



ARROWSTREET

REVERE RIVERFRONT MASTER PLAN

FINAL REPORT

REVERE, MA
JANUARY 2021

PREPARED FOR
CITY OF REVERE

Revere RiverFront Master Plan

City of Revere

January 2021

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I. BACKGROUND



CITY OF REVERE

Brian M. Arrigo
Mayor

January 31, 2021

Anthony Zambuto, President
Revere City Council

Louis Ciarlone, Chair
Revere Planning Board

Revere City Hall
Revere, MA. 02151

Dear President Zambuto and Chairman Ciarlone,

When I convened and commissioned the RiverFront Development Advisory Group (DAG), I was confident that they could produce a thoughtful and substantive Master Plan for this emerging new gateway district. After five sessions of thorough and candid discussion among affected residents, city officials, elected leaders and other representatives of both the public and the private sectors, the DAG has now set forth a new vision for this entire area. It focuses on the recreational, environmental and civic potential of an enhanced Gibson Park in a manner that integrates the surrounding public and private properties and complements the adjacent Riverside and Point of Pines neighborhoods. I am pleased to present you with the product of that collaborative effort: *A Master Plan for the RiverFront District*.

To the ultimate benefit of the City of Revere as a whole, the DAG recognized and responded to the unique and timely opportunities afforded by the prospective sale of the G/J property as well as our emerging plans for community use of the long-vacant Riverside Boat Works property. In that new and evolving context, the DAG proposes to supplant these unsightly current uses, transforming the RiverFront District into the waterfront haven of recreational variety and residential vitality that has for decades been the potential of this peninsula. And they do so in a manner that fully incorporates the long-neglected waterfront in an environmentally innovative and sustainable way that begins to address persistent flooding problems in the Riverside community as well as long-term climate-change issues and opportunities in the area as a whole.

For this notable effort and positive outcome, I hereby extend the gratitude of the City of Revere to all of the members of the RiverFront Development Advisory Group as well as others from the Revere community who also participated in the several public meetings sponsored by the DAG. Our thanks particularly include the members of the expert, experienced and multi-disciplinary consultant team – Arrowstreet: Planners and Architects, Copley-Wolff: Landscape Design Group and Lloyds Register: Engineers – that together guided, informed and staffed this collaborative effort.

President Anthony Zambuto,
Revere City Council
Louis Carlone, Chair
Planning Board

Page two.

January 31, 2021

Our appreciation also extends to Redgate, the prospective new owners of the G/J property, whose development team has provided invaluable technical assistance and continuing professional input and feedback. In many respects, it was Redgate's appreciation of and commitment to the development potential of the G/J site that was the catalyst and inspiration for this entire process.

Finally, and most gratefully, we acknowledge and applaud the critical role of the Seaport Economic Council, Chaired by Lieutenant Governor Karyn Polito. It was as a result of their understanding of Revere's potential and their endorsement of Revere's aspirations that the funds were provided to finance RiverFront Master Planning process. This enterprise would simply not have been possible without their support and encouragement.

We clearly understand that, as creative and responsive as this Master Plan is, it just the beginning of the transformation of the RiverFront district into the active and attractive northern gateway and mixed-use community that the Development Advisory Group has envisioned and that the residents of Revere deserve. Its implementation will require several critical next steps that will involve the Planning Board and the City Council among other public agencies and community organizations. To that end, I hereby commend the *RiverFront Master Plan* for your consideration; and I look forward to continuing the working relationship with the members of the City Council, the Planning Board and the many others that will ultimately lead to its successful and timely realization.

Regards



Brian M. Arrigo
Mayor
City of Revere

cc: Members of the Revere City Council
Members of the Revere Planning Board
Members of the Riverfront District Development Advisory Group
Members of the Seaport Economic Council
Other Interested Parties.

Background

The 19.4 acre Revere RiverFront District borders the Riverside and Point of Pines neighborhoods and is centered around the public and private properties that surround Gibson Park. Intersected by North Shore Road, those properties include the vacant Riverside Boat Works, the G/J tow/salvage yard, the former Mirage site, the southbound and northbound ramps to the General Edward Bridge, the Point of Pines Yacht Club and the former Alden Mills Fire Station on the Lynnway in Revere. Although this RiverFront Master Plan represents the first time that these properties have been considered together and as part of a larger mixed-use community, many of them have individually received significant city and community attention in the past:

- Gibson Park itself was recently improved by the City with an updated ball field as well as a new playground and community garden.
- The waterfront site of the former Mirage Club became an adult daycare center and host to other related small businesses.
- The vacant Riverside Boat Works property has been twice proposed for redevelopment, but both proposals were withdrawn in the face of concerted opposition from the community and our local elected officials, specifically including Ward Councilor John Powers, for its being too dense and otherwise inappropriate for that relatively small 50Ksf site immediately adjacent to the Riverside neighborhood.



- A new option for the Riverside Boat Works as a regional rowing center has now emerged at the suggestion of City Council President Patrick Keefe and is being actively pursued by the City; and that proposal is consistent with Riverside advocacy for a community use for this crucial parcel.
- The City recently approved municipal bonds to fund replacement of the vacant Alden Mills Fire Station with a new and expanded public safety facility.
- The Point of Pines Yacht Club began planning for a dredging program to facilitate, expand, and enhance its continued successful operation.
- MassDOT began planning for the replacement of the General Edwards draw-bridge with a fixed-span structure.
- The City and the Commonwealth of Massachusetts began to prepare a Municipal Vulnerability Preparedness (MVP) program and Coastal Resiliency Study to address and resolve environmental problems throughout Revere, specifically including persistent flooding in the Riverside community as well as the expected impact of sea-level rise on both the Riverside and Point of Pines communities in particular.
- The G/J parcel became available for sale and has been put under agreement for development by Redgate



The G/J site has long created the unsightly first impression of Revere for countless daily commuters and others entering our community from the North Shore across the General Edwards Bridge. The prospect of redevelopment of the 4.5-acre (10.8-acre including waterways) G/J parcel was a major catalyst for the potential transformation of the district as whole.

This was true in no small part because the prospective new owner of this property is Redgate, an experienced Boston developer that Revere knows well and that knows Revere well. Redgate has already successfully completed more than \$300M of major residential and mixed-use projects: One Beachmont on Revere Beach Parkway; 500 Ocean, home to the Dryft and Fine Line restaurants and Ryder on Revere Beach Boulevard and Ocean Avenue, which will feature another waterfront restaurant. Redgate has confidence in the future of Revere, its resources and foresight to continue to invest in the City's Future.

The prospect of a new northern gateway into Revere, one organized around a public park with a revitalized riverfront and a vibrant mix of recreational, residential and community uses, was the stimulus for the City of Revere to seek funds to master plan this evolving new waterfront district from the Seaport Economic Council (SEC), Chaired by Lieutenant Governor Karyn Polito. Based on a personal request and presentation by Revere Mayor Brian Arrigo, the SEC members were not only enthusiastic about the environmental, economic, transportation and civic potential of the district, but they were also impressed by the considerable amount of preparatory work that had already been done to realize that potential. The result was an SEC commitment to fund the formulation of this RiverFront District Master Plan.

Robert O'Brien

*Planning and Development Director
City of Revere*

RDAG Members, Consultants & Stakeholders

As of January 2021

RIVERFRONT DEVELOPMENT ADVISORY GROUP MEMBERS

Community Members

Jay Bolton | *Point of Pines Yacht Club*

Elaine Hurley | *Riverside Resident, Riverside Association*

Loretta LaCentra | *Riverside Resident, Riverside Association*

Eric Lampedecchio | *Former Riverside Resident, Community Advocate*

Robert Marra | *Point of Pines Resident, Former Mayoral Chief of Staff*

John Shue | *Point of Pines Resident*

Gina VanderLoop | *Point of Pines Resident, POPBA,*

Alliance for Health & Environment

Elected Officials

Jessica Giannino | *At-Large City Councilor, State Representative*

Patrick Keefe | *Then City Council President*

John Powers | *Ward 5 City Councilor*

RoseLee Vincent | *Former State Representative*

City Staff

Elle Baker | *Open Space and Environmental Planner*

Julie DeMauro | *Transportation Planner*

Michael Hinojosa | *Director of Parks and Recreation*

Gene McKenna | *Former Revere Planning Board Chair*

Nicholas Moulaison | *Conservation Commission Chair*

Robert O'Brien | *Planning and Development Director*

Paul Rupp | *Development Consultant*

Frank Stringi | *Chief Planner, Site Plan Review Committee Chair*

Michael Tucker | *Zoning Board of Appeals Chairman*

RIVERFRONT DISTRICT CONSULTANTS

David Bois | *Arrowstreet – Architecture & Master Planners*

Amy Korté | *Arrowstreet – Architecture & Master Planners*

Sean Sanger | *Copley Wolff Design Group – Landscape Architect*

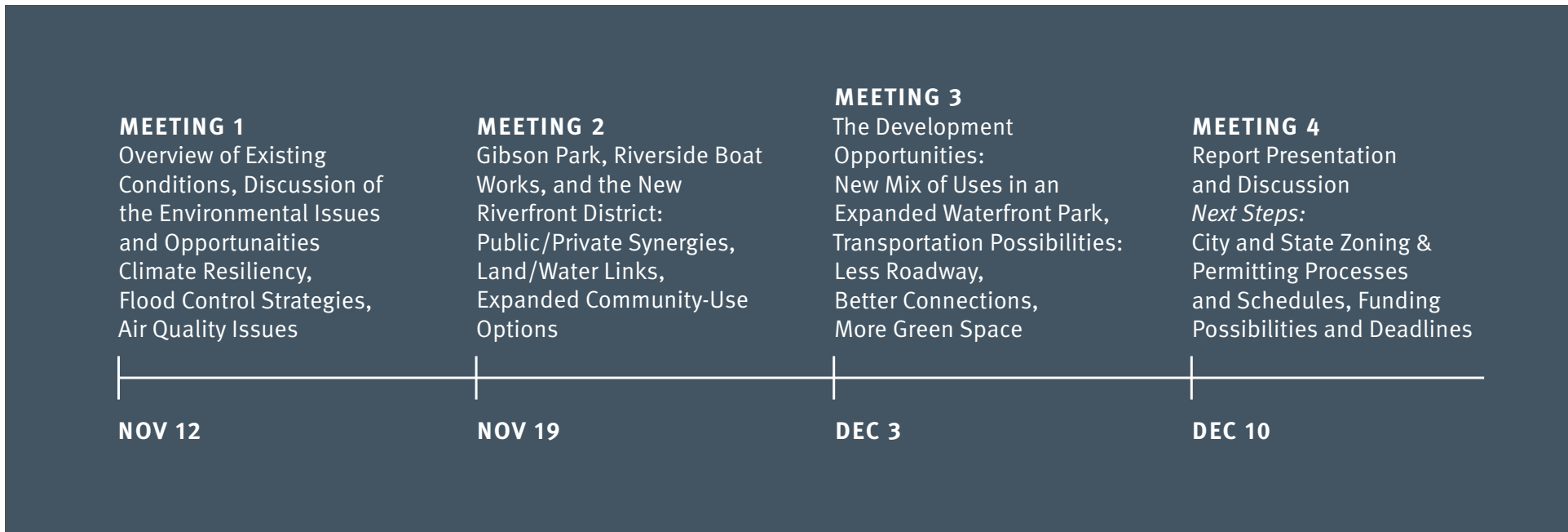
John McAllister | *Lloyd's Register Engineering*

Jay Borkland | *Lloyd's Register Engineering*

STAKEHOLDERS

Will Goldenheim | *North Shore Maritime Center*

Damian Szary | *Redgate*



Also involved on the team was Sean Sanger of Copley-Wolff Design Group, landscape architects with expertise and experience on waterfront and parkland projects in the Boston area and beyond, as well as John McAllister and Jay Borkland of Lloyd’s Register North America, Inc. They came with comparable expertise and experience on a variety of climate-change and other environmental engineering projects throughout the east coast, most recently involving revitalization of the nearby Saugus River waterfront.

After the Mayor convened an initial introductory meeting of the DAG and the consultant team, there followed five, 2-hour virtual DAG meetings that were open to the public and recorded and broadcast on Revere TV. Each of the initial four of these positive and productive meetings focused on specific aspects of the planning process. These included a review of existing conditions; a discussion of open space issues and opportunities at Gibson Park, Riverside Boat Works and the surrounding waterfront, with specific attention to persistent flooding problems in the Riverside neighborhood; a consideration of our

transportation options in the context development plans for both Gibson Park, the G/J site and potentially the adjacent former Mirage property; and finally an overview of preliminary findings and conclusions regarding the transformative potential of the district as a whole, as well as the planning, permitting and funding steps required to implement that comprehensive district vision. Following the preparation by the consultant team of a draft master plan, based on the extensive community input and feedback through the first five sessions, the DAG met for a sixth time to critique and endorse the final RiverFront Master Plan that is now before you.

II. EXISTING CONDITIONS





Existing Conditions

The Revere RiverFront District area of study encompasses 19.4 Acres and is made up of a mix of private and public properties. The parcels included in the district are unique but have one key characteristic in common—direct adjacency to the Pines and Saugus Rivers with undefined or limited public access to the waterfront. The City of Revere has identified an opportunity to re-imagine how this natural resource could benefit the community as a whole.

The largest single parcel in the district is comprised of Gibson Park. This 6.22-acre parcel includes a mix of active uses, is well maintained and has some significant programming. Currently the park acts as the home of the Revere HS tennis and golf team, providing practice facilities and a location for home tennis events. Despite this, the park is still underutilized. Currently the park suffers from poor accessibility, with all traffic required to be routed from 1A through the adjacent Riverside neighborhood. With its remote location, limited visibility and signage, and the entrance through a series of

neighborhood streets, the park feels less like a community resource and has less use than other Revere Parks. In addition to access issues, much of the park is susceptible to flooding, rendering it unusable, or at least unpredictable, for scheduled use by community groups and youth sports. Finally, there is approximately 700 ft of Pines River frontage, with excellent views of the marsh and City of Boston. However, currently, the only access to the waterfront is through ad hoc paths, which impact the natural vegetation and are not connected to any accessible pathways.

Boat Works Site

At the south end of the district and directly between the Riverside neighborhood and Gibson Park is the vacant Riverside Boat Works. Currently, this building is abandoned and the site is mostly vacant gravel parking area. The site also has waterfront access, previously utilized for docking and launching of boats associated with the Boat Works.

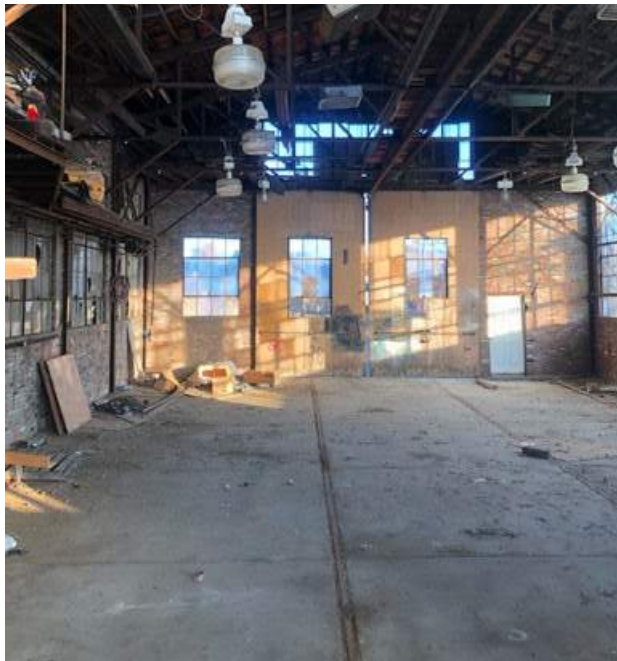
Given its former use, the site elevations are very low and frequently result in the first area to flood during higher tide events. As mentioned, the buildings are currently abandoned and suffer from lack of maintenance and vandalism. Current conditions, at best result in an eyesore within the neighborhood, at worst potentially dangerous conditions as the building and structure continue to deteriorate. This vacant property currently acts as the gateway and first impression of Gibson Park for traffic through the Riverside neighborhood.

