INDIA BASIN

WATERFRONT PARKS & TRAILS

San Francisco, CA

November 2015

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PREPARED BY

bionic

PLANNING
LANDSCAPE ARCHITECTURE
URBAN DESIGN

PARTNERS

SAN FRANCISCO RECREATION & PARKS

BUILD INC

THE TRUST for PUBLIC LAND

SAN FRANCISCO Parks Alliance
OUR CITY, OUR PARKS

PORT OF SAN FRANCISCO

PG&E

LENNAR URBAN

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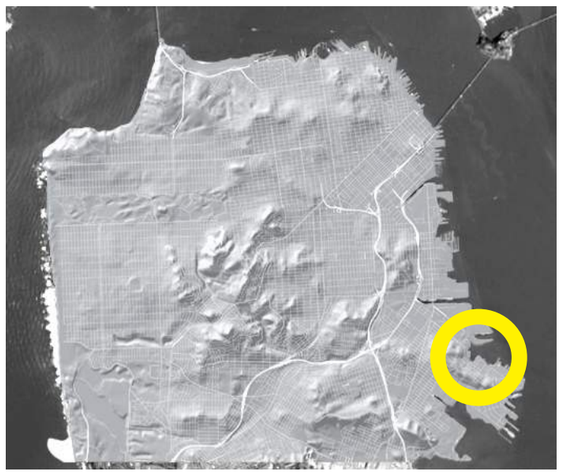
NORTHSIDE PARK
700 INNES
INDIA BASIN OPEN SPACE
96

INTRODUCTION & KEY FINDINGS



Introduction

The India Basin Waterfront Study was initiated to envision the waterfront as a future legacy waterfront park for the City of San Francisco and greater Bay Area.

The study includes 7 sites in India Basin: Heron's Head Park, the Hunter's Point Shoreline, India Basin Shoreline Park, 900 Innes, India Basin Open Space, 700 Innes "Big Green", and Northside Park. All property owners were engaged in the process. The 8th site is the Bay itself.

The study was conducted from January - September 2014 and included technical studies, regional and city wide analyses, precedent studies, site analysis and inventory, programming, public engagement and outreach, and task force involvement.

This report documents the technical studies, analysis, programming, and process that have been completed to date. This document will be updated and appended to include future phases of design and planning.

Project Goals

GOAL 1
Prioritize environmental cleanup to promote public health, safety, and welfare.

GOAL 2
Develop a common set of data, facts, and analysis from which to base design decisions.

GOAL 3
Provide a complimentary design & programmatic blueprint for the future development of a legacy waterfront park system that is accessible and available to all.

GOAL 4
Ensure a diverse & balanced mix of recreational, educational, and ecological services across all seven properties.

GOAL 5
Stimulate meaningful and inclusive local, citywide, & regional community engagement and participation.

GOAL 6
Coordinate the future design of a “shared design palette” for all 7 sites to ensure that signage/wayfinding, furnishings, lighting, and pathway design are coordinated for a seamless user experience.

GOAL 7
Design a landscape that is adaptive and resilient in the face of anticipated sea level rise.

GOAL 8
Expand public access to the Bay and accelerate the development of the Blue Greenway.

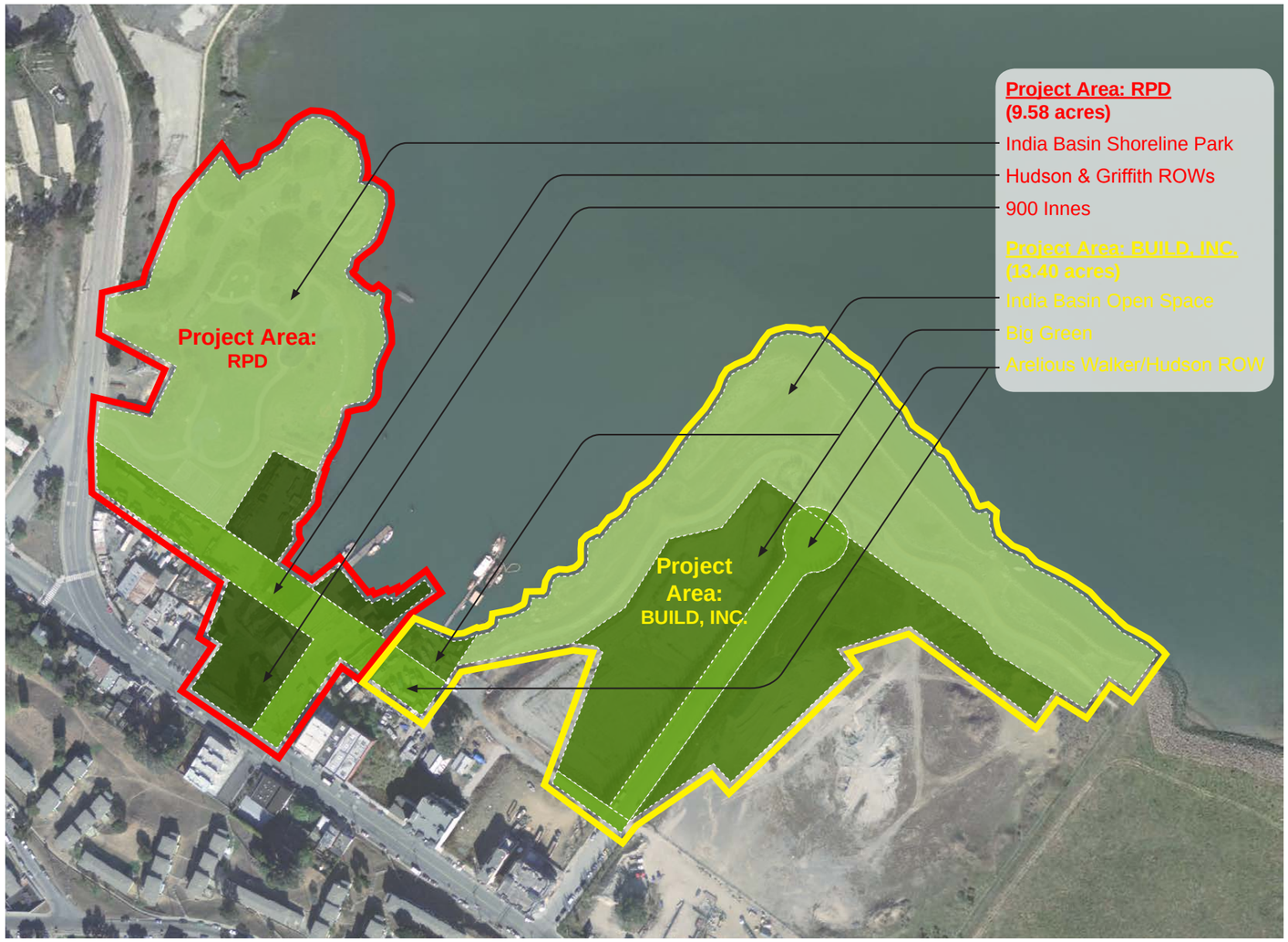
GOAL 9
Identify and implement “early win” activation and design projects.

Property Ownership

PROPERTY	OWNER	ACRES
India Basin Open Space	RPD	6.15
India Basin Shoreline Park	RPD	5.6
Big Green	Build Inc	5.63
Hudson / Arelious Walker ROWs	DPW	1.62
900 Innes	RPD/CCSF	2.4
Hudson / Griffith ROWs	DPW	1.58
Heron's Head Park	SF Port	22.69
Northside Park	Lennar	13.63
Hunters Point Shoreline	PG&E	4.66

FOCUS AREA

Focus Area



PROPERTY OWNERSHIP LEGEND

Owner	Color ID
RPD	
DPW	
BUILD, INC.	
RPD/CCSF	

PROJECT AREA: RPD

Property	Owner	Acres
India Basin Shoreline Park	RPD	5.60
Hudson/Griffith ROWs	DPW	1.58
900 Innes	RPD/CCSF	2.40
	SUB-TOTAL	9.58

PROJECT AREA: BUILD INC.

Property	Owner	Acres
India Basin Open Space	RPD	6.15
Big Green	BUILD, INC.	5.63
Arelious Walker/Hudson ROWs	DPW	1.62
	SUB-TOTAL	13.40
	TOTAL	**22.98**

Key Technical Findings & Strategies

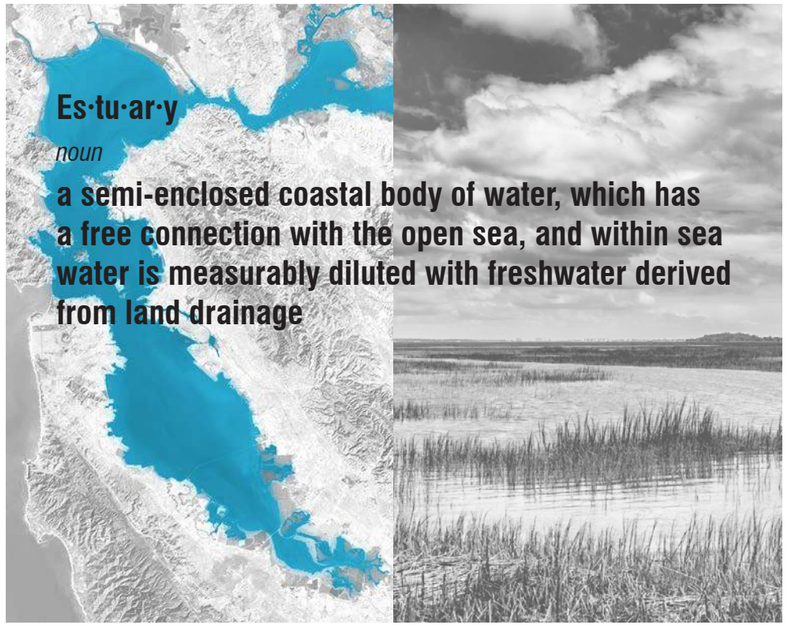
The following technical studies were conducted at a Basin Wide scale and within the Focus Area.

BASIN WIDE STUDIES
- Bathymetry & Topographic Surveys
- Coastal Processes Study
- Sea Level Rise – Opportunities & Constraints
- India Basin Transportation Action Plan

FOCUS AREA
- Biological Resources Assessment
- Wetlands Delineation
- Delineation of Jurisdictional Waters
- Preliminary Geotechnical Report
- Sediment Analysis
- Historic Report

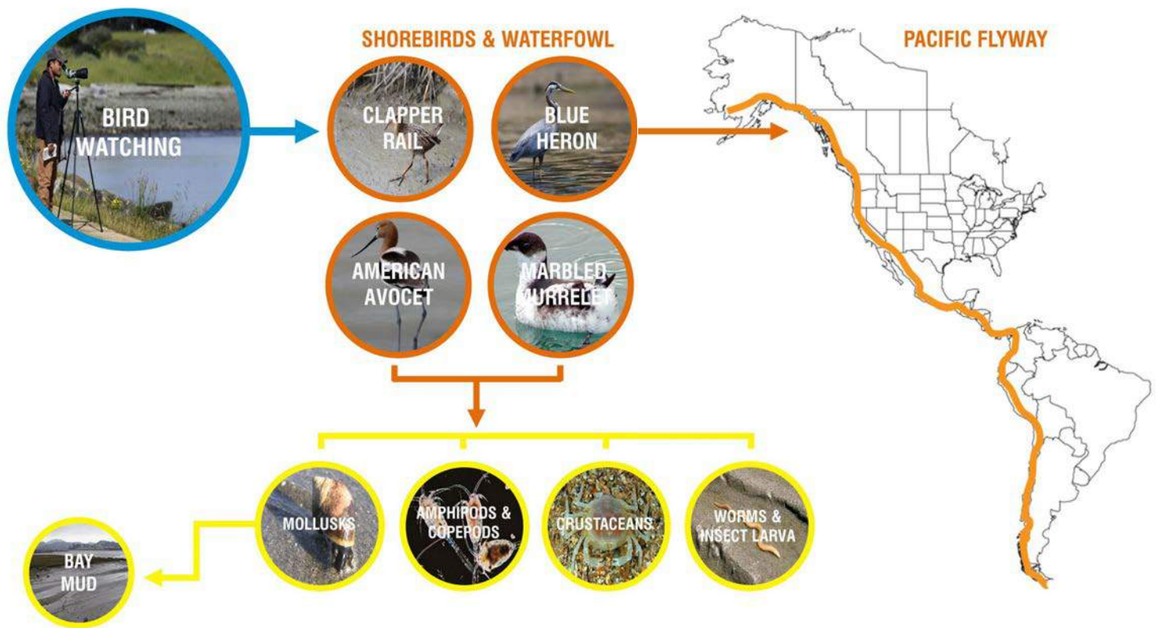
The findings of the technical studies informed design strategies. The key technical findings and strategies are outlined in this chapter. Chapter 7 - Appendix includes the full technical study reports.

Basin Context



EXISTING CONDITION

India Basin is part of the San Francisco Bay Estuary. It is also a critical site centrally located on the Pacific Coast Flyway, and serves as a feeding, nesting, and resting ground for thousands of Pacific Coast bird species. The basin is already home to a rich and diverse food chain of species that make the waterfront a unique place to visit and recreate.



