

# EAST END LAGOON PARK & PRESERVE

MASTER PLAN, GALVESTON, TEXAS



# Executive Summary

## Summary

In the spring of 2010, the City of Galveston engaged the AECOM Planning + Design team to develop a master plan for the East End Lagoon, a 700 acre site located on the east end of the island. The mandate for the project was to develop a world-class and sustainable natural recreational area and nature preserve.

The master plan for the East End Lagoon Park & Preserve reflects the uniqueness of Galveston Island, its context and conditions, and the people whose needs and desires have helped to shape it. By merging design with good planning, the team provided the City with a usable blueprint that stresses practical implementation strategies, measures to promote environmentally sensitive development, and sustainable practices and policies to ensure the East End Lagoon Park & Preserve is a treasure for future generations.

## Planning Team

The design and planning team selected for the East End Lagoon Master Plan was lead by AECOM and includes Lake | Flato Architects, Main Street Design, Inc., and M2L Associates, Inc. The objective of the team was to develop a plan for the Park & Preserve that was visionary and would create a destination that could be used by locals and visitors alike. The site plan and building were designed to respond to the unique characteristics of the place and to be a natural partner with the environment.

## Public Involvement

The East End Lagoon Park & Preserve study was guided from inception to final recommendations by input and feedback from City of Galveston representatives, residents, and stakeholders.

## Steering Committee

The driving force in the development of this master plan was the City's Steering Committee. The Steering Committee for the Park & Preserve was appointed by the City of Galveston, and their mandate was to provide guidance for the design team and to serve as a sounding board for thoughts and ideas. Steering Committee members included:

- Jeri Kinnear - chairperson of the City of Galveston Park Board of Trustees
- Dr Jackie Cole - former City Council member
- Dianna Puccetti - City Council member
- Mort Voller - past president of the Galveston Island Nature Tourism Council (GINTC)
- Gary Anderson - past president of GINTC
- Dr. Bill Merrill - George P. Mitchell professor of Marine Sciences at Texas A & M Galveston
- Shirley Foster - current president, GINTC

Six meetings were held with the Steering Committee during the project, and the Steering Committee made it clear they wanted a "world class" site and educational facility that would attract both local residents and visiting tourists. The Steering Committee envisions the preserve and its interpretive center as a potential hub for nature tourism/environmental education on Galveston Island, with links to other sites and organizations on the island.

## Public Meetings

The key to any successful project is stakeholder involvement. For this project, four public meetings were held in order to give interested individuals an opportunity to participate in the planning process. At

each of the meetings, audience members asked questions, shared their opinions, and offered suggestions on how to improve the plan. At several of the meetings, audience members were asked a series of questions and each used a clicker to provide input in real time. The final public meeting consisted of a presentation of the final master plan to the City Council.

## Understanding the Site

The East End Lagoon Park & Preserve is located on the eastern tip of Galveston Island, and the 700 acre site is the largest undeveloped piece of land on the island. The site is bound by the seawall and Seawall Boulevard to the west, the ship channel to the north, East End Beach to the east, and Appfel Park Road to the south and southeast. There is great access to the beach as well as to the lagoon that is parallel to Seawall Boulevard.

The site is representative of the type of landscape typically found on a barrier island. Galveston Bay is the 2nd largest estuarine complex in the region and has been declared an estuary of national significance by the Environmental Protection Agency's National Estuary Program. The East End Lagoon site offers visitors the opportunity to learn about the east end tidal lagoons, wetlands, grasslands, dunes, inter-tidal marshes, and sea grasses that are on the island. The mix of salt water and freshwater in Galveston Bay supports a wide variety of marine and bird life.

Much of the site has been impacted over the years by human and natural activities. Because it is located on a barrier island, the site is in a constant state of flux, and many of the impacts are unavoidable. The site has a long history of disturbance, including: jetty construction; damage from the 1900 storm; seawall and road construction; borrow activities; military fort, training activities, LORAN facility construction; NOAA research facility; off-road vehicular activities; beach parking; and beach related activities. Despite the level of disturbance, the site is significant because it is one of the few remaining large tracts of coastal prairie left on Galveston Island..

In some ways it is fragile and vulnerable because of its exposure to the elements, but it is also resilient. Approximately 80% of the site is considered to be jurisdictional wetlands and it is frequently inundated with water. Flooding from storm surges is a common occurrence. It is not uncommon for a spring tide with strong off-shore winds to inundate the site with 5' tidal surges.

The East End Lagoon site can be divided down into six (6) distinctive zones: the Lagoon, the Wet Ponds area, Upland Prairie, Beach Zone, Big Reef, and the Big Reef Beach Zone. Collectively, these zones boast a striking diversity of habitats, from the fast-moving waters of the Houston Ship Channel to the breaking waves west of the jetty on East Beach, with tidal lagoons and wetlands, coastal prairie grasslands, inter-tidal wetlands, sand flats and dunes, and sea grass beds all represented. The East End Beach is the only naturally accreting sand beach on Galveston Island, and the dunes, though ravaged by Hurricane Ike, are the last natural barrier dune system on the island. The estuary and shallows provide critical shelter, feeding, and nursery grounds for countless species of fish and shellfish, and the site teems with bird life, especially during the fall and spring migration seasons when it is heavily populated by migratory waterfowl passing through along the Mississippi Flyway.

The Park & Preserve is surrounded by powerful evidence of the role of humans in the natural world. The views north and east from the site are often dominated by big tankers and freighters moving through the ship channel or queuing in the Bolivar Roads Channel as they await their opportunity to berth. To the west, the cargo cranes of the Port of Galveston are visible, while to the south stand the tall condominium towers of the Palisade Palms development and the iconic low-rise coastal cottages of BeachTown, both of them testaments to people's desire to live as close as possible to the coastline.

Parking and traffic are a problem during the summer, especially when events occur on the beach. There could be thousands of cars parked from the beginning of the Seawall Blvd. all the way to the beach area.

## Design Concepts

The basic concept for the East End Lagoon Park & Preserve is to protect and restore existing natural resources while enhancing the overall visitor experience. The site is referred to as a "park & preserve" because it will provide a variety of recreational opportunities while also emphasizing the importance of preserving the open, undeveloped character of the site. The Park & Preserve will not be gated or fenced, and will be open to the public. There will be no fee to access the site, which will be open year round and geared toward day use.

