TECHNICAL ANALYSIS & RESILIENT SCHEMATIC DESIGN DEVELOPMENT OPTIONS FOR DORCHESTER'S WATERFRONT

EXECUTIVE SUMMARY

JUNE 2023

boston planning & development agency

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The City of Boston would like to thank the Commonwealth of Massachusetts Office of Coastal Zone Management for their generous support.

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The Dorchester Resilient Waterfront Project at Tenean Beach / Conley Street is a catalytic project identified in the 2020 Climate Ready Boston (CRB) Coastal Resilience Solutions for Dorchester report. Given this near-term need to address coastal flooding from sea level rise and storm surge, the Boston Planning & Development Agency (BPDA) took the lead on advancing this project by applying for and receiving a Coastal Resilience Grant from the Massachusetts Office of Coastal Zone Management. The team was ultimately awarded this grant whose aim is to advance the conceptual project in Climate Ready Boston to 30% schematic design. While the Boston Planning & Development Agency took the project management lead, the City of Boston's Environment Department was the project management partner. The Massachusetts Department of Conservation and Recreation (DCR), the landowner of Tenean Beach, has also been a key partner thus far.

This project begins to illustrate the complex nature of resilient design options for the City of Boston. The city's 47-mile coastline falls under ownership by various public and private partners. The City of Boston's objective as laid out in the CRB reports is to develop designs to respond to all areas of the coastline effectively while protecting and enhancing our sacred and valuable waterfront public realm. No design or project is intended to use the public realm as sacrificial zones to flooding. Rather, the intent is to strengthen those areas for the public benefit and use in the long term.

Tenean Beach, owned by DCR, is also abutted by other State entities such as the Massachusetts Bay Transportation Authority (MBTA) and the Massachusetts Department of Transportation (MassDOT) who have also been involved in the development of the schematic design options for this grant funded project. Tenean Beach is also the site of several outfalls which the Boston Water and Sewer Commission (BWSC) control and their technical expertise has been extremely valuable to this project as well.

Besides our governmental partners, the Resilient Dorchester Project at Tenean Beach / Conley Street would not have been possible without the technical expertise of our consultant team led by SCAPE Landscape Architecture.

The community has also played an important part in helping to develop this project. We would like to thank and acknowledge everyone who provided valuable feedback and insight that helped refine the proposed designs including the Port Norfolk, Dorchester, and Boston at-large communities, the people representing various Community Based Organizations and Non-Profits, and the elected officials that represent this area of our city.

The schematic design created as a result of this grant is only the beginning of what is to come on this property. Continued collaboration and cooperation between the City and State is needed to fully deliver the final implementation of this project for the future protection of Dorchester. We are hopeful that this project acts as a lesson for future CRB implementation and we will continue to use this as an example for not only ourselves but for other municipalities across the region and beyond.

boston planning & development agency

IN PARTNERSHIP WITH

City of Boston Environment

dcr MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

CONSULTANT TEAM

SCAPE — LANDSCAPE ARCHITECTURE

TETRA TECH — COASTAL ENGINEERING DESIGN

WOODS HOLE GROUP — COASTAL MODELING

DAWOOD EST. 1992 — SITE SURVEY

GRANT FUNDED BY

CZM

FY23 GRANT

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INTRODUCTION

PLANNING FOR CLIMATE CHANGE

Climate Ready Boston

The City of Boston released the Climate Ready Boston report in 2016. This report included a vulnerability assessment of current and potential future risks associated with climate change, updated climate projections, and an implementation roadmap that identified the areas of the City that are projected to be the most vulnerable to extreme heat, stormwater flooding, and coastal flooding from sea-level rise and storms. The report also outlined next steps to help the City prioritize subsequent planning efforts and projects to protect Boston's communities, buildings, infrastructure, and economy from these risks. Since 2016, the Climate Ready Boston report has evolved into the City's ongoing initiative to adapt to the current and projected impacts of climate change. The primary focus of Climate Ready Boston has been to address coastal flooding in the City of Boston, a coastal city with 47 miles of shoreline.

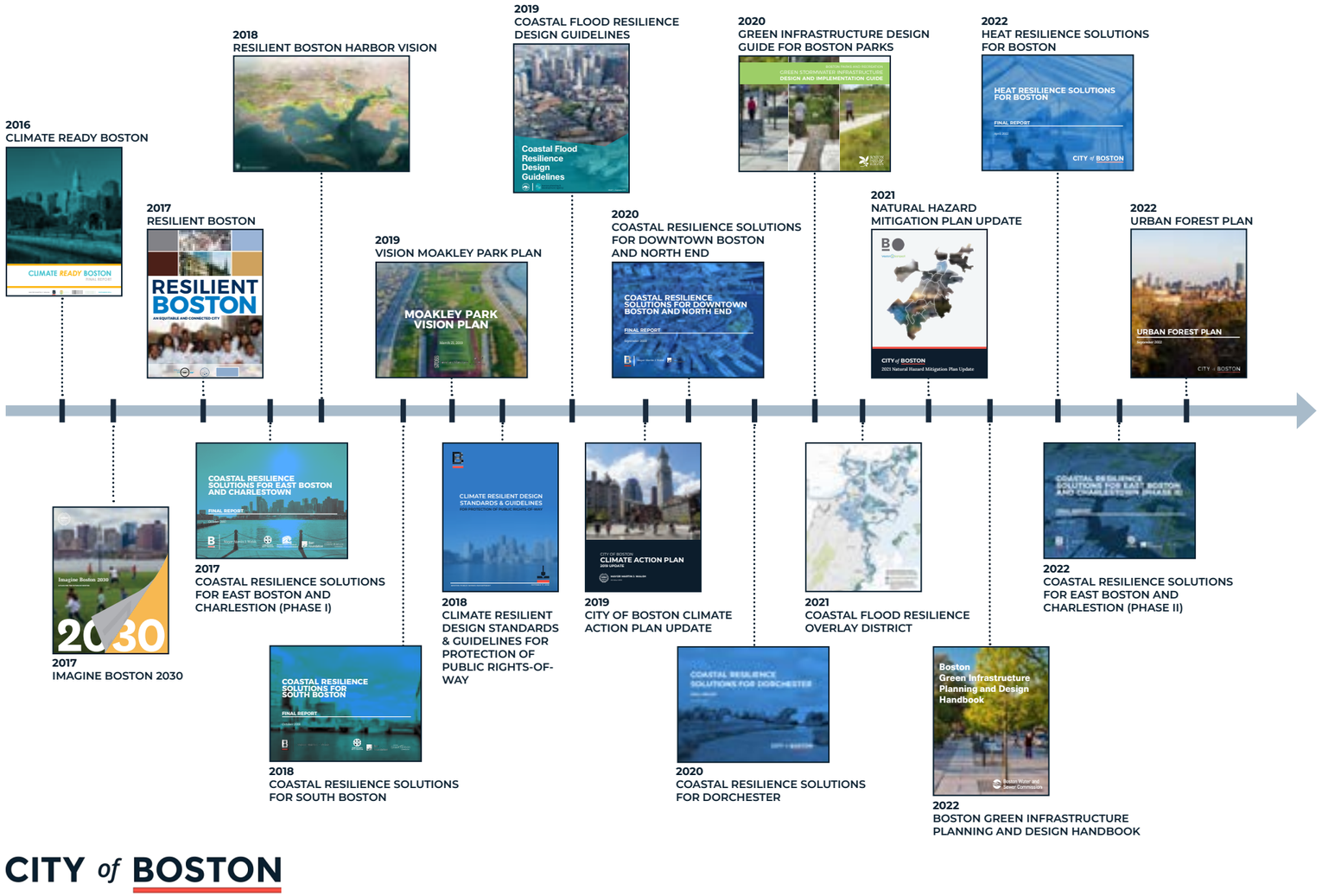


Figure 1: Timeline graphic from Climate Ready Boston report, showing various initiatives

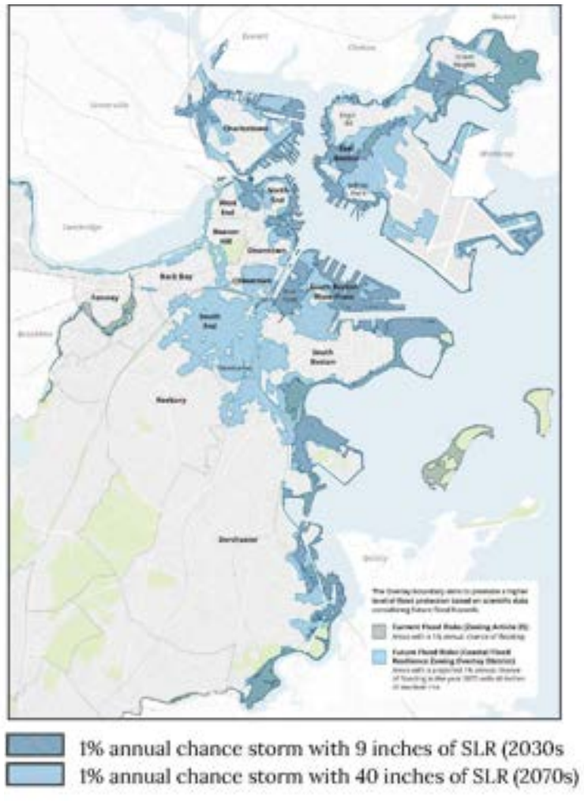
PLANNING FOR CLIMATE CHANGE

Neighborhood-Level Coastal Resilience Planning

Between 2016 and 2022, the City completed neighborhood-level coastal resilience planning studies in each of Boston's five waterfront neighborhoods. Informed by community and stakeholder engagement, each of these plans present conceptual designs that would address coastal flood risk in the near- and long-term. In October of 2020, the City released the Coastal Resilience Solutions for Dorchester plan. The CRS identified Tenean Beach and the Conley Street underpass as high-priority areas given the present-day flood risk at the beach and a flood pathway originating from this area that poses a threat to the broader Dorchester community.

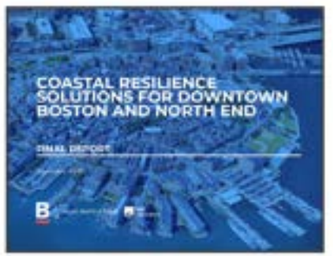
Read more about Coastal Resilience Solutions for Dorchester (2020) report here:

https://www.boston.gov/departments/environment/climate-ready-boston/climate-ready-dorchester



East Boston & Charlestown Phase 1 (2017)

South Boston (2018)



North End & Downtown (2020)

Dorchester (2020)

East Boston & Charlestown Phase 2 (2022)

Figure 2: Graphic showing the five coastal resilience plans for Boston and a map of flood risks

WHY A PROJECT HERE, NOW?

Coastal storm surge and sea-level rise impacts in Dorchester

Coastal flooding in Dorchester has a profound impact on communities, causing physical damage, stress, displacement costs, and business interruption. It also disrupts vital infrastructure systems, such as transportation, stormwater infrastructure, and other essential facilities relied upon by residents.

Through coastal modeling efforts, multiple flood pathways have been identified along the Dorchester waterfront. These flood pathways are low-lying areas that allow water to enter inland, causing damage to critical community and transportation infrastructure. As a result of climate change, there will be an increase in the frequency of severe storms and sea-level rise, further exacerbating flood risk.

The following figures are from the Coastal Resilience Solutions for Dorchester (2020) report. For further information and to access the final report, please use the link provided on page 12.

Fig. A shows the flood pathways created during a 1% annual chance flood in 2030, which includes both fringe and inland flooding.

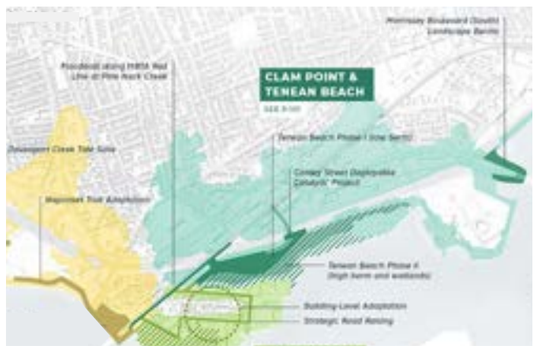
Fig. B. shows this condition in 2070.

At a high-level, these help illustrate the extent of infrastructural and community impact. These will be articulated in finer detail in later pages of the executive summary.

Figure 3: Coastal flooding - 9 inches of SLR (2030s) in the near term

Risk Zones

The 2020 Coastal Resilience Solutions for Dorchester report identified five risk zones with the aim of developing both short-term and long-term solutions to reduce the risks of coastal flooding and sea-level rise. These risk zones are specific to Dorchester's diverse shoreline and population, and each zone is characterized by a series of flood pathways or adjacent areas susceptible to flooding. This particular project is located in the Clam Point and Tenean Beach risk zone, which encompasses three distinct flood pathways, each activated at different flood elevations. The first pathway projected to be activated is at Tenean Beach/ Conley St., specifically at the I-93 underpass. The main objective of this project is to close this flood pathway through the design at Tenean Beach.



Clam Point and Tenean Beach risk zone as identified in Climate Ready Dorchester (CRD)

Figure 4: Coastal flooding - 40 inches of SLR (2070s) in the long term

WHAT IS AT RISK IF WE DO NOTHING?

Without intervention, rising sea levels and storm surges in Dorchester pose a significant risk to buildings, transportation infrastructure, and stormwater systems.

Buildings

In the near future, a significant number of structures are at risk of flooding due to rising sea levels. This flooding could result in substantial damages amounting to millions of dollars ($36 million estimated in the short term, for a 1% Annual Chance Flood). In the long term, various types of buildings, including residential, commercial, governmental, industrial, and educational, may be impacted, along with a small number of mixed-use buildings expected to be minimally affected.

Transportation Infrastructure

The roads and transportation system in Dorchester face frequent and severe floods, posing risks to the community. Immediate concerns include the vulnerability of the MBTA Red Line and Morrissey Boulevard, which could lead to isolations and disruptions in emergency response. By the end of the century, all evacuation routes, including I-93 South, Neponset Avenue, and Gallivan Boulevard, will be susceptible to coastal flooding and sea-level rise. Closure of Morrissey Boulevard due to flooding could result in significant daily delay costs, while delays at Red Line stations could also incur additional expenses.

Stormwater Infrastructure

As sea levels rise and storms become more severe, the existing stormwater system in Dorchester will struggle to cope. Low-lying pipes, outfalls, and facilities located in floodplains will be particularly affected. Additionally, stormwater outlets without tide gates may contribute to flooding in surrounding low-lying areas. With long-term sea level rise, and even near-term coastal storm events, the stormwater system may not be able to discharge due to high water levels at the outlets. Stormwater storage and pumping infrastructure is currently lacking to mitigate these impacts.