Habitats & Wetlands

EXISTING CONDITION

The Biological Assessment Report found numerous species currently existing in India Basin. No significant or endangered species were found within the focus area. The Basin has 4 areas identified as wetlands and tidal marshes. They vary in size and habitat quality.

STRATEGY

Identify opportunities to enhance or create wetlands and a range of habitats throughout the basin.

Respect existing habitats and species throughout the design and construction process.

Species found in India Basin.

Wetland areas of India Basin.

Wave Energy & Erosion

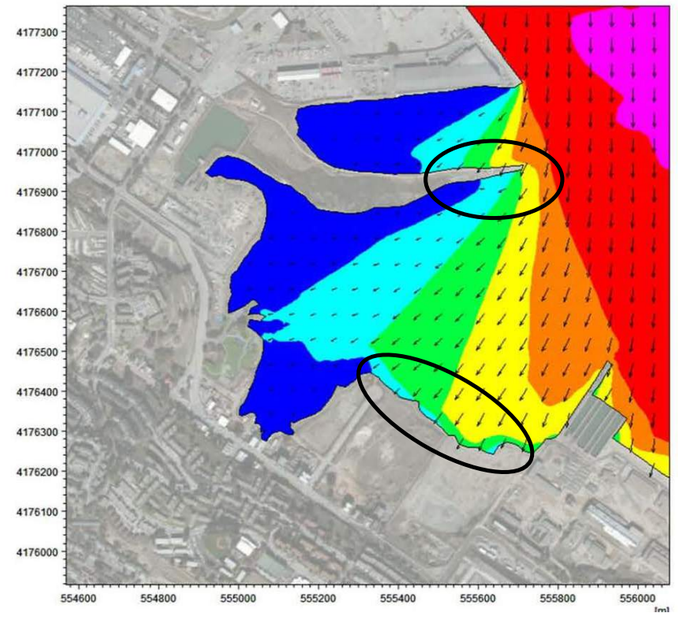
EXISTING CONDITION

The Coastal Processes Study found that wave energy enters the basin from 2 primary directions. Continued wave energy is causing apparent shoreline erosion in the areas identified.

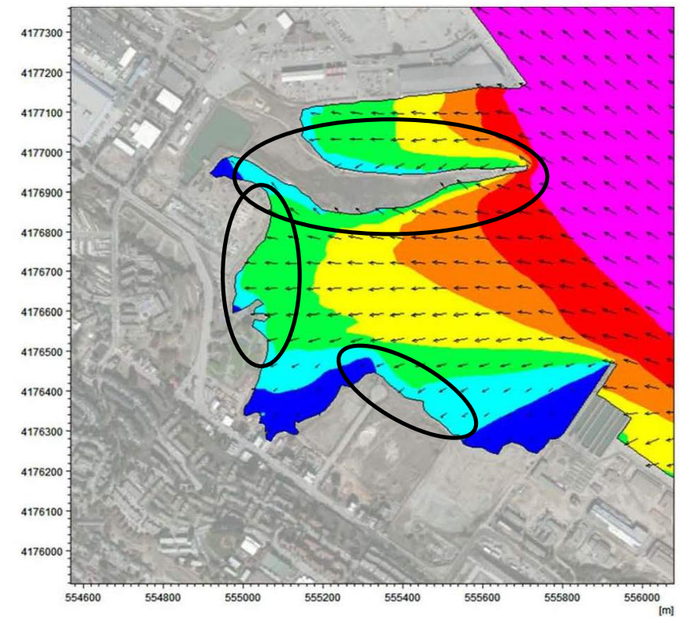
STRATEGY

Use living shoreline projects to test for erosion control, wave attenuation, habitat improvement and creation.

Source: Coastal Processes Report, Moffat & Nichol, India Basin Waterfront Study



Primary wave direction and areas subject to erosion.



Wave direction and areas subject to erosion during a 50-year storm event.

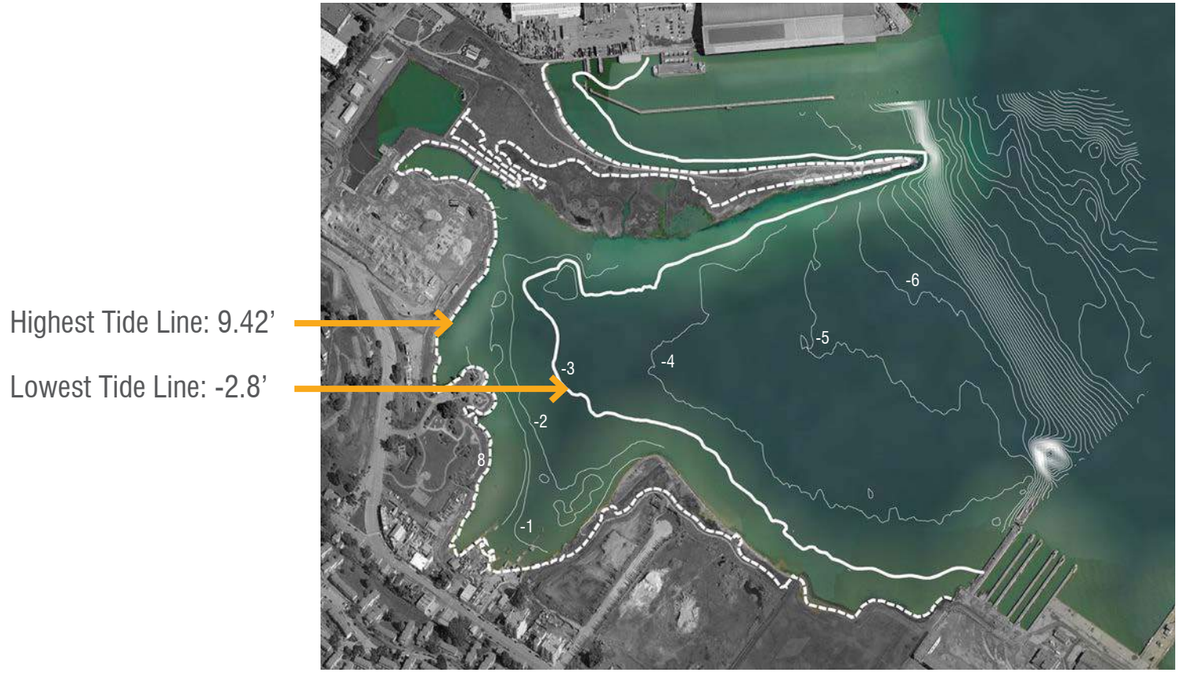
Bathymetry & Boat Launches

EXISTING CONDITION

A bathymetry study measured the depth of the basin at 1’ contour intervals. The study found that the basin is relatively shallow. At the lowest tide, the mud line is offshore by at least 40’ in all locations, often further.

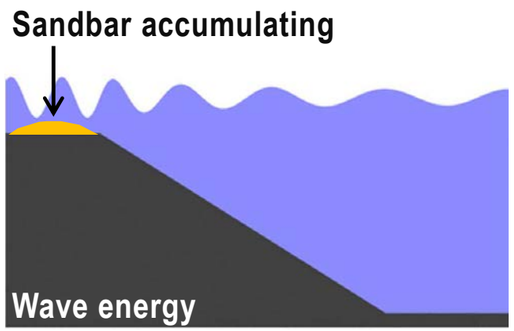
STRATEGY

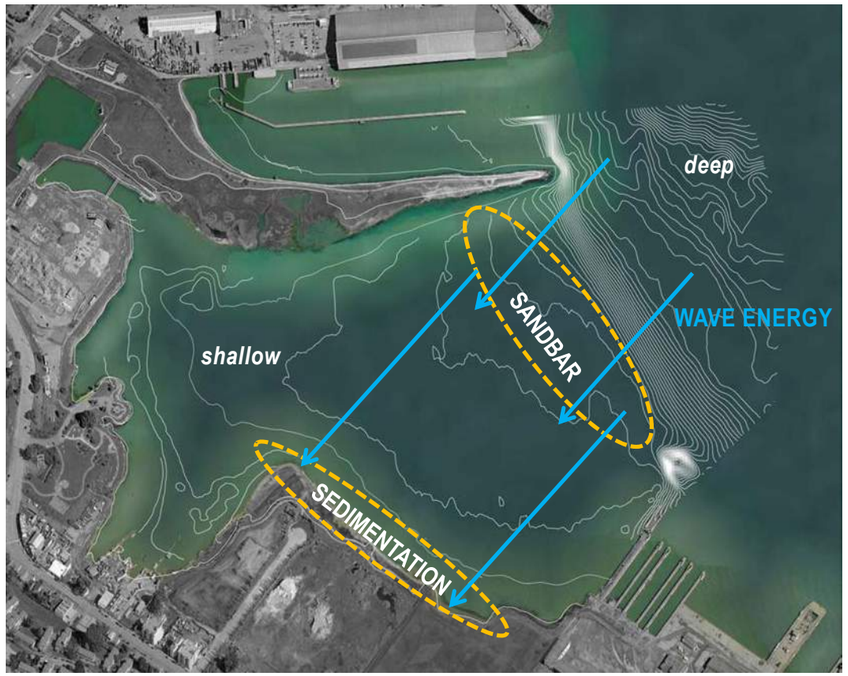
Locate human-powered boat launches throughout the basin where the lowest tide line is closest to the shoreline. This study found that a boat launch should likely be located at the tip of India Basin Shoreline Park and India Basin Open Space.



Bathymetry: 1’ contour intervals. (Datum: NAVD 88)

Potential locations for human-powered boat launches.





Shoaling & sedimentation occurring in the Basin.

Shoaling & Sedimentation

EXISTING CONDITION

The coastal processes study found that the wave energy and direction is resulting in an offshore sandbar through the process of shoaling. Shoaling is defined as:

(n) sandbank or sand bar in a shallow water body

(v) to become shallow as a result of wave energy

Due to the bathymetry of the basin and the sandbar accumulation, sedimentation is occurring on the Northeast shoreline of India Basin Open Space.

STRATEGY

Design to accommodate natural sedimentation processes of the basin. Enhance existing sand dunes on the Northeast shoreline and consider the opportunity to create a public access beach where regulations permit.

Sea Level Rise

EXISTING CONDITION

Sea level rise analysis was conducted throughout the basin to determine which portions of the shoreline may be impacted by projected sea level rise conditions. According to BCDC and One SF, the “Most Likely Scenario” should be used for long term planning. The “Worst Case Scenario” is predicted at 69” above mean sea level.

“MOST LIKELY SCENARIO”
2100 = 26” to 46” above existing mean sea level

STRATEGY

Anticipate that short-term investments located near the shoreline may need to be relocated upland in the future given long-term sea level rise. Identify locations for future habitat creation.

Sources:
**One SF: “Guidance for Incorporating Sea Level Rise Into Capital Planning in San Francisco”, 2014*
**BCDC: Sea Level Rise Policies Fact Sheet*

2100 +46”
2100 +26”
Existing Sea Level

Existing Sea Level Rise

2100: +26”

2100: +46”

Predicted 100-year storm flood conditions.

Flooding & Storm Surge

EXISTING CONDITION

According to the Coastal Processes Study, The FEMA flood prediction for the 100-year storm event today and in the future with the assumed worst case scenario will impact the shoreline in numerous locations throughout the Basin.

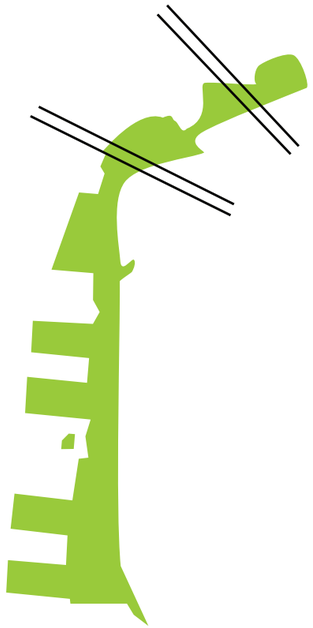
STRATEGY

Locate all major capital improvements at or above elevation 20' (NAVD 88) or raise elevations where feasible. These may include utilities, roads, restrooms, permanent structures and facilities, infrastructure, and bridges. Identify soft-edge strategies for shoreline protection and wave energy dissipation.

Elevation+20' will site above projected flooding.