The story being told on the site is “Exploring the intersection of people and nature – past, present and future – in a dynamic and constantly changing environment.” This story focuses on how humans interact with barrier island environments, and interpretation can occur both on the site and in an environmental education center. Authenticity is critical to the success of the Park & Preserve, and especially its interpretive center. The center and its experiences need to be clearly and unambiguously grounded in a powerful sense of place. They have to be of and about Galveston Island, offering something that could only happen here.

Because of the condition of the site, emphasis will be more on restoration and protection than on preservation. Although there are few areas of the site that need to be preserved, many areas can be enhanced by removing invasive species, cleaning up debris and pollution, adding native plant materials, and creating a more sustainable environment. It is important to keep this site open and accessible and to respect the sensitive nature of the existing landscape, and it will be managed to allow it to continue to be a dynamic and constantly changing landscape.

One issue that has been discussed throughout the planning process is the importance of not over-developing the site. Too often, a project like this is developed to a point where the site itself is compromised because of too many improvements, too many changes, and too many visitors. The basic idea behind the East End Lagoon Park & Preserve Master Plan is to keep development along the edges of the site, minimizing impacts to key natural resources, limit development in the interior of the site, and to follow the concept of “laying lightly on the land.”

The vast majority of the site is left undeveloped, although some of it will be restored in order to create a healthier natural environment. The end result of the recommendations in this master plan is that the East End Lagoon site will continue to be an undeveloped open space, but with trails, restored habitat, and some development along Boddeker Road.

Site activities include a mixture of self-discovery as well as programmed activities. Although we want to encourage visitors to the site, it is important to minimize the potential impacts of these visitors. Some parking will be provided onsite, but visitors may have to park elsewhere and be shuttled in for major events and for busy weekends.

Any structures added to the site, including the environmental education center, should be consistent with what we would expect to find in these types of coastal areas. That means utilizing colors, textures, materials, and forms found in the local architectural vernacular.

## Sustainability Concepts

One of the over-riding concepts for the East End Lagoon Park & Preserve is to emphasize sustainability in terms of how the site is developed and interpretive stories are told. Sustainable projects promote biological diversity, contribute to the quality of the air and water and reduce the impacts of construction and human use to help preserve the planet for future generations. The East End Lagoon Park & Preserve does just that. This means incorporating the following strategies:

- Significant green infrastructure
- Quantification of the carbon footprint of the proposed project
- Integration of renewable energy technologies
- Significant preservation/enhancement of ecology/habitat
- Incorporation of bicycle and pedestrian infrastructure
- Incorporation of cutting edge water management and recycling techniques
- Landscape design requiring no potable water for irrigation
- Involvement of the community in the development of the plan/design
- Significant use of local materials (more than 50%)
- Significant use of recycled materials
- Adoption of management plan/strategy to guide sustainable practice on-site during construction
- One-hundred percent use of native (or climate equivalent) plants

## Environmental Education Center

The environmental education center within the Park & Preserve provides year-round educational opportunities and is intended to be a “world class” destination site. The consensus was that the environmental education center needed to have up to 20,000 square feet of interior space. Any major building on the site, include the environmental education center, must be a minimum of 18’ above the ground to prevent flood damage.

The environmental education center is a facility that evolves and changes over time. The center can be constructed in phases depending upon how much space is needed to meet projected needs, and it will serve as the focal point of the site during all phases.

Six potential locations on the site were evaluated in order to determine which would be the best for the environmental education center. The site chosen for the environmental education center was just off Boddeker Road near the lagoon. The building will be set a minimum of 100' away from the lagoon in order to minimize environmental impacts to jurisdictional

wetlands. This part of the site is already disturbed, and emphasis will be on keeping construction impacts to a minimum.

One of the biggest constraints for the environmental education center is that it had to be raised a minimum of 18' above sea level in order to avoid hazards associated with storm surges and severe weather impacts. As a result, the buildings are elevated on a raised platform. The advantage of this solution is that visitors have stunning views looking across the site that include the lagoon, the marsh areas, the beach and the dunes to the east, the Big Reef area, and the shipping channel.



Figure 1.0: Looking East from Lagoon towards the Environmental Education Center (Phase II)

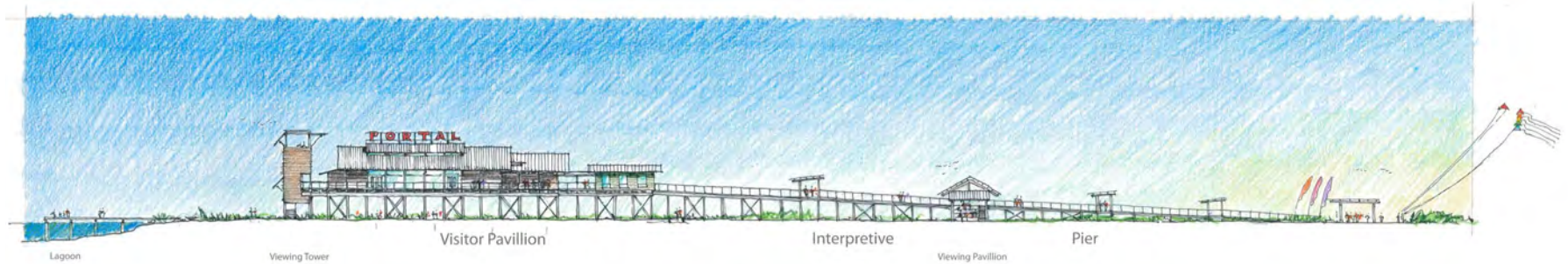


Figure 1.1: South Elevation of the Environmental Education Center

A 400'-long "interpretive pier" that runs parallel to Boddeker Road provides access to the raised platforms that house the environmental education center. The basic concept is that this structure would visually look like an old fishing pier on the site, and would appear to "fit" the site better than would a more utilitarian structure. The pier in essence functions as a long ramp that has a 5% slope and provides handicapped accessibility to the environmental education center. The east end of the pier is at ground level, and it connects to one of the major gateways into the site. Facilities at the gateway include an overhead structure that provides shade, interpretive panels that provide an overview of the Park & Preserve, and benches for the weary. Visitors can either follow paths leading into the site or traverse up the interpretive ramp. Four landings, or platforms, are located along the interpretive pier. Each includes benches and interpretive panels, and is wide enough for a small group of people to gather. One of these landings, located about two-thirds up the ramp, is covered to provide shade, and it is large enough to accommodate a class of school kids.

