EPA United States Environmental Protection Agency

FEMA

RECOVERY AND RESILIENCY PARTNERSHIP

MEXICO BEACH

STORMWATER MANAGEMENT AND GREENSPACE PROJECT

MEXICO BEACH, FLORIDA

DECEMBER 2019

Recovery and Resiliency Partnership

The Recovery and Resiliency Partnership (RRP) is a project of the U.S. Environmental Protection Agency (EPA), Region 4; the U.S. Federal Emergency Management Agency's (FEMA) Interagency Recovery Coordination (IRC) field operations; and Mexico Beach, Florida to support coastal recovery from Hurricane Michael and improve Mexico Beach's future resilience to stormwater impacts. EPA Region 4 convened federal, state, and local partners to help the community develop a vision for sustainable stormwater management that supports recovery, economic development and local quality of life. Throughout the project, the EPA and IRC field operations worked closely with city staff to respond to specific community goals and challenges with a set of sustainable design options that foster a strong sense of place. The results provide an integrated network of open space, trails, wetlands and canals that connect business and residential areas across the city.

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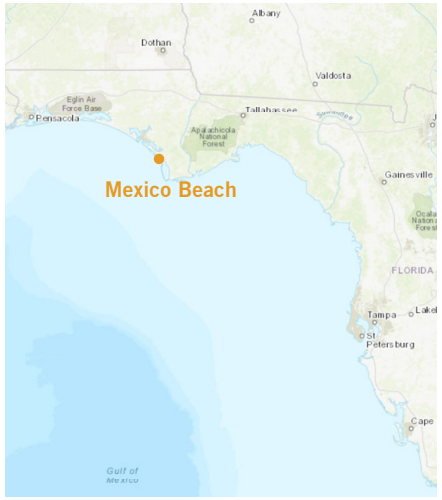
Executive Summary

Hurricane Michael had catastrophic impacts on Mexico Beach in October 2018. Recovery will take many years of hard work, planning and community commitment. The resources to support the long-term recovery of the city and the integration of resiliency to future storm-related events will be a significant challenge for the immediate future as well as an opportunity. *The Recovery and Resiliency Partnership: Mexico Beach Stormwater Management and Greenspace Project* outlines a set of sustainable design strategies for improving resilience and supporting long-term recovery across Mexico Beach.

The report describes the stakeholder and public engagement process, existing conditions, needs and opportunities analysis, and design tasks undertaken to address citywide and site-specific challenges. The report includes proposed designs that integrate sustainable practices, accompanied with detailed illustrations to help community members, city staff and potential developers envision the functional, aesthetic and experiential qualities of the proposed designs. The six design projects, which are linked by land and water systems, focus on three strategies: managing stormwater for resilience and recreation, making connections across the landscape, and expanding community spaces as well as the local economy. The report concludes with next steps for implementing the design and policy strategies based on input from the city and the Recovery and Resiliency Partnership (RRP).

Potential funding sources are included in an active (digital) document separate from this report. The document is designed for the city and the RRP to record and update opportunities, tasks and actions in real time.



Mexico Beach is located on the panhandle of Florida.


Site of former City Pier and condos on 37th Street.


Recent flooding in the area.

Introduction

Community

The project area is in Mexico Beach, Florida, which is located in Bay County between Tyndall Air Force Base to the west and Port St. Joe to the east. Mexico Beach was home to almost 1,200 residents and an additional 11,000 during the height of the tourist season. On October 10, 2018, Mexico Beach was at the epicenter of Hurricane Michael, a Category 5 hurricane, that devastated the 1.83 square mile community. According to the Federal Emergency Management Agency, Mexico Beach was 'wiped out' by the hurricane and over 80% of the building structures suffered extensive damage.

Problem

Mexico Beach is a small beachfront community located on a coastal highway in a rural portion of Florida. Mexico Beach has grown, but has had limited long-term community planning since incorporating in 1962. Given the devastating impact of Hurricane Michael, there is an opportunity to redesign portions of the city to better integrate greenspace and the canal system to benefit both citizens and visitors.

The city's Stormwater Master Plan, completed in 2015, identified flooding and infrastructure deficiencies within the city's stormwater management system as well as water quality issues. These stormwater management issues were further compounded by Hurricane Michael. The proposed infrastructure solutions identified in the 2015 Plan, along with the existing and planned community park assets and the city's resiliency goals, provided the foundation for design solutions. EPA Region 4, the State of Florida and FEMA IRC sponsored this technical assistance to support the recovery effort with a sustainable vision and set of design options to improve stormwater management, open space and economic development.

Process

Early discussions between Mexico Beach and FEMA IRC identified opportunities for enhancing the long-term recovery efforts of the city. Because of the identification of potential Brownfields, stormwater issues, and recreational and economic needs, the city committed to developing the Recovery and Resiliency Partnership (RRP) as a technical assistance tool for addressing issues and identifying opportunities. The partnership conducted the following activities to develop design options for the project locations identified by the city:

- Reviewed existing planning documents.
- Participated in weekly meetings.
- Conducted an initial site visit to identify and discuss the potential project locations.
- Developed initial design concepts.
- Coordinated with the city and a landscape architecture class from Mississippi State University to provide design concepts for additional areas in the community.
- Convened a series of working sessions and public open house events to share information with the public.
- Refined the design concepts to incorporate

community feedback and integrate subject matter expertise from the RRP.

- Coordinated with the National Park Service - Rivers, Trails & Conservation Assistance Program to develop refined wetland park concept plans.
- Reviewed revised design options with the city and RRP to identify potential funding opportunities.
- Identified an economic overview of design implementation benefits.
- Developed a final report summarizing the technical assistance.

Community Concerns

Mexico Beach residents, property owners, business leaders and city staff shared several key concerns that they hoped the design concepts could address.

Flooding

Many concerns center around potential flooding and damage from future storm events. Inundation maps from Hurricane Michael reveal that many areas which should have been protected from flooding were among the most damaged due to an influx of water in channels that were connected to a compromised drainage system. The community expressed support for stormwater infrastructure and design projects that will help redirect water away from developed areas and infiltrate runoff to improve water quality.

Safe Transportation

Community members are concerned with the increasing vehicular traffic on roadways which causes inconvenience, noise and pollution in Mexico Beach. The limited road and sidewalk infrastructure cannot safely accommodate the growing volume of cars and support safe pedestrian activity. Narrow sidewalks and canal crossings (bridges), unmarked street crossings, and increasing golf cart traffic on streets and sidewalks challenge pedestrian safety, particularly along the beachfront access areas of Highway 98 and 15th Street.

Character

The damage resulting from Hurricane Michael has led to an increase in real estate transactions. Older property owners who have decided not to rebuild have sold their properties. Local real estate professionals note that the average age of property owners is decreasing, and many properties have been purchased by non-local buyers. The increasing number of non-resident property owners concerns some residents, who worry about the upkeep and occupancy of the properties. Community members also express concern about redevelopment that is not consistent with the character of Mexico Beach, and express preferences to maintain the culture, scale and feel of the community.

Maintenance

Community members expressed concern about the city's ability to maintain new and restored parks and recreation areas. With only a fraction of the community being able to return to their homes, the tax base presents new resource challenges for the community. In particular, residents worry that if the stormwater flow is re-engineered to rely more heavily on conveyance of water through the canal system and wetlands, maintenance issues may exacerbate rather than resolve flooding issues.

Community Engagement

In June 2019, the RRP conducted a site visit to evaluate project locations, observe ground conditions, and gather information about community goals. During facilitated discussions with stakeholders and community members, the team gathered a number of goals and considerations to inform the design process. The city and the project team identified over a dozen potential sites for design projects and prioritized five sites as well as an integrated greenway-blueway trail system for development of conceptual designs.

The design team, city and RRP planned a series of targeted stakeholder meetings and community open house engagement events in September 2019 to share initial design concepts, gather input on the designs and review feasibility of the proposed projects. The city, federal and state partners also discussed project strategies, priorities, and funding opportunities for implementation.

The city publicized the two open house events by posting flyers, sharing information on the city website and through local media. The city also coordinated stakeholder meetings with participants who have specific interests in the project.

Over 50 community members attended an open house session, and 77 community members responded to the online survey that followed. Participants shared enthusiasm for the designs and for the future of Mexico Beach. Detailed information about community input is located in Appendix A.

Participants identified the following priority issues and goals for the project area: flood reduction, vehicular and pedestrian safety, accessible parks and public spaces that attract visitors and benefit residents, and water quality improvements.

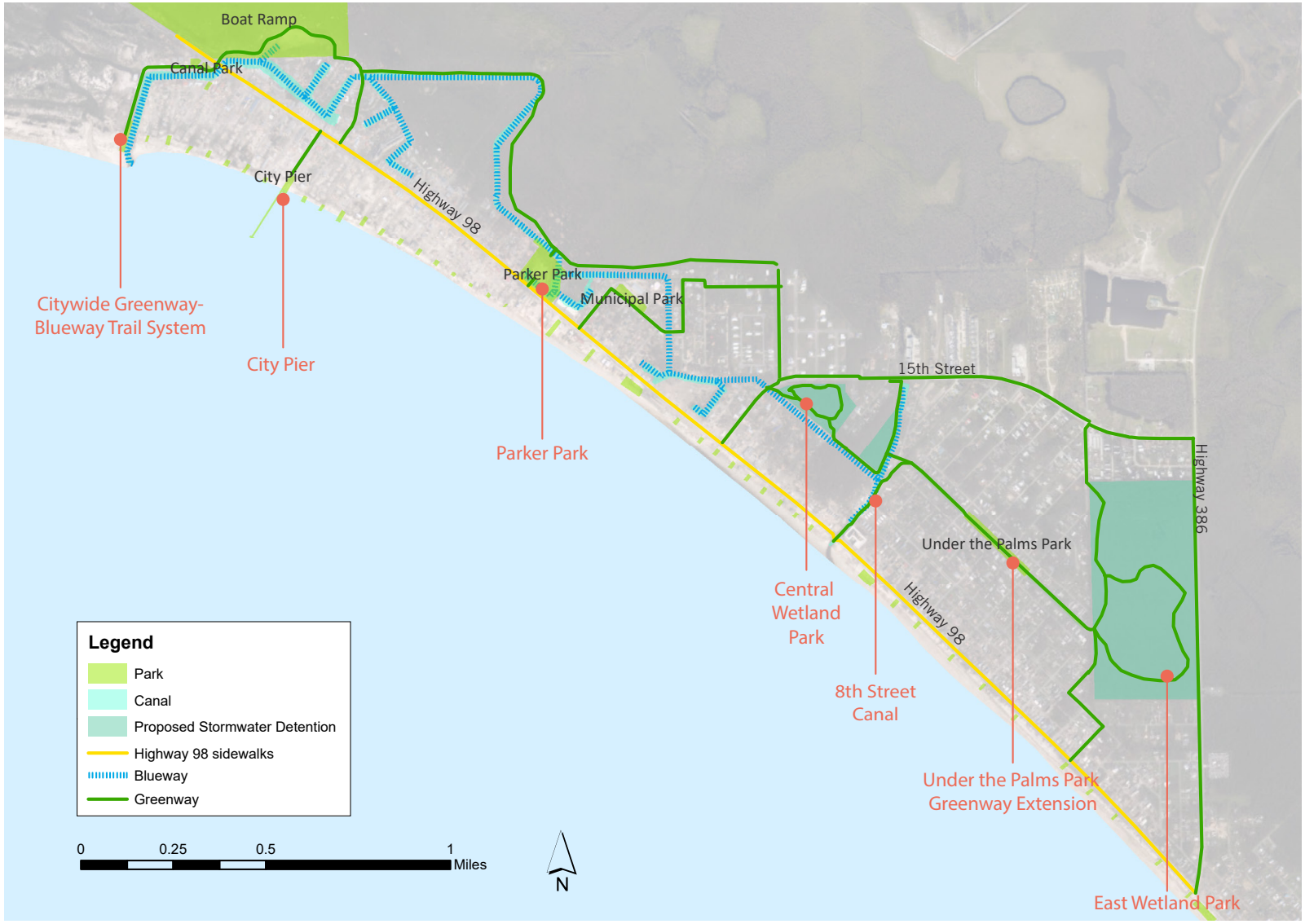
Local, State and Federal Agency Engagement

Regular engagement under the FEMA IRC field operations with the city started an open line of communication and built a foundation of trust early. Throughout the design process, the RRP continued to build on that foundation by regularly sharing input and expertise on design development. Ongoing participation of local, state and federal partners helped identify potential funding sources, funding criteria and design features to leverage a range of opportunities that can promote recovery and support initiatives in Mexico Beach.

Members of the Recovery and Resiliency Partnership review design concepts during the federal, state and city implementation planning session.

Site Locations

The design strategies and concepts for the project sites and the citywide greenway-blueway trail system focus on increasing resilience and enhancing community by improving stormwater management, alternative transportation and opportunities for economic development.



Design Strategies

Managing Stormwater for Resiliency and Recreation

This set of concept designs consider how the landscape can function as an integral part of the stormwater infrastructure to reduce flooding and improve water quality in Mexico Beach.

Regional Stormwater Detention

The proposed plan includes a network of regional stormwater detention areas that will temporarily store water during rain events to prevent flooding and improve water quality. The plan includes reversing the flow of stormwater to Panther Swamp, which eliminates the direct discharge of untreated stormwater to the Gulf of Mexico from the 8th Street Canal.

8th Street Canal

In conjunction with regional stormwater ponds, the city's proposal to revert the flow of stormwater back into Panther Swamp located just to the north of Mexico Beach presents opportunities for placemaking along the 8th Street Canal, including a safe pedestrian access point to the beach under Highway 98.

Wetland Parks

Restoration of two large wetland areas in Mexico Beach will provide new recreational, ecological, and educational opportunities by welcoming visitors safely into wetlands for wildlife viewing, birdwatching and low impact recreational activities. Healthy wetlands also provide secondary water quality treatment.

Making Connections: Citywide Greenway-Blueway Trail System

Two concepts focus on linking greenspaces and destinations with multiuse paths.

Citywide Greenway-Blueway Trail System

A citywide greenway-blueway trail system offers recreational and economic opportunities while addressing safety and transportation issues. A network of linear bioswales (planted channels) and sections of pervious pavement can mitigate the effects of stormwater runoff from the paved paths, and boardwalks will offer a new glimpse into wetlands and wildlife within the city with low ecological impact.

Under the Palms Park Greenway Extension

The linear right-of-way above the box culvert that extends from the 8th Street Canal to 3rd Street offers recreational space for a greenway connection and passive recreation features, such as gardens, on the east and west sides of the existing Under the Palms Park.

