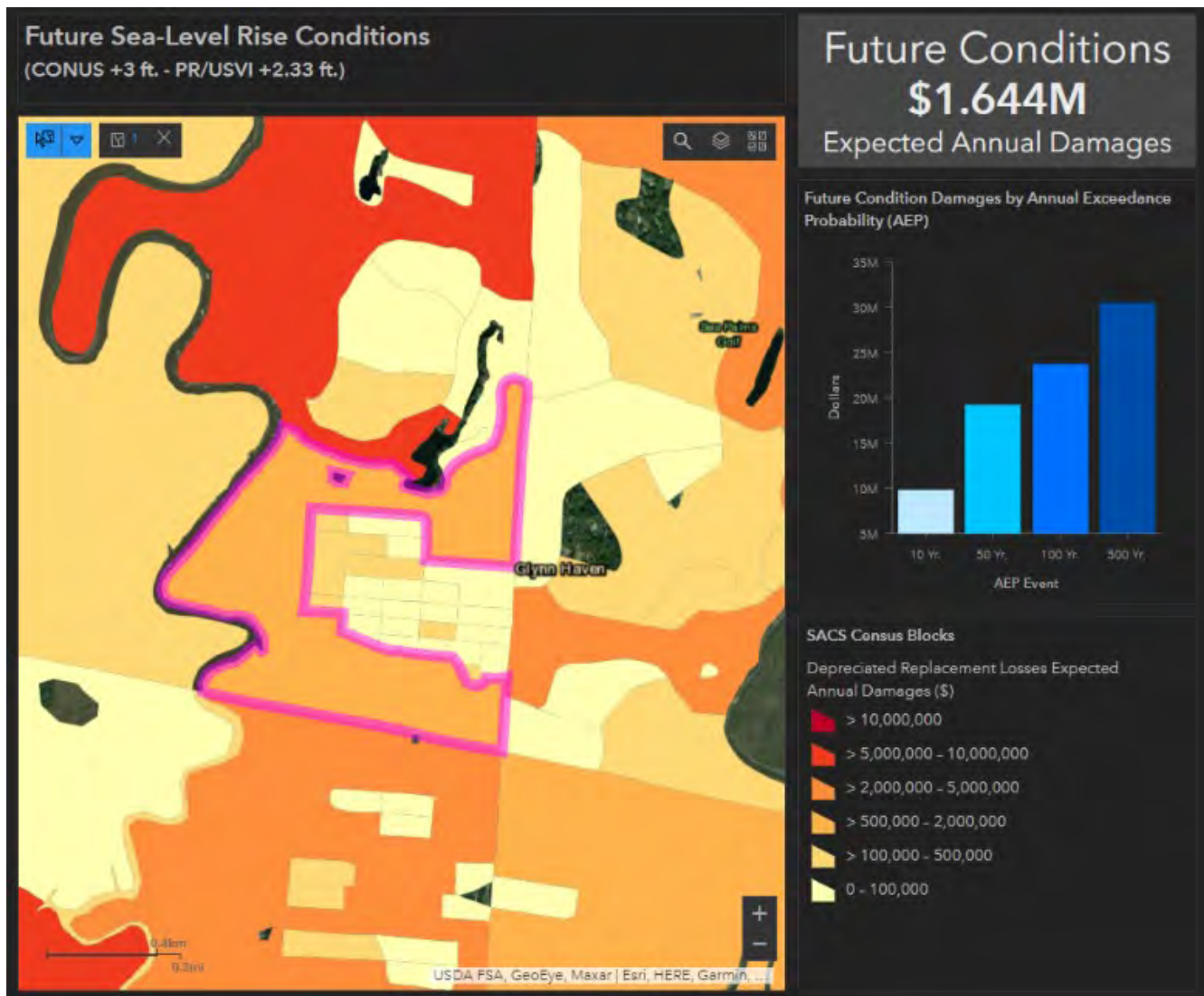


Figure 21: Tier 2 Economic Risk Assessment with Projected Future Conditions of Approximately \$1.64 Million in Expected Annual Damages

After identifying the problem and assessing potential risk using SACS tools, stakeholder input, and strategies from the Glynn County Climate Resilience Adaptation Report, potential structural, nonstructural, and NNBF measures were identified to address CSRM risks such as storm surge inundation and erosion within WWTP footprint. Another component of the MCL report is a detailed and descriptive list of CSRM measures, which includes a measure-performance designation based on a measure’s ability to reduce inundation, wave attack and erosion harm as primary, secondary, or nonrelevant function of the measure. As displayed in **Figure 22**, measures were separated by primary CSRM function, with yellow and red representing the approximate placement of applicable measures to address erosion and inundation risks. It is important to note that not all CSRM measures provide the same level of flood risk or erosion reduction benefits. In some circumstances, a NNBF measures may be unable to replicate the risk management provided by traditional structural and nonstructural measures but may provide important environmental and social benefits such as supporting species habitat, water quality, or public enjoyment.

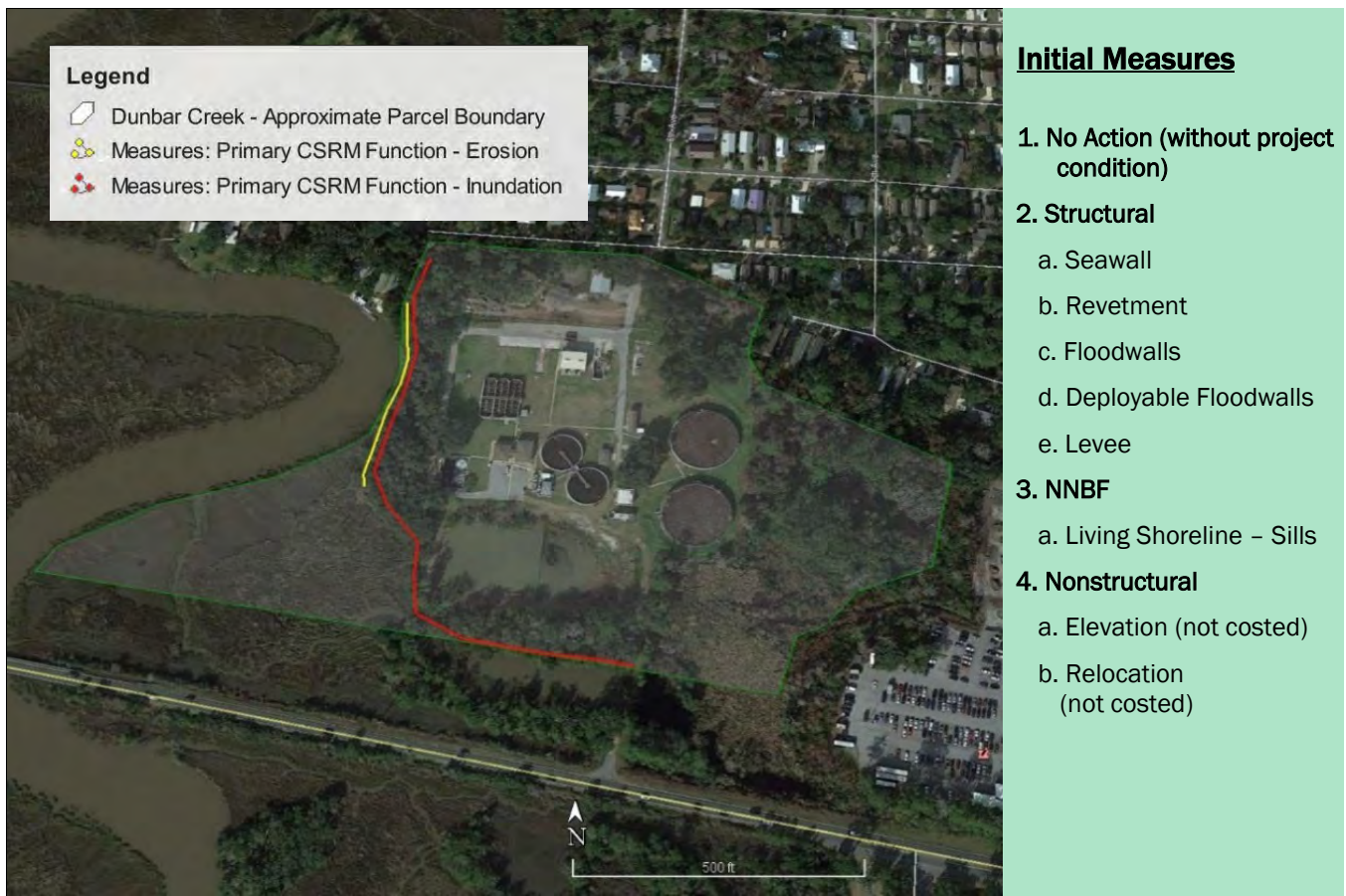


Figure 22: Dunbar Creek Wastewater Treatment Plant Approximate Coastal Storm Risk Management Measure Placement and Measures