A series of modular buildings make up the environmental education center. This approach will allow the environmental education center to be developed in phases. It would be prudent for the City to re-evaluate their wants and needs before developing subsequent phases of the project. The three primary phases for building development are as follows:

**Phase I** - The first phase of the environmental education center involves developing the interpretive pier, the first building platform, approximately 7140 sq. ft. of enclosed, climate controlled space, and a viewing tower that serves as the iconic image of the center. The building itself includes a small gift shop, office space for staff, a small warming kitchen for use with events and other activities, a mechanical/storage space, restrooms, and a multipurpose room. A lobby/reception area is located near the east side of the center. The retail center will also include items such as sunscreen,

frozen bait, snacks, drinks, fishing poles, and other day-to-day items. A covered deck is located on the west end of the multi-purpose room.

Below the main platform is space for storage and hands-on interpretive activities. The observation tower is located on the far west of the platform and extends one level above the main floor. An elevator will be located in the tower in order to ensure that all visitors have an opportunity to experience the views from the top level. The multi-purpose room can be used as a classroom, meeting space, or event space.

**Phase II** - In the second phase, the building platform is expanded and a second structure, approximately 4,000 sq. ft. in size, is constructed. This additional space is intended as an environmental education and interpretive space and would include interpretive displays that tell the story of Galveston Island, barrier islands, and coastal environments. The deck wraps completely around the new building space, continuing to offer 360-degree views of the site. The Phase II building provides more flexibility for providing interpretive opportunities for visitors and can accommodate permanent exhibits as well as be used for classroom activities.

**Phase III** - In this phase, the platform is expanded further, and an additional building is added. This building includes space for an expanded multi-purpose room/classroom, and for expanded interpretive/retail space. A deck accessible from the multipurpose room/classroom space is added, as is a wrap-around deck on the south side of the new building. The basic idea is for any new construction to be done without comprising the experience for those visiting the site or the environmental education center. The buildings that were built in the first two phases of the project would not have to be closed during construction of the Phase III building.

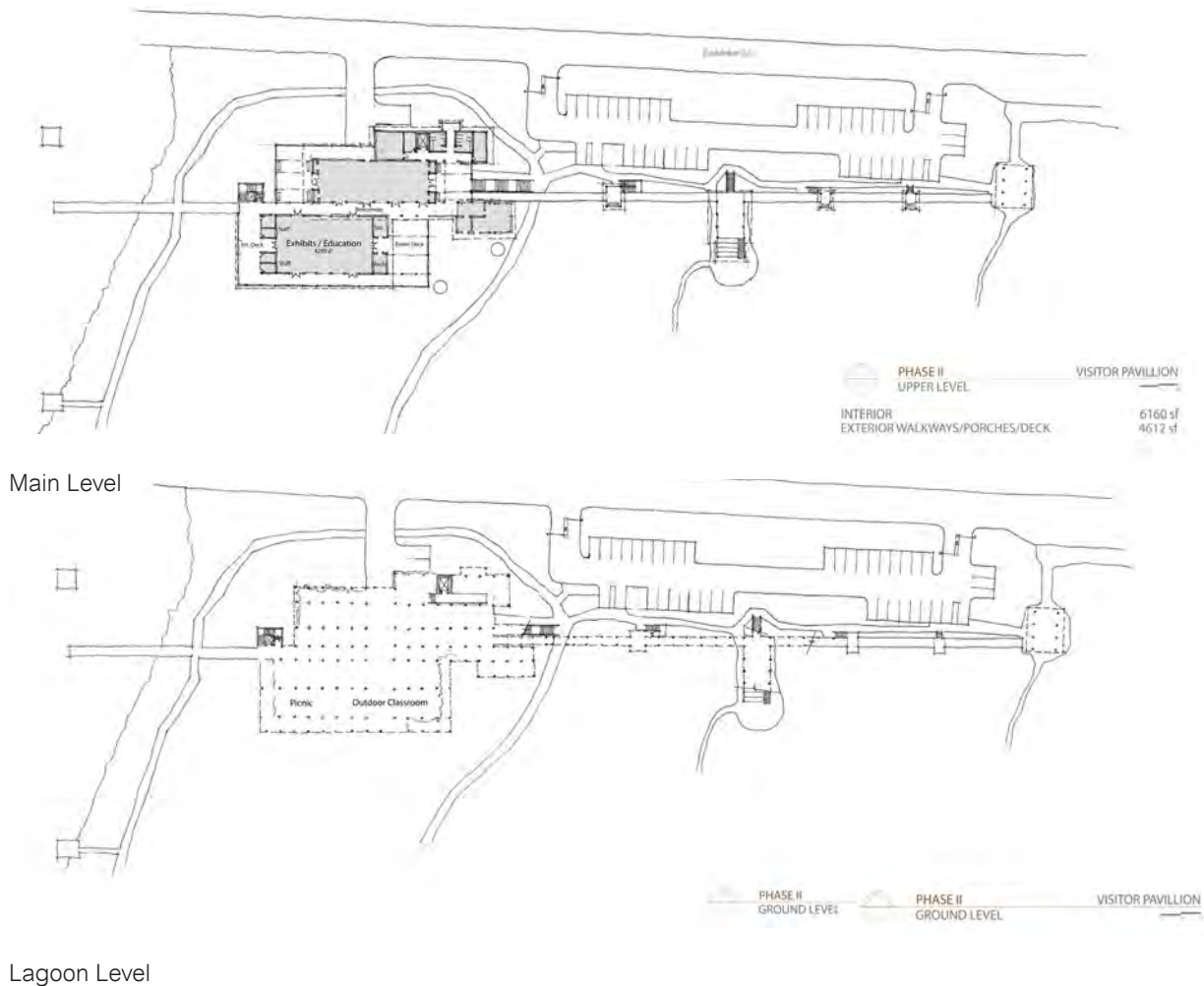


Figure 1.2: Phase II of the Environmental Education Center  
 If desired, a fourth phase, consisting of an additional building, could be added for use as an expanded flexible interpretive and multi-purpose space. This building could also include additional staff office space as well as restroom facilities and mechanical/storage space. An uncovered deck would wrap around the south and east sides of the building.

## Parking

The fundamental concept behind parking is that not all parking needs can be met on the East End Lagoon Park & Preserve site without causing significant environmental damage to the site. The idea is to provide essential parking for the environmental education center while also providing parking for fishermen, hikers, and beach visitors.