LEGEND

- *1% Annual Chance Flood with 40 inches of SLR (2070s)*
- *Planned or Ongoing Project*

POTENTIALLY IMPACTED BUILDINGS BY LAND USE IN A 1% FLOOD WITH 40 INCHES OF SLR

- *Residential*
- *Commercial*
- *Heavy Commercial*
- *Governmental*
- *Industrial*
- *Educational*
- *Other (Tax Exempt)*
- *Mixed Use*

Sources: Boston Open Data, MASSGIS, BH-FRM, MAPC

Figure 5: Potentially impacted buildings in a 1% Annual Chance Flood with 40 inches SLR (2070s)

LEGEND

- *1% Annual Chance Flood with 40 inches of SLR (2070s)*
- *Planned or Ongoing Project*
- *Roadway*
- *Rail Station*
- *Rail Line*
- *Pump Station*
- *Tide Gate*
- *Outfall*
- *Harborwalk*
- *Neponset Greenway Trail*

Sources: Boston Open Data, MASSGIS, BH-FRM

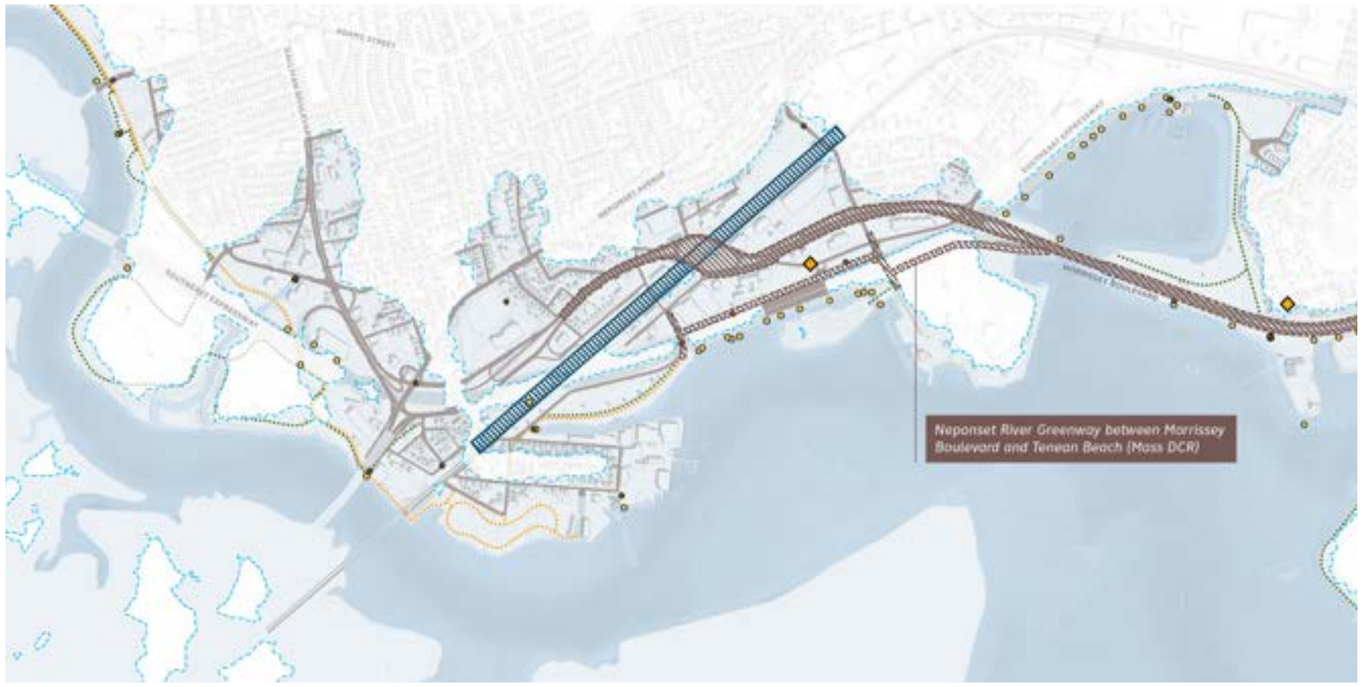


Figure 6: Potentially impacted infrastructure in a 1% Annual Chance Flood with 40 inches SLR (2070s)

WHO IS AT RISK IF WE DO NOTHING?

Community Assets

Dorchester is a thriving neighborhood with a rich multicultural heritage and valuable community and ecological assets.

The neighborhood's community assets, such as libraries, clinics, schools, and associations, play a crucial role in promoting the health and well-being of residents. However, many of these assets are located in the floodplain, putting them at risk of flooding due to projected sea-level rise. Facilities like the Leahy Holloran Community Center and McCormack Middle School are particularly vulnerable. It is important to protect these assets from the impacts of climate change to ensure their continued contribution to the community.

Ecological Assets

Dorchester's ecological assets, including beloved open spaces like Malibu Beach, Tenean Beach, and the Neponset River wetlands, are essential for ecological health and risk reduction. However, anticipated sea-level rise will result in monthly tidal flooding, which will alter the ecosystem's functions and undermine the resilience provided by these natural areas.

Multicultural Heritage

Despite the challenges posed by climate change, Dorchester's multicultural heritage, influenced by Vietnamese, Caribbean, and Irish cultures, remains a source of strength and unity. The blending of these cultures fosters mutual understanding, appreciation, and pride in the neighborhood's diverse traditions. Dorchester exemplifies the power of cultural exchange, where different communities come together, enrich one another, and create a vibrant mosaic of cultural heritage.

By recognizing and preserving its community and ecological assets, while embracing its diverse cultural heritage, Dorchester can pave the way towards a sustainable and inclusive future, where both its physical and cultural landscapes flourish.

VIETNAMESE LUNAR NEW YEAR CELEBRATION

IRISH HERITAGE FESTIVAL CELEBRATION

DORCHESTER DAY PARADE

CARIBBEAN CARNIVAL PARADE

Figure 7: Potentially impacted community assets in a 1% Annual Chance Flood with 40 inches SLR (2070s)

PROJECT GOALS & EVALUATION CRITERIA

Project Goals

The design team worked closely with the City, key stakeholders, and community members to develop project goals to guide the development of the design for Tenean Beach.

The primary project goal is to reduce flood risk to inland neighborhoods and Morrissey Boulevard during both everyday tidal events and larger flood events.

Goals include the preservation, protection, and enhancement of waterfront access, recreation, local ecology and open space. Complimentary goals also include the improvement and increased compatibility with adaptation efforts to protect critical transportation.

1 Provide flood risk reduction to inland neighborhoods as well as DCR's Morrissey Boulevard during:
(a) larger/rare flood events,
(b) tidal flood events.

2 Preserve, protect, and enhance waterfront access and recreation by providing flood risk reduction to DCR's assets at Tenean Beach.

3 Preserve, protect, and enhance local ecology and open space.

4 Improve or be compatible with adaptation efforts of critical transportation infrastructure, such as (1) the Southeast Expressway, (2) MBTA Rail Line, and (3) evacuation routes from Port Norfolk

5 Improve or align with adaptation efforts of stormwater infrastructure.

Evaluation Criteria

The Climate Ready Boston evaluation criteria were used as a tool to weigh design options and ensure that the final design embodies the City's goals for coastal resilience projects. The criteria include:

- Effectiveness: How well does the project meet its resilience goals?
- Feasibility and Maintenance: Is the project feasible and what level of maintenance is required?
- Design Life and Adaptability: What is the design life of the project and can it be adapted to future conditions?
- Environmental and Public Health Benefits: How will the project reduce pollution, improve habitat, or promote healthy activities and human wellbeing?
- Social Equity and Quality of Life: Does the project offer co-benefits that support social equity and quality of life for the surrounding community?

Figure 8: Icons illustrating Climate Ready Boston evaluation criteria

THIS PROJECT AS A FIRST STEP

Near-term Catalytic Project with Long-term Vision

In the near-term, the flood pathway at Conley St./I-93 underpass is activated and causes localized flooding in the adjacent industrial and residential areas inland, in addition to impacting critical transportation and access infrastructure for the surrounding community.

In the long-term, all three flood pathways (that are part of this defined Risk Zone, see Risk Zone on pg 15) are activated, and extensive inland flooding occurs and monthly tidal flooding at Tenean Beach expands further inland to Conley Street. Critical transportation infrastructure and access, such as the local road network, pathways, and MBTA Red Line, are all vulnerable.

This project seeks to close the near-term pathway, and aims to reduce coastal flood risk to areas that are projected to experience coastal flood risk in the near term (2030s, see Fig. 9). The project is the first step towards a long-term continuous line of protection along the coast that reduces coastal flood risk from all three pathways (see Fig. 11).