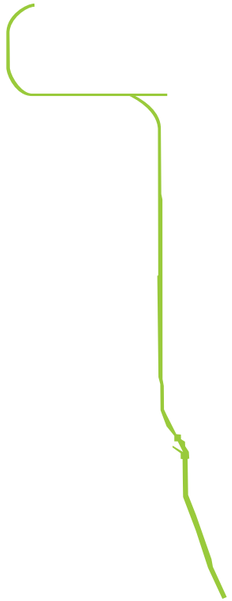
CONTEXT

INDIA BASIN
63 ACRES
1.5 MILES



BROOKLYN BRIDGE PARK
85 ACRES
1.3 MILES

SEATTLE WATERFRONT
2 MILES

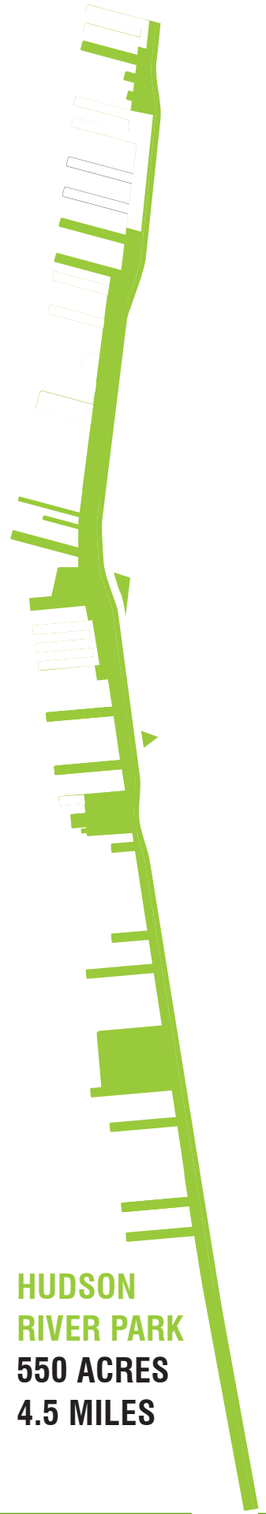


HIGHLINE
9 ACRES
1.5 MILE

CRISSY FIELD
130 ACRES
1.5 MILES

GOVER-NOR'S ISLAND
87 ACRES

SOUTH LAKE UNION PARK
12 ACRES



HUDSON RIVER PARK
550 ACRES
4.5 MILES

Precedents

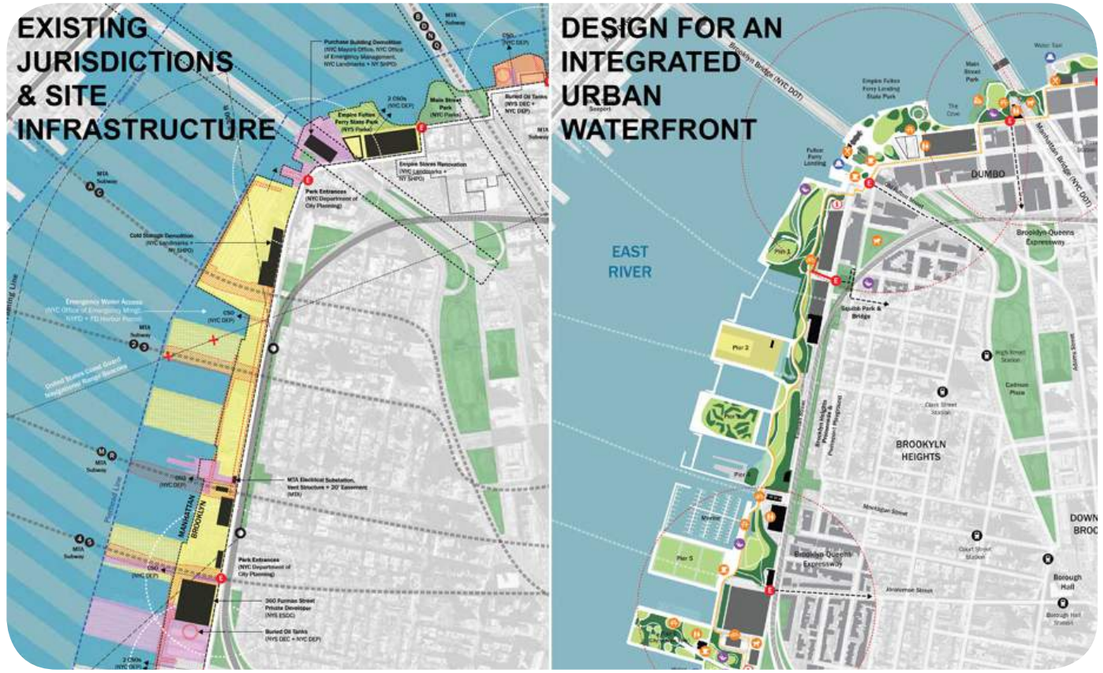
Precedent studies of parks, open spaces, and trails in the following categories were studied as models for India Basin:

Legacy Waterfront Parks
21st Century Park Systems
Destinations & Great Parks
Coordinated & Complex Sites
“Future Proofed” & Resilient Landscapes

These studies informed the goals and programming for the waterfront. They suggest operational and economic models for creating a successful waterfront in India Basin.

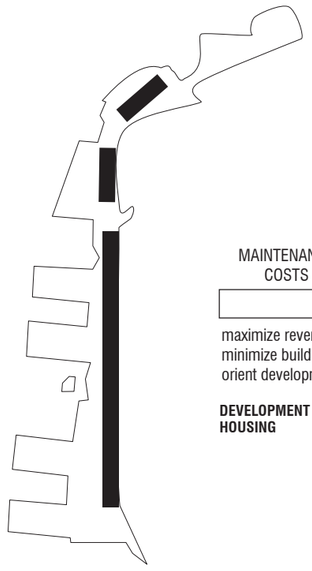
Brookly Bridge Park, NY

PLANNING



PROGRAM & ELEMENTS

ECONOMIC SELF-SUFFICIENCY MODEL

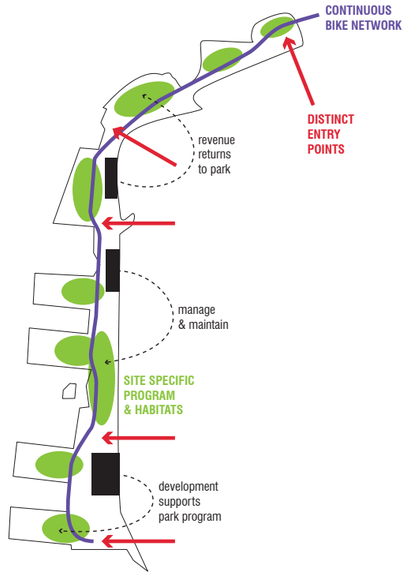


DEVELOPMENT =
20% of PARK

MAINTENANCE COSTS = SITE GENERATED REVENUE

maximize revenue
minimize building footprint
orient development towards park mission & program

DEVELOPMENT = ADJACENT HOUSING



DEVELOPMENT =
9% of PARK

BROOKLYN BRIDGE PARK
85 ACRES
1.3 MILES

SIMILARITIES TO INDIA BASIN

- post-industrial waterfront
- coordinated / complex ownership
- soil contamination
- structural limitations
- isolation
- harsh winds
- sun exposure

PROJECT GOALS

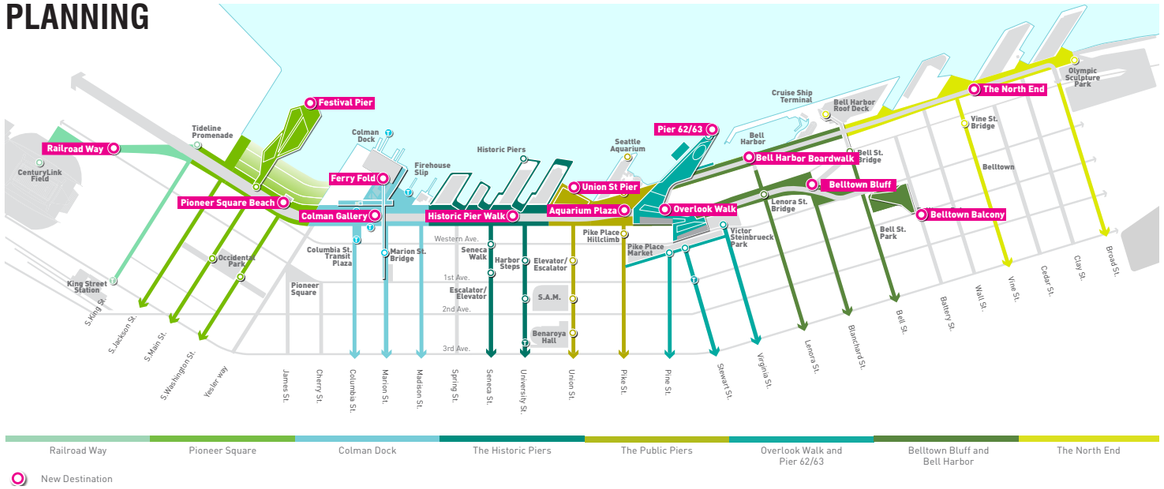
allow site's emotional power and intensity to resonate in a new ecologically, socially, and economically sustainable park setting

PLANNING & ECONOMIC STRATEGIES

- establish urban junctions as entry points
- economic self-sufficiency
- preserve / reuse marine structures
- create diverse natural areas
- treat stormwater on site

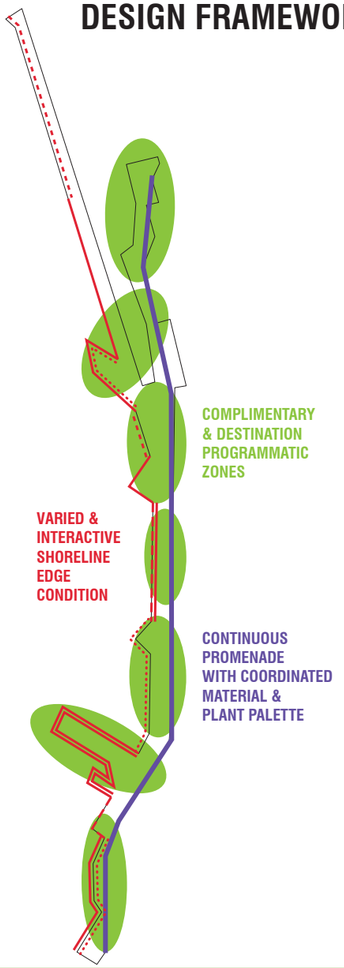
Seattle Waterfront, WA

PLANNING

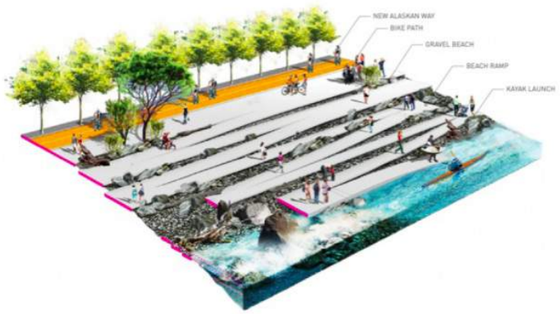


SEATTLE WATERFRONT
2 MILES

DESIGN FRAMEWORK & PROGRAMMATIC MODEL



PROGRAM & ELEMENTS



SIMILARITIES TO INDIA BASIN

- post-industrial waterfront
- coordinated / complex ownership
- sea level rise implications

PROJECT GOALS

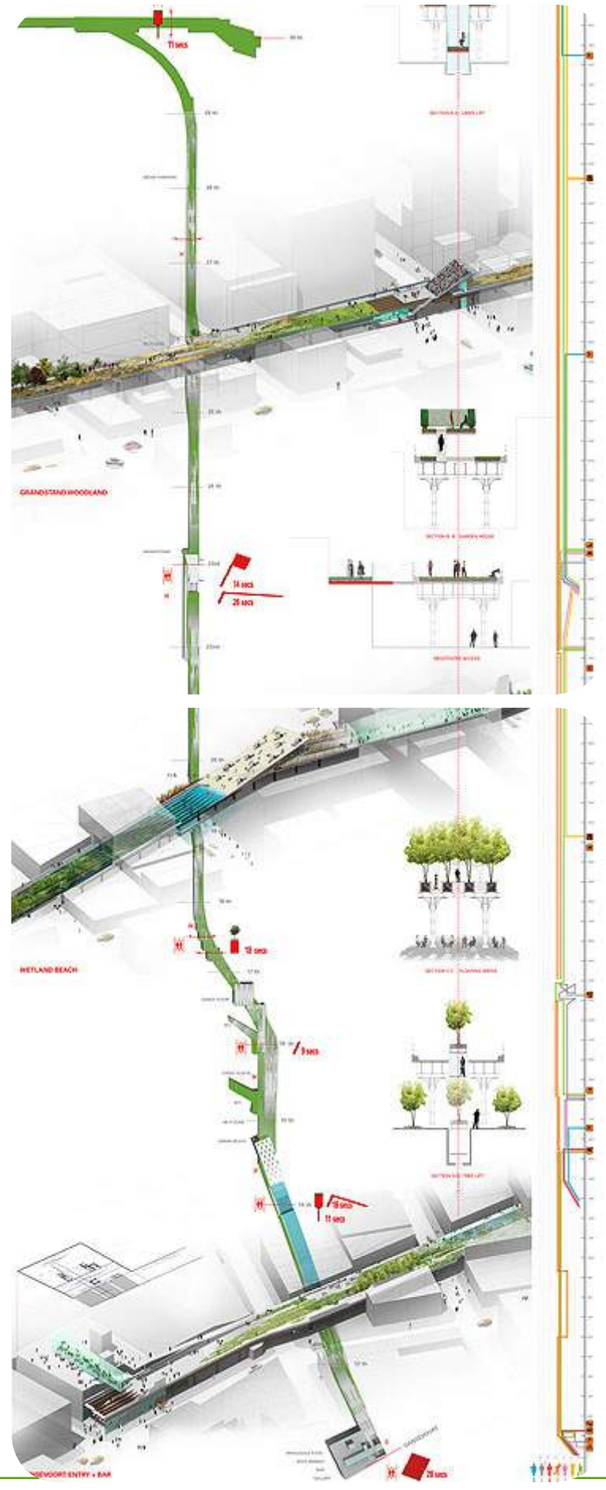
Create a waterfront for all that reconnects the city to its waterfront, embraces and celebrates the past, and creates a bold vision that is adaptable over time.