The MCL tool provides an ROM cost estimate range for the selected measures including high and low values, equivalent annual costs (EAC), and the total first construction cost (**Table 13**). Costs given in the MCL are based on a Class 5 estimate using broad assumptions, historical data, and incomplete technical details (AACE International 2020). Prices can vary from -20 percent to +50 percent. EAC is the annual cost range based over a 50-year analysis period. As identified from the Tier 2 Economic

Risk Assessment, damages to property and infrastructure adjacent to Dunbar Creek show existing condition EAD of approximately \$600,000 or the future condition EAD of approximately \$1.64 million in any given year if no CSRM measures were implemented (**Figure 21**). Because of the spatial extent of the census block, smaller-scale issues may be harder to directly quantify with this product. This preliminary analysis, which considers economic damages and estimated construction first costs, shows that multiple measures have the potential to be economically justifiable at the lower end of the cost range and that more detailed analysis could be warranted in this area. It is recommended that follow-on analyses be completed to further evaluate multiple measures (including real estate, environmental, cultural resources, and maintenance costs and nonmonetized benefits) and address coastal storm risk comprehensively. Alternatives could be developed using standalone measures or a combination of measures, such as elevation in tandem with one or more of the structural and NNBF measures, to reduce the flood and erosion risks at this location. While measures were evaluated specifically to preserve the uninterrupted conveyance and treatment of sewage at the WWTP, broader measures can be evaluated to address coastal storm risks and sea level rise within the Dunbar Creek-adjacent neighborhoods.

Table 13: Measures and Cost Library-Derived Costs for Dunbar Creek Wastewater Treatment Plant

Primary Coastal Storm Risk Management Function	Measure	Unit(s)		Rough Order of Magnitude (ROM) Cost Range (Equivalent Annual Costs)	ROM Total First Construction Cost
Inundation ¹	Seawall	Linear Feet	1,300	\$464,000–\$888,000	\$12,500,000–\$24,000,000
Inundation ¹	Floodwalls	Linear Feet	1,300	\$276,000–\$433,000	\$7,440,000–\$11,700,000
Inundation ¹	Levees/Dikes	Linear Feet	1,300	\$41,100–\$110,000	\$1,100,000–\$2,980,000
Inundation ¹	Elevation	Number of Assets	–	Not currently costed	Not currently costed
Inundation ¹	Relocation	Number of Assets	–	Not currently costed	Not currently costed
Erosion/ Wave Attack ²	Bulkhead	Linear Feet	440	\$31,000–\$50,700	\$837,000–\$1,370,000
Erosion/ Wave Attack ²	Revetment	Linear Feet	440	\$133,000–\$356,000	\$3,590,000–\$9,610,000
Erosion/ Wave Attack ²	Living Shoreline – Sills	Linear Feet	440	\$37,900–\$180,000	\$1,020,000–\$4,850,000

¹ Approximate placement of erosion reduction measures displayed in yellow on Figure 22

² Approximate placement of inundation reduction measures displayed in red on Figure 22

5.2.2 Impacts of Sea Level Rise

As discussed in Section 4.1.3, sea level rise will increase exposure to hazards for low-lying coastal areas, including this focus area. Sea level rise is fundamentally incorporated into the FAAS and was considered carefully by stakeholders when identifying specific problems and needs. Site-specific considerations for each project area beyond those already addressed in the SACS would likely be addressed during Tier 3 follow-on activities with stakeholders.

While historically, residents of Georgia’s coastal communities have thought of coastal hazards in terms of single-event hurricanes or coastal storms, it is important to also consider the long-term, sustained effects of sea level rise on real property, natural habitats, and the ability to sustain growth in the regional economy. In the future, strategies will need to shift from addressing a single immediate concern to planning and executing comprehensive solutions that address multiple points of vulnerability. These strategies will rely on extensive coordination with local authorities and will require the integration of innovative solutions with existing and planned sea level rise mitigation efforts. Sea level rise scenarios are particularly important for design considerations for measures such as road elevation, seawall, living shorelines, and floodwalls. Some structural measures, like barriers and seawalls could potentially be adaptable to sea level rise by increasing structure elevations over time. This type of action requires sufficient available land to verify a stable design. NNBF and blended hybrid solutions that incorporate both NNBF and structural measures were identified as preferred future CSRSM strategies by stakeholders to increase habitat along the shorelines while also ensuring proper shoreline stabilization. NNBF measures such as living shorelines and marsh enhancement may require adaptive material placement and elevation strategies to sustain targeted habitat types as sea level rises. For example, thin-layer placement can be utilized to maintain targeted coastal wetland elevations.

5.2.3 Potential Benefits and Impacts

The FAAS includes a focused array of potential actions, lead stakeholders, solutions, needed actions, a time frame for implementation, and potential funding sources. These elements are essential to make actionable recommendations and were coordinated closely with stakeholders. Potential benefits of the FAAS can be evaluated either individually as specific solutions to identified problems, or collectively as a system of solutions that address the shared vision. This report does not prioritize individual actions that make up the FAAS, although these actions could be prioritized to maximize finite resources. Prioritization could be based on several factors, including benefit-cost, time frame of incurring negative effects, or by availability of authorities and funding. As shown with the Dunbar Creek WWTP example from Section 5.2.1, there are SACS tools that can be used to help facilitate planning and prioritization. The FAAS provides a consistent platform to evaluate stakeholder-identified problems and needs in the focus area.

While proposed CSRSM measures may reduce risks related to sea level change and storm damages, they can cause adverse effects for cultural and environmental resources. For example, structural measures may prevent natural marsh migration, while nourishment material, if not carefully screened, can include larger quantities of fines that can cause the beach face to harden or darken, impacting sea turtle nesting habitat. Relocating or altering a historic structure is an example of a potential adverse effect because it impacts the integrity of the structure. Any implemented measures would need to comply with Section 106 of the National Historic Preservation Act, including soliciting feedback from the consulting parties associated with these important resources, to ensure the preservation and integrity of these resources.

5.3 Focus Area Action Strategy

Table 14 is the FAAS for the Glynn County Focus Area, which was developed in partnership with key stakeholders. The strategy combines ongoing, planned, and needed actions based on prioritization, timing, and sequencing to advance the shared vision.