MassDOT Corridor

Directly to the east of Gibson Park is Route 1A. As MassDOT land, much of this corridor is dedicated to the roadway and roadway maintenance/safety. However, this section of 1A is undergoing significant study and potential future improvements including the replacement for the General Edwards (GE) Bridge—which includes raising the elevation and eliminating the draw bridge required for boat traffic. Changes to the GE Bridge will require changes



ABOVE Existing Boatworks Structure
LEFT Interior of boatworks
BELOW Existing Boatworks Pier



to the ramp interchanges (north and southbound) and other street access points to meet new roadway grades. Currently 1A ramps are large sweeping off ramps with significant infield areas. These ramps directly abut Gibson Park, but provide no access and even limit safe pedestrian and bike access from the Point of Pines neighborhood.

G&J Towing Site

The second largest parcel in the district is a private site, currently occupied by a tow/salvage yard by G/J Towing and is referred to as The G/J site. With high visibility from Route 1A southbound and 2,200 LF of waterfront, the site has the potential to act as a gateway to Revere from this major vehicular route from the north. However, this site has the appearance of a scrap yard and years of neglect have resulted in a host of environmental issues at the shoreline.

Private uses abut directly to the coastal edge, with various conditions at the shoreline, including pavement, scattered granite sea wall blocks, vertical wood sheathing, failing concrete and wood decking. A large 1 ½ story metal building occupies most of the site—with the remainder as parking (both paved and gravel). With no public access to the water along the extent of the site.

As stated, the recent sale and potential redevelopment of the G/J site has provided a catalyst for the study of the area as a district



ABOVE IMAGES Existing Conditions. Photos of G&J Towing Site.



and, this redevelopment, is expected to contribute to the public realm improvements.

Existing Pier

As part of the G/J site, an existing pier extends from the northern end of the site to approximately mid-way across the river towards Lynn. This existing pier is also in a state of disrepair. Due to the inaccessible nature of the pier and the scope of this study, extensive evaluation of pier conditions was not performed. It is clear however that extensive repair/renovation will be required for potential reuse of this asset.

Mirage Site

Adjacent to the G/J site is another smaller site housing the former Mirage Club, now an adult daycare center and other related small businesses. This waterfront site is almost entirely within assumed Chapter 91 jurisdiction, though there have been various active uses on the site since 1932. It should be noted that, unlike the G/J site, the owners of the Mirage site were not active participants in the RiverFront Master Plan process, and access to the site and associated documents was limited.

In the entirety of the 19.4 acre district, only about 38% of the shoreline is currently able to be accessible to the public, with no accessibility to people with disabilities. Approximately 100% of the site is susceptible to flooding or in danger of future flooding issues as the impacts of climate change continue.



TOP Existing Pier
BOTTOM Mirage Site



III. ENVIRONMENTAL CONSIDERATIONS

Resiliency Approach

The world is changing. The frequency and severity of storms are increasing with time and the oceans are responding to climate change with rising tides and higher water levels that now flood an increasing cross section of the coastal lowlands as part of the daily tidal cycle. The City of Revere, as a coastal community with a large cross-section of low-lying landscape adjacent to the ocean and a City with one of the longest coastlines in the Commonwealth, is on the front line. Higher tides and coastal damage as a result of increasing storm and severe weather is disproportionately affecting the City, and the trends indicate the situation will continue to have increasing impacts with flooding, erosion, wave and water damage, storm surge, and waterfront degradation.

Today the City is incorporating resiliency preparation into all of its planning and development efforts. For this district specifically, the focus is on adapting strategies and interventions in the park, boatyard, and private development area that can positively impact the overall Riverside area. These efforts will make forward progress toward ameliorating the effects of the encroaching ocean from storms, sea level rise impacts, and storm surge to the extent possible given the geographic constraints.



ABOVE Flooding at Mills Avenue and River Avenue



ABOVE FEMA Flood Map

Climate adaptation, once the realm of occasional interventions that typically took the form of monolithic hard-scape coastal structures—walls that cut off communities from the environment and split neighborhoods into unconnected segments, has morphed over time into strategies that stress working with nature and building with the environment. Today the approach to resiliency is to create robust systems that leverage the natural landscapes ability to absorb extreme events, playing to the strength and flexibility of the environment and resulting in more durable outcomes through designs that work with nature.

The modern approach to coastal resilience engenders a spirit of cooperation with the natural landscape—sculpting the land to take advantage of the attributes of natural systems that control water flow and surge and creating an aesthetic landscape that is both pleasant to the communities they serve as well as provide protection from the storm and from the encroachment of water along the coastline due to climate-driven sea level changes.

The road to the modern resiliency approach incorporates the full range of human historical experience, from early reactions to environmental events that involved retreating from the problem areas, to the concept of let-it-happen-and-rebuild-

with-same-after, to wall off the problem, to the modern approach that involves engineered solutions coupled with the strategy of working with nature. Nationally, the approach to resilience has evolved in part because of several extreme events. Hurricane Katrina in the Gulf and Superstorm Sandy along the mid- to north-Atlantic coast were extremely impactful and devastating to the communities affected. These events represent a wake-up call to coastal communities, and they changed the dialogue around coastal planning and development approaches.

One outcome from these relatively recent extreme events was a movement to adjust the overall approach to resilience from a reactive to a proactive approach to coastal protection. A concrete outcome of that resilience shift was the development of a community approach to resilience that is now embedded in planning efforts across the range of coastal environments. An example of this approach is the coastal resilience strategy known as Rebuild by Design, which started as design competition for rebuilding the New Jersey, New York, and Connecticut coastal communities after the devastating effects of Superstorm Sandy, and grew to create a new approach to thinking about resilient engineering that incorporates community needs across the board (<http://www.rebuildbydesign.org/>).

The central tenet that comes out of the Rebuild by Design strategy is the concept of building for the norm as well as the storm. This approach engenders the concept of creating resilient interventions that protect coastal communities when there is a storm or event, while at the same time improving the utility and attractiveness of the landscape to encourage and improve community use on a daily basis when there is not a storm. The thinking around resilience shifted to working with the natural environment to create healthier, more useful, and protective interventions. A broad range of engineered solutions were developed to support resiliency efforts for all coastal situations—from urban to natural greenfield, and suburban to degraded brown field. Many interventions were patterned after the innovative approaches taken in the Netherlands, a country that exists with nearly its entire landscape below sea level.

The range of interventions and strategies that resulted from the Rebuild by Design competition, which called on the global community of coastal resiliency designers to bring forth advanced concepts to the combat the coastal degradation issue, created a toolbox of concepts and designs that can be applied to a broad range of scenarios.

Interventions range from concepts that are applied to the direct interface between the upland and the ocean and bay to reduce the impacts of storm surge and wave action, to concepts that create stormwater storage or conveyance that reduce the compounding effects of flooding from heavy rain events where upland water overwhelms the traditional stormwater systems of traditional engineered solutions. Examples include:

- **LIVING SHORELINES AND LIVING REEFS** – developing resilience along the interface between the land and the water through the building of marsh, reef, and dune structures out of natural plant, sediment, and soil materials.
- **SCULPTING THE LANDSCAPE** – developing berms and high and low areas that act as a system to keep water out, direct water to safe holding structures, and to creating natural wetlands and coastal marsh to store water and reduce erosional action.
- **RAIN GARDENS AND BIOSWALES** – creating natural low areas that direct water away from vulnerable areas to storage areas or discharge back to the ocean or bay.



ABOVE Mill River Before Storm



ABOVE Mill River After Storm



- **BLUE-GREEN WATER PARKS** – which act as water storage systems during high water times, and are open green space which can be used by the community when the water levels recede.
- **SLOW STREAMS** – slowing down contributing water to allow for infiltration and to draw out the build-up effect during high water influx periods.

- **SUBSURFACE STORAGE** – providing a place for floodwater to go in the subsurface (under parkland or structures) that allows water to be moved from flood areas where it can do damage to underground storage galleries that then allow for infiltration or discharge to the ocean of the collected water as the extreme events recede.
- **SURFACE AND SUBSURFACE CONVEYANCE** – Piping, trench drains, pump conveyance and directional galleries that move water from areas where it can build up and flood to areas where storage and discharge can be achieved.

A number of the modern interventions and strategies from the Rebuild by Design play book were incorporated into the design of the resilience approach to the park, boatyard, and development. The specific design elements associated with these strategies are included in the design basis and the design elements included in the design sections described herein.

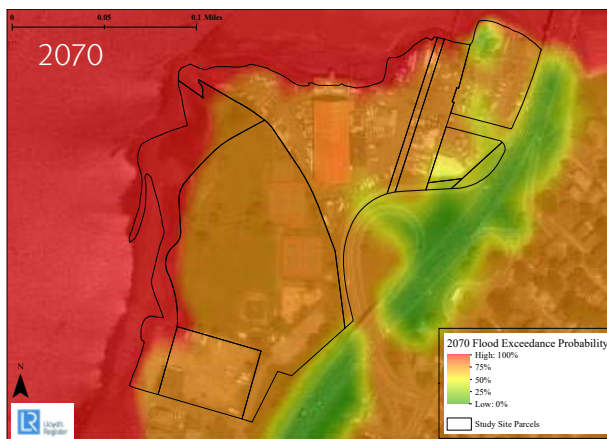
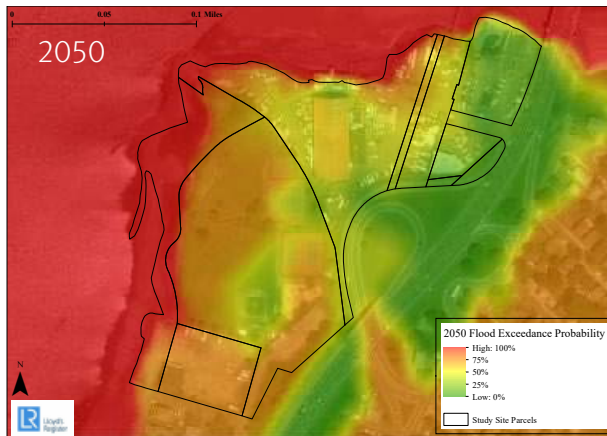
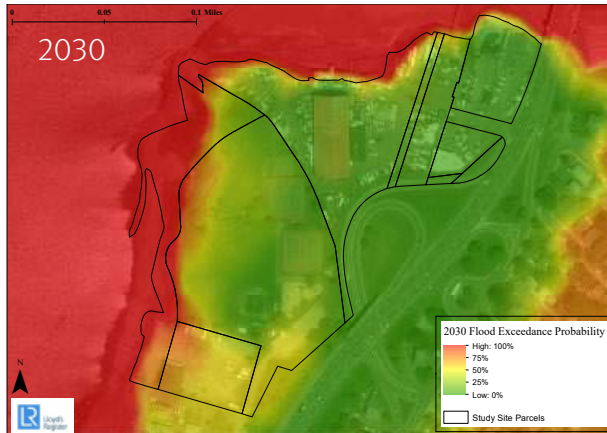
Methodology

The process of determining the appropriate interventions and strategy for resilience for the park, boatyard, and development included the following steps: assess historic conditions; assess current conditions; obtain measurements of the landscape; review the results of predictive models to provide context for future conditions; identify intervention types that would have the highest likelihood of success; identify the location, size, and layout of interventions that would have the highest chance of creating resilience and reducing storm impacts and impacts from daily tidal cycles; and integrate those designs into the overall use, landscape, and aesthetic designs being developed as part of the master plan for the area.

The master planning process included significant stakeholder forums where input from the community was incorporated into the planning process, and the resiliency design team learned an extensive amount from first-hand accounts, descriptions of issues, and desires and ideas from the community and incorporated these ideas into the overall resiliency design elements.

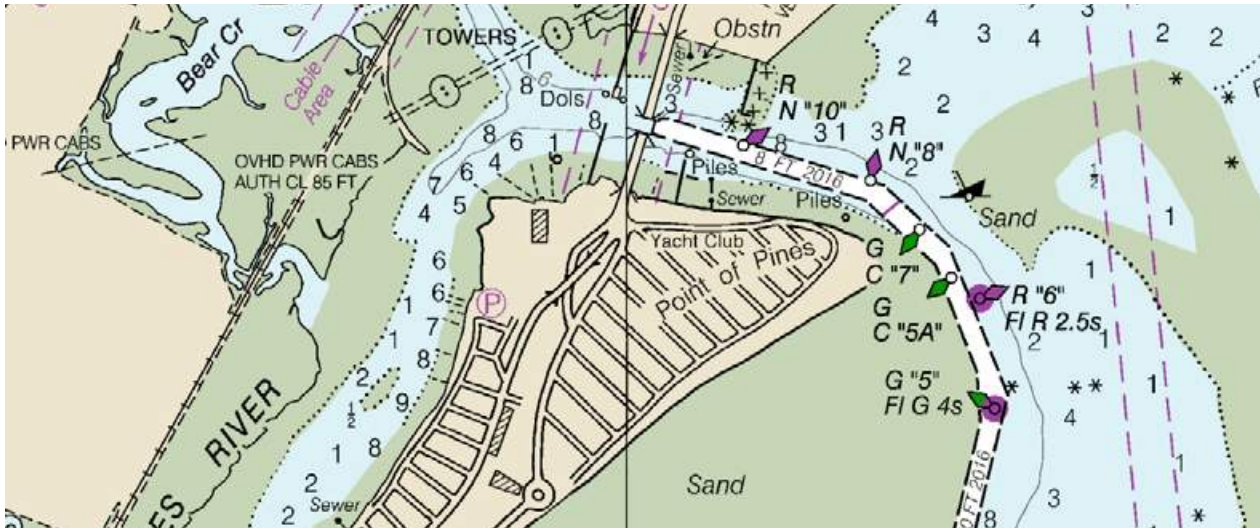


ABOVE Example of Subsurface detention



- Historic conditions – maps and accounts of flooding over the past 20 years were identified and reviewed and formed a baseline for condition projections.
- Current conditions – measurements of the landscape were obtained and a base map of existing conditions was created on which overlays of interventions and strategy concepts could be made.
- Predictive models – showing likelihood and severity of flooding and storm damage from storm scenarios that ranged from minor to severe were reviewed. A storm condition that was considered reasonable for future conditions was selected as the design storm condition.
- Potential intervention types were identified which would have the highest likelihood of success, including the identification of the location, size, and layout of interventions that would have the highest chance of creating resilience and reducing storm impacts and impacts from daily tidal cycles.
- Integration of those high-likelihood of success designs into the overall use, landscape, and aesthetic designs being developed as part of the master plan for the area was undertaken.

LEFT IMAGES From Massachusetts Coastal Flood Risk Model



Baseline Environmental Conditions

The RiverFront Master Plan study area sits relatively low with respect to topography, with site grades around elevation 6.5 (NAVD 88) in the parking area of the boat works up to around elevation 10 on the baseball infield at Gibson Park and at the G/J property. The highest elevations in the study area are associated with North Shore Road, Route 1A, in particular with the overpass that allows for access to the Point of Pines neighborhood from the southbound lanes of North Shore Road.

The topography within the study area is relatively flat, with grades decreasing along a gentle slope from the east to the west and north west. The steepest parts are the embankment along North Shore Road, and then where the upland meets the tidal area of the Pines and Saugus River.

