

CHAPTER **3**

Neighborhood Vision

NEIGHBORHOOD VISION

The Neighborhood Plans express the community's vision and priorities for the future, setting a framework for how the Glenwood, Millville and St. Andrews neighborhoods could rebuild, change and grow over the coming years. Although this community has been through recent challenges, out of the challenges a renewed optimism for the future has emerged, a desire to not simply return to pre-storm conditions, but to exceed them and become an even better place to live, work, and visit. The unique vision and strategies for each neighborhood are described in subsequent chapters; several themes are consistent for all neighborhoods:

Create Complete Neighborhoods

The neighborhoods themselves should become more complete with infill development in walkable centers including needed shops and services as well as homes, gathering places and recreational amenities. Commercial corridors should be retrofitted to stimulate the economy and better meet the needs of the communities that have grown around them. A variety of housing types are provided to meet the needs of many households. Programs and policies aligned to the neighborhood vision should support small businesses, entrepreneurs, and opportunities for workforce development.

Create Great Streets

The neighborhoods should be connected by great, tree-lined streets that are designed to be safe and comfortable for people in cars, riding bikes and walking on sidewalks and trails. City policies should support the design of streets consistent with the land uses and neighborhood context that surround them.

Create Resilient Open Spaces & Infrastructure

The neighborhoods should have a robust, resilient infrastructure to support existing homes, businesses and envisioned new additions. This includes a network of green and blue spaces to help withstand storms, keep the bay healthy, and support quality of life for residents. It also includes investing in robust broadband service that provides access to all residents and businesses.





A City of Complete Neighborhoods

The vision for the future of Panama City is to become a city of complete neighborhoods, with walkable centers that include places to gather and for recreation, with a mix of land uses that provide daily services and opportunities for employment, and with variety of housing types. To achieve the vision for complete neighborhoods, this plan recommends revitalizing each neighborhood's walkable mixed-use centers; implementing a housing strategy that accommodates existing and future households of varying incomes and needs; and supporting local communities through workforce development and small business / entrepreneur programs.

The Glenwood, Millville and St. Andrews areas as they exist today are a result of planning and decisions of previous leaders dating back to the early 1900s. The city's downtown and its historic neighborhoods originally were settled as independent towns, each with its own mixed-use community center. St. Andrews had its beginnings in the early 1800s, incorporating in 1908. Sawmill interests founded Millville in the late 1800s, which incorporated in 1913. Panama City was founded between the two; with an active port and railroad, the town became the focus

of commerce and Bay County seat in 1914. The Glenwood neighborhood north of downtown was historically the center of culture and commerce for Panama City's African American community with businesses lining what is today Martin Luther King Jr. Boulevard. In 1926, the three towns consolidated into one city. A map from the 1940s shows the basic settlement pattern with development along the waterfront surrounding the original towns and key connectors such as 15th Street, 11th Street, and US Highway 98 linking them together.

Today's City zoning map contains evidence of past conditions with mixed-use downtown districts in Downtown Panama City, St. Andrews and Millville, and commercial zoning lining primary corridors such as MLK Jr. Boulevard and 15th Street. It also demonstrates a policy shift to single-use, auto-oriented settlement patterns, with large areas of commercial land surrounding 23rd Street and single-use residential neighborhoods further to the north. This trend, consistent with national trends dating from the 1950s, moved the focus of commerce away from the original towns to new suburban areas.

Five Basic Components of Complete Neighborhoods:

» **Identifiable Center & Edge**

One should be able to tell when they have arrived in a neighborhood, and when they reach its center. The center has places where the public feels welcome and encouraged to congregate. The best centers possess a mix of uses, providing some of people's daily needs while fostering social connections.

» **Walkable Size**

The size of a neighborhood should be suitable for walking. Most people will walk approximately one-quarter mile (5 minutes) before turning back or opting to drive or ride a bike. The Glenwood, Millville and St. Andrews areas are comprised of multiple walkable neighborhoods.

» **Mix of Land Uses & Housing Types**

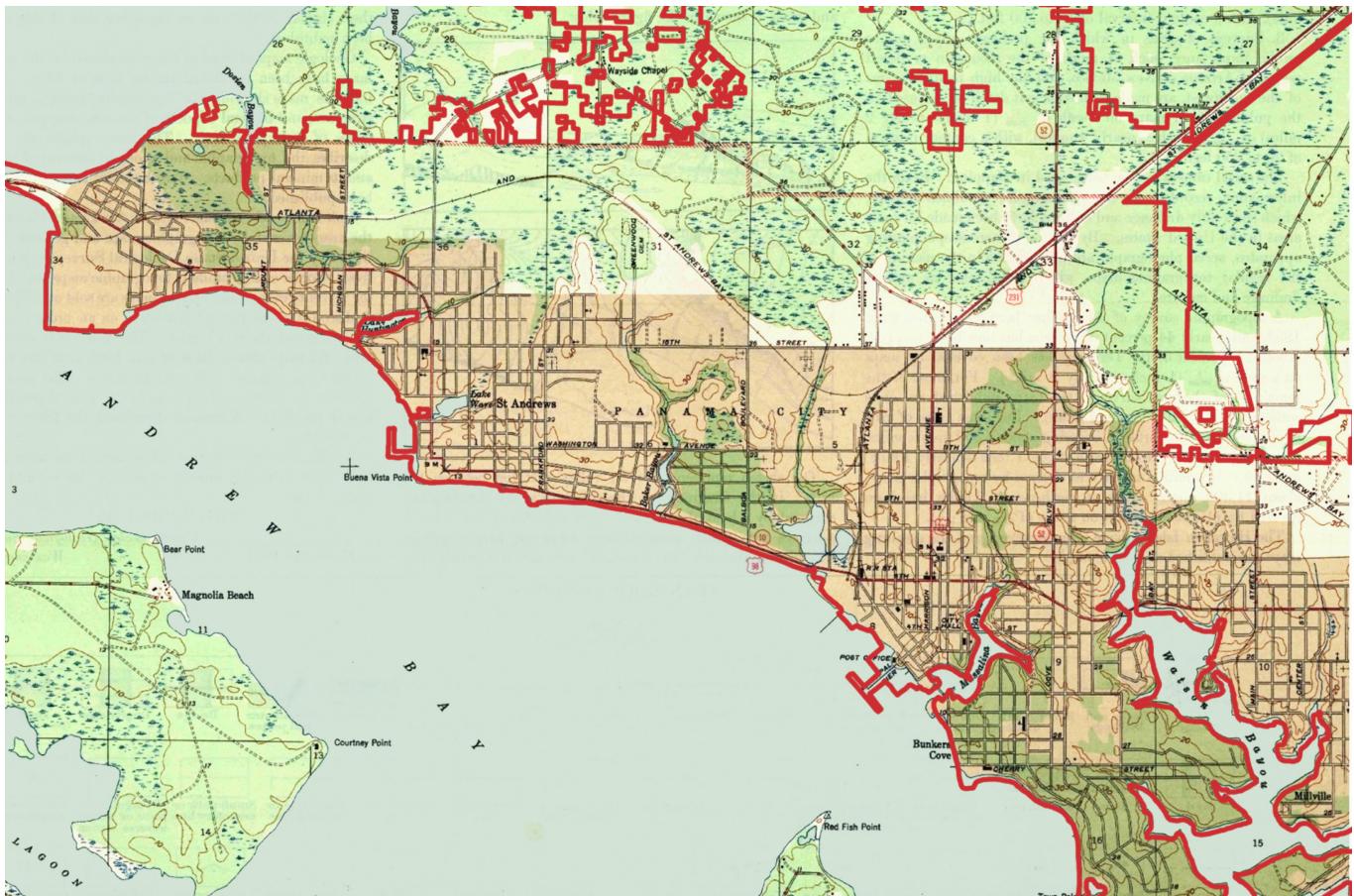
Great neighborhoods have a mix of land uses and housing types that enable residents to dwell, work, socialize, exercise, shop, and find some daily needs and services within walking distance.

» **Integrated Network of Walkable Streets**

A network of streets allows pedestrians, cyclists, and motorists to move safely and comfortably throughout the neighborhood. The street network forms blocks that set up logical sites for private development, provides routes for multiple modes of transportation, and provides accommodation for non-motorized alternatives.

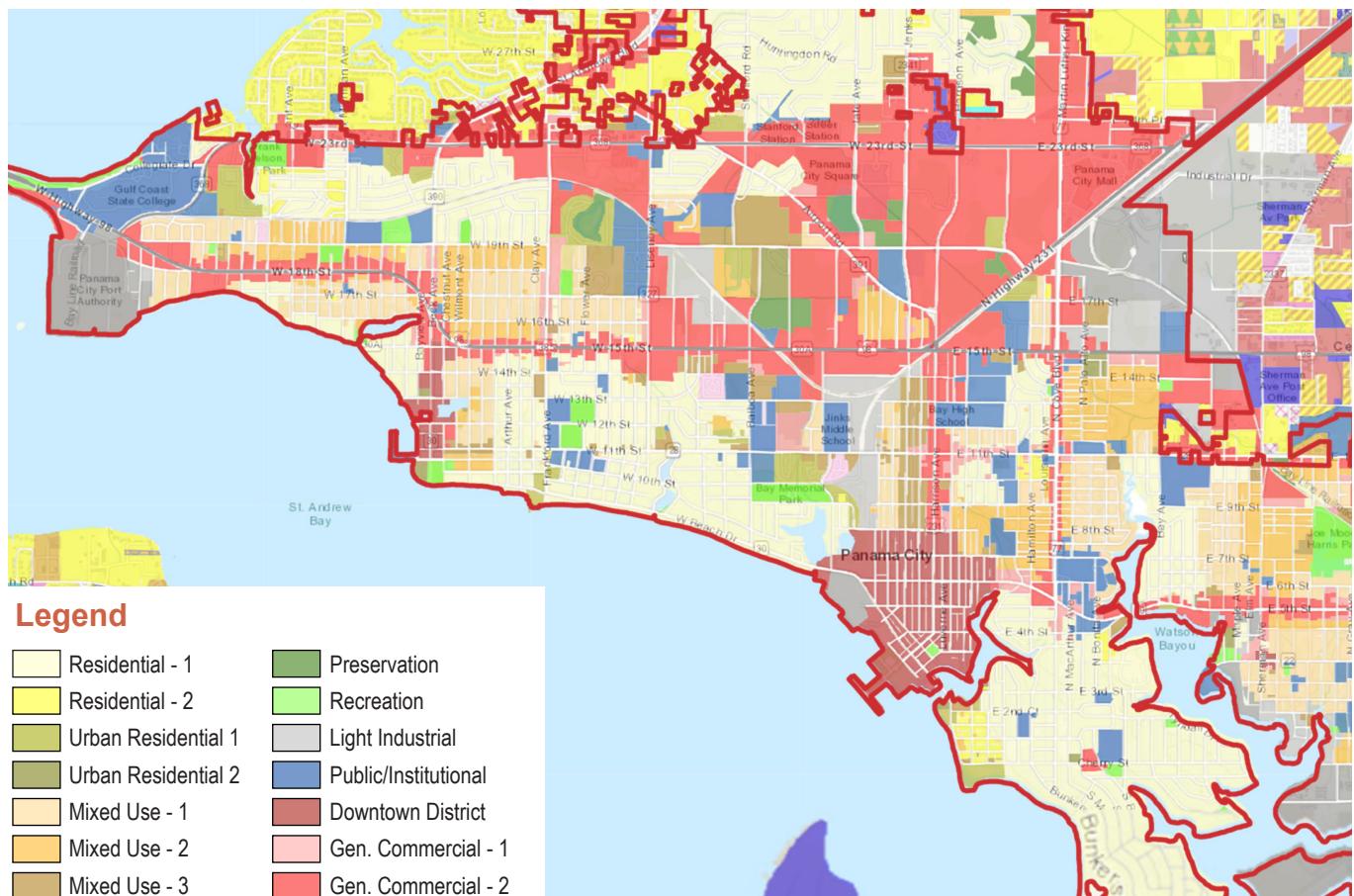
» **Special Sites Reserved for Civic Uses**

In complete neighborhoods, some of the best real estate is set aside for community purposes. Unique settings such as terminated views or locations with greater activity should be reserved for landmark buildings that will act as permanent anchors for community pride. Similarly, special sites should be set aside for parks, greens, squares, plazas, and playgrounds (each of which has its own distinct character). Each neighborhood should have one special gathering place at its center.



Above: 1943 map of Panama City and surroundings (red outline indicates 2020 City limits)

Below: 2020 City Zoning Map



Legend

- [Light Yellow Box] Residential - 1
- [Yellow Box] Residential - 2
- [Light Green Box] Urban Residential 1
- [Dark Green Box] Urban Residential 2
- [Light Orange Box] Mixed Use - 1
- [Orange Box] Mixed Use - 2
- [Brown Box] Mixed Use - 3
- [Dark Green Box] Preservation
- [Light Green Box] Recreation
- [Grey Box] Light Industrial
- [Blue Box] Public/Institutional
- [Red Box] Downtown District
- [Pink Box] Gen. Commercial - 1
- [Dark Red Box] Gen. Commercial - 2

Complete Neighborhoods

Based on observation of existing conditions, the future vision, and the five components of complete neighborhoods, this diagram defines multiple neighborhoods within each study area.

St. Andrews

The area surrounding the St. Andrews historic downtown, or Greater St. Andrews, consists of several compact neighborhoods. Pocket neighborhoods made up of several blocks come together at major roads, such as Frankford Avenue and 15th Street, where businesses, services and civic uses are located. Lake Huntington and Oaks by the Bay Park are key gathering spaces. Each neighborhood is within proximity to the central downtown district and connected by a grid of streets. St. Andrews School and Oakland Terrace Elementary School are two important civic uses that anchor the neighborhood fabric.