PLANNING & ECONOMIC STRATEGIES

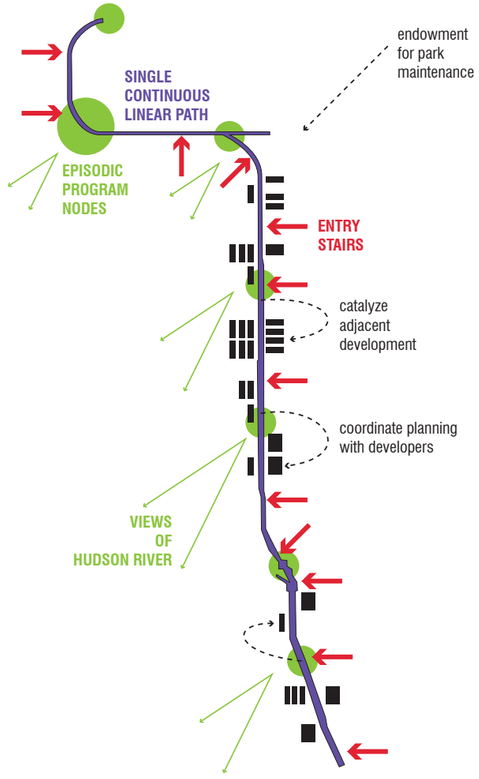
- organized zones of programmatic focus with destination programs that enhance views and experiences of the Bay
- great urban street / promenade as spine with coordinated material & plant palette
- art plan that reveals the unique / historical character & identity of the site
- coordinated activity & event programming
- resilient sea wall is interpretive & varied with interactive shoreline edge conditions

High Line, NY

PLANNING



FRAMEWORK & ECONOMIC STRATEGY



HIGHLINE
9 ACRES
1.5 MILE

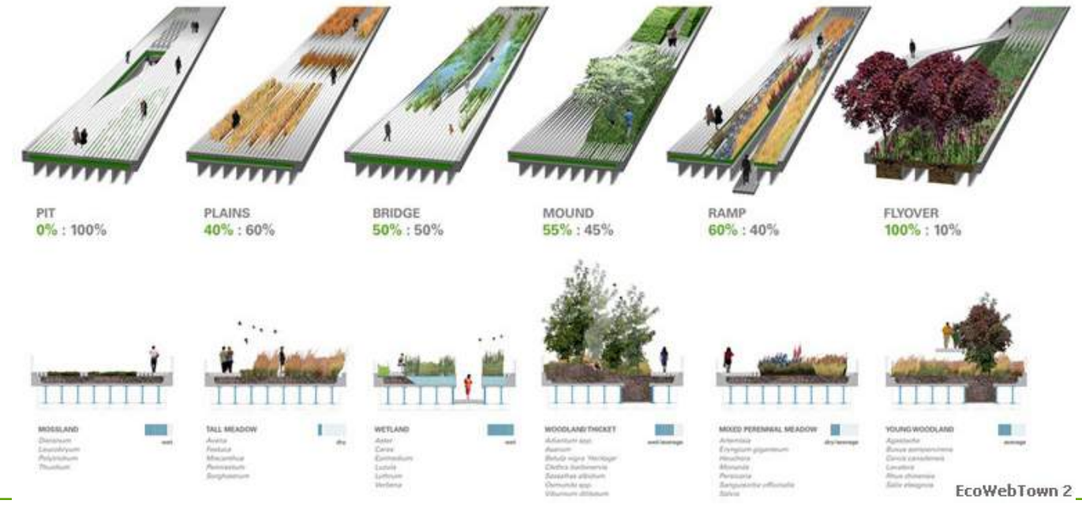
SIMILARITIES TO INDIA BASIN

- post-industrial
- coordinated / complex ownership
- structural limitations
- isolation

PROJECT GOALS

retrofit the existing structure, retain historic elements, and create a one-of-a-kind recreational amenity and public promenade that is coordinated with adjacent development for economic potential and stimulation

PROGRAM & ELEMENTS



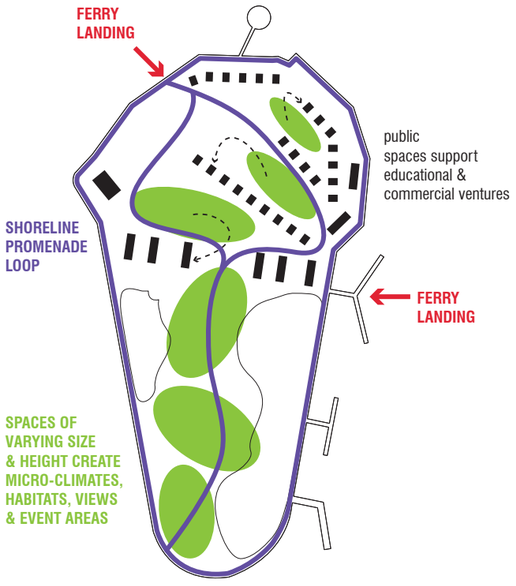
PLANNING & ECONOMIC STRATEGIES

- continuous paving & planting system for varying ratio of hard to soft surfaces
- planting that is “wild” in character
- episodic & sequential public spaces along linear path
- endowment for park maintenance

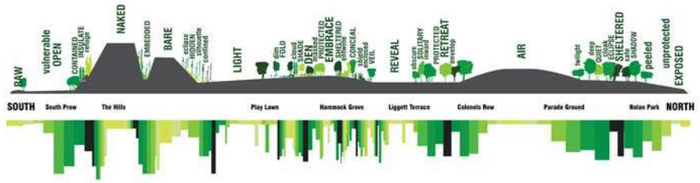
Governor’s Island

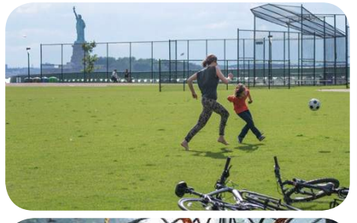
PLANNING

FRAMEWORK



PROGRAM & ELEMENTS





GOVERNOR'S ISLAND
87 ACRES
2.2 MILES

SIMILARITIES TO INDIA BASIN

- landfill, vacant property
- isolated
- serene and quiet
- strong currents and wind

PROJECT GOALS

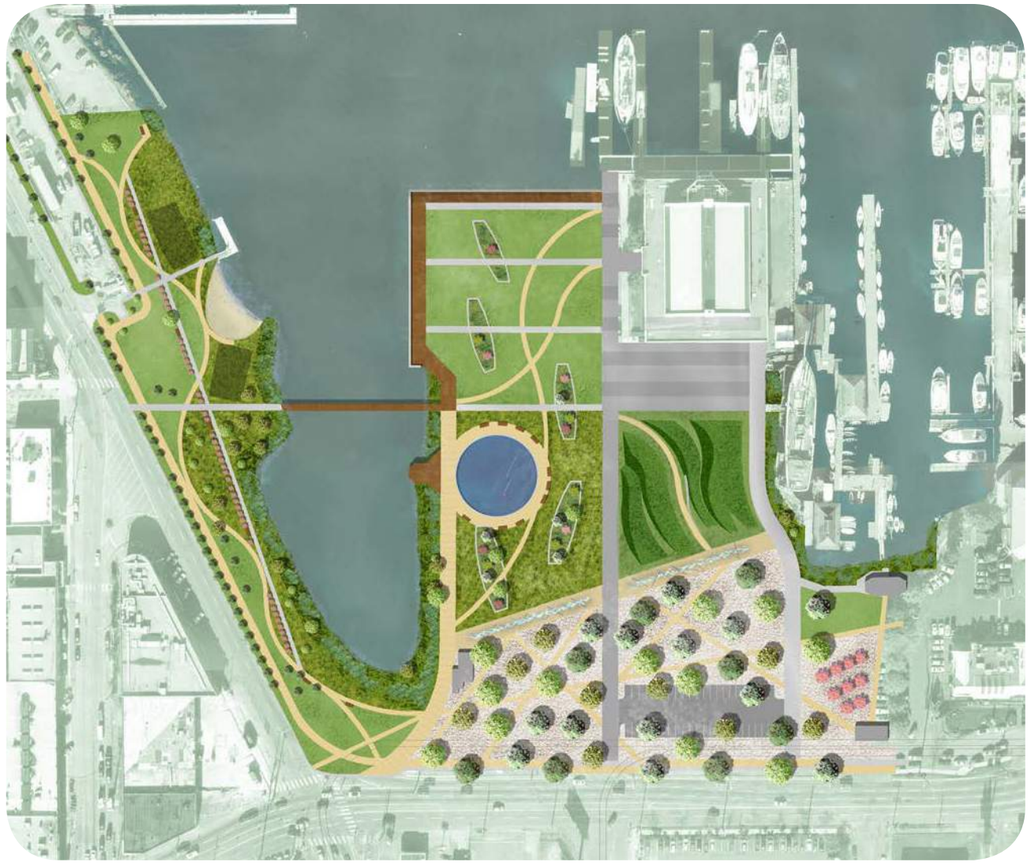
create a destination landmark with an extraordinary vantage point of New York Harbor, and the chance to experience the sensations of a green Island surrounded by water and sky

PLANNING & ECONOMIC STRATEGIES

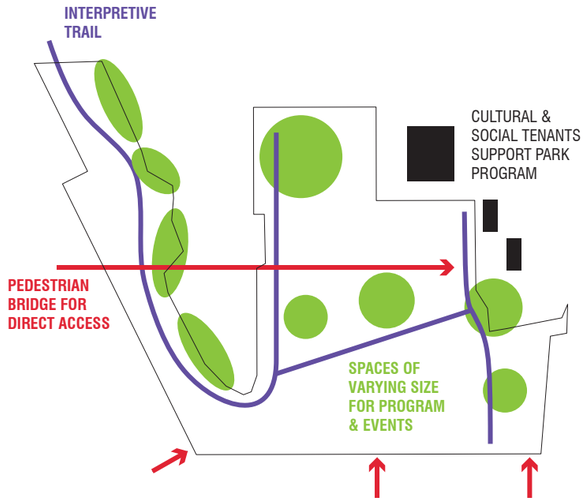
- continuous waterfront promenade
- high & low points for varied micro-climates, habitats, views, and experiences
- customized paving, furniture, and signage unique to the place
- elevated above 100-year sea level rise
- park spaces support educational, not-for-profit and commercial ventures

Lake Union Park, WA

PLANNING



FRAMEWORK



PROGRAM & ELEMENTS

SOUTH LAKE UNION PARK
12 ACRES

SIMILARITIES TO INDIA BASIN

- post-industrial waterfront
- coordinated
- soil contamination
- boat program

PROJECT GOALS

optimize the site to provide access to water and green space, connect the surrounding neighborhoods, and celebrate the cultural,industrial, and maritime heritage of the city and region

PLANNING & ECONOMIC STRATEGIES

- Historic Ships Wharf
- restored shoreline / wetlands
- model boat pond
- history trail
- fountain for all ages & abilities
- human powered boat launch beach
- state-of-the-art Center for Wooden Boats
- event space
- Museum of History and Industry