With respect to groundwater in the area – the USACE reports, from a regional flood study, that groundwater levels are generally between mean high tide and mean low tide. This is confirmed from boring data provided from the G/J facility performed relatively recently by McPhail Associates. Soils are generally mapped (by the USDA’s NRCS) as Udorthents, wet substratum, described as “Excavated and filled sandy and gravelly human transported material over highly-decomposed herbaceous organic material.” The boring data from the G/J facility shows that the surface is underlain by fill material in depths of 6 to 10 feet below the surface. There was some peat material noted in one of the borings, and underlying the peat and fill material were marine sand deposits.

floodplain are ball field and North Shore road. The Massachusetts Department of Coastal Zone Management (CZM) maps almost the entire area (except the exceptions noted in the FEMA maps) as being impacted by a category 1 hurricane. The study area has such a well-known reputation for flooding issues that it was identified as the first area to be studied by the Boston Region Metropolitan Planning Organization (MPO) as a pilot study for resiliency measures along sections of Route 1A in Revere. The draft report describes the study area as *“natural low-lying area and close to the flood pathways of the Pines River estuary to the north and the Chelsea Creek estuary to the south. The corridor is highly vulnerable to flooding resulting from high tides, coastal storm surge, and rain storms, and to inundation from sea level rise. These hazards are expected to worsen in the future.”*¹

As part of their evaluation, the MPO study looked at the Massachusetts Coastal Flood Risk Model’s flood risk probabilities and depth of flooding for four scenarios—present day, 2030, 2050, and 2070.

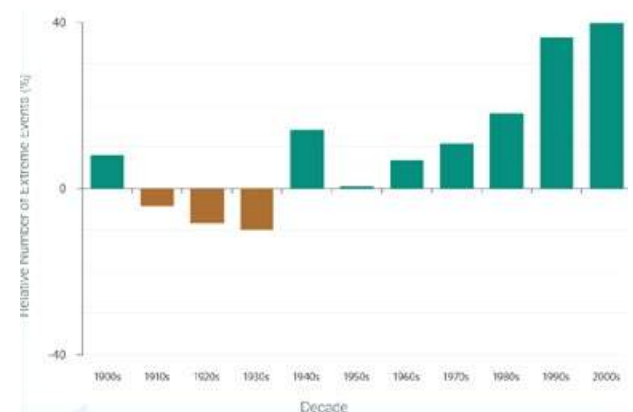
The images were provided to the Master Plan consultant team for use and they show in the RiverFront Master Plan study area, particularly around the water’s edge and the Boat Works site, vulnerable to flooding based on different combinations of estimates for sea level rise, heights of storm surge and tides, and wave action.

As part of the National Climate Assessment² from the US Global Change Research Program, there are several trends that are going to continue to influence conditions in the RiverFront Master Plan study area, most notably with respect to sea level rise and increased heavy precipitation. These conditions are going to exacerbate and already significant flooding problem in the area. According to the assessment, sea levels will rise between 1 and 4 feet by the year 2100. A more localized study performed by the Commonwealth of MA in 2013³ shows scenarios that vary from 0.7 feet (a linear interpretation of historical data, and least likely) to 6.6 feet (derived from ocean warming and maximum ice sheet loss). Under these sea level rise scenarios, the RiverFront Master Plan area will be significantly affected and potentially flooded twice per day with the tide cycles.

In addition to sea level rise, the national climate assessment also noted that heavy rainfall events are become more frequent and more intense. Since 1991 there has been a greater than 30% increase in heavy rain events when compared to the period from 1901 to 1960. And the average annual precipitation has increased over 8% in that same time period. So more intense and more frequent storm events occurring in an area already subject to flooding means more flooding interventions will be needed to address these changes.



ABOVE Hurricane Surge



ABOVE Observed U.S. Trend in Heavy Precipitation

¹ December 1989 Flood Damage Reduction Report, Saugus River and Tributaries

² <https://nca2014.globalchange.gov/>

³ Sea Level Rise, Understanding and Applying Trends and Future Scenarios for Analysis and Planning, MA Coastal Zone Management



Public Storm Water Infrastructure

There are five separate tributary drainage areas in the study area west of North Shore road, plus the tributary drainage associated with North Shore Road and the cloverleaf off-ramp, which appears to drain into itself. For the Master Plan purposes, the consulting team looked only at the tributary drainage area west of North Shore Road and their supporting infrastructure. It is important to note that there is only stormwater conveyance infrastructure in the study area, and there does not exist any capacity to store/detain/retain stormwater.



The Thayer Avenue drainage area is approximately 270,000 sf (or 6.2 acres) and includes roadways, the North Shore road embankment, the southern half of the Boat Works property and the residential area from the southern part of John Avenue to the north including those parts of Hayes Ave, Mills Ave, River Ave and Thayer Ave. Stormwater management within the Riverside neighborhood is achieved through a catch basin and pipe outfall system. The closest outfalls to the study area exist on Mills Avenue just north of River Avenue and at the intersection of Mill Avenue and John Avenue. The City performed upgrades to this system in 2015, including adding in-line check valves on the outfalls to prevent tidal incursion of the Pines River into the stormwater management system. As a result, the drainage system outfalls are tidally influenced

and cannot discharge at higher ends of the tidal cycle.

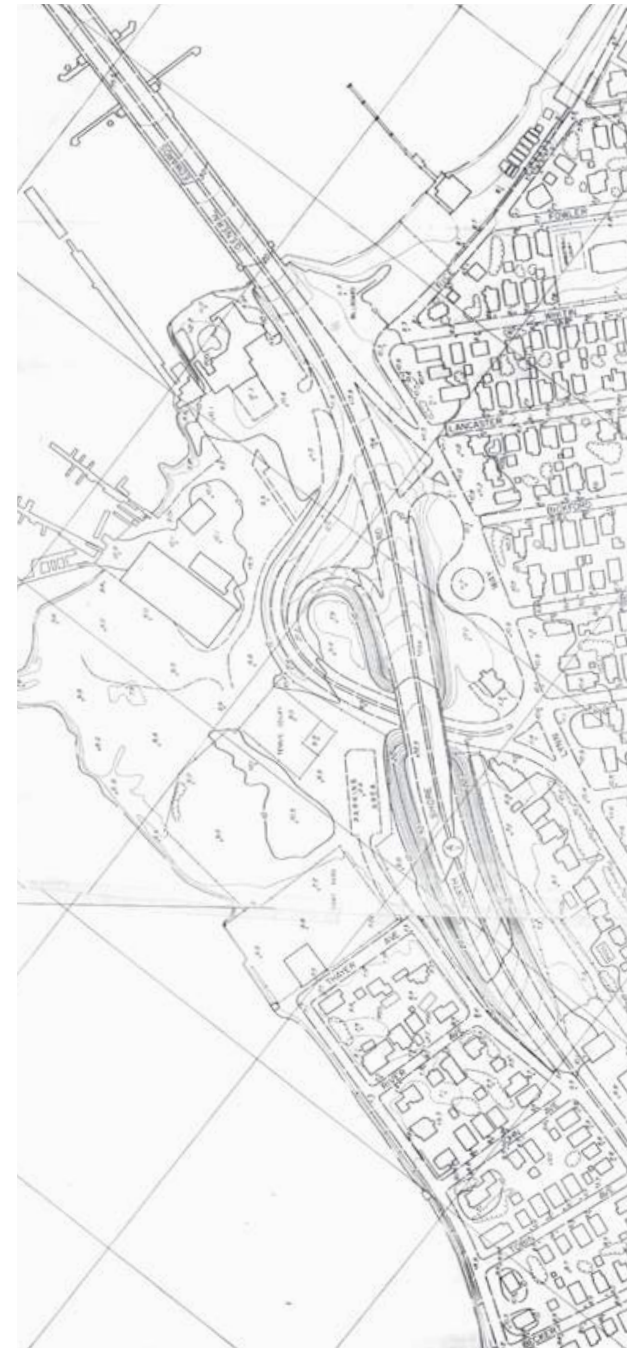
The Gibson Park drainage area is approximately 350,000 sf (or 8.1 acres) and includes some roadway and parking areas, the northern part of the Boat Works property and all of Gibson Park. Gibson Park contains a couple of catch basins and a pipe network to an outfall along the south western portion of the park. The outfall pipe appeared to be damaged at the time of the study.

North of Gibson Park, there is no stormwater management infrastructure on site at the G/J property or near the Mirage site. Stormwater flows overland in those areas towards the north and northwest into the Saugus River. The western portion of the G/J property has a drainage area of 110,000 sf (2.5 acres) and flows to the north and northwest without any structural stormwater controls. The northern portion of the G/J property, including the Commonwealth electrical property and the western portion of the Mirage property, have a tributary area of 180,000 sf (4.2 acres) and flow to the north without any structural controls. The eastern part of the Mirage site has a tributary area of 30,000 sf (0.7 acres)

and flows overland to the north. It is important to note that while there are no stormwater controls in this area, the ground cover is either impervious pavement or dense packaged gravel, both conditions which are prone to increased runoff volumes.

For the Point of Pines neighborhood, there is also a similar network of catch basin and pipe network. There exists a drain pump station on Rice Ave that includes a 24" diameter pipe for discharge into the river. As part of our efforts the Master Plan team did not look into stormwater issues within the Point of Pines neighborhood as they were not highlighted as an issue and North Shore Road acts as a natural break in the watershed separating the flow from the different neighborhoods.

There is also a sewer pump station in the Point of Pines neighborhood. It appears that improvements to this pump station will be required to accommodate new flow from new developments in the area. While the consultant team did not look into it as part of the Master Plan process, we understand that upgrades to the sewer pump station will be required to support an increased flow to the pump station.



Water Access and Infrastructure

The RiverFront Master Plan study area is surrounded by water to the west and north with the Pines and Saugus Rivers. Access to the waterside, however is controlled and limited in the existing condition. The Point of Pines Yacht Club is the only water-oriented parcel in the area, and is a private facility, but does have a boat launch and docks for vessels.

The former Riverside Boat Works site, along the Pines River, did have good water access previously, serving as a boatyard with a marine railway and seawall and timber bulkhead wall that is currently in disrepair. Due to the lack of upkeep on the site, there really isn't any safe and reliable water access to the watersheet.

Along the western edge of Gibson Park there is a mixture of tidal salt marsh, riverbank, and coastal beach area. There is a significant amount of phragmites (aka common reed), an invasive species that is not very hospitable to salt marsh birds and other salt marsh animals. While there is no formal path to the water's edge along Gibson Park, there are a few well-worn informal paths that people have taken down to the water's edge.

The watersheet along the G/J property and up to the Mirage site starts as a continuation of the

salt marsh and riverbank from Gibson Park. Along the northern edge of the properties there is some rip rap stabilizing the bank, along with a vertical sheet pile wall, and some riverbank areas that have asphalt pavement right up to the edge of the bank. There is a section of salt marsh around the northeastern limit of the G/J property, which is actually part of a section of land owned by National Grid.

To the east of the National Grid land, along a narrow strip of property referred to as Parcel 2, exists a pier that remains from a former railroad alignment. The pier is not actively used or maintained and its structural integrity should be evaluated for its potential for re-use or redevelopment.

Some issues facing potential water uses are the water depths along both the Pines and Saugus Rivers. Both areas are subject to significant accretion of sand in the area, reducing water depths which makes it difficult to launch vessels and get to the water, particularly at low tide. The Point of Pines Yacht Club conducts periodic maintenance dredging to maintain the necessary water depths for their activities. A 1989 Environmental Notification Form that was filed for a North Shore Boat Works project that never came to development called for 7,900 cy of sediment to be dredged and disposed in the

open ocean. They needed the dredge to support depths for the marina and boat works activities. As it currently stands, any proposed dredging would require new sediment sampling and analysis, and given the historical industrial uses that are tributary to the Pines River, it is unlikely that the sediments would still qualify for open ocean disposal and would likely need to find another disposal option. That can't be known for sure until the sampling and testing is completed.



ABOVE Saugus River

Other Environmental Considerations

In addition to the environmental factors discussed above, there are latent environmental conditions that would need to be investigated and factored into a redevelopment plans. These latent environmental conditions include on-site and subsurface soils, groundwater, and building and other materials that exist on-site.

The G/J property has had many vehicles left on it and vessels were left at the Riverside Boat Works. Both of these situations risk the potential for leaching contaminants, such as heavy metals, volatile organic compounds, and petroleum hydrocarbons into the soils and/or groundwater and would need to be investigated and possibly re-mediated. It is important to note that these investigations, often referred to as an Environmental Site Assessment, are a routine and common practice used in the redevelopment of a property. The typical process involves performing historical research and a site visit to see if there is the potential for a recognized environmental condition that would warrant further investigation. If there is a recognized environmental condition then an environmental investigation program would be laid out which may involve drilling, soil and/or groundwater sampling, and potentially hazardous material sampling. Then pending the results of that investigation, if necessary, a remediation and/or abatement



ABOVE MassDEP Bureau of Waste Site Cleanup
LEFT Waste and car and boat parts on shoreline



program can be laid out to minimize risk for the redevelopment scenario.

External environmental factors, such as the Wheelabrator facility across the Pines River, can have detrimental air quality effects to the RiverFront Master Plan Study area. The fly ash landfill, which was approved for an expansion of an estimated 400,000 cy in April 2018⁴ poses an environmental risk to the natural resources in the area surrounding the Rumney Marsh. It appears by the MA DEP decision that the proposed environmental and engineering controls associated with that expansion are capable of protecting the surrounding resource areas.

As part of the Clean Water Act, states are required to develop and update biennially a list of waters that are impaired, commonly referred to as the 303(d) list. From the Massachusetts 303(d) list, a Total Maximum Daily Load (TMDL) exists

for the Pines River and Saugus River for an impairment from fecal coliform (TMDL No. 50122). The TMDL sets a target limit for fecal coliform entering into the waterbodies from the entire watershed. Therefore, any redevelopment in the RiverFront Master Plan study area would need to ensure they don't contribute potential additional fecal coliform to the waterbodies. This can be done by proper sewerage and control of waste and waste products in the area.

The Natural Heritage and Endangered Species program run by the Commonwealth has mapped the northeastern portions of the study area as habitat for the Common Tern. Common Terns typically look for sandy or gravelly areas or salt marshes with low vegetative ground cover for nesting. Redevelopment with the mapped nesting areas would need to be cognizant not to create a detrimental effect on the Common Tern habitat.



ABOVE NHESP Protected Habitat Area

⁴ MA DEP FMF#39704, BWP SW11 / Landfills- Major Modification Transmittal N. X271439



Permitting Considerations

The richness of the area’s natural resources also means that steps need to be taken to ensure that the natural resources are protected and that any development is performed in a responsible manner. There are several governing regulations that would apply and would need to be considered as a redevelopment program is developed.

Some of the natural resources in the area include the Rumney Marsh Area of Critical Environmental Concern (ACEC), as well as the Saugus and Pine Rivers. The Rumney Marsh ACEC contains over 1000 acres of saltmarsh, tidal flats, and shallow sub tidal channels and has been classified as a “biologically significant estuary” by the US Fish and Wildlife service. Because of the significant natural resource value associated with the Marsh, the Commonwealth set it aside as a designated ACEC in August 1988, to protect the resources it contains. Thus, any development regime will need to be cognizant of these resources and work to complement the protections set forth in the ACEC.

The other resources in the study area are the Saugus and Pines Rivers, both tidal rivers, and who fall under the protection of the Massachusetts Wetland Protection Act, the Rivers Act, and the Public Waterfront Act, commonly referred to as the Chapter 91 program. This program is the oldest of its kind in the nation, formally established in 1866,

and is intended to protect and promoted the public use of tidelands and other waterways for the general public. The program is tasked with ensuring the development within current and historical tidelands is done protecting and preserving public rights and workplace rights over the waterfront areas.

Another notable permitting and review program is the local Site Plan Review performed by the City of Revere through a combined effort of several municipal departments. The purpose of the Site Plan review process is to ensure responsible development within the City that conforms to accepted standards and regulations, is congruous with the surrounding neighborhoods and environments, and can be supported by existing resources and infrastructure in an area.

The text above highlights some of the most notable regulations that would affect development in the study area, however, in order to bring a project through design to implementation, there will be a series of municipal, state and federal permitting activities undertaken. The full extent of the permit requirements won’t be known until the design phase of the project is brought forth.