Wetland area and channel.

Under the Palms Park.

Expanding Community Spaces and Local Economy

The City Pier and Parker Park design concepts propose restoring and expanding high value community spaces for recreation and entertainment.

City Pier

Enhancing features around the future City Pier community space, as well as positioning adjacent properties for mixed use (residential and commercial), offers opportunities to meet new construction regulations more affordably and to create a destination with economic opportunity and recreational amenities.

Parker Park

A thoughtful restoration of Parker Park improves upon recently constructed park features that were destroyed by Hurricane Michael and connects the park to a citywide greenway-blueway trail system.

City Pier area.

Design Strategies

Community Input

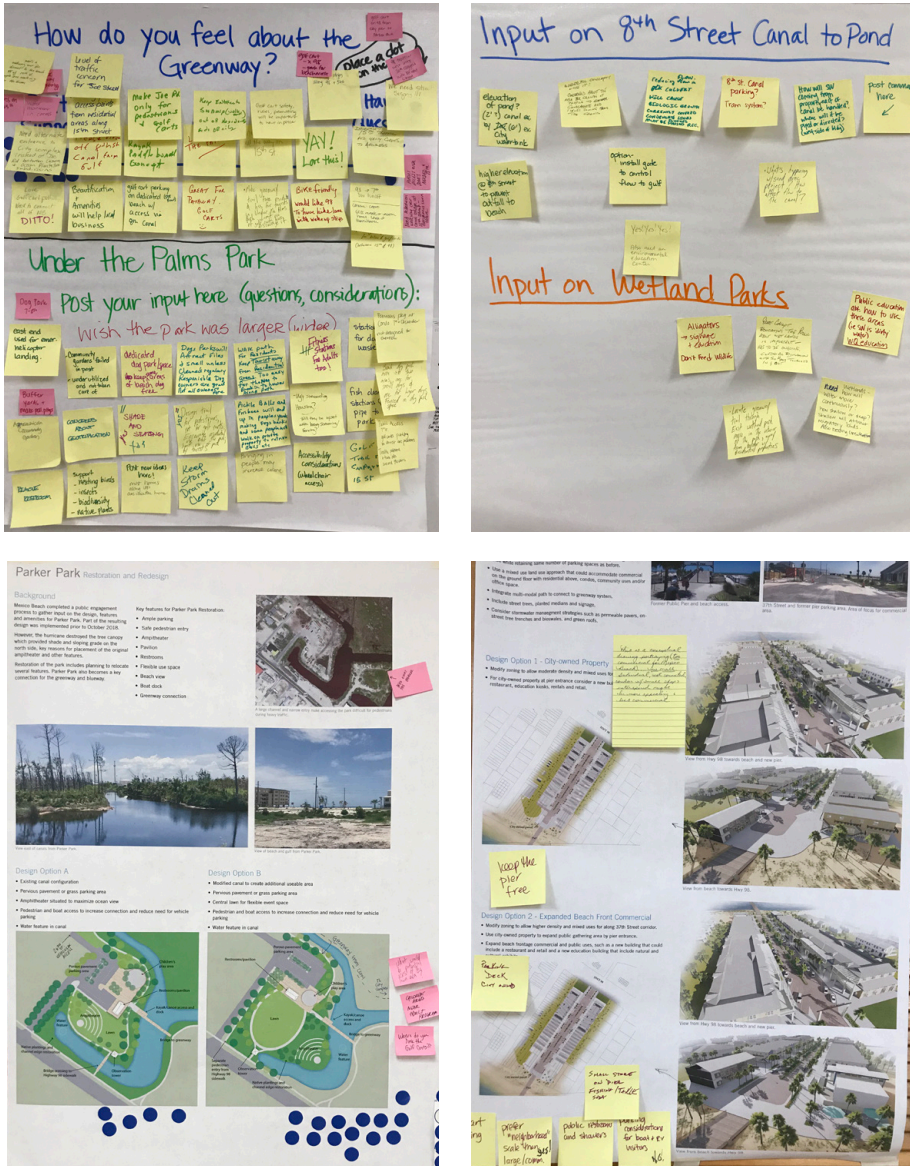
Community members provided valuable input on the concept designs during the public open house sessions and through an online survey. The majority of participants responded favorably to the concepts.

In both open houses and surveys, the proposed 8th Street Canal project, the citywide greenway-blueway trail system and the Under the Palms Park greenway extension received overwhelming support.

Most community members responded favorably to the wetland parks, but expressed concerns about how potential flooding and mosquitoes could be managed. Restoration of Parker Park was strongly supported, and the majority of participants expressed a preference for one of the two concepts presented.

Although the community agreed upon prioritizing the reconstruction of the City Pier, some participants expressed concern about rezoning the pier area (37th Street) to accommodate small-scale commercial use. Concerns included the scale and character of commercial development and communications with existing property owners regarding the potential transition.

The design team revised the conceptual approach to the pier development by adding more of a small community feel and fishing town atmosphere which was based on input from the community engagement meetings.



Examples of community input and preferences provided during community open house sessions.

Design Strategies

Sustainability and Resiliency Features

The design options address specific challenges by integrating best practices to address stormwater while providing amenities to improve public spaces and biking and walking safety. Each design option integrates one or more of the tools described on this page to help manage the volume, flow and/or treatment of stormwater. The icons are included on the concept design plans to indicate the tools used. For more information about the benefits, see the Benefits of Sustainability and Resiliency Features section.

Vegetated Swales (Bioswales)

Vegetated swales, sometimes referred to as bioswales, are broad, shallow channels designed to convey and infiltrate stormwater runoff. Swales reduce stormwater volume and improve water quality through infiltration and vegetative filtering. Swales can be planted with grasses, perennials, shrubs and trees to increase aesthetic and habitat value.

Wetland Retention

Enhancing existing wetlands can provide stormwater detention, improved water quality, increased habitat and new recreational amenities.

Rainwater Storage

Capture systems collect and store stormwater for specific purposes, such as irrigation, and often can hold water for a significant period of time.

Pervious Pavement

Pervious concrete and asphalt have proven viable alternatives to reduce stormwater runoff volume, rate, and pollutants.

Waterway Restoration

Vegetated buffers on either side of a waterway enhance watershed health by moderating water runoff quantities and improving water quality. The vegetation can intercept, absorb, and infiltrate surface runoff to help moderate the peak runoff rates during rain events, which reduces erosion and sedimentation of the channel.

Pollinator Gardens

Many types of plants, including fruit and vegetable crops, depend on animals (such as butterflies, bees and birds) for pollination. Using pollinator-friendly plants can also help support these important species.

Native Plantings

Incorporating vegetation into the landscape is a stormwater management technique that mimics natural drainage. Vegetated areas intercept and infiltrate rainfall to decrease stormwater volumes and can also remove pollutants.

Health and Wellness

Increasing opportunities for health and wellness can strengthen a community's resilience by increasing wellbeing and community ties through exercise and social interactions. In addition, recreation amenities can bolster economic recovery as recreational tourism grows in popularity.

Alternative Transportation

Providing infrastructure for safe travel by foot, bicycle and paddle boat can reduce vehicular traffic and encourage healthier lifestyles.

Resiliency

Many sustainability features are part of larger design strategies to increase resilience in storm events, such as slowing stormwater runoff by collecting and detaining water temporarily to reduce damage. Designs also include strategies to increase resilience by creating places and spaces that support economic development, such as greenways and commercial opportunities to attract visitors and boost employment. Design tools and strategies to support economic recovery and build resilience for future storm events are highlighted within each design concept.

CONCEPT DESIGNS

1 | Regional Stormwater Detention

2 | 8th Street Canal

3 | Wetland Parks

4 | Under the Palms Park Greenway Extension

5 | Citywide Greenway-Blueway Trail System

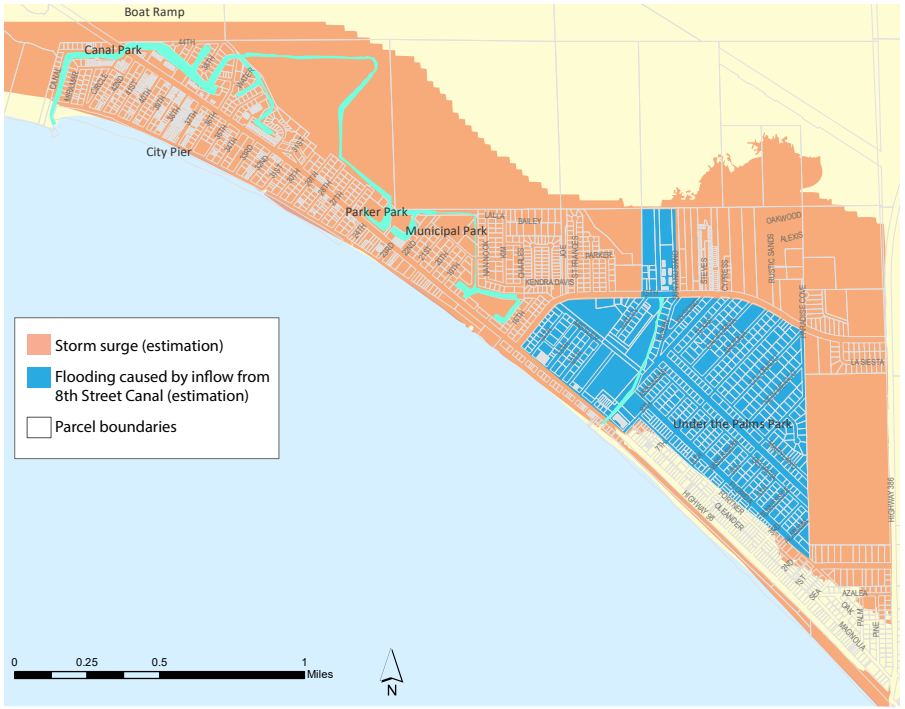
6 | Parker Park

7 | City Pier

1 | Regional Stormwater Detention

Existing Conditions: Stormwater Flow Issues

- The city's stormwater system collects runoff through a series of ditches, canals and pipes that outfall at two key locations to the Gulf of Mexico.
- The stormwater network is not functioning as originally designed due to alterations that impede flow (such as private owners altering ditches or constructing pipes).
- Several stormwater pipes and infrastructure features are undersized.
- The 8th Street Canal allows water to backflow into the city during storms. The storm surge during Hurricane Michael entered 8th Street Canal and flooded inland neighborhoods, causing extensive damage.



Map showing area of inundation during Hurricane Michael. 8th Street Canal acts as a conduit for storm surge during storm events, resulting in increased flooding in inland neighborhoods.

Drainage ditch.

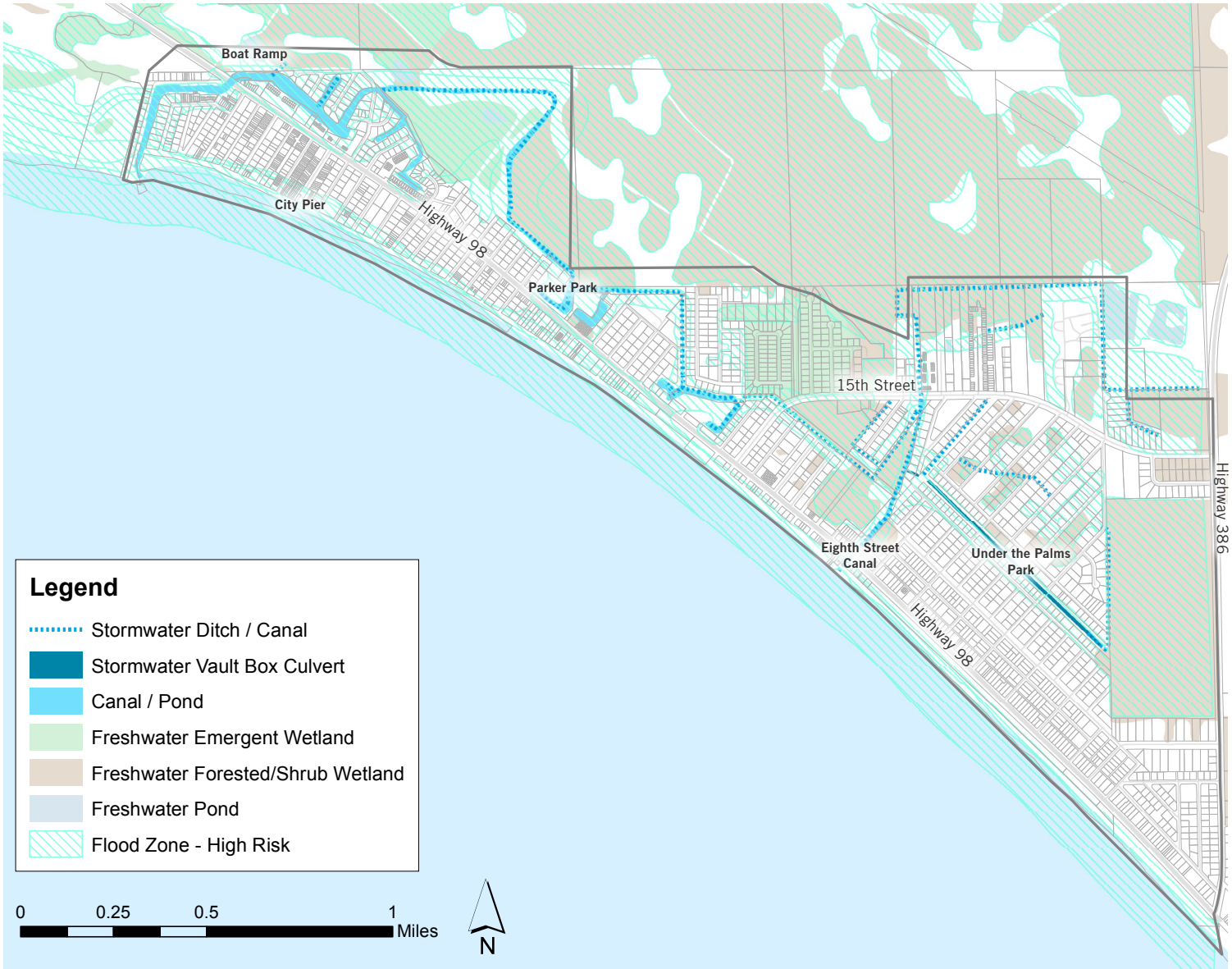
Channel adjacent to proposed Central Wetland Park.

8th Street Canal.

Box culvert.

1 | Regional Stormwater Detention

Existing stormwater infrastructure includes a network of drainage channels, a large box culvert, and canals that discharge to the Gulf of Mexico.