Enjoy

Intertwine, WA

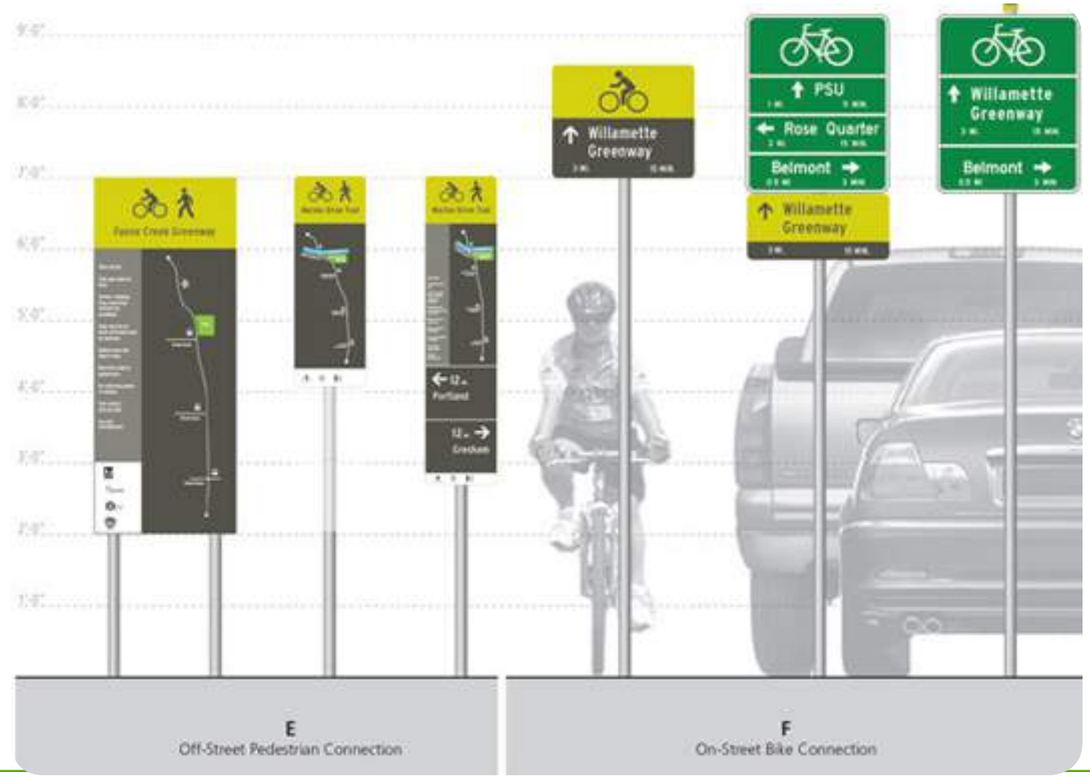
SPLISH
SPLASH

PACK A
PICNIC

HIKE
BIKE
FLY A KITE

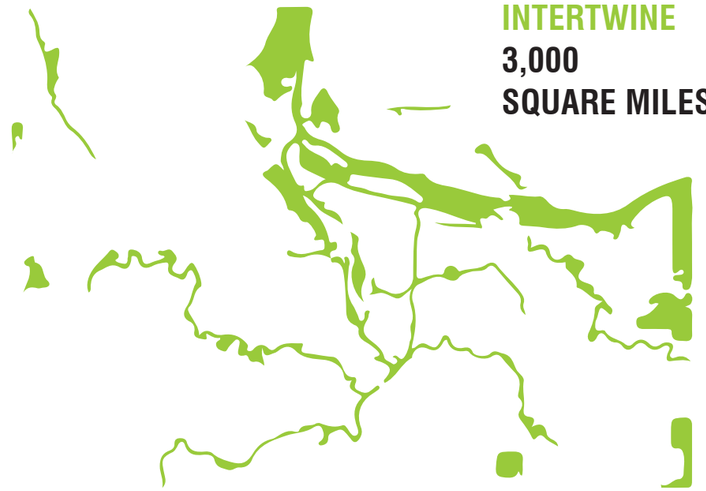
BRANDING SIGNAGE & WAYFINDING

PROGRAM & ELEMENTS



INDIA BASIN
63 ACRES
1.5 MILES

INTERTWINE
3,000
SQUARE MILES



SIMILARITIES TO INDIA BASIN

- unique coalition of public, private, and nonprofit organizations
- network of parks & trails of different shapes, sizes & programs

PROJECT GOALS

create a cohesive and complete network of parks, trails, and natural areas for the Portland / Vancouver region

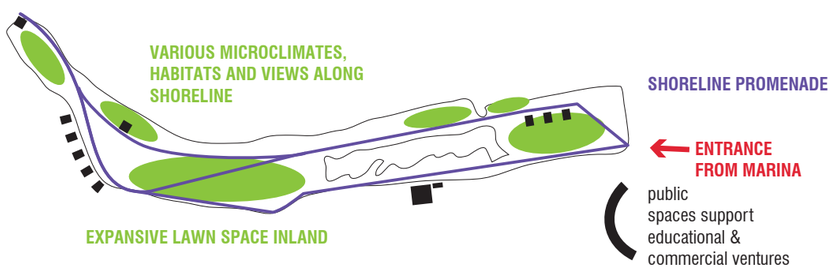
PLANNING & ECONOMIC STRATEGIES

- coalition to tap new sources of funding, better leverage existing investments, and more fully engage residents with the outdoors and nature
- coordinated signage and wayfinding throughout the system
- clear brand & identity for open space system

Crissy Field, CA

PLANNING & DESIGN

FRAMEWORK



CRISSY FIELD
130 ACRES
1.5 MILES

PROGRAM & ELEMENTS

SIMILARITIES TO INDIA BASIN

- continuous waterfront
- San Francisco Open Space

PROJECT GOALS

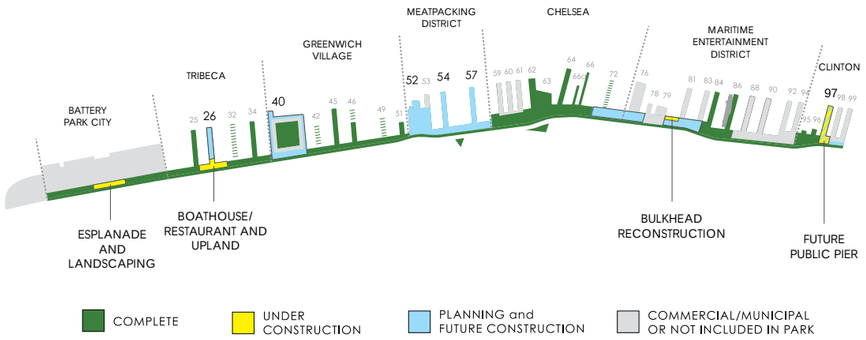
integrate a diversity of natural landscapes and recreational uses with a vigorous and dynamic environment, all within the context of an enduring historical landmark.

PLANNING & ECONOMIC STRATEGIES

- coalition to tap new sources of funding, better leverage existing investments, and more fully engage residents with the outdoors and nature
- coordinated signage and wayfinding throughout the system
- clear brand & identity for open space system

Hudson River Park, NY

PLANNING & DESIGN



HUDSON RIVER PARK

130 ACRES

1.5 MILES

PROGRAM & ELEMENTS

SIMILARITIES TO INDIA BASIN

- continuous waterfront
- many different owners

PROJECT GOALS

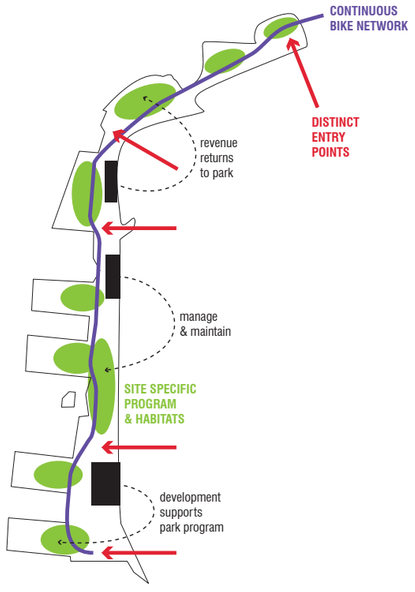
goal was to create a waterfront that would serve the city following the loss of maritime industry and also act as a marine sanctuary

- largest open space construction project in NYC since Central Park

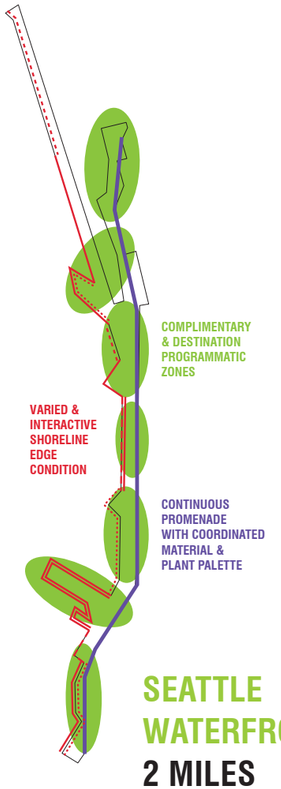
PLANNING & ECONOMIC STRATEGIES

- managed by Hudson River Park Trust
- confines commercial space to 4 distinct nodes along the park
- O + M funded through income generated within the park area by rents from commercial tenants, fees concession revenues, grants and donations, capital projects funded by city, state, and federal sources
- private funding via Friends of Hudson River Park