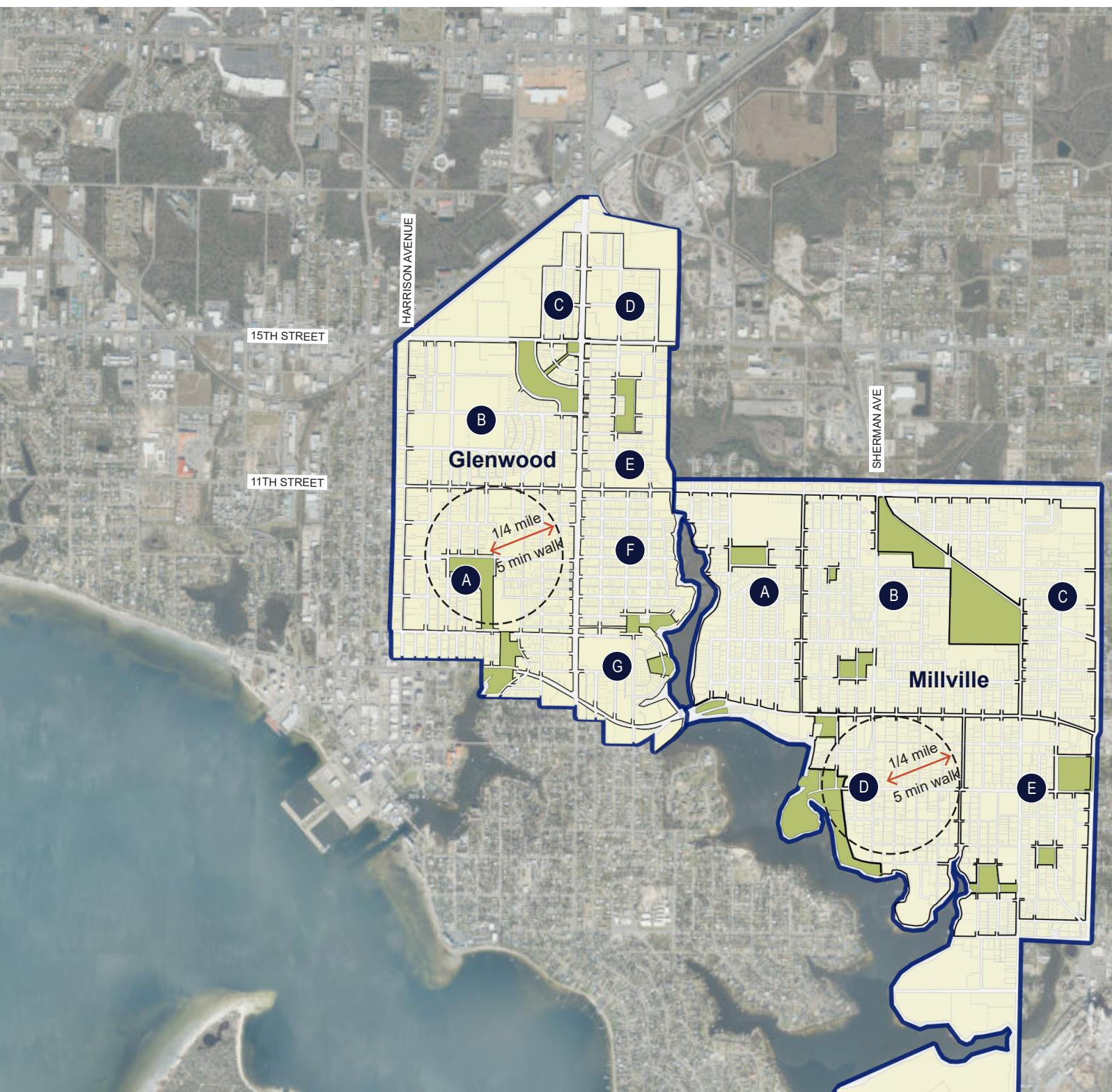
Glenwood

Today's Glenwood lacks a defining center and edge. Primary roads are wide and inhospitable to walking and biking. Glenwood does have a strong presence of civic buildings and institutions throughout, including Bay High School, Martin Luther King Jr. Center (to be rebuilt), A.D. Harris Center, Ascension Sacred Heart Bay Medical Center, and many City-owned and County-owned facilities. The future condition shows well delineated neighborhoods with distinct open spaces, and strong edges formed by prominent, walkable streets.

Millville

Greater Millville is larger than the other study areas, and consists of a collection of smaller neighborhoods. Where these neighborhoods come together, business and other commercial uses line the edges of major streets. Barriers today, these seams should become more walkable and connect the blocks on either side. While Millville currently has a number of open spaces, they are not evenly distributed. The future vision introduces pocket parks and stormwater parks to balance open space among the neighborhoods, promoting connectivity and walkability. Many churches are located in the neighborhoods, and Bay County Public Schools occupies an elementary, middle, and high school along 11th Street as well as Margaret K. Lewis School along East Avenue. Additionally, public boat launch sites provide access to the water, which is an important part of Millville's identity.





The three study areas are subdivided to show that many smaller neighborhoods make up a collective community. Each lettered neighborhood area contains many of the components of complete neighborhoods: an identifiable center and edge, a walkable size (five minute walk from center to edge), a mix of land uses and housing types, a network of walkable streets, and special sites reserved for civic uses.

Revitalizing Panama City's Historic, Walkable Neighborhood Centers

Today, there is a desire to revitalize Panama City's historic centers and reinvigorate their surrounding neighborhoods. The Neighborhood Plans are an opportunity to organize City priorities, policies and programs to direct rebuilding and future growth to fit the community's vision. Changes to land development regulations, demonstration of development potential on publicly-owned land, and incentives for private development can be coordinated according to plan strategies and illustrations to implement this idea. The map on this page illustrates the general vision for future development in the Neighborhood Plans study areas, and should be used to inform updates to the City's zoning code as well as context classification assignments for neighborhood streets.

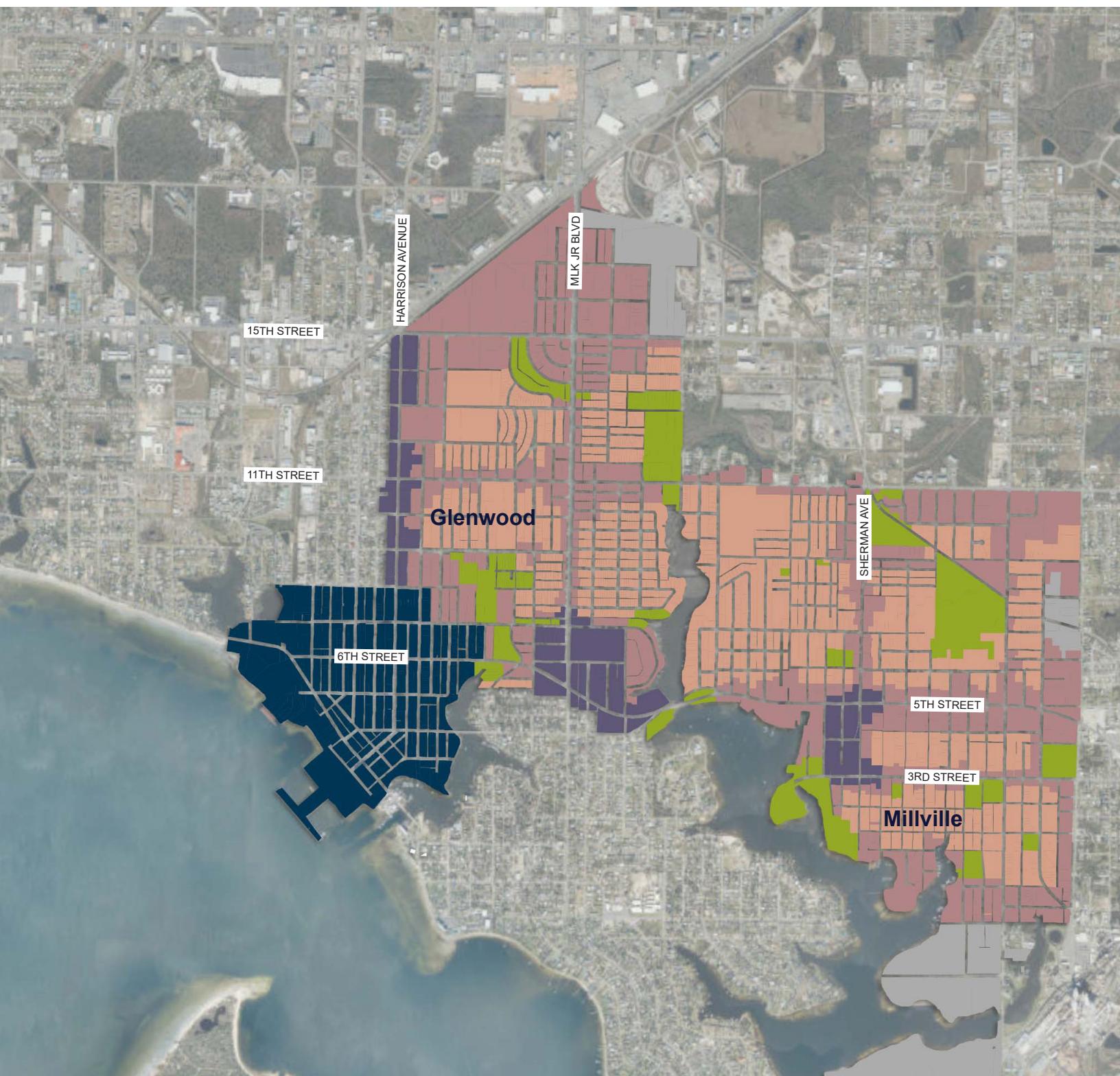
Neighborhood Downtown areas are where the greatest mix of uses and intensity of development and commerce is anticipated. These areas are generally positioned around the existing / historic business districts along Harrison Avenue in Glenwood, near 3rd Street and Sherman Avenue in Millville, and surrounding Beck Avenue in St. Andrews. Neighborhood Downtown areas should be the most walkable parts of town — the focus of activity and community gathering, with mixed-use buildings lining sidewalks and formal community gathering spaces.

Neighborhood General areas contain a mix of commercial and residential uses, often connecting neighborhood centers. The ability to safely walk, bike and drive along these corridors is critical. There is more variety in development patterns in these areas with some larger gaps or setbacks between buildings. Neighborhood General areas should welcome, to the extent the market supports, a range of housing types and neighborhood-serving commercial uses within a short walk of surrounding homes.

Neighborhood Residential areas have less activity than other parts of the neighborhood. These areas are primarily residential, although they may contain small increments of mixed-use such as live/work units or a corner store. Residents are connected by tree-lined streets and sidewalks to the downtown and general areas.

Each neighborhood also contains parks and open spaces, including low-lying areas that were historically part of the bayou drainage system.





Updates to Land Development Regulations

Realizing future development in walkable neighborhood centers as described in this plan will require updates to land development regulations. Each neighborhood chapter includes a description of existing zoning requirements that prohibit development as illustrated in the plan, as well as additional standards that could be introduced to give more predictability to the form of future development. General recommendations that apply across all neighborhoods are described below. Updates to zoning could be accomplished by creating new districts devised specifically to match each neighborhood vision; a draft of proposed zoning updates is included in **Appendix A**.

- **Replace General Commercial Zoning on Neighborhood Corridors.** Panama City's General Commercial zoning prohibits residential development. Given the amount of commercially-zoned properties across the City, there is not enough market demand to line each corridor with businesses, so the likely result would be vacant buildings and lots and loss of the synergy that comes from a cluster of activity. Future businesses would be better served by focusing commercial activity in nodes. To encourage revitalization, a mix of uses (including residential) should be permitted in Glenwood, Millville and St. Andrew's commercial corridors. In addition, the same commercial zoning standards that shaped development along the 23rd Street corridor apply to General Commercial corridors in the historic neighborhoods. The prescribed setbacks are inconsistent with the neighborhood vision for walkable urban settlements; on shallow lots along MLK Jr. Boulevard, the setbacks also result in some lots that are unbuildable.
- **Revise Building Setbacks, and Add Parking Setbacks.** The placement of buildings and parking directly relates to the walkability of a place. Buildings with active uses lining sidewalks encourage pedestrian activity, essential to a traditional business district. Existing City practice calls for a 20' setback from both frontages on corner lots to preserve a clear visibility triangle for drivers. This type of standard originated in suburban settings, where faster moving traffic and less on-street parking dictates a need for a larger field of vision to give adequate time to slow or stop. This standard should only be applied in a neighborhood downtown context in rare, unique circumstances. Otherwise, physical cues such as buildings closer to the street, narrower vehicle lanes, and shorter block lengths reduce vehicle speeds.
- **Add Standards to Support Walkability.** Additional provisions should be added to zoning district updates to shape future development according to the vision; examples are included on the next page.
- **Adjust Parking Ratios.** Adequate parking is needed to support business and ensure that parked cars do not intrude on surrounding residential neighborhoods. However, too much parking is harmful to the character of historic settlements; it sterilizes what should be an active public realm. Minimum parking requirements in Panama City are currently one-size-fits-all; a new standard for walkable, traditional neighborhoods should be established (in contrast to requirements for auto-oriented suburban areas). This could include reducing or eliminating required parking for small lots or for historic buildings. More about parking regulation and policy updates is included in the St. Andrews chapter and Appendix B.
- **Allow and Encourage “Missing Middle” Housing Types.** The vision anticipates a variety of infill housing, seeking development of affordable and market-rate units compatible with existing homes. The goal is to preserve neighborhood character and provide opportunities and support for existing residents to remain in place, while also attracting new households of a variety of ages and income levels. Existing residential district standards, including minimum lots sizes and setbacks, are not consistent with the historic settlement forms and lot sizes present in the neighborhoods. Eliminating the requirement for detached units to be on individual parcels, and regulating density by building design (building height and massing) rather than units per acre, are examples of adjustments to allow and encourage more variety in building types (duplex, triplex, townhouse, cottage courts and small apartments).
- **Update Stormwater Requirements.** Requirements for on-site stormwater retention constrain development on neighborhood lots. Ideas for shared solutions and updates to the City Code are described in the *Resilient Infrastructure* section of this Chapter.

and St. Andrews have no building setback requirements. This allows buildings to be built up to the sidewalk; but also would permit buildings to be set back behind a field of parking. A maximum setback should be included to give more predictability to the location of future buildings. A parking setback can be introduced to ensure that parking is separated from sidewalks by buildings or landscape.

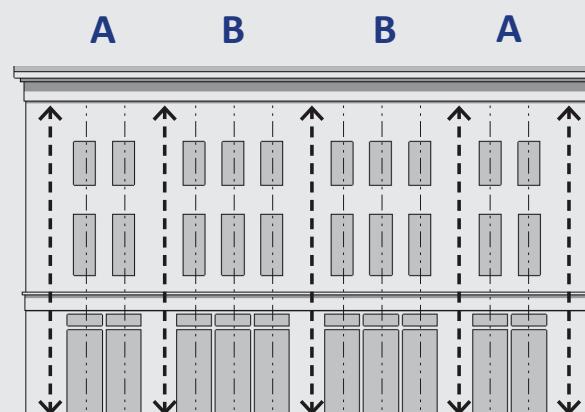
Design Standards

Building Design Standards should be included with zoning updates. These standards go beyond simply permitting the land uses envisioned by the plan; they will give guidance to developers and assurance to property owners that future buildings on surrounding parcels will contribute to the public realm and be consistent with the vision. Such provisions could include:

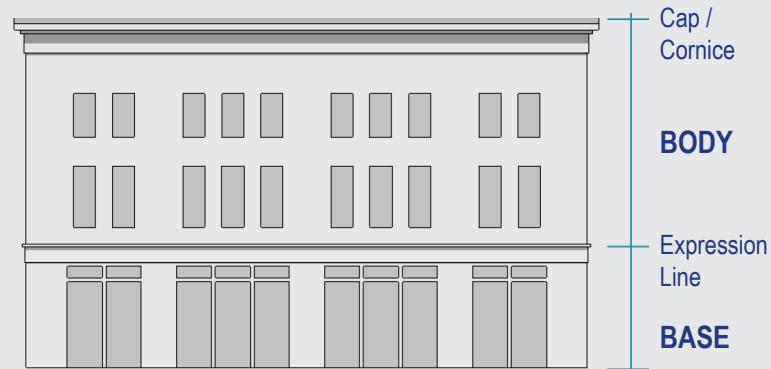
- Standards for building frontage occupancy, which require that a minimum percentage of the front of the lot to be occupied by building. This results in a consistent building wall with active facades along the sidewalk.
- Requirements for minimum fenestration (doors and windows) on all building facades that face onto a street or public space. Ground floor shopfronts should have the greatest percentage of transparency; upper floors could have less. Liner buildings should be used when building use limits the ability to meet such requirements (such as on parking garages or theatres). The result is that doors and windows, rather than blank walls, greet the public realm.
- Building standards can require facades to be organized with a distinct base, body and cap, using articulation such as an expression line and cornice to relate to the scale of a pedestrian. Defining structural / fenestration centerlines and/or facade bay rhythm can result in agreeable proportions. A basic list of permitted building wall materials can ensure quality and durability.
- Requirements for building entrances to face streets or public spaces in neighborhood downtown areas will maximize street activity, providing pedestrians with frequent opportunities to enter buildings and minimizing expanses of inactive walls.
- Additional design guidelines could describe desired architectural details and configurations. These may include storefront design guidance, or guidelines for encroachments over sidewalks (such as awnings, canopies, galleries or second-story balconies) to give shelter and shade to pedestrians.