1 | Regional Stormwater Detention

Proposed Design: New Drainage Pattern

- The city has identified three vacant wetland properties located along the stormwater network where excess stormwater can be diverted and detained. The city prioritized two of the wetlands to consider in the near term for stormwater detention.
- Ponds in the wetland areas can store stormwater and attenuate stormwater flow for flood control during rain events.
- Enhanced wetlands may provide wetland mitigation credits[1] for future development.
- The existing stormwater box culvert can serve as a stormwater vault during rain events and hydrologically connect the proposed wetland parks.

[1] Wetland mitigation banking is the restoration, creation or enhancement of wetlands for the purpose of compensating impacts to wetlands at another location. Purchasers can buy credits from wetland mitigation banks to compensate for the impact of lost wetlands.

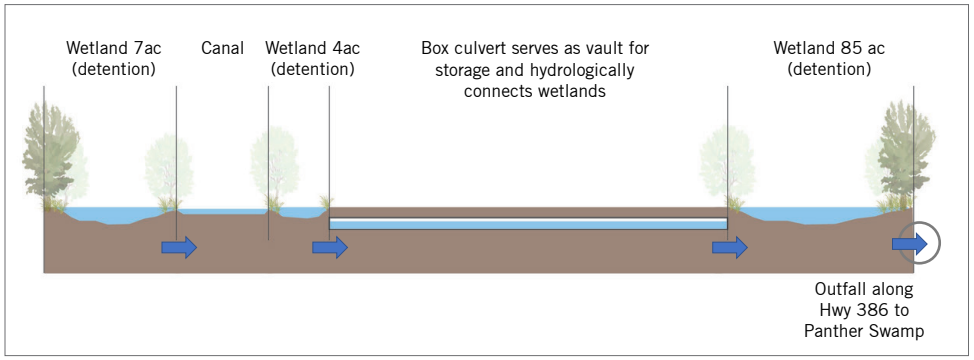
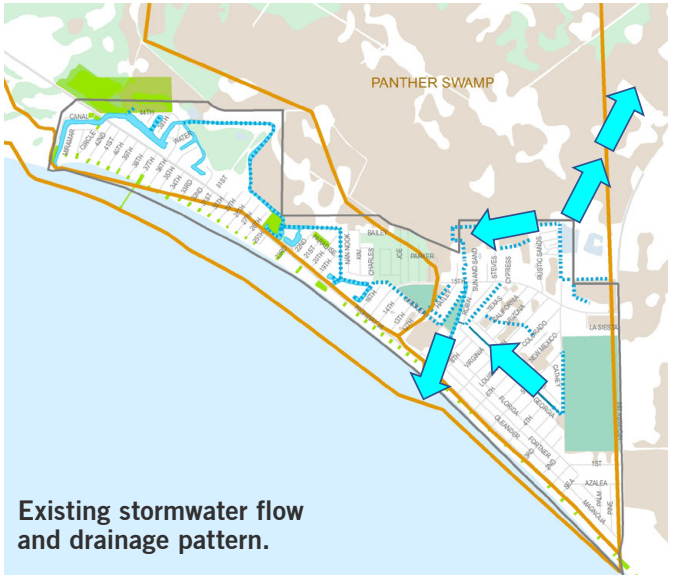
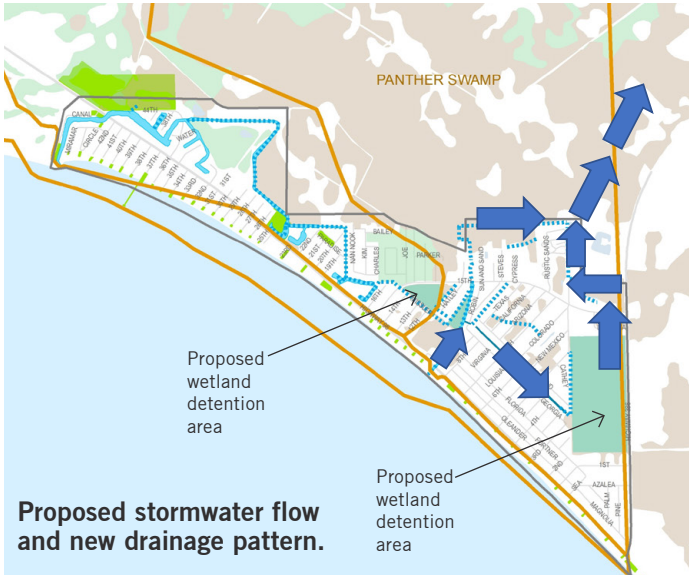


Diagram of Proposed Stormwater System.

The proposed drainage system increases resiliency by creating several large spaces capable of storing sizable volumes of water. The system is designed to slowly release water to avoid flooding and erosion while providing natural filtration that can improve water quality.



Stormwater from neighborhoods east of 15th Street moves toward the 8th Street Canal and discharges to the Gulf of Mexico.



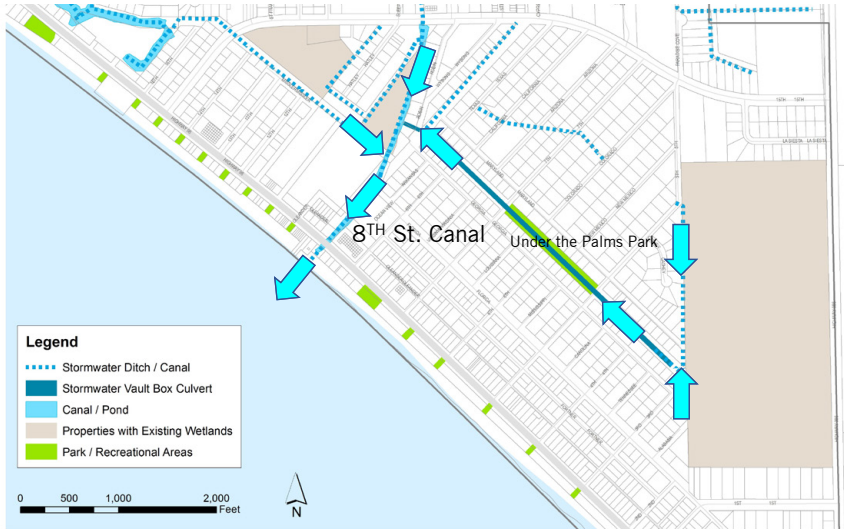
The proposed system directs stormwater to detention areas (when needed) to balance flow through the large box culvert into Panther Swamp.

2 | 8th Street Canal

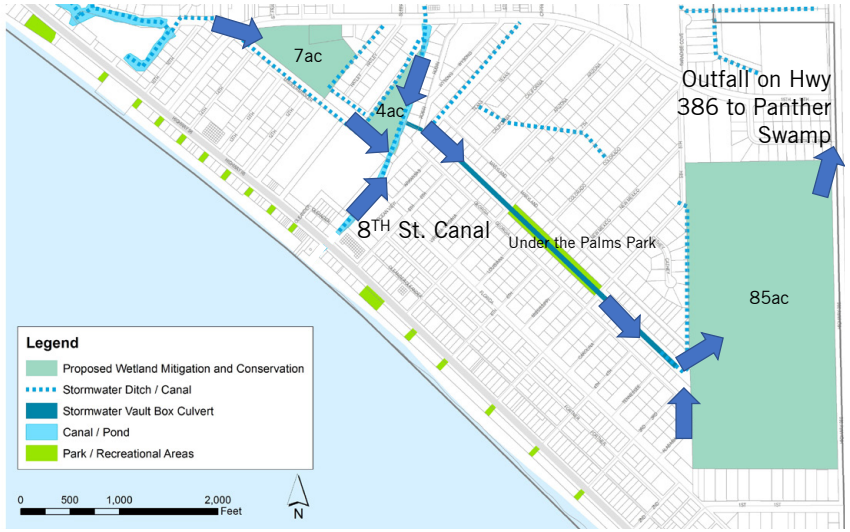
Existing Conditions: Drainage Pattern

- Stormwater runoff is managed through a series of ditches, canals, an underground culvert, and an outfall to the Gulf of Mexico via the 8th Street Canal.
- The 8th Street Canal directly discharges untreated stormwater into the Gulf of Mexico. The discharge contains pollutants, including nutrients upstream of the city that are collected in the larger drainage basin. As this area continues to be converted into farmland, pollutant loads to the Gulf of Mexico will increase significantly. The discharge also contains tannins, which create a dark brown color (and often odor) on the beach.
- During Hurricane Michael, the 8th Street Canal was a direct conduit for storm surge. This caused extensive flooding. The surge moved up the canal and spread outward to inundate entire inland neighborhoods bordering the canal.
- Because Highway 98 acts as a levee against storm surge and the canal presents a break in the levee, the 8th Street Canal is one of the city's most vulnerable features with regards to resiliency and mitigation.

Tannins enter the Gulf of Mexico from the 8th Street Canal.



The existing drainage pattern directs stormwater toward the 8th Street Canal and discharges untreated stormwater into the Gulf of Mexico.



The proposed stormwater management system directs stormwater to detention areas away from the 8th Street Canal, and stormwater no longer discharges onto the beach.

2 | 8th Street Canal

Proposed Design: Convert Canal to Pond

Closing the canal can increase resilience to flooding in storm events and present new opportunities for recreational features and ecological enhancements. Redesigning the canal as a pond with public greenspace, a beachfront connection and blueway access offers new amenities for residents and visitors.

- Eliminating the outfall and installing a dune/ berm can increase protection against surge for all residential neighborhoods south of 15th Street.
- Extension of the proposed greenway provides a safe connection under Highway 98 to the beachfront for pedestrians, bicyclists and golf carts.
- Reinforcement of areas (where the bridge meets grade on north side of the highway) with native plantings can prevent erosion and provide important habitat.
- Blueway access, boat launch and kayak storage provides beach access for paddlers.
- Native plantings and riparian edge restoration can improve ecological health and increase flood resilience.

Existing 8th Street Canal opens to beachfront under Highway 98.

The proposed plan to end 8th Street Canal creates a pond, greenway extension and an underpass to the beachfront.

2 | 8th Street Canal

Illustration of Proposed Design Concept

Illustration of proposed new community recreational asset.

3 | Wetland Parks

Proposed Design: Wetland Parks

Proposed wetland parks offer many opportunities to increase resilience to storm events, enhance recreational opportunities and improve ecological health in Mexico Beach.

Stormwater ponds within the wetland parks will capture the high flow stormwater runoff, attenuate flow and reduce the peak discharge. Then, the ponds will overflow to the wetlands for additional absorption and treatment. The ponds serve as the primary attenuation/ treatment, and the wetlands serve as secondary treatment.

Several specific features and benefits include:

- The proposed ponds and wetland conservation areas can improve water quality through natural filtration and infiltration.
- Detaining stormwater in the wetlands can reduce flooding during significant rain events.
- The areas can also provide recreation opportunities for wildlife watching, walking or biking along street edges and boardwalk paths.
- Ecological benefits of stormwater detention include wetland restoration and high value habitat.
- Best practices might include low impact design for access and walkways, wetland restoration and native species habitat protections.
- Enhancing the wetlands could potentially be used to create a wetland mitigation bank, enabling private property owners to purchase credits for impacts to wetlands in another location during construction.

Proposed wetland parks are connected by drainage channels and an underground box culvert, significantly increasing potential water storage area.

Wetlands increase resiliency by capturing and slowing the movement of large volumes of water. The vegetation protects the land from erosion, reduces sediment in the canal, and helps to filter pollutants from water. The wetland parks also offer opportunities for economic revitalization by attracting visitors and creating a potential bank for wetland credits to offset development.

3 | Wetland Parks

Central Wetland Park

- Central Stormwater Park (7-acre parcel) can include a wet pond and boardwalk paths that connect to the citywide greenway.
- Other features might include native plantings, wildlife viewing platforms and accessible gathering areas with structures such as pavilions that can be flooded during significant rain events.
- Parking along 15th Street provides easy access to the park, paths and pavilion.

View from 15th Street of proposed Central Wetland Park and greenway (left of channel).

View from 15th Street shows proposed park on the right. A proposed crosswalk and separate bridge for pedestrians and bicyclists can support safe access to the park.

Proposed Concept for Central Wetland Park. The concept plan was prepared with assistance from the National Park Service - Rivers, Trails & Conservation Assistance Program.

3 | Wetland Parks

East Wetland Park

- The existing 85-acre wetland can be enhanced to provide regional stormwater detention.
- Proposed boardwalk paths and wildlife observation deck offer wildlife viewing and educational opportunities.
- A proposed trailhead facility, greenway connection and parking along Highway 386 provides access to amenities.
- The greenway connection along Highway 386 can serve as a regional greenway connection and shared amenity for Gulf and Bay Counties.

View of existing wetland at proposed East Wetland Park looking west.

Proposed Concept for East Wetland Park. The concept plan was prepared with assistance from the National Park Service - Rivers, Trails & Conservation Assistance Program.

3 | Wetland Parks

Illustration of Proposed Design Concept

Illustration of proposed wetland park, boardwalk and pavilion.

4 | Under the Palms Park Greenway Extension

Existing Conditions

- An underground box culvert extends under several blocks within a residential area, creating a linear greenspace in the right-of-way that is approximately 120 feet wide and 3,000 feet long behind houses which face Georgia Avenue or Maryland Boulevard.

The greenspace in the right-of-way between 5th Street and 7th Street is maintained as a public park. Under the Palms Park includes a playground, walking loop, restroom and pavilion.

- The unprogrammed greenspaces have been used as an informal dog park.
- Fish cleaning stations behind homes adjacent to the right of way have created pollution issues.
- Trees and shrubs that served as a planted buffer between housing and public greenspace were destroyed by the hurricane and have not been replaced.

Arrows indicate proposed greenway and greenspace extensions on top of box culvert.

Existing linear greenspace above box culvert.

