

Charles River
Watershed Association

Flooding, Access, Mobility, Safety: I-90 Project and Implications for Allston-Brighton residents

September 6, 2022

Meeting Norms & Logistics

Charles River Watershed Association

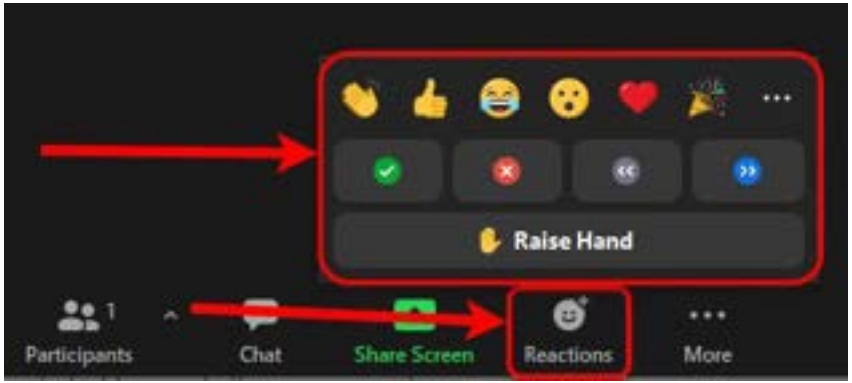
Please stay on mute

Stay within time limit

Be respectful of others

Ask questions in the chat

If you need technical assistance, chat @Dira Johanif or @Heather Miller directly



Land Acknowledgement

Charles River Watershed Association



The Charles River Watershed resides on occupied territory of the **Massachusetts**, **Nipmuck** and **Wampanoag** tribes.

Map image of native settlements and trails c. 1600-1650 in Southern New England. Source credit: Harvard Map Collection

Agenda

Charles River Watershed Association

- Introduction
- Background on CRWA
- Brief overview of I-90 Allston Multimodal Project
- Project Area current conditions, vulnerability
- MassDOT alternatives for I-90
- Q&A & Next Steps

Speakers



Dira Johanif,
Urban Resilience Advocate
CRWA

Renee Bourdeau, PE
Senior Water Resources Engineer
Geosyntec Inc.



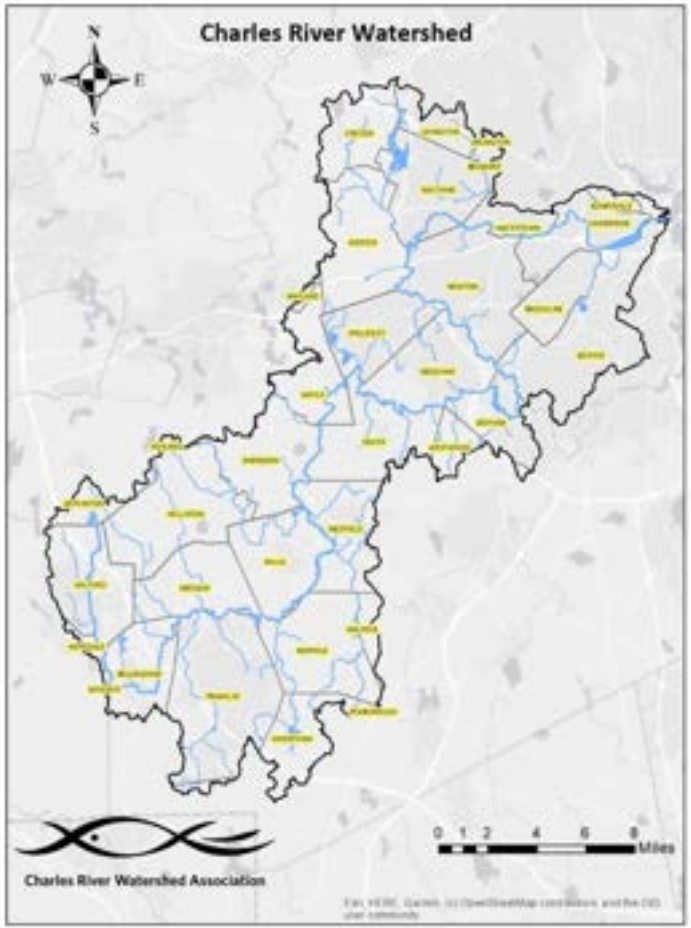
Charles River Watershed Association

CRWA's mission is to protect, restore, and enhance the Charles River and its watershed through science, advocacy, and law.