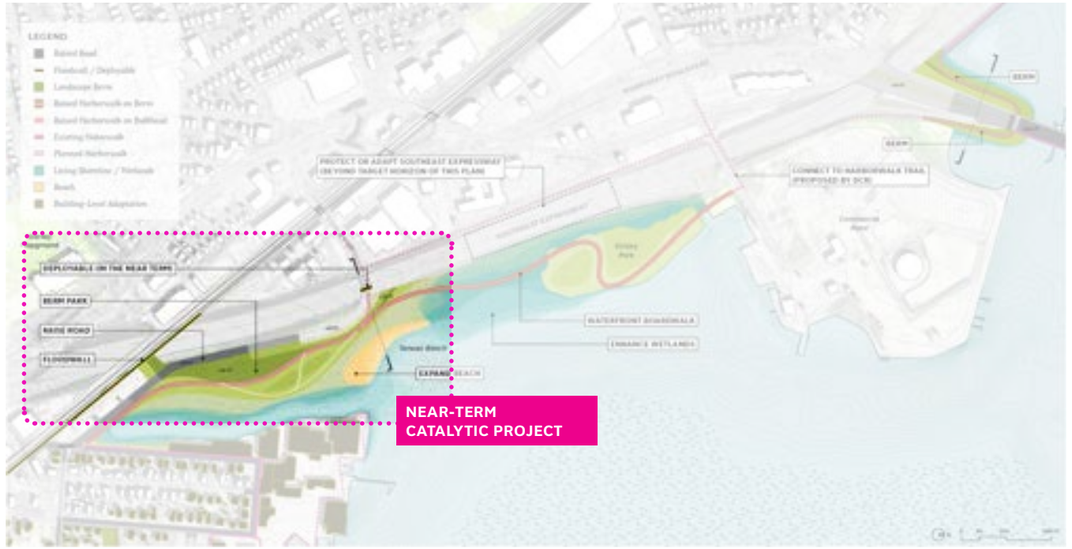


Figure 10: Map illustrating the near-term catalytic project extents

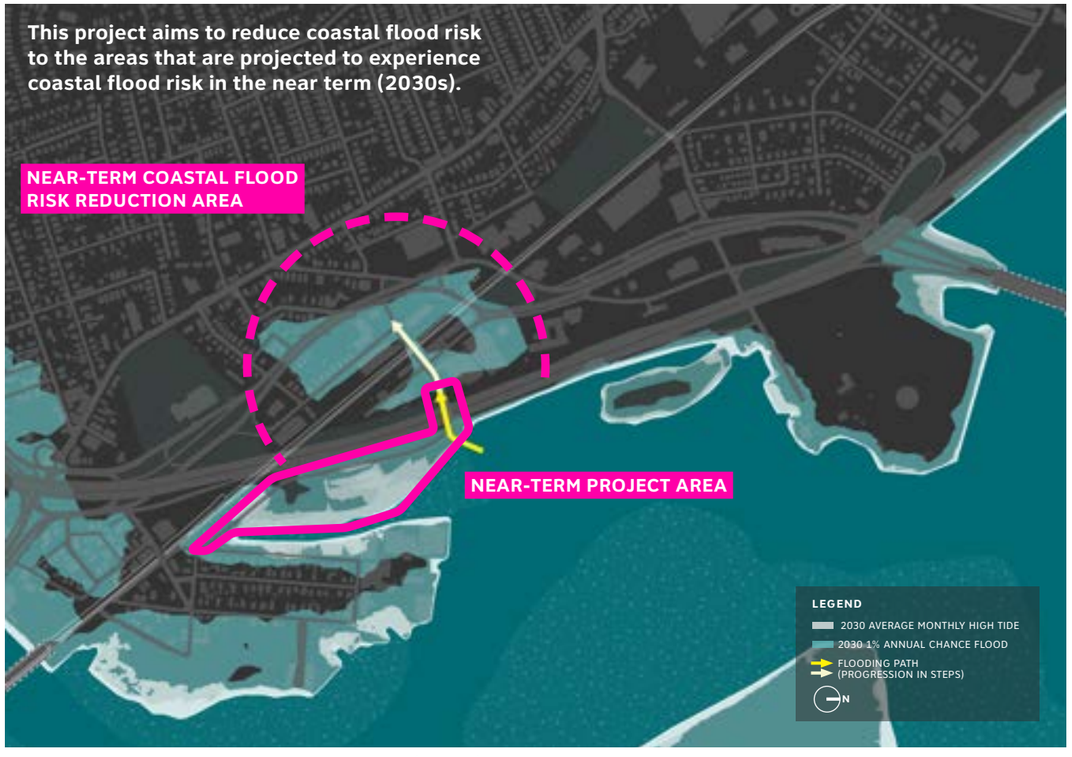


Figure 9: Coastal flooding - 9 inches of SLR (2030s) in the near term

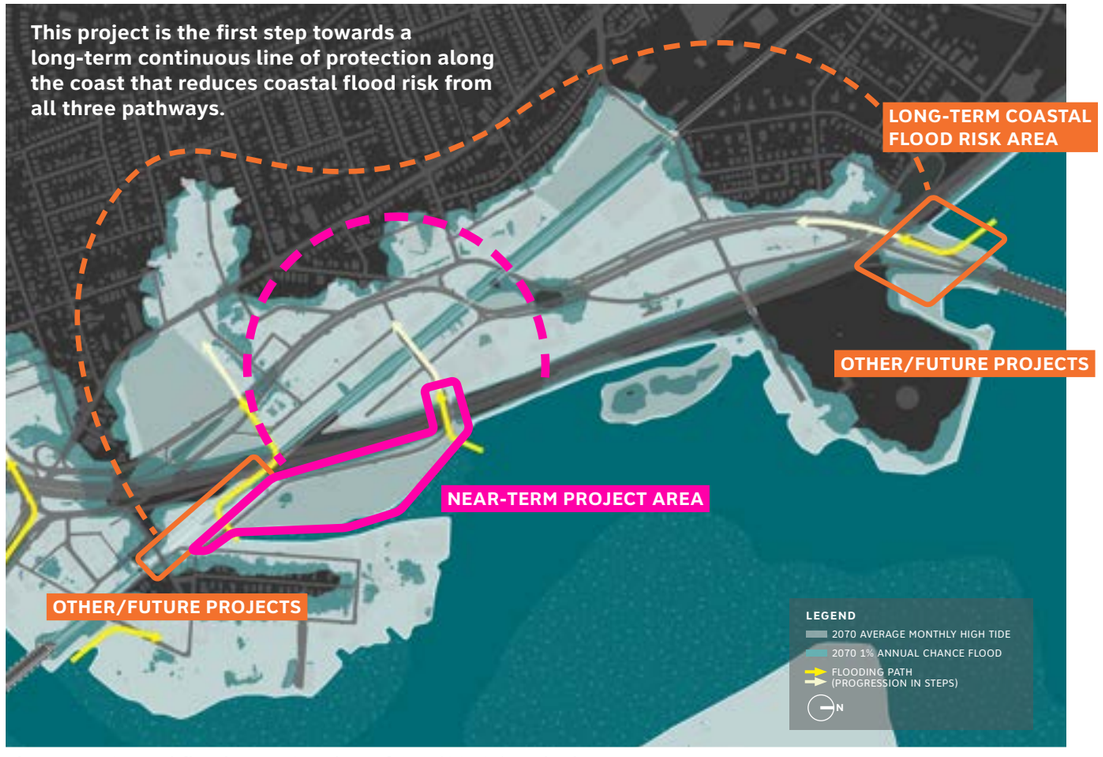


Figure 11: Coastal flooding - 40 inches of SLR (2070s) in the long term

PROJECT DESCRIPTION

SITE CONTEXT

Project Extents and Coordination

The project site – which measures approximately 435,600 square feet (sf) or more than 10 acres – consists of open space owned by the Massachusetts Department of Conservation and Recreation (DCR). The site today includes a public beach, salt marsh, active and passive recreational amenities, a parking lot, and a roadway variously named Conley Street and Tenean Street. Recreational amenities include a harborwalk, playground, basketball court, tennis courts, and picnic shelters. These amenities are distributed across approximately six parcels identified as DCR-owned properties. Parcels and rights-of-way (ROWs) owned by the City of Boston, Massachusetts Bay Transportation Authority (MBTA), and Massachusetts Department of Transportation (MassDOT) also fall within the project site.

The project site is bounded by the Southeast Expressway/Interstate-93 embankment (the "Expressway Embankment") to the west, an MBTA maintenance yard to the south, Pine Neck Creek to the east, and the Neponset River to the north. A stormwater outfall and riprap-stabilized shoreline is located at the upstream end of Pine Neck Creek. Access to the site is provided via Tenean Street from the south and Conley Street from the north. Conley Street passes through an underpass running through the Southeast Expressway Embankment. The surrounding land is used for transportation facilities, residential neighborhoods, and various types of light industrial properties.

As a result of this unique location adjacent to various infrastructures, the project team has worked in direct coordination with respective key agencies – DCR, MASSDOT, MBTA, and BWSC – throughout the design process.

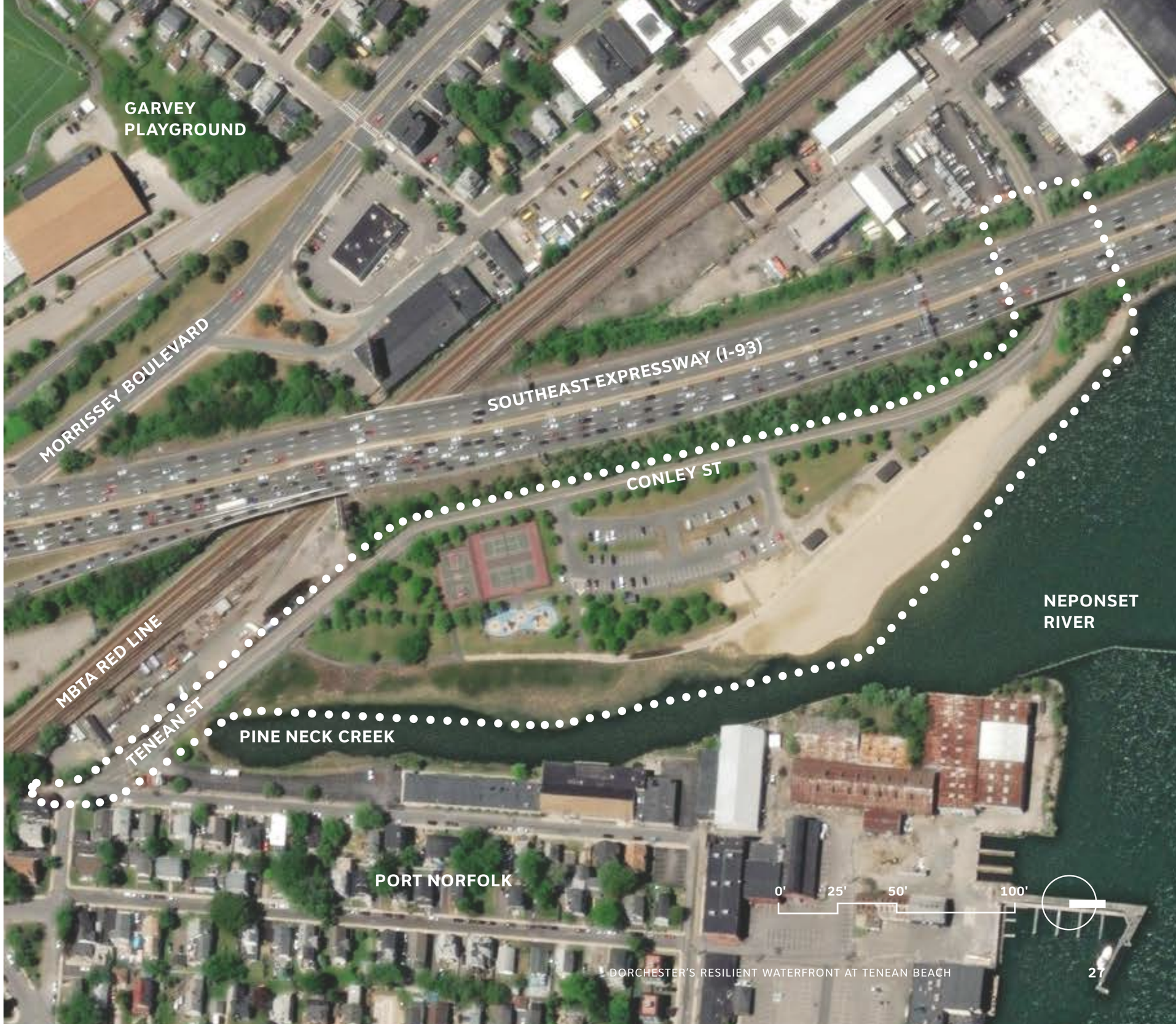


Figure 12: Satellite view of plan and adjacent infrastructure

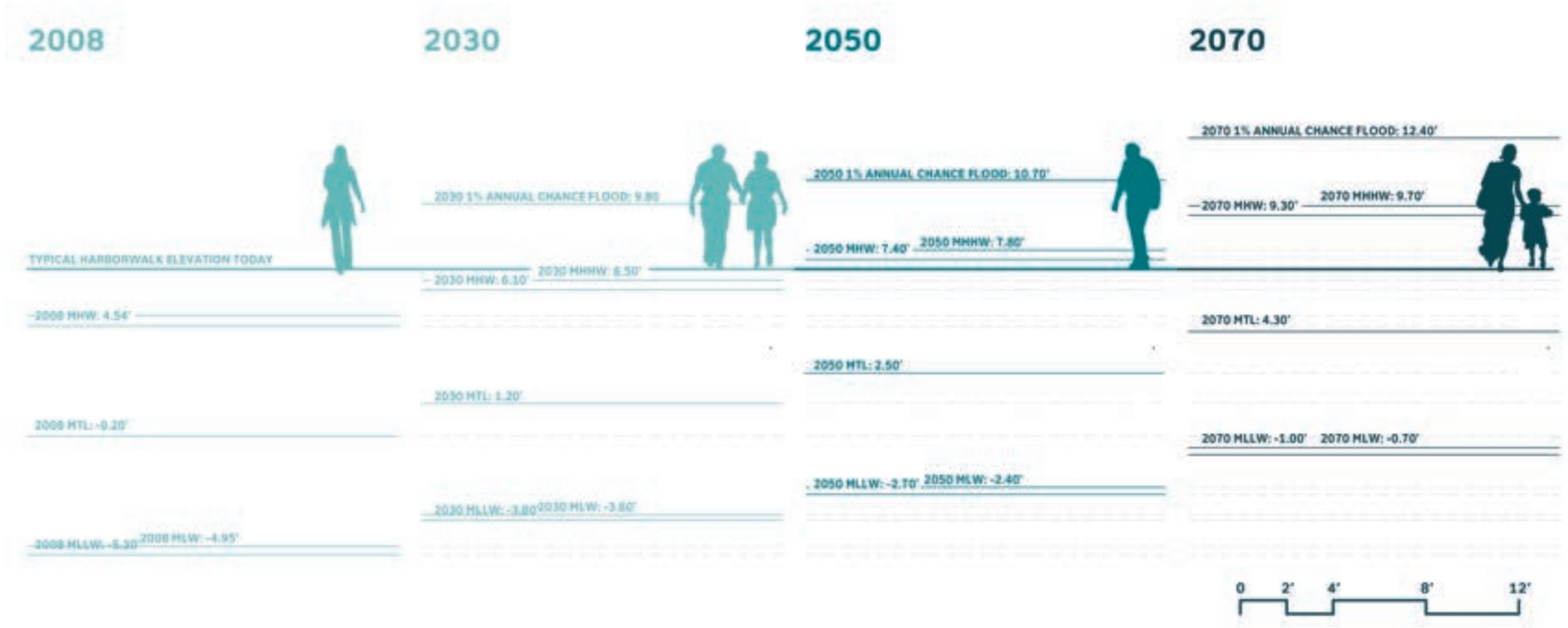
SITE CONTEXT

Climate Projections & the Massachusetts Coast Flood Risk Model

The project is guided by the best available science on the future risks of coastal flooding from high tides, storm surge, and waves. The Massachusetts Coast Flood Risk Model (MC-FRM) is a high-resolution, probabilistic, hydrodynamic model that estimates overland coastal flooding risks throughout Massachusetts in Present* (2008), 2030, 2050, and 2070. The MC-FRM accounts for the impacts of sea level rise and climate change influences on tides, waves, storm track, and storm intensity. The Commonwealth of Massachusetts' High sea level rise projections for Boston Harbor of approximately 1.3 ft by 2030, 2.5 ft by 2050, and 4.3 ft by 2070, compared to the 2008 baseline, are integrated in the MC-FRM. If sea level rise follows Intermediate projections, the MC-FRM coastal flood risk projections may occur 20 to 30 years later than indicated.

MC-FRM data was used to establish coastal design parameters for the project. These parameters included future tidal datums, water surface elevations, and wave heights at the project site. Tidal datum projections were used to inform the proposed site design. These projections helped identify areas subject to future daily or monthly high tide inundation and influenced ecological restoration elements and associated plantings. The Design Flood Elevation (DFE) of 14.0 ft NAVD88 was established for proposed coastal flood protection elements based on the 2050 1% annual chance storm including waves. Coastal flood protection elements were also designed to be adapted to meet a higher, long-term DFE of 16.2 ft NAVD88 based on the 2070 1% annual chance storm including waves.

** 2008 represents the mid-point of the 19-year tidal epoch (1999-2017) for which sea level data was available at the time MC-FRM was in development and serves as the baseline for Present day conditions.*



WHAT'S AT RISK FROM FLOODING?

What are the Coastal Flood Risks in 2030?

Coastal modeling indicates that in the near-term (2030s), the flood pathway that enters at Conley St/I-93 underpass would put the following infrastructures at risk:

1. Commercial and residential buildings
2. Morrissey Boulevard
3. Access to Tenean Beach
4. Conley Street and Port Norfolk access route
5. MBTA Red Line

Figure 13: Coastal Flood Risk in 2030

COASTAL HAZARDS

High Tide Flooding Today

While Tenean Beach is vulnerable to storm events in the future, it is also subject to tidal flooding today, making portions of the site inaccessible.

The image below is during a high tide event where the water is at El. 6.0’ NAVD88.

Given the site elevation and observed water levels at the Boston tide gauge, the extent of flooding viewed here may occur:

- On average of 67 days per year over the past 10 years
- Estimated around 57 days in 2022

This serves to illustrate that certain low-lying portions of the site are already witnessing inaccessibility impacts. With more frequent flood events comes increased maintenance needs such as sweeping sand from paths, cleaning out drains, replacing salt-intolerant and inundation-intolerant planting, and more frequent re-paving, among other concerns.

Figure 14: El 6.0’ NAVD88, 2/19/2023 at 9:00am

Recent Storm Events

In addition to tidal flooding today, the site experiences more frequent storms, including Nor’easters, which raise water elevations even higher.

The image below is during such an event where the water elevation is at El. 7.3’-7.5’ NAVD88. The extent of flooding as viewed here may occur:

- On average of 4 days per year over the past 10 years
- Estimated around 4 days in 2022

While we are planning for future storms, these images show that flooding is already happening frequently at Tenean Beach, rendering it temporarily unusable to the community.

Water Quality Challenges

Another hazard and challenge for Tenean beach is water quality. While many of the beaches in Boston continue to be among the cleanest urban beaches in the country. Eleven area beaches earned scores of over 90% this year, however Tenean scored 89% in 2022 and has a six-year average safety rating of 76%.

Water quality at Tenean Beach is monitored throughout the swimming season in compliance with Massachusetts Department of Public Health (DPH) beach testing guidelines, approximately from Memorial Day to Labor Day of each year. The Massachusetts Department of Conservation and Recreation (DCR) manages the beach posting program at Tenean Beach, displaying blue flags at the beach when bacteria levels meet single sample limits, and red flags when bacteria levels fail to meet the limit. Red flags are also flown following extreme weather events. There are no combined sewer overflows (CSOs) that impact Tenean Beach. Sources of bacteria at Tenean Beach include animal and bird waste and urban stormwater runoff in wet weather. While the tests themselves are extremely accurate, it takes 24 hours for them to be completed and posted. As a result, they are always at least one day late, and do not reflect current conditions on the beach.