Resilient Redevelopment Strategies and Considerations

Once the design team was able to understand what the underlying conditions and issues facing the RiverFront area were, the next step in the process was to look at other strategies and interventions that have worked in other locations to analyze their applicability for the RiverFront area. There are resiliency strategies can be applied to different scenarios to address different concerns, and the consultant team highlighted three issues of noted concern to be addressed:

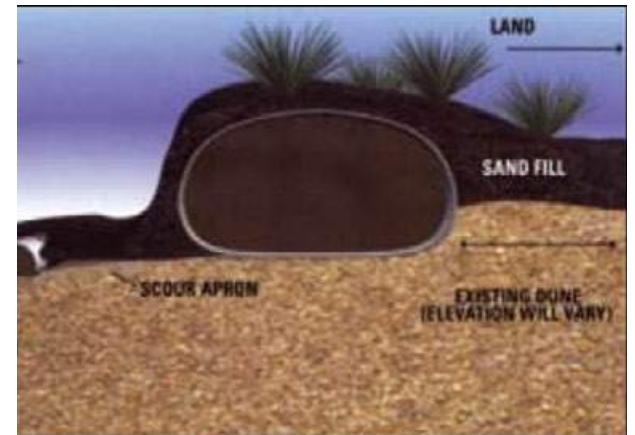
Storm Surge and Coastal Flooding

- 1. SEAWALLS** – Seawalls are coastal protection structures, typically vertical and designed to withstand anticipated wave forces and to a height to resist over topping from storm surge. They are a solid regional protection strategy or to provide targeted protection to a particular structure or area.
- 2. BREAKWATERS** – Breakwaters are near shore structures designed to reduce coastal erosion and diminish effects of wave action. Breakwaters can come in various shapes and materials, from solid core and rock lined structures to geo-bags filled with dredged sediment.

- 3. REVETMENT WALLS** – Similar to seawalls, except with a more sloping face as opposed to a vertical seawall. They are effective in absorbing and deflecting energy and protecting shorelines.

Shoreline Stabilization

- 1. LIVING AND/OR VEGETATED SHORELINES** – Natural shoreline protection systems that are typically used in low wave environments. They can include marsh sills toed in with coir logs and living reefs (for subtidal applications) that can be toed in with oyster shell bags or small stone-like structures.
- 2. SAND MATTRESSES** – Similar to the geo-bag approach, sand mattresses are typically geosynthetic structures filled with sand or dredged material and laid in targeted areas along a sloped coastal embankment.
- 3. CONCRETE MATTRESSES** – More of a harder shoreline stabilization measure, concrete mattresses are interwoven articulating concrete blocks that can be laid on an eroded coastal slope to provide protection, particularly in high energy wave environments.

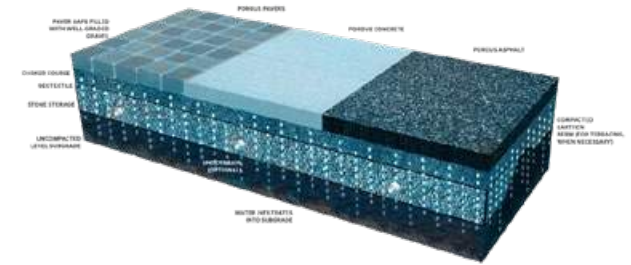


ABOVE Example of Terraced Flood Berm and Living Shoreline
BELOW TenCate Geotube system sand dune cross section

Rainfall Flooding

- 1. REDUCE TRIBUTARY AREAS** – Rainfall flooding often occurs when runoff generated from a tributary area collects at a discharge/low point where there is not sufficient capacity to handle that flow. By reducing or breaking up the area that contributes runoff to a discharge/low point, you thereby reduce the amount of runoff volume that collects there and therefore can reduce intensity of the flood event at that location. The difficulty with this approach is to find a safe new discharge location for the tributary area that you are removing that won't exacerbate flooding in another area.
- 2. DETENTION AND RETENTION** – Rainfall flooding often occurs when the intensity of rainfall event causes such runoff that it overwhelms the stormwater management network and causes backups which lead to localized flooding. Detention and retention strategies aim to provide temporary storage for the runoff to collect and then slowly discharge back along the normal intended flow course. Detention is typically holds the water very short term, 48-72 hours maximum, while retention strategies typically hold the water longer. These strategies provide a buffer and store the water so the conveyance network does not get overwhelmed and cause flooding. One of the biggest issues with these strategies is that they often require large areas and can be somewhat unsightly without some aesthetic aspects added to the design.

- 3. RE-GRADING AND ELEVATING AREAS** – Water flows along its lowest most accessible path. If there is the possibility to re-grade some areas to create a new flow path, runoff can be directed to a new area, hopefully away from sensitive areas or critical infrastructure. Another strategy is to raise the elevation of targeted areas/infrastructure to better protect them from flooding. This strategy needs to be done carefully and studied to not create flooding problems elsewhere. In coastal areas, this is less of a concern as the volume of water resulting from tidal flooding and small changes in elevation often displace a de-minimis amount of water, however in inland areas small changes can divert water to places it once didn't go, creating new flooding issues.
- 4. INFRASTRUCTURE UPDATES** – Targeted infrastructure improvements can make a significant impact after a drainage area has been studied and the underlying causes of flooding are better understood. Increasing the diameter of a conveyance pipe or adding in new catch basins or manholes in strategic locations can make a big impact in collecting and conveying water better where localized flooding might have existed. Other strategies can be implemented to help facilitate maintenance or prevent clogging issues, like trash racks, sedimentation structures, and pipe hoods. Any of these strategies need to be targeted to a specific problem that occurs the site, which can only be well understood after performing an engineering study of the area.



ABOVE Porous Pavement Applications



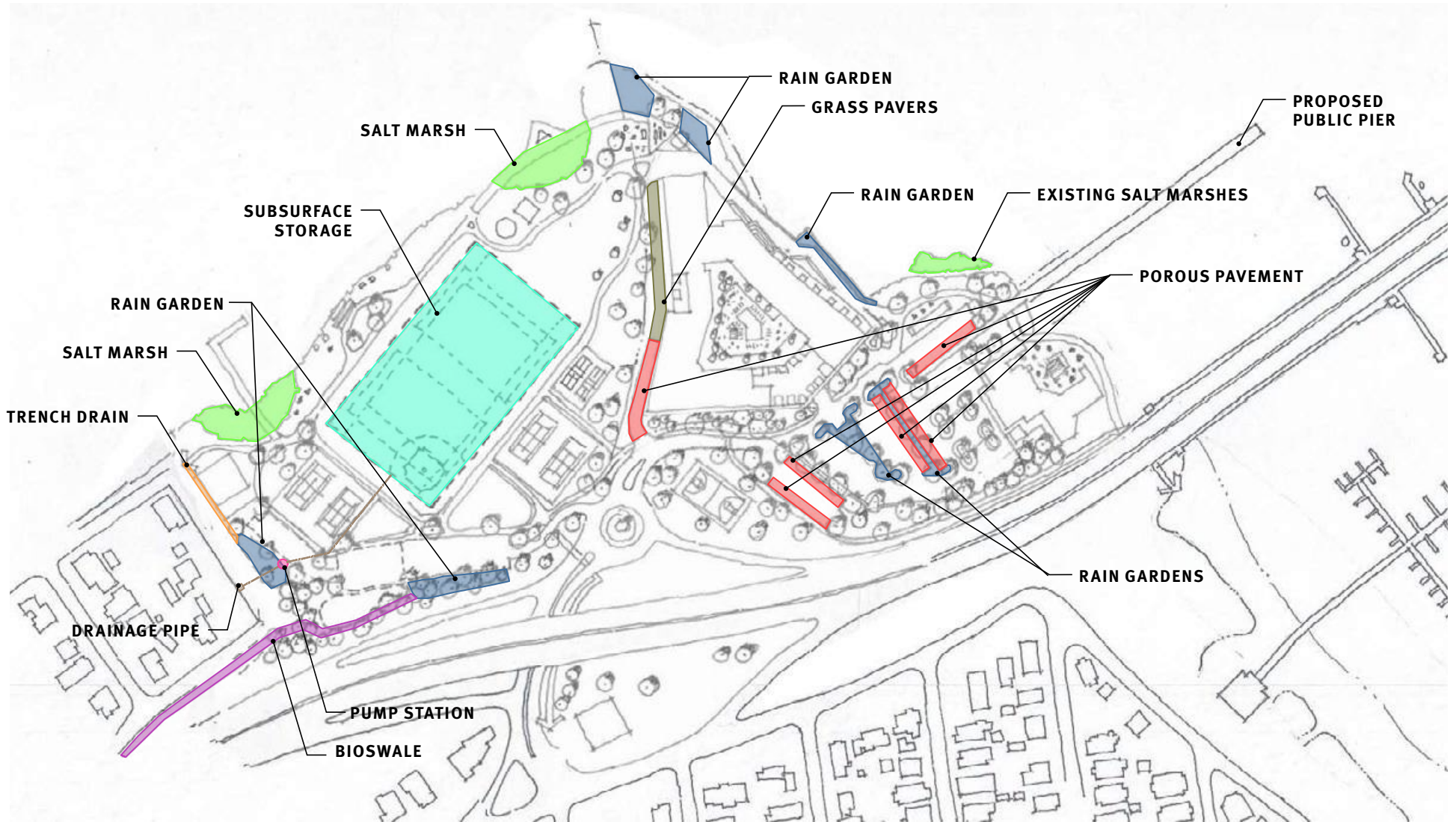
ABOVE Precedent rain garden



ABOVE Example of duckbill outfall

5. TIDAL OUTFALL STRUCTURES – Protection and mitigation strategies for tidal outfall structures can have a significant impact on upstream flooding. The primary use of tidal outfall structures are to keep water from a rising/high tide event from entering into and backing up an upland area, but they also serve to prevent the back-flow of debris and detritus from clogging up the upstream stormwater infrastructure.

There are several types of these structures, duckbills, flap gates, self-regulating tide gates and in-line check valves. Duckbills and in-line check valves are least vulnerable from getting clogged open by debris, however if an in-line check valve does become clogged it is typically much more intrusive to free up the valve. Flap gates are the most susceptible to issues and if debris gets stuck in the opening and keeps the flap open, it will thereby negate any benefits of the flap gate. Self-regulating tide gates have floats on the top and bottom and can be adjusted to provide site specific flow/flushing in estuarine environments where salt water flushing can be beneficial to habitat.





ABOVE Example of subsurface detention below an athletic field



ABOVE Existing Outfall

Proposed Resiliency & Flooding Interventions for the Master Plan Study Area

The location of the study area leaves it very vulnerable to natural forces such as storm surge, heavy rainfall events and tidally influenced flood events. While the MVP study is focusing on a wider, more large-scale strategy to make this portion of the City more resilient, there are several smaller scale strategies to increase the resiliency of the RiverFront area. In a light of a regional approach being developed and the desire not to negatively affect other parts of the City just to protect the RiverFront area, the Master Plan team have developed targeted interventions to reduce the impact of extreme events, ameliorate existing flooding conditions, and promote natural features best equipped to provide a resilient edge to the RiverFront area. These resiliency and flood improvements strategies are as follows:

Decreasing the Tributary Area to the Riverside Neighborhood

In order to allow southbound vehicles to access the Point of Pines neighborhood, North Shore Road is elevated to the east of Gibson Park and slopes down from their as it reaches into the Riverside neighborhood at John Avenue. South of the underpass, there is a large embankment that slopes down to meet the

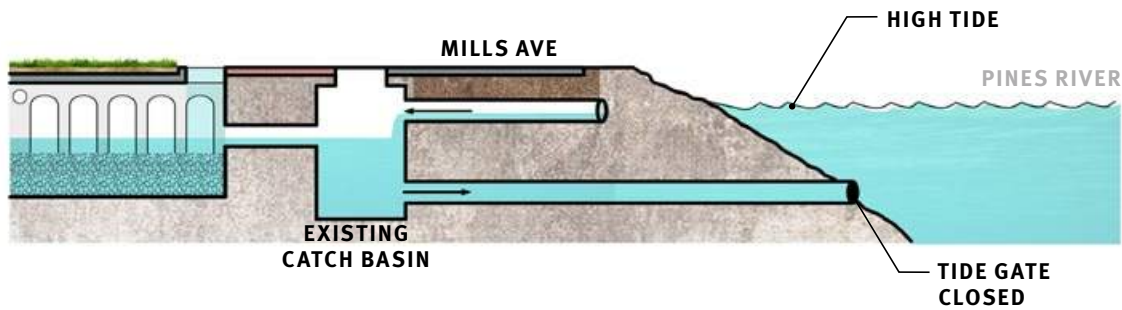
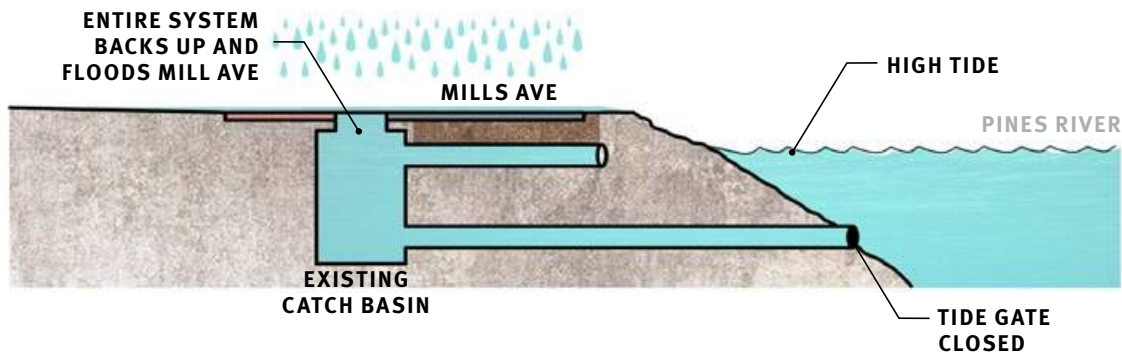
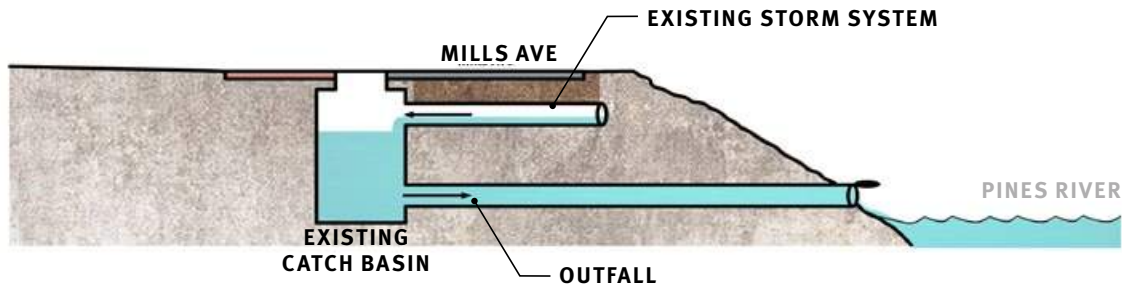
grades Hayes Avenue. While this embankment is vegetated and therefore doesn't contribute runoff like an impervious (paved) area would, it still represents approximately 14,000 sf of tributary drainage area to the Riverside neighborhood. One of the interventions proposed in this Master Plan is to remove that stormwater flow from the neighborhood's tributary area.

This can be accomplished through a bioswale along the base of the embankment that is sloped to direct flow to the north towards the new infrastructure that will be put in place around Gibson Park. A bioswale, aka a vegetated drainage swale, is a vegetated feature that gives a natural feel to stormwater management and provides some water quality treatment in addition to its conveyance capabilities. By removing this 14,000 sf of tributary area, the drainage tributary to this northern part of the Riverside neighborhood is reduced by 6 percent.

Tide Gates and Backflow Prevention

The outfalls in and around the study area are tidally influenced, meaning that at higher ends of the tide cycle that outfalls are submerged and therefore cannot discharge.

In 2015, the City upgraded some of the outfalls in the Riverside neighborhood with in-line check valves, to prevent the tide from rising back up through the stormwater system. During the public process, some of the neighborhood residents brought up issues with the performance of those



ABOVE Proposed Rain Storage Diagram

check valves that will need to be investigated. The outfalls pipe for the Gibson Park network appears to be partially crushed and with no tidal controls on it.