Example of facade fenestration



Structural and fenestration centerlines, showing how the solid and voids in the facade align vertically; and organization of the facade into vertical modules. The facade example here follows an ABBA pattern.



The Base, Body & Cap

Build Workforce, Affordable & Market-Rate Housing

The long-term health of Panama City and the Glenwood, Millville and St. Andrews neighborhoods depends on providing a diverse housing stock that can meet the needs of the variety of city residents. Neighborhood revitalization will be supported by repairing and rebuilding housing that was lost during Hurricane Michael, and infilling vacant lots. Depending on life circumstances, household characteristics and incomes, residents need both ownership and rental housing of all sizes at a range of rents and prices. Committing to achieving and maintaining that diversity calls for multiple strategies.

In June 2020, ReHouse Bay was launched to raise public awareness about available City and County housing assistance, to help households navigate state housing programs and understand eligibility requirements. Rehousebay.org states: *"In the wake of Hurricane Michael, the lack of affordable housing has emerged as the most pressing challenge for communities in Bay County. The Florida Legislature recently appropriated more than \$36 million in funding to Bay County and the City of Panama City to address unmet housing needs through the Hurricane Housing Recovery Program (HHRP) and the State Housing Incentive Partnership (SHIP). ReHouse Bay programs are currently underway to help survivors access affordable housing; County and City staff are working to quickly and efficiently distribute all available housing assistance funds."*

Affordable housing programs are available to help applicants that meet certain requirements (such as household income) to meet their housing needs. The table below shows gross household income ranges that may qualify for the ReHouse Bay programs.

ReHouse Bay Program Eligibility	
Household Size	Household Income Range
1	\$14,600 - \$68,040
2	\$17,240 - \$77,840
3	\$21,720 - \$87,500
4	\$26,200 - \$97,160
5	\$30,680 - \$105,000
6	\$35,160 - \$112,840

Source: rehousebay.org (additional limits apply for larger households)

Programs available to individuals and families include:

- *Housing Repair and Recovery Program* to provide funding to repair, or to demolish and reconstruct eligible homes.
- *First-time Homebuyers Program* to provide funding to eligible families and individuals to lower up-front costs like down payment and closing costs, and keep mortgage payments affordable. In addition to funding, program participants will also receive first-time homebuyer counseling.
- *Foreclosure Prevention and Short-term Mortgage Assistance* to survivors of Hurricane Michael with demonstrated hardship.
- *New Construction Program* to help eligible applicants build new, affordable housing on their property.
- *Short-term Rental Assistance* as a one-time grant to applicants that can demonstrate sustainable income but do not exceed income limits for household size.

The Neighborhood Plans create several major new development opportunities, using parks, plazas and other amenities to support a variety of new housing units. Those opportunities should be actively marketed to local and regional investors, taking full advantage of existing programs that support homeownership as well as Opportunity Zone incentives. ReHouse Bay will soon offer programs for builders, contractors, and developers to incentivize the construction of new housing affordable to low and moderate-income individuals and families; details of a proposed City infill housing program targeted for the Glenwood, Millville and St. Andrews neighborhoods are described in the Glenwood chapter, page 4.38.

The City should continue to publicize programs providing down payment assistance and other supports for first-time homebuyers to alert neighborhood residents to the availability of resources. The most successful programs for first-time homebuyers begin by educating prospective buyers and helping them develop the skills needed to be a successful homeowner, including counseling on the homebuying process, how to clean up their credit to qualify for a loan and how to maintain a house. This would be particularly effective if coupled with the sale of new units built under the City infill program or the Academy of Building Arts workforce development effort described later in this chapter. The City can partner with local organizations to host Financial Literacy courses at easily-accessible neighborhood facilities.

Missing Middle Housing



New housing in the Glenwood, Millville, and St. Andrews neighborhoods should not be limited to detached single family homes or large apartment buildings. The neighborhood vision supports a range of “Missing Middle” types. The term Missing Middle was conceived by Daniel Parolek of Opticos Design in 2010 to define a range of housing types compatible in scale with single-family homes that help meet the growing demand for walkable living and that are often lacking in today’s neighborhoods. Missing Middle housing increases affordability while also considering neighborhood design and infrastructure needs.

The following characteristics of missing middle housing, excerpted from missingmiddlehousing.com, explain the appeal:

Small-Footprint Buildings

These housing types typically have small- to medium-sized footprints, similar to nearby single-family homes. This allows a range of Missing Middle types—with varying densities—to be blended into a neighborhood.

Lower Perceived Density

Due to the small footprint of the building types and the fact that they are usually mixed with a variety of building types within the neighborhood, the perceived density of these types is usually quite low. But, the actual measured densities can meet established thresholds for supporting transit and neighborhood-serving main streets.

Walkable Context

Missing Middle housing types are best located in a walkable context. Buyers and renters of these housing types are often trading square footage for proximity to services and amenities.

Smaller, Well-Designed Units

Most Missing Middle housing types have smaller unit sizes, which can help developers keep their costs down and attract a different market of buyers and renters, who do not have such options in many communities.

Fewer Off-street Parking Spaces

A balance must be sought between providing necessary car storage, and the expense and impact on community design of too much parking. Since they are built in walkable neighborhoods with proximity to transportation options and commercial amenities, Missing Middle housing types typically do not provide more than one parking space per unit.

Simple Construction

Missing Middle housing types can be simply constructed, which makes them an attractive alternative for developers to achieve good densities without the added financing challenges and risk of more complex construction types. This aspect can also increase affordability when units are sold or rented.

Creates Community

Missing Middle housing creates community by integrating shared community spaces within the building type (for example, bungalow courts), or simply being located within a vibrant neighborhood with places to eat and socialize.

Marketable

Because of the increasing demand from baby boomers and millennials, as well as shifting household demographics, the market is demanding more vibrant, sustainable, walkable places to live. Missing Middle housing types respond directly to this demand.

Affordable Infill Housing

In partnership with the City of Panama City, in the summer of 2020 Out of the Box Realty constructed two model homes on Roosevelt Drive near 15th Street in the Glenwood neighborhood; a third model house is under construction. Out of the Box is an approved builder of the ReHouse Bay program. These homes are the first built as part of the City's initiative to provide affordable infill housing as part of recovery from Hurricane Michael.

Out of the Box homes are made with structural insulated panels enabling them to withstand winds up to 186 miles per hour, and can be rapidly built on-site. Homes are designed to be energy-efficient and made from materials resistant to mold, mildew and termites to cut maintenance costs for future homeowners.

Qualified buyers can select one of the models to be built on lots the City has identified for this program. The 2 bedroom / 2 bath model homes are priced between \$150,000 to \$175,000, with up to \$50,000 of down payment assistance available to qualified applicants through the Re-House Bay program.

The Out of the Box homes are just one example of the City's affordable housing programs in action. Habitat for Humanity has also partnered with the City to build two houses with the future homeowners providing sweat equity to reduce the cost of the homes. Additional partnerships with developers and contractors are underway to implement revitalization goals for Panama City's neighborhoods. The Academy of the Building Arts initiative described on page 3.16 proposes a new strategy to use workforce training programs and City-owned lots to build new infill homes for low-income households.



Top: Out of the Box model home built in the Glenwood neighborhood (Credit: Panama City News Herald)

Middle, Bottom: Out of the Box housing (Credit: realityoutofthebox.com)

Expanding the supply of market-rate housing will attract more middle-income households to the neighborhoods to achieve a broader mix of incomes. The greening of the neighborhoods, creation of vibrant gathering places and other physical improvements will serve existing residents while also attracting new residents eager to enjoy these new amenities. The City owns multiple properties, of which some are well situated for market-rate development. The City can make sites available for private housing development and solicit proposals from prospective developers. As the project financing allows, the City could leverage the value of its land by requiring developers to commit 10 to 15 percent of the new units as workforce housing at rents or prices affordable to working people, such as police officers, nurses and teachers. The development agreements should seek a 30-year commitment of affordability.

A significant presence of heirs' properties is a concern that threatens secure land ownership and housing repairs and redevelopment for family-owned properties in Glenwood and Millville, where family heads often passed away without a will that would provide clear title to their descendants. As a result, a property may be nominally owned by several or even dozens of heirs, making it difficult or impossible to get a mortgage, insurance, or disaster relief to help rebuild a destroyed house. The process for clearing title involves identifying and contacting all living heirs to secure releases or going through the courts and the costs associated with legal services are often beyond the family's resources. As part of the Florida Department of Economic Opportunity *Housing Repair and Replacement Program*, funding is available to pay for attorneys to provide title assistance services for eligible low-to-moderate income (LMI) families directly impacted by the hurricane. A separate initiative unrelated to Hurricane Michael efforts, the Florida Bar Association offers pro-bono assistance to help families in low-income communities clear title on their properties, available through the Community Development Legal Project. Moving forward, a new community-based program could be established to supplement these efforts, targeted to assist affected Glenwood and Millville properties. Such a program could provide outreach to the community to inform about available resources, solicit applications, and recruit probate attorneys to participate at discounted fees.

The Panama City Housing Authority is rebuilding units uninhabitable following Hurricane Michael at Fletcher Black Memorial Homes. Site planning and design are also underway for development of new housing to replace what was damaged at the Massalina Memorial Homes site, expected to be completed by late 2021.

Low-Income Housing Tax Credits are a key federal source of financial support for affordable housing. The credits are awarded by the Florida Housing Finance Agency in a statewide competition. The credits awarded to each development are then sold to investors with the proceeds serving as equity in the project financing. Non-profit and private developers seeking tax credit funding need approval and support of the local jurisdiction. Panama City should work with developers in their applications for tax credits.

Across the country, many institutions and other major employers looking to attract and retain good workers have participated in Live Near Your Work programs, providing direct grants to their employees buying nearby homes. Some have gone so far as to partner with developers to build new rental housing nearby, taking advantage of surplus land and/or favorable financing. The City should approach major employers to gauge their interest in such an arrangement.

Support Workforce Development, Small Businesses & Entrepreneurs

Residents are the essence of these three neighborhoods. Their well-being and economic futures must be a key focus for the Neighborhood Plans. The number of low-income households living in the Glenwood and Millville neighborhoods points to the need for economic opportunities to help residents prepare themselves for a more prosperous future with good jobs and entrepreneurial success.

Academy of the Building Arts

Hurricane Michael devastated parts of the three neighborhoods, destroying homes and forcing long-time residents to leave Panama City to find jobs and housing. Despite extensive repairs and some new construction, the housing stock has not yet been restored to its previous levels. Many homes destroyed in the storm have not been rebuilt, and the City now owns multiple vacant lots throughout the Glenwood and Millville neighborhoods. At the same time, many Glenwood and Millville residents need to improve their economic futures with better jobs and skills. The Plan must address not just the physical needs of the communities but also strategies for job creation and workforce development. Young people starting out and those returning from incarceration face particular challenges.

A new Academy of the Building Arts would address the twin needs for housing and workforce development. A focused collaboration among non-profit workforce training entities, the school system, the City and the federal government should be pursued. Focusing on housing construction, this new collaboration would bring together workforce training professionals with local home builders and the city. The City would provide developable lots in the Glenwood and Millville neighborhoods and help secure funding for materials, staff, participant wages, transportation and other associated costs.

For the past 50 years, the Panama City Marine Institute (PCMI) has worked with young people with a troubled past to gain training and change their lives through treatment, education and behavioral modification through experiential challenges. Supported by a grant from the U.S. Department of Labor, it has a current initiative working with incarcerated individuals, preparing them for their release with counseling, support services, housing, training for construction industry jobs and job placements. The training program is certified through the National

Center for Construction Education and Research. In addition to classroom training, the core of the program includes hands-on construction experience. In particular, PCMI has a partnership with Community Homes to train workers in construction using insulated concrete, an innovative building system well suited to withstanding hurricane-force winds. The system allows much faster construction at a lower cost than traditional stick-built housing construction. Unit designs appropriate to the scale and character of the neighborhoods can be developed and built at an affordable price. With additional grant funding, the program could be expanded to include other young residents. The U.S. Department of Labor's YouthBuild initiative supports such training activities.

The Academy's efforts would:

- Provide local workers with valuable, marketable skills and work experience;
- Help returning citizens rebuild their lives;
- Create affordable housing for local residents; and
- Reknit the neighborhoods by filling in vacant lots.

Additional partners, such as Habitat for Humanity and local church groups, could assist in completing interior finishes as a way to reduce the cost for some of the units and support affordable homeownership.

Other Workforce Development Activities

The extensive green infrastructure network proposed in this Plan also will generate many construction and maintenance jobs. The Nature Conservancy has partnered with the National Oceanic and Atmospheric Administration (NOAA) to create GulfCorps, a hands-on program to train youth in wetland restoration and monitoring along the Gulf Coast. Panama City Marine Institute has pursued similar programs with Baywatch with grants from Florida Fish & Wildlife. Such programs should be expanded and linked to future green infrastructure investments in the neighborhoods, helping to provide qualified workers for the multiple projects. (More information on these programs is included later in this chapter.)

Beyond construction, other new employment opportunities are emerging with Eastern Shipbuilding's new contract to build the Coast Guard Offshore Patrol Cutters. Thomas E. Haney Technical Center provides training in pipe fitting and welding. Other workforce training programs directly linked to prospective jobs could be a boon for neighborhood residents. The A.D. Harris Learning Village Campus could host additional workforce training programs.

The design of the programs needs to recognize the financial realities of participants' lives and the barriers that prevent them from taking advantage of existing training programs. First and foremost is the need to begin earning income as soon as possible to cover living expenses, transportation to the training center and/or work site, and child care to allow them the freedom to participate in training programs. For some, basic life skills, such as budgeting, time management and getting along with supervisors, are skills they still need to learn. Some workforce development participants benefit from focused pre-training counseling and assistance to prepare themselves for a successful training experience.

Small Business Assistance

Home building also offers potential opportunities for small contractors. Given opportunities to build small infill housing projects, local businesses may develop and grow into successful, sustainable businesses. Many such companies at their early stages of development need assistance in bonding, bidding and other skills as well as basic elements of any business – accounting, marketing, legal, human resources, etc.

Training and technical assistance are available through Gulf Coast State College, FSU Panama City and the Small Business Development Center. Helping local companies access those resources can improve their chances for success. One effective approach is to develop a business incubator where multiple small businesses have individual offices in a building but share facilities such as meeting rooms and equipment (e.g., printers and copiers). That becomes a logical focal point for technical assistance providers, and the participating businesses help each other through joint bidding, networking, sharing experiences and providing referrals.

For contractors, some specific steps could help to level the playing field and ensure their ability to participate in the communities' rebuilding. Reserving individual lots or small bundles of lots specifically for small contractors could provide them with opportunities appropriately sized to their capabilities. In addition, the City should look into streamlining its requirements for independent contract bidders to improve the process and support local business.

Pre-approved architectural plans, or preferred plans, that comply with all zoning and building code provisions could streamline the development process and reduce the up-front investment and risks associated with development approvals.