Figure 15: EL 7.3’ - 7.5’ NAVD88 (shown), El. 8.47’ Peak, 12/23/2023 at 9:27am

SITE STRATEGY TO MEET DESIGN FLOOD ELEVATION

Design Flood Elevation

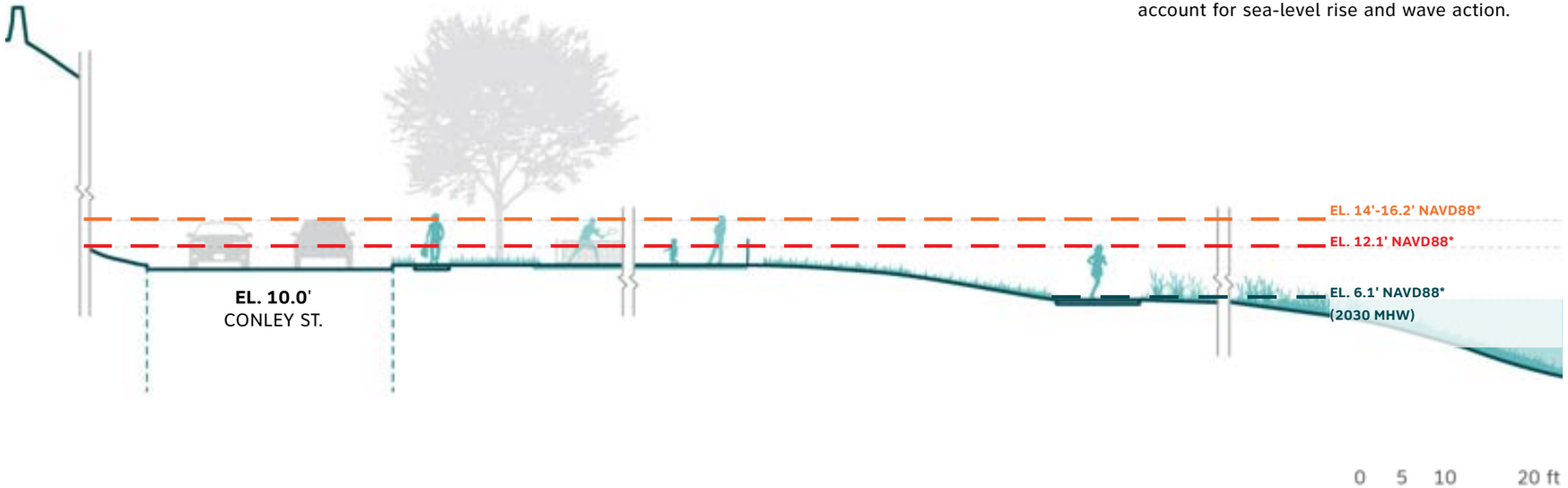
Through coastal modeling efforts using MC-FRM, the team has identified Design Flood Elevations (DFEs) based upon the near-term (2030s) and long-term (2050s-2070s) 1% annual chance flood, accounting for wave action and sea-level rise. Using these target elevations, the team strategized on the best approach to meet the elevation with the technical constraints of the site. These constraints include: minimizing fill, as this is an ACEC resource area (see section on Technical Considerations page 36), working with existing grades, creating a fully passive (non-deployable dependent) system, and reducing hardened infrastructure wherever possible.

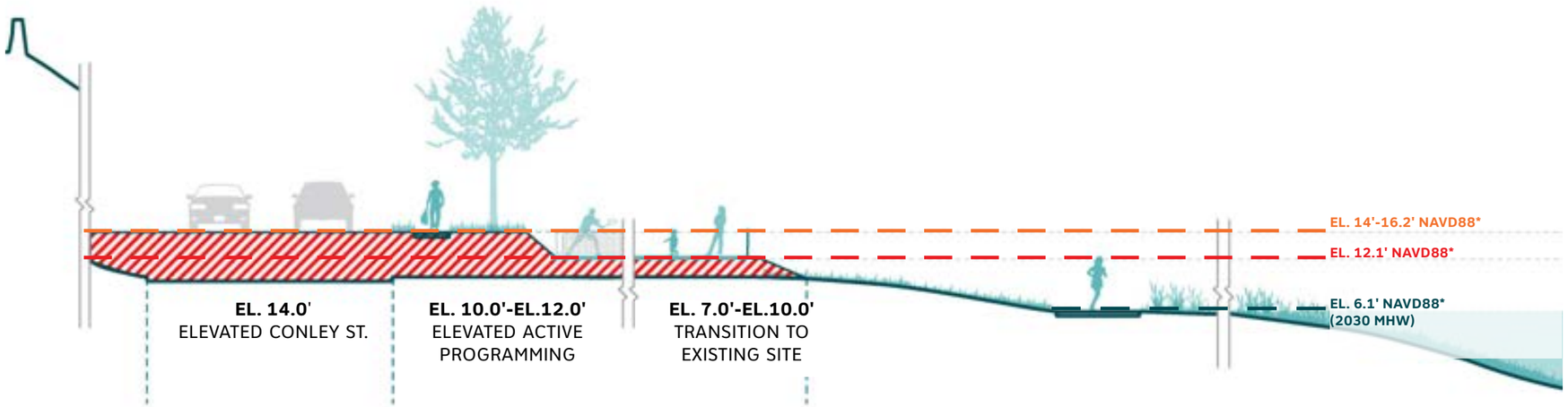
In Figure 16, the proposed DFEs are overlaid on top of an existing site section at Tenean Beach. The red hatch in Figure 17 indicates the full strategy to meet those DFEs. The plan elevates Conley Street to meet El. 14 (about 4ft of grade change), working to address the flood pathway underneath the I-93 underpass as long as is technically possible. To address community feedback encouraging extended use of active recreation, the project also proposes to raise the active recreation between El. 10-12 (about 2-4ft of grade change) to allow this programming to flood less frequently in the future and extend its use. From here, the site steps down to meet existing grade.

The site strategy to meet the DFE creates an independently effective system to close the identified flood pathway in the near-term while elevating other portions of the site for extended programmatic use into the future.

The "Design Flood Elevation" (DFE) is the target elevation for coastal resilience solutions in order to reduce coastal flood risk in the **near term (2030s)** and the **long term (2050s - 2070s)**.

The DFEs are based on 1% annual chance flood and account for sea-level rise and wave action.





**Elevations given in NAVD88 can be converted to Boston City Base (BCB) elevation by adding 6.46 feet.*

Figure 16: Existing Site Section with Design Flood Elevation Datum Overlay

Figure 17: Proposed Site Section with Site Elevation Strategy

DESIGN PARAMETERS & TECHNICAL CONSIDERATIONS

Design Parameters

The parameters used to guide the development of Tenean Beach's design were derived from the community engagement process and conversations with key stakeholders.

- Provide fully passive flood management: After reviewing alternatives, community members and stakeholders expressed a clear preference for a fully passive flood management solution, meaning that no temporary or deployable flood structures would be used. While this approach typically requires more up front investment, it reduces ongoing maintenance costs and labor required to deploy temporary structures. It also offers opportunities to integrate elevated features seamlessly into park amenities.
- Elevate Conley Street and improve it as an access route: Community members emphasized the importance of Conley Street as a key access route serving the Port Norfolk neighborhood and beyond. Low points along Conley Street will be elevated to extend access during flood conditions, and no deployable flood gates will impede access.
- Maintain or expand active recreation opportunities: Community members expressed a desire to maintain or expand the active recreation amenities on site, including basketball and tennis courts and the playground.
- Enhance ecology and opportunities to connect with nature: Many constituents also noted that they value Tenean Beach as a place to connect with the natural environment, indicating that restoration efforts should be balanced with active recreation opportunities.

Figure 18: Existing Plan - Design Parameters

Technical Considerations

A number of technical considerations also guide the design, ensuring that the project performs as expected and complies with relevant regulations.

- Area of Critical Environmental Concern (ACEC): An ACEC is a designated area that protects natural resources, such as the Neponset River Estuary. The entire Tenean Beach site is within the Neponset River Estuary ACEC and has a resource management plan.
- Chapter 91: The Massachusetts Public Waterfront Act - Chapter 91 protects people's access to the waterfront and helps license marine structures and alterations. Portions of the site are within the Chapter 91 delineation.
- The Massachusetts Wetlands Protection Act: The Massachusetts Wetlands Protection Act protects wetlands, floodplains, waterfront areas, and other areas from destruction or alteration. The site is subject to Wetlands Protection Act regulations.
- Project Performance: Coastal modeling of the design has confirmed that the project will perform as expected and will not increase flooding in the Port Norfolk neighborhood or other adjacent areas.

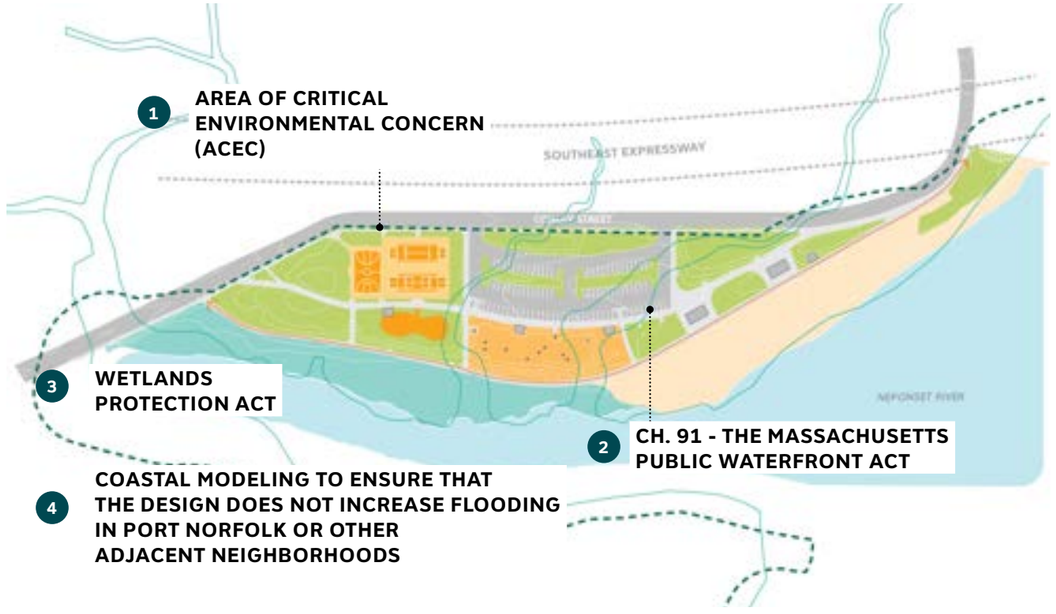


Figure 19: Existing Plan - Technical Considerations

SITE MODIFICATIONS

Maintain and Relocate

The plan maintains all existing recreational amenities or replaces them in-kind.

- The existing playground, recently constructed and well-loved by the community, is maintained and connected to the renovated pathway network.
- The existing picnic area alongside the playground also remains with enhanced seating opportunities. Picnic shelters are replaced.
- Existing sports courts, including basketball and tennis, are elevated and expanded.
- An elevated parking area and drop-off area preserves 70% of the current parking spaces, in accordance with the project parameters.
- The Harborwalk, compromised by frequent flooding today, is elevated and realigned closer to Conley Street to prolong its usability.
- The beach and marsh areas along the Pine Neck Creek are also enhanced.

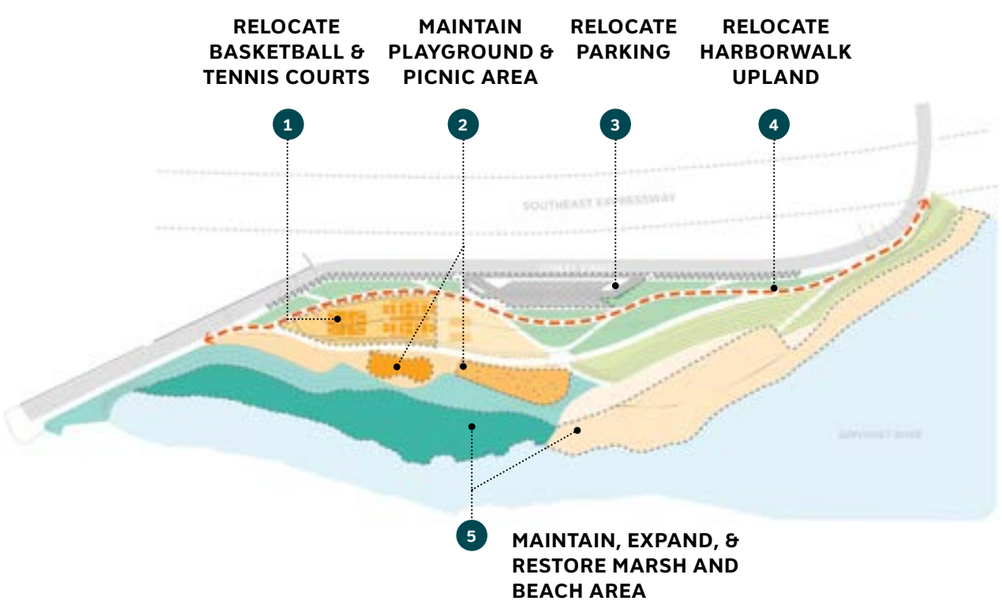


Figure 20: Proposed plan, amenities and assets being maintained

New Passive and Active Programming

The proposal for additional site programming draws from the priorities expressed by community members through the engagement process.

- Overlooking the beach, a recreational lawn provides flexible space for everyday gathering or small events.
- A tree grove at the heart of the site provides opportunities for quiet contemplation and enjoyment of water views.
- Along Conley Street, coastal plantings buffer sound and views of vehicular traffic, while contributing to stormwater management.
- The elevated segment of Harborwalk ties into the Neponset River Greenway Extension to the north and is widened along Conley Street (toward Franklin Street) to the south.

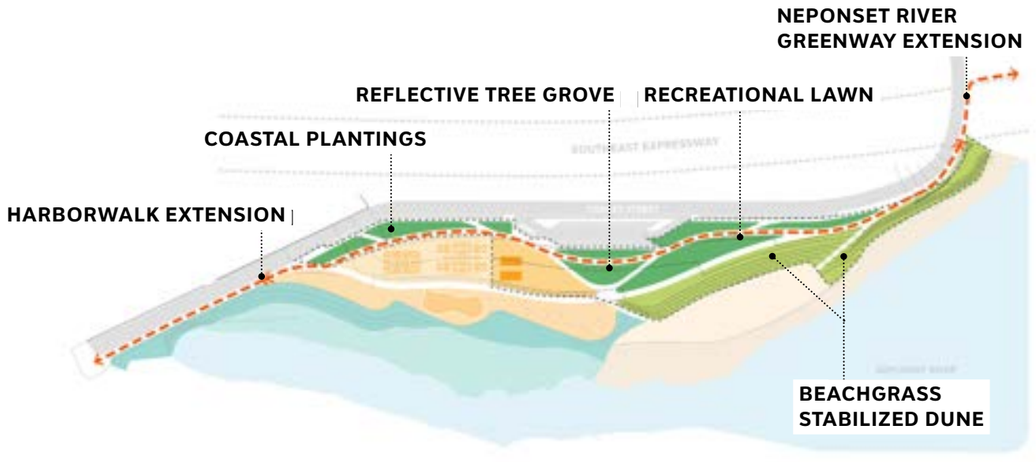


Figure 21: Proposed plan, improved or new programming

ACCESS AND CIRCULATION

The project enhances pedestrian and bicycle connectivity within and beyond the site. The Harborwalk shifts closer to Conley Street and lifts to elevation 14 NAVD88 to prolong its useful life. Secondary pathways link the Harborwalk to the active program areas and the beach. All pathways are designed to support universal access.