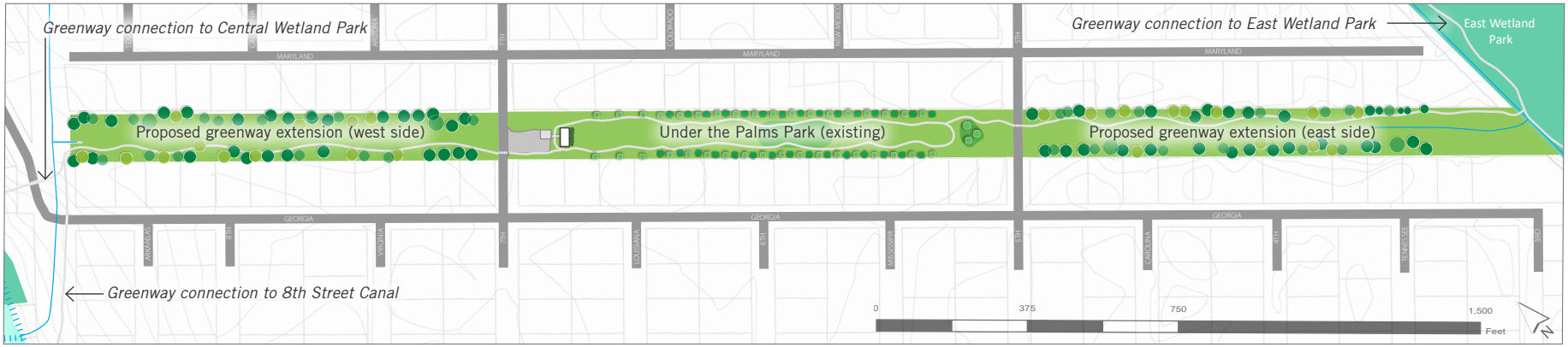
4 | Under the Palms Park Greenway Extension

Proposed Design: Greenway Extension and Greenspace Enhancement

- The design proposes to extend the existing path at Under the Palms Park across the length of the greenspace above the box culvert.
- The proposed path provides safe, off-street connections for pedestrians and bicyclists between multiple neighborhoods.
- The proposed path links to the 8th Street Canal and beachfront access on the west side and links to East Wetland Park on the east side.
- Community members support passive uses in the greenspace along the path, such as pollinator gardens, native plantings, outdoor art and fitness stations.
- Re-establishing the tree and shrub buffer between houses and the greenspace can provide privacy for residents, enhance the park for visitors and support biodiversity.

Enhanced greenspaces can increase property values and support economic recovery.

Illustration of paths and greenspaces planted with natives proposed in the Under the Palms Park greenway extension. Native plants will encourage the return of local pollinators and help address the destruction of vegetation by Hurricane Michael.



Multimodal paths on both sides of the park connect to the proposed greenway.

4 | Under the Palms Park Greenway Extension

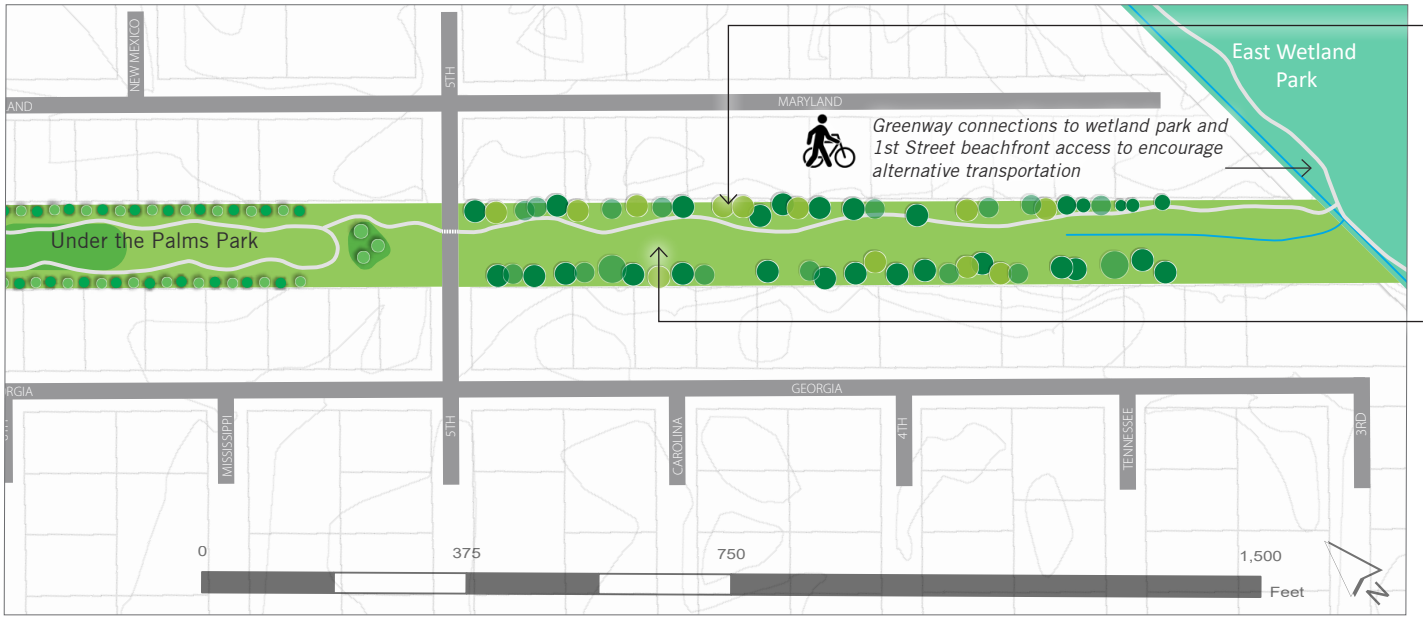
Proposed Design: Greenway Extension and Greenspace Enhancement

West side of Under the Palms Park Greenway Extension.

Walking paths, gardens and passive recreation opportunities to support health and wellness through exercise and social interaction (across site)

Native trees and shrub plantings to re-establish a vegetative buffer that can enhance privacy and improve wildlife habitat

Native plantings and pollinator gardens planned for greenspace along the path to provide an important food source for pollinators



East side of Under the Palms Park Greenway Extension.

Native trees and shrub plantings to re-establish a vegetative buffer that can enhance privacy and improve wildlife habitat

Native plantings and pollinator gardens planned for greenspace along the path to provide an important food source for pollinators

5 | Citywide Greenway-Blueway Trail System

Existing Conditions: Unsafe Alternative Transportation Routes

- Mexico Beach lacks consistent sidewalks and bicycle infrastructure.
- On-street pedestrian activity, particularly along 15th Street, is unsafe because of high speed traffic, limited visibility around curves and narrow bridge crossings.
- Highway 98, the main road through Mexico Beach and for beach access, is heavily traveled. Walking across Highway 98 to access the beachfront is dangerous during high traffic.
- Golf carts are increasingly used by tourists and residents to move around the city. Golf carts are not permitted on Highway 98, which is the primary route to beach access points.

Proposed Design: Greenway-Blueway Trail System

- A multimodal greenway can improve safety by accommodating pedestrian, bicycle and golf cart traffic on dedicated paths that are separated from the road. This can include multi-use bridge paths alongside existing vehicular bridges. Designated, marked crosswalk locations can slow traffic and heighten driver awareness.
- The multimodal greenway can reduce traffic on Highway 98 by providing alternative routes across the city and to the beachfront.
- Blueway paddle trail access points intersect with the greenway system to provide access and connections for non-motorized watercraft.
- This highly accessible recreation amenity can increase health and wellness and support economic development in the community.

The proposed citywide greenway-blueway trail system supports resilience by creating an amenity that enhances economic development. The proposed system provides connections to key commercial areas, beaches and parks. The system, which offers many access points, can serve as an attraction for visitors interested in paddling, walking and biking.

A dedicated path separated from the existing road will increase safety for pedestrians and bicyclists along 15th Street.

Narrow bridges are dangerous for pedestrians and bicyclists. Dedicated multimodal bridges are proposed along existing bridges on 15th Street.

A wider multimodal sidewalk along Highway 98 and safe crossings to access the beach will increase safety for pedestrians and bicyclists.

5 | Citywide Greenway-Blueway Trail System

Path Types. The greenway system is designed within public right-of-way areas along the city's streets and canal system. Different types of paths are proposed to improve safety and prevent disturbance in wetland areas.

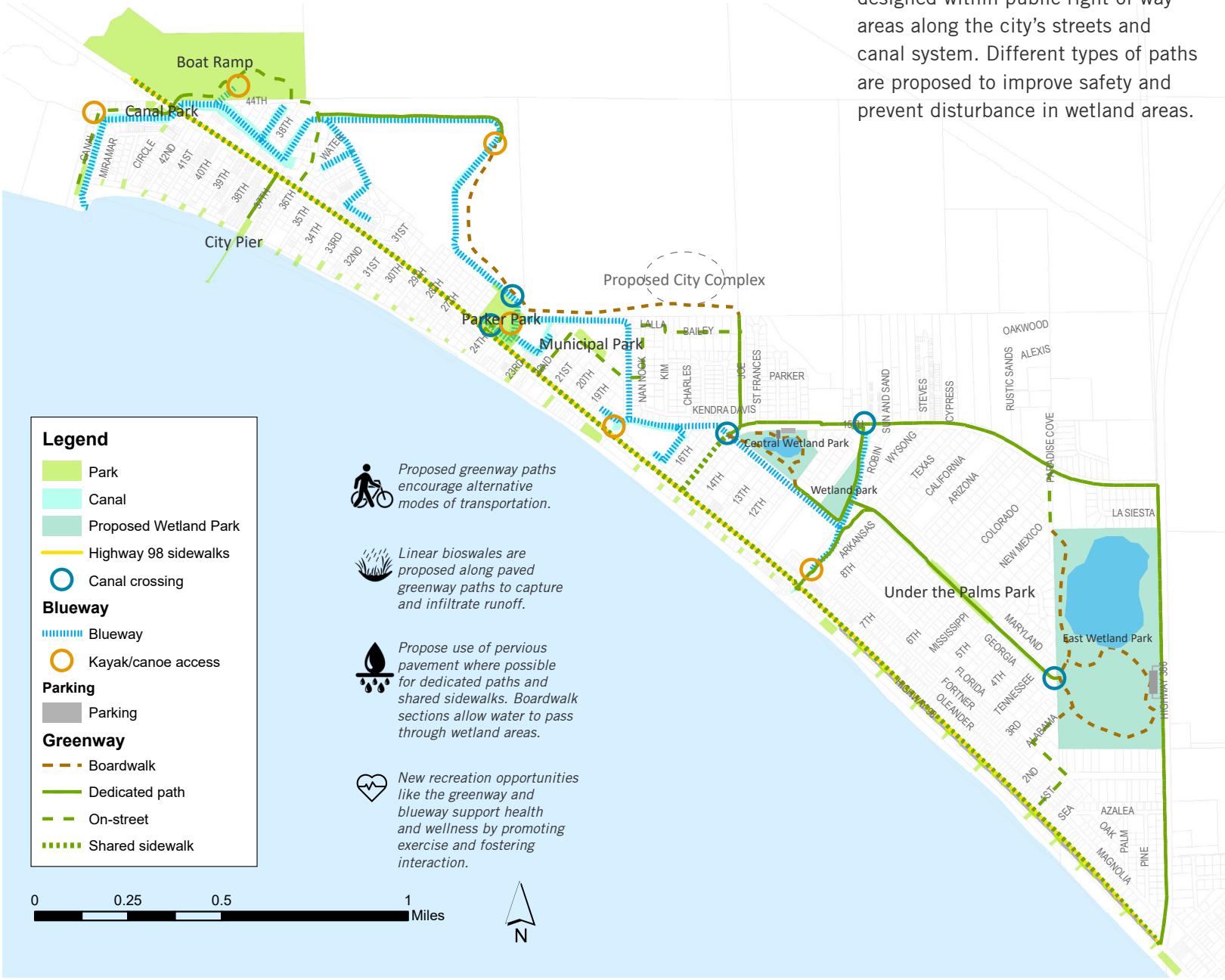
Boardwalk.

Dedicated path.

On-street path.

Shared sidewalk.

Blueway.



5 | Citywide Greenway-Blueway Trail System

Blueway

The blueway provides access by canoe, kayak, paddleboard and other non-motorized watercraft along the canals between the Mexico Beach Boat Ramp to the proposed 8th Street Canal pond. Convenient boat access points offer boat entry, docks and pull-out areas so boaters can use the waterway to access and enjoy destinations and amenities throughout Mexico Beach. Greenway and blueway connections offer many ecotourism opportunities for residents and visitors.

Key features and opportunities:

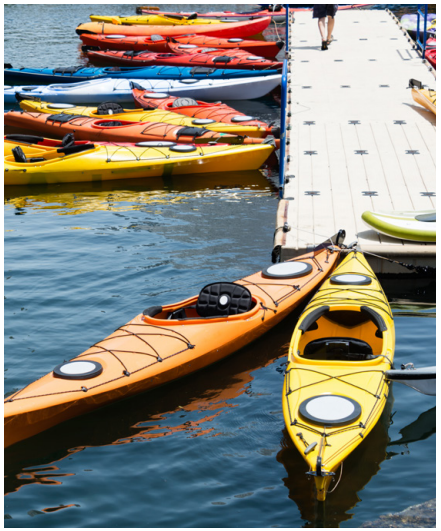
- Boat entry infrastructure
- Docks, tie-ups and/or temporary boat storage area
- Wildlife watching
- Potential for boat rentals for visitors

Diagram of path type.

Wildlife watching destinations.

Canoeing and kayaking opportunities.

Greenway paths intersecting with blueways.



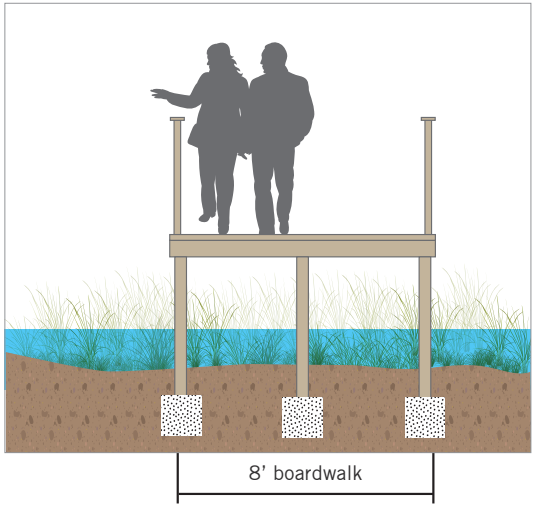
Boat launch, docks and tie-up areas.

5 | Citywide Greenway-Blueway Trail System

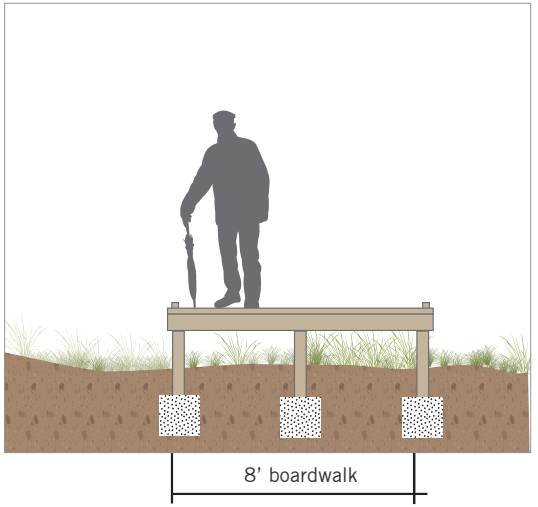
Boardwalk

Several segments of the greenway include elevated boardwalks to protect wetland areas and to provide safe access across canals. These areas may also flood temporarily. Boardwalks typically include wood, recycled plastic or composite construction materials installed on concrete footers. Wooden framing with composite decking may be preferred for reduced maintenance and improved resiliency. Higher boardwalk segments will require handrails for safety. Key features:

- Elevated walkway, 6 to 8 feet wide, accommodates pedestrians and bicyclists over wetlands and other protected areas.
- Areas along the boardwalk for users to pause without congesting flow.