Examples to Reference:

- » After Hurricane Hugo hit Charleston, South Carolina in 1989, the American College of the Building Arts was created to train workers in traditional construction skills, equipping its students with sought-after skills and meeting building owners' needs for workers knowledgeable in the repair and maintenance of historic structures.
- » In Chattanooga, the Lyndhurst Foundation created model house plans for new construction in the Southside neighborhood as it underwent a major transformation and rejuvenation. Once impoverished and declining, the neighborhood is now a vibrant mixed-income, diverse neighborhood with quality housing and many small businesses attracted by the growing population and the improved physical environment.
- » The Incremental Development Alliance builds knowledge and training for developers and focuses on small-scale projects like those envisioned for the neighborhoods.
- » The City of Seattle passed an ordinance in 2019 to make it easier for more property owners to build backyard cottages (accessory dwelling units). The program increases ADU production to grow volume and variety of choices, supports lower- and middle-income homeowners in developing ADUs, and increases access for lower income renters.

Community Development Corporations (CDCs) are non-profit organizations that offer services and programs that support community development, often found in areas struggling to organize or in low-income areas. Activities and initiatives may include economic development, real estate, youth leadership and education, community planning, and business incubation. This type of organization could help facilitate efforts to establish resources and focus investment in areas of need.

Fast, affordable, and reliable broadband access has become an essential resource for community businesses to connect and be successful. The City should invest in broadband infrastructure in order to connect its residents and promote a strong and competitive business environment.

Panama City's Main Street Programs

Over the past year, Panama City's Community Redevelopment Agency (CRA) has been working to establish an expanded Main Street program as part of its operational organization. The Main Street Approach is a time-tested framework for community driven, comprehensive revitalization. Main Street programs support local business, encourage economic activity and historic preservation, and provide a structure for continued community involvement in neighborhood improvements.

In 2020, the CRA revived the Panama City Main Street organization for Downtown (which was the second oldest Main Street program in all of Florida), and created new programs for Glenwood and Millville. (St. Andrews already utilizes a similar approach with the St. Andrews Waterfront Partnership assisted by the state's Waterfronts Florida Partnership Program.) In January 2021, the CRA began outreach to establish Advisory Committees for each neighborhood. The neighborhood Main Street programs can work to realize several of this plan's implementation action steps, specifically those for preserving historic and cultural assets; creating quality gathering places; conducting promotions, marketing and special events to activate neighborhood centers; and supporting small businesses and entrepreneurs. Importantly, the

Advisory Committees set up a framework for continued community input and dialogue during implementation.

The Main Street Approach is focused on revitalizing and strengthening a downtown or commercial district's economy. The program's work is organized around these Four Points:

- *Economic Vitality* – focuses on capital, incentives and other tools to assist new and existing businesses and create a supportive environment for entrepreneurs that will drive local economies.
- *Design* – supports a community's transformation by enhancing the physical and visual assets that set the commercial district apart
- *Promotion* – positions the downtown or commercial district as the center of the community and hub of economic activity, while creating a positive image that showcase a community's unique characteristics
- *Organization* – involves creating a strong foundation for a sustainable revitalization effort, including cultivating partnerships, community involvement and resources for the district.

Each program's work will be informed by an understanding of local and regional market data and inclusive community engagement.



Florida Main Street

Florida Main Street is a technical assistance program with the goal of revitalizing historic downtowns and encouraging economic development within the context of historic preservation.

Since 1985, Florida Main Street has offered technical assistance to Main Street programs across the state. The program is a part of a network of over 40 nationally recognized programs throughout the country. Florida Main Street is administered by Division of Historical Resources under the Florida Department of State. The program is affiliated with the National Main Street Center and utilizes the National Main Street Center's Four-Point Approach which offers a framework for community-based revitalization initiatives.



OUR COMMUNITIES

[https://dos.myflorida.com/historical/preservation/
florida-main-street/communities/](https://dos.myflorida.com/historical/preservation/florida-main-street/communities/)

Main Street Programs:

- **Create Jobs.** A revitalized district attracts new industry and strengthens service and retail job markets.
- **Save Tax Dollars.** Revitalization stabilizes and improves the area's tax base, while also protecting existing investments.
- **Preserve the Community's Historic Resources.** In an economically healthy downtown, property owners can afford to maintain their historic buildings and preserve an important part of the community's heritage.
- **Build Community Pride.** Main Street provides a public space for members from all areas of the community to come together, create new partnerships, and celebrate their downtown.
- **The Main Street Approach** is most effective in places where community residents have a strong emotional, social, and civic connection and are motivated to get involved and make a difference. This approach works where existing assets—such as older and historic buildings and local independent businesses—can be leveraged. It encourages communities to take steps to enact long term change, while also implementing short term, inexpensive and placed-based activities that attract people to the commercial core and create a sense of enthusiasm and momentum about their community. Both small-city downtowns and urban neighborhoods throughout the nation are renewing their community centers with Main Street methodology.
- **The Refreshed Main Street Approach** is a common-sense, strategy driven framework that guides community-based revitalization efforts. Building off three decades of success, this updated model harnesses the social, economic, physical, and cultural assets that set a place apart, and ultimately leads to tangible outcomes that benefit the entire community.

A City of Connected, Great Streets

Panama City's complete, historic, mixed-use neighborhoods want to resume a more walkable urban context, and be connected by a network of great streets. Each neighborhood's existing small blocks and extensive street grid, dating from the early 1900s, provides a great framework for pedestrian activity. However, many of the city's key connective corridors were assumed to have sprawl-like, suburban neighborhood context, so the streets were designed to prioritize automobile flow at the expense of pedestrians and cyclists.

This plan recommends street design and intersection improvements to each neighborhood's primary mixed-use commercial corridors, aimed to improve safety and walkability through widened sidewalks, street trees, pedestrian-scaled lighting, and improved crosswalks. Many of these design elements help manage high motor vehicle speeds leading to better balance between all modes. Recommended street and intersection design concepts are provided within each neighborhood chapter. Key areas of focus include:

Neighborhood Streets

- MLK Jr. Boulevard and Harrison Avenue in Glenwood
- 3rd Street and East Avenue in Millville
- Beck Avenue in St. Andrews

Cross-town Connections

- 15th Street
- 11th Street
- 5th / 6th Street (US Business 98)

Cross-town street connections are recommended to be improved with shade trees and green infrastructure, as well as protected sidewalks, bikeways and/or multi-use trails (where right-of-way width allows) to provide a safe and convenient experience for all travelers.

Connected sidewalks are needed throughout the neighborhoods. Investments by the City and CRA can prioritize routes to parks, schools, and neighborhood business districts. New trails can be installed in coordination with green infrastructure, wetland/bayou restoration projects, and swale upgrades.

Great Streets are:

» **Shaped**

A street should function as an outdoor room, surrounding its occupants in a space that is welcoming and usable. A 1:3 ratio for building height to street width is often cited as the ideal minimum for a sense of enclosure. In the absence of spatial definition by facades, disciplined tree planting is an alternative.

» **Connected**

An interconnected web of streets is the most basic and effective form of bringing a neighborhood together. The need for connectivity extends to all mobility facilities such as connected sidewalks, trails, bike lanes, and transit networks.

» **Comfortable**

Motorists, pedestrians, and cyclists typically prefer shady streets, which protects users from the elements. Shade can be provided with canopy trees or architectural encroachments over the sidewalk.

» **Safe**

Slowing traffic increases safety for pedestrians and cyclists. An increase of just 10 miles per hour (from 20 MPH to 30 MPH) yields a significant jump in the chances of a pedestrian fatality if an incident occurs. There are several design strategies to reduce car speeds; for example, reducing the vehicular travel lane width, including parallel parking, and reducing curb turning radii.

» **Memorable**

Perhaps one of the toughest elements of street design is creating a memorable experience. This is difficult, because there are may layers of nuance that respond to the local culture and history. Oftentimes a memorable experience emphasizes the "local-ness" of a place by embracing unique factors such as notable local shops or restaurants, unique quirky historical features, distinctive native landscaping, or local historic architecture. The best streets are the "postcard view" of the Town, serving as high-quality public gathering spaces that define local culture and character.



Primary Neighborhood and Cross-town Connector Streets

Restoring the street tree canopy is essential to both comfort, safety and character. Street trees provide shade, enclosure of the street, visual cues for drivers to slow down, and important environmental benefits. Streets identified for streetscape improvements should be prioritized for trees, which can be designed as part of the city's green infrastructure that improves stormwater management. Additional street trees should be planted throughout the neighborhoods, coupled with efforts such as ReTreePC which has a goal for planting 100,000 trees by 2025.

Policy Recommendations

Policy changes are recommended to guide the physical improvements noted above and to reinforce the direction for great streets. The City should adopt a Complete Streets Ordinance that requires future street projects consider and balance the needs of all roadway travelers (pedestrians, cyclists, motorists and transit users). In addition, the City should take a context-based approach to street design, where the physical design features of the roadway (such as travel lane width, on-street parking, and design speed) are adjusted based on the land use patterns and urban design of the surrounding neighborhood. The design of streets in suburban areas of the

city, where driving is the default mode of transportation, should be different from streets in walkable neighborhoods and centers. FDOT has recently adopted a new manual to plan for state facilities based on context (see following page); the City should adopt a similar approach for all City streets.

Particularly important in these neighborhoods is the design of US Business 98, which is owned by FDOT and crosses through central portions of each neighborhood as Beck Avenue and Beach Drive (in St. Andrews); 6th Street (in Glenwood) and 5th Street (in Millville). The City has begun conversations with FDOT to transfer this street corridor to City ownership, which would give the City direct control to implement desired street design changes. The neighborhood vision for the US Business 98 corridor is a highly walkable and bikable condition with safe, frequent pedestrian crossings. Implementing recommended changes to street design in coordination with updated land use regulations can better serve the economic and quality of life interests of adjoining property and business owners, surrounding residents, and visitors.

Context-based Street Design

Context describes the physical form and characteristics of a place. What happens within the bounds of the street right-of-way should largely be determined by the setting of private development lying outside of the right-of-way lines. Context is one of those fundamental bridges between development planning, infrastructure design and engineering. When places are well understood, treasured context can be preserved. Also, undesirable places can be programmed for future change — change based on a better understanding of context and the required balance between public and private interests.

Context-based street design is critical to balance the multiple and sometimes competing demands placed on streets to create a transportation system in harmony with vibrant places of commerce and community. Context helps determine where street design should optimize commerce and community and where mobility should be prioritized. In all cases, streets should be designed to safely and comfortably accommodate diverse modes of travel, although some modes are given higher priority than others depending on the context.

The Florida Department of Transportation (FDOT) has adopted a context classification system to help plan and design state facilities in greater harmony with the surrounding land use characteristics and intended uses of the roadway. The context classification assigned to a street or highway segment determines the key design criteria of each element, including the design speed, which informs lane width, street tree placement, on-street parking, and many other elements necessary for good street design.

FDOT's context classification system incorporates eight context zones, or character areas, for the purpose of street design, ranging from natural to urban core. While the FDOT Context Classification guide and Design Manual were developed for state facilities, the same classifications can be applied to local streets across the City, to guide future street design elements. Context classifications of Neighborhood Center (C5) and Neighborhood General (C4) are appropriate within the neighborhood study areas, to reinforce the community vision. These two context classifications allow for and support street designs, such as the ones illustrated in this plan, that prioritize the pedestrian and a walkable environment.

FDOT Context Classifications





Existing and Potential Future Boat Ramps in Panama City

Water Access

In Panama City, water mobility is just as important as walking, biking, driving and transit. There are opportunities to use water transportation to enhance mobility between the neighborhoods. Community members expressed a desire for the City to consider a water taxi service from St. Andrews to Panama City Beach and Downtown.

Access to the water, and convenient boat trailer parking, is part of the transportation system. Bob George Park in Millville is being improved to include additional space for trailer parking and kayak storage. The existing boat ramp in St. Andrews is constrained as the town has grown up around it; there is little space for trailer parking, and maneuvering to the ramp can be challenging. However, the ramp is loved by locals. Some trailer parking is accommodated in the St. Andrews marina, but that is difficult to access for boaters who launch on their own. The City should study future options for launching and trailer parking in St. Andrews.

Additionally, the City should promote and educate users about other boat launch options, including the recently re-opened Carl Grey Park (which has sufficient parking areas). Signage and marketing materials about city-wide boat launch resources can inform community members of options and availability. Pursuing a new boat launch, parking and storage at Snug Harbor can additionally provide convenient access in a less constrained footprint.

A City with Resilient, Green Infrastructure

The Green-Blue Framework

From its founding, Panama City's vitality and quality of life have been inextricably connected to the water and the health of its natural resources, including St. Andrew Bay, Massalina Bayou, Watson Bayou, and inland bayou extensions. The strategies presented in this section aim to strengthen community well-being and resiliency by protecting, restoring, and maximizing the value of these natural assets.

To define and prioritize investment in pursuit of this goal, a "Green-Blue Framework plan" has been created for each neighborhood. Each framework plan synthesizes background analysis, stakeholder interviews, and public input to create a road map for community resiliency. The framework plans are not stormwater management plans, or open space and recreation plans, or watershed plans – instead, they take a big-picture view to connect the dots across neighborhoods, disciplines, and City departments, and to weave nature-based solutions into infrastructure, open space, economic development, transportation, and placemaking.

The primary resiliency goal for Glenwood, Millville, and St. Andrews is to prioritize investment that will foster healthier, happier, more valuable, and stronger neighborhoods.

Resiliency Goals:

- » **Healthy** neighborhoods minimize impact on natural resources and support walking and bicycling as authentic and enjoyable modes of transportation.
- » **Happy** neighborhoods demonstrate social engagement, pride, and local stewardship.
- » **Valuable** neighborhoods include a wide range of amenities, activities, economic opportunities, and public spaces, and support opportunity and access for all.
- » **Strong** neighborhoods bend without breaking when subjected to external stress and recover more quickly after adversity.