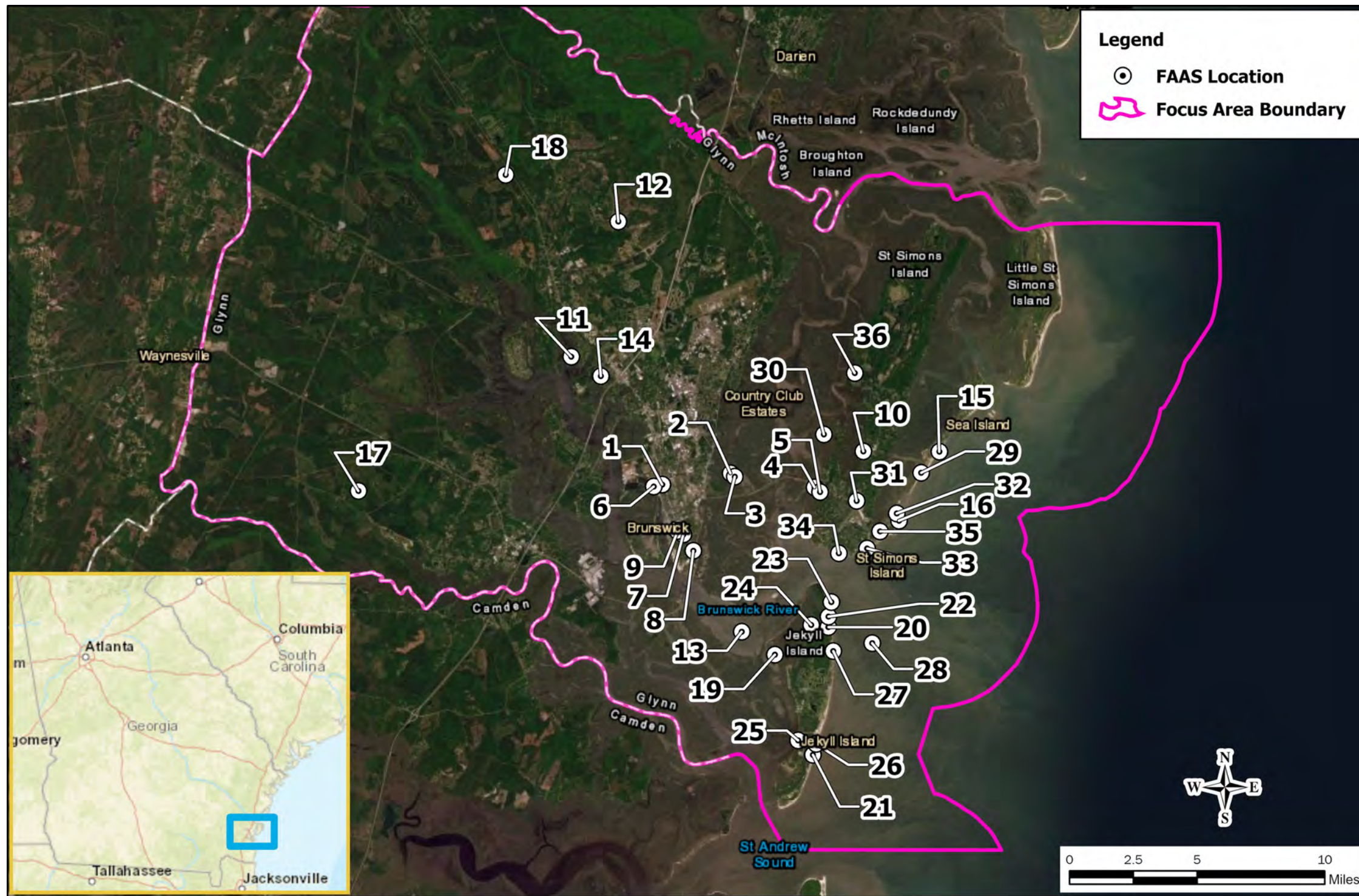
This report does not seek to create a strategy separate from the significant and ongoing efforts in the focus area, but to support those of the region and develop initial considerations for future federal and non-federal efforts. While many of the individual localities, shown in **Figure 23**, have unique and pressing issues associated with coastal storm risk and sea level rise that are described in **Table 14**, commonality throughout the focus area can be found among stakeholders to address problems and expand upon known working initiatives that are reducing risk in the focus area. Individual actions can be incorporated into more comprehensive plans that use the collective expertise of the diverse stakeholder groups in the area.

A unique attribute of the Georgia coastline and of Glynn County is the expansive network of undeveloped coastal wetlands. Continued protection and enhancement of these natural features is a focus area-wide strategy that provides numerous benefits to the area, including attenuating wave energy, slowing inland water transfer, and increasing infiltration. Additionally, the Glynn County Focus Area is at the forefront of many innovative pilot and demonstration projects which include living shorelines, thin-layer placement and green infrastructure that provide ecosystem services not available through traditional shoreline protection techniques. Continued implementation and documentation of these projects allows to proactively explore whether these techniques can be used in the future to build a more resilient Glynn County and Georgia coast.

Coordination with stakeholders and USACE teams conducting multiple studies in the focus area indicated that USACE is in a unique position to provide information and assistance to advance innovative planning, design, and implementation of emerging coastal storm risk management measures to address problems and further opportunities described in this report. For example, identifying AIWW operation and maintenance (O&M) materials that could be beneficially used is a strategy to expand RSM opportunities within the focus area that would ultimately support many ongoing and future initiatives.



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Author: K7RGLTRL	Map Date: 8/31/2021
Data Sources: USACE Service Layer Credits: World Street Map: Esri, HERE, Garmin, NGA, USGS, NPS World Imagery: Earthstar Geographics World Boundaries and Places: Esri, HERE, Garmin	Georgia Appendix
	Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Glynn County FAAS Locations

South Atlantic Coastal Study

Figure 23: Glynn County Focus Area Action Strategy Locations Referenced in Following Table

Table 14: Glynn County Focus Area Action Strategy Table

Map Location	Theme	Description/Purpose	Location	Potential Lead Stakeholder(s)	Summary of Specific Actions Needed to Implement	Status (ongoing, planned, needed)	Timeframe ¹	Potential Funding Source
1	Drainage improvements, Shoreline stabilization/protection	Supplemental studies are needed to address stakeholder-identified areas in the City of Brunswick that have experienced repetitive flooding. This would complement the Tier 1 and Tier 2 Risk Assessments by using local stakeholder knowledge to further refine and characterize areas of high risk.	Brunswick	Local County or City Governments, Georgia Department of Natural Resources (GADNR) Coastal Resources Division (CRD), USACE	Higher-resolution investigations may be necessary to further refine specific high-risk areas within the county. SACS Geoportal tools can be used to support future efforts and are continually refined. An ongoing study, "Shoreline Assessment and Implementation Resiliency Plan" provides a broad listing of erosional and flood-prone areas within the city of Brunswick and the County-identified hot spots.	Ongoing	Short	Local, GADNR CRD, USACE (Planning Assistance to States)
2, 3	Drainage improvement, Land use, zoning, and policy	Riverside Drive is frequently flooded during normal rain events and experiences significant flooding during larger storm events and named storms. This road is the only way on and off the small island community abutting the Back River. The Riverside Drive community is highly vulnerable to storm surge.	Brunswick	Local County or City Governments, Georgia Emergency Management and Homeland Security Agency (GEMA), Federal Emergency Management Agency (FEMA), Georgia Department of Transportation (GDOT), U.S. Department of Housing and Urban Development (HUD)	Define flood risk and identify possible measures such as elevating the road and drainage improvements. Quantify benefits including use as a critical evacuation route. Identify vulnerable and repetitive loss properties from past storms. Coordinate with FEMA to find funding sources to institute buyouts and raise of repetitive loss properties in high-risk areas	Needed	Mid	Local, GEMA, FEMA, GDOT, HUD
4, 5	Critical infrastructure protection, Shoreline stabilization/protection	Address repetitive inundation issues at F.J. Torras Causeway and the intersection of Ocean Highway 17. F.J. Torras Causeway is the main roadway to St. Simons Island/Sea Island and an important evacuation route.	Brunswick	Local County or City Governments, GDOT	Define flood risk and identify possible measures such as elevating the road and drainage improvements. Quantify benefits including use as a critical evacuation route.	Needed	Short	Local, GDOT, GEMA, FEMA, USACE
6	Shoreline stabilization/protection	Address erosional concerns at multiple locations adjacent to Academy Creek (Palmetto and Greenwood Cemeteries, Selden Park, and Academy Creek wastewater treatment plant [WWTP]).	Brunswick	Local County or City Governments	Define nature and extent of erosion at Academy Creek and identify potential measures to address erosional concerns, which may include natural and nature-based features (NNBF) such as a living shoreline, riprap to stabilize the bank, or relocation of susceptible gravesites/structures.	Needed	Short	Local
7	Drainage Improvements, Cultural resource protection	Address flooding risk to historic, commercial, and residential structures in downtown Brunswick.	Brunswick	Local County or City Governments, GEMA, FEMA, HUD, GADNR Historic Preservation Division (HPD)	Elevate repetitive loss properties. Elevation is an option to maintain historic value of asset while reducing damages from coastal hazards. Conduct a study to address flooding risk with potential measures such as green stormwater infrastructure, property acquisition, floodproofing structures, or implementing planning development controls.	Needed	Long	Local, GEMA, FEMA, USACE
8	Drainage Improvements	Address nuisance flooding near Glynn Middle School and its adjacent infrastructure (recreational fields and parking). Lanier Boulevard has repetitive flooding issues.	Brunswick	Local County or City Governments, GDOT	Define flood risk and identify possible measures such as elevating the road and drainage improvements, property acquisition, and planning development controls. Quantify benefits and cost of improvements.	Needed	Mid	Local, GEMA, FEMA, USACE
9	Drainage improvements	Address nuisance flooding near Glynn Academy High School. Frequent flooding has inundated surrounding roadways and adjacent infrastructure, including parking lots for staff and students.	Brunswick	Local County or City Governments	Define flood risk and identify possible measures such as elevating key infrastructure and implementing drainage improvements.	Needed	Mid	Local, GEMA, FEMA, USACE