Section elevation of an 8' wide boardwalk in an area where flooding may occur frequently. Boardwalks with an elevation over 30" from ground require hand rails.



Section elevation of an 8' wide boardwalk close to ground, but elevated to protect the wetland dynamics and ecology.

Diagram of path type.

Illustration of boardwalk path in wetland area.

5 | Citywide Greenway-Blueway Trail System

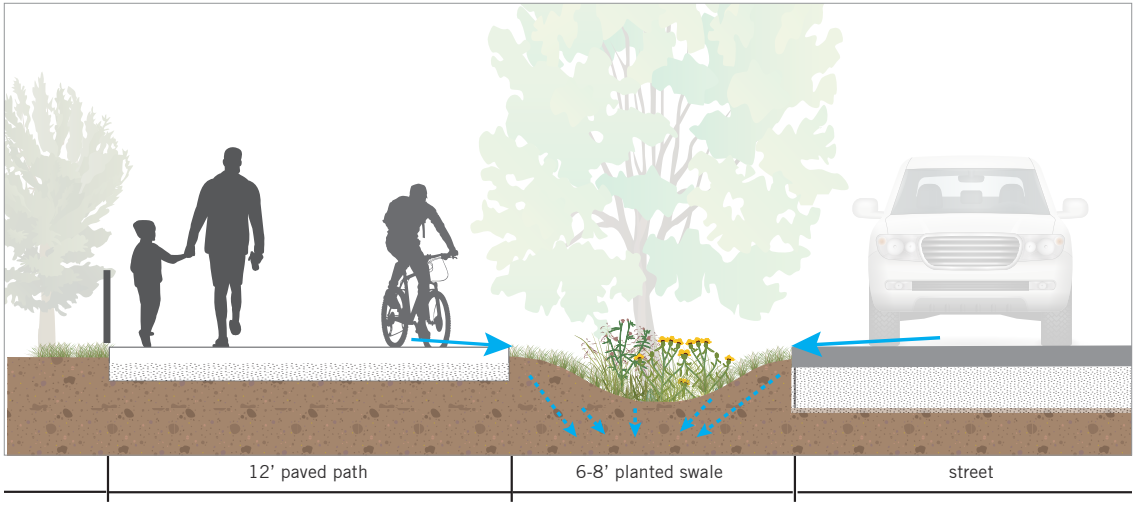
Dedicated Path

Dedicated greenway paths are wide, multimodal paved paths that are separated from streets to provide safe passage for pedestrians, bicyclists, golf carts and more.

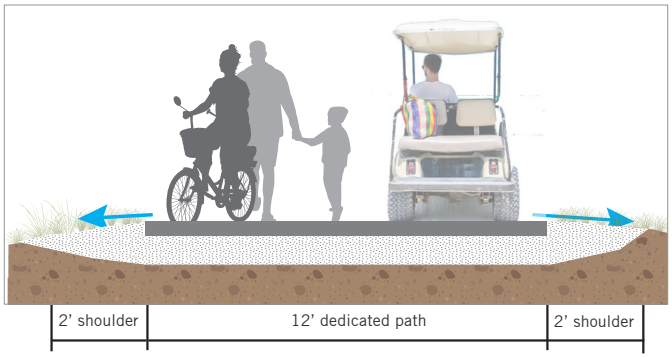
Key features:

- A paved path, 10 to 15 feet wide, accommodates pedestrians, bicyclists and golf carts.
- Streetside greenways with planted swales between the greenway and street can help collect and treat stormwater. Planted swales also provide a safe buffer between the greenway users and vehicular traffic.
- Interior trails (not along street) constructed with gravel can improve infiltration, maintain a natural feel and/or reduce implementation costs.

Diagram of path type.



Streetside dedicated path. A 12' wide paved path with a bioswale capturing runoff from the greenway and street. Blue arrows illustrate the water flow.



Interior dedicated path. Blue arrows illustrate the water flow.

Shared dedicated path along two-lane highway with a grass swale.

Illustration of greenway path adjacent to canal.

Local dedicated path with shoulders for pulling off or passing.

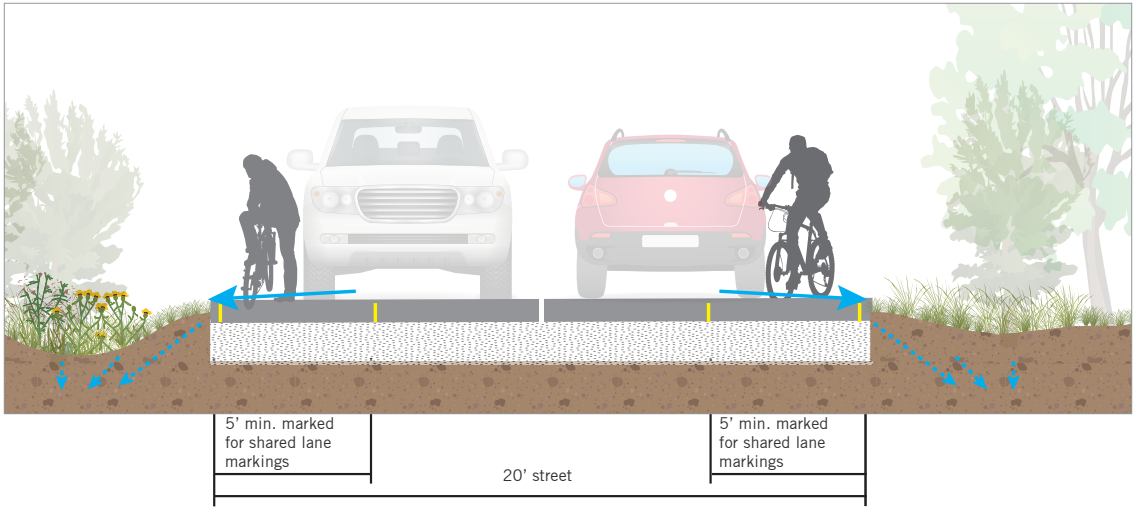
5 | Citywide Greenway-Blueway Trail System

On-street Path

Several segments of the greenway included bike and pedestrian lanes that share the road with vehicles. These on-street segments, most of which connect through a residential area between Parker Park and the proposed City Multiuse Complex, will be marked to designate the shared lanes to increase safety and awareness.

Key features:

- On-street markings designating a minimum of 5 feet on each side of the road to indicate a shared lane.
- Greenway signage along roads with shared lanes to alert automobile drivers.



Section elevation of an on-street shared path. Blue arrows illustrate the water flow.

Diagram of path type.

Example of on-street path marked for bicycle use.

5 | Citywide Greenway-Blueway Trail System

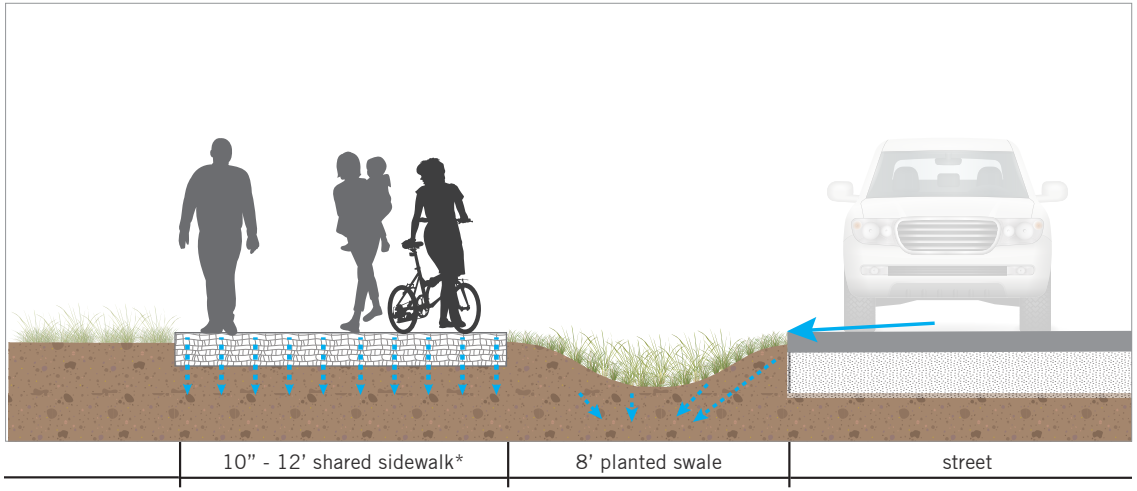
Shared Sidewalk

The greenway will share existing sidewalks along Highway 98 and 15th Street. Widening the sidewalks from 8 feet (existing) to 10 or 12 feet wide where possible will enhance safety for multimodal users and provide golf cart access to the beachfront and commercial areas.

Key features:

- Shared sidewalks, 10 to 12 feet wide, accommodate pedestrians, bicyclists and golf carts.
- Pervious pavement allows water to infiltrate below sidewalk.
- Planted swales, 4 to 6 feet wide, collect, absorb and filter stormwater runoff from the street and sidewalk.

Diagram of path type.



Section elevation of a 10' wide pervious pavement sidewalk with a bioswale capturing runoff from the greenway and street. Blue arrows illustrate the water flow.

*shown as pervious pavement

Illustration of proposed shared sidewalk along Highway 98.

6 | Parker Park

Existing Conditions

Mexico Beach completed a public engagement process in 2015 to gather input on the design, features and amenities for Parker Park. Part of the resulting design was implemented prior to the hurricane and was destroyed. The community identified several issues that need to be addressed, including a narrow, unsafe pedestrian entry, and a large channel with limited circulation and steep slopes that occupies usable park space between the highway and the park.

Design Opportunity: Restoration

Restoration of the park includes relocating several features and addressing community concerns. Parker Park is a key connection for the proposed greenway-blueway trail system.

Restoring Parker Park, the city's primary outdoor gathering space which serves as a farmers market, concert venue and playground area, is important for community resiliency and long-term recovery.

Most of the park features and tree canopy have been damaged or demolished. A large channel and narrow entry make accessing the park difficult for pedestrians during heavy traffic (Google Earth, April 2019).

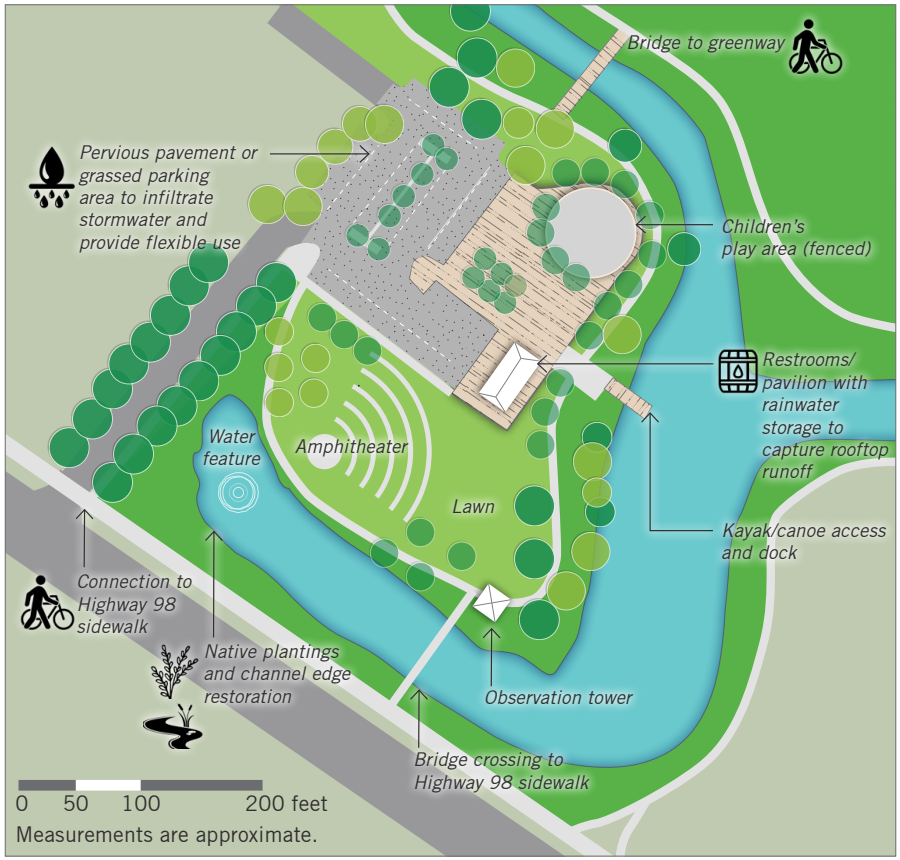
View looking east toward canals from Parker Park.

View toward beach and Gulf of Mexico from Parker Park.

6 | Parker Park

Option A

- Existing canal configuration.
- Pervious pavement or grass parking area and water storage for structure.
- Amphitheater situated to maximize ocean view.
- Pedestrian, golf cart and boat access to greenway-blueway trail system.
- Water feature in canal.



Option A plan for Parker Park includes existing canal.

Option B (preferred by open house and survey participants)

- Shortened canal to create additional greenspace (contingent upon permitting approval).
- Pervious pavement or grass parking area and water storage for structure.
- Central lawn for flexible event space.
- Pedestrian, golf cart and boat access to greenway and blueway trail system.
- Water feature in canal.

Option B plan for Parker Park closes part of the canal to enlarge entry and lawn area.

7 | City Pier

Existing Conditions

- The City Pier, a significant economic and recreation asset, was destroyed during Hurricane Michael. City Pier was the only public pier of its size to serve Gulf County and Eastern Bay County.
- The pier entry area at the end of 37th Street included restroom facilities. Parking for the pier was located in the street right-of-way, and private properties lined the entryway along 37th Street.
- Rebuilding the pier is a high priority for the city, and plans have been submitted for a new structure.
- Housing along the entry street to the pier was destroyed, and ownership and development in this area is changing. Therefore, the city is considering new on-street parking configurations and rezoning to accommodate small scale mixed uses in addition to current residential zoning.
- Community and stakeholder input suggests that enhancing amenities surrounding the pier such as seating, shade, shopping and food, as well as linking into the greenway to increase accessibility, might appeal to visitors and transform the pier into a multiuse destination and commercial center to enhance economic opportunities.