- Founded in 1965 by residents who did not accept that "the Charles cannot be cleaned up"
- One of the oldest watershed organizations in the country
- Work with EPA, state agencies, and 35 watershed municipalities

- Interdisciplinary staff
- **Program Areas:**
  - River Science & Restoration
  - Stormwater Solutions
  - Climate Resilience
  - Outreach & Education

Charles River Watershed Association



CRWA takes a watershed-scale view…

- Charles River is 80 miles long
- River runs north
- 35 towns in watershed
- Over 1 million residents
- 308 mi^2 watershed

A Legacy of Results for the Charles

Charles River Watershed Association



CRWA advocacy during Big Dig > led to the Zakim bridge



Begin Flagging Program, notifying recreational users of water quality



Medfield State Hospital Cleanup (largest restoration project in watershed)

1974

1990

1995

2000

2006

2015

2019

Creation of Natural Valley Storage Area (NVSA)



Launch volunteer water quality monitoring program - Issued the first D grade



Launch of American Shad Restoration Project



Formation of Charles River Climate Compact

I-90 Allston Multimodal Project

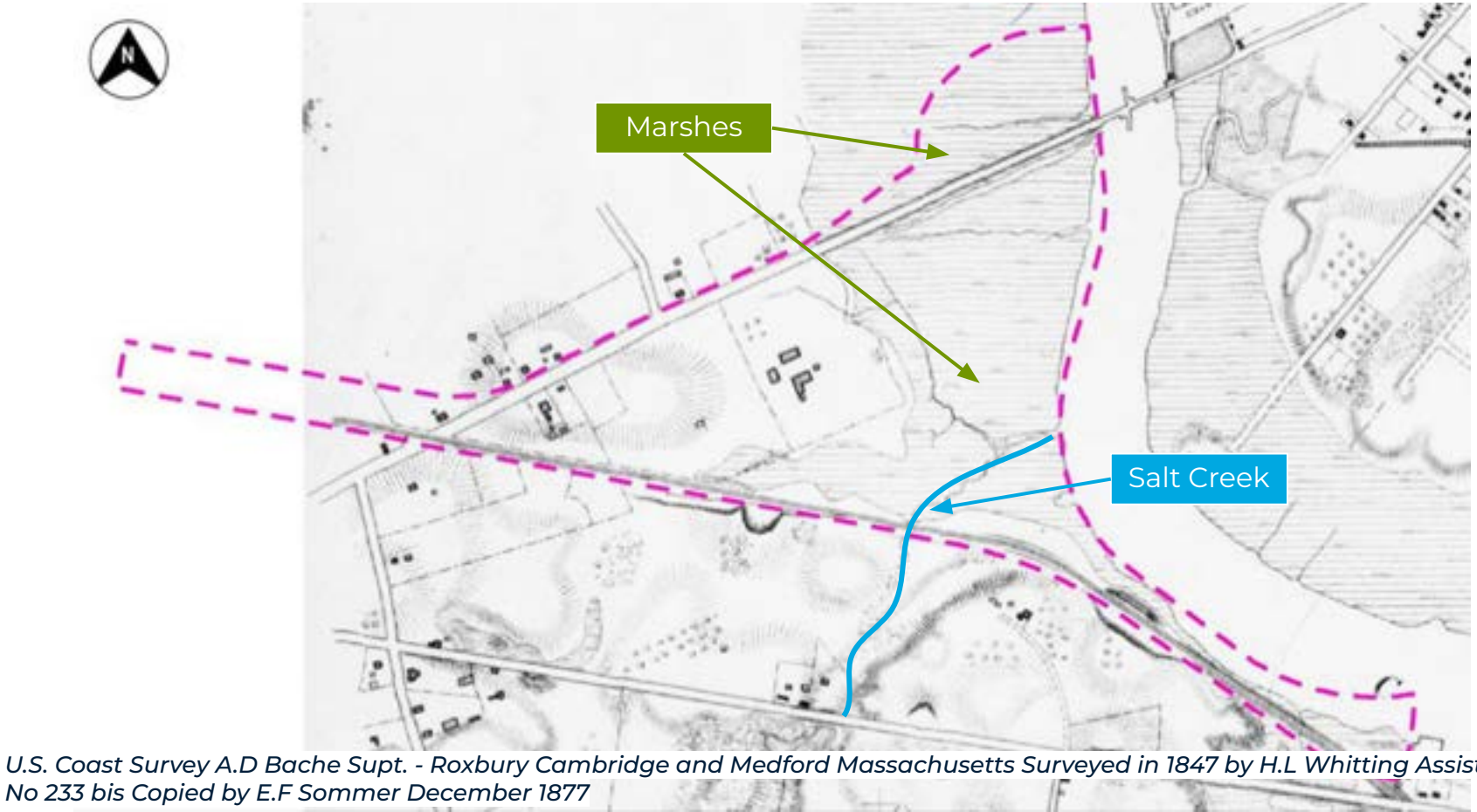
Charles River Watershed Association



Image source: Google Maps

Project Site in 1847

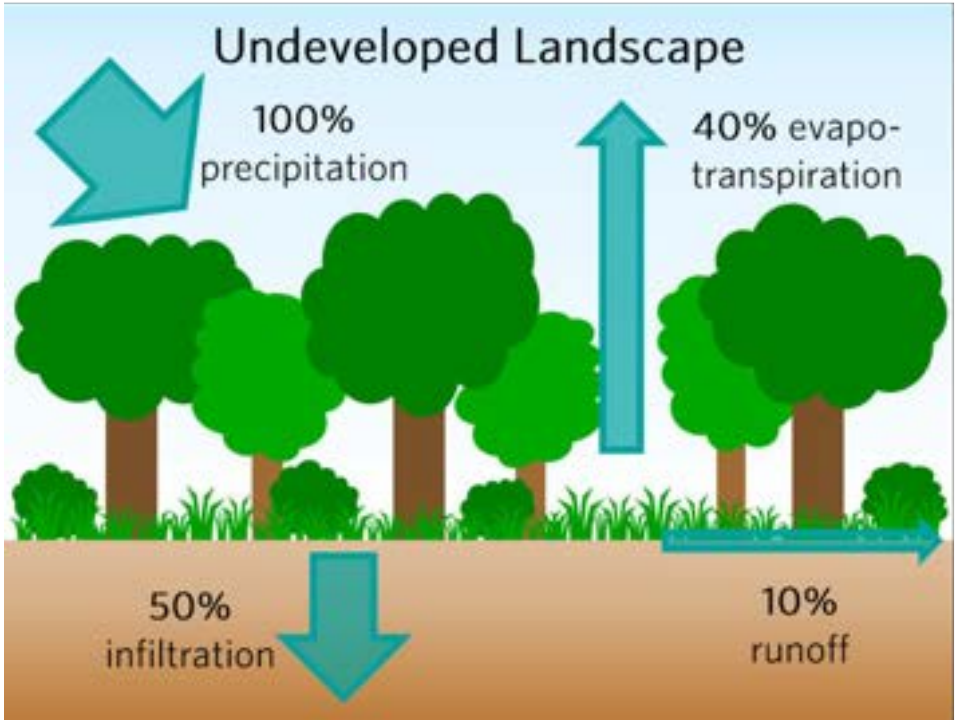
Charles River Watershed Association

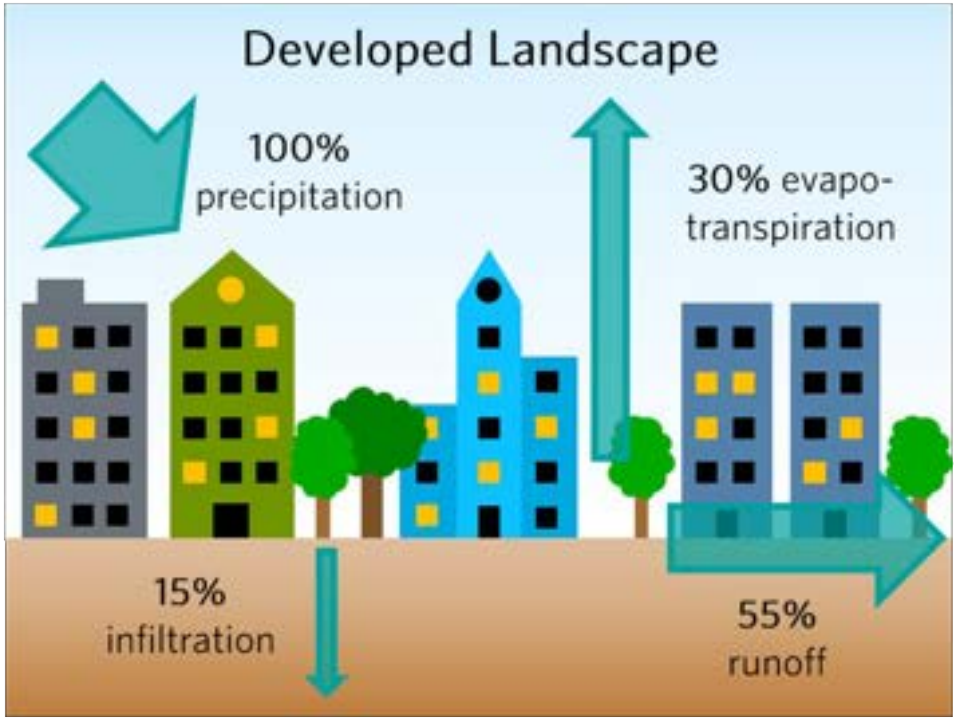


U.S. Coast Survey A.D Bache Supt. - Roxbury Cambridge and Medford Massachusetts Surveyed in 1847 by H.L Whitting Assist. Register No 233 bis Copied by E.F Sommer December 1877

Impervious Surfaces = Flooding

Charles River Watershed Association





Impervious Surfaces **alter natural hydrology, leading to increased stormwater runoff pollution into waterbodies & flooding**