Map Location	Theme	Description/Purpose	Location	Potential Lead Stakeholder(s)	Summary of Specific Actions Needed to Implement	Status (ongoing, planned, needed)	Timeframe ¹	Potential Funding Source
10	Critical infrastructure protection, Shoreline stabilization/protection	There are several areas where critical infrastructure, including electrical substations and WWTPs, are exposed to coastal storm hazards and vulnerable to sea level rise. Jekyll Island Substation, Academy Creek WWTP (Brunswick), Dunbar Creek WWTP (St. Simons Island), and Jekyll Island WWTP are all located in highly vulnerable locations. Georgia Power has near-term plans to shift the footprint of Jekyll Island's substation landward.	Entire Focus Area	Georgia Power, GEMA, FEMA, USACE, Jekyll Island Authority (JIA), Georgia Environmental Finance Authority	Define the flood risk and identify applicable measures. Reach out to lead stakeholders to confirm interest in assessing the problem for the chosen high-risk location. The MCL can be used to develop screening level cost estimate for alternative measures to address the problem. Potential measures for the electrical substation may include elevation of the structure, bulkhead, etc.	Needed, Ongoing	Mid	Local, GEMA, FEMA, Georgia Power, USACE
11	Land use, zoning, and policy	There is high probability of increased development classified with a medium-high and high-risk rating in the Economic Risk Assessment. Increased development may also increase the overall risk in the area (decreased imperviousness and increased population density). The development of a subdivision may increase a medium-risk area to a high-risk area at the southern tip of Brunswick. Land use rules could be updated to limit development in low-lying areas.	Entire Focus Area	Local County or City Governments, FEMA	Stricter codes can be adopted for high-risk areas along tidally influenced shorelines. New codes may include raising the base floor elevation or limiting development in flood-prone areas. Implement stricter state/local regulation on wetland development. New development should maintain natural land buffers to allow marsh migration as sea levels rise. Land buffers with valuable environmental resources should be targeted for conservation/preservation.	Needed	Mid	Local, GEMA, FEMA, GADNR, HUD
12	Drainage Improvements	A county-wide study is needed to determine all county and locally maintained roads under a certain elevation that are subject to flooding and/or at risk to sea level rise.	Entire Focus Area	Local County or City Governments, GEMA, FEMA, GDOT	Identify all county and locally maintained roads that are subject to or at risk for flooding. Identify potential resiliency measures, such as elevation and sea level rise modeling, to determine appropriate height for roads and mitigation measures.	Needed	Mid	Local, GEMA, FEMA, GDOT
13	Environmental resource protection, Shoreline stabilization/protection	Non-beach-quality material from the Brunswick Harbor may be beneficially used for ecosystem restoration. These include Regional Sediment Management (RSM) strategies such as thin-layer placement to elevate marshes wetlands or island habitat creation for wildlife and environmental benefits. Examples include expanding/reinforcing the existing Bird Island and construction of additional bird islands.	Entire Focus Area	GADNR CRD, USACE (O&M), Georgia Ports Authority (GPA), Jekyll Island Authority (JIA), Local County or City Governments	Find appropriate dredged material for habitat creation. Identify appropriate locations for additional habitat/bird islands. Determine costs to transport and place material.	Needed	Mid	Local, GADNR CRD, USACE, GPA, JIA
14	Drainage Improvements	Flooding/inundation occurs in socially vulnerable neighborhoods throughout the City of Brunswick and unincorporated Glynn County. Examples include reoccurring flooding adjacent to the terminus of Crispin Boulevard. Drainage improvements and continued buyouts and acquisition are necessary to protect people and property.	Entire Focus Area	Local County or City Governments, GEMA, FEMA, HUD	Identify vulnerable and repetitive loss properties from past storms. Coordinate with FEMA to find funding sources to institute buyouts and raise repetitive loss properties in high-risk areas. Conduct a study to define flood risk and identify potential measures such as NBBF and green stormwater infrastructure.	Needed	Long	Local, GEMA, FEMA
15, 16	Shoreline stabilization/protection	Conduct a shoreline assessment and implementation resiliency plan for Glynn County (phase 1 and 2).	Entire Focus Area	Local County or City Governments	The ongoing study, "Shoreline Assessment and Implementation Resiliency Plan," provides a broad listing of erosional and flood-prone areas within the city of Brunswick and the County-identified hotspots. Phase two of the Shoreline Assessment and Implementation Resiliency Plan will include a SLR and critical infrastructure assessment.	Ongoing	Short	Local
17	Land conservation and preservation	Identify locations for open space preservation. Preserve low-lying areas for increased flood resiliency.	Entire Focus Area	Local County or City Governments, GADNR CRD, National Oceanic and Atmospheric Administration (NOAA), The Nature Conservancy (TNC)	Conduct a study to identify areas for absorbing inundation. Development of an open space mapper can assist can potentially provide a Community Rating System rating improvement.	Planned	Mid	GADNR, USACE, NOAA
18	Risk Communication	Conduct a Georgia hurricane evacuation study to provide local government officials with information that could help them make hurricane evacuation decisions and provide emergency management officials with information for effective planning.	Entire Focus Area	USACE	The most recent Georgia hurricane evacuation study was completed in 2013. Efforts to complete the updated Georgia hurricane evacuation study are ongoing.	Ongoing	Short	USACE