Aerial of pre-storm City Pier area (Google Earth October 2015).

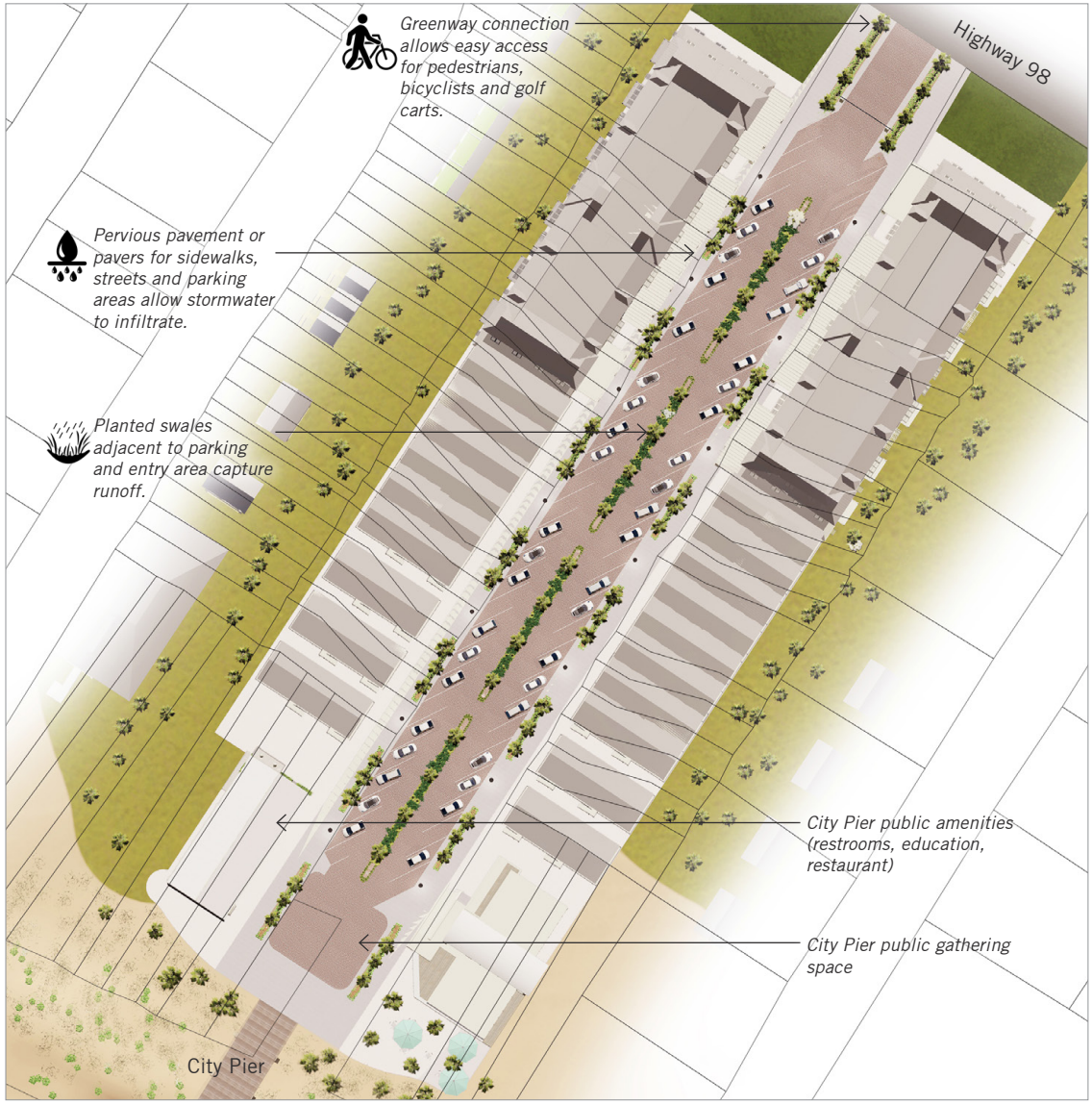
7 | City Pier

Design Opportunity 1: Enhanced Community Spaces

This design proposes expanding public gathering spaces and enhancing amenities by the pier entrance. Specific ideas for public areas, uses and programming include:

- Expanded beach frontage for commercial and public uses such as a new buildings that could include a restaurant, retail and educational space for natural and cultural exhibits.
- A city-owned bait/tackle/gift shop at the base of the pier to serve recreational fisherman/visitors.
- A city-owned restaurant space that can be rented to local business to encourage return of local restaurants that were completely destroyed.
- An educational center to serve both Gulf County and Bay County schools and visitors. Prior to Hurricane Michael, local schools traveled to Mexico Beach to plant dune grass and learn about beach habitat. An educational center can create greater potential for this opportunity.
- Educational kiosks to inform visitors of the importance of the dune system and functions.
- A plan for entry, parking and circulation to accommodate vehicles and alternative transportation such as bicycles and golf carts.
- Integration of sustainable materials and features, including pervious pavers for sidewalks and vehicle lanes with vegetated swales along hardscape areas.

Developing a small scale mixed use area and improving public amenities at the pier can support economic recovery by increasing tourism, employment and tax income.



Conceptual plan of alternative access and parking for pier and properties on 37th Street to support expanded community spaces and small scale commercial.

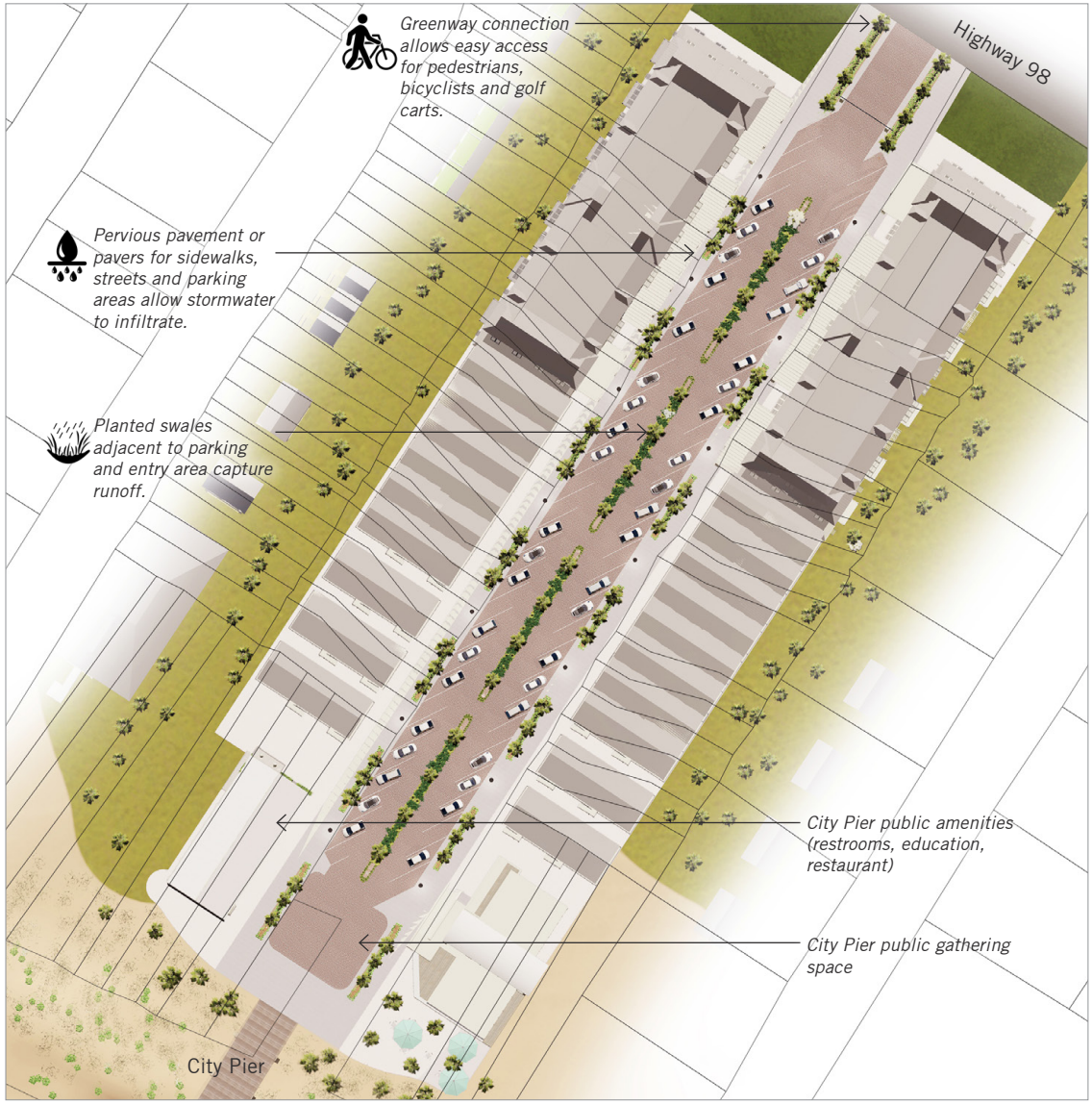
7 | City Pier

Design Opportunity 2: Expanded Beachfront Commercial Area

This design proposes allowing mixed use along 37th Street to position the City Pier area as a destination for residents and visitors and bolster resilience by offering alternative uses in for flood-prone areas.

Specific ideas and opportunities include:

- Modified zoning that allows higher density and small scale mixed uses along 37th Street corridor to create a downtown space.
- Mixed use planning that can improve resiliency by increasing economic opportunity and safety of residential areas. A new floodplain ordinance requires all residential structures on 37th Street to be elevated above the 500-year flood zone. This creates potential for commercial space to be utilized safely through flood proofing at street level and ensures residential spaces are protected from storm surge.



Conceptual plan of alternative access and parking for pier and properties on 37th Street to support expanded community spaces and small scale commercial.

Mixed use zoning presents an opportunity to utilize the space under residential areas for economic development.

7 | City Pier

Illustration of Proposed Design Concept

Illustration of entry to 37th Street and mixed use development. Sustainability features include planted swales to capture runoff and pervious pavers to increase infiltration.

7 | City Pier

Illustration of Proposed Design Concept

Illustration of pier area and parking along 37th Street. Bicycle racks, tables and shade areas welcome community members to the expanded public and commercial spaces.

Benefits of Sustainability and Resiliency Features

Integrating features to better manage stormwater through natural drainage techniques and improving public green space can provide a range of economic, environmental and social benefits.

Economic

Parks and natural areas have great economic value; they support regional economies through tourism, agriculture and other activities. Economic impacts of recreational activities can include outdoor recreation spending and reduced public costs related to healthcare and infrastructure. In 2012, outdoor recreation contributed $646 billion to the U.S. economy, supporting 6.1 million jobs and generating $39.9 billion in national tax revenue and $39.7 billion in state and local tax revenue.[1] Protected green space can also increase the property values of nearby homes by 8-20% providing amenities that draw people to live and work in the community.[2]

Wetlands can play a key role in reducing the frequency and intensity of floods by soaking up and storing a significant amount of floodwater and thereby reducing damage to property and infrastructure during storm events. Economists estimate that one acre of wetlands provides about $10,000 worth of ecosystem services which include: filtering and recharging drinking water, preventing flooding, protecting our coasts from hurricanes and storms, and providing habitat for diverse wildlife populations.[3]

Rainwater harvesting has significant potential to provide economic and environmental benefits by reducing stormwater runoff and conserving potable water. Typical domestic indoor per capita water use is 70 gallons per day (gpd); however outdoor water use can constitute 25% to 58% of overall domestic demand, increasing per capita domestic use up to 165 gpd. While potable water is used almost exclusively for domestic uses, almost 80% of demand does not require drinkable water. Similar trends exist for commercial water use. Rainwater harvesting offers an alternative water supply that can more appropriately match water use to the quality of water supplied.[4] For example, a 2019 modeling study found that if Florida's Broward and Palm Beach Counties implemented a regional rainwater harvesting system to provide outdoor irrigation for single-family homes, that rainwater harvesting system could contribute 54% of the total additional demand for water from single-family homes in the year 2060.[5]

Landscaping with native plants contributes to the preservation of biodiversity and minimizes maintenance costs. Native plant species are often adapted to local climates and can require less water and fertilizer than their non-native counterparts. Studies suggest that even individual trees may benefit property values. For example, a 2018 study examined the impact of tree canopy cover on the sales prices of almost 5,000 single-family homes in Tampa, Florida and estimated that one average-sized tree would add $1,738 to the combined sales in a neighborhood.[6]

[1] The Outdoor Recreation Economy. Outdoor Industry Association. Available at http://outdoorindustry.org/pdf/OIA_OutdoorRecEconomyReport2012.pdf
[2] Blog published by the National Association of Realtors. Available at https://www.houselogic.com/remodel/windows-doors-and-floors/9-surprising-things-add-value-your-house/
[3] The National Wildlife Federation. Available at https://www.nwf.org/Our-Work/Waters/Wetlands-and-Watersheds
[4] Managing Wet Weather with Green Infrastructure: Municipal Handbook Rainwater Harvesting Policies. EPA. Available at https://www.epa.gov/sites/production/files/2015-10/documents/gi_munichandbook_harvesting.pdf
[5] Wurthmann, K. (2019). Assessing storage requirements, water and energy savings, and costs associated with a residential rainwater harvesting system deployed across two counties in Southeast Florida. Journal of environmental management, 252, 109673.
[6] Landry S., Koeser, A., Northrop, R., McLean, D., Donovan, G., Andreu, M. & Hilbert, D. (2018). City of Tampa Tree Canopy and Urban Forest Analysis 2016. Tampa, FL: City of Tampa, Florida.

Environmental

Bioswales can reduce the concentrations of total suspended solids between 76% to 99%. For example, Gainesville, Florida, found that retrofitting an existing parking lot with a bioswale and pervious pavement would treat nitrogen and phosphorous loads down to levels below those of undeveloped areas.[7] Depending on the intensity of the precipitation event, studies have shown that pervious pavement can infiltrate as much as 80 to 100% of the rain that falls on a site.[8]

Natural stormwater management features (stormwater infiltration basin and a bio-filter) installed in a residential area in north-central Florida reduced the concentrations of dissolved phosphorus by over 70% in soils above the water table.[9]

In 2016, urban trees in Tampa, Florida sequestered a total of about 62,000 tons of carbon, which is the equivalent of annual carbon emissions of about 43,900 automobiles.[10] To further explore the range of benefits human receive from nature, visit EPA's EnviroAtlas at: www.epa.gov/enviroatlas/enviroatlas-data.