Project Site Today

Charles River Watershed Association



Photo credit: Jesse Costa/WBUR



Magazine Beach

Throat area*

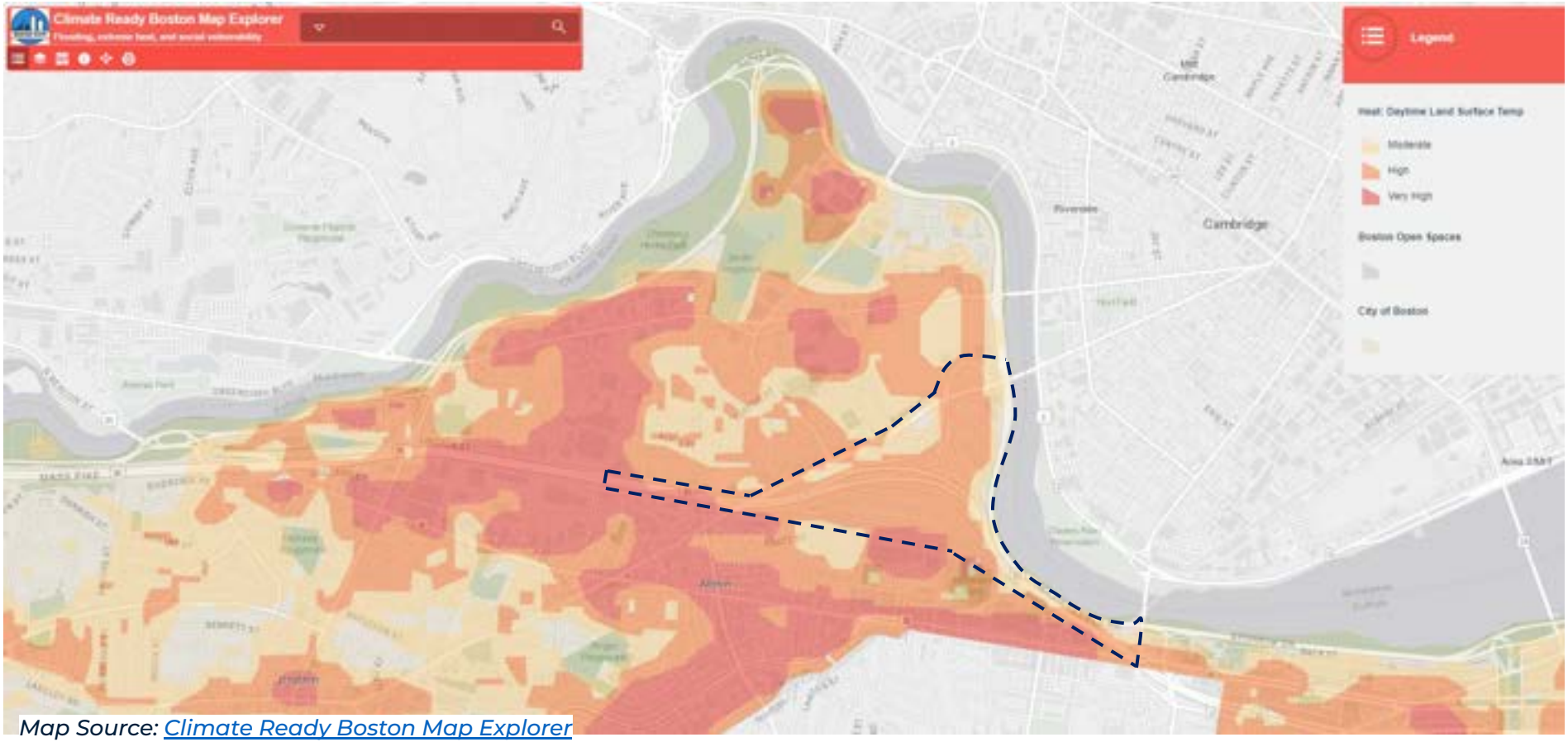
BU

Harvard Ave. T stop

Image source: Google Maps

Allston-Brighton is Climate Vulnerable

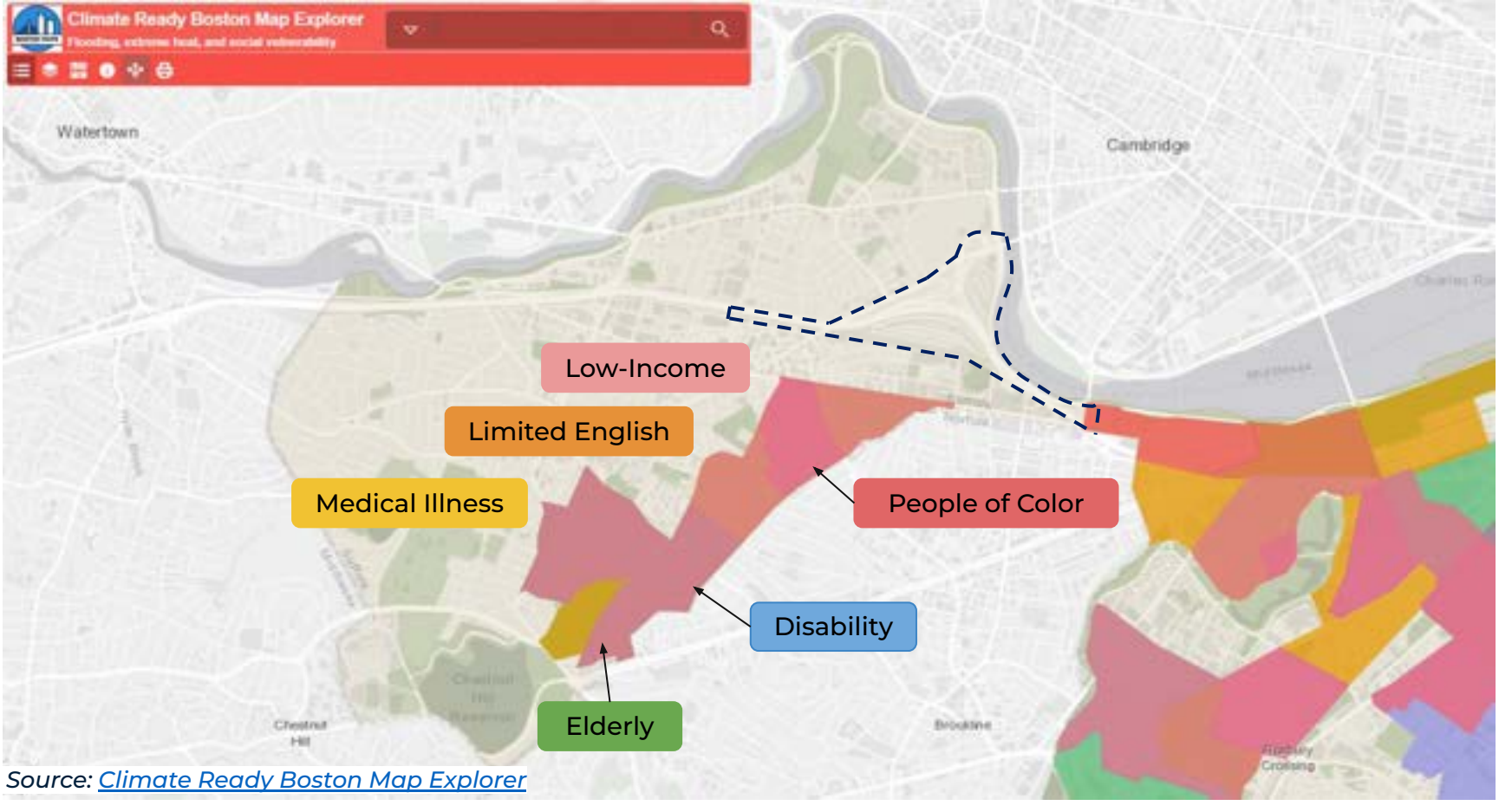
Charles River Watershed Association



Map Source: [Climate Ready Boston Map Explorer]

Allston-Brighton is Climate Vulnerable

Charles River Watershed Association



Map Source: [Climate Ready Boston Map Explorer]

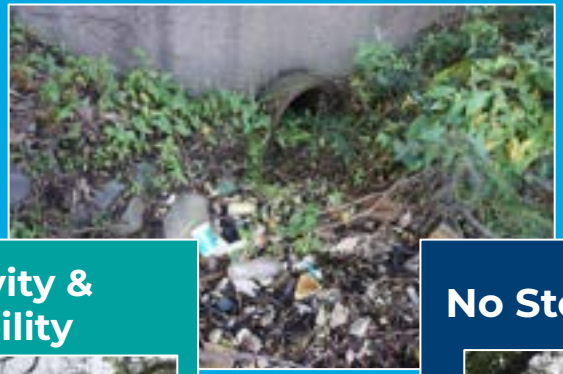
Current Conditions of Project Site

Charles River Watershed Association

Bank Erosion



Trash/Pollution



Low Connectivity & Walk/Bike-ability



No Stormwater Treatment



CRWA History with I-90 Project

Charles River Watershed Association





Picture shows elevated Massachusetts Turnpike between BU and Charles River with Soldiers Field Road at grade. The bend in the Turnpike at the top of the picture would be straightened if the broader project I-90 Allston interchange project is pursued.

TRACKING TRANSPORTATION / TRANSPORTATION / OPINION

Charles R. advocates not on board with Soldier's Field bypass

Claim that the idea has been well received not accurate

EMILY NORTON, LAURA JASINSKI and KANE LARIN Oct 31, 2019

I-90 Project Timeline

Charles River Watershed Association

Project started in 2014 = **8 years**

Still remaining: complete state/federal (MEPA/NEPA) environmental review, permitting, design, and construction - complete in 2030? 2035?