Parking would be handled for day-to-day use by a series of parking “cells” located primarily along Boddeker Road, with additional parking near the old shrimp hatchery and at the end of the seawall. The free and paid parking for the East End Beach would remain. Parking near the environmental education center will require a payment, but other parking along Boddeker Road will be free of charge. On-street parking wouldn’t be allowed on Boddeker Road in order to reduce congestion as well as the visual and environmental impacts that cars would have here. Parallel parking is allowed along Apffel Park Road, and is being considered along Seawall Boulevard.

Our recommendation is to provide parallel parking along Seawall Boulevard, but only in selected locations.

The amount of parking available on site will accommodate most day-to-day activities, but may be insufficient for busy weekends, especially if there are activities planned on the beach or at the environmental education center. During these types of events, the recommendation is to regulate traffic

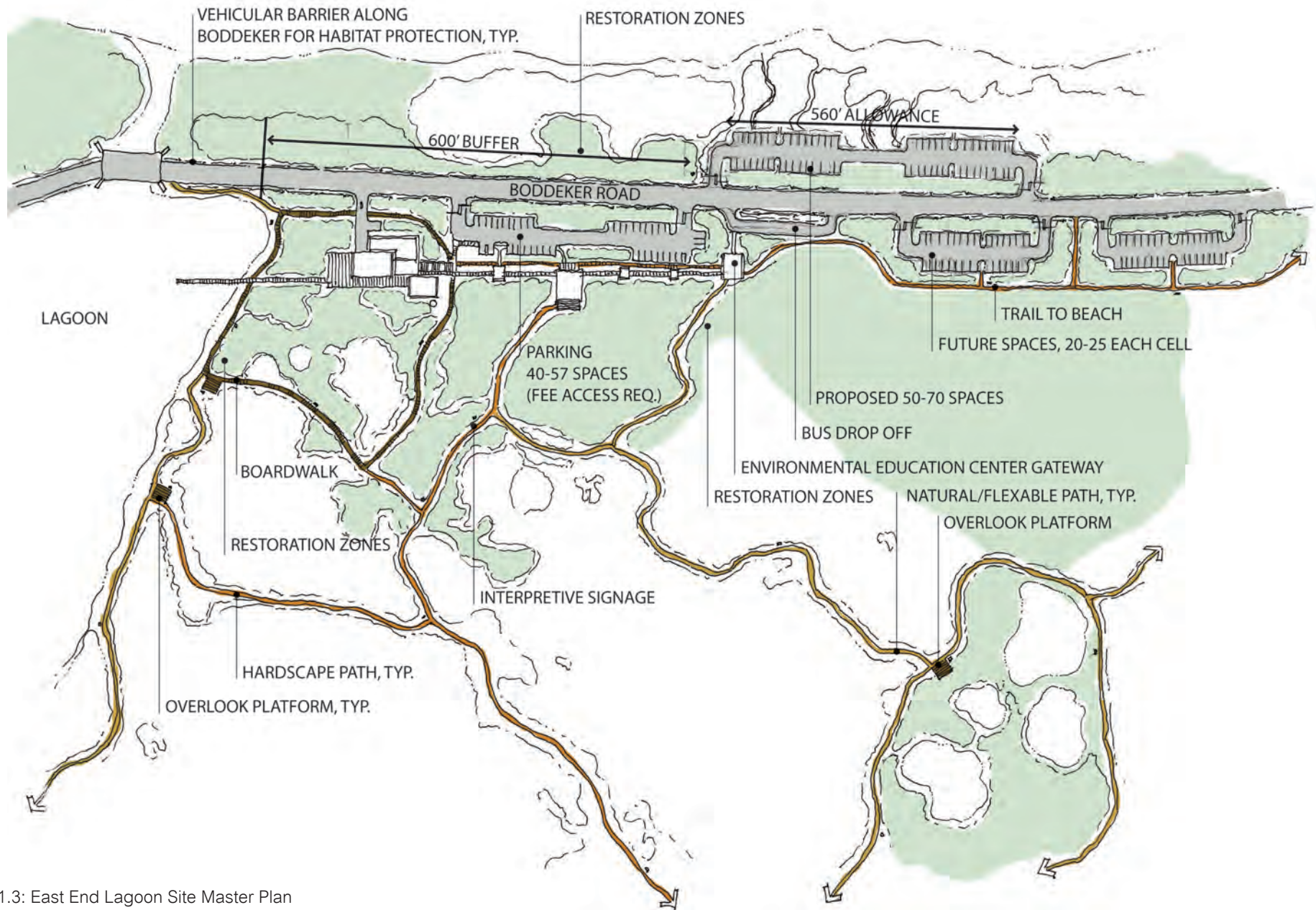


Figure 1.3: East End Lagoon Site Master Plan



on Boddeker Road by turning away cars on the intersection of Boddeker Road and Seawall when all parking areas are full. During major events, the City needs to establish parking off-site and provide a shuttle bus to bring visitors to the environmental education center or to the beach. This is the most effective way to accommodate large crowds without causing irreparable environmental damage to the Park & Preserve.

## Trails

A network of trails, consisting of unpaved paths, paved trails, and boardwalks, will provide access throughout the site. Gateways, trailheads, viewing platforms, and bird blinds are used to enhance the visitor experience. Trails also provide access to the Big Reef area.

There will be a clear hierarchy of trails, with ADA accessible trails and boardwalks located near the environmental education center and trailheads, and most of the other trails on the site being more informal. These informal trails would be unpaved and constructed of crushed sea shells or other organic material, and would only be wide enough to accommodate movement. Cars are kept out of the Park & Preserve in order to preserve the environmental integrity of the site as well as maximize the visitor experience. The trail network is intended to provide access throughout the Park & Preserve as well as link to surrounding areas.

Four major gateways are identified. Each is considered to be a major trailhead and includes an iconic overhead structure that serves as a visual landmark as well as provides shade and protection for visitors. These four gateways are: Seawall Boulevard Gateway; Education Center Gateway; Crossroads Gateway, and BeachTown Gateway.

## Seawall Trailhead

This area is located at the corner of Seawall Boulevard and Boddeker Road adjacent to the lagoon. This trailhead includes a small parking lot, a bait shop, a small dock for kayaks and canoes, a swimming platform, and connection to a hard-surface trail that loops around the lagoon. The site is close enough to the environmental education center for people to park there and walk over. This is a place where visitors can easily access the

trail leading around the lagoon, or get to the lagoon itself. The architecture of the bait shop needs to be consistent with that being established at the environmental education center. The bait shop has limited facilities and will not be elevated.