As part of the master plan strategy, all outfalls will need to have verified functional tidal/back-flow controls. The stormwater management systems are not designed for, nor do they have the capacity to handle tidal flows within the system. There are several options that can be implemented for tidal controls, including in line check valves, duck bill tide gates, self-regulating tide gates, and flapper valves, each with their own advantages and disadvantages.

Installing a pump station

The relatively low topographic profile of the study area, particularly in the southern part, creates a challenge to efficiently and effectively move stormwater away from inundated areas to new management structures. The Master Plan team are proposing to use the topography as it exists and install a stormwater pump chamber near some of the lowest elevation which is at the Boat Works site. Placing the pump chamber there avoids trying to create shallow sloped conveyance structures that would make maintenance difficulties and could have a higher possibility of issues or failure. A stormwater pump chamber already exists near Rice Avenue in the Point of Pines neighborhood.

⁵ Based on rough calculations using the USDA's Urban Hydrology for Small Watersheds (TR-55), an effective planning tool, however more detailed calculations would be need for full design.

Providing subsurface, off-line storage

One of the biggest issues facing the stormwater management strategy was what to do with the runoff during the higher ends of the tide cycle when the outfalls can't discharge. In order to address this issue, the Master Plan proposes to provide off-line subsurface storage underneath the multi-use fields that will detain and possibly infiltrate the runoff during the higher end of the tidal cycle and then continue to recharge in the groundwater as well as discharge into the Pines River as the tidal cycle enters its lower phase.

The subsurface storage would be placed on a bed of crushed stone (typically 6 inches) and then the chambers placed on top of the crushed stone bed. The chambers come in various sizes, shapes, and materials, from plastic to concrete. Under the 210 ft x 360 ft multi-purpose field, using an 18" storage profile, there could be the capacity to store up to 1.62 acre-feet of runoff, and with a 24" storage profile, could result in a storage capacity of 2.34 acre-feet of runoff. This subsurface storage system would be fed by the drainage tributary area of Gibson Park and the northern part of the Riverside neighborhood. The 18" storage volumes are of sufficient capacity to handle the runoff volume of 4 inch storm event⁵ from both of these tributary areas, and the 24" storage volume is of sufficient capacity to handle the runoff volume of a 10 year storm event, which is 4.6 inches. This represents a significant improvement in flood storage capacity where currently none exists in a consistently flood prone area.

Moving and Managing Stormwater Away from the Riverside Neighborhood

The subsurface storage system will provide a significant amount of flood storage capacity and relief to the northern part of the Riverside neighborhood, however the challenge remained how to get the water from the neighborhood to the storage area. The existing stormwater infrastructure in the neighborhood consists of a classic catch basin to pipe to manhole to outfall network, with outfalls at the intersection of Mills Avenue and John Avenue and to the north of the intersection of Mills Avenue and River Avenue. Both of these outfalls are tidally controlled, which means if a rainfall event is occurring while the outfalls are submerged during the higher end of the tidal cycle, the rainfall runoff collects in the catch basins and pipe network but has nowhere to discharge and therefore backs up in the system and eventually floods out into the street once the storage capacity of the pipes is exhausted.

Installing new infrastructure to redirect the runoff directly to the pump chamber (which pumps to the storage field) would be very costly and disruptive, requiring digging up most of the streets in the northern part of the neighborhood. Also, at the lower end of the tide cycle, the existing network is functional and does not need to be disturbed. Therefore, to provide relief only when flooding is a risk, the Master Plan team is proposing to provide a "relief valve" in the existing catch basin and pipe network. There is a catch basin along the southeastern end of Thayer Avenue that is



ABOVE Example of reinforced turf application

essentially the second in line of the catch basin and pipe network that collects runoff from the neighborhood and ultimately discharges at the extension of John Avenue at Mills Avenue. Tapping into this catch basin and installing a new pipe outlet above the invert of the existing outlet pipe and directing that new pipe to the stormwater pipe chamber will allow the system to back up but not to the roadway surface, and as the flow backs up, it discharges into the pipe chamber, which can then send it up to the subsurface storage area.

This solution minimizes disturbance to the neighborhood, with a trench saw-cut and excavated across Thayer Avenue, maintains the existing network, and provides a manner for the runoff to get to the subsurface storage area.

Reducing Impervious Areas and Promoting Pervious Materials

Another effective stormwater management strategy is to reduce the amount of runoff that is generated during stormwater events. Impervious areas, such as asphalt pavement and concrete, have very little capacity to store and retain water, and therefore generate the most amount of runoff. Reducing the amount of these impervious and hard packed gravel areas will reduce the volume and velocity of runoff generated from these surfaces.

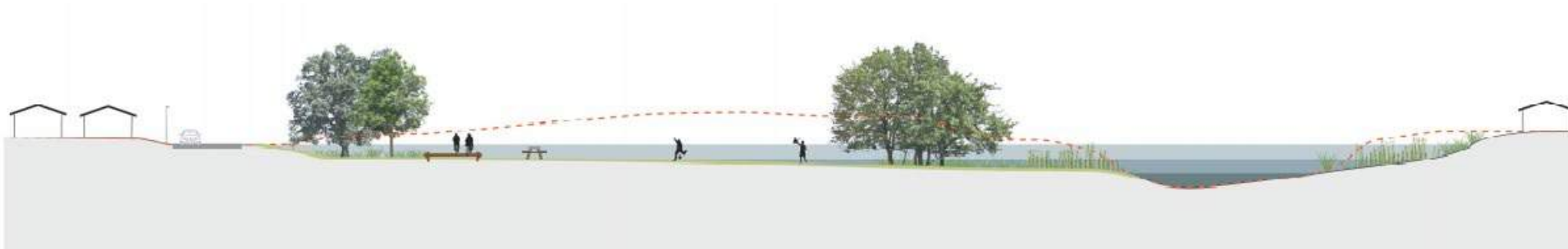
Some the strategies reflective of this around the development parcel include using grass paver or reinforced turf for fire lanes (which are not subject to regular traffic flow), creating more vegetated/ green space (particularly on a site that is mostly hard-packed gravel) and using porous pavement technology in some of the parking areas.

Porous pavement is a remarkable technology that has the structural capabilities of a classic asphalt pavement, however as its name implies the surface coarse is porous, and therefore permeable, and the substructure of the pavement is designed to provide both structural support but also stormwater storage capacity.

These paved areas change from creating runoff to capturing/storing and even infiltrating it, so they provide a net benefit for stormwater management without losing the functionality of the parking surface. There also exists the technology for permeable sports surfaces, such as Tennis courts, which could be explored and implemented for the Gibson Park improvements.



ABOVE Rain garden precedents



ABOVE RBD Interboro Team - Living with the Bay

Providing Water Quality Treatment to Storm Water Runoff

While most of the strategies and interventions discussed so far have dealt with flooding or stormwater volume issues, water quality issues associated with runoff also need to be considered and addressed. Runoff from impervious areas such as pavement can contain harmful nutrients, oils and sediments that can have a deleterious effect on the waterways from which they discharge. Water Quality treatment strategies can capture and control nutrient containing sediments in the runoff providing some treatment prior to discharge into the waterways. Some of the treatment strategies proposed as part of this Master Plan include the implementation of a bioswale along the bottom of the embankment from North Shore Road along Hayes Avenue and several raingardens strategically placed throughout the RiverFront study area.

Bioswales, or grassed channel biofilter swales, are treatment and conveyance best management practices that provide longer hydraulic residence time than drainage channels. The longer hydraulic residence time allows for sediment to settle out prior to discharge to the final treatment BMP (such as a raingarden).

Raingardens are a bioretention technique is a technique that uses soils, plants, and microbes to treat stormwater. These are typically shallow depressions (6-9”) to allow for some ponding that are filled with a specific soil media (sandy with some mulch and organic material), and mulched and planted. They are aesthetically pleasing, appearing as a planting bed, but function as the soil media and the plant roots treat and uptake nutrients present in the runoff. According to the MA DEP Stormwater Policy⁶ they are effective at removing at up to 90% of total suspended solids (with pretreatment) 30%-50% total nitrogen, 30%-90% total phosphorus, and 40%-90% metals.

⁶ 2008 MA DEP Stormwater Policy, Volume 2 Chapter 2, Pages 23-35



LEFT Precedent for landscape sculpting

Sculpting the Landscape

Storm surge from the Pines and Saugus River can also contribute a significant amount water and flooding to the area. Erecting a seawall is an effective solution to keep flooding out, however if it is not part of an integrated regional strategy, it might protect the targeted area, but it could also push that water somewhere else, such as into the Riverside neighborhood. That is a strategy to be explored as part of the MVP and other regional planning process. In the meantime, an effective strategy proposed

as part of this Master Plan process would be to perform some targeted landscape sculpting, raising some areas and lowering others. Raising the elevation of some areas would provide targeted protection to certain areas, while lowering other areas, such as to create new salt marsh, provides storm surge storage in a manageable manner. This strategy would provide some targeted protection, while providing a net-zero fill and therefore not pushing water away into other vulnerable areas.



ABOVE Precedent for living shoreline



ABOVE Precedent for saltmarshes

Expanding and Developing Salt Marsh and Living Shorelines

Salt marshes are a type of coastal wetland formed along tidal channels, behind barrier beach and dune systems, and in other low-lying areas subjected to tidal inundation. Salt marshes provide habitat for many species of fish, shellfish, birds, and other species. For our Master Planning purposes, salt marshes provide a significant flood protection benefit. Salt marshes are known to help control flooding, protect shorelines from storm damage, improve water quality in coastal waters by filtering out sediment and nutrients, and provide recreational and educational opportunities. According to the Rumney Marsh ACEC Salt Marsh Restoration Plan (SRMP)⁷ *“Salt marshes help mitigate these impacts by storing and attenuating storm flows, thereby promoting sediment deposition, stabilizing and protecting shorelines, and maintaining nutrient and carbon exchange.”*

This master plan proposes to protect, expand and create new salt marsh areas along the water’s edge throughout the RiverFront district. The increased salt marsh area will create improved flood storage and storm surge benefits and be consistent with many of the goals of the Rumney Marsh ACEC SRMP, including:

- Continue efforts to discover as yet unknown salt marsh restoration opportunities which could provide further ecological benefits to the ACEC
- Use projects to educate the community regarding wetlands and wetland restoration
- Increase public access to the ACEC
- Protect existing salt marsh from encroaching development

Another strategy being proposed as part of this Master Plan is to create more living shorelines where possible along the water’s edge of the RiverFront area. Living shorelines are essentially more natural “softer” shoreline interventions in lieu of harder ones such as seawalls and bulkheads. These strategies, when sited correctly, can provide a stable shoreline and/or slope transition to the upland that is natural and can have other ecological benefits such as habitat or sediment retention. Some of the shoreline areas along the Pines River, which is not subject to heavy wave action (relative to other coastal locations), are a good candidate for these living shoreline features.

⁷ Massachusetts Wetland Restoration Program and MA DEM ACEC Program, May 2002

Proposed Waterfront Infrastructure Improvements for the Master Plan Study Area

In an effort to expand public access to the water, there are two key improvements proposed as part of this Master Plan process, as well as several other interventions and improvements that will create a better connection to the watershed. The two infrastructure improvement areas are currently located on private property, however the improvements proposed were assumed to be done in some manner of a public development process, either through agreements/easements between the property owners and the City or through the City gaining control of the parcels.

The possibility of a public pier has long been sought after in the Riverside area. A 2005 study by the Cecil Group entitled “Revere Public Pier Feasibility Study” looked at two areas for the potential establishment of a public pier, at the Boat Works property and at the existing former railroad alignment pier. Overall, the study highlighted the former railroad alignment pier for having the most potential for a public pier. The biggest limitations to developing the pier at that site were the roadway access from North Shore Road for northbound vehicles and the parking loading required for a public pier.



During the master planning process, the consultant team reviewed different options and how they could affect and enable the possibility of a public pier at this site. While the structural integrity of the pier remains an unknown requiring further investigation, the team was able to highlight some potential solutions to the issues highlighted in the 2005 study. Most notably access to the site and the study area has been significantly improved with the recommended off-ramp improvements that include the roundabout, as discussed in the transportation section. With respect to parking for the pier, the option of incorporating the pier into Gibson Park allows for the added parking spaces being created for Gibson Park to be available for the public pier. Further study on the development of the pier is needed, however the two restricting issues as well as the potential parking requirement highlighted in the 2005 feasibility study appear to have a viable solution. This pier could be used as a public fishing pier, or even pending further study, have a gangway and float added to be used for excursions and/or water taxi services.

The other area for public water access that was studied was at the boat works. Leading up to the master planning process, the City had been in discussions with the North Shore Maritime Center for the potential of a community boating location. Rowing is one of the fastest growing sports in America and the sculls are shallow draft vessels and therefore don't need deep draft water access. In the development

of the discussions, the Boat Works facility was identified as a promising potential location to create a community rowing opportunity. The consultant team, along with a separately contracted engineering consultant working for the City reviewed the development possibilities associated with a community rowing location. The consultant, Collins Engineering, Inc. looked specifically at the water's edge redevelopment possibilities at the Boat Works site and consulted together with the Master Plan consultant team to look at creating a comprehensive approach to the redevelopment of the Boat Works that fits in with the Master plan vision for the RiverFront area.

As discussed in other sections of this Master Plan, the eastern portions of the Boat Works site are being fully incorporated into Gibson Park and will provide additional parking, recreational and stormwater management space for the overall RiverFront study area. The western portion of the site is where the waterfront infrastructure redevelopment will take place. The existing on-site building structure was not evaluated as part of either study process, however it is clear that upgrades and improvements will be needed to provide a more solid structural and resilient facility, however that process can occur as the redevelopment options are further studied.

Under the envisioned redevelopment scenario, the existing revetment wall that is currently in disrepair will be rebuilt, most likely with additional rip rap and stone. Under initial planning,



the revetment wall would be rebuilt to a height to provide storm surge protection for the property up to original elevation to match surrounding protection elevations, however, if as the result of the MVP process that is just getting underway, a higher sea wall elevation is recommended to better protect the entire area, that revetment wall height could be adjusted higher.

The northwestern portion of the waterfront would become salt marsh, as noted in the resiliency improvements section. The central-western portion of the waterfront, which would have direct pedestrian access from the parking area, would be the location of a stone pad kayak/portable vessel launch. The pad wouldn't extend too far into the water, and therefore would be optimal for use at the higher end of the tidal cycle. Along the southwestern edge of the site would be the landing pad, gangway and floating docks that would be used for the community rowing program. The gangway would extend out to the floating docks that would sit in a minimum of 18 inches of water even at the lower end of the tide cycle. The floating docks would be oriented parallel to shore to allow for easier launching of the sculls directly into the river without having to maneuver the scull too much initially.

Those two infrastructure projects would greatly improve public access to the water sheet, promote healthy outdoor recreational opportunities, and reconnect the area to its natural resources.

A scenic view of a park featuring a winding wooden boardwalk that curves through a lush green landscape. In the background, a calm lake reflects the sky, with a rocky shoreline visible. Numerous people, including families and individuals, are seen walking along the boardwalk, some carrying backpacks and others wearing hats. The overall atmosphere is peaceful and recreational.

IV. MASTER PLAN VISION & DEVELOPMENT OPPORTUNITIES

RiverFront Master Plan Vision

Revere's connection to the waterfront is deep seated and multi-faceted. In addition to the home of the nations first public beach, the city's network of marshes and rivers feed the ocean and provide scenic and environmental benefits to its residents and the larger region. Through the feedback from the public meetings, it is clear the vision for the new RiverFront district must maximize its recreational, environmental and educational value to the community.

For the residents of the adjacent neighborhoods, Revere and the region as a whole, the water has a magnetism that is undeniable. Across the region and the country, there has been a renaissance which has led to the redevelopment of urban, industrial or just overlooked waterfronts to create places for people. Re-conceiving the connectivity to our natural resources, to create new opportunities for interaction with nature, is a trend that has only gained momentum during the past year and the impacts of COVID-19.