Scientists estimate that one out of every three bites of food we eat exists because of pollinators like bees, butterflies, birds and bats, and other insects. Of the 1,400 crop plants grown around the world, almost 80% require pollination by animals. The USDA estimates that crops dependent on pollination are worth more than $10 billion per year.[11] In addition to food we eat, preserving or restoring habitats that support pollinators also contributes to a healthy ecosystem that can better clean the air, stabilize soils and protect from severe weather by holding and storing stormwater.

Benefits of Greenways

Health and Wellness – Access to greenways and trails has positive impacts on public health and wellness. Research shows that providing convenient access to places for physical activity, such as trails connecting to parks or other recreational facilities increases:

- Level of physical activity in a community, especially if the spaces are near their homes,
- Opportunities to interact with neighbors which is important to building social ties, strengthening neighborhoods and personal wellness, and
- Physical and mental wellbeing through exercise and social interaction which can reduce overall health care costs.

Reduced Automobile Use - Transportation is responsible for 85% of U.S. petroleum use.[12] Greenways can function as viable alternative transportation corridors between homes, shopping, and entertainment. Shifting short trips to bicycling and walking reduces miles driven and could save 4-10 billion gallons of fuel each year.[13]

Local Recreation Economy - Americans spend more on bicycling each year than they do on airline travel. Trail-based tourism can be a major economic driver in many small communities, supporting local small businesses through annual revenues of millions of dollars per trail in direct consumer spending.[14]

[7] Sansalone, J., Raje, S., Kertesz, R., Maccarone, K., Seltzer, K., Siminari, M., ... & Wood, B. (2013). Retrofitting impervious urban infrastructure with green technology for rainfall-runoff restoration, indirect reuse and pollution load reduction. Environmental pollution, 183, 204-212.
[8] The Value of Green Infrastructure. The Center for Neighborhood Technology. Available at https://www.cnt.org/sites/default/files/publications/CNT_Value-of-Green-Infrastructure.pdf
[9] O'Reilly, A. M., Wanielista, M. P., Chang, N. B., Xuan, Z., & Harris, W. G. (2012). Nutrient removal using biosorption activated media: Preliminary biogeochemical assessment of an innovative stormwater infiltration basin. Science of the Total Environment, 432, 227-242.
[10] Landry S., Koeser, A., Northrop, R., McLean, D., Donovan, G., Andreu, M. & Hilbert, D. (2018). City of Tampa Tree Canopy and Urban Forest Analysis 2016. Tampa, FL: City of Tampa, Florida.
[11] https://www.fs.fed.us/wildflowers/pollinators/importance.shtml
[12] https://www.eia.gov/energyexplained/use-of-energy/transportation.php
[13] https://www.railstotrails.org/resource-library/resources/investing-in-trails-cost-effective-improvements-for-everyone/
[14] https://www.railstotrails.org/experience-trails/benefits-of-trails/

Next Steps

The City of Mexico Beach Stormwater Management and Greenspace Project provides a robust vision to implement sustainable design strategies that support the city's recovery and improve resilience.

Moving Forward

Implementation planning for the proposed stormwater management and greenspace design strategies will require a combination of actions to help move the projects forward:

- Continue to evaluate and prioritize which projects to initiate first.
- Identify project lead(s) and partners needed to implement and maintain the project.
- Continue to engage the public on timing, design development and design decisions.
- Conduct engineering studies and site plan designs.
- Assemble funding, which may come from a variety of sources.
- Remain flexible and creative to respond to new opportunities as they arise.

Priorities

The city has prioritized the following projects for funding and near-term implementation, while also recognizing that other projects may move forward more quickly based on scale, complexity and funding opportunities.

- Regional stormwater detention
- 8th Street Canal
- Citywide greenway
- Pier reconstruction and zoning overlay to support mixed uses

Implementation Framework

As part of the process, the RRP discussed an initial implementation framework to identify potential actions, leads, partners, and timing considerations. The following potential actions were identified and opportunities to engage the community are noted with an asterisk (*).

Regional Stormwater Detention and Management

- Conduct hydrologic study to assess stormwater flow, feasibility of projects, develop construction designs, and prioritize funding for implementation of proposed stormwater management strategies (funding pending).*
- Acquire wetland properties (see Wetland Parks section for more information)
- Include information in water bills about what residents and business owners can do to help improve water quality, such as best practices for fertilizing lawns.
- Enforce existing stormwater management policies related to stormwater conveyance and provide homeowner information on best practices.
- Enforce residential pervious surface policies to reduce stormwater runoff and provide homeowner information on best practices.
- Conduct ongoing maintenance and repairs of smaller drainage ditch system (debris and sediment removal, pipe connectivity and repairs).
- Conduct water quality monitoring to identify and address any issues.
- Proceed with design, permitting and construction.

8th Street Canal

Note that implementation of regional stormwater detention must be implemented prior to construction of 8th Street improvements.

- Conduct property survey to verify the boundaries of the canal, right-of-way and adjacent properties.
- Reapply for a permit to dredge the canal to original channel location.
- Evaluate acquisition of property near Highway 98 bridge for parking and access.
- Proceed with design, permitting and construction.

Wetland Parks

- Determine permitting required for boardwalks and structures.
- Conduct wetland restoration activities, and develop park site plans.*
- Evaluate next steps for East Wetland Park based on the Phase 1 Environmental Assessment results.
- Acquire wetland properties:
  - Identify funding sources.
  - Evaluate acquisition and conservation easement options.
  - Conduct appraisal to determine fair market value.
- Establish stormwater credit and banking policies and procedures.
- Proceed with design, permitting and construction.

Under the Palms Park Greenway Extension

- Replace trees lost during Hurricane Michael to restore the vegetative buffer between homes and park.
- Move forward with the expansion of a multi-use trail throughout the green space.*
- Coordinate with Florida Department of Environmental Protection (FL DEP) Office of Greenways and Trails.
- Proceed with design, permitting and construction.

Citywide Greenway-Blueway Trail System

- Develop motorized vehicle access policy for proposed greenway types.
- Identify parking and authorized crossings on Highway 98 for golf carts to access the public pier and city-dedicated beach access points that coincide with greenway.*
- Coordinate with Federal Highway Administration and Department of Transportation (DOT) on safe pedestrian street crossings for 15th Street and Highway 98.
- Verify right-of-way width considerations for proposed greenway segments.
- Consider moving existing lift station on 15th Street as part of the greenway and sidewalk improvements.
- Coordinate with Bay and Gulf Counties on potential regional greenway connections and expansion.
- Conduct educational seminars on bicycle/pedestrian safety, sharing the road, trail widths, etc.*
- Coordinate with Florida Department of Environmental Protection (FL DEP) Office of Greenways and Trails.
- Incorporate trail maintenance strategies into planning and funding requests.
- Coordinate with planned and future development to incorporate greenway access and expansion.*
- Develop branding and wayfinding signage to build awareness of the trail system.*
- Proceed with design, permitting and construction.

Parker Park

- Explore permitting for partial infill of canal at park entrance for water quality, safety and park enhancement.
- Coordinate with DOT on a golf cart crossing on Highway 98 to access the pier.
- Proceed with design, permitting and construction.

City Pier

- Conduct property survey to determine extent of public right-of-way for travel lanes and parking needs.
- Draft a zoning overlay to allow for commercial/mixed use development along 37th Street between Highway 98 and the pier.*
- Determine parking requirements of proposed commercial development to guide streetscape planning for multi-modal lanes.
- Consider acquisition of additional property near beachfront.
- Proceed with design, permitting and construction.

Continued Community Engagement

Throughout this process, community members have been actively engaged to learn about the project and provide input on the design concepts. As the concepts are further refined, it is recommended that the city continue to engage the community to inform design development and foster community support for implementation. The city should use varied approaches to community engagement in order to engage the broadest possible spectrum of community residents. Potential engagement approaches could include:

- Provide a page or section on the City of Mexico Beach website to post routine updates on project status, funding awards, and next steps.
- Include information on the city website for collecting donations to support these efforts.
- Develop and distribute resident education materials on stormwater management best practices and bike/pedestrian safety.
- Provide advance notice of public meetings to encourage out-of-town property owners to participate.
- Prioritize additional outreach related to potential zoning changes or policy updates, particularly related to the public pier area. Additional clarification may be helpful to explain what zoning modifications mean for existing and future property owners in this area.

Participants in the open house sessions review and discuss design concepts.

Building Partnerships and Support

Throughout the process, staff from the following regional, state and federal agencies and organizations offered their technical assistance and expertise in helping Mexico Beach connect their vision to implementation opportunities. Each individual's time and energy in supporting RRP activities in reviewing documents, identifying funding opportunities, and participating in meetings has contributed greatly to the success of this effort. The city is committed to ongoing collaboration with these partners to identify funding sources and coordinate on action items to achieve the vision and goals outlined in this report.

Regional

- Bay County Tourist Development Council (TDC)
- Emerald Coast Regional Council
- Mexico Beach Artificial Reef Association (MBARA)
- Mississippi State University
- Triumph Gulf Coast, Inc.

State

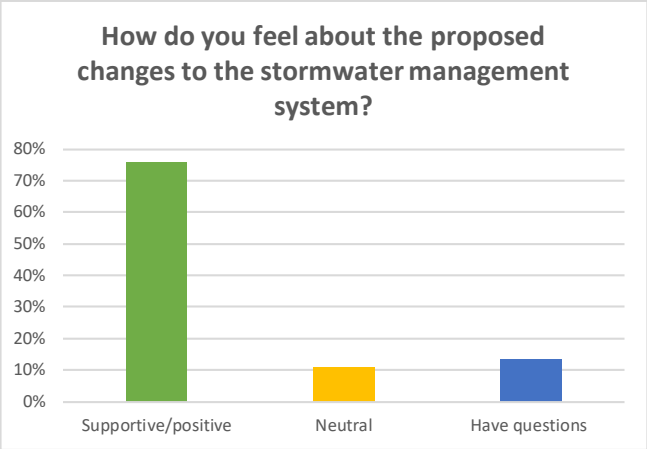
- Florida Department of Economic Opportunity (FL DEO)
- Florida Department of Environmental Protection (FL DEP)
- FL DEP, Office of Greenways and Trails
- Florida Department of Emergency Management (FL DEM)
- Florida Department on Transportation (FL DOT)

Federal

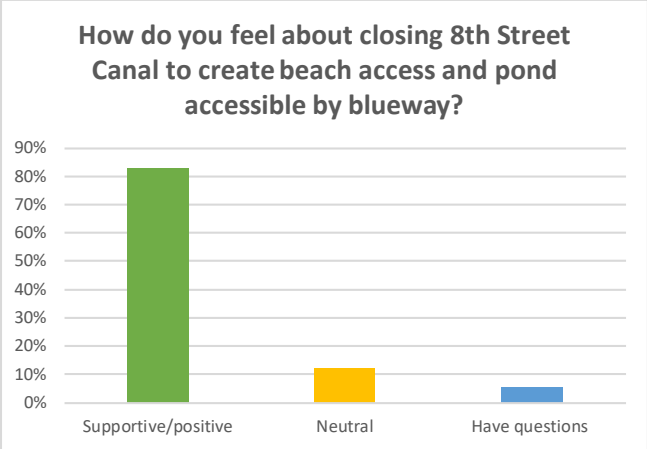
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Transportation (DOT)
- U.S. Department of Interior (DOI)
- Economic Development Administration (EDA)
- Federal Highway Administration (FHA)
- Federal Emergency Management Agency (FEMA)
- Housing and Urban Development (HUD)
- National Oceanic and Atmospheric Administration (NOAA)
- National Park Service (NPS)
- U.S. Environmental Protection Agency (EPA)
- U.S. Department of Agriculture (USDA)

A. Community Input Survey

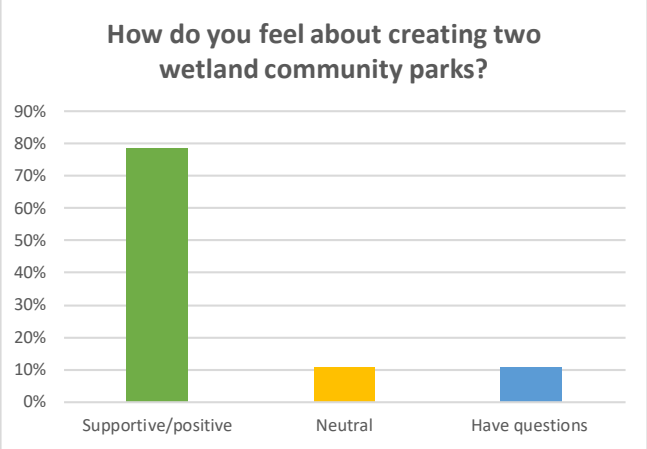
Seventy-seven community members responded to a survey for design input following the public open house sessions and stakeholder meetings in September 2019. The survey helped reach residents who were not able to attend the open house—80% of the survey respondents indicated they did not attend an open house session. The following charts reveal preferences indicated by responses to questions about the design projects.



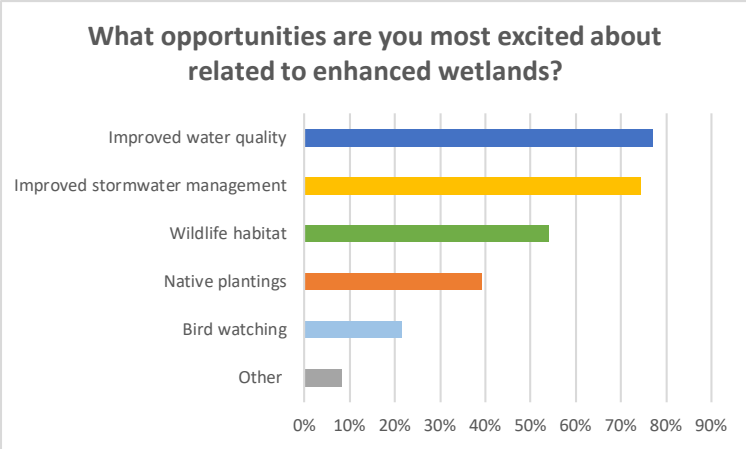
Overwhelming support with key questions about mosquito habitat and ensuring northern neighborhoods don't have flooding issues as a result.