Map Location	Theme	Description/Purpose	Location	Potential Lead Stakeholder(s)	Summary of Specific Actions Needed to Implement	Status (ongoing, planned, needed)	Timeframe ¹	Potential Funding Source
19	Environmental resource protection, Shoreline stabilization/protection	The Jekyll Marsh thin-layer placement pilot program supports coastal marsh and enhance coastal resilience. This RSM strategy could be expanded to other coastal wetland areas in the area.	Jekyll Island	USACE (Operations & Maintenance [O&M]), GPA, JIA, GADNR CRD, Environmental Protection Agency (EPA), NOAA	This is an on-going study. 5,000 cubic yards of O&M dredged material from the Atlantic Intercoastal Waterway (AIWW) was placed into marsh adjacent to Jekyll Creek using thin-layer placement methodology. Monitoring is being conducted to determine the effects of the thin-layer placement.	Ongoing	Short	USACE, GPA
20	Land use, zoning, and policy	Promote property buyouts/acquisitions of Vulnerable/repetitive loss properties on Jekyll Island adjacent to North Beachview Drive.	Jekyll Island	JIA, GADNR CRD, GEMA, FEMA	Vulnerable/repetitive loss properties adjacent to North Beachview Drive should be acquired and converted to natural open spaces for absorbing inundation and providing wildlife habitat.	Needed	Long	FEMA
21	Shoreline stabilization/protection	The central and southern portions of Jekyll Island have been historically understudied in terms of beach/dune processes. Conduct a study that identifies focal areas of concern on the south end of Jekyll Island and develops conceptual design of potential engineering solutions.	Jekyll Island	JIA, GADNR, USACE, GPA	Conduct a study to identify focal areas of concern in the southern portion of Jekyll Island. Identify beach-quality cost-effective sand sources for Jekyll Island. Potential to enhance existing dune system or create dunes in areas presently lacking to provide an inundation buffer to upland development.	Needed	Mid	JIA, State of Georgia, USACE
22, 23	Shoreline stabilization/protection	Address erosion in the northern portion of Jekyll Island while preserving the unique characteristics of the island. Identify potential RSM opportunities to support this effort. Strategy 1: Conduct Jekyll Island beach nourishment at the north end of island with possible sand sources at the channel entrance, including sediment traps/harbor/channel dredging/offshore. There is an RSM opportunity in the Jekyll Island northern littoral zone. Strategy 2: Sand placement along northern side of Jekyll Island using shoal attachment/nearshore placement/traditional renourishment (approximately 1 million cubic yards). Possible sand sources at the entrance channel include sediment traps/harbor/channel dredging/offshore.	Jekyll Island	JIA, GADNR, USACE, GPA	Strategy 1: This involves a 2,200-foot shoal attachment and nearshore placement for beach renourishment (approximately 400,000 cubic yards of sand). Evaluate sediment quality of potential beneficial use sources and determine benefit and cost of using that source. Strategy 2: This is a 10,000-linear foot north beach renourishment (approximately 1 million cubic yards of sand). Identify a source of beach-compatible sand. May require a sand search study. Any measures to address erosion in the northern portion of Jekyll Island must consider the preservation of the iconic shoreline of Driftwood Beach.	Needed	Mid	JIA, State of Georgia, USACE
24	Cultural resources protection, Shoreline stabilization/protection	Preserve at-risk historic and archaeological resources on Jekyll Island, e.g., preservation of Horton House and adjacent DuBignon Cemetery.	Jekyll Island	JIA, GADNR CRD, GADNR HPD	Identify potential measures to protect the archaeological sites. Measures may include NNBF such as living shorelines, or the addition of riprap to absorb shoreline wave energy and reduce erosion.	Needed	Short	JIA, State of Georgia, USACE
25	Shoreline stabilization/protection	Repair Northloop trail and historic district trail. Active erosion hazard is affecting access to outdoor recreation opportunities.	Jekyll Island	JIA, GADNR, USACE	Identify potential measures to protect trail stability. Measures may include elevating or relocating trail. Potential measures along shorelines may include living shorelines or riprap. These measures may also provide Coastal Storm Risk Management (CSRM) benefits to adjacent upland infrastructure.	Ongoing, Needed	Short	JIA, State of Georgia, USACE
26	Shoreline stabilization/protection	Address area of active erosion near South Beachview Drive that can impact the roadway. CSRM Measures are necessary to provide long term protection to the road.	Jekyll Island	JIA, USACE, GPA	Identify potential measures to protect South Beachview Drive from active erosional forces. Measures may include beach nourishment or construction of dunes.	Needed	Short	JIA, State of Georgia, USACE
27	Shoreline stabilization/protection	Use a study and sediment transport model to assess viability of near shore placement and engineered onshore shoal attachments at Jekyll Island.	Jekyll Island	JIA, USACE, Academia	Define the study area, determine boundary conditions, and develop different shore placement alternatives to be modeled.	Needed	Mid	JIA, State of Georgia, USACE
28	Shoreline stabilization/protection	Conduct a study to quantify the thickness of beach quality sand deposits seaward of Jekyll Island.	Jekyll Island	JIA, USACE, Academia	Perform sand search to characterize sand resources, including collection of geophysical data and geotechnical borings and evaluation of permitting requirements to develop identified resources that could be used without interference with the natural nearshore shoaling system.	Needed	Mid	JIA, State of Georgia, USACE

Map Location	Theme	Description/Purpose	Location	Potential Lead Stakeholder(s)	Summary of Specific Actions Needed to Implement	Status (ongoing, planned, needed)	Timeframe ¹	Potential Funding Source
29	Environmental resource protection, Shoreline stabilization/protection	Protect the undeveloped Sea Island Spit located at the southern end of Sea Island. This area contains important seabird habitat.	Sea Island	Local County or City Governments, GADNR CRD, Academia	Identify potential funding sources. Identify measures to protect or increase accretion at the sea island spit. Measures may include beach renourishment and offshore living shoreline/breakwater.	Needed	Short	Local, GADNR
30	Shoreline stabilization/protection	Expand Back River artificial oyster bed project, phase 1. There is potential to utilize NNBF measures similar to this in other areas of the county.	St. Simons Island	GADNR CRD	Phase 1 of project was completed May 2020. GADNR CRD placed approximately 3,700 bags of recycled shells on the east bank of the Back River near the F.J. Torras Causeway. This multipurpose project provides essential fish habitat, new oyster growth, and protects against riverbank erosion.	Ongoing	Short	DNR, Coastal Conservation Association Georgia
31	Drainage improvements	Flooding issues are on the Southern portion of Frederica Road in St. Simons Island and adjacent communities. Analyzing sea level rise scenarios to better address long-term solution to the flooding problems may be necessary.	St. Simons Island	Local County or City Governments	Define flooding and costal storm risk and identify measures to address the risk to critical infrastructure. Measures may include raising the road elevation or improving drainage.	Ongoing	Short	Local
32	Shoreline stabilization/protection	Maintain existing armoring and shoreline protection at Gould's Inlet. The public parking area and the public access point suffered from overwash during the last two major storm events. Additional protections, such as dune construction, may help the revetment minimize storm surge and inundation during storms. Area has become increasingly important shoreline bird habitat.	St. Simons Island	Local County or City Governments	This is an ongoing effort to maintain 1960s revetment structure along the St. Simons Island shoreline, including Gould's Inlet. Determine the benefit of additional measures such as dune construction in conjunction with revetment repair.	Ongoing	Short	Local
33	Shoreline stabilization/protection, Risk Communication	Protect the public beach access locations at St. Simons Island through the construction of protective dunes. Constructed dunes will also serve as a flood reduction strategy for adjacent upland homes and infrastructure and supplement the planned rock revetment repairs.	St. Simons Island	Local County or City Governments, GEMA, FEMA, USACE	Identify beach-quality cost-effective sand sources for St. Simons Island. Outreach to residents throughout the county may be helpful to better educate the community on flood risk benefits and recreational benefits of beach nourishment/dune creation. Establish dune system to provide an inundation buffer to upland development.	Needed	Mid	Local, USACE
34	Shoreline stabilization/protection, Risk Communication	Add beach nourishment/dune protection on the southern tip of St. Simons Island to provide much needed flood risk and recreational benefits.	St. Simons Island	Local County or City Governments, USACE, DNR	There is little interest by the public for beach nourishment in the area and past contention to CSRMs proposals. Outreach to residents throughout the county may be helpful to better educate the community on flood risk benefits and recreational benefits of beach nourishment/dune creation.	Needed	Mid	Local, USACE
35	Shoreline stabilization/protection	There are active erosional areas impacting Ocean Boulevard. Recently completed efforts have included headwall and tide flap repairs. There is potential for NNBF and structural/hybrid measures vs. continued repairs of the headwall.	St. Simons Island	Local County or City Governments, GDOT, GEMA, FEMA, USACE	Identify measures to protect areas of Ocean Boulevard with erosional concerns. Measures may include repair of existing headwall, NNBF such as living shoreline, and additional structural features such as placement of riprap to repair areas of active erosion.	Needed	Short	Local, GDOT, GEMA, FEMA, USACE
36	Cultural resource protection, Shoreline stabilization/protection	Fort Frederica National Monument is at risk because of erosion and inundation. Archaeological resources can be irrevocably lost if no CSRMs measures are implemented.	St. Simons Island	Local County or City Governments, USACE, GADNR, GADNR HPD	Identify potential measures to protect the Fort Frederica archaeological site. Measures may include NNBF such as living shorelines, or the addition of riprap to absorb shoreline wave energy and reduce erosion.	Needed	Short	National Park Service, USACE