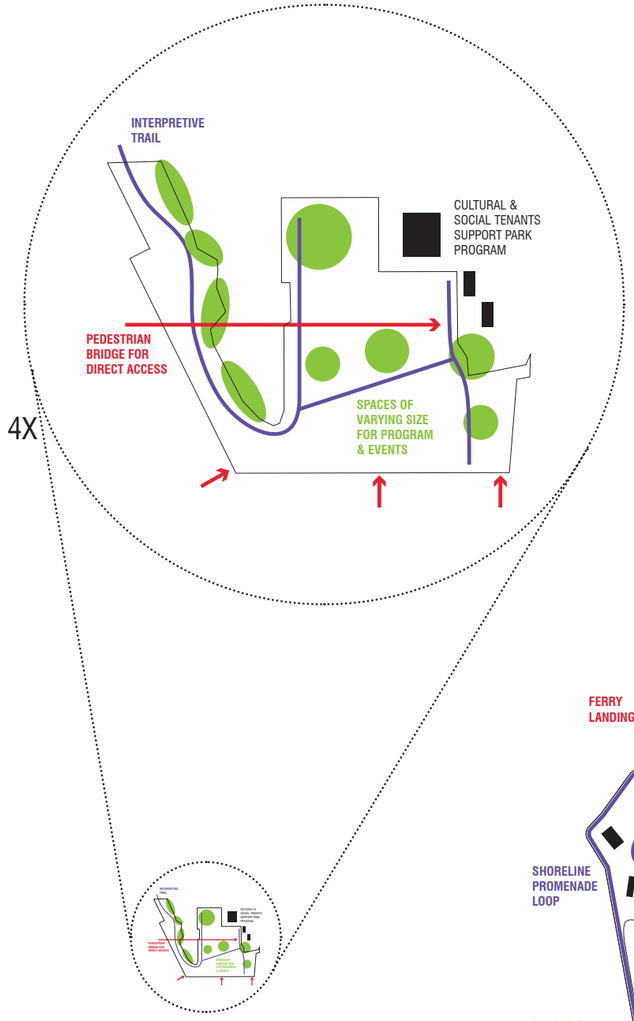
Precedent Program



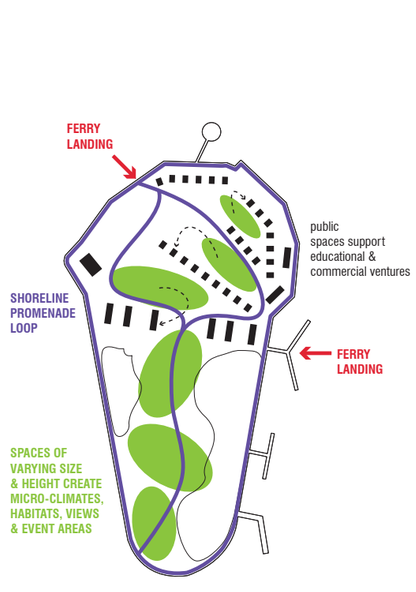
BROOKLYN BRIDGE PARK
85 ACRES
1.3 MILES



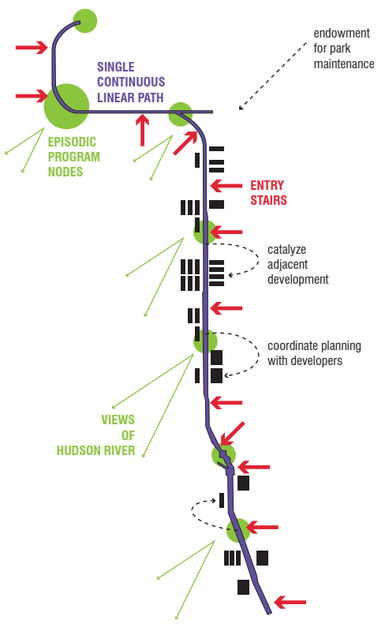
SEATTLE WATERFRONT
2 MILES



SOUTH LAKE UNION PARK
12 ACRES



GOVER-NOR'S ISLAND
87 ACRES



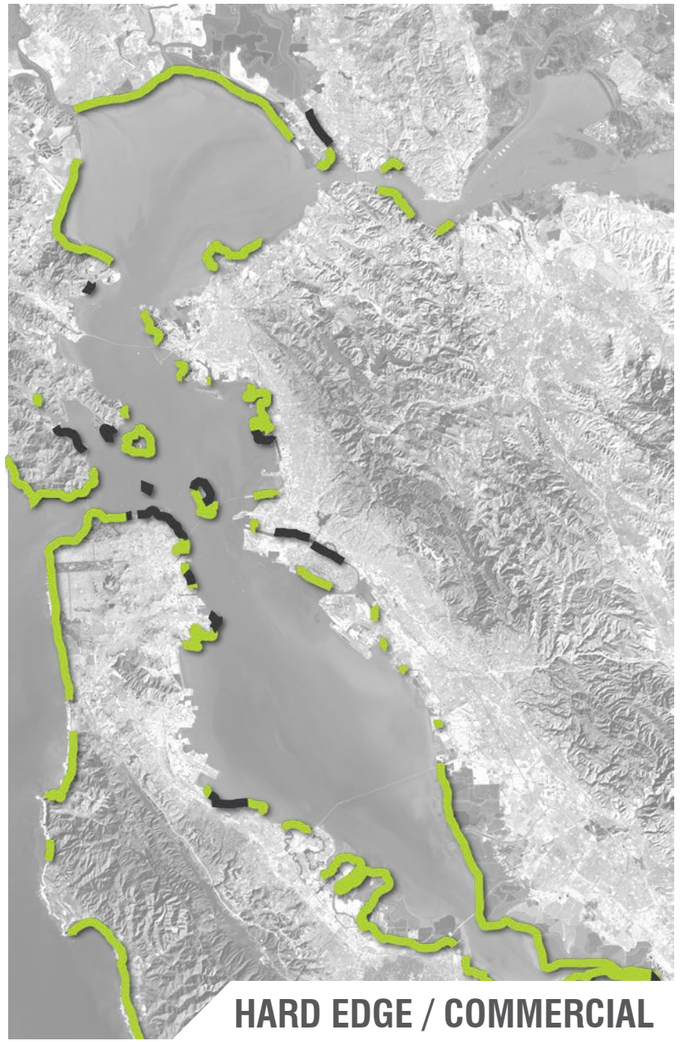
HIGHLINE
9 ACRES
1.5 MILE

Regional Context

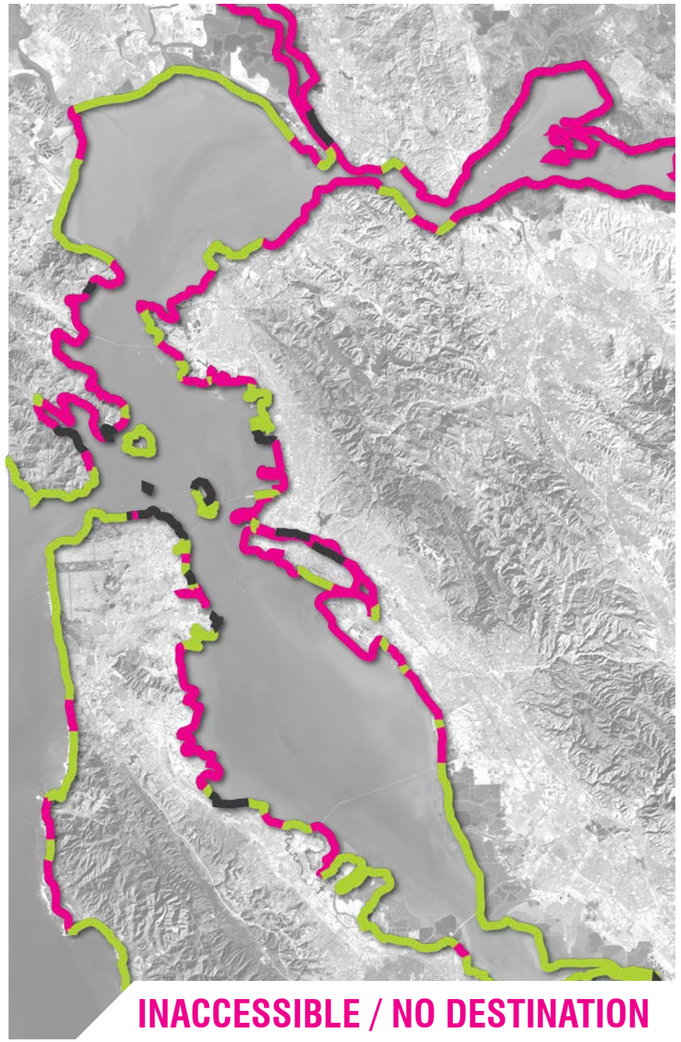
The San Francisco Bay waterfront at a regional scale is composed of primarily 3 types of shorelines: a soft edge with passive recreation hard edges with commercial or maritime uses, and shorelines that are inaccessible or consist on a passive trail with no destination or attraction. A 4th type of shoreline exists in a few distinct places throughout the Bay: soft edge with active recreation.

What type of shoreline edge would make the India Basin Waterfront unique and a destination park in the context of the region?

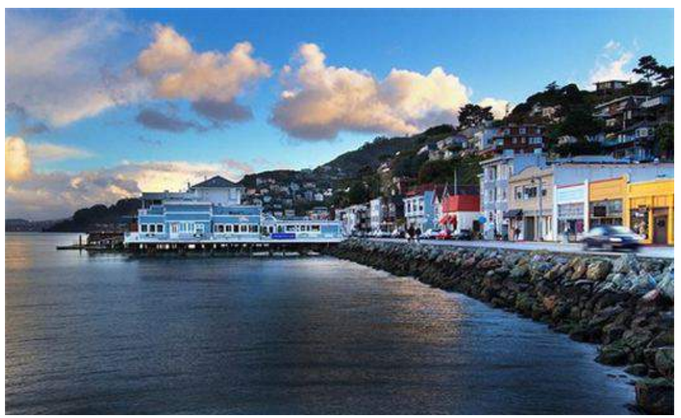
SOFT EDGE / PASSIVE RECREATION



HARD EDGE / COMMERCIAL



INACCESSIBLE / NO DESTINATION



City Context

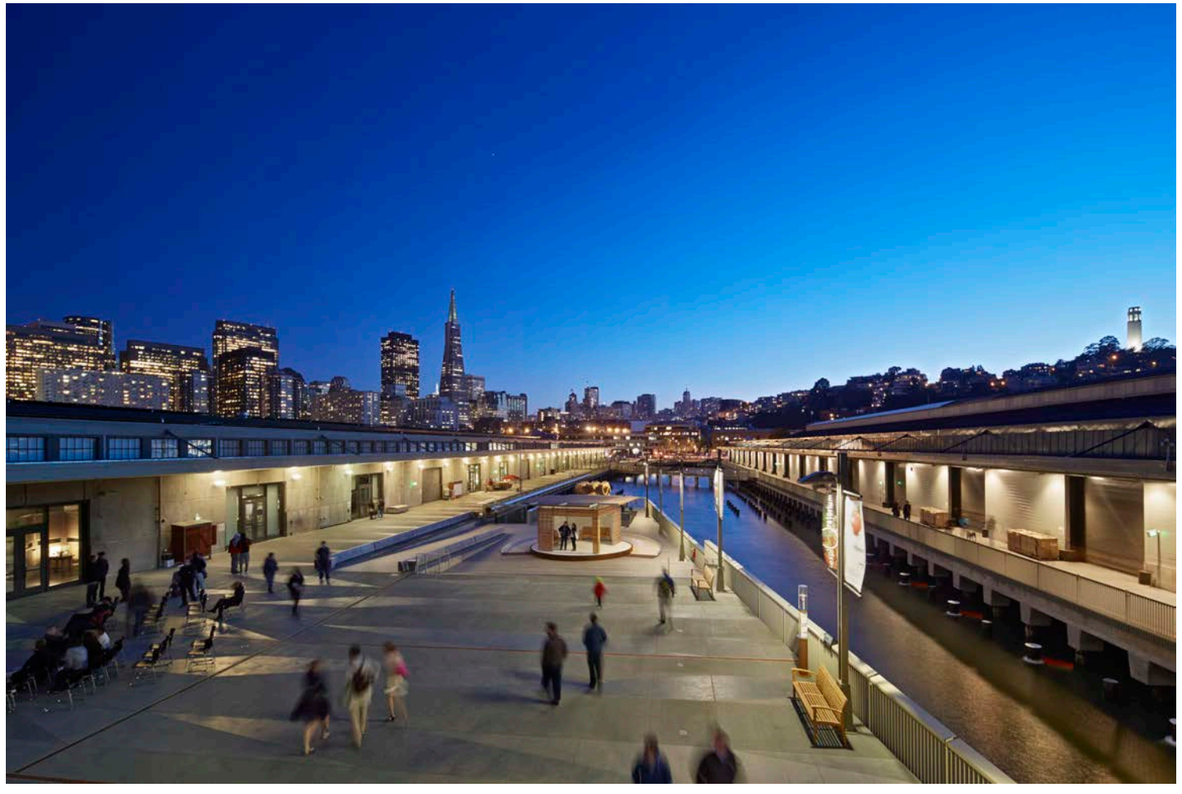
At a City Scale, San Francisco is composed of primarily 2 types of shorelines: a soft edge with passive recreation and a hard edge with commercial uses. As a new, unique legacy waterfront park for the city, the India Basin Waterfront should be a combination of both hard and soft edges.

HARD SOFT

INDIA BASIN

SOFT EDGE / PASSIVE RECREATION

HARD EDGE / COMMERCIAL

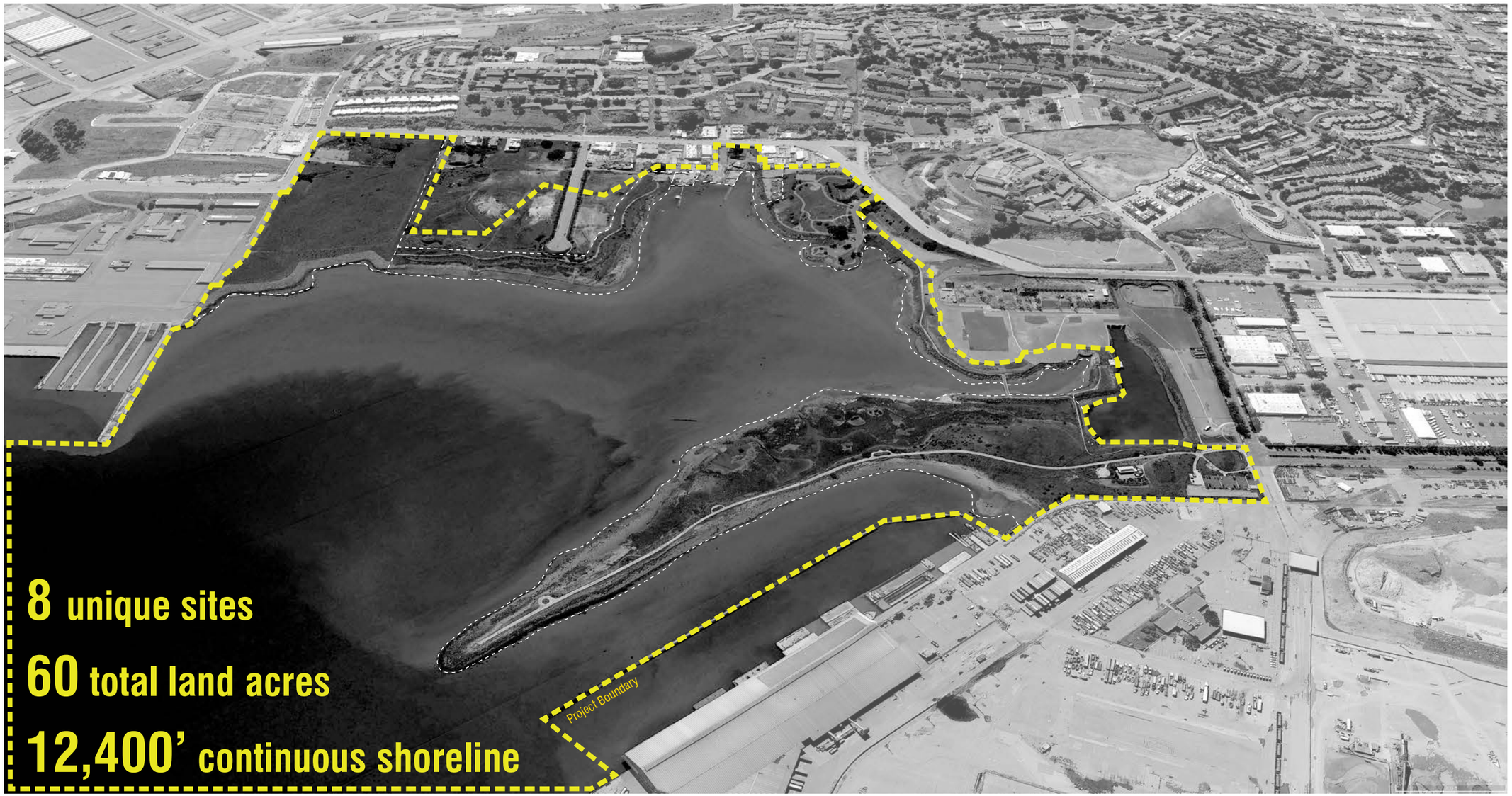


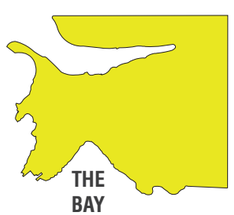

NORTHSIDE PARK
700 INNES
INDIA BASIN OPEN SPACE
96

BASIN ASSETS & ANALYSIS

Sites

The India Basin Waterfront is composed of 7 unique landside sites that equate to approximately 60 total land acres and over 12,000 feet of continuous shoreline. The Bay itself is the 8th site.