## Camp Site

A tent camping area is proposed for the former LORAN site. The entrance into the camp site is off of Boddeker Road, and it follows the path of the existing trail in order to minimize environmental impacts. Approximately 25 to 30 tent platforms are constructed on-site. The wooden platforms are 10'x10' in size and arranged in small clusters to encourage group outings. These clusters are connected via a raised boardwalk that creates a loop and provides connectivity for campers. The raised platforms reduce environmental impacts and help keep campers dry. The "tents" are made of canvas walls and are kept up throughout the camping season and taken down in the fall. They can also be dismantled and stored during severe storms.

A raised restroom facility, approximately 18' above the ground, is located in the center of the camping area. It is approximately 20'x 25' in size and includes a shower facility below the main platform. A small parking lot is also located within the camping site. Both the restroom/shower facility and the campground are intended for the exclusive use of campers.

## Big Reef

Because of the predominantly wet conditions of the site, the majority of the pedestrian trails in the Big Reef area are boardwalks. These enable visitors to move through the site while staying dry. At the end of the two boardwalks heading toward the shipping channel are soft-surfaced trails that enable visitors to get off the boardwalk and walk to the edge of the channel. Five interpretive overlooks are located along the boardwalks, one of which is an existing bird watching tower. A kayak dock/ramp is also included. The purpose of this ramp is to allow visitors to put in a kayak in order to gain better access to wildlife viewing areas along the water. The small lagoon will be closed so that kayakers can't paddle out into the ship channel.



Figure 1.4: Big Reef

Big Reef is essentially an island that offers easy sanctuary for wildlife. The sandy edge of Big Reef, especially at the southern end, is part of a federally designated as critical habitat for the endangered Piping Plover. Its grassy and sandy hummocks provide nesting for skimmers, least terns, Wilson’s plovers, and many other species. Some amount of inter-tidally washed habitat needs to be set aside and clearly designated for Piping Plovers.

## Landscape Restoration & Site Improvements

When the East End Lagoon Park & Preserve site was transferred to the City of Galveston as part of the National Park Service’s Federal Lands to Parks Program, the National Park Service included a statement on the transfer that said the land “will be preserved for beach access, protection of the coastal wetlands/beach dune habitat, and nature study, including natural trails and wildlife observation areas.” The overall vision for the Park & Preserve is consistent with this statement. Landscape restoration efforts onsite should be part of the Park & Preserve’s overall goal of providing environmental education opportunities for visitors. Specific areas for restoration include: the coastal prairie area; the dune edge; the lagoon edge; the beach zone north of Big Reef; and the black mangrove restoration and preservation.

The first phase of landscape restoration should focus on the areas along Boddeker Road, especially in the areas near the Seawall Trailhead and the proposed environmental education center. Other priority areas include the area around the turtle/shrimp hatchery, including the entry road, and along the diagonal trail through the middle of the Park & Preserve site. Future phases of landscape restoration include the coastal prairie area, the dune edge, and the lagoon edge.

As part of lagoon restoration, fingers of the lagoon could be extended further into the site in order to create more wetland coastline and opportunities for kayaking, wetland restoration activities, and birding. The salt marsh area to the east of the lagoon should also be restored. The landscape areas that are restored around the environmental education center could directly be tied into programmed activities associated with the center. Restoring areas that are visually and physically accessible from the raised boardwalk would allow all visitors to experience the natural resources of the site.

Not all visitors will have the time, interest, or ability to walk very far into the site, so the restoration areas near the environmental education center can give them a glimpse of what else is on the site. It may even encourage some visitors to spend a little more time on site exploring the other, larger restoration projects.

## Interpretive Planning

The East End Lagoon Park & Preserve presents a remarkable interpretive opportunity. Not only will the new Park & Preserve safeguard and make publicly accessible a vital natural area – arguably the most ecologically significant parcel of undeveloped land remaining on Galveston Island today – it has the potential to transform popular perceptions of the island among residents and visitors alike and provide a tourism destination that focuses on natural resources.

At the East End Lagoon Park & Preserve we are challenged to fully interpret the complex interactions between people and nature, industry and ecology, and cultural heritage and natural history. What is recommended is a new kind of “nature preserve,” with a new kind of environmental education

center at its heart. It will combine wildlife viewing and nature observation with active recreation, and it will welcome sport and subsistence fishers and shell-fishers armed with poles, traps and nets as well as birders equipped with cameras and binoculars.

Scientists and researchers, possibly including undergraduate and graduate students at TAMUG, Texas A&M's marine resources-focused Galveston campus, may conduct on-going projects at the preserve, working with high-school students and other community members who might get involved in "citizen scientist" type activities. The goal is to make the Park & Preserve and its environmental education center into a kind of "living laboratory," active rather than passive, constantly evolving and changing. Local school children who have grown up beside these wetlands but never ventured into them will discover exciting new worlds to explore and may even catch glimpses of possible future careers. Beachgoers down for the day from greater Houston will encounter a rich palette of environmental experiences to complement the island's famous surf and sand. And destination nature tourists drawn to the Gulf Coast's world-class birding will have a new starting point from which to launch their adventures.

The East End Lagoon Park & Preserve and its environmental education center will evolve over time. Beginning with a targeted focus on the ecology and natural history of the preserve and its habitats, interpretive offerings will expand to include a diverse network of trails and exterior interpretation as well as long-term and changing interior exhibits addressing not just the immediate environs of the East End Lagoon Park & Preserve, but a broad range of related regional, national, and global topics. The phased implementation of the East End Lagoon Park & Preserve initiative is deliberate and strategic, enabling the new institution to learn and adapt as it grows.

The media and methodologies recommended for the East End Lagoon Park & Preserve are a mix of the familiar (interior and exterior graphics, signage, and exhibit components; live animal displays; touchable sculptural elements; mechanical and audiovisual or multimedia interactives; and environmental education programs) and the unexpected (adventure play experiences; aquatic trails; interpretive

fitness courses; on-site overnight programs.) Our intention is to create a linked palette of experiences that engage our visitors' bodies and senses as well as their minds, surprising and challenging them while providing essential and sometimes surprising information.

Interpretive Media Exterior Exhibits and Graphics - This category includes elements such as kiosks; interpretive graphic panels, waysides and rails; trailhead and trailside interpretation; flora and fauna species identification graphics; informational, instructional, and regulatory graphics; wildlife and habitat viewing aids such as siting tubes or view framing devices; and simple sculptural elements or hands-on interactive devices. These elements may take a wide range of different sizes, styles and forms, depending upon their purpose, content, and installation location. Most will be permanent, but some may be ephemeral, for example, to provide interpretation for a temporary trail or natural occurrence. Most will be located within the boundaries of the Park & Preserve, but some may be installed off-site as a means of extending the reach and impact of the preserve's presence.