¹ short = <2 years; mid = 2-10 years; long = > 10 years



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6. Recommendations

The focus area action strategy was developed to advance the shared vision and manage increased coastal storm risk as a result of sea level rise in the Glynn County Focus Area as shown in **Figure 24**. The shared vision is the overarching goal of the FAAS, broadly representing problems and opportunities stakeholders wish to address in the focus area. Resultingly, FAAS goals and objectives support the shared vision. SACS key products and other stakeholders’ shared tools and data were used to support FAAS goals and objectives by assessing risk and identifying ongoing, planned, and needed actions to communicate and address the risk.



Figure 24: Focus Area Action Strategy Supports the Focus Area’s Shared Vision

Recommendations are made for either multi-agency action, USACE action, or consideration by the United States Congress (Congress) to advance specific actions resulting from analyses presented in this report and coordination with stakeholders throughout the focus area. Recommendations are organized into six categories, as shown **Figure 25**, and three implementation timeframes (near-, mid-, and long-term). Importantly, follow-on study efforts should incorporate an integrated approach to the maximum extent practicable, including consideration of structural, nonstructural, and NNBF measures, as well as the shared responsibility of all stakeholders to contribute to coastal storm risk management. Implementation timing is influenced by the degree of stakeholder collaboration needed, technical complexity of the recommendation, current momentum toward implementation, and other factors needed to implement the recommendation. Implementation timeframes include:



Figure 25: Recommendation Categories

- **Near-Term Implementation (<5 years):** These recommendations are generally less complex and have significant stakeholder momentum toward implementation. The recommendations generally maintain and adapt actions that are recognized to successfully manage coastal storm risk.
- **Mid-Term Implementation (5-10 years):** These recommendations may be more technically complex and/or require additional stakeholder coordination and collaboration for implementation. They advance emerging efforts to address coastal storm risk.
- **Long-Term Implementation (>10 years):** These recommendations typically require significant stakeholder coordination before implementation and may be the most challenging to implement on regional scales from technical, political, or social perspectives. Importantly, coordination and collaboration on these recommendations should not be delayed. The long-term timeframe is reflective of the time to implementation based on immediate action to advance these recommendations which include complex issues such as land-use, zoning, and building codes. Given the uncertainty surrounding impacts from sea level rise and other factors (e.g., development trends), long-term recommendations may require reconsideration prior to implementation.

Table 15 provides the recommendations for the Glynn County focus area.

Table 15: Recommendations for the Glynn County Focus Area

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Activities and Areas Warranting Further Analysis	Near-Term (<5 years)	Multi-Agency Action	Improve risk communication in Glynn County	<p>Community-based education on coastal storm risks and sea level rise within the county should be promoted through increased public outreach. As part of the Focus Area Visioning Meetings, stakeholders identified that the proposed implementation of Coastal Storm Risk Management (CSRM) measures such as beach nourishment has been a long-standing issue of contention within the Golden Isles. Without the support of the community, resiliency and risk management efforts are unlikely to be prioritized and progressed. Stakeholders are encouraged to use the publicly available SACS tools (e.g., Geoportal, Tier 2 Economic Risk Assessment) to assist in risk communication, and the SACS Coastal Program Guide to locate additional opportunities for funding. Potential lead stakeholders would include the Brunswick-Glynn County Emergency Management Agency and local governments.</p> <p>*This recommendation is applicable throughout all coastal counties within the planning reach.</p>	Stakeholder Collaboration

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Activities and Areas Warranting Further Analysis	Near-Term (<5 years)	Multi-Agency Action	Expand the Community Rating System (CRS) Open Spaces Explorer Application	<p>The CRS Explorer Application should be expanded to Glynn County. The CRS Open Spaces Explorer identifies parcels that currently qualify for Open Space Preservation (OSP) credit and calculates the points they provide, assists in identifying future open space in the floodplain, and serves as a flood-risk communication tool for residents and decision makers. Non-federal participants are encouraged to use the SACS Coastal Program Guide to locate additional opportunities to fund this effort. Potential lead stakeholders include The Nature Conservancy, local governments, and Georgia Department of Natural Resources (GADNR).</p> <p>*The CRS Explorer Application is presently in-use by neighboring Camden County. Expansion of, or similar efforts to the CRS Explorer Application are applicable and recommended throughout all coastal counties within the planning reach.</p>	Stakeholder Collaboration
Activities and Areas Warranting Further Analysis	Long-Term (>10 years)	Multi-Agency Action	Protect and preserve coastal wetlands	<p>Glynn County is situated on a low coastal plain with vast expanses of tidal marsh that surround most of the river corridors within the county. Continued preservation and legal protections of these natural features within the focus area will provide environmental benefits, reduce onshore storm impacts, and provide natural attenuation and infiltration of stormwater. Stricter local regulations on wetland development are encouraged. Potential lead stakeholders would include Glynn County, all local municipalities, and the GADNR.</p> <p>*This recommendation is applicable throughout all coastal counties within the planning reach.</p>	Guidance/Policy

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Regional Sediment Management Practices	Near-Term (<5 years)	USACE	Sustain and expand Atlantic Intracoastal Waterway (AIWW) operation and maintenance efforts to characterize beneficial use material	<p>Near-shore and non-beach-quality dredged material within the focus area should be beneficially used when feasible. Current USACE Regional Sediment Management (RSM) efforts include a study to characterize shoaled material and identify appropriate beneficial uses of dredged sediment along the AIWW. A consistent inventory of material quality and suitability should be shared with stakeholders to promote beneficial use of the dredged material. Continued sediment characterization efforts and collaboration to discuss opportunities with stakeholders such as Jekyll Island and St. Simons Island is recommended.</p> <p>*Characterization efforts can be expanded throughout the AIWW to inform sediment suitability for beneficial use and to engage potential stakeholders.</p>	Funding
Regional Sediment Management Practices	Near-Term (<5 years)	USACE	Beneficially use dredged maintenance material from the Brunswick Harbor on northern shoreline, Jekyll Island	The northern portion of Jekyll Island has experienced severe damage from recent coastal storms while the central and southern portions of the island have been historically understudied in terms of beach and dune processes. There is potential for RSM to provide beneficial use of sediment to address erosion and storm damage. The Jekyll Island Authority is encouraged to continue coordinating with USACE on the feasibility of this action.	Funding
Study Efforts (follow-on USACE feasibility study)	Long-Term (>10 years)	Congress	Federal participation in St. Simons Island CSRM	Alternatives for protection of St. Simons Island should be evaluated in a new study. This study would complement ongoing studies and actions in the focus area, which includes a two-phase countywide Shoreline Assessment and Implementation Resiliency Plan and the repair of the historical ocean-facing rock revetment known as the Johnson Rocks. To implement this recommendation, a non-federal sponsor (such as Glynn County) would need to request participation from USACE. Multi-stakeholder coordination and leveraging of applicable existing data into follow-on actions would be required. Continued collaboration to discuss these opportunities is recommended.	New Study Authority