At the heart of the reconnecting the RiverFront District with the water is the repurposing of the Riverside Boat Works into a rowing center. More than just a singular use building, the goal of this programming is to educate users and create a stronger bond with nature and environmental

stewardship. The renovation of the old Riverside Boat Works for rowing and small water craft is really the creation of a community center.

Goals for Gibson Park focus on a mix of active and passive uses to support a diversity of users - key to successful park design. Walking trails create spaces for all ages, from young children learning to bike to seniors on sunset walks. Unique to its river front location, boardwalks extending across the marsh help reconnect people to the water from the park. To support a variety of resting areas, multiple seating types are proposed – benches along pathways, picnic areas and reused granite blocks (from the G&J site) as stadium seating with river views. Extensive discussion around programming of the active uses identified a clear desire for flexibility, increasing the potential for use throughout the year.

Gibson Park, with its sunset vistas and Boston skyline views is utilized and known for its natural beauty. However, from the larger perspective, this beauty is obscured by buildings in disrepair, a shoreline cluttered with abandoned cars, boats and other machinery and a tow yard that dominates the long views and mars this gateway to Revere from the north. Current shoreline conditions, the dilapidated pier and the industrial buildings

monopolize the western views from 1A south. Shoreline improvements, with marsh and vegetated slopes replacing rubble and pavement, as well as the repurposing and renovation of the pier will dramatically improve the visual at the waters edge. Iconic architecture, placed carefully in the landscape to enhance the varying public realm conditions around the site, will provide a dramatic new entry and frame views to the picturesque park.

The G/J site provides an opportunity to reimagine the waterfront with a generous public boardwalk that expands access to the water and is supported with an activated ground plane. As proven throughout Revere, new residential development brings vibrancy and, as the density increases, commercial uses to areas that were once covered with underutilized parking. Planned correctly, density can preserve and enhance the best features of the natural environment and is additive to the community. Places like Dryft and Fine Line at 500 Ocean serve as both amenities to the building residents and the greater community of Revere.

Longtime residents of Revere, in talking about Dryft, have said that they finally feel like they have a place in the City where they can gather, meet friends and call their own. A new residential building on G/J will create the economic catalyst for commercial



opportunities on the Mirage and G/J site to flourish and succeed. These commercial spaces will also be an amenity for users of Gibson Park, the new Community Boathouse and revitalized pier.

With the natural beauty of the site and immediate connections to nature, the private parcels of the G/J site and the Mirage have potential to be much more vibrant than their current use. In a mutually beneficial way, a residential project taking advantage of the natural landscape, dramatic waterfront view and ample outdoor recreational areas by creating seamless connections provides community benefits of reconnecting a closed and underutilized site to the Revere community.

COVID-19 has also had immediate, and likely lasting, impacts on multifamily development. Work from home has been a trend for years and, as it is adopted by more companies as a permanent benefit for their employees, is even now more of a focus for new development. Residential design, which for years trended towards smaller units (studios, micros, and 1 bedrooms) is now trending toward larger units (with a higher percentage of 2

and 3-bedrooms) which offer an extra room to work-from-home. Recent data in Revere backs this up, with the two- and three-bedroom units leasing first (to support empty-nesters or couples who want more space to spread out) with a much greater availability of one-bedroom and studio apartments. Co-working spaces within residential buildings have shifted toward more private bookable offices, within the amenity spaces of residential buildings. The parking trends, of providing fewer parking spaces per unit, offering shuttles to public transit and space for shared car services have stayed consistent, as residents seek ways to minimize their environmental footprint by not owning a car or downsizing from a two-car to single car household. As remote work changes our economy, reducing traffic and commutes while redefining the typical workday, the G/J development has the potential to directly address the needs of future tenants while

TOP LEFT Dryft at Waterfront Square
 MIDDLE LEFT Granite seatwalls along the shoreline
 BOTTOM LEFT Waterfront pedestrian paths



also restoring the site for the community.

To achieve a vision for the new RiverFront, the masterplan process identified a series of key goals:

1. Improved public access to the RiverFront, including walking paths, boardwalks over new salt marshes, overlooks with scenic views of the marsh, Saugus River and downtown Boston in the distance, fishing, access for small boats and additional seating to further connect people visually and physically with the water.
2. Connectivity throughout the site that support public uses. Proposed pathways throughout Gibson Park create a third of a mile loop connecting the numerous sports fields and open space amenities. Waterfront walks along the northern edge of the site connect Gibson Park with the proposed public pier which extends out into the Saugus River and potentially with The Point of Pines neighborhood in the future.
3. Improved Riverfront access for pedestrians,



bicyclist's and vehicles

4. Resiliency improvements that integrate seamlessly into the landscape and built environment to create amenities.
5. In addition to existing tennis courts and recently renovated playground new sports fields within Gibson Park will include:
 - a. New synthetic turf multi-purpose sport field with lights that can accommodate football, two U10 soccer fields, one U12 soccer field or a little league/softball diamond.
 - b. Relocated and enlarged community gardens.
 - c. Off leash dog park
 - d. Full sized basketball court
 - e. Two Pickelball courts
 - f. Bocce Court
 - g. Dock to launch kayaks, canoes and windsurfers.



h. Additional parking

6. Gateway art within round-about accentuating the proposed new Gibson Park entry
7. New uses and development appropriately scaled to support active uses at grade
8. Architecture on the G/J site that is designed as an iconic "gateway" to the City from the north, with a generous public boardwalk and an active mix of uses along the ground floor.

Throughout the process, it was important to understand that the master plan needed to strike a balance between the multiple voices heard during the process. The plan represents a collective effort of the City, community members, other stakeholders and the design team to maximize the potential for the district. Redevelopment of the waterfront provides an opportunity to reconnect, to repair, and to reinvigate Revere's "other waterfront."

Improved RiverFront Accessibility

As the site of one of the largest parks and one of the largest businesses in the City of Revere, the RiverFront District is remarkably inaccessible today. Gibson Park and the G/J site are completely disconnected as a result of the location of the sweeping Route 1A southbound ramp that divides these two elements of the larger site; and each of these two elements independently has only limited vehicular access and virtually no pedestrian or bicycle access.

On the one hand, Gibson Park is only safely accessible to motorists through the contiguous Riverside neighborhood; and motorist access from the adjacent Point of Pines neighborhood is constrained and circuitous. On the other hand, the G/J site has no direct access from Revere to the south and only one point of access from the north via the Whitin Road Extension, which is expected to be eliminated when the new General Edwards Bridge is constructed.



LEFT ABOVE Current conditions
LEFT BELOW Round about designed to reclaim green space for Gibson Park & provide future access



LEFT The roundabout will open up more space for sports facilities and parking, while reducing the traffic through Point of Pines and Riverside neighborhoods.

For those and other reasons, accessibility was recognized as a threshold challenge on which the viability of the vision for an integrated and revitalized RiverFront District fundamentally depended. And even before the RiverFront Master Plan process began, the City of Revere in consultation and coordination with the Redgate development team, initiated conversations with representatives of the Massachusetts Department of Transportation (MassDOT) regarding the nature, scope and schedule their plans for the new General Edwards Bridge and related Route 1A access and egress ramps.

From these timely and productive discussions, two important facts became clear to all concerned. Firstly, the higher profile of the planned new fixed-span bridge would result in a more southerly landing point that would preclude the already limited Whitin Avenue access/egress to the G/J site

from Route 1A southbound. Secondly, the redesign of the existing Route 1A on-and-off-ramps could be considered separately from the re-design of the bridge itself. That in turn led to a focus on whether a reconfigured southbound on-and-off-ramp could provide future access to both the G/J site and Gibson Park—i.e., to the RiverFront District as a whole.

From the collaborative consultation among transportation and development representatives of the City of Revere and civil and traffic engineers from MassDOT and Redgate teams, the option emerged of a reconfigured southbound on/off-ramp network that would incorporate small-radius traffic roundabout. That combination would provide multi-modal northbound and southbound links from all of Revere to every element of the RiverFront district, while correspondingly reducing adverse traffic impacts on the riverside community.

This approach has the additional advantage of recovering a large portion of the now inaccessible infield of the current loop ramps system for community use; and most importantly, all these transportation improvements can be made before the new bridge is funded, designed and constructed.

On that basis, the reconfigured ramp with a new roundabout is the concept plan that was presented to and discussed with the RiverFront DAG; and that is the concept that is now reflected in this RiverFront District Master Plan as well. That has been done in full recognition of the fact that this preliminary plan will need to be refined, designed, permitted and funded, but with confidence that the early and continuing planning participation of MassDOT augurs well for the prompt and positive outcome of those critical next steps.

A More Active and Attractive Waterfront Park

Gibson Park is a valuable recreational asset to the Revere community as whole, which now contains a ball field and tennis and basketball courts as well as a playground and community garden. Gibson Park is also home base for both the RHS tennis and golf teams; and in-season, it is an important element of the Revere Parks & Recreation Department programming. But despite its size and waterfront location, Gibson Park has never lived-up to its full potential as a community recreational resource.

In part that has been due to its relative inaccessibility; in part to its limited flexibility and lack of parking; in part to its location adjacent to an unsightly salvage and tow yard; and in part to the frequent flooding in this general area. All these existing conditions have played a role in the relative under-utilization of Gibson Park over the years; and perhaps none is more significant than the fact that the unique waterfront location of Gibson Park has not been fully appreciated and systematically developed, at least not in recent years.

The DAG sought to address all of those conditions in the RiverFront Master Plan; and the result is a more diversified and sustainable Gibson Park that takes full advantage of its exceptional waterfront



TOP Precedent for mirage site
BOTTOM Precedent for bike path and marsh



location. The playground, tennis courts and community garden have been retained and in some cases expanded; and they now also include a dog park. The baseball diamond has been integrated into a larger multi-use field that can be sub-divided for youth soccer and other recreational and athletic purposes. The potential for high mast lighting and additional parking has also been provided, which can be supplemented as needed, as well as access to bathrooms and other public amenities in nearby public and private properties. Pedestrian and bicycle pathways have been introduced throughout the park with links to surrounding properties and adjacent neighborhoods; and visible public art opportunities have been identified and accommodated. It should be noted that, depending on the timing of park improvements, the City's needs may change. Therefore, coordination of final park programming will require input from Revere Parks and Recreation.

Most importantly, Gibson Park now fully embraces and celebrates its waterfront location with attractive, safe, and fully accessible boardwalks and overlooks along the shoreline. It does so in an environmentally sustainable and resilient manner that features restored salt marshes and other shoreline planting and seawall improvements as well as a series of rain gardens and natural stormwater features that would begin to minimize and mitigate the persistent flooding in the general area.

LEFT IMAGES Precedents for the new sports fields and bike path

Perhaps the most innovative and responsive of these interventions is the incorporation of significant flood storage capacity in underground chambers beneath and possibly somewhat beyond the multi-use field. These chambers would be managed by a new pump-station that the Riverside community currently lacks. This system would allow for the temporary storage of flood waters from storm events, which now routinely inundate both Gibson Park and major portions of the Riverside neighborhood. Combined with the repair and/or maintenance of subsurface drainage infrastructure elsewhere in Riverside, this complex of new flood-control-and-response strategies now reflected in the RiverFront Master Plan will make important first steps in addressing the climate-change and sea-level-rise issues and opportunities that are being more fully addressed in the City's larger and continuing Municipal Vulnerability Preparedness (MVP) program.

Equally importantly, Gibson Park is now integrated into a larger district in which the surrounding properties support and enhance the recreational uses and community purposes of the park itself, as further described below. This is in stark contrast to the existing conditions in which the surrounding properties actually compromise those purposes and diminish those uses.

Re-Purposed Riverside Boat Works Property

The poorly maintained condition of the now long-vacant Riverside Boat Works property—its derelict building, its unkempt boat yard, its deteriorating seawall, its collapsed wharf and silted waterfront has been a source of community controversy for many years. And the various redevelopment proposals advanced by its previous owners have also been vocally and consistently opposed by the City and the community.

In that contentious historical context, the DAG and this RiverFront Master Plan have now fully embraced the preference of the Riverside community that this crucial site be redeveloped for a civic purpose directly related to the adjacent Gibson Park. Fortunately just such a purpose had already begun to emerge in the months before the commencement of the master planning process—i.e., a regional maritime center focused around a community rowing program and related waterside activities on the Pines River, all involved shallow draft vessels like sculls, canoes, kayaks and paddle-boats. It should be noted that the site was evaluated for use as a community boat launch for motorized boats—however, it was determined that the site conditions and the traffic considerations resulted in this use being discounted at this location.

TOP Existing Boat Works Site





The idea of a North Shore Maritime Center at this location was brought to the City through the Council President Patrick Keefe by former collegiate and Olympic rower Will Goldenheim, who has long been involved with Community Rowing in Boston as well as similar programs in the Town of Saugus and at St. Mary's School in Lynn, where he also teaches. Will understood that the Pines and Saugus Rivers would provide an ideal community rowing venue for Revere and other North Shore communities and could also be the home for a new rowing program at Revere High School. To that end, the Revere City Council made a commitment to fund preliminary engineering for the docking and other facilities necessary to establish such a program. Will Goldenheim and his colleagues expect to be able to raise from private sources the \$100K +/- that will then be required to construct those new water-based facilities.

That status of planning was presented to the DAG by Will Goldenheim in conjunction with the Master Plan consultant team; and the DAG response was positive and enthusiastic. The related discussions also extended to the renovation of the existing building

as a combination boat storage, rower training and community educational center, not unlike the new Community Rowing facility on Soldiers Field Road in Boston, albeit on a smaller scale and with a less expensive budget. In this scenario, which is illustrated in the RiverFront Master Plan, the site would be used for a combination of facility parking as well as for other recreational and environmental programs directly related to Gibson Park and its waterfront. Indeed, all aspects of the North Shore Maritime Center would support water-based activities at Gibson Park itself; and the Point of Pines Yacht Club would provide docking space for any deeper draught vessel required to supervise these new Pines River programs.

In sum, as further described and illustrated elsewhere in the RiverFront Master Plan, this creative community strategy for the former Riverside Boat Works would convert this private liability into a public asset in manner that supports the revitalization of the RiverFront District as a whole. That will require further discussions with its current owners, who are aware of and open to that outcome, which would be a win-win for all concerned.



ABOVE Dryft, 500 Ocean, and the Waterfront Square Plaza

Transformed G/J Site

As envisioned in this RiverFront Master plan, the change from the existing use of the G/J site as an unsightly tow and salvage yard to its planned redevelopment as an active and attractive residential community with a range of public amenities is fundamental to the creation of a more appropriate northern gateway to Revere. Redgate's redevelopment of G/J will partially fund and fully support the larger and longer vision for the entire RiverFront district.

As with the re-purposed riverside Boat Works, the new residences will both encompass and improve the pines river shoreline and water-sheet as well as fully embrace the adjacent Gibson park. This distinctive new structure will be at once on the water and in the park. It will provide in and around its ground floor community and active uses, including the potential for commercial space that will expand and enhance public access to and enjoyment of both Gibson park and the Pines River. Redgate's intention to gift the existing public pier to the City of Revere and to work collaboratively with the City to improve that abandoned waterfront facility for its public use and enjoyment will further public access to the RiverFront.

The City has confidence in this outcome because Redgate has a history of successful, mixed-use development in Revere for which promises were made and kept. Those projects include One



Beachmont and 500 Ocean, which brought Revere the popular Dryft and Fine Line restaurants, as well as 50 Ocean and 21 Revere Beach Boulevard, known as Ryder, which will include another waterfront restaurant. Based on its demonstrated performance with the hundreds of millions of dollars of new investment in our community that the 700 residential units in those previous buildings represent, it is fair to say that Revere knows Redgate and Redgate knows Revere, to the obvious advantage of both.