Interior exhibits and graphics - Interior exhibits and graphics will be installed within the environmental education center, primarily in a dedicated interpretive gallery and in public reception areas and circulation spaces. Among the components and methodologies we would recommend for consideration during the planning and design of the environmental education center exhibits are: traditional interpretive graphics and displays; objects and artifacts; audiovisual programs; interactive multimedia; hands-on and mechanical interactives; and dioramas or replicated environments.

The environmental education center's public reception areas and circulation spaces, exterior as well as interior, will house informational graphics and other media as well as simple flat art-style changing exhibits. In the open-air but roofed and shaded entrance pavilion at the base of the experience pier we will provide welcome and orientation information, visit planning support, and announcements of programs and events. These will be primarily graphical, but interactive multimedia systems may also be employed. As the amount of fully climate controlled interior space increases during Phase II of the project, the main level lobby and/or adjacent circulation spaces might be designed to incorporate clear

surfaces and flexible display systems for simple changing displays of mission-related artworks, photographs, etc.

**Portable Interpretive Media** - Portable interpretive media are an important tool for informing and engaging visitors to the East End Lagoon Park & Preserve. Portable media are capable of providing in-depth interpretation of the features and natural resources of the preserve without cluttering the site with fixed graphic elements. These media can vary widely in type and complexity, ranging from simple “dive card” style laminated graphics for species or habitat identification, or for “treasure hunt” activities, to field guides or notebooks, to “discovery kits” containing a variety of tools and information. At the other end of the technological spectrum are smart-phones, PDA’s, and MP3 players. These offer exceptional adaptability, content capability, and opportunities for engagement and interactivity.

**Interpretive Play** - Many key themes and messages of the exhibits for the Park & Preserve and the environmental education center can and should be introduced to younger audiences in the form of interpretive or “adventure” play opportunities. Interpretive play spaces should be developed as part of the environmental education center site design, including both large-scale elements like the wet play zone mentioned above and simpler, smaller things such as paving changes, embedded objects, and touchable sculptures. The Park & Preserve should also include a dedicated “discovery trail” designed specifically for children.

**Self-Directed Activities** - The range of self-directed visitor activities anticipated at the Park & Preserve includes walking and hiking, birding and wildlife viewing, recreational and subsistence fishing and shell fishing, exercise and active recreation, swimming, and canoeing or kayaking.

**Staff or Volunteer-Led Activities** - A number of potential “mediated” activities in the Park & Preserve will require infrastructure support would benefit from the development of dedicated informational or interpretive elements.

## Interpretive Phasing Recommendations

**Phase I: Portal to the Preserve** - The first phase of the East End Lagoon Park & Preserve project will focus on making the new preserve’s natural resources publicly accessible and on providing the necessary

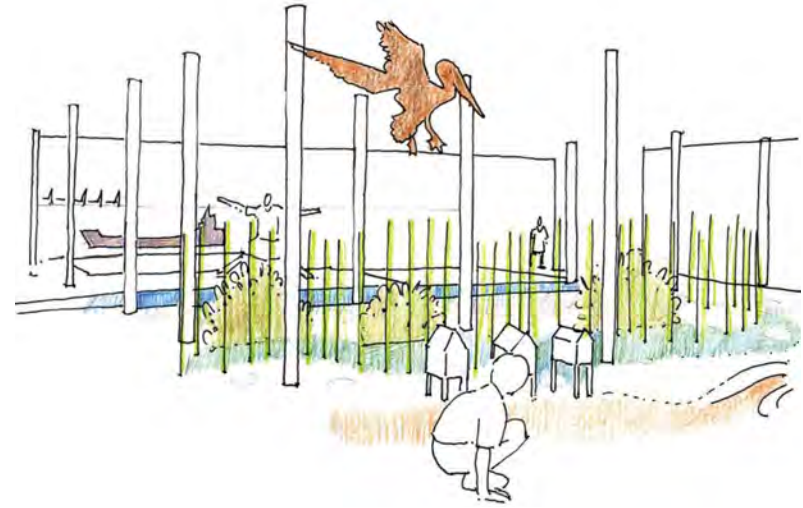


Figure 1.5: Interpretive Exhibit

interpretive support to ensure that guests have a safe, satisfying, and stimulating experience. Interpretive messaging in Phase I will concentrate on informing guests about the key habitats and plant and animal species of the East End Lagoon and environs, and about the interrelated natural history and cultural heritage of Galveston Island.

**Phase II: East End Environmental Education Center** - Phase I of the East End Lagoon Park & Preserve project will be largely devoted to developing exterior interpretive components, either at the environmental education center or around the site, with only an absolute minimum of fully enclosed and climate-controlled space being constructed. In Phase II these exterior experiences will be augmented with additional interior exhibits. New trails, trailheads and site interpretation will be rolled out; additional administrative and support spaces will be provided; the project’s retail presence will be expanded; and a dedicated children’s adventure play zone will be created.

**Phase III: Gulf Coast Discovery Lab** - During Phase III: the environmental education center’s enclosed multipurpose and classroom spaces will be significantly expanded; a larger retail component will be developed; improvements and additional accommodations will be provided at the eco-camp; and any remaining site interpretive elements will be completed. The provision of additional multipurpose and classroom areas will free up

space within the environmental education center for a dedicated long-term interpretive installation. Exhibits and experiences installed in the long-term exhibition space would expand the environmental education center's interpretive perspective to encompass the entire U.S. Gulf Coast.

An additional phase could be added to stress global perspectives. This could include the development of an additional large-scale flexible interpretive or multipurpose space capable of housing programs, functions and events; major traveling exhibits; or additional permanent exhibits; as well as expanded administrative space

### Impact of City Property

The City of Galveston owns the property between Boddeker Road and the ship channel, just east of the end of Seawall Boulevard, and there are concerns about how potential development of this site may impact the proposed environmental education center that would be on the other side of Boddeker Road. There are no immediate plans for the City to develop this property or to lease it to out for development by others, but there have been discussions that this would be a good location for future commercial

uses. One major issue is whether this type of development, if it occurs, will have a detrimental impact on the environmental education center.