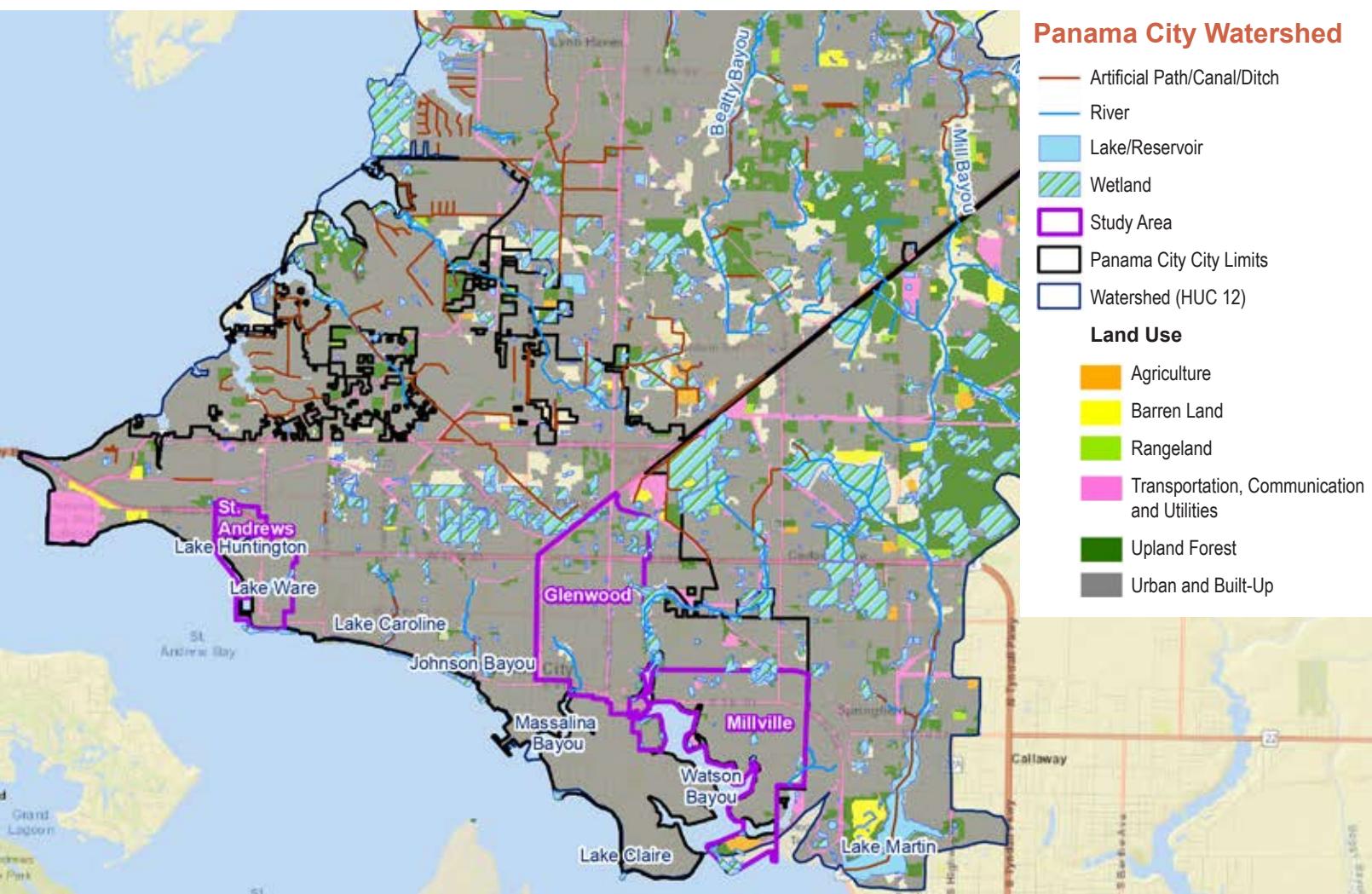


Watershed-Scale Environmental Context

Panama City lies within the St. Andrew Bay watershed and the Mill Bayou-Watsons Bayou Frontal subwatershed. The hydrology of the subwatershed has been significantly altered by development, with most land now urbanized and dominated by impervious surfaces. Natural streams have been generally channelized into open canals and ditches or routed into below-grade culverts to accommodate development, and few pockets of wetlands and upland forests remain within the subwatershed. This displacement of vegetated surfaces and natural wetlands prevents the absorption and cleaning of stormwater runoff, especially near the Bay. Additionally, loss of coastal vegetation (e.g. salt marshes) and riparian buffers, that historically dissipated wave energy and stabilized soils, has contributed to shoreline erosion.

The main waterbodies surrounding Panama City are St. Andrew Bay (North Segment), Watson Bayou, Robinson

Bayou, Massalina Bayou, Johnson Bayou, and Pretty Bayou. Water quality in these bayous and St. Andrew Bay fails to meet Florida water quality standards due to excessive bacteria and nutrients. These pollutants have contributed to red tide, closing of shellfish harvesting, and impacts to recreational activities. Sedimentation has also been observed as having an impact on the bayous and near-shore waters, affecting boating in Watson Bayou and along the St. Andrews neighborhood waterfront. Smaller waterbodies in the neighborhood study areas include Lake Huntington, Lake Ware, and unnamed tributaries to the bayous. While water quality data are unavailable for these waterbodies, the project team assumes that water quality is comparable to downstream bayous. For Lake Ware, the City may soon begin water quality sampling to help address concerns about poor water quality and lack of tidal flushing.



Water Supply

Panama City purchases drinking water from Bay County Utility Services. Water is withdrawn from Deer Point Lake, a 5,000-acre impoundment located 7 miles north of Panama City, and treated at Bay County Water Treatment Plant. Based on recent water quality annual reports, the water provided by Bay County meets drinking water quality standards.

Panama City owns and operates the water distribution system within the city. According to DPW, much of the city, including the three subject neighborhoods, suffers from low water pressure due to calcified water distribution pipes. This low pressure causes both inconvenience (e.g. inadequate pressure for washing laundry) and potentially dangerous situations in which there is insufficient water pressure to meet firefighting needs. The City has hired a consultant to assess the water distribution system and prioritize needed improvements.

Wastewater

Panama City collects sanitary sewage in a separate sewer system (i.e. not combined with stormwater) and conveys that flow through a network of gravity mains, pump stations, and force mains to two wastewater treatment facilities. Despite having sewer available, many properties continue to use septic systems because they would be required to pay sewer bills if they connected to sewer. DPW expressed concern that septic systems are leaching sewage into waterbodies, particularly in the Millville neighborhood.

Panama City's sewage infrastructure is in severe disrepair, due to years of neglect and recent storm damage. Since 2016, failing pump stations and pipes have caused over 35 documented sewage spills, including into St. Andrew Bay, Watson Bayou, Lake Huntington, Lake Ware, and neighborhood streets¹. The City has hired a consultant to evaluate the collection system and prioritize system improvements.

Sewage is routed to two wastewater treatment plants: St. Andrews Wastewater Treatment Facility (WWTF), located to the northeast of the St. Andrews study area, and Millville WWTF, located on a peninsula in Watson Bayou within the Millville study area. Both treatment plants discharge treated wastewater to St. Andrew Bay. The City is pursuing funding to study relocation of Millville WWTF.

¹ FDEP Proposed Consent Order. Documented sanitary sewer overflows from September 2016 – October 2019.

In a proposed Consent Order issued in early 2020, Florida Department of Environmental Protection (FDEP) cited Panama City for Clean Water Act violations resulting from sewage spills and a malfunctioning disinfection system at Millville Wastewater Treatment Facility. The Consent Order, if approved as proposed, would require Panama City to fix the disinfection system, remove illicit connections of sewer pipes to the stormwater drainage system, repair / upgrade sewage lift stations, and develop plans and programs to maintain all systems in working order.

To comply with the Consent Order, Panama City will need to undertake significant infrastructure improvements over the next decade – including replacing pipes under many streets. Within the neighborhood study areas, that likely means significant construction disruptions as well as opportunities to rebuild streets in a way that better fits community needs and vision.

Until the lift stations, sewer pipes, and disinfection system are repaired or replaced, there may continue to be interruptions in on-water recreation. For example, FDEP issued swimming advisories in 2019 after sewage spills into Watson Bayou and Lake Huntington, and in 2020 after a sewage spill into Lake Ware.

Drainage / Stormwater Infrastructure

Panama City's drainage conveyance infrastructure includes a network of open ditches and swales, catch basins, and drainage pipes. The City also operates one stormwater lift station, located at W 19th Street and Beck Avenue. Stormwater conveyed by the drainage system discharges directly to the Bay and bayous, as well as to tributary streams, wetlands, Lake Ware, and Lake Huntington. To remove sediment from stormwater before it is released to waterbodies, the City operates several end-of-pipe water quality treatment units, "Baysaver" proprietary systems. These units are primarily located around Watson Bayou. Further upstream, stormwater ponds settle out sediment while slowly releasing flow.

Stormwater runoff and pollutants are generated from impervious and compacted surfaces, including streets, parking lots, buildings, lawns, and construction sites. In compliance with the MS4 General Permit, Panama City requires erosion and sediment control on large construction sites, and long-term management of runoff from development projects. The City's stormwater requirements exempt projects that increase a site's net impervious area by less than 2,000 square feet. Cumulatively, these

incremental expansions of impervious surfaces lead to substantial increases in stormwater runoff and pollution.

DPW noted several locations with frequent localized flooding. Thunderstorms, which often drop several inches of rain in a short time, can overwhelm drainage system capacity. In some locations, such as in St. Andrews on Beck Avenue, localized flooding is exacerbated by high tide, which slows the flow out of drainage pipes. High tides can surcharge pipes and ditches and flood low lying areas. Sea level rise will continue to worsen conditions.

Stakeholders mentioned several city-wide drainage and stormwater quality initiatives and opportunities currently underway, including the following:

- **Stormwater Master Plan.** The City recently initiated a stormwater management study of the Glenwood area, with the intent of eventually expanding the scope to encompass a city-wide stormwater master plan. The study includes development of a stormwater model; an assessment of stormwater infrastructure deficiencies; and identification of up to four capital improvement projects to mitigate those deficiencies. The City anticipates completing this study by spring of 2021.
- **Stormwater Utility.** Once the stormwater master plan is complete, the City hopes to create a stormwater utility to fund implementation of the master plan. A stormwater utility, analogous to a sewer utility for sewage, is a mechanism to generate dedicated stormwater management funds by assessing user fees. Bay County and City of Springfield have established stormwater utilities. A stormwater utility would provide Panama City with sustainable funding for maintaining and improving the City's stormwater infrastructure, meeting MS4 Permit obligations, and enforcing/incentivizing stormwater management and pollution prevention on private property.
- **Urban forestry.** The City received a grant to plant trees at Oaks by the Bay Park in St. Andrews, to replace trees lost during Hurricane Michael. The City also received a grant to develop an urban tree inventory.
- **Drainage swale/ditch maintenance.** DPW recently cleared storm debris, regraded, and grassed ten drainage ditches. DPW hopes to build berms and add walking/biking paths with lighting and benches along the ditches.
- **Hazard Mitigation Grants.** The City recently applied for a FEMA hazard mitigation grant to fund a

wetlands and drainage improvement project. The project would focus primarily on Robinson Bayou subwatershed to the north of the neighborhood study areas; however, the application also identified secondary-priority target areas including two sites in Glenwood and one in St. Andrews. The grant has not been awarded as of August 2020. Panama City also applied for federal hazard mitigation grants for priority projects including wind retrofits, generators, and sanitary sewer and drainage infrastructure improvements.

Watershed Initiatives

Several watershed initiatives have the potential to provide useful guidance, resources, and funding for local restoration projects. These include:

- » **RESTORE Act.** Funding for restoration projects, made available after the Deepwater Horizon oil spill in the Gulf, is administered by Bay County.
- » **St. Andrew and St. Joe Bays Estuary Program.** Bay County and Florida State University Panama City, with funding from The Nature Conservancy and RESTORE Act, are establishing an Estuary Program and developing a Comprehensive Conservation and Management Plan for the watershed. This non-regulatory program will provide Panama City with an opportunity to collaborate with neighboring communities and watershed stakeholders to develop watershed action plans and funding.
- » **The St. Andrew Bay Surface Water Improvement & Management (SWIM) Plan.** Developed in 2017 by the Northwest Florida Water Management District, the St. Andrew Bay SWIM Plan provides a framework for resource management, protection, and restoration. The Plan recommends projects for addressing water quality and natural resource challenges.
- » **Recovery and Resiliency Partnership Projects (R2P2).** The Cities of Springfield and Parker are in the process of developing economic and ecological resiliency project plans, with technical assistance from FEMA's R2P2 program¹. Concept designs that have been presented for public review include nature-based stormwater features integrated with parks and bike/pedestrian connectivity routes.

¹ Recovery and Resiliency Partnership Projects <http://r2p2.skeo.com/>

Natural Hazards

Bay County is highly prone to flood and wind hazards associated with hurricanes, tropical storms, and rainfall with high intensity or duration. Bay County experiences on average 80 severe thunderstorm days each year. Hurricanes and tropical storms increase the threat of storm surge flooding and can also generate high winds and wave action. Hurricane Michael, which made landfall in October 2018 as a Category 5 hurricane, caused catastrophic wind and debris damage to structures and trees. Past hurricanes, including Dennis in 2005 and Opal in 1995, caused significant flooding and erosion.

Panama City's coastline areas are particularly vulnerable to hurricane storm surge. Storm surge is an abnormal rise of water generated by a storm, over and above the predicted astronomical tides. Flooding from storm surge depends on many factors, such as the track, intensity, size, and forward speed of the hurricane and the characteristics of the coastline where it comes ashore or passes nearby². Storm surge inundation maps from the National Oceanic and Atmospheric Administration (NOAA) depict areas that are vulnerable to storm surge for category 1-5 hurricanes, as predicted using the hydrodynamic Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model.

The Federal Emergency Management Agency (FEMA) creates and updates Flood Insurance Rating Maps (FIRMS), identifying Special Flood Hazard Areas (SFHAs). SFHAs are defined as the areas (zones A, AE, and VE) that will be inundated by the 100-year flood, which has a 1 percent chance of occurring in any year. VE zones face additional coastal impacts due to wave velocity action from waves greater than 3 feet in height. The 500-year flood zone has a 0.2 percent chance of flooding in any year.

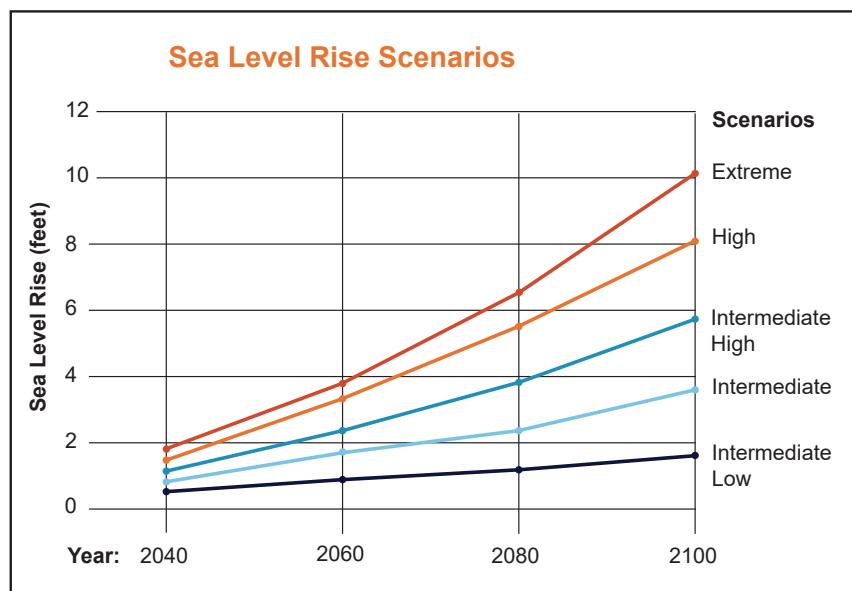
The Bay Country Local Mitigation Strategy (LMS) documents the county's natural hazards, vulnerabilities, and hazard mitigation strategies. Panama City participates in LMS updates with the County and six other municipalities³.

Climate Change

In coming decades, climate change is anticipated to increase temperatures, intensify storms, and raise sea levels in Florida. These changes will exacerbate existing hazards related to high temperatures, flooding, storm surge, and wind-related storm damage in Panama City. Panama City may also experience an increase in drought periods, with related water supply challenges.

The National Oceanic and Atmospheric Agency (NOAA) has projected multiple possible scenarios for sea level rise in Panama City, ranging from an intermediate low scenario of 1.5 feet of water level rise by 2100, to an extreme scenario of over 10 feet of water level rise by 2100⁴. Most low-lying developed areas do not currently experience tidal flooding impacts; however, as sea level rises, high-tide flooding will become more frequent with longer duration. If unmitigated, tidal flooding will cause increasing complications such as road closures, infrastructure damage, erosion, and surcharging of local drainage systems.