THE BAY

NORTHSIDE PARK

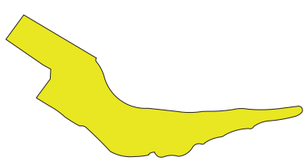
THE BIG GREEN

INDIA BASIN OPEN SPACE

900 INNES

INDIA BASIN SHORELINE PARK

HUNTERS POINT SHORELINE



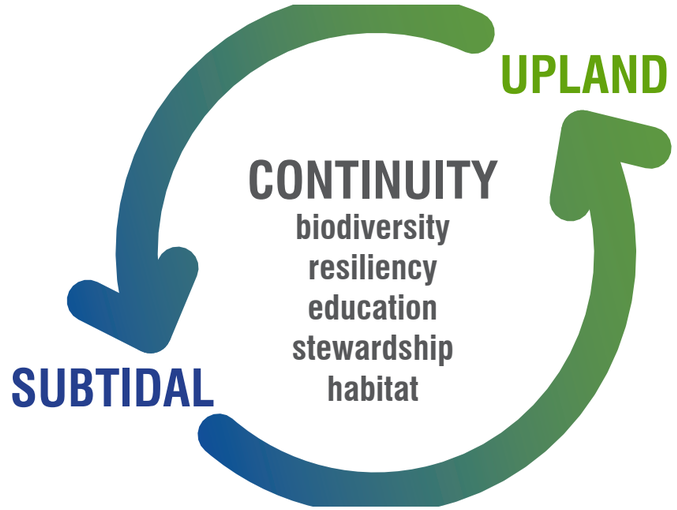
HERON’S HEAD PARK

Continuity

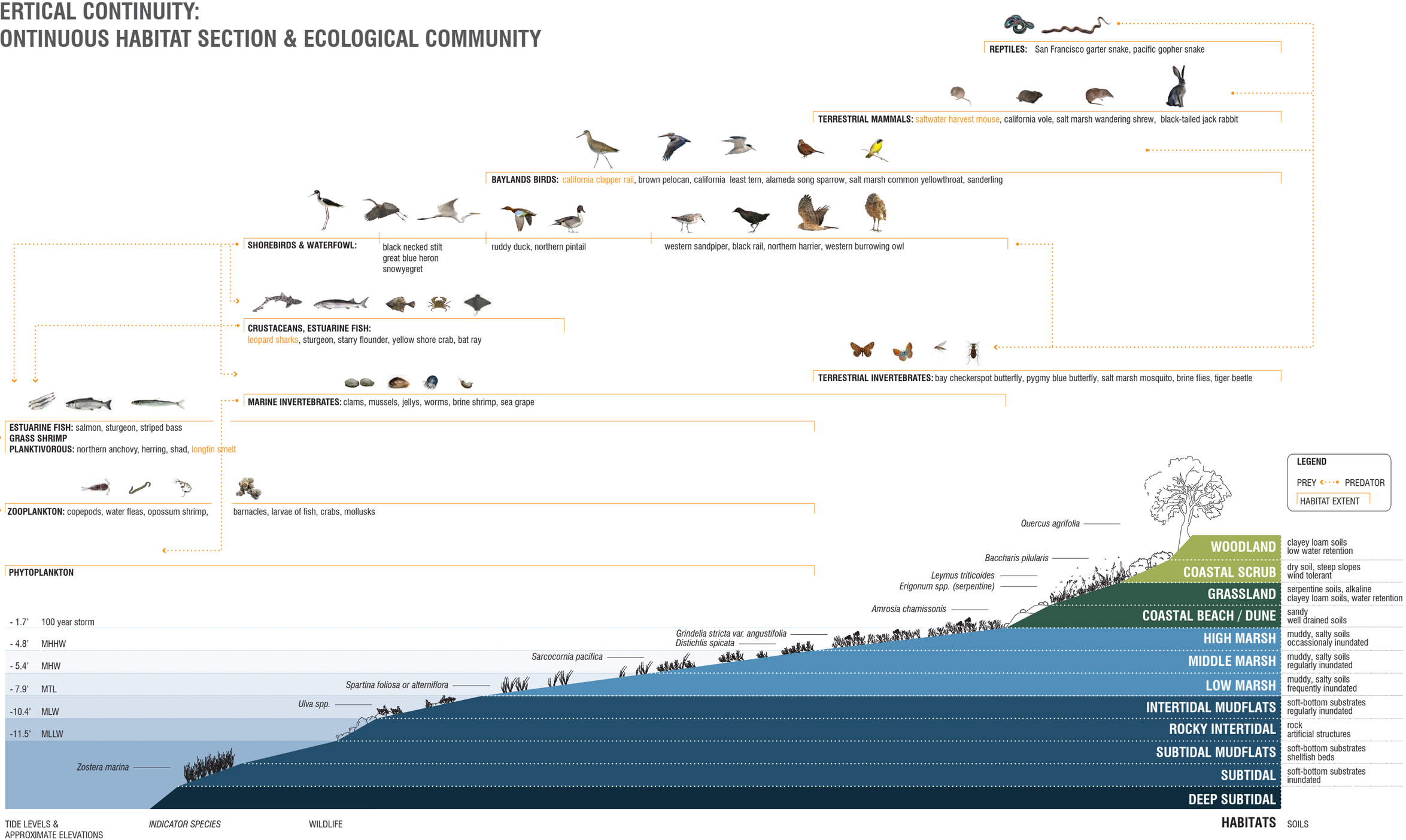
Adjacency and continuity is rare in urban landscapes. The adjacency of the India Basin Waterfront sites presents a unique opportunity for the Waterfront to become a rare amenity that offers not only public offerings but also unique and diverse ecologies. Both linear and vertical continuity can stimulate biodiversity, habitat, resiliency, opportunities for environmental education, and stewardship.

HORIZONTAL CONTINUITY

VERTICAL CONTINUITY



VERTICAL CONTINUITY:
CONTINUOUS HABITAT SECTION & ECOLOGICAL COMMUNITY



What Makes India Basin Unique?

The Basin is made up of many characteristics, physical assets and amenities that should be preserved and enhanced. These assets offer the potential to make the India Basin Waterfront a truly unique public open space and legacy waterfront park.


shorelines


naturally forming
habitats


waterfront
destination


cultural
history


views


industrial
heritage


encounters with
the water

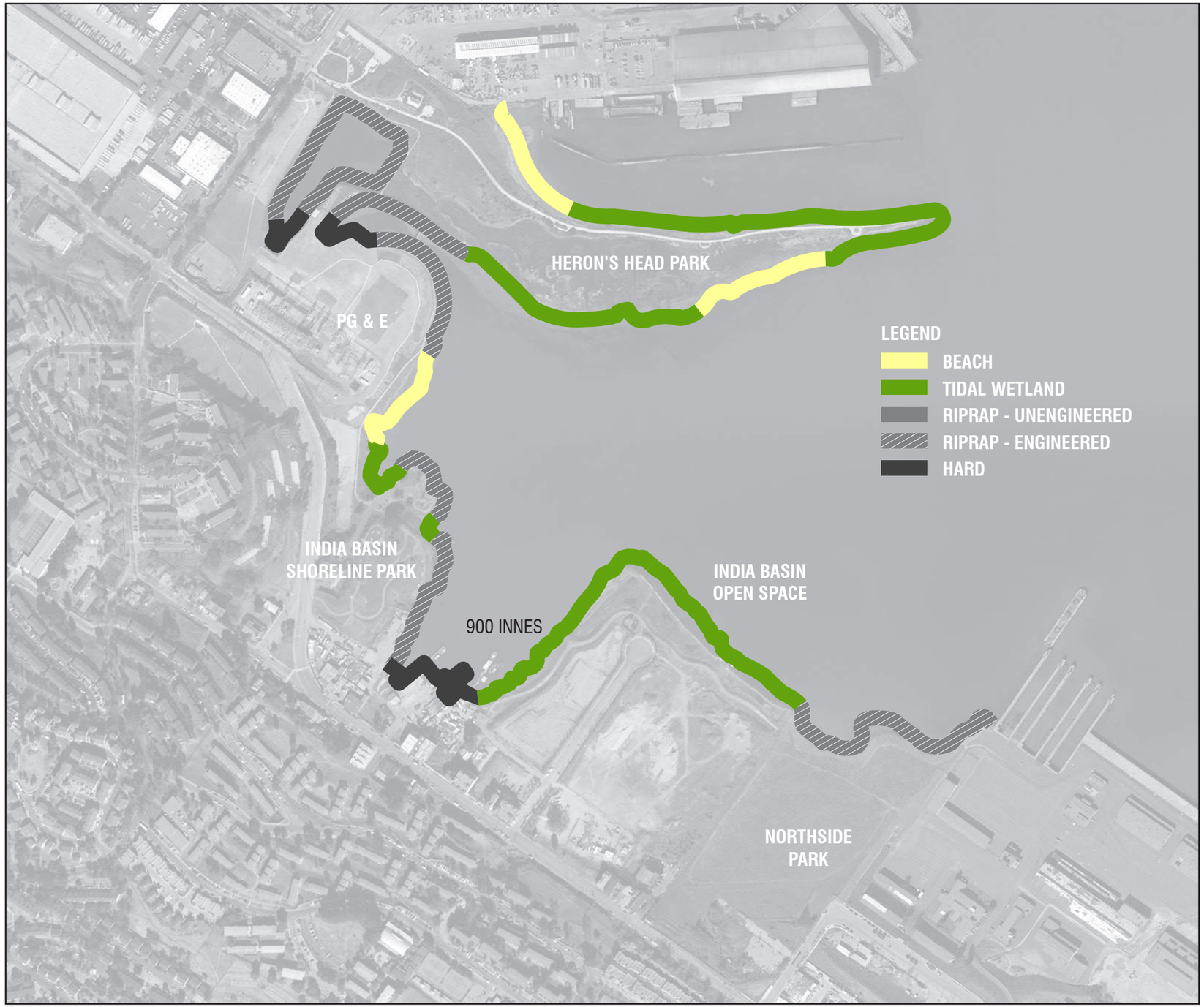

tidal
dynamics

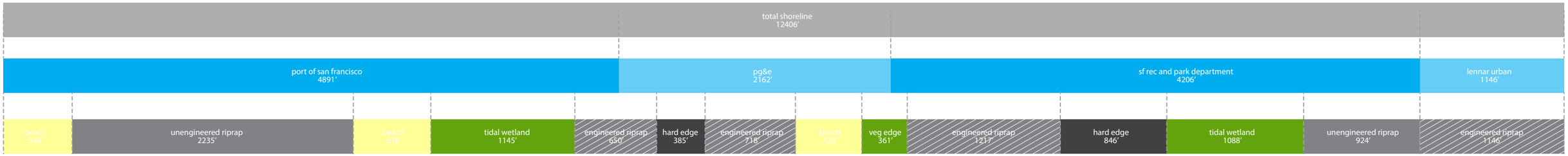

biodiversity

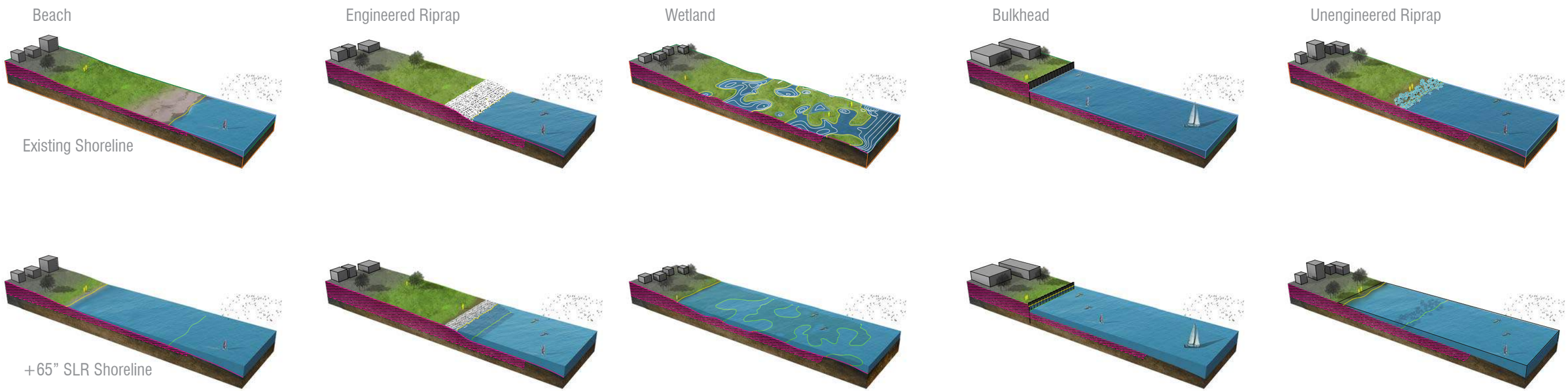

destinations

Existing Shoreline Conditions

Data was gathered to analyze the existing conditions of the shoreline. 5 types of shorelines were identified. Each type would require a different strategy for shoreline improvements.




total shoreline
12406'
port of san francisco
4891'
pg&e
2162'
sf rec and park department
4206'
lennar urban
1146'
beach
546'
unengineered riprap
2235'
beach
616'
tidal wetland
1145'
engineered riprap
650'
hard edge
385'
engineered riprap
718'
beach
528'
veg edge
361'
engineered riprap
1217'
hard edge
846'
tidal wetland
1088'
unengineered riprap
924'
engineered riprap
1146'