Any new structure on the City property would have to be elevated in a manner similar to the environmental education center, so it could have a negative impact on views. The best way to minimize this problem is to restrict development to the area directly across from the center. There is a view zone from the decks and the multi-purpose room of the environmental education center that is blocked by the restroom and kitchen building mass, and any building in this area would not impact views. In addition, there is an area 30 degrees off of north towards the west that might be able to accommodate lower development or a raised building that is visually permeable and would not completely block the view. For example, raised decks in this area would not be a major problem, although solid woods would restrict views.

### Economic Analysis

Given its size, physical characteristics, and location in the greater Houston region, the East End Lagoon Park & Preserve has the potential to be a model for park development. With this potential in mind, the objectives established for East End Lagoon Park & Preserve include financial self sufficiency and sensitivity to the environment. The design team conducted a comprehensive analysis of recreational opportunities in the greater Houston market and undertook research on best practice recreational development in parks around the country.

In the case of the East End Lagoon, a day use facility does not have the potential to be financially self-sufficient. A facility with overnight accommodations significantly increases market potential, provides a market for on-site amenities, and improves revenue streams. The more uses that occur on the site, the stronger of a destination the property becomes for all user groups. From an economic perspective, the objective is to reach a balance between impacting the site and developing the facilities that can generate income and a facility with overnight facilities increases the opportunity to achieve this balance.

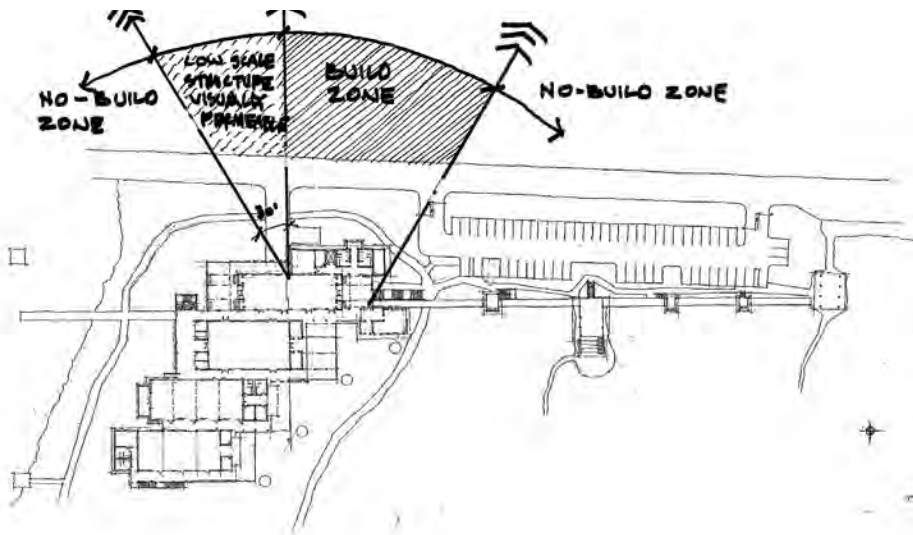


Figure 1.6: Impact of City Property

## Financial Performance

Projected revenues from core operation would increase from \$321,000 (Phase I) to \$1.48 million (Phase III) and the operating budget would increase from \$491,000 to \$1.64 million. Increasing revenues result from a combination of increased attendance and higher per capita fees associated with increased scope of the attraction. The bottom line financial performance is a deficit which ranges from \$169,000 (Phase I) to \$162,500 (Phase III). The best overall performance is Phase III with a deficit estimated at \$163,000. The cost recovery factors for the environmental education center as a stand-alone attraction ranges from 66 to 90 percent.

While Phase I and II have the lowest expenses, the scale of the development limits potential visitation, and therefore, associated revenues. Phase III provides the scale to attract higher visitation and multi-day program participation, while offsetting some of the costs associated with operating a larger facility.

The addition of ancillary income to the financial bottom line of the environmental education center reduces the anticipated deficit for the East End Lagoon Park & Preserve, and increases the overall cost recovery factor. When ancillary income is considered, the deficit is reduced to a range of \$35,500 (Phase I) to a profit of \$47,000 (Phase III) with a cost recovery factor ranging from 93 to 103 percent. Phase III development is projected to break even in terms of costs to income.

The ability of Phase I to appeal to a broad market and generate revenue is limited by its modest size. As the facility develops to Phase II, its ability to generate revenue increases, but the facility's still somewhat modest size cannot draw or accommodate a larger audience to offset the increased operating costs associated with the facility. Phase III achieves a balance between the scale necessary to attract and accommodate sufficient visitation to generate revenues and offset operating costs.

Given both the absolute size of the deficit and cost recovery factor, Phase III appears to optimize financial performance. The overall property is anticipated to operate at approximately break even, with a cost recovery

factor of 103 percent. This phase achieves the best balance between size, revenue generation and operating costs.

Two of the development phases of the East End Lagoon Park & Preserve Master Plan are expected to operate with a financial deficit. The remaining phase (Phase III) is expected to operate just above break even. Ways to make up the difference in funding are:

- Corporate/Institutional Grants
- Corporate Sponsorships and Advertising
- Friends Groups
- Adopt-A-Park
- Volunteer Programs
- Programming Partnerships

## Implementation Plan

Development of the East End Lagoon Park & Preserve is expected to be constructed in phases. This approach will allow later phases to adapt to the lessons learned during the initial phases of the project and will allow for the appropriate level of expansion based on visitation, demographics, and changing priorities.

Implementation of the project can be divided into two distinct phases: 1) environmental permitting and first phase of construction, and 2) subsequent phases of construction. It is the intent that the project will be permitted in the initial phase for ultimate development to allow for construction of subsequent phases without the added expense and delay of new permit applications. The following sections outline the recommended course of action to achieve the successful and timely construction of each phase of the project.

## Environmental Permitting and First Phase of Construction

One of the reasons that the East End Lagoon Park & Preserve site is exciting as a major public space is the dynamic characteristics of the landscape. Being on the water side of the seawall ensures that the site will be in a constant state of flux; storm surges, tidal changes, shifting sands,

strong winds, and other natural processes will continuously shape the site. The environmentally sensitive nature of the site, including valuable wetland and coastal resources, also means that significant up-front effort will be required to meet all regulatory and permitting requirements.

Work conducted or structures built below the mean high tide line are subject to Section 10 of the Rivers and Harbors Act and a Department of the Army (DOA) permit is required. Also, the discharge of dredged or fill material below the annual high tide line or into Waters of the United States, including adjacent wetlands is subject to Section 404 of the Clean Water Act (CWA) and a DOA permit is required. In order to submit a DOA permit application, a preliminary footprint of development and assessment of impact must be determined.