Project timeline keeps getting extended

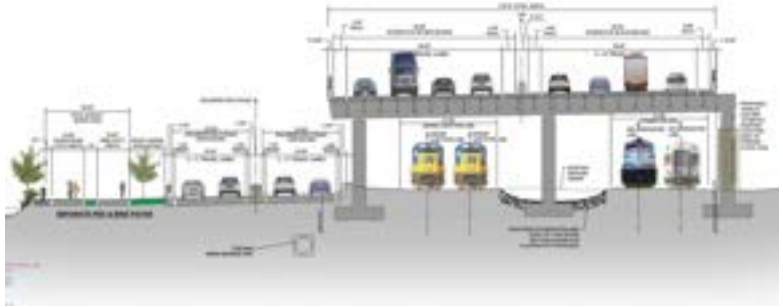
We expect this infrastructure to last 50 to 100 years

2050 and 2070 flood predictions are well within the design life of this project and must be accounted for

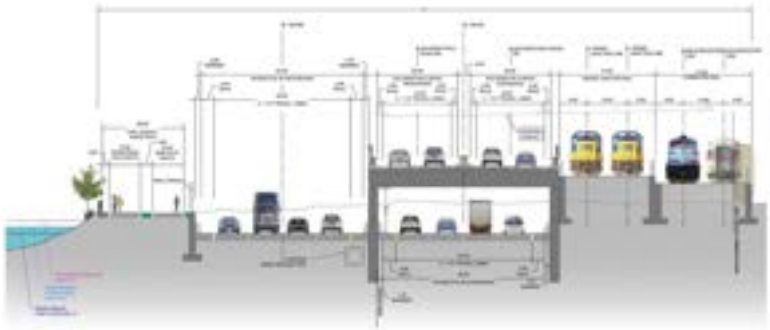


Three Design Options

Charles River Watershed Association