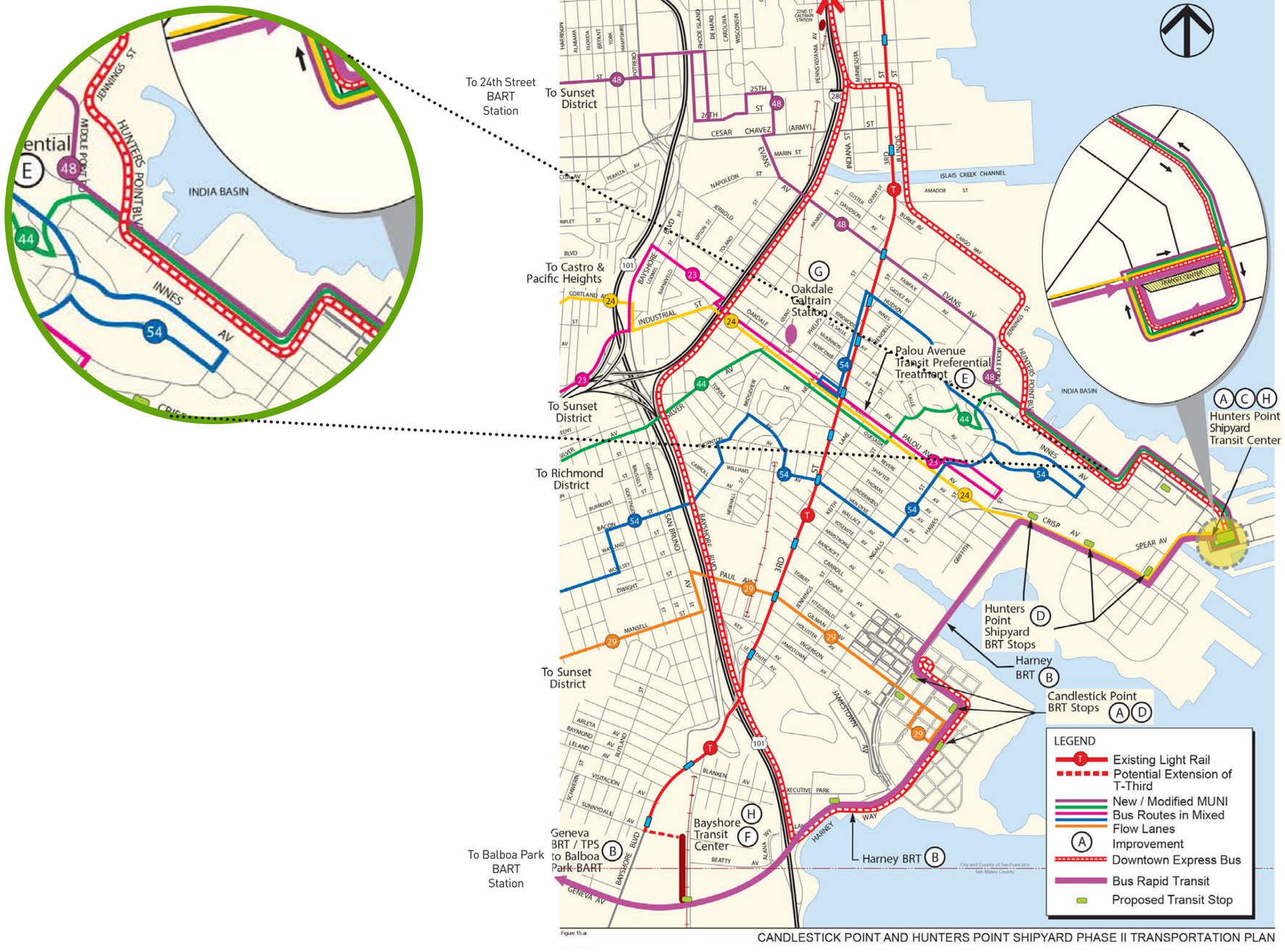

Beach
Engineered Riprap
Wetland
Bulkhead
Unengineered Riprap
Existing Shoreline
+65" SLR Shoreline

ACCESS & CIRCULATION

HPS TRANSPORTATION PLAN

The Hunter's Point Shipyard / Candlestick Point Transportation Plan studied the primary public transportation options for future access to India Basin.

Credits: Lennar Urban.



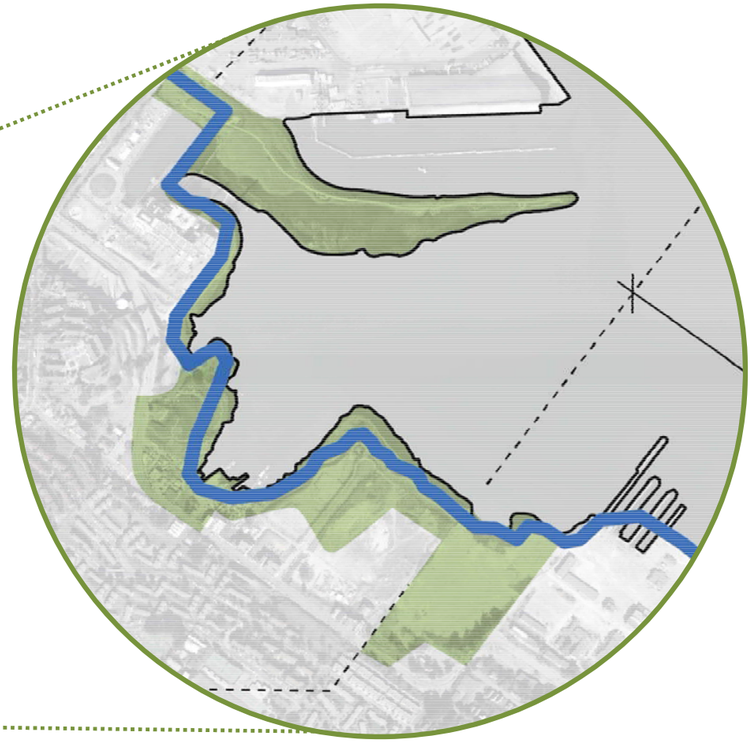
FUTURE TRANSIT ROUTES

BLUE GREENWAY

The Blue Greenway is a 13 mile network along the southeastern waterfront of San Francisco. The India Basin Waterfront will be one of a few locations along the entire network where there exists continuous waterfront access directly adjacent to the shoreline.

BLUE GREENWAY

13 miles



1.5 mile continuous waterfront
64 acres

Waterfront Parks Vision Plan in the Blue Greenway

PEDESTRIAN & BICYCLE CIRCULATION

The Innes Avenue Transportation Action Plan did not take into consideration Sea Level Rise and Storm Surge Flooding. The Blue Greenway and Bay Trail will be affected by these changing climate conditions. The routing of the Blue Greenway / Bay Trail should take into consideration projected Sea Level Rise and Storm Surge conditions.

Credits: Build Inc./Gehl

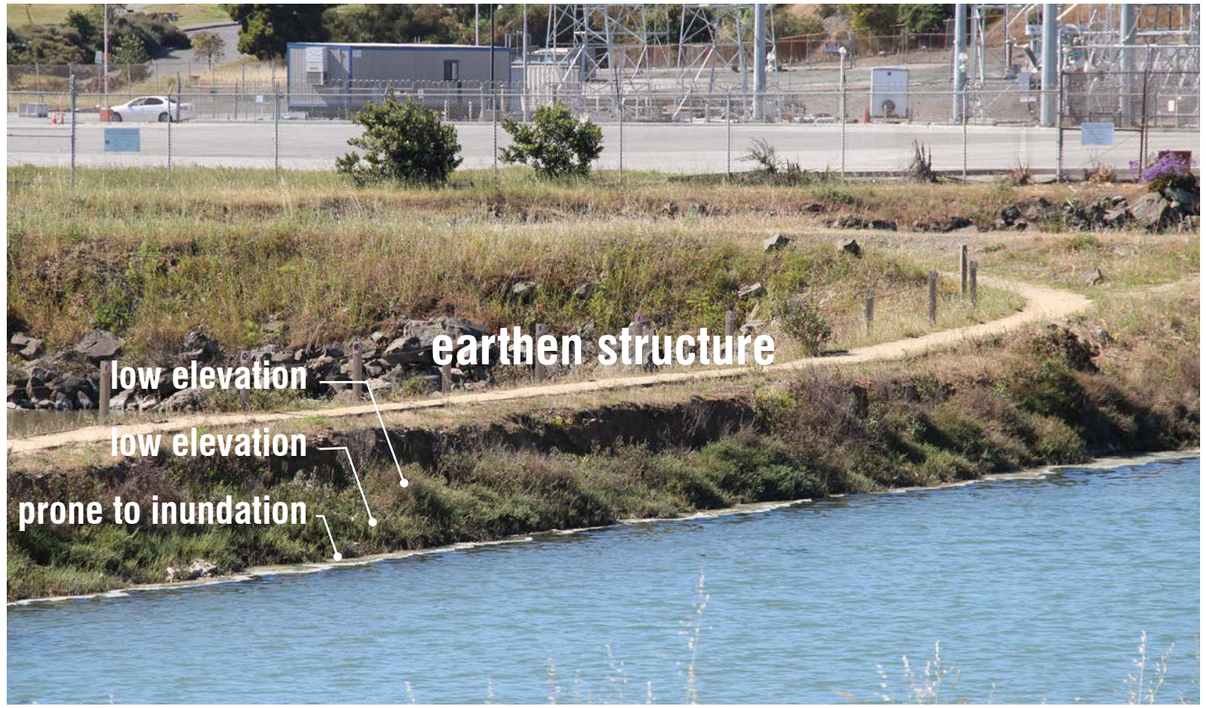
INNES AVENUE TRANSPORTATION ACTION PLAN

The Innes Avenue Transportation Action Plan identifies preferred streetscape sections and amenities, and bicycle lane alignments from Cargo Way to the Hunter's Point Shipyard. This plan serves as a reference document for the India Basin Waterfront Study and suggests options for where the Blue Greenway and Bay Trail may connect at the perimeter of the Waterfront Park.

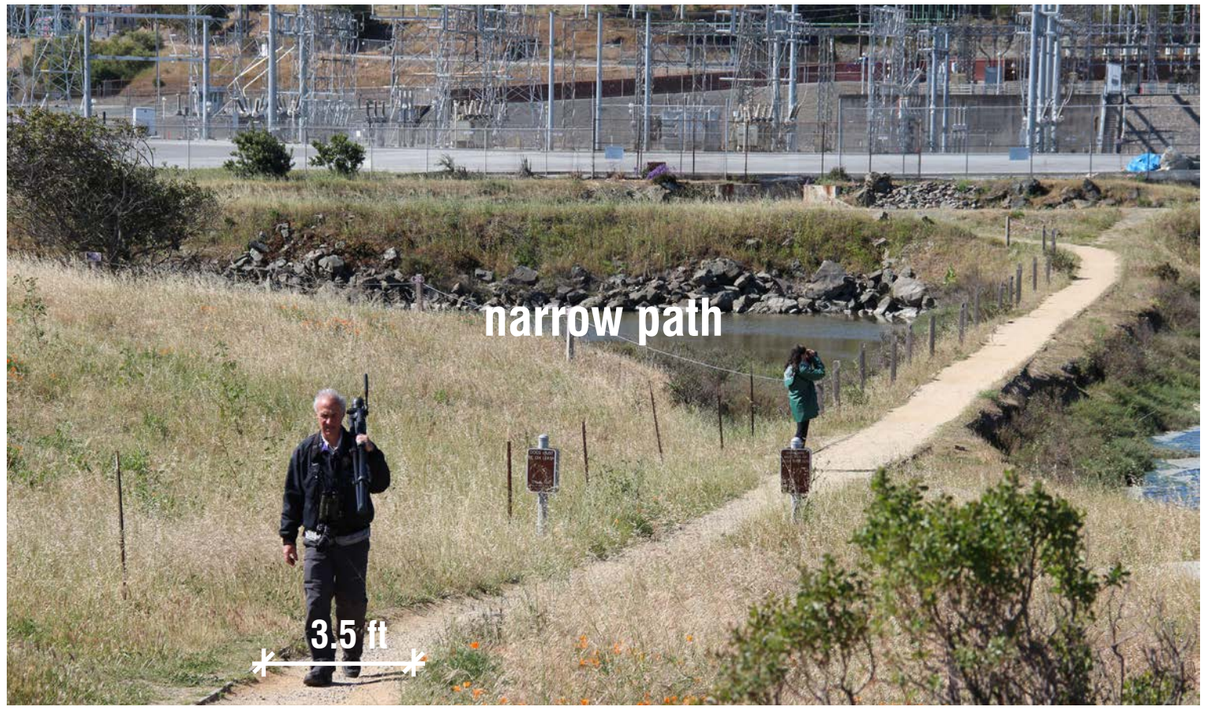
Credits: Build Inc./Gehl

CONNECTION

The existing connection from Heron's Head Park to the Hunter's Point Shoreline is a critical connection along the Blue Greenway / Bay Trail should be studied in greater detail.


earthen structure
low elevation
low elevation
prone to inundation


adjacent habitat


narrow path
3.5 ft


7 ft


NORTHSIDE PARK
700 INNES
INDIA BASIN OPEN SPACE
96