⁴ NOAA Sea Level Rise Viewer <https://coast.noaa.gov/slriser/#/layer/sce/6/-9538840.004930543/3525072.9869863265/15/satellite/57/0.8/2100/interHigh/midAccretion>



² NOAA National Storm Surge Hazard Maps <https://www.nhc.noaa.gov/nationalsurge/>

³ Bay County Community Rating System (CRS) Progress Report 2019 <https://www.baycountyfl.gov/DocumentCenter/View/4420/2019-Progress-Report?bidId=>; Local Mitigation Strategy <https://www.baycountyfl.gov/181/Local-Mitigation-Strategy>

Watershed-Scale Solutions

Overarching watershed-scale solutions focus on protecting and restoring inland and coastal natural resources, improving city-wide infrastructure, and connecting neighborhoods with green corridors. A range of policy and organizational strategies aim to advance those solutions. These strategies, applied city-wide, will require long-term planning and coordination among multiple City departments.



Example of engineered channels and ponds needing restoration and naturalization at MLK Boulevard & E 11th Street.

GREEN-BLUE FRAMEWORK STRATEGIES: WATERSHED SCALE



Land Conservation

Conserve and protect vacant land in low-lying areas of historic bayou influence to preserve the land's water quality, flood storage, and ecological functions.



Wetland and Floodplain Restoration

Restore degraded wetlands and floodplains to improve stormwater treatment, flood storage, surge attenuation, tidal flushing, and habitat.



Stream Restoration

Enhance stormwater ditches by adding floodplain, sinuosity, and native vegetation. Create trails and other community amenities along restored streams.



Living Shorelines

Restore coastal wetlands and shorelines, combining native vegetation, oyster reefs, and structural elements to absorb wave energy, reduce erosion, improve water quality, and protect coastal properties.



Interconnected Greenways

Create networks of accessible, multimodal trails and paths along natural features, with urban linkages, to expand community access to open space and waterfront amenities.



Resilient Infrastructure

Upgrade and maintain wastewater infrastructure to reduce vulnerability to natural hazards and eliminate discharge of untreated or under-treated sewage.

Adapted from FEMA (2020) Building Community Resilience with Nature-Based Solutions

Resilient Infrastructure

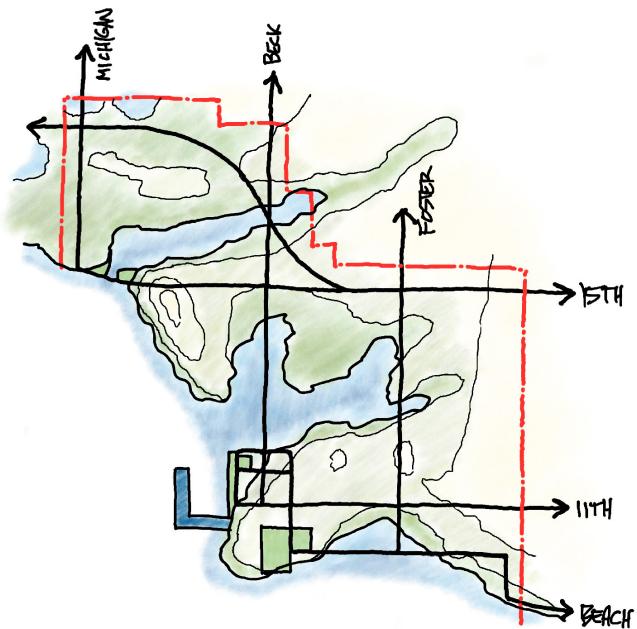
The City is in the process of assessing drinking water, wastewater, and stormwater infrastructure to prioritize improvements and to plan for ongoing maintenance. Already identified as a high priority, the City is pursuing funding to repair and upgrade wastewater pump stations that were damaged during Hurricane Michael. As part of the stormwater master plan, the City will evaluate stormwater and flood management needs throughout the City. The stormwater master plan should prioritize areas identified in each neighborhood's Green-Blue Framework for assessment and design. Design of infrastructure upgrades should also account for increased precipitation and rising sea level. By preparing for future conditions, the City's infrastructure will be more capable of withstanding increasingly intense and frequent storms and preventing high-tide flooding.

Key to implementing the resilient infrastructure projects is the creation of a dedicated staff position. Funding a stormwater staff position within the Department of Public Works is necessary to insure green infrastructure solutions are included in the capital improvements and review private development proposals for compliance with flood plain and stormwater regulations.

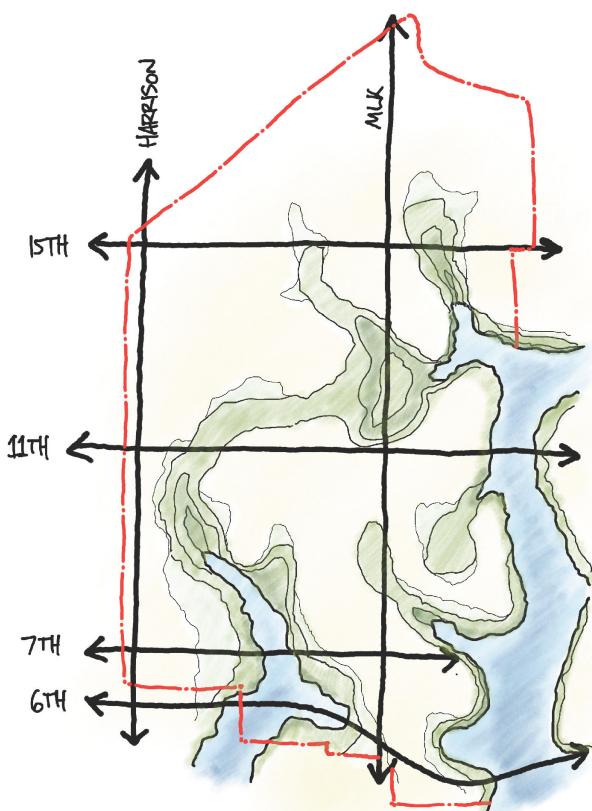
Wetland and Floodplain Restoration

Coastal and inland wetlands, floodplains, and forests act as sponge, filter, flood storage, habitat, and storm buffer. In Glenwood, Millville, and St. Andrews, wetland and floodplain restoration is largely focused on historic bayou extensions. These extensions are typically flat or very gradually sloping low-lying areas of Watson Bayou and Massalina Bayou. These systems have been significantly altered in much of Panama City, fragmenting their connections to the larger bayous and resulting in increased flooding, erosion, and water quality impacts. Restoring these altered natural systems can alleviate the impacts of past development patterns and fortify communities against intensifying storms, rising sea level, and other climate change effects. Protecting the remaining unaltered natural systems will likewise prevent worsening impacts.

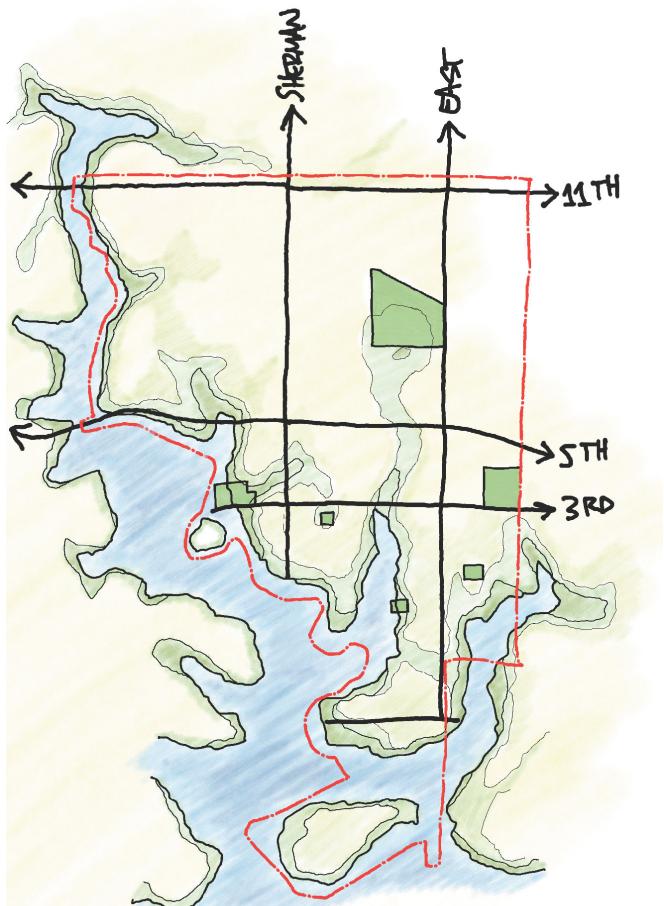
Historic Bayou Influence Areas



St. Andrews



Glenwood



Millville

The original natural lines on the land, stripping back decades of human influence – earth moving, road construction, development, and myriad other alterations – are still visible in Panama City's topography, soils, and drainage patterns. These sketches, inspired by local designer/artist Jane Perry, examine historic bayou influence areas in Glenwood, Millville, and St. Andrews.

Stream Restoration

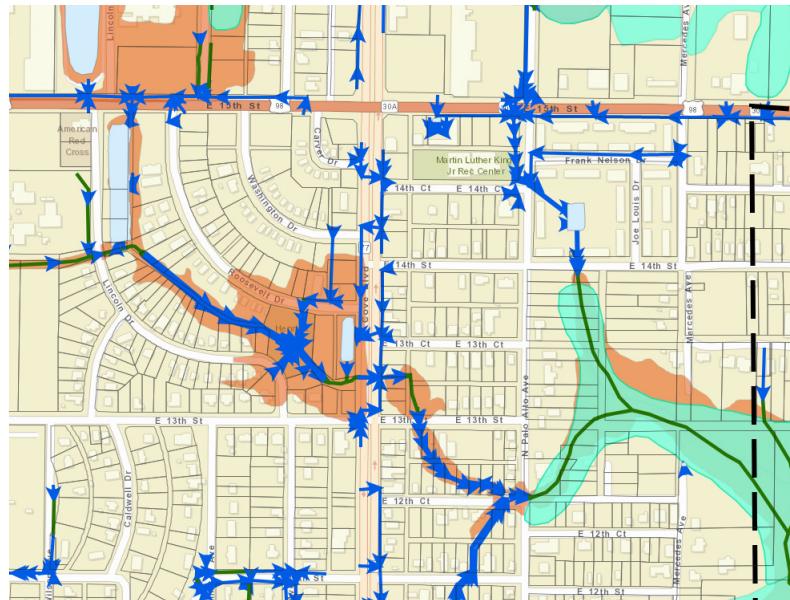
As part of the development process, meandering streams with considerable flood storage volume are often straightened to swiftly channel stormwater away from newly developed areas. Converting streams to ditches increases erosion, degrades habitat, and exacerbates downstream flooding. Stream restoration returns waters and greenways to a more meandering pattern and recreates floodplain areas for holding back large rain events.

In Panama City, stream restoration techniques can be integrated into rehabilitation of hurricane-damaged stormwater ditches. As these ditches are cleared, regraded, and re-vegetated, the City can look for opportunities to restore floodplain, sinuosity, and native vegetation. The stormwater master plan analyses will be instrumental in determining the necessary conveyance capacity for these ditches. Restored ditches should also be designed to include trails, benches, and other amenities wherever possible, particularly where streams flow near public space improvements, redevelopment projects, and stormwater management interventions.

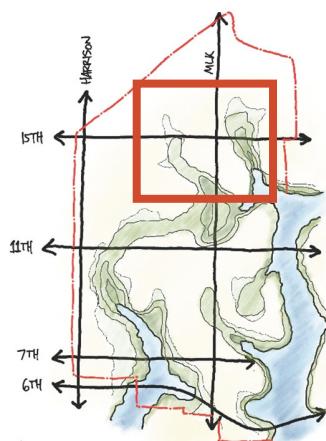


Above, left: Existing drainage channel at Lincoln Drive & 15th Street

Above, right: Existing Detention Pond at Lincoln Drive



Above: GIS map enlargement reveals transformation of Glenwood's historic Watson Bayou extension. The natural system has been channelized over time with pipes (blue lines), swales (green lines), ponds, and culverts to accommodate development.



Living Shorelines

Living shorelines are a design solution that recreates natural communities of seagrass, oyster reef, and other natural habitat and structures along degraded shorelines. These restoration areas reduce erosion and flood damage by slowing waves and reducing wave height. They also filter pollutants and provide valuable habitat to aquatic organisms.

Living shoreline opportunities exist along Glenwood, St. Andrews, and Millville waterfronts as well as between them. The shoreline along West Beach Drive, for example, is eroding and could be fortified with living shoreline and shore buffer restoration. In Millville, a living shoreline is being developed on the Watson Bayou waterfront south of Millville Waterfront Park. The project includes vegetated bank stabilization, seagrass planting, and riprap breakwater.

Living shorelines are one of the nature-based solutions that FEMA provides credit for under the Community Rating System (CRS). Participating communities can earn credit for flood-reduction actions such as open space preservation and wetland restoration, and thereby earn discounts on flood premiums for property owners, renters, and businesses.

Community Greenways

The proposed Green-Blue Framework plans weave trails throughout the historic bayou extensions, establishing a trail and connectivity network, creating floodable parks, providing open space access to underserved areas, and connecting residents to waterfront amenities.

Community parks, open space, and recreation are critical elements to any community's health and quality of life for all residents. An open space network that provides the most value is accessible to all, incorporates passive and active recreation, provides space for community gathering and engagement, and can serve multiple purposes as needs may change by time of day, day of the week, or even as the community evolves over the years.

In Glenwood, Millville, and St. Andrews, many areas have little or no usable green open space, and many of the existing parks lack amenities that the community needs. A green network that can be embraced by the community and improve quality of life should strive to achieve the following goals:

1. Parks and open spaces that meet ADA accessibility, making them inviting to all;
2. Safe environments including enhanced lighting, maintenance, and visibility;
3. Connectivity for pedestrians and bicyclists to access usable open space within a quarter mile (5-minute walk), including an overall trail network;
4. Conservation / protection of natural resources and neighborhood-scale stormwater management and flood control;
5. Maintenance plans that simplify designs and leverage partnerships with local organizations;
6. Enhanced connection to water resources; and
7. Spaces and designs that reach a broad audience by providing flexibility and layered uses.

Floodable Parks

Floodable Parks provide for community enjoyment and recreation in addition to stormwater control. These places can be designed to filter, absorb, and temporarily store stormwater, storm surge, and high tides to help alleviate neighborhood flooding.

- » Floodable Parks can be a shared stormwater solution in vulnerable low-lying areas that are high risk for development.
- » Stormwater control and treatment must be complimentary to other active and passive uses of the park. Stormwater design should be secondary to ensure the recreational value and lovability of the park.
- » Floodable Parks require a commitment to operation and maintenance.

Land Conservation

Land conservation can be achieved through a combination of voluntary buyouts and other conservation mechanisms, such as conservation easements, landowner agreements, tax incentives, and transfer of development rights. Local conservation organizations, such as Bay County Audubon Society and Bay County Conservancy, could be strong partners in such conservation and restoration efforts.

For voluntary buyouts, the City should develop a strategic buyout program that promotes clustering of buyout properties within areas identified in each neighborhood's Green-Blue Framework. The buyout program, while focused primarily on reducing flood risk, should prioritize properties based on their location within each neighborhood's Green-Blue Framework and proximity to other buyouts. A study by The Nature Conservancy and Texas A&M University¹ found that a similar buyout program in Houston was cost-effective and achieved broader social and environmental benefits than programs focused exclusively on flood risk. The Houston buyout program in the study prioritized buyouts based on flood loss claims, proximity to natural features (floodplains, wetlands, parks, and other protected areas), and proximity to existing buyouts. Rather than producing a checkerboard of green spaces, as is typical of buyouts focused solely on flood loss, the strategic buyout program resulted in clustered green spaces that add multiple values – open space, reduced flood risk, and community amenities.