Modified Highway Viaduct



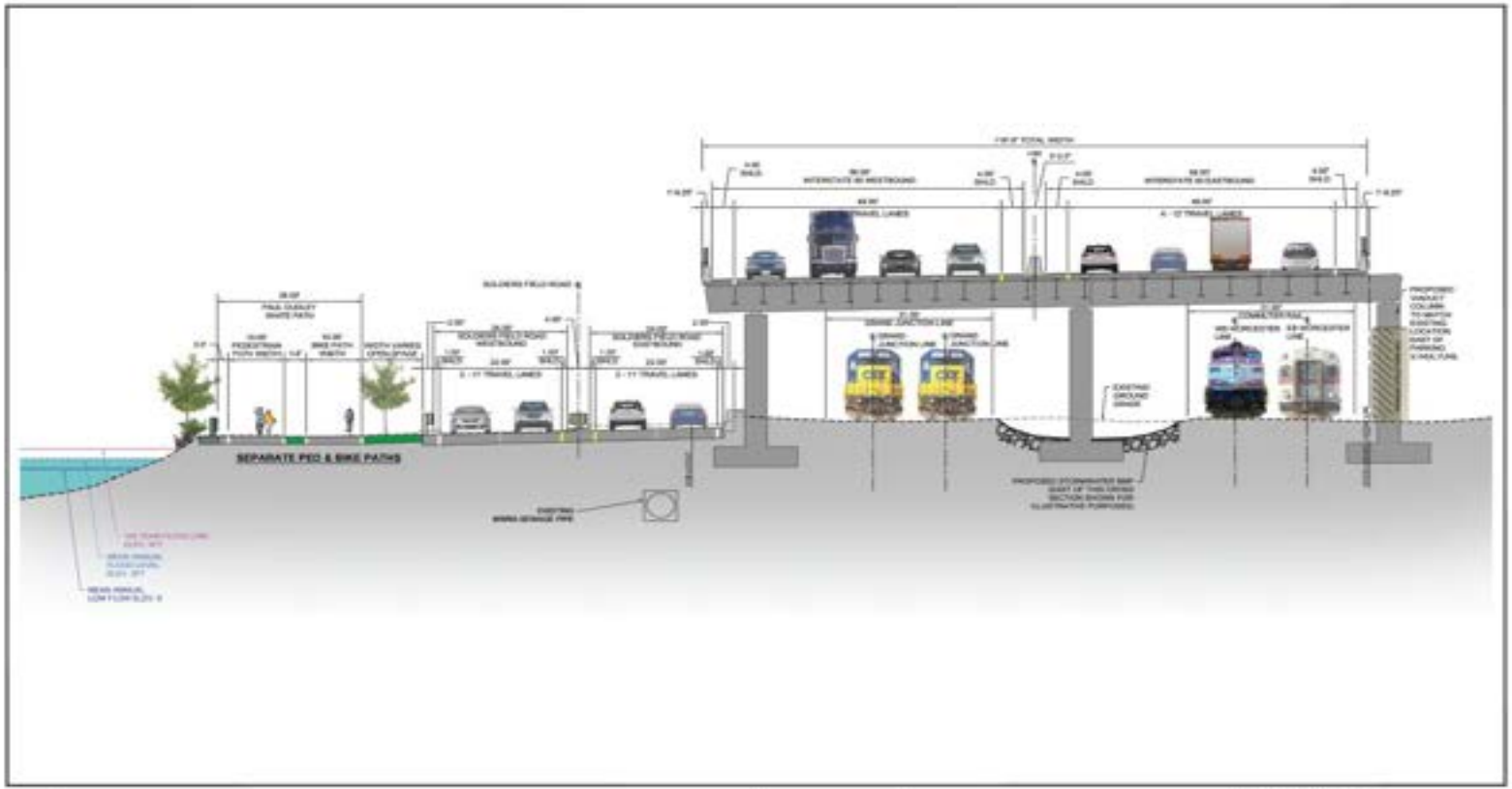
Soldier's Field Road (SFR) Hybrid



Modified At-Grade

Modified Highway Viaduct

Charles River Watershed Association



ALLSTON MULTIMODAL PROJECT

massDOT Highway Division

DRAFT

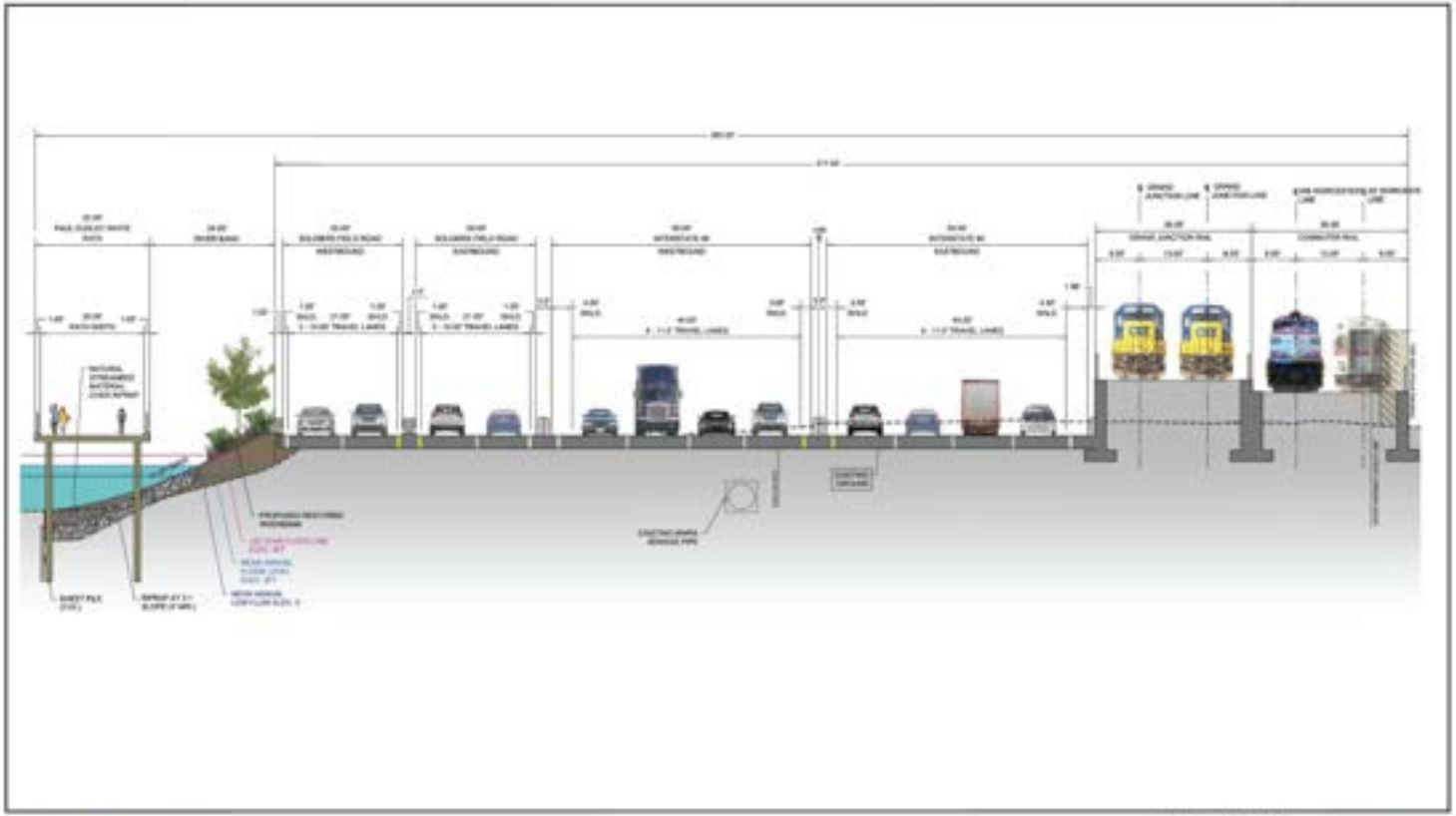
I-90 Allston Multimodal Project
Notice of Project Change