A central drop off and parking area provides easy vehicular access to Tenean Beach. On-street parking along Conley Street supplements the parking supply to achieve the project target of 70% of existing parking spaces.

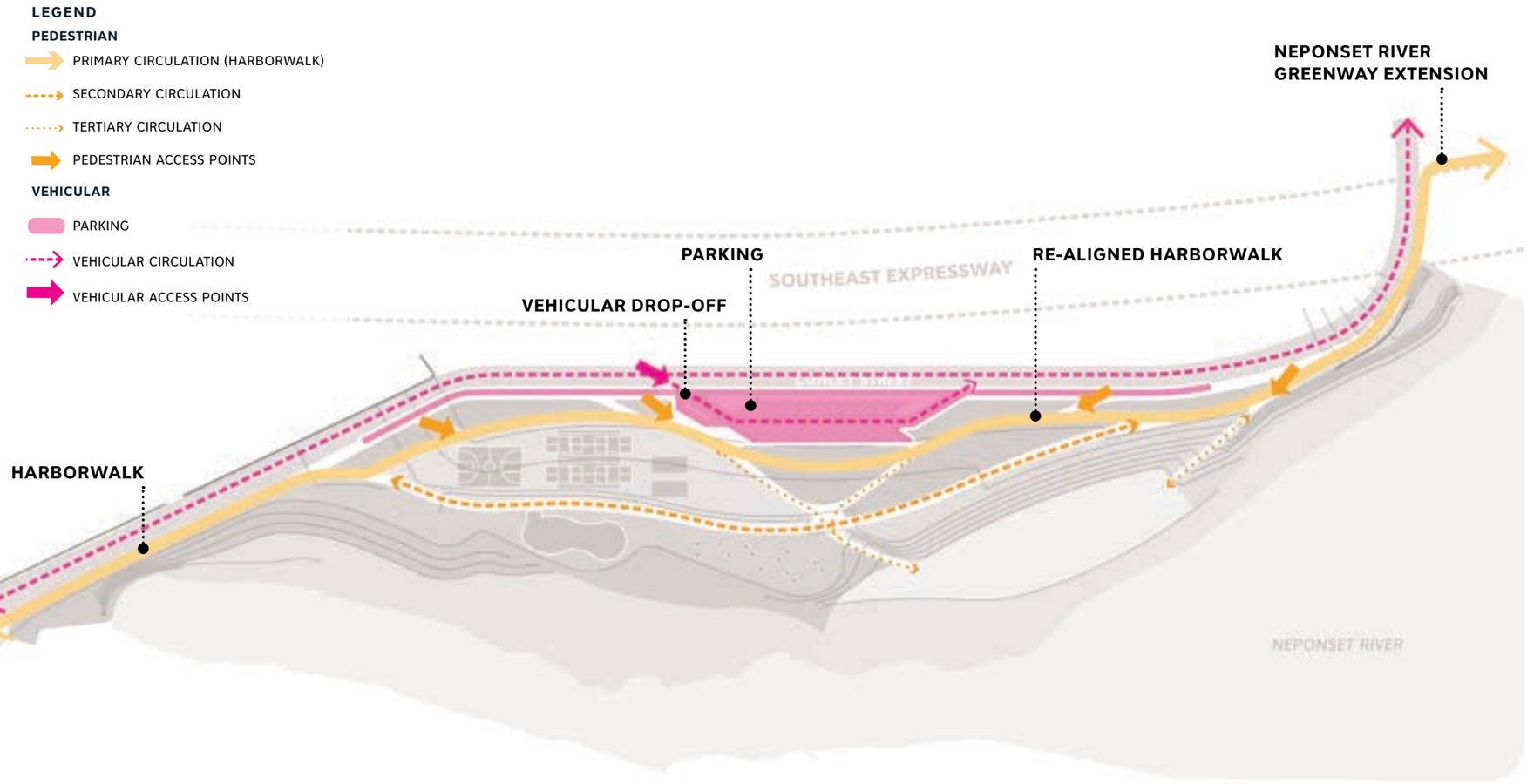


Figure 22: Proposed access and circulation diagram

DESIGN PROPOSAL

This plan envisions Tenean Beach as an even more vibrant recreational destination on the Dorchester Waterfront—a site with the potential to strengthen the physical and social resilience of the surrounding community, enhance safety and access for pedestrians and cyclists, provide active and passive recreation amenities, and revive the coastal ecosystem.

DESIGN PROPOSAL

Figure 23: Design proposal with program callouts

PROJECT BENEFITS

PROJECT EFFECTIVENESS AT RISK REDUCTION

Coastal Flood Risk Reduction in the Near-term

Coastal modeling demonstrates independent effectiveness of the project - reducing flood risk in an area that includes critical transportation infrastructure, industrial and commercial uses, residential buildings, and valued public open space.

The Massachusetts Coast Flood Risk Model (MC-FRM) was used to analyze the reduction in coastal flood risk with the project compared to if no action is taken. The design goal established by the BPDA for the project was to mitigate the Tenean Beach and Conley Street flood pathway, providing protection up to a 2030 1% annual chance flood plus 1 ft of freeboard, at a minimum. MC-FRM simulations performed to evaluate the proposed project's effectiveness confirmed that the project meets this goal.

Figures below demonstrate the near term effectiveness of the design proposal, with the left figure showing extents under existing flood conditions, and the right figure showing flooding extents under the proposed design.

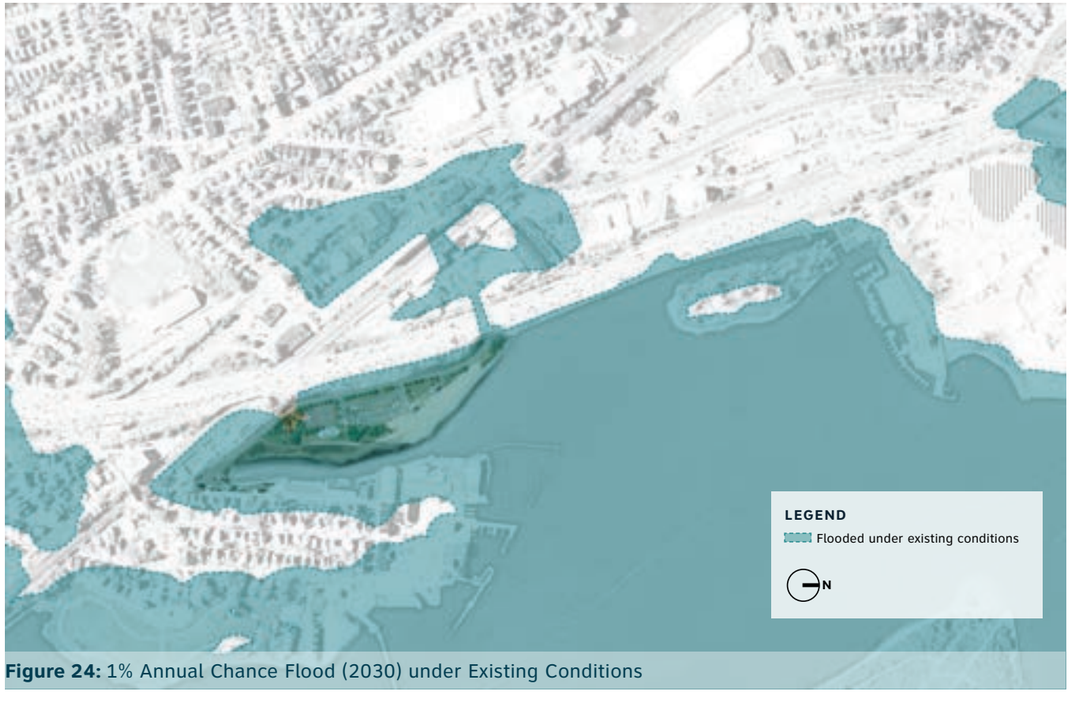


Figure 24: 1% Annual Chance Flood (2030) under Existing Conditions

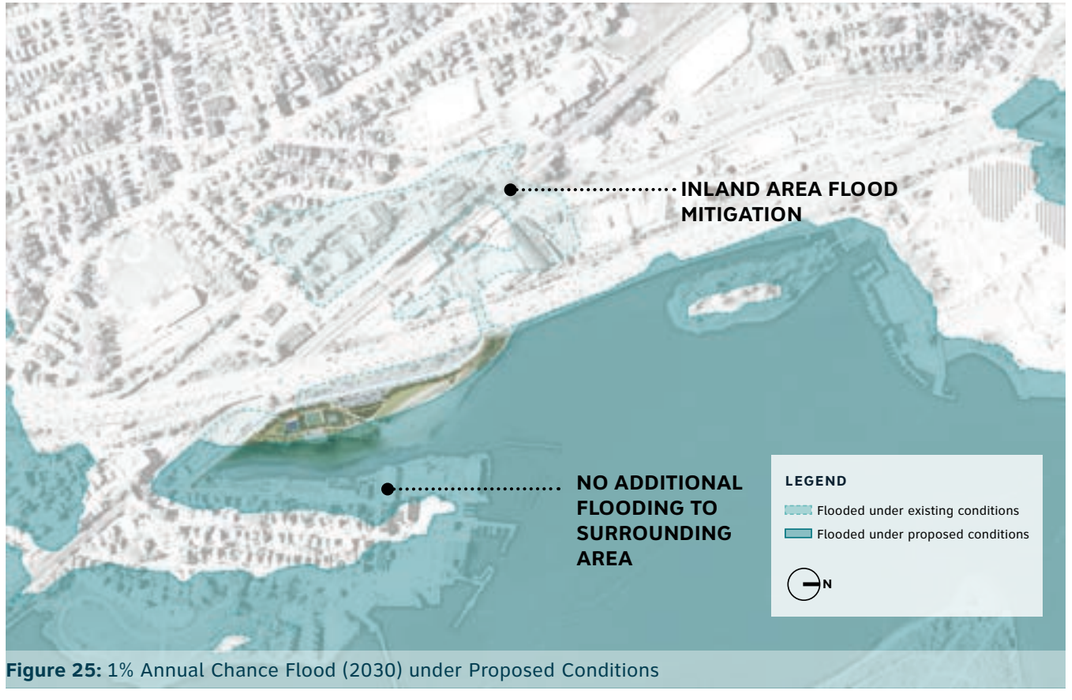


Figure 25: 1% Annual Chance Flood (2030) under Proposed Conditions

PROJECT EFFECTIVENESS AT RISK REDUCTION

Residual Risk in the Long-term

In higher, more extreme floods that become more likely in the long-term, the proposed project is still effective at blocking flooding through Tenean Beach and Conley Street. However, there are other flood pathways through which flooding could impact the area otherwise protected by the project. These flood pathways include the Morrissey Blvd/I-93 underpass located just south of the Dorchester Bay Basin, and the MBTA Red Line maintenance yard located adjacent to the project site. Due to the additional flooding coming from these pathways, there is an area of uncertainty in the flood extents due to the model's resolution, the ability to represent flow hydraulics through the MBTA Red Line underpasses at Morrissey Blvd, and limitations due to LiDAR. This area of uncertainty is represented as the diagonal hatch. Resiliency strategies to address these flood pathways will be necessary for long-term coastal flood protection.