Authority Category	Implementation Timing	Recommendation For	Recommendation	Description	Next Step to Implementation
Study Efforts (follow-on studies)	Long-Term (>10 years)	Multi-Agency Action	Perform a comprehensive wastewater infrastructure improvements study in Glynn County	There are several areas where critical infrastructure, including water and wastewater systems, are exposed to coastal storm hazards and are vulnerable to sea level rise. Academy Creek wastewater treatment plant (WWTP) (Brunswick), Dunbar Creek WWTP (St. Simons Island), and Jekyll Island WWTP are examples of wastewater systems located in highly vulnerable locations that have been emphasized during stakeholder engagements. Adaptation options for water infrastructure should be further explored to identify applicable measures to address at-risk infrastructure. This study should leverage findings from the Brunswick-Glynn County Joint Water & Sewer Commission, 2017 Glynn County Climate Resilience Adaptation Report, and the Glynn County Shoreline Assessment and Implementation Resiliency Plan. Continued collaboration to discuss these opportunities and identify potential partnerships and lead stakeholders is recommended.	Identify Likely Lead Stakeholder(s)
Study Efforts (follow-on studies)	Long-Term (>10 years)	Multi-Agency Action	Perform a county-wide assessment of road flooding in Glynn County	Many vital roadways located within the low-lying coastal flood plains are susceptible to flooding from riverine and tidal flooding. With respect to sea level rise projections, potential short-term and long-term measures and solutions should be identified to address these at-risk roadways. The F.J. Torras Causeway, Riverside Drive, Frederica Road, and Ocean Boulevard are examples of affected roads that have been emphasized during stakeholder engagements. This recommendation addresses the problem of nuisance flooding impacting roads in low-lying areas. Initial coordination should take place between stakeholders needed for engagement in this type of study. Potential lead stakeholders would include Georgia Department of Transportation (GDOT) and Glynn County. Continued collaboration to discuss these opportunities and identify potential partnerships is recommended. *This recommendation is applicable throughout all coastal counties within the planning reach.	Identify Likely Lead Stakeholder(s)

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<http://dx.doi.org/10.1175/WCAS-D-14-00049.1>



NATIONAL EXPLORER

MUNICIPALITY REPORT Tree Equity Score

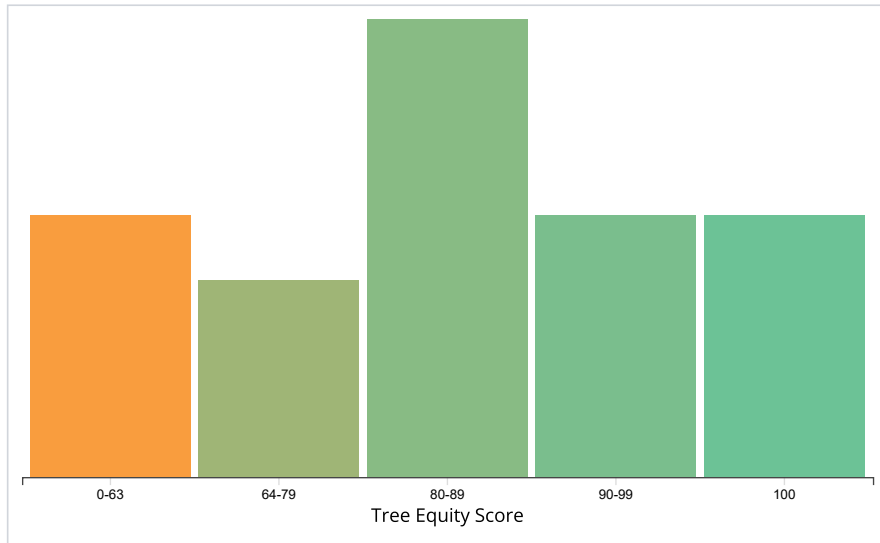
Brunswick

Tree Equity Score: 81

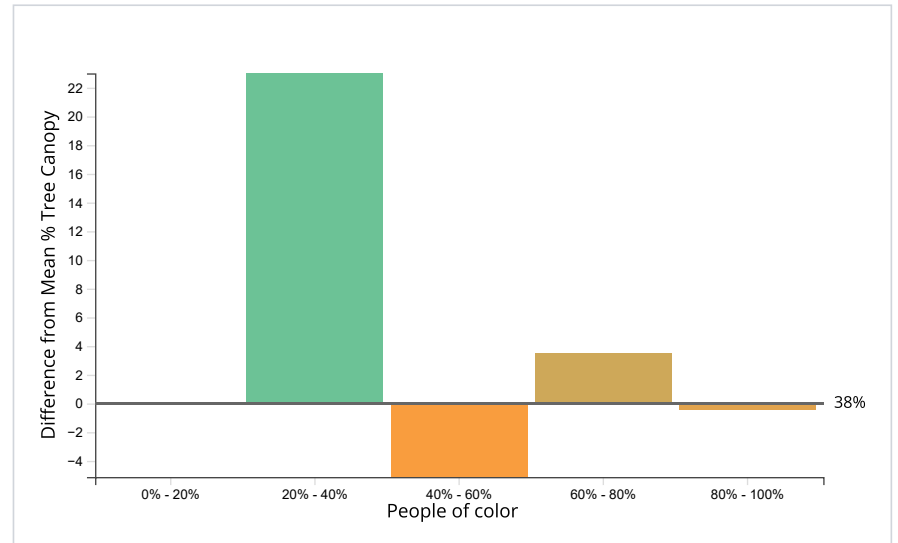
Urbanized Area Summary

Urbanized area population	24,103	Seniors	16%
People of color	67%	Children	25%
People in poverty	62%	Unemployment rate	9%

Distribution of Tree Equity Scores



Tree Canopy % vs. People of Color %



Each bar represents the mean tree canopy % for block groups within the specified range of people of color. The amount above or below the thick horizontal line indicates the difference from the area-wide mean canopy %.

Rhode Island

Greater Phoenix

San Francisco Bay
Area

Greater Houston

Greater Detroit

Washington, DC
Metro

Tree Equity Score

A map of tree cover in any city in the United States is too often a map of race and income. This is unacceptable. Trees are critical infrastructure that every person in every neighborhood deserves. Trees can help address damaging environmental inequities like air pollution.

The score evaluates data from each neighborhood's:



Existing tree canopy



Population density



Income



Employment



Surface temperature



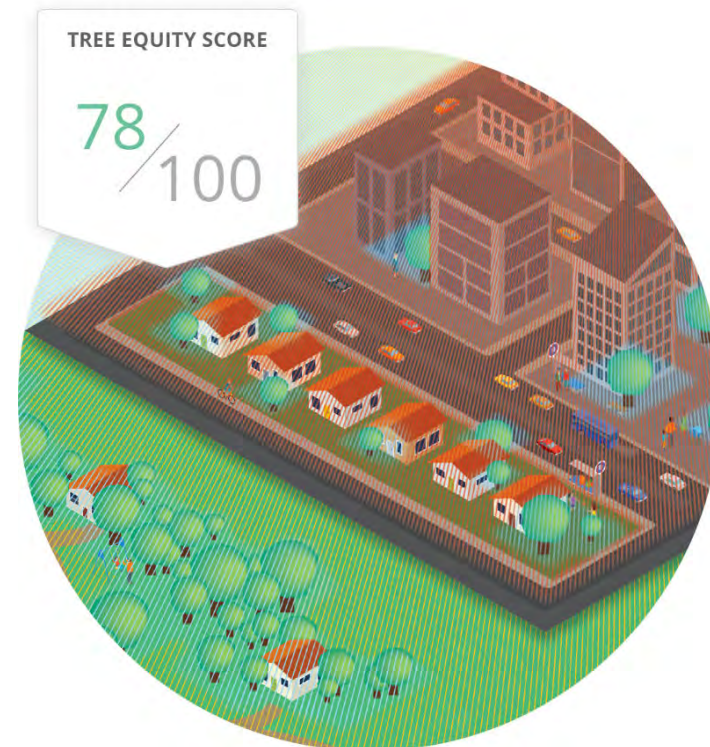
Race



Age



Health



These metrics are combined into a single score between 0 and 100. A score of 100 means that a neighborhood has achieved Tree Equity. To learn more, visit our [methodology page](#).