Workforce Development

To accomplish Green-Blue Framework objectives, the City will need a workforce skilled in wetland restoration, green infrastructure, tree planting, open-space amenity installation, and maintenance. That need is also an opportunity: investment in nature-based solutions can yield social and economic benefits in the form of local jobs.

The City should explore opportunities to prepare workers and businesses with the skills they will need for wetlands, green stormwater infrastructure, and parks. The City could support and build upon three existing programs:

- Gulfcorps is a program administered by The Nature Conservancy (TNC). Through Gulfcorps, young adults are recruited, trained, and employed

¹ The Nature Conservancy and Texas A&M University. Strategic Property Buyouts to Enhance Flood Resilience: Creating a Model for Flood Risk Reduction, Community Protection and Environmental Gains

at local conservation corps in all five Gulf states. Projects include invasive species removal, planting native trees and grasses, building and maintaining trails and boardwalks, restoring natural shorelines, and restoring rare or important species and habitats. In Panama City, TNC has partnered with Children's Home Society of Florida to provide training space. One of the Panama City crew's projects is Panama City Beach Conservation Park, for which the crew has provided trail maintenance, trash removal, prescribed fire, and wetland restoration.

- Panama City Marine Institute has an environmental program for youth as well as a workforce development program. While the organization's workforce program is currently focused on construction trades, their wetlands restoration and environmental monitoring programs may provide a good foundation for a new environmental jobs-training program.
- The National Green Infrastructure Certification Program (<https://ngicp.org/>) offers training and certification for green stormwater infrastructure construction, inspection, and maintenance workers. Panama City could partner with neighboring communities and state agencies to host a training and certification exam for local landscape and construction contractors interested in expanding or shifting their services toward green infrastructure.

St. Andrew and St. Joe Bays Estuary

The nascent Estuary Program² affords an opportunity for Panama City to pursue shared solutions and funding with neighboring communities to address watershed issues. In May 2020, Bay County approved program funding, accepting \$1 million from The Nature Conservancy and allocating \$720,000 from RESTORE Act funds. These funds will be passed to Florida State University, Panama City campus, which will serve as the host organization and will provide administrative, financial management, and program organizational support. As a key watershed stakeholder, Panama City will be invited to join other local, federal, and state organizations in the Estuary Program's decision-making body. By engaging early and often, Panama City can ensure that the City's needs and Green-Blue Framework solutions are considered in the Estuary Program's action and funding plans.

² <https://pc.fsu.edu/estuaryprogram>

City Code Improvements

Reduction of overall impervious area within the watershed starts with neighborhood-scale concentration of focused redevelopment with open space preservation/restoration set forth by the Green-Blue Framework plan for each neighborhood. Many provisions to support shared neighborhood-scale solutions already exist in the City's code, for example, flexibility within Downtown District and ability to provide off-site improvement; however more coordination is recommended to increase stormwater retrofits, calibrate stormwater regulations to the community vision for various neighborhoods, and integrate with the upcoming Citywide Stormwater Management Master Plan. Restoration projects and preservation can be implemented with FEMA funds, CDBG-DR grants, Stormwater Utility, and other related sources.

At the scale of the block, street, and site, the City's stormwater requirements exempt projects that increase a site's net impervious area by less than 2,000 square feet. Cumulatively, these incremental expansions of impervious surfaces lead to substantial increases in stormwater runoff and pollution. Compliance with stormwater regulations for a specified amount of land disturbance, rather than a net increase of impervious surface, would increase the ability to provide much needed stormwater retrofit of currently highly impervious sites. An increase in projects subject to stormwater requirements should be combined with additional flexibility for redevelopment/infill projects in specified neighborhood center areas to enable and incentivize redevelopment consistent with urban design best practices and each neighborhood's vision. These might include:

- Coordination between each neighborhood's plan and parking study to minimize parking requirements and encourage permeable surfaces wherever possible. Details and technical requirements are needed to require appropriate design and implementation of permeable parking.
- Sliding scale for stormwater requirements within specified focused development areas based on technical feasibility and site constraints.
- Flexibility to pay for stormwater mitigation off-site within the same subwatershed, coordinated with the City via a stormwater coordinator and the Stormwater Utility. This off-site shared stormwater management should be integrated into the neighborhood as an appealing and useful open space amenity within each neighborhood plan and coordinated with the Citywide Stormwater Management

Master Plan. Section 106-15 of the City Code is already a great start.

- Water quality treatment should always be required. Neighborhood plans and the upcoming Stormwater Management Master Plan should make every effort to demonstrate the applicability of simple and aesthetically valuable water quality Best Management Practices (BMPS) within the various neighborhood center contexts in Panama City.

The flexibility already provided within Section 106-11.B is useful, but should be accompanied by a set of guidelines or checklist for predictability. This list could limit application of this provision to focused neighborhood centers defined by the City, and might include more specific evaluation factors such soil conditions, topography, constraints introduced by proposed density/scale, etc.

Wetland & Floodplain Protection Recommendations:

- Current no-development buffer is 30 feet from jurisdictional wetland. Consider increasing the buffer width and enforcing against existing encroachment.
- Preservation zoning district requirements should be investigated for Green-Blue Framework areas to codify preservation of those areas.
- Code prohibits development, fill, or regrading within regulatory floodways unless encroachment analysis shows no rise. This requirement could be expanded to apply to other inland flood zones.

Waterway Dredging

Community participants identified the need to conduct dredging to restore water quality and increase quality of life and property values. The City has been working to develop a citywide dredging ordinance/program to help fund projects, in tandem with efforts to reduce stormwater runoff sediment load from the watershed that has contributed to filling in of the waterway. Dredging is expensive to design, permit and implement; a new program could institute a 2-tier fee system whereby property owners along the waterway (who benefit the most) as well as those within the overall watershed contribute to costs. The City is also conducting a cost-benefit analysis of contracting out dredging services versus purchasing equipment to reduce expense.

Neighborhood-Scale Solutions

Detailed neighborhood plans for Glenwood, Millville, and St. Andrews are presented in each neighborhood's section of the report. These neighborhood-scale solutions are informed by watershed-scale strategies and sensitive to each neighborhood's unique context.

GREEN-BLUE FRAMEWORK STRATEGIES: NEIGHBORHOOD- AND SITE-SCALE TOOLKIT



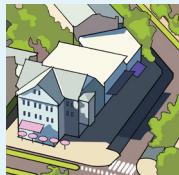
Urban Tree Canopy

Restore pre-Hurricane Michael tree canopy, with a focus on planting resilient species and providing healthy root zone (uncompacted, aerated, watered) for tree health.



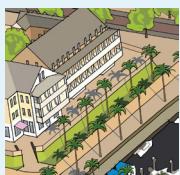
Low Impact Development

Expand implementation of low impact development practices such as preserving existing trees, adding new shade trees, protecting wetlands and vegetated buffers, protecting floodplains, and minimizing impervious cover within the watershed.



Focused Development

Guide development to locations that avoid sensitive natural systems and minimize risk from flooding, coastal impacts, and climate change.



Adaptation

Employ adaptation tools such as hardening, floodproofing, and raising to protect existing and future structures from storm surge and tidal flooding.



Green Stormwater Infrastructure

Construct small-scale green stormwater infrastructure facilities, such as rain gardens, and permeable pavement, throughout upland areas including streets, parks, parking lots, and private parcels. Incorporate green stormwater infrastructure, tree planting, and impervious area reduction into utility upgrade and street retrofit projects wherever possible.



Stormwater Parks

Improve existing stormwater ponds by adding native vegetation and flood storage.



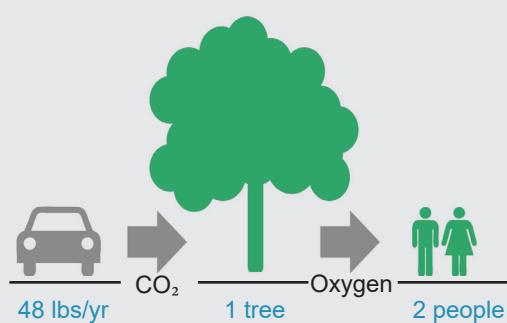
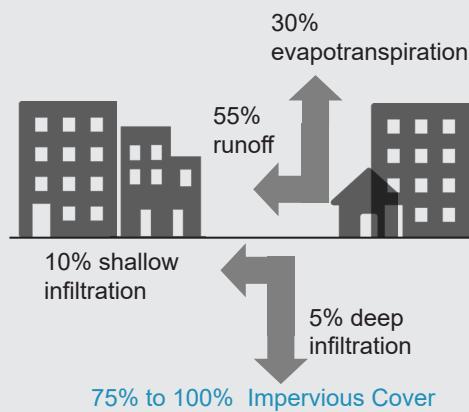
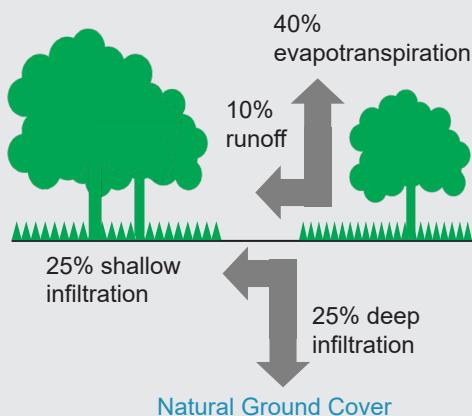
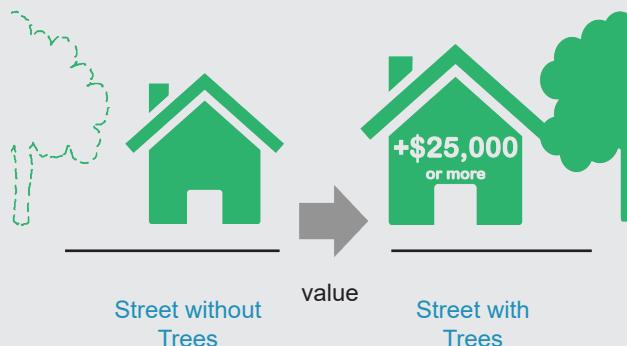
Waterfront Parks

Create parks along the Bay and Bayou waterfronts that are designed to flood and absorb wave energy during extreme storms.

Create recreational areas as part of stormwater ditch, pond, and wetland improvements. Amenities may include paths, gathering spaces, scenic views, wildlife viewing platforms, and waterfront access. Stormwater parks are designed to flood during extreme events and to withstand flooding.

Adapted from FEMA (2020) Building Community Resilience with Nature-Based Solutions

The Value of Street Trees



A primary focus of this plan is to restore the street tree canopy lost during Hurricane Michael. The City should develop an urban forest inventory and master plan that promotes the sustaining value of trees. Beyond design aesthetics, urban trees have numerous economic and environmental benefits.

» Economic Value

Research has shown that trees positively affect both property values and office occupancy rates. National studies show that trees increase property values by 5 to 15 percent.

» Human Health

Trees remove harmful pollutants from the air and soil and generate oxygen. Research has linked the presence of urban trees to reduced rates of cardiovascular disease, strokes and asthma due to improved air quality. Simply taking a walk down a tree-lined street, even in an urban setting can significantly reduce stress level by helping interrupt thought patterns that lead to anxiety and depression. Increased tree canopy can be directly correlated with wellness and social equity.

» Reduce Stormwater Runoff and Pollution

Trees decrease the amount of stormwater runoff and pollutants that eventually reach local waterways. Trees perform this important service through evapotranspiration and retention. The leaves and branches of trees intercept rain and prevent a portion of it from reaching the ground. The root structure of trees improves conditions for the infiltration of stormwater into the soil, further reducing the amount of runoff. Trees are also capable of absorbing certain pollutants.

» Carbon Storage and Sequestration

Carbon dioxide (CO₂) is commonly known as a type of greenhouse gas associated with climate change. The photosynthesis process of trees helps to reduce concentrations of CO₂ in the air by sequestering and storing carbon. Carbon sequestration varies based on tree species and age. Mature large trees store the most carbon.

Focused Development

These neighborhood plans guide development to corridors and centers that align with existing infrastructure, transportation systems, economic development objectives, historic and cultural resources, and protection/restoration of natural systems. These areas were identified by reviewing previous planning efforts, looking at historic patterns of development, listening to the public and other stakeholders, and then generating a consolidated vision plan. Clustering development around designated corridors and centers can allow for and enable contiguous green spaces and sensitive natural resources to be protected and restored. In conjunction with focused growth, protection and restoration of natural resources can target connected green swaths, thus reducing overall impervious area in the watershed and providing a host of other environmental and community benefits.

Adaptation

Where development is desired in environmentally vulnerable locations, such as low-lying coastal areas in St. Andrews, designs that account for frequent flooding and high groundwater must be utilized. Successful redevelopment within adaptation areas should use a broad suite of tools designed to redirect flood waters, allow flood waters to pass through, and/or temporarily store portions of flood waters. The approach embraces the reality of frequent flooding, and the design responses integrate these conditions into the lived experience. The Adaptation Toolkit provides primary techniques available at the block, street, building, and site scale.



Example of wetland restoration project used in Chepachet
(Credit: HW)

Low-Impact Development and Green Infrastructure

The future vision for development weaves “Low Impact Development” (LID) and green stormwater infrastructure (GSI) principles into the built landscape. LID is an approach to land development that works with nature to manage stormwater as close to its source as possible, reduce the impact of development on the environment, and promote the natural flow of water. LID often utilizes GSI practices such as permeable surfaces, rain gardens, bioretention systems, and tree filters to naturally filter and absorb runoff, thus minimizing downstream impacts.

Filter

Filtration BMPs predominantly treat stormwater runoff, not manage increases in runoff rate or volume. Practices are typically vegetated shallow depressions or open channels, including bioretention areas, bioswales, and vegetated sand filters. Some sites with high groundwater or poorly draining soils may still be appropriate for filtering GSI practices, using “wet systems” such as vegetated wet swales or constructed wetland systems designed to mimic natural wetlands – implementing the watershed scale Green-Blue Frameworks. Wetland systems are nature’s original filters – a high priority is placed on protection of existing wetlands and creation of new systems wherever possible.

Absorb + Store

Trees are stormwater machines. In addition to providing a host of environmental, economic, and community health benefits, trees draw moisture from the ground



Example of stormwater area in Fisher Hill (Credit: KMDG)

and intercept and store rainfall, which can significantly reduce local flooding, delay the onset of peak flows, and lessen requirements for additional stormwater infrastructure. Street trees can also be designed as tree trenches, which in conjunction with structural soil or silva cell structures to provide appropriate soil volume, can also accept runoff via gutter flow to feed root systems and encourage infiltration.

Detention of stormwater runoff has typically been accomplished in Panama City with engineered stormwater ponds, which may most efficiently achieve stormwater quantity mitigation but often have a negative impact on community safety and value. Basins often are designed with steep slopes to maximize volume within a given area, and require perimeter fencing for safety.

Porous surfaces, rain gardens, green roofs, and trees absorb stormwater – promoting infiltration and evapotranspiration and reducing runoff. Practices such as infiltration basins, recharge basins, dry wells, and sub-surface chambers are designed to store collected stormwater on-site and release it slowly, mitigating flooding impacts downstream and providing groundwater recharge and reuse of stormwater runoff wherever possible.