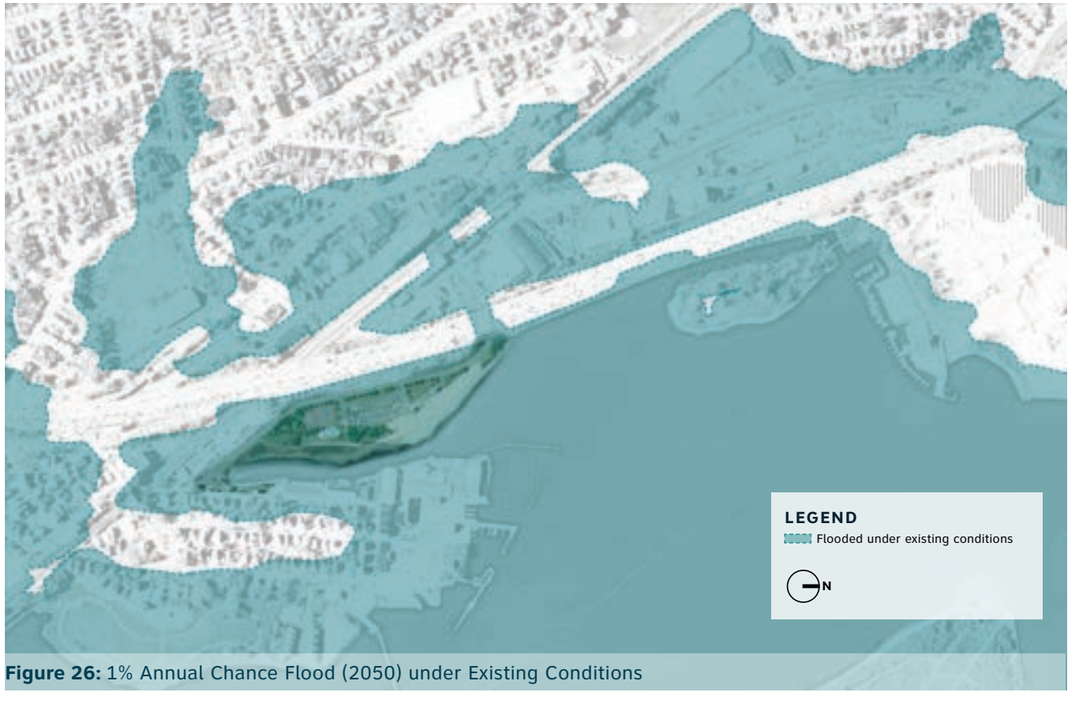


Figure 26: 1% Annual Chance Flood (2050) under Existing Conditions

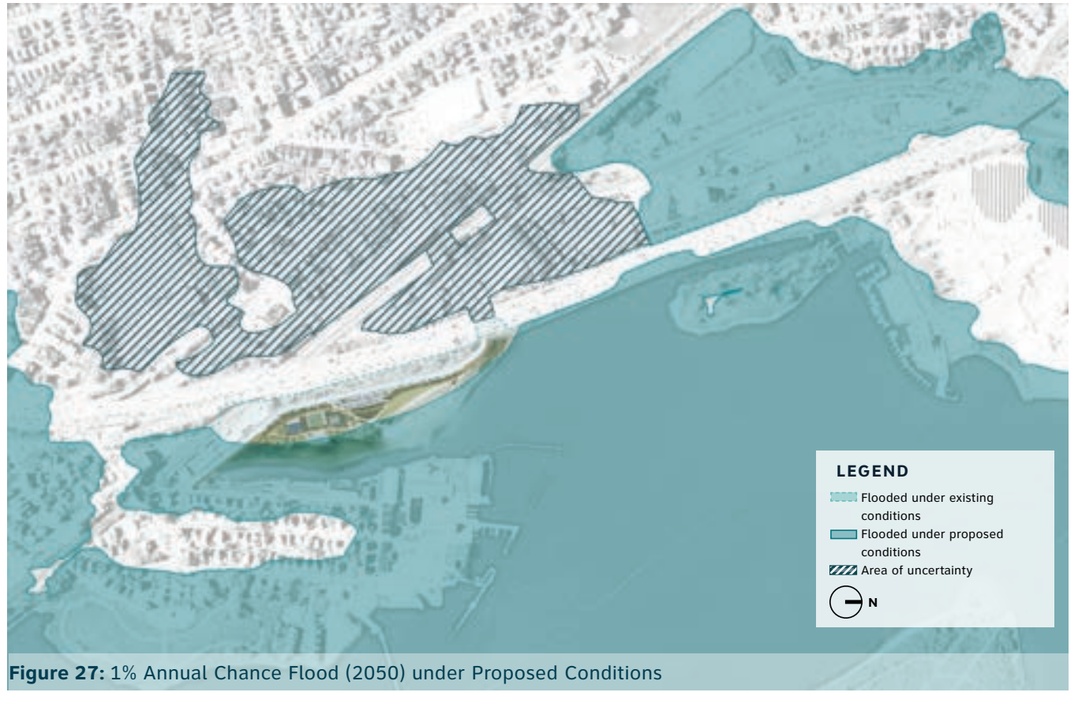


Figure 27: 1% Annual Chance Flood (2050) under Proposed Conditions

1% Annual Chance Flood (2050) under Proposed Conditions

PROJECT EFFECTIVENESS AT RISK REDUCTION

Site Flood Exposure

In addition to reducing risk during extreme flood events, the proposal will also improve the performance of the site flooding and enable extended use of park programs.

The following figures demonstrate:

- Existing Conditions
  - Under existing conditions, Conley St. near Pine Neck Creek, a critical access route to the Port Norfolk community, will be subject to monthly flooding in 2030, an increase of frequency from flooding in moderate floods today.
  - Under existing conditions, the beach will be subject to daily flooding in 2030, an increase of frequency from flooding monthly today - rendering it less usable with more maintenance needs as sand is pushed inland on a regular basis.
  - Under existing conditions, the edges of the sports courts will be subject to flooding in moderate storms in 2030, and to an increase of frequency from flooding in extreme floods today.
- Proposed Conditions
  - With the proposed design in 2030, Conley St. near Pine Neck creek, a critical access route to the Port Norfolk Community, will be subject to flooding only in extreme floods. This is an improvement from potentially flooding monthly under existing conditions.
  - With the proposed design in 2030, the beach will be subject to monthly flooding. This is an improvement from flooding daily under existing conditions. This will enable the sandy beach to be used more often. The coastal dune will also block and trap wind- and water-borne sand, reduce the need to manage sand migration in upland areas
  - With the proposed design in 2030, the sports courts, parking, and parts of Conley street are protected in extreme floods. This is an improvement from potentially flooding in moderate storms under existing conditions.

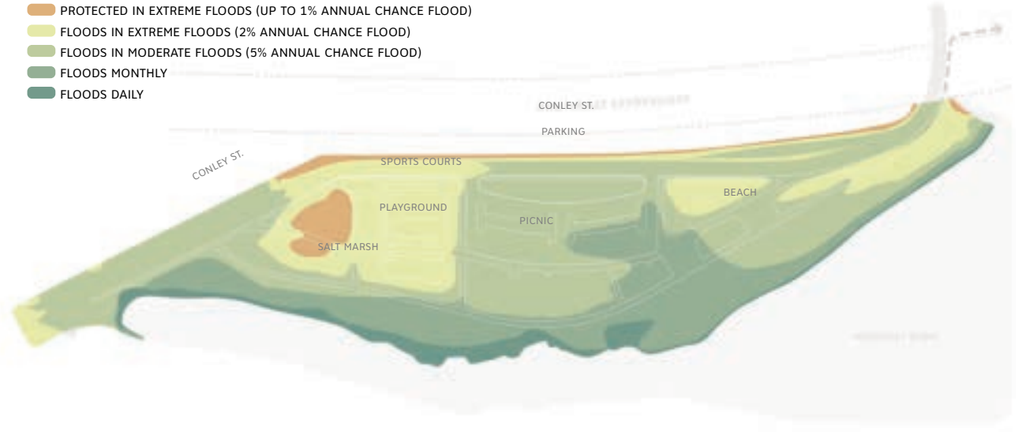


Figure 28: Predicted Flood Frequency Today

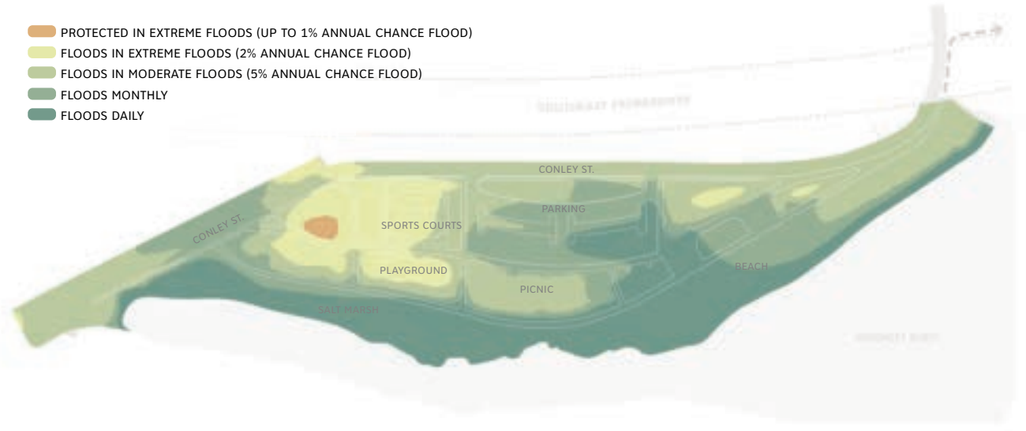


Figure 29: Predicted Flood Frequency in 2030 Without Project

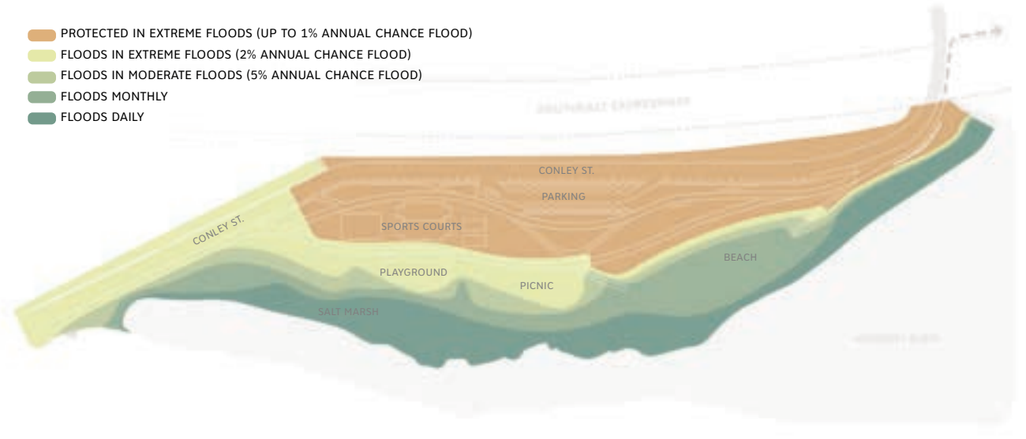


Figure 30: Predicted Flood Frequency in 2030 With Project

COMMUNITY-WIDE BENEFITS

Transportation Access

The project has broad reach outside its focus area at Tenean Beach. Flooding in this location would impact a network of critical transportation infrastructure.

Flooding would impact the (1) MBTA Red Line, which is the subway line with the greatest ridership, (2) the Southeast Expressway, and (3) Morrissey Boulevard. These vital transportation lines move the Dorchester community to their places of work and commerce. As a result, flooding would cause far-reaching impacts to the City's economy such as shutdowns due to failure and maintenance, technical, or structural issues.

The proposal seeks to minimize this risk in the near-term. In the long-term, it will be necessary to adapt and tie into adjacent ongoing efforts to further reduce risk in this area. Minimizing risk in this area would mean sustained mobility for economic growth and housing development to address the affordability crisis. It would also mean critically supporting the social and cultural networks of this diverse community.

Sources: Boston Open Data, MASSGIS, MC-FRM

Figure 31: Map showing impacted buildings and infrastructure from flooding

BENEFITS TO DISADVANTAGED COMMUNITIES

Socially vulnerable community members

Social vulnerability is the extent to which social groups are susceptible to the detrimental impacts of natural hazards, including deaths, injuries, and other losses that are disproportionate to other groups in the same region. The project lies within an area that serves a cross section of low to high socially vulnerable community members. Reducing flood risk would benefit socially vulnerable community members directly.

Designated Geographical Area for Environmental Justice Populations

Areas within one mile of the project site are considered a Designated Geographical Area ("DGA") for Environmental Justice ("EJ") populations in accordance with the Massachusetts Environmental Policy Act ("MEPA") regulations at 301 CMR 11.02. The Project Site is located in Census Block Group 2, Census Tract 1006.03 of Suffolk County, and the EJ criteria of Census Block Groups within the project site's DGA include: Minority; Income; Minority and Income; Minority and English Isolation; and Minority, Income, and English Isolation. The project site has 462 EJ Populations within a five-mile radius and 32 EJ Populations within a one-mile radius. See Figure 7, Environmental Justice Populations (5-Mile Radius) and Figure 8, Environmental Justice Populations (1-Mile Radius).

Figure 32: Environmental Justice populations

Figure 33: Map showing socially vulnerable areas and infrastructure impacted by flooding

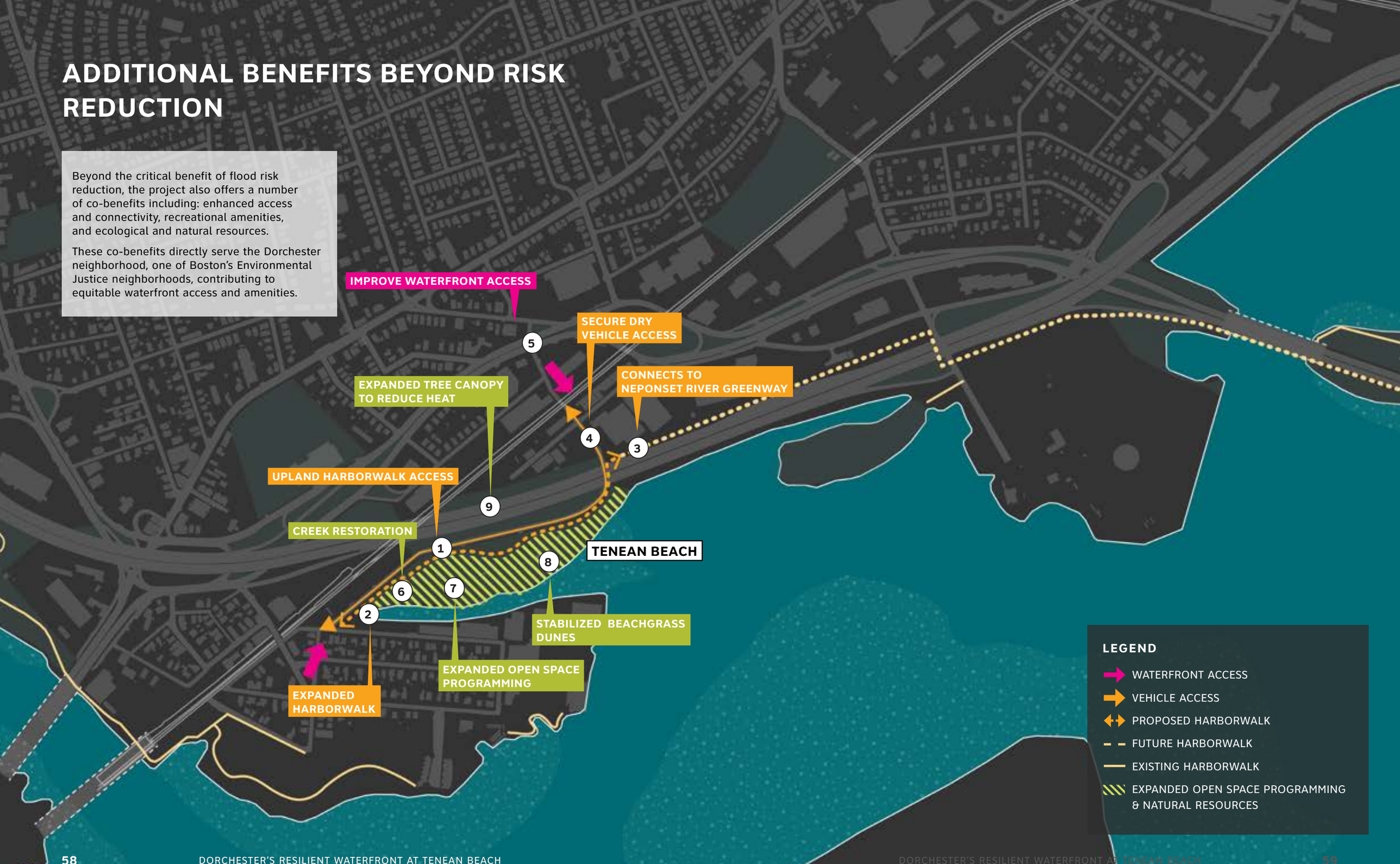
Figure 34: Map illustrating additional benefits beyond risk reduction (following spread)

Sources: Boston Open Data, MASSGIS, MC-FRM

ADDITIONAL BENEFITS BEYOND RISK REDUCTION

Beyond the critical benefit of flood risk reduction, the project also offers a number of co-benefits including: enhanced access and connectivity, recreational amenities, and ecological and natural resources.