Several efforts will need to be performed simultaneously in order to permit and design Phase I of this project and all subsequent phases.

The U.S. Army Corps of Engineers (USACE) currently has a Memorandum of Agreement with the Texas Commission on Environmental Quality (TCEQ) so that if a TCEQ and USACE permit is needed, then a joint permitting process can occur. Other permits, such as building permits from the City of Galveston and Galveston County will also be required, but these permits do not require the same level of effort as the DOA permit and do not have lengthy review processes.

Work required to submit the DOA permit will include the completion of all required environmental studies, the conceptual design of the fully phased East End Lagoon Park & Preserve based on the findings of the environmental studies, and the completion of the DOA permit application. A pre-application consultation meeting will need to be held with the Galveston District of the USACE at the beginning of this process. This meeting will introduce the USACE and resource agencies to the proposed project, review the permitting process and requirements for the permittee, and identify any specific environmental or regulatory issues that the resource agencies may be concerned about. Additional coordination with the U.S. Coast Guard, Federal Emergency Management Agency (FEMA), National Oceanic and Atmospheric Administration (NOAA), and the Department of the Interior will need to occur in this.

Department of Army Permit - To add fill to Waters of the United States, a (DOA) permit is needed. Per Section 404, the clean water act, discharge of dredged or fill material into Waters of the United States, tidal wetlands adjacent to Waters of the United States, and fresh or brackish wetlands adjacent to tidal wetlands is regulated. The DOA permit is coordinated with other resource agencies and state and federal regulations. The process for obtaining a DOA individual permit is lengthy and typically takes between 12 and 24 months depending on the complexity of the project and the sensitivity of the ecosystems to be impacted. It is possible that an Environmental Impact Statement (EIS) or an Environment Assessment (EA) will be required as a secondary submittal in the permit process.

Environmental Studies and Associated Required Design Work - In order to submit a DOA permit application, a preliminary footprint of development and assessment of project impact must be determined. Small variations in the impacts to Waters of the United States, including wetlands, between the permitted impact and the constructed impact are allowed. However, if the ultimate design results in a significant increase in impact, then the permit process could start over, postponing construction until a new permit is issued. Other environmental activities that will be addressed include: functions and services, threatened and endangered species, essential fish habitat, water quality, cultural resources, conceptual mitigation plan, among others.

## Subsequent Phases of Construction

Subsequent phases of construction will be easier to design and construct as all major environmental permitting will have been addressed during the initial phase of construction. Furthermore, due to the presence of this Master Plan and completed construction documents for the previous phase or phases, concept definition for each subsequent phase will have already been developed. However, as the East End Lagoon Park & Preserve grows into its final form, small changes in space and programming needs to meet changing priorities may require changes to the concept as presented in this Master Plan.

## Funding and Governance Structure

Governance refers to ownership of the project, the physical resources that will make up the project, and the responsibility for ongoing operations. The ownership and governance of the East End Lagoon Park & Preserve should be vested in an independent entity whose express purpose is the fund raising and operation of both the park and the environmental education center.

The development and operations of the East End Lagoon Park & Preserve should be vested in a non-profit organization, specifically one qualifying under Section 501(c)(3) of the Internal Revenue Code. This is a type of corporation widely used by museums and cultural attractions.

The board of directors of the non-profit corporation will constitute the Park & Preserve's board of trustees. Board membership should include representatives of the Galveston community, including citizens who have been instrumental to the process of making the Park & Preserve concept a reality. It is important that the board includes local representation, and that the skills of the board include not only subject interests, but knowledge of good business management and fund-raising skills. Board membership can include ex-officio representatives of supporting organizations, including government officials.

A non-profit 501(c)(3) corporation can pursue implementation of the project and is legally empowered to accept grants and donations. A first action of the corporation would be securing initial funding to hire key staff including fund raising/development staff, and to continue with the planning process.

## Overall Funding Strategy

The next step will be to develop an overall funding structure for the attraction, identifying the major sources of funds to be pursued for development of the Center. Provision will need to be made not only for capital development funds, but also for an endowment or other source of annual support for the Park & Preserve.

## Construction Cost Estimate

Construction of the East End Lagoon Park & Preserve is expected to occur in phases based in large part on available funding. This cost estimate for each phase is considered to be conceptual in nature and is intended to give a ballpark idea of what it will take to implement the project.

### Estimated Construction Costs

Phase IA Cost (This phase would be a way to begin construction with limited funds. The idea was to develop a presence on site for under \$1 million.)

• Buildings/Structures	\$468,000
• Site Development	\$163,000
• Interpretation	\$308,000

Total Phase IA Construction \$939,000

Phase I Cost

• Buildings/Structures	\$4,520,000
• Site Development	\$646,000
• Interpretation	\$684,000

Total Phase I Construction \$5,850,000

Phase II Cost

• Buildings/Structures	\$3,005,000
• Site Development	\$666,000
• Interpretation	\$1,365,000

Total Phase II Construction \$5,036,000

Phase III Cost

• Buildings/Structures	\$2,400,000
• Site Development	\$20,000
• Interpretation	\$125,000

Total Phase III Construction \$2,545,000



Phase IV Cost (This phase could be pursued if additional building space is required.)

• Buildings/Structures	\$2,267,000
• Interpretation	\$100,000
 Total Phase IV Construction	 \$2,367,000

### Estimated Environmental Permitting Costs

Environmental studies required for permitting include wetlands delineation, functions and services assessment, threatened and endangered species assessment, essential fish habitat assessment, historic and cultural resources study, Section 401 water quality certification, development of the conceptual mitigation plan, and other smaller studies. Also included in this section is the DOA permit application preparation and permit coordination. If directed by the Corps of Engineers, and Environmental Assessment (EA) or Environmental Impact Study (EIS) may also be required to receive Corps approval for this project. The ultimate cost of this environmental work is dependent on the project specific requirements and the determined need for an EA or EIS.”

Environmental Permitting Costs      \$300,000 to \$450,000

### Estimated Design Costs

Phase IA Cost - Design Cost	\$278,000
Phase I Cost - Design Cost	\$826,000
Phase II Cost - Design Cost	\$893,000
Phase III Cost - Design Cost	na
Phase IV Cost - Design Cost	na

### Estimated Operational Costs

Phase IA Cost - Operational Cost	\$70,000
Phase I Cost - Operational Cost	\$421,000
Phase II Cost - Operational Cost	\$940,000
Phase III Cost - Operational Cost	\$1,644,000
Phase IV Cost - Operational Cost	\$2,422,000