In this instance, Redgate's confidence in the potential of Revere was reflected in their decision to pursue the acquisition and redevelopment of the challenging G/J site; and the prospect of such redevelopment that was a major catalyst for the master planning process itself Redgate and its development team also made major contributions to preliminary investigation and evaluation of the transportation and environmental improvements necessary to enable and facilitate its redevelopment and, for obvious reasons, Redgate was also a major participant in the presentation to and discussion with the DAG about the nature and scope of the redevelopment and related transportation plans for the district, topics to which one of the DAG public meetings was fully devoted.



Redgate understands that this development will have a significant visual impact as the gateway to Revere from the northern access at route 1a. While preliminary, the design approach is to integrate the building within an active/public

Riverwalk, with a varied massing creating a distinctive contemporary roof line taking advantage of the site's high visibility. The building has been significantly set back from 1a, with cuts and angles to reduce the visual mass of the project. The RiverFront Master plan shows some conceptual massing plans for the residential development site, which highlight both the water and the parkland views from this location. Like other Redgate projects, the design will be distinctive, appropriate for the location and site.

Though plans are still too preliminary as to involve architectural detail, but illustrate an approach that sites the building in a way that supports both the development of Gibson park and the creation of a public waterfront. While the development of the project is too preliminary to include an actual unit count, which is dependent on the final sizes of the units themselves, Redgate did indicate that for economic reasons alone the unit count would be likely be higher than the 195 at One Beachmont and lower than the 305 units at 500 Ocean. The most likely range would be 260 to 290 total units total; and the mix of units would likely include studios, 1Br, 2Br and a limited number of 3Br units. Like other referenced projects, the development at the G/J site will consist of quality materials utilized in a distinctive building.

Based on demonstrated market demand and analysis, parking ratios are estimated to be no less than 10—i.e., one parking space for each unit in addition to additional visitor parking resident



TOP LEFT Baxter Park
 TOP RIGHT Amphitheater
 BOTTOM Photo of Silvia Lopez Chavez painting the Ryder mural.
 Credit: <https://www.silviaopezchavez.com/#/ryder-revere-beach-mural/>

parking would be provided either under the building itself or in nearby landscaped surface parking lots on the property. As with all multi-family complexes in Revere, its residents will not be eligible for on-street parking permits anywhere in Revere, specifically including but not limited to Riverside and Point of Pines neighborhoods, with that prohibition readily enforceable as the on-street resident parking is further extended there. As with other development in Revere, Transit Demand Management (TDM) will be required, Measures to reduce vehicle dependency will include shuttle service to the blue line, access to Zip Cars, and, in cooperation with the MBTA, relocation of bus service to better serve residents.

Critical to the functional integrity and economic viability of the RiverFront Master plan is the fact that many of the major amenities designed and funded by Redgate as an integral part of this

residential development project will be fully accessible to the community. On the waterside, these certainly include the reclamation and restoration of the RiverFront shoreline for public access; in full compliance with the requirements of MGL Chapter 91. This project will assure public access to a portion of the Pines River waterfront that is now completely neglected and effectively closed to the public. The proposed renewal of shoreline salt marshes, the construction and maintenance of fully accessible boardwalks, seating decks, and overlooks along the waterfront perimeter of the development site has set the standard for the balance of the waterfront shoreline along Gibson Park itself on the landside perimeter of the development. Amenities will include attractive landscaping that blends into Gibson Park, potential flexible meeting space or seasonal commercial space, both inside and outside of the building, that could service and support Gibson Park and neighborhood activities and events.

The expectation is that Gibson Park will be an amenity for the new Revere residents of this complex and that the complex will likewise be an amenity for the patrons of Gibson Park. That mutually beneficial resident/community relationship is fully expected to prevail for the Pines River water-side as well. The project provides extensive public amenity with a modest density—at approximately half the density of other waterfront development in Revere—that results in a distinctive gateway to Revere from the north.



ABOVE Precedent for new Mirage site

Other Planning Efforts

There are other important projects and initiatives related to, but not part of this RiverFront Master Plan that would support and even enhance the major elements of the plan:

- A Potentially Revitalized Mirage Site
- An Enhanced Point of Pines Yacht Club
- A New Point of Pines Fire Station
- A Relocated MBTA Bus Stop
- An Eventual New Northbound Route 1A On/Off Ramp

A Potentially Revitalized Mirage Site

Immediately adjacent to the G/J site, on the segment of the waterfront between the planned new Redgate development and the General Edwards Bridge, lies the former Mirage and Jacob’s Ladder property. This property is owned separately from the G/J site; and it has been recently used for a variety of uses, including adult day care.

The owners of this property are aware of the RiverFront Master Planning process; but they have not yet been active participants. Nonetheless, the DAG has focused on the potential of this property for a waterfront restaurant, which was very much favored as a valued element of the RiverFront Master Plan. Given the limits of the Chapter 91 boundaries on this property, it is relevant and legally significant that the existing structures on the property were formerly used for such purposes; and this general area was once among the most active and attractive social and hospitality centers in the Revere community.

During the course of the DAG discussion of this matter, Redgate made clear its view, as an experienced developer of mixed-use projects in Revere and elsewhere, that under current circumstances, not least the relative inaccessibility of the former Mirage site, a new waterfront restaurant at this location would not be economically viable at this time. Redgate emphasized, however, that if and when those circumstances changed, along the lines contemplated in the RiverFront Master Plan

and in the context of continued improved conditions in the surrounding area, they would welcome and support a waterfront restaurant on this neighboring property.

Although Redgate could not and did not speak for the property owners, they expected that the current owners of this property would respond favorably to the possibility of reactivating a waterfront restaurant once it was economically viable to do so. For that reason, the RiverFront Master Plan illustrates what might be viable on that site in the future—e.g., once the residential development itself is completed—understanding that such an option was not now possible.

An Enhanced Point of Pines Yacht Club

The Point of Pines Yacht Club is represented on the RiverFront DAG, has been an invaluable participant in the master planning process. It will also be a valued element of the RiverFront District both in its own right and as supporter of the boating activities planned for North Shore Maritime Center at the former Riverside Boat Works. The Point of Pines Yacht Club was especially helpful in exploring the possibility of locating a public boat launch somewhere within the RiverFront District, possibly at the North Shore Maritime Center or at the Yacht Club itself; but no site proved feasible either because of the shallowness of the water and/or the lack of necessary parking. The Yacht Club was likewise helpful with regard to issues of flooding and sea-level rise, which are obviously major concerns for their own operation.



ABOVE IMAGES Precedents for potential new Mirage Site



ABOVE Photo from Revere Journal, August 22, 2019 , *Persistence Pays Off: Ward 5 Councillor Powers Worked Hard to Bring New Fire Station to Point of Pines*

In all of these and other respects, the point of Pines Yacht Club is considered an essential component of the RiverFront District community; and to that end, the DAG is fully supportive of the required dredging and other facility improvements that will maintain its social and economic success in this growing waterfront district.

A New Point of Pines Fire Station

Another important element of the new RiverFront District is the planned replacement of the vacant Alden Mills Fire Station with a new and expanded state-of-the-art facility in the same location. This project has long been championed by Ward 5 Councillor John Powers; and it has now been fully funded and is in final design with the full support of Mayor Arrigo and the City Council.

This new public safety facility is especially important not only because of the substantial new residential development along the waterfront, including that proposed for the RiverFront District itself, but equally so because the Riverside and Point of Pines neighborhoods have been relatively underserved since the Alden Mills Fire Station closed. For that reason, the new Point of Pines Fire Station represents an essential civic investment and public safety presence in the new RiverFront District.

Currently, Point of Pines, Riverside, and the Northern end of Revere Beach Boulevard are not accessible to emergency apparatus in flood conditions. The new station in this location will remedy that condition. Obviously, improved access to Gibson Park, the proposed development and Route 1A is critical. In coordination with the Revere Fire Department, the team reviewed roadway improvements intended to extend to the intersection of the new access road with the Lynnway. These improvements, while minor in scope, will permit the use of current fire department equipment (tiller articulated vehicles) as well as future equipment (high water vehicles and a tower truck). This accommodation for future vehicles is especially important because these vehicle specifically relate to the needs of the community – flood rescue throughout the area and the long reach requirements of the new development at Revere Beach.

A Relocated MBTA Bus Stop

As part of the ongoing MBTA review of their bus operations, there is the distinct possibility that the bus stop on the Lynnway in Revere east of Route 1A may well be eliminated due to relative lack of patronage. As part of the master planning process, and particularly in the context of the reconfigured access/egress patterns described above, it has now been suggested that this MBTA bus stop could be relocated to the west side of Route 1A into the heart of the RiverFront District. That would provide public transportation links to Gibson Park as well as direct connections between this district and the Blue Line –thereby adding a missing TOD dimension to new residential development and the RiverFront District as a whole.

An Eventual New Northbound Route 1A On/Off Ramp

At some point in the future, the roadway access/egress patterns for the RiverFront District will be completed with the relocation of the existing northbound ramp connection to the General Edwards Bridge. Unlike the situation with southbound ramp network, which needs to be reconfigured to provide more complete and direct access to Gibson Park and the RiverFront District, there is less urgency on the northbound side until the new General Edwards Bridge is designed and constructed. Once that does happen, the new GE Bridge itself will become a prominent feature of the new northern gateway to Revere that the RiverFront District aspires to become.



- | | | | | |
|----------------------------|--|--|--------------------------------|--|
| A Community Boating | F New Parking (34) | K Existing Backstop | P Elevated Boardwalk | U New Parking (25) |
| B Salt Marsh | G Existing Parking (36) | L Dog Park | Q Overlook | V New Basketball |
| C Dock | H Community Garden | M Salvaged Sea Wall & Stone Seating | R Range & Putting Green | W Art |
| D New Tennis (2) | I Existing Playground | N Existing Tennis (2) | S Passive Area | X Potential Future Restaurant |
| E Rain Garden | J Multi-Purpose Field (210'x360') | O New Pickleball (2) | T Potential Public Pier | Y Potential Future Pedestrian/
Bike Connection |



RAIN GARDENS

DOG PARK

COMMUNITY GARDEN

FIRE HOUSE

ART

NEW BASKETBALL

COMMUNITY BOATING

NEW TENNIS

EXISTING PLAYGROUND

EXISTING TENNIS

MULTI-PURPOSE FIELD

NEW PICKLE-BALL

PASSIVE AREA

DOCK

SALVAGED SEA WALL & STONE SEATING

POTENTIAL FUTURE RESTAURANT

NEW PARKING


ELEVATED BOARDWALK

SALT MARSH

POTENTIAL PUBLIC PIER

EXPANDED PARKING FOR GIBSON PARK

OVERLOOK

An aerial photograph of a coastal area. On the left, a multi-lane highway interchange with several overpasses and ramps runs vertically. To the right of the highway is a large parking lot filled with cars and trucks, a large red-roofed industrial building, and a boat yard with numerous boats. Further right, there are two tennis courts with red and green surfaces, a baseball field, and a grassy area. The entire land area is bordered by a body of water on the right and bottom. The text 'V. IMPLEMENTATION STRATEGY' is overlaid in white on the right side of the image.

V. IMPLEMENTATION STRATEGY

Next Steps

The RiverFront Master Plan provides a vehicle to identify, organize, illustrate and advocate for the goals and aspirations that have emerged for this emerging gateway district from the several collaborative planning and discussion sessions that have occurred to date. But the RiverFront Master Plan alone is not sufficient to realize those goals and aspirations. That will require a series of zoning, permitting, funding and other approvals, of which the following are among the most relevant and timely.

1. PREPARATION OF A ZONING OVERLAY

DEVELOPMENT DISTRICT: To permit planned redevelopment of the private properties in the RiverFront District as conceptually outlined in the Master Plan, it will be necessary to prepare and approve a Zoning Overlay District that would allow for such redevelopment. This is exactly the process that was successfully employed for the redevelopment of Suffolk Downs; and in this case, the required zoning overlay district would specifically apply to the private properties north of Gibson Park and east to the General Edwards Bridge. These prominently include the former G/J site, which is currently zoned for industrial uses that are clearly incompatible with the mix of residential and commercial uses now contemplated for the RiverFront District. A Zoning Overlay District can and will be prepared as soon as the final draft of RiverFront Master Plan is completed.

2. **PLANNING BOARD ADOPTION OF THE RIVERFRONT MASTER PLAN:** The RiverFront Master Plan must be presented to and adopted by the Revere Planning Board, which can meet for that purpose in early February. Once adopted by the Planning Board, the RiverFront Master Plan would be favorably referred to the Mayor and the City Council.
3. **PLANNING BOARD AND CITY COUNCIL APPROVAL OF THE ZONING OVERLAY DISTRICT:** In the context of the adopted RiverFront Master Plan, the related RiverFront Zoning Overlay District must be approved first by the Planning Board and then by the City Council, based on the Planning Board recommendation. Each of these bodies must hold a public hearing on the proposed Zoning Overlay District; and in this case, the Planning Board and the City Council public hearings could be combined. The Planning Board would then meet to consider overlay district approval; and the City Council would subsequently meet to consider the matter based on the Planning Board recommendation. Those approvals could be completed by the end of February.
4. **CITY AND STATE PERMITTING OF ANY PRIVATE DEVELOPMENT PURSUANT TO THE RIVERFRONT ZONING OVERLAY DISTRICT:** Any private development plans that are made pursuant to the approved Zoning Overlay District, specifically including planned Redgate redevelopment of the G/J site, must be further reviewed and approved by the City of Revere



ABOVE G/J Site looking toward Mirage Property

and the Commonwealth of Massachusetts pursuant to their regular requirements of project permitting. In the case of the City of Revere, this would include the public processes of review and approval by the Revere Conservation Commission and the Site Plan Review Committee, which encompasses all of city agencies that are responsible for development review, approval and oversight. In the case of the Commonwealth, this includes the multi-dimensional Massachusetts environmental policy act (MEPA), Coastal Zone Management (CZM)], Department of Environmental Protection (DEP) which administers MGL Chapter 91, and other environmental and transportation review and approval requirements. The details of those numerous city, state and possibly federal permitting requirements are further detailed elsewhere in this document.

- 5. CITY PURCHASE OF THE RIVERSIDE BOAT WORKS PROPERTY:** The plan to redevelop the former Riverside Boat Works property for community purposes will require the purchase of this property from its current private owner, who is aware of and receptive to the nature and scope of the planning process that has been underway. That will require an objective appraisal of the value of this property and an agreement as to its sale price, which would include the resolution of pending fines due to the unacceptable maintenance standards of its previous owners. Once an acceptable price is determined, the purchase is likely to be funded from a combination of city appropriations and potential support from state parkland

or climate resiliency funds—e.g., the Parkland Acquisitions and Renovations for Communities (PARC) Program, the MVP Action Grants, and the CZM Coastal Resiliency Program. Ward 5 Councilor John Powers, who has long been an advocate of community uses for this property, is expected to be a champion of the funding required to make Riverside Boat Works a public property and an integral element of the adjacent public park.

- 6. DESIGN AND FUNDING OF THE NORTH SHORE MARITIME CENTER:** As outlined in the RiverFront Master Plan, the North Shore Maritime Center include both land-side and water-side improvements. The land-side improvements include renovation of the existing derelict building and grounds, which have yet to be designed and cost-analyzed; and once they are, sources of public funding can be identified and secured. The water-side improvement require preliminary engineering that has already been funded by the City of Revere; and otherwise, it is expected that the docking facilities will be funded privately, as previously noted.
- 7. MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (DOT) AND REVERE TRAFFIC COMMISSION APPROVAL OF THE PROPOSED NEW RAMP AND ROADWAY CONFIGURATION:** The new ramp/roadway configuration that is reflected in the RiverFront Master Plan will be proposed by the City of Revere and hopefully funded through the MassWorks and/or I-Cubed programs at no cost to MassDOT. But since these are primarily DOT roadways, the planned reconfiguration will require DOT review and

approval. To that end, DOT has been fully involved from the outset in continuing discussions with both Redgate and the City of Revere as these transportation strategies have evolved; and the approach outlined in the RiverFront Master Plan is based on DOT input and feedback. The formal process of DOT approval has yet to begin; but DOT participation to date augurs well for the outcome of that process. Review and approval by the Revere Traffic Commission will also be required for those elements of the roadway network that fall outside of DOT jurisdiction.