These co-benefits directly serve the Dorchester neighborhood, one of Boston's Environmental Justice neighborhoods, contributing to equitable waterfront access and amenities.



ADDITIONAL BENEFITS BEYOND RISK REDUCTION

Access to Open Space and Recreation

The plan envisions Tenean Beach as a critical piece of open space and recreational infrastructure, complementing other parks and amenities nearby.

The existing playground is maintained and is joined by new basketball and tennis courts. A flexible lawn provides a space for everyday gathering and small events. Picnic areas overlook the water's edge, capturing scenic views. A series of new picnic shelters provide comfortable, shady places to gather in the summer months.

All of these amenities connect to the broader open space network via the reconstructed Harborwalk, which ties into the Neponset Greenway Connector.

Ecology and Natural Resources

The plan for Tenean Beach embraces its role as a critical natural resource within the Neponset River Estuary. The design aims to reduce impervious surfaces and enhance stormwater infiltration on the site. In areas near the Pine Neck Creek where segments of the existing Harborwalk are removed, disturbed areas will be restored with native coastal species to promote ecological health.

Heat Benefits

The design recognizes that Dorchester was prioritized as one of Boston's hottest neighborhoods in the 2022 Heat Resilience Solutions for Boston Plan. Taking advantage of coastal breezes, Tenean Beach is already one of the cooler spots in Dorchester, serving as a refuge for community members on the hottest days. Additional canopy trees and picnic shelters proposed in the design will increase climate comfort within the park.

Figure 35: Recreational Amenities (Looking south towards Port Norfolk)

Figure 36: Harborwalk (Looking north towards Harbor)

RE-ALIGNED HARBORWALK

COASTAL PLANTING

RECREATIONAL LAWN

BEACHGRASS STABILIZED DUNES

BEACH

+14.0

+12.0

+10.0

**Elevations given in NAVD88 can be converted to Boston City Base (BCB) elevation by adding 6.46 feet.*

INCORPORATING NATURE-BASED SOLUTIONS

Natural Infrastructure & Other Nature-Based Solutions

The proposed design minimizes hard engineering solutions to the extent feasible given site constraints and the project goals. It relies heavily on natural infrastructure and nature-based solutions to reduce flood risks, erosion, and wave damage. These elements are designed to also generate co-benefits including reducing heat impacts, creating habitat, filtering pollutants, and providing recreational benefits.

Elevated Landscape

The project proposal prioritizes a passive solution to address the flood pathway at Conley St./I-93 underpass, thereby eliminating a need for a deployable flood wall. Through strategically elevating the landscape and meeting existing site conditions, the design is able to develop the open space co-benefits listed above. For further details about the elevated landscape, please see section titled *Site Strategy to Meet Design Flood Elevation* on pg. 34.

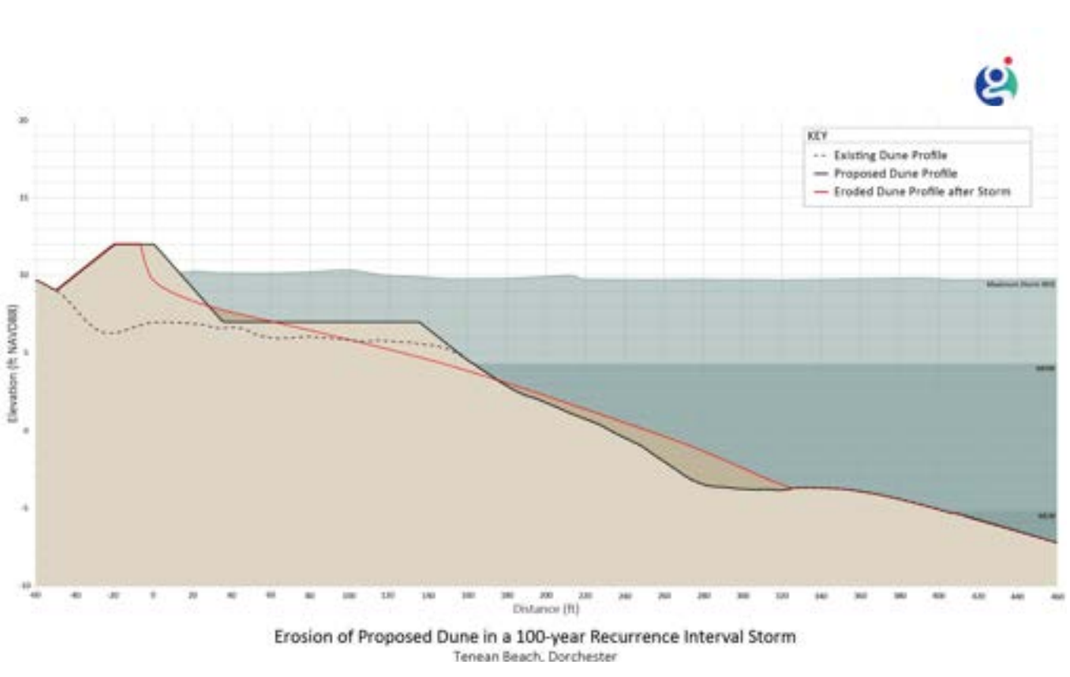


Figure 37: Excerpt from beachgrass stabilized dune modelling process

Beachgrass Stabilized Dune

The project expands and enhances the existing coastal beach and constructs a new beachgrass stabilized coastal dune with beach compatible sand. The footprint of the proposed beach and dune would displace existing hardscapes (paths, sheltered patios, parking), some of which would be relocated further away from the shoreline.

At its widest cross-section, the beach berm will be restored to about 100 ft wide, rising at a 10:1 slope from 7 ft NAVD88 to the toe of the new dune at 8 ft NAVD88. The existing and proposed beach narrows and profile steepens at its northern and southern ends, based on the site topography.

The proposed dune will be approximately 450 feet long, with a foreslope of 7:1 and a 20 ft wide crest at elevation 12 ft NAVD88. The dune will be stabilized with beachgrass and selectively planted with other native dune species, such as downy serviceberry (*Amelanchier arborea*), beach plum (*Prunus maritima*), and black cherry (*Prunus serotina*) to provide a more diverse habitat for a range of species.

The landward edge of the dune will be separated from a parallel access path with dimensioned stone edging. The flood protection berm would be landward of the access path. The edging serves multiple purposes, including providing seating, minimizing sand migration and associated maintenance, and discouraging informal footpaths through the dune. Formal and universally accessible paths to the beach will be provided near the northern and southern ends of the dune.

Coastal modeling has demonstrated that the expanded beach and new dune will provide flood and storm damage protection to upland access paths, recreational areas, and the flood protection berm. Based on cross-shore performance modeling, the beach and dune improvements will withstand a present day 10% annual chance storm with minimal erosion of the beach berm and dune foreslope. In a more extreme 1% annual chance storm, the dune and beach berm would sustain more erosion but not be fully eroded, and a substantial portion of the dune volume and crest would remain intact. After such an event, some maintenance would be required. However, sand eroded in these events would remain in the nearshore above Mean Low Water where they would continue to provide storm damage protection functions. Water levels and wave runup during these storms will not exceed the dune crest, demonstrating the flood protection benefits.

Recreational services provided by the beach will also be made more resilient to sea level rise with the proposed design. If no action is taken, the beach will be fully inundated daily at high tide in 2030. With the proposed improvements, inundation will be limited to a monthly occurrence in 2030 (97% less frequent, not accounting for storms).

Creek Restoration

Coastal wetlands, particularly salt marshes, were once the dominant plant community in the Boston area. However, over the past few centuries, these marshes have experienced significant loss due to land reclamation, pollution, and alterations to the natural water flow.

At the southern end of the Dorchester site, Pine Neck Creek, a small tributary of the Neponset, flows into the surrounding estuary. While there is currently some marsh vegetation along the creek's shores, its quality has been degraded by invasive species and pollutants from upstream sources and nearby roads.

One common issue faced in tidal marshes is the muddling of separation between different salt marsh zones. With rising sea levels and changes in flooding patterns, there is often an increased presence of Saltmeadow cordgrass (Spartina alterniflora), which is typically found in low marsh habitats, in high marsh zones. This alteration can have a significant impact on wildlife, particularly birds that depend on specific breeding areas within the marsh.

To address these challenges, this project aims to restore the important transitional zones from low to high marsh and implement upland plantings. This will help facilitate natural shifts in vegetation without losing the integrity of the high marsh areas. To achieve this, the project will allow for inundation and buffer areas in specific low-lying portions of the site.

Figure 38: Pine Neck Creek outfall and existing marsh

Coastal Planting

This project draws inspiration from various coastal conditions found in Massachusetts, such as Plum Island and Cape Cod National Seashore, to inform the selection of plant species. The chosen plants are naturally salt-tolerant and hardy, making them well-suited for several typological zones within the project area, including the low marsh, high marsh, coastal dune, maritime forest, and planted buffer.

In the low marsh, Saltmeadow Cordgrass (*Spartina alterniflora*) dominates the landscape, forming a nearly monocultural presence in the low-lying areas. Moving to the higher marsh, a diverse mix of grasses, including Saltgrass (*Distichlis spicata*) and Switchgrass (*Panicum virgatum*), coexist with shrubs that can withstand inundation, such as Grounsel Bush (*Baccharis hamifolia*) and Marsh Elder (*Iva frutescens*).

Transitioning to the coastal dune, a range of scrubby and low-lying vegetation thrives in the sandy environment. Examples of these species include American Dunegrass (*Leymus mollis*), Beach Heather (*Hudsonia tormentosa*), and Beach Plum (*Prunus maritima*).

Moving further inland, in the upland portions of the site, the project incorporates elements from the coastal forests of Massachusetts. Here, a higher shade-producing overstory of maples and oaks contributes to the maritime forest. The shrub layer includes species such as Viburnums (*Viburnum dentatum*) and Summersweet (*Clethra alnifolia*).

Lastly, the planted buffer serves a dual purpose of collecting stormwater runoff from adjacent areas and providing visual protection from Conley Street and Southeast Expressway. This buffer zone includes a mix of species that can thrive in urban environments, providing both noise reduction and pollution mitigation along the road.

Figure 39: Dune and maritime forest ecological communities in Plum Island, Massachusetts

Figure 40: Bird's eye view of northern half of the site

**Elevations given in NAVD88 can be converted to Boston City Base (BCB) elevation by adding 6.46 feet.*

DESIGNING WITH ADAPTABILITY

Project Strategy

During the development phase, the project team considered how the design would adapt to meet flood elevations in the long-term. The current design can accommodate these three adaptation possibilities:

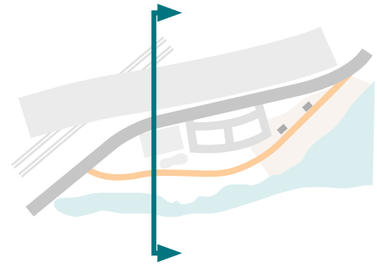
1. **Elevate Site to El. 16.2' NAVD88**
   This option would require more fill, but have less maintenance requirements in the long-term.

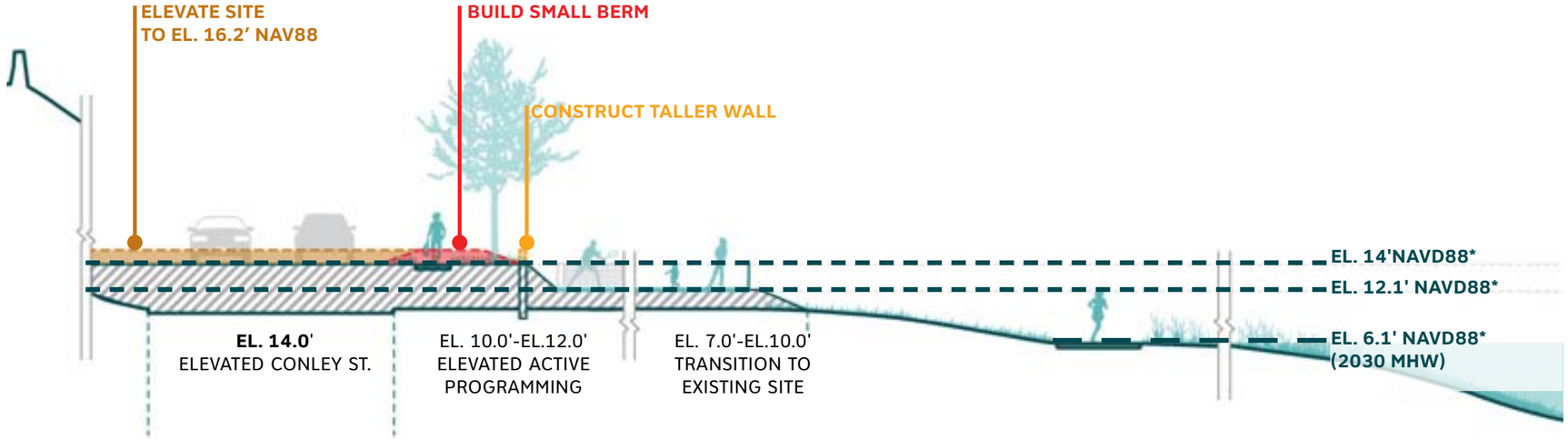
2. **Build a Small Berm**
   This option would limit fill, but leave areas adjacent to Conley Street vulnerable to wave action.

3. **Construct Taller Wall**
   This option would introduce more hardened infrastructure to the site design and require the most maintenance. However, its limited footprint will impact the current design less. Similarly, this would leave areas adjacent to Conley Street vulnerable to wave action.

The direction of adaptation option will depend on design development and continuing conversations on cost, environmental permitting, the site's relationship with adjacent projects, and long-term maintenance roles.

Note: With the implementation of any of these strategies, there is likely to remain some limited risk from intermittent wave splash over during large storm events. This may reduce the usability of the roadway, parking, and sidewalks immediately inland of the flood protection infrastructure. However, it will not be sufficient volume to flood areas inland of the Expressway/I-93.





**Elevations given in NAVD88 can be converted to Boston City Base (BCB) elevation by adding 6.46 feet.*

Figure 41: Diagram showing potential adaptation strategies

COMMUNITY ENGAGEMENT AND PRIORITIES

OUTREACH & ENGAGEMENT

Community Members & Stakeholders

This project continues community and stakeholder outreach and engagement efforts started during Climate Ready Dorchester, with a more definitive focus around the catalytic project site at Tenean Beach.