Introducing the Tree Equity Score Analyzer

American Forests has developed the Tree Equity Score Analyzer (TESA) for cities and states that want to dive deep into decision-making around Tree Equity Scores.

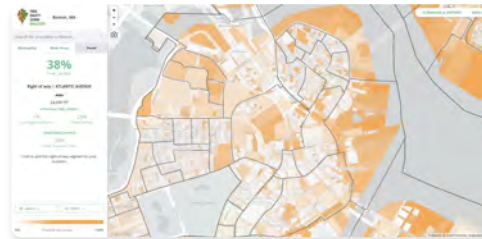
Features

Explore municipalities, city parcels, and more.

Dive deep with environmental, climate, demographic, and health data.

Build, save, and share custom tree planting scenarios.

Learn more



TESA Boston

LAUNCH



TESA Rhode Island

LAUNCH



TESA Richmond, VA

LAUNCH

Join the Movement

Want to work with American Forests to calculate the Tree Equity Scores for your neighborhood? Want to create a TESA for your city or state? Reach out to our team today to find out how we

Every gift helps American Forests restore damaged wildland and urban forests – for people, for wildlife, for the planet. Give today and help us protect forests for tomorrow. A contribution of any amount can have a big impact.

can work together! And join the conversation on social media, using #TreeEquity.

[DONATE TODAY](#)

[JOIN US](#)



1220 L Street, NW, Suite 750
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Tree canopy data provided by [EarthDefine](#).

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APPENDIX S



ParkServe®



July 10, 2023

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Project Areas

Brunswick, GA - City Level Report

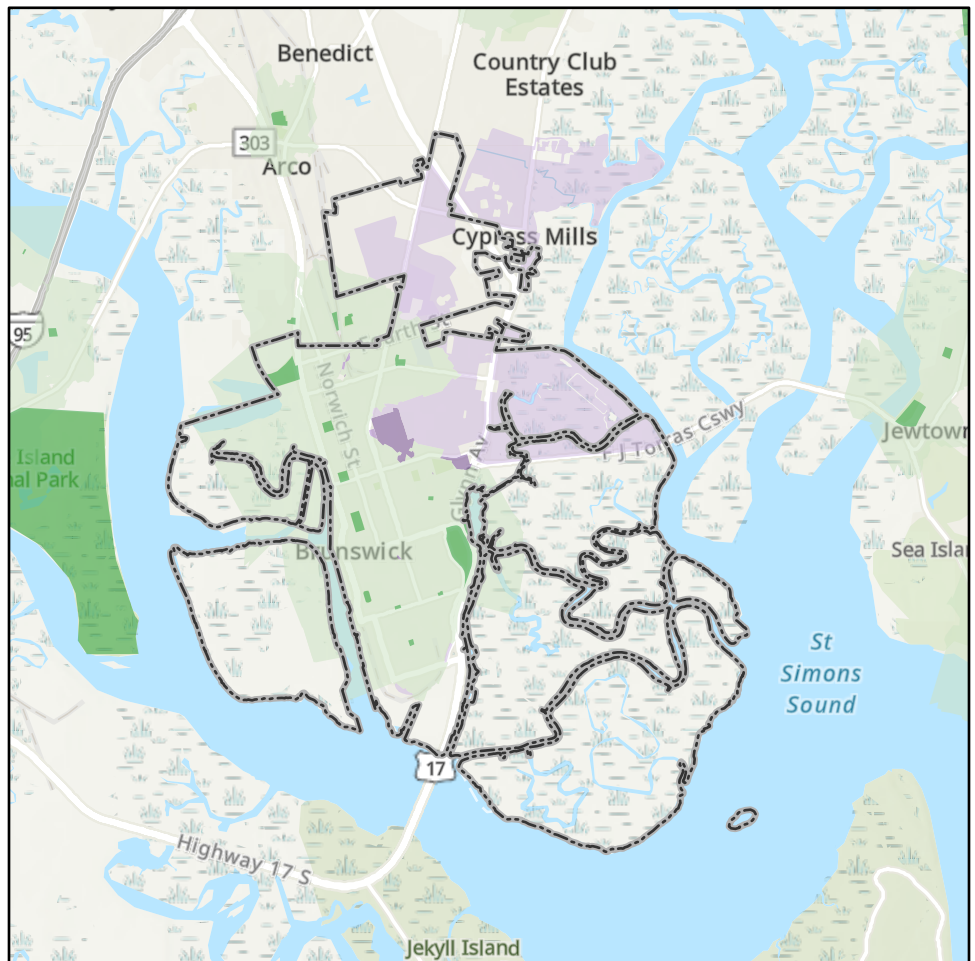
All statistical results are aggregated for the listed project areas and their service areas. Service areas are based on 10-minute (1/2 mile) walk times from project access points defined for each project area and based upon the walkable network.

City Statistics Current

City: Brunswick, GA	
Park Acres	109
Total Population	15,098
Served Population	10,184
Percent Served	67.5%

Legend

- City Boundary
- Parks
- Service Areas
- Priority areas for new parks
- Very high priority
- High priority
- Moderate priority

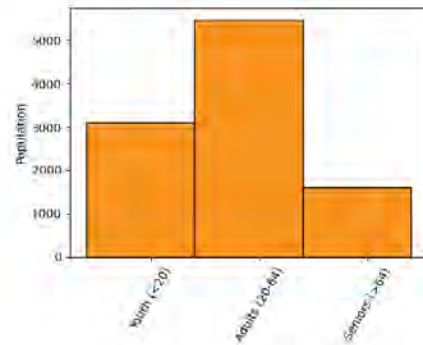


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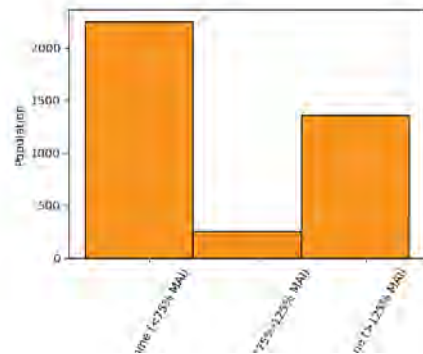
Population	Within a 10-minute walk
Total Population	10,184

Age	Within a 10-minute walk
Children (less than age 20)	3,105
Adults (age 20 to age 64)	5,481
Seniors (age 65 and up)	1,599

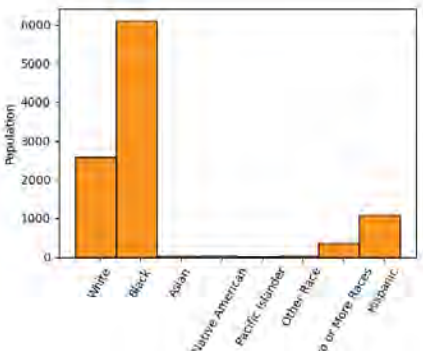


Households by Income	Within a 10-minute walk
Low income	2,247
Middle income	255
High income	1,362

(Generated from urban area median income)



Race/Ethnicity	Within a 10-minute walk
White*	2,563
Black*	6,102
Asian*	26
Native American*	22
Pacific Islander*	2
Other Race*	33
Two or More Races*	354
Hispanic	1,082



* Excludes those that report Hispanic origin (which is captured separately from race by the U.S. Census)

Demographic information is derived from ESRI 2022 Demographic Forecast Block Groups data.

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