8. PROJECTING THE COSTS OF THE VARIOUS GIBSON PARK IMPROVEMENTS: It will be necessary to refine the designs and estimate the costs of the various elements of the proposed RiverFront Master Plan improvements to Gibson Park—its various physical, recreational, landscaping, lighting, resiliency and other components. Based on those costs estimates, we can begin to convert each of these elements into specific projects for which we can then identify and secure available sources of funding.

9. PROJECTING THE COSTS OF VARIOUS SHORELINE IMPROVEMENTS: Likewise, it will be necessary to refine the designs and estimate the costs of the various elements of the proposed shoreline improvements—its various recreational, planting, flood-control, climate-resiliency and other components. Based on those costs estimates, we can begin to convert each of these elements into specific projects for which we can then identify available sources of funding.

10. TRANSFER OF EXISTING PIER OWNERSHIP TO THE CITY OF REVERE: Redgate is prepared to transfer the ownership of the existing pier on the G/J property to the City of Revere at no cost; and they will work with the City to secure the funding required to rehabilitate that pier for community use. This transfer and the related design and funding of this project will require additional work between Redgate and the City, including identifying and securing the funding resources required to realize the civic and community potential of this facility as outlined in the Master Plan. That work could/should begin asap.

11. CITY PURCHASE OF THE NGRID RIGHT-OF-WAY: The National Grid right-of-way for their underground utility cables immediately abuts the G/J property in the vicinity of the pier referenced above. City of Revere ownership of this rightof-way, with required National Grid easements, would allow for the improvement and use of this crucial property for community purposes, including providing attractive access and shelter facilities for the public pier itself. The City will need to undertake negotiations with National Grid to effect this sale; and Mayor Arrigo has sent a letter to National Grid to initiate this purchase/sale this process, to which National Grid appears to be receptive. It is not expected that this will involve a substantial cost to the city requiring outside funding.

12. CONVERSATIONS WITH THE MIRAGE PROPERTY-OWNERS: The former Mirage site is owned by two partners who are aware of the RiverFront Master Plan process but have chosen not to actively participate thus far. Given the Master Plan aspirations for that site—i.e., a waterfront restaurant—it would be important to engage them in discussions as soon as practical to be sure that we move forward together in a mutually beneficial way. Our assumption is that, as conditions in the surrounding area change in the direction outlined in the Master Plan, not least including the mixed-use/residential redevelopment of the G/J site, the prospect of another waterfront restaurant on that site might change their view on its viability and relative attractiveness as compared to current uses. If so, that dialogue should begin sooner than later.

13. COORDINATION WITH SEAPORT ECONOMIC COUNCIL: In addition to the funding sources referenced above, we will work closely with the Seaport Economic to fund and implement over time major elements of the RiverFront Master Plan in accordance with their mission and available resources.

Matrix of Projects

A. Riverside Boat Works

1. Planning/Permitting
2. Design
3. Construction
4. Funding: Seaport Economic Council (SEC), other

B. RiverFront District

Access Improvements

1. Planning/Permitting/Coordination with MassDOT
2. Design/Construction
3. Funding: MassWorks, Complete Streets, SEC, MassTrails, other

C. Gibson Park Improvements

1. Multi-use field and stormwater retention
2. Dog Park Rain Garden/Parking
3. Tennis, pickleball & basketball
4. Funding: Parkland Acquisitions and Renovations for Communities (PARC), Municipal Vulnerability Preparedness grants, other

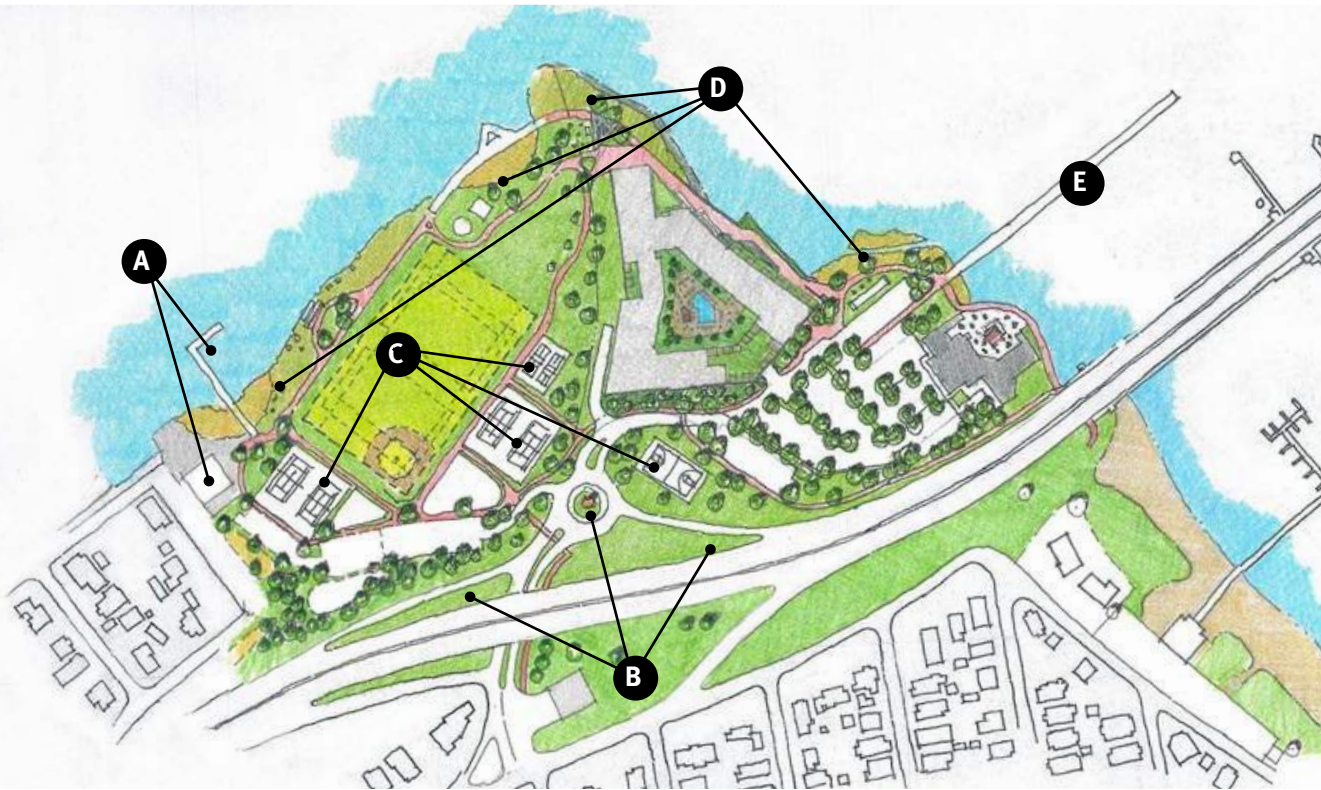
D. Continuous Shoreline

Access/Improvements

1. Resiliency improvements
2. Public walkway
3. Marsh restoration
4. Funding: SEC, PARC, Complete Streets, MassTrails, MVP, other

E. Public Pier

1. Evaluation
2. Planning / Permitting
3. Design / Reconstruction
4. Funding: SEC, MassWorks, other



Likely funding sources for each project are identified above, these are not necessarily the only means that may become available, it is important to be aware that state and federal programs are sometimes added or curtailed; that priorities and eligibility criteria periodically change; and that program budget levels can expand and contract over time. Revere’s Community Improvement Trust Fund and developer contributions are valuable tools to help meet grant match requirements and give the City a certain competitive advantage.

The City of Revere is fortunate to have a highly skilled and competent staff in the Department of Strategic Planning and Economic Development and to have historically supportive state and federal elected representation. The City is well positioned to make significant progress in achieving this master plan vision over the coming several years.

APPENDIX



List of Materials Reviewed and Referenced

In an effort to review and understand the underlying conditions in the RiverFront study area and develop appropriate strategies for this Master Plan, the consultant team reviewed a variety of sources, including the following:

MassGIS- OLIVER The Online Data Viewer – Commonwealth of Massachusetts, http://maps.massgis.state.ma.us/map_ol/oliver.php

City of Revere GIS, <https://www.Revere.org/gis>

FEMA Flood Rate Insurance Maps, Panels 25025C0028J (3/16/2016), 25025C0029J (3/16/2016) and 25009C0529G (7/16/14)

Rumeny Marsh Area of Critical Environmental Concern Salt Marsh Restoration Plan, Massachusetts Wetland Restoration Program and MA DEM ACEC Program ,May 2002

Massachusetts Department of Environmental Protection, Stormwater Management Policy, 2008

USDA’s Urban Hydrology for Small Watersheds (TR-55)

Commonwealth of Massachusetts- Sea Level Rise, Understanding and Applying Trends and Future Scenarios for Analysis and Planning, MA Coastal Zone Management, 2013

National Climate Assessment, US Global Change Research Program, 2014, <https://nca2014.globalchange.gov/>

Massachusetts Coastal Flood Risk Model, Executive Office of Energy and Environmental Affairs

Boston Region Metropolitan Planning Organization, “Exploring Resilience in MPO-Funded Corridor and Intersection Studies,” draft November 2020

National Oceanic and Atmospheric Administration, Navigational Chart No. 13275, Salem and Lynn Harbors

USDA, Natural Resources Conservation Services, Web Soil Survey, National Cooperative Soil Survey

US Army Corp of Engineers, “Flood Damage Reduction, Feability Report and Final Environmental Impact Statement/Report, Water Resources Investigation, Saugus River and Tributaries, Lynn, Malden, Revere and Saugus, Massachusetts,” December 1989

US Army Corps of Engineers, Channel Condition Survey, Saugus River, SAU-8m Sheets V-101 – V-107, dated October 19, 2016

City of Revere via a grant from the MA Office of Coastal Zone Management, “Biological and Recreational Study of the Pines River Estuary” May 19, 1978

The Cecil Group, with FXM Associates and Vines Associates, “Revere Public Pier Feasibility Study”, June 2005

AECOM “ City of Revere, Massachusetts, Municipal Vulnerability Preparedness, Summary of Findings Report” June 2019

Plan entitled “Existing Conditions Plan” Sheet C-2, for project “Proposed Condominium Development, 29 Thayer Avenue

Environmental Notification Form, Commonwealth of MA, Executive Office of Transportation and Construction, Comment letters, North Shore Boat Works renovation project, dated 1-11-89

Pines Riverside Association, Comment Letter regarding North Shore Boat Works EOE #7523, dated January 27, 1989 prepared by Medford Engineering and Survey, Dated March 24, 2006

HMM Associates, “Project Impact Assessment Report, for the Proposed Improvements to the North Shore Boat Works Boatyard/Marina Facility, Point of Pines, Revere, Massachusetts” January 3, 1989

Plan set entitled “Proposed Landside & Marina Facility Improvements”, 2 sheets, prepared by HMM Engineers, Inc. dated January 4, 1989

McPhail Associates, Inc., “Preliminary Geotechnical Engineering Report, 22 Whitin Avenue Ext., Revere, Massachusetts” dated January 23, 2020

Boston Planning & Development Agency, “Coastal Flood Resilience Design Guidelines” draft – September 2019

North Shore Boat Works Boatyard/Marina, Chapter 91 Waterways License Application, February 13, 1989, prepared for Mr. David Colbert, North Shore Boat Works, 7 Thayer Avenue, Revere, MA 02151, prepared by HMM Associates, Inc.

MassDEP – Bureau of Waste Site Cleanup – Phase I Site Assessment Map, 500 feet & 0.5 Mile Radii, for site 22 Whitin Avenue, Revere, MA

Plan Set entitled “City of Revere Massachusetts, Pump Station Upgrade, Point of Pines” prepared by Brown and Caldwell, 10/21/10

Plan Set entitled “City of Revere, Massachusetts, Department of Public Works, Mills Avenue, Green Street and Charger Street Drainage Improvements” created by CDM Smith, February 2015

MA DEP FMF#39704, BWP SW11 / Landfills- Major Modification Transmittal N. X271439 for the Wheelabrator Ash Landfill

List of Required Permits

AGENCY	PERMIT	REGULATIONS	COMMENTS
LOCAL			
Revere Conservation Commission	Order of Conditions under the Local Wetland Bylaw	310 CMR 10.000	Required for any disturbance in tidal wetlands or within 200 ft of a riverfront
Revere Zoning Board of Appeals and/or City Council	Special Permit	Revere Zoning Ordinance	Will be required if any of the proposed structures, signage, or features of the Riverwalk do not comply with the zoning by-law
Revere Department of Public Works	Water and/or Sewer Connection Permit		Required to connect into municipal sewer or water service
City Council and Planning Board	Zoning Overlay District		
Revere Site Plan Review Committee	Site Plan Review	Zoning Ordinance Chapter 17.17	Site Plan Review is required for all new construction projects over 1,000 gross square feet of building area
STATE			
MA Department of Environmental Protection	Order of Conditions- Wetland Protection Act	310 CMR 10.00	Required for any disturbance in tidal wetlands or within 200 ft of a riverfront
MA Department of Environmental Protection	401 Water Quality Certification	314 CMR 9.00	Should dredging or activities occur within the River
MA Department of Environmental Protection	Chapter 91 License	310 CMR 9.00	For dredging or structures that could occur within current and/or historical tidelands both public and private

AGENCY	PERMIT	REGULATIONS	COMMENTS
STATE			
MA Department of Environmental Protection	Uniform Hazardous Waste Manifest	31 CMR 30 and MGL 21E	Handling, transporting, and disposing of hazardous materials should they be encountered during the project
MA Environmental Policy Act	Environmental Notification Form, Draft Environmental Impact Report, Final Environmental Impact Report	301 CMR 11.00	Should any of the review thresholds under section 11.03 be triggered, such as state listed endangered species present, alterations requiring a variance under the Wetland Protection Act, alterations of bank or salt marsh above thresholds
MA Environmental Policy Act	Environmental Notification Form, Draft Environmental Impact Report, Final Environmental Impact Report	301 CMR 12.00	Work within an Area of Critical Environmental Concern
MA Environmental Policy Act	Environmental Notification Form, Draft Environmental Impact Report, Final Environmental Impact Report	950 CMR 71.00	Work affecting historical properties and places as determined by the Massachusetts Historical Commission
Massachusetts Water Resources Authority	8 (M) permit	Section 8(M) of Chapter 372 of the Acts 1984	To build, construct, excavate, or cross within an easement or other property interest held by the MWRA

AGENCY	PERMIT	REGULATIONS	COMMENTS
STATE			
MA Department of Transportation	State Highway Access Permit (SHAP)	700 CMR 13.00	When physical work or activities take place within, or impact, the State Highway Right-of-Way or property owned or under the custody and control of MassDOT-Highway
MA Department of Conservation and Recreation	Street Opening Permit		For any work done in the Lynnway
FEDERAL			
US Army Corps of Engineers	Clean Water Act 404 Permit	33 USC 1251, 33 CFR 322	For discharge of dredged or fill material into waters of the U.S.
US Army Corps of Engineers	Rivers and Harbors Act of 1899 Section 10	33 USC 401-413, 33 CFR 323	For work, including structures, seaward of the annual high water line in navigable waters of the United States
Federal Emergency Management Agency	Floodplain determination	Executive Order No. 149	The National Flood Insurance Program is administered in MA by the Department of Conservation and Recreation. Requires review by applicable state agencies for projects within the Floodplain
US Fish and Wildlife	Incidental Take Permit	50 CFR 17.00	Project that “takes” federally defined endangered or threatened species
US Environmental Protection Agency	Permit under the NPDES program	40 CFR 122	Construction activities disturbing greater than 1 acre of land will require coverage and authorization to discharge stormwater under the National Pollutant Discharge Elimination System administered through EPA