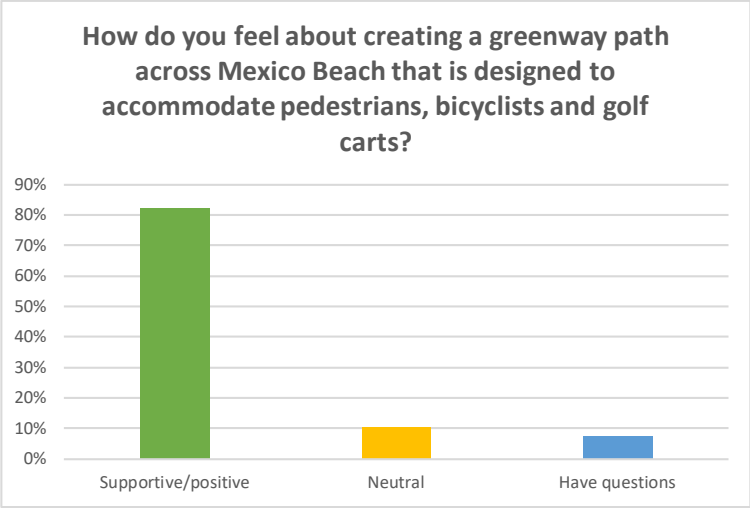
Strong support for closing canal to improve the Gulf of Mexico and provide recreational opportunities.



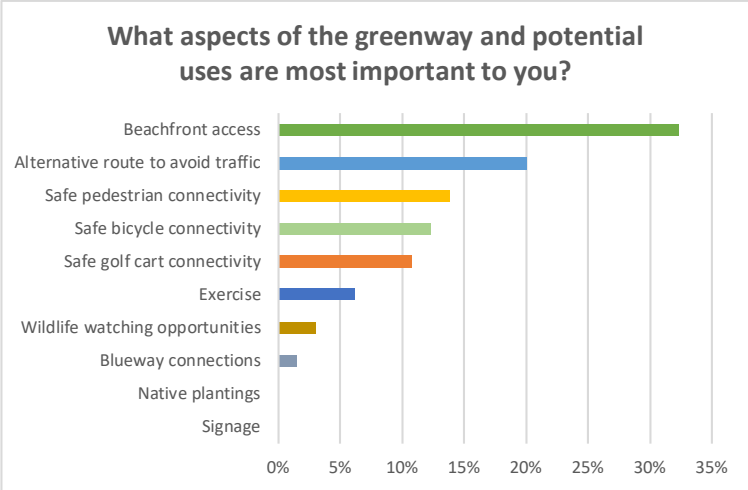
A few concerns were also noted related to maintenance, flooding and attractive nuisance (i.e., mosquito, alligator).



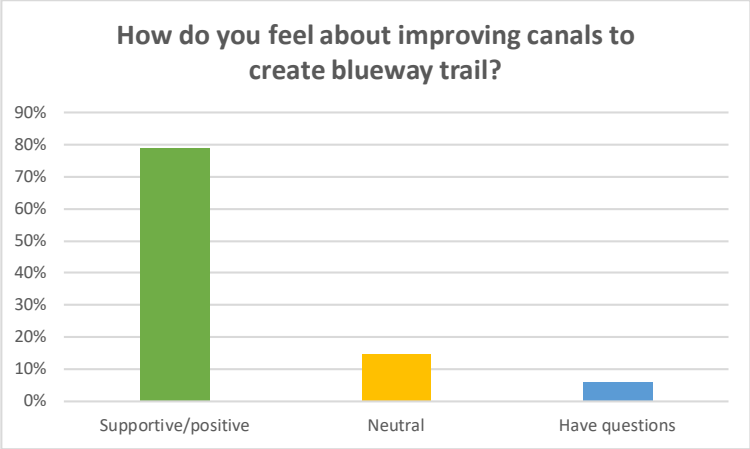
Participants selected top three choices. Recreational opportunities were also identified and support for improved water quality was echoed in the comments provided.



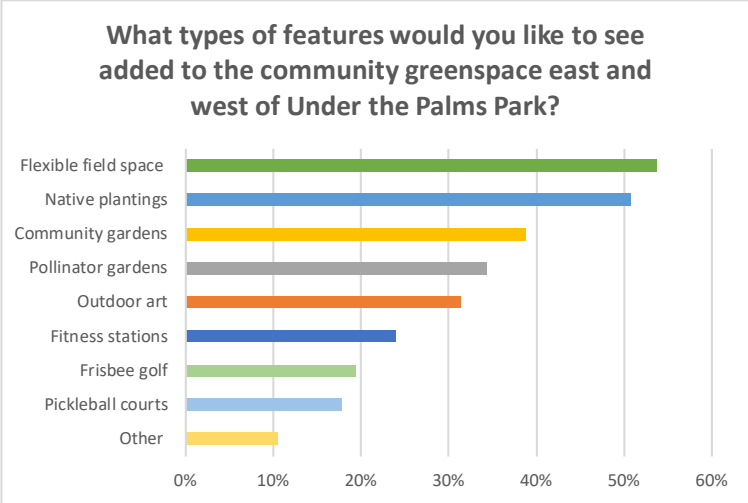
Strong support overall, consistent with Open House responses.



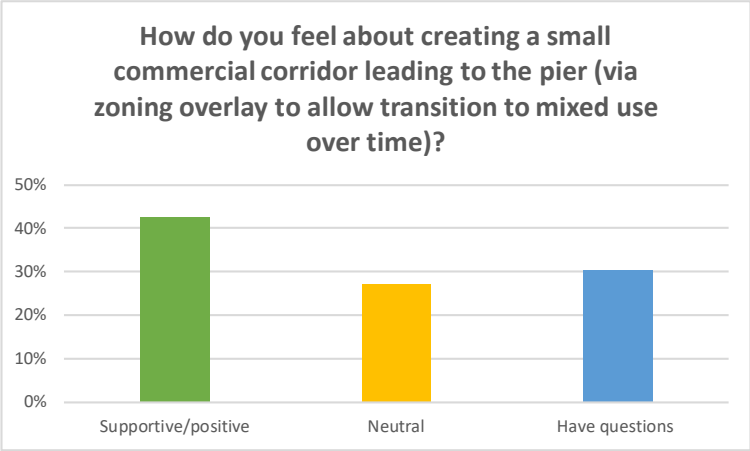
Participants selected all that applied. Key interests include beachfront access, alternative routes to avoid traffic and safe connections.



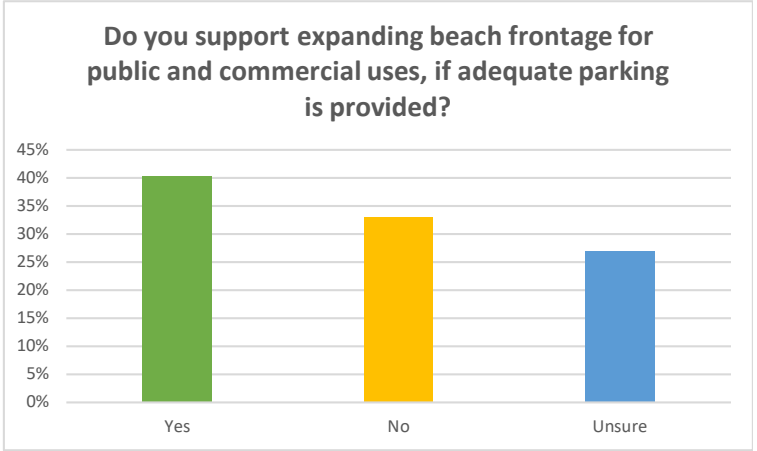
A few concerns related to cleanliness of canals and public parking at kayak tie up areas.



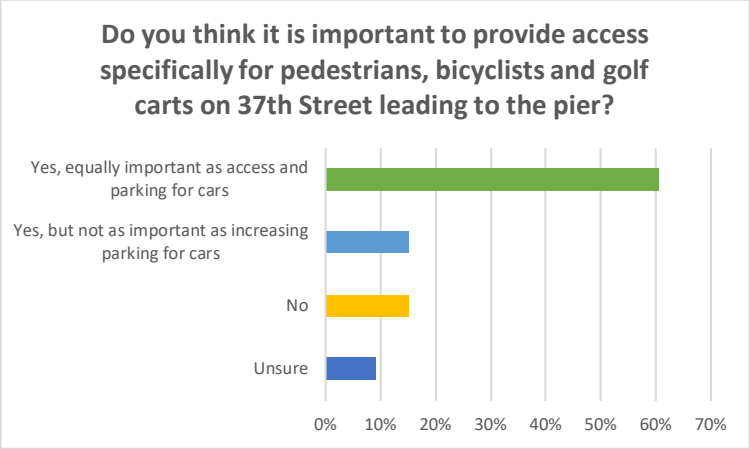
Participants selected top four choices. Additional suggestions included kid-friendly areas, additional restroom facilities, benches/picnic tables, and addressing safety with pedestrians and golf carts. Flexible field was one of the least preferred options among Open House participants.



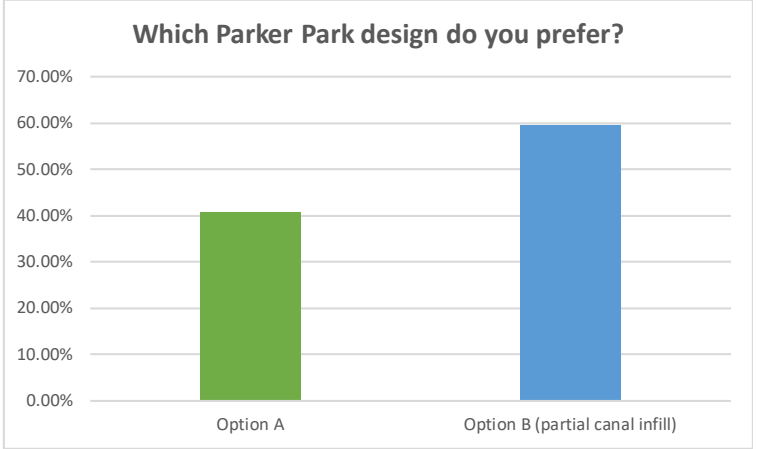
Key concerns include coordination with property owners in this area and adequate parking.



Participants expressed concerns about considering this design option until the city discusses potential zoning and property options with property owners.



While most selected equally important, comments provided included concerns about the potential incompatibly of users on a shared path.



Most Open House participants preferred Option B (reducing canal to create more park/lawn space) over Option A, which retained the canal as-is.

B. Funding Opportunity Tracking

The RRP developed an active (digital) tracking tool to identify funding opportunities to support the City of Mexico Beach with implementation of the Stormwater Management and Greenspace projects. The tool allows multiple users to view, contribute and update information in real time. Over 70 potential funding opportunities have been identified during the process. In addition to providing basic information about the funding opportunity, the tracking tool identifies the suitability of the funding source to support specific projects, the level of match required, and whether City Council resolution or letters of support are needed. A snapshot of the tracking tool is provided below.

FUNDING PROGRAM	AGENCY	DUE DATE	SUITABLE FOR RRP PROJECT?	PROJECT NAME	COMPETIVE?	TYPICAL USES
Florida Recreation Development Assistance Program (FRDAP)	FDEP	Oct. 29, 2019	Yes	#2 – Stormwater Park Detention	Yes	Acquisition or development of public outdoor recreation
2019 Urban and Community Forestry Grant Program	Florida Forest Service	Oct. 25, 2019	Yes	#5 – Under the Palms Park #6 – Parker Park	Yes	The purchase and installation of community trees on public right-of-way, in parks or other public spaces; tree study
Gulf of Mexico Bay-Watershed Education and Training (B-WET) Program	NOAA	Nov. 29, 2019	Maybe			Authentic experiential learning for K-12 audiences in Gulf of Mexico coastal communities
National Coastal Resilience Fund	NFWF	Mar-April 2020	Yes	#2 – Stormwater Park Detention	Yes	Restores, increases and strengthens natural infrastructure to protect coastal communities while also enhancing habitats for fish and wildlife
Hazard Mitigation Assistance (HMA): Flood Mitigation Assistance (FMA) Program	FEMA	Jan. 31, 2019	Yes	#1 – 8th Street #2 – Stormwater #3 – Greenway #4 – City Pier #6 – Parker Park	Yes	Flood mitigation plans, flood mitigation, floodplain storage and diversion, wetland restoration/creation
Florida Resilient Coastlines Program	FDEP	flexible	Yes	SW	no	Provides funding for resilience planning and implementation of resilience-related plans
Florida Boating Improvement Program (FBIP)	FWC	Feb. 2020	Yes	#6 Parker Park	Yes	Boat ramps, piers, derelict boat removal
Shade Structure Program	American Academy of Dermatology	Dec. 31, 2019	Yes	#6 Parker Park		For purchase of permanent shade structures to schools, day cares, and parks.
Shared-Use Nonmotorized (SUN) Trail Program	FDOT	Dec. 20, 2019	Maybe	City-wide Greenway and Blueway Trail System	Yes	Separated bike and pedestrian trails

Snapshot of the funding opportunity tracking tool.

C. Concept Design Additional Information

The following estimated quantities for specific design features are provided to support information requests for funding opportunities. Actual quantities for implementation can be determined following completion of design development and construction documentation. Measurements based on GIS mapping using NAD_1983_StatePlane_Florida_North_FIPS_0903_Feet projected coordinate system.

Greenway

Linear measurements are provided based on the concept plan. Square footage based on estimated width of path.

Total length of proposed greenway trail system:

- 66,960 LF or 12.7 miles (including shared sidewalk adjacent to Highway 98)
- 49,425 LF or 9.3 miles (excluding shared sidewalk adjacent to Highway 98)

Estimates by proposed greenway trail path type:

- Boardwalk: 13,900 LF (83,384 SF based on 6' width)
- Dedicated path: 22,980 LF (275,720 SF based on 12' width)
- On-street: 10,600 LF (street marking costs utilize linear feet)
- Shared sidewalk (excluding Highway 98): 993 LF (9,930 SF based on 10' width)
- Shared sidewalk (adjacent to Highway 98): 16,540 LF (165,400 SF based on 10' width)

Trees and Shrubs

Parker Park
Recommended estimate based on concept plan (specific quantity to be determined in planting plan): 50-75 trees; 25-45 shrubs.

Under the Palm Park Greenway Extension
Recommended estimate to create planted buffer between homes and greenspace east and west of existing Under the Palms Park based on concept plan (specific quantity to be determined in planting plan): 180-220 (mix of large shrubs and trees).

City Pier
Recommended estimate for streetscape (median and sidewalk planters) and public gathering space based on concept plan (specific quantity to be determined in planting plan): 75-90 trees; 45-60 shrubs.

RECOVERY AND RESILIENCY PARTNERSHIP

MEXICO BEACH

STORMWATER MANAGEMENT AND GREENSPACE PROJECT