Engagement with the community was centered on two public workshops, with robust outreach detailed below. Community members were able to contribute feedback to help directly advance the design. For greater detail on these workshops, see the next section on *Engagement Process*.

Stakeholder engagement included recurring meetings throughout the project timeline with key agencies that have direct adjacencies to the project site, these include: DCR, MBTA, MASSDOT, and BWSC. Their contributing feedback and guidance throughout the process enabled a coordinated design and a grounded point of departure for future design development. For further detail, see section on *Partners Involved in the Project Design* at the beginning of this Executive Summary document.

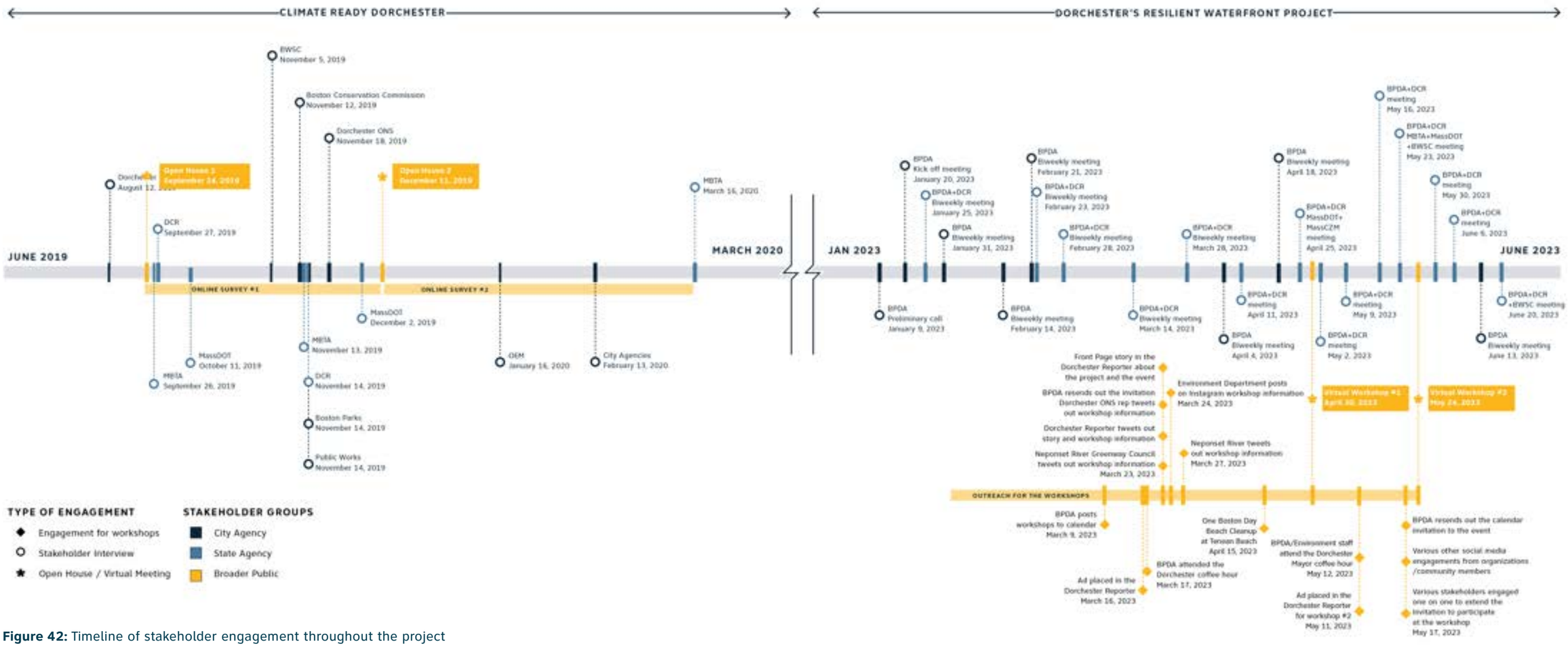


Figure 42: Timeline of stakeholder engagement throughout the project

ENGAGEMENT PROCESS

Community Engagement

Two workshops were held to engage the public in the Dorchester Waterfront project. The workshops were designed to ensure accessibility to a wide audience and were translated into Spanish, Vietnamese, and Haitian Creole. A diverse set of participants attended, including local residents, nonprofits, governing agencies, construction administrators, and researchers. The first workshop was a listening session that aimed to gather feedback on existing conditions and offer two alternatives to understand priorities. The second workshop focused on hearing feedback on a hybrid scheme that incorporated the preferred elements from those two alternatives. Throughout the workshops, participants were given the opportunity to share comments or concerns using the meeting chat and an online interactive feedback tool.

To make the research and design options more accessible to the public, the content was distilled into clear, digestible slides. Technical information was communicated through diagrams and simple statements. During the first workshop, the content was broken down into several topics, including Climate Ready history, ongoing project coordination, existing conditions and key takeaways, project goals and criteria, climate adaptation, and a question session. The second workshop included a recap of the first workshop, a discussion of design refinements, and a question session.

I biked downtown from Milton for 30 years past Tenean beach. It was a beautiful, relaxing respite from the harrowing ride on Morrissey past UMass.

Figure 43: Site photographs paired with feedback quotes from Workshop 1

Port Norfolk was isolated during the 2018 storms. The parking lot floods more than 4 times a year. I have run clean ups of debris.

Deployable walls trap Port Norfolk residents in, and emergency vehicles out.

COMMUNITY PRIORITIES

Key Takeaways

At Workshop 1, participants provided feedback on two schemes: one that was primarily nature-based and another that was primarily recreation-based. The nature-based scheme raised concerns about long-term usability, lack of active space, and floodwater management. While participants appreciated the idea, they felt it did not provide sufficient protection for public transit and lacked parking. On the other hand, the recreation-based scheme received more enthusiasm due to its ability to provide equitable access, passive flood management, and maintain usable space for longer. Some participants suggested incorporating more nature-based measures from the first scheme, and some expressed concerns about floodwater management were also expressed.

The key takeaways from Workshop 1 were that most participants preferred a passive flood management solution. The feedback encouraged maintaining Conley as an evacuation route, evaluating interior stormwater management, and protecting Port Norfolk. Additionally, participants expressed interest in a hybrid solution with both passive and active aspects.

Workshop 2 received less feedback, with participants indicating preference towards the combined scheme's enhanced natural environment, beach and active recreation, passive flood infrastructure, continuity of the Neponset Greenway, and enhanced public transit protection. Some participants expressed their desire for more parking, while others preferred less parking. Additionally, a few participants requested reconsideration of including restrooms and water retention areas.

These key takeaways have been folded into the design parameters, as seen on page 36, and set the guidelines for the design proposal.

Figure 44: Several priorities distilled from Workshop 1

Continued Community Involvement

Community engagement is an integral part of every project that will be advanced from Climate Ready Boston, regardless of who the lead agency. The Resilient Dorchester Waterfront Project at Tenean Beach/Conley Street is no exception. The community was heavily engaged during the grant-funded process. With two public workshops, several public appearances at meetings, coffee hours, and press coverage, the project team strives to give the community a voice to ensure that they influence design outcomes. As the project advances to future phases of design and permitting, public outreach will continue, welcoming all voices to be heard.

To learn more about the two community workshops for this project, please visit:

https://www.bostonplans.org/planning/planning-initiatives/dorchester-resilient-waterfront-project

Figure 45: A Climate Ready Dorchester community meeting

NEXT STEPS

COORDINATING WITH KEY EFFORTS

Hazard Mitigation Plan

The Resilient Dorchester Waterfront project at Tenean Beach / Conley Street is in direct alignment with the goals laid out in the 2021 Natural Hazard Mitigation Plan (NHMP) adopted by the City of Boston through the Office of Emergency Management.

The five goals of the plan are:

1. Equitably protect the health and safety of the public through awareness, preparedness, and connectedness.
2. Increase resilience by protecting and enhancing natural resources.
3. Implement hazard mitigation and climate adaptation projects that meet strategic priorities.
4. Invest in protecting properties and structures.
5. Ensure that essential services and infrastructure will function during and after a hazard event and prepare essential services for projected climate change impacts.

This project works towards goals 2,3, and 4 as well as Climate Adaptation Action #8 (A8): "Implement Climate Ready Boston and Continue to Develop Strategies that Integrate Various Natural Hazards." In the NHMP, Climate Adaptation Action 8 (A8) was deemed as a High Priority project. The Resilient Dorchester Waterfront Project at Tenean Beach / Conley Street was also identified as a catalytic near-term project in the Coastal Resilience Solutions for Dorchester report.

The Federal Emergency Management Agency (FEMA) approved 2021 NHMP update makes the City of Boston eligible for FEMA grants. We can use those grants to put in place the strategies identified in the final report, including projects such as the Tenean Beach / Conley Street project.

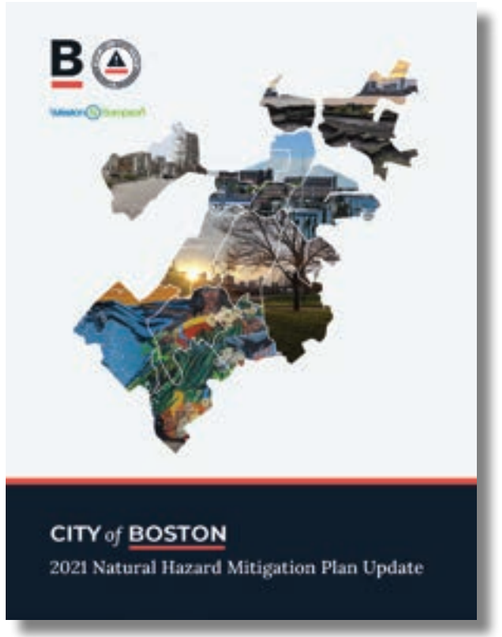


Figure 46: City of Boston 2021 Hazard Mitigation Plan

Read more about 2021 Natural Hazard Mitigation Plan here:

https://www.boston.gov/departments/emergency-management/natural-hazard-mitigation-plan

Morrissey Boulevard

The Massachusetts Department of Transportation, Massachusetts Department of Conservation and Recreation, City of Boston, and Boston Planning and Development Agency are currently collaborating on a planning study for the future redesign of Morrissey Blvd. Morrissey Blvd, a critical transportation infrastructure and designated evacuation route, is vulnerable to coastal flooding from the Tenean Beach and Conley Street flood pathway, as well as other flood pathways emanating from the Dorchester waterfront. Improving the resiliency of Morrissey Blvd to coastal flooding is a key planning goal of the project, thus there is a shared interest with the proposed project at Tenean Beach and Conley Street. The collaborating partners have agreed to plan Morrissey Blvd resiliency improvements to provide protection from the 2070

1% annual chance storm based on the MC-FRM.

Joseph Finnegan Stormwater Park

The Joseph Finnegan Park storage basin envisions a hybrid natural storage system and pump station to be constructed in the park, adjacent to the Neponset River. The basin can serve as a walkable recreation area during dry weather or low tide rain events. However, during heavy rainfalls, it can store excessive water and pump it into the river if necessary. Potentially, some of the stormwater storage tanks could also be located in the Tenean Beach project. This decentralization of tanks from Joseph Finnegan Park would benefit both parks in a mutually advantageous manner.

Neponset River Greenway Extension

The Massachusetts Department of Conservation and Recreation (DCR), with the assistance of the BSC Group, Inc. (BSC) and Massachusetts Department of Transportation (MassDOT), are currently working on an extension to the Neponset River Greenway between Tenean Beach and Morrissey Boulevard in Dorchester. The project features a 3,620-foot long multi-use pathway, with a 10 foot boardwalk portion.

The first section of the project will go from Victory Road to the William T. Morrissey Boulevard, while the second stretches from Victory Road to Tenean Beach off Conley Street, which links in to the Dorchester Waterfront project site.

The project aims to connect the Lower Neponset River Trail Greenway at Tenean Beach to the Harbor Walk. Along the way, the project will resurface some sections of street, add sidewalks, increase stormwater infiltration, and allow for new wetland habitat establishment.

More information available at:

https://www.boston.gov/sites/default/files/file/2021/07/Neponset%20River%20Greenway%20NOI_Combined.pdf

Figure 47: Neponset Greenway Extension, BSC Group

ROADMAP TO IMPLEMENTATION

The Tenean Beach proposal embodies a design solution that effectively mitigates flood risk while providing additional benefits of expanded recreation and improved access to the extended Dorchester community. To achieve successful implementation, further development is required in the following areas.

Coordinate a Comprehensive Flood Resilience Strategy

This is an initial step towards establishing a continuous coastal flood resilience strategy. Efforts must be coordinated and planned in conjunction with adjacent resilience projects to ensure long-term risk reduction.

Explore Funding Opportunities for Design and Construction

There are numerous opportunities for grant funding, including Federal Emergency Management Agency (FEMA), Massachusetts Municipal Vulnerability Preparedness (MVP), Massachusetts Office of Coastal Zone Management (CZM), and National Fish and Wildlife Foundation (NFWF). Continued discussions are necessary to determine which grants would best serve the project, which grants are most competitive for selection, and what design modifications may be required.

Conduct Detailed Site Investigations

Delineation of Wetland Resource Areas

A professional wetlands scientist is required to accurately delineate wetland areas, including salt marshes and bordering wetland vegetation. Identifying these areas is crucial for determining the impacts of the proposed design on wetland resources.

Bathymetric Surveys

Surveyed bathymetric data of the project area will provide more accurate details of site elevations both above and below water. This information is essential for the development of the design and will serve as the foundation for site grading, which is necessary to achieve the proposed project goals.

Geotechnical Investigations

A geotechnical investigation is critical for understanding the subgrade conditions necessary for designing foundations that support flood resilience infrastructure, such as berms and walls.

Figure 48: Next steps include further site investigations, such as wetland delineation and more detailed surveys

Facilitate Discussions with Regulatory Agencies for Permitting

Collaborating with regulatory agencies from the outset allows for smoother design development, integrating permitting requirements with the design process. Continued innovative collaborations between the City, DCR, and other agencies are essential to establish a replicable process that enables coastal risk reduction transformation along the waterfront.

Continual Hydrodynamic Modeling

As the design progresses into more detailed phases of documentation, it is important to model refined designs to confirm that the project is achieving the desired ecological and hydrological goals. Modeling will also be able to demonstrate that there are no adverse impacts on adjacent property owners as a result of the design implementation.

Develop an Inclusive Community Engagement Plan

To engage a broader cross-section of the diverse demographic that resides in the area, outreach and engagement efforts need to be accessible and targeted. Defining an equitable engagement plan, one that is tactical and accessible, will allow diverse voices to be heard and help shape the design proposal towards a more beloved community amenity.

Figure 49: Further hydrodynamic modelling is needed to understand desired goals for the site