Beautify

Context-appropriate, strategically designed GSI practices provide value as aesthetically pleasing landscape amenities – “green design” features with more bang for the buck. Very often, green site design is also more cost effective compared to traditional “pipe and pond” approaches, especially when considering shared systems at the scale of the neighborhood or block, such as flood-



Example of stormwater area used in Boston Public Schools
(Credit: HW)

able parks and wetland restoration. Current monitoring data shows that GSI practices have a better chance of long-term success because they are typically visible, simple, easily understood, and most important, well loved by the surrounding community. Detention basins and technologically advanced solutions can lose functional value quickly if they are abandoned as eyesores or because they are too complicated or costly to maintain.

Green infrastructure projects at multiple different scales are proposed within each neighborhood's green-blue plan. For example, restoration of Henry Davis Park will increase Glenwood's flood mitigation capacity and serve community benefit when realized as an expanded wetland system with trails. Integration of urban green infrastructure systems and shade trees with appropriate soil volume as part of St. Andrews Beck Avenue retrofit (similar to what is currently being designed for Harrison Avenue Downtown) will mitigate flooding, improve water quality in the Bay, and greatly improve streetscape quality. And the proposed floodable park at E 6th Street and Elm Avenue in Millville will address localized flooding and provide value as a neighborhood park.

Below: Thomasville, GA. Street trees are being installed using structures to provide enhanced soil volume to filter runoff and promote root growth. These systems are currently being incorporated the Harrison Avenue retrofit following Downtown Plan recommendations, and should be considered for street retrofits in Glenwood, Millville, and St. Andrews



Adaptation Toolkit

Dry Floodproofing

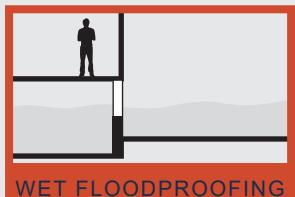
Water tight structures using external coating or internal membranes can prevent flood waters from entering. On-going maintenance is required and dry floodproofing may not always be the most aesthetically pleasing. As a first step, flood shields for windows and doors may protect vulnerable openings.



DRY FLOODPROOFING

Wet Floodproofing

Building modifications such as breakaway walls designed to break free when subjected to flood forces can safely allow flood waters to enter and leave the lower level. Elevating utilities above the base flood elevation is critical. Often requires repair costs by the owner after flood events.



WET FLOODPROOFING

Raise Finish Floor Elevation

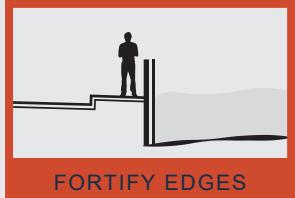
The most common form of adaptation is to elevate the entire first floor elevation above the base flood elevation. This can be accomplished on piles or earth fill. This technique can create accessibility issues depending on the site's surroundings, and can sometimes be difficult to retrofit into historic neighborhoods.



RAISE FINISH FLOOR

Fortify Edges

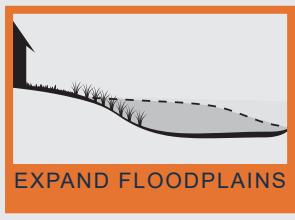
Seawalls, bulkheads, berms, and levees are common techniques to repel flood waters at the edges of sites or neighborhoods. An important role for the hard edge is to dissipate the velocity of flood forces from direct storm surge. Over time, scouring from constant wave energy can undermine the structural integrity of the structure from underneath. Requires periodic inspections to ensure stability.



FORTIFY EDGES

Expand Floodplains

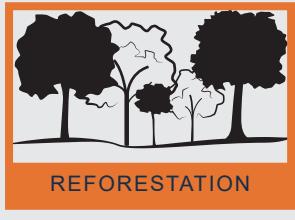
Development often hugs the coastline, infringing upon the riparian buffer/edge. Development along the coastal bank replaces a natural healthy riparian edge with manicured lawns, roads, and docks. Healing the riparian edge in balance with reasonable human uses and access to the water will expand floodplains by recreating a natural living shoreline.



EXPAND FLOODPLAINS

Reforestation

Transforming forests into pavement results in more runoff, higher pollutant loads, and erosive concentrated flows. The marina area is a prime example of a highly impervious area with tremendous opportunity for tree canopy cover improvements - also adding to land value and public health.



REFORESTATION

Restore Wetlands

Wetlands are extremely productive living ecosystem that also attenuate wave velocity, provide water quality treatment, and act as a natural buffer between the built environment and water resources. Restoring degraded wetland systems by enforcing and regulating buffer protection zones is critical to sustain a healthy relationship with water.

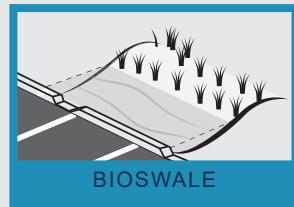


RESTORE WETLANDS

Resilient Infrastructure Toolkit

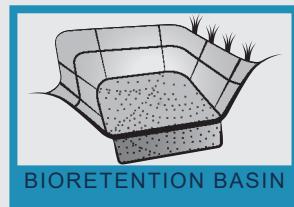
Bioswales

Bioswales are linear landscape elements designed to convey runoff. Typically bioswales are vegetated and provide water quality treatment. Bioswales designed with pretreatment facilities will perform higher filtering function and will require less maintenance over time.



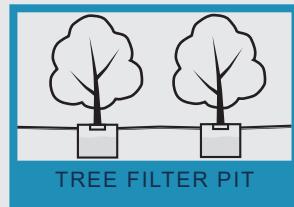
Bioretention Basins

Bioretention basins are depressions in the landscape designed to collect and filter stormwater. A more highly engineered rain garden, bioretention basins typically have pretreatment forebays, perforated pipe underdrains, and special soils that help filter and enhance infiltration.



Tree Filter Pits

Tree filter pits use stormwater runoff for irrigation. Primarily a water quality practice, runoff enters the systems from a deep sump inlet structure as a form of pretreatment. Stormwater is stored in the gravel reservoir below ground which allows the tree roots to soak up runoff.



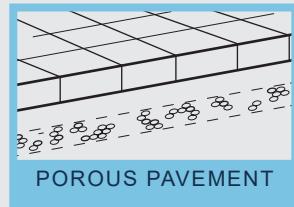
Stormwater Planters

Raised planters are ideal stormwater solutions for projects with space constraints adjacent to buildings. Roof runoff is diverted via downspouts into above-ground planters where microbes in the soil and around plant roots help to filter runoff before overflow into the storm system.



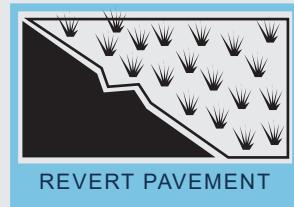
Porous Pavement

A range of free-draining alternatives to typical impervious bituminous pavement and concrete are available, such as pervious concrete, porous asphalt, pervious pavers, and structured grass. Proper design of the system base and review of the existing subbase for infiltration capacity is required.



Revert Pavement to Green Space

Often the simplest and most cost-effective green infrastructure retrofit, “grey to green” interventions replace extraneous pavement with planted landscape, including tree planting if possible.



Constructed Wetlands

Constructed wetlands mimic natural wetland function. Systems are designed for water at all times, either in saturated soil or as standing water. They are often designed with engineered soils and can include small islands and pools. Typically they are constructed as part of larger projects or systems.



Neighborhood Vision

Implementation Actions

Action Key	Action / Description	Time Frame		
		Immediate (first year)	Near-Term (years 1-5)	Long-Term (5+ years)
Complete Neighborhoods				
2	Invest in broadband infrastructure that provides access to all residents	X		
112	Pursue zoning updates to implement the vision. Zoning updates should use neighborhood character maps to inform permitted mix of uses, setbacks, lot size, parking requirements, and building design standards.	X		
51	Draft design standards to provide guidance for future buildings to conform with floodplain regulations and accommodate to sea level rise, while also enhancing neighborhood walkability (see St. Andrews chapter for more information).	X		
44	Produce signage / marketing materials about City-wide boat launch resources to inform community members of options and availability	X		
108	Produce RFP and make City-owned lots available for infill housing development	X		
131	Improve the usability of CRA grants by revising requirement for three independent bids	X		
155	Coordinate technical assistance for small businesses with Gulf Coast State College and FSU Panama City	X		
164	Engage the community in volunteer and educational opportunities related to green infrastructure	X		
165	Create a summer job youth program to undertake public improvements (planting trees, etc.)	X		
166	Commit to a diverse housing stock of different sizes, types and prices / rents	X		
128	Increase code enforcement to clear and/or clean vacant lots	X		
130	Invest in code enforcement with assistance to low-income homeowners to make improvements	X	X	
146	Promote strategic events, such as races, festivals, boat parades, and annual activities that connect residents across Panama City neighborhoods	X	X	
147	Create an Academy of the Building Arts in partnership with Panama City Marine Institute, Bay District Schools and local homebuilders (includes next 6 lines)	X	X	
148	Pursue grants and sponsorships	X	X	
149	Develop coordinated literacy and job-skills training	X	X	
150	Recruit community youth, adults and returning citizens	X	X	
151	Provide transportation, financial and child care support for participants	X	X	
152	Make City-owned land available for hands-on construction activity		X	
153	Fund home rehab and building efforts		X	X
171	Incentivize development of workforce and affordable housing in the sale of City-owned properties	X	X	
168	Develop an education and outreach program to inform residents of available heirs property/title assistance programs offered by the Department of Economic Opportunity and Florida Bar Association. Consider supplementing existing resources by establishing a community-based program that provides assistance in clearing titles (See action #171)	X	X	

Action Key	Action / Description	Time Frame		
		Immediate (first year)	Near-Term (years 1-5)	Long-Term (5+ years)
172	Continue to implement ReHouse Bay housing programs to provide housing assistance to low and moderate income households. Provide training, credit repair and financial assistance for first-time homebuyers. Partner with local organizations to host Financial Literacy courses at easily-accessible neighborhood facilities	X	X	
167	In Public / Private Partnership developments of City-owned land, require 10 to 15 percent of units be earmarked for workforce housing	X	X	X
154	Package and earmark some City-owned land sales for small contractors		X	
156	Consider establishing a Community Development Corporation to help businesses access Small Business Administration loans and other financing		X	
163	Provide financial literacy and other life skills training for area youth		X	
173	Partner with non-profits and / or developers to compete for Low-Income Housing Tax Credit support for mixed-income housing		X	
175	Consider developing architectural designs and plans for small infill housing that have been pre-approved for zoning and building permits		X	
169	Establish a community-based program to provide legal assistance in clearing title for heirs properties; develop application process and sliding-scale fee program; recruit probate attorneys to participate and negotiate discounted fees; inform residents and solicit applications for the heirs property program; screen applications to prioritize properties where title can be easily resolved		X	X
Great Streets				
114	Adopt a Complete Streets Ordinance	X		
115	Adopt C-4 and C-5 designations for context-sensitive design by FDOT	X		
113	Adjust City practice for intersection / site distance triangles to allow buildings along the sidewalk in C-5 context areas (neighborhood downtowns) in most circumstances	X		
5	Add street lighting to enhance safety; priority areas include street design projects and neighborhood downtown / mixed-use corridors		X	X
9	Redesign priority street connections to improve safety, walkability, and bikeability (specific streets highlighted in neighborhood chapters and US Business 98 below)		X	X
13	Improve US Business 98 Corridor streetscape, lighting, safety, infrastructure (including street trees / soil cells), bike facilities, and walkability, from the 5th Street bridge to East Avenue in Millville; from the 5th Street bridge to Massalina Bayou in Glenwood; and Beck Ave in St Andrews.		X	X
17	Enhance cross-town street connections (include street trees, green stormwater infrastructure and protected bikeway/sidewalks or multi-use trail) via 15th Street; 11th Street; Beach Drive; 5th/6th Street		X	X
18	Improve auto-oriented intersections for safety, walkability, and bikeability (specific intersections highlighted in neighborhood chapters)		X	X
21	Invest in neighborhood sidewalks, prioritizing routes to parks, schools, and neighborhood business districts		X	X
22	Restore the street tree canopy, focusing initially on street design projects and neighborhood downtown / mixed-use corridors		X	X

Action Key	Action / Description	Time Frame		
		Immediate (first year)	Near-Term (years 1-5)	Long-Term (5+ years)
Resilient Infrastructure				
45	Adopt an internal City policy / protocol for evaluating and integrating green stormwater infrastructure into street retrofit, infrastructure upgrades, and other capital projects	X		
47	Create a comprehensive coastal resiliency plan including design guidelines and regulatory audit	X		
50	Develop a strategic buyout / incentive and conservation program to implement watershed restoration according to each neighborhood's Green-Blue Framework plan, including permanent conservation mechanisms, restored natural systems, space for flooding and absorption	X		
75	Engage with the St. Andrew and St. Joe Bays Estuary Partnership to develop action plans and funding to address watershed issues	X		
76	Partner with Healthy Gulf and other regional entities working to clean up the Gulf of Mexico to gather support for green infrastructure and water quality improvements	X		
78	Develop maintenance plan and strategy for each park as well as overall park system	X		
116	Revise stormwater management regulations to add clarity, adapt to scale / context of place, allow for shared solutions, and remove barriers to green stormwater infrastructure	X		
119	Adopt City policy to seek easements for public access to the waterfront in the approval process for future developments	X		
1	Upgrade / replace water, sewer, stormwater infrastructure; priority areas include street design projects and sewer lift stations damaged in Hurricane Michael. Other locations will be identified and prioritized as part of ongoing sewer, water, and stormwater infrastructure assessments	X	X	
79	Improve safety and access in all existing parks, including lighting, site visibility, and handicap accessibility	X	X	
74	Develop an urban forest inventory and master plan to replace tree canopy lost in Hurricane Michael and improve conditions for tree health	X	X	
118	Investigate and incentivize green restoration opportunities within the floodplain	X	X	
158	Conduct information sessions to help educate local contractors as to green infrastructure and coming opportunities		X	
159	Develop workforce training and entrepreneurship support programs for green infrastructure and wetland restoration, installation, maintenance and monitoring with non-profit partners. Recruit neighborhood residents		X	
160	Explore opportunities to create a National Green Infrastructure Certification Program center to train and certify local workers		X	
120	Prepare citywide Master Stormwater Plan		X	
121	Pursue creation of a stormwater utility		X	
4	Upgrade and maintain wastewater infrastructure to eliminate discharge of untreated or under-treated sewage, and relocate vulnerable infrastructure	X	X	X
49	Create new trail networks, taking advantage of green stormwater infrastructure, wetland/bayou restoration projects, connections to the water, and swale upgrades	X	X	X
88	Seek opportunities to create pocket parks	X	X	X

Action Key	Action / Description	Time Frame		
		Immediate (first year)	Near-Term (years 1-5)	Long-Term (5+ years)
46	Prioritize, design, and install green infrastructure improvements	X	X	X
77	Fund a stormwater staff position within DPW to ensure green infrastructure solutions are included in the City's capital improvements, review private development proposals for compliance with flood plain and stormwater regulations, coordinate implementation of the citywide Stormwater Master Plan and stormwater utility, and pursue grant funding for resilient infrastructure projects (See actions #75-76, #122, #123, #160-162)	X	X	X
6	Underground / harden utilities; priority areas include street design projects and neighborhood downtown/mixed-use corridors		X	X
Note: See Implementation Action Plan (Chapter 7) for a full summary of actions with anticipated time frame, responsible parties, and funding sources.				