Modified Highway Viaduct Throat Area Option Cross Section

FIGURE 2.2.2 - 3

Modified At-Grade

Charles River Watershed Association



ALLSTON MULTIMODAL PROJECT

massDOT Highway Division

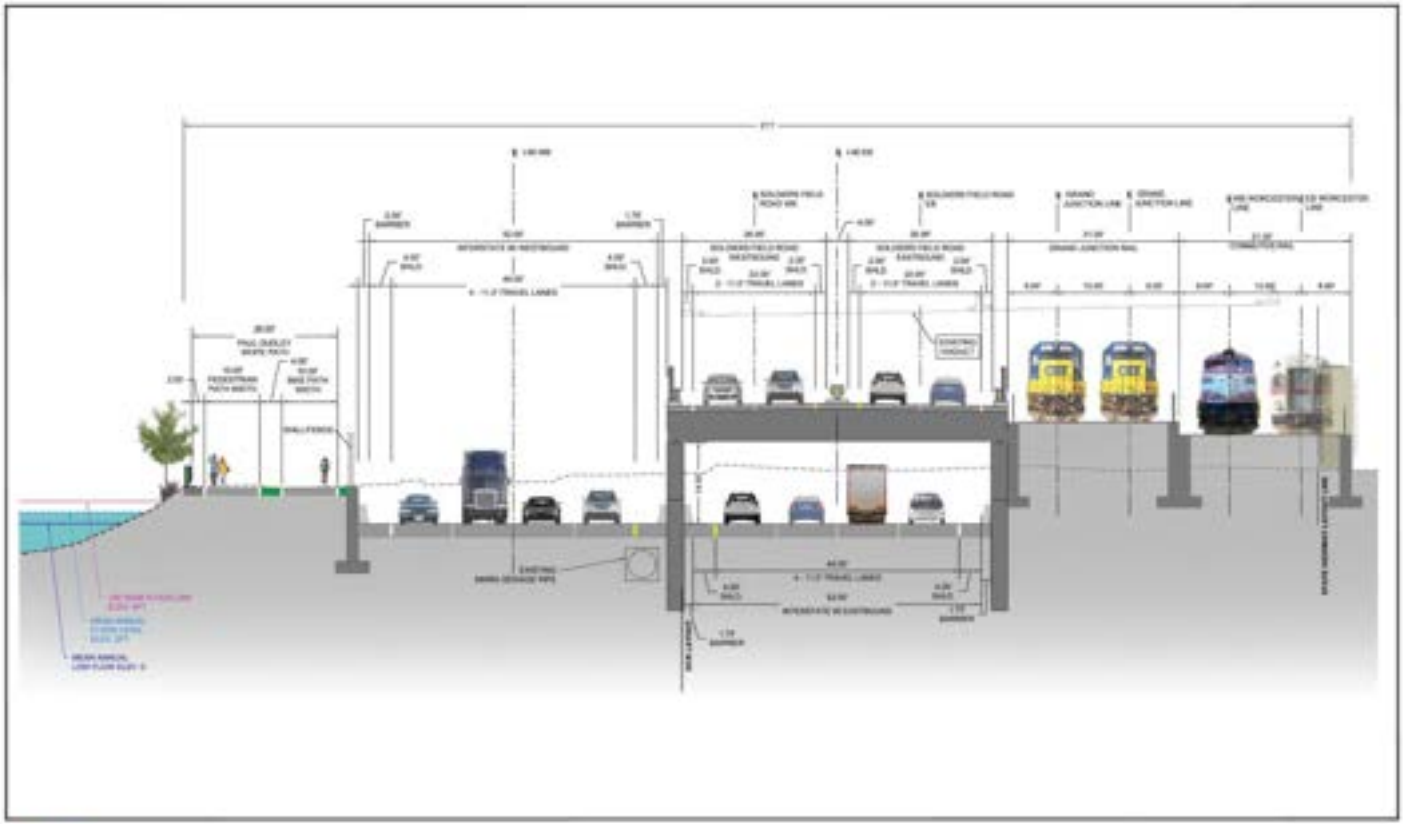
DRAFT

Modified At-Grade Throat Area Option Cross Section

FIGURE 2.2.2 - 5

SFR Hybrid

Charles River Watershed Association



ALLSTON massDOT

DRAFT

SFR Hybrid Throat Area Option Cross Section

FIGURE 2.2.2 - 7

Impact Review of the I-90 Project

Charles River Watershed Association

Reviewed Publicly Available Information:

- Massachusetts Sea Level Rise and Coastal Flooding Viewer
- I-90 Allston Multimodal Project, Technical Report Addendum (Nov 2018)
- I-90 Allston Interchange, A Multimodal Transportation Project - Public Presentation by MassDOT (June 2022)
- Resilient MA, Climate Change Clearinghouse for the Commonwealth (CCSC) Viewer
- NOAA Sea Level Rise Viewer
- Massachusetts Department of transportation GIS for Transportation
- I-90 Allston Multimodal Project, Notice of Project Change (July 2022) including Appendices

Analyzed through an Environmental Engineering Lens for:

1. Flooding
2. Impacts to Charles River Health
3. Access to the River
4. Impacts to Recreation
5. Quality of Life: aesthetics, noise, pollution

Allston-Brighton is Flood Vulnerable

Charles River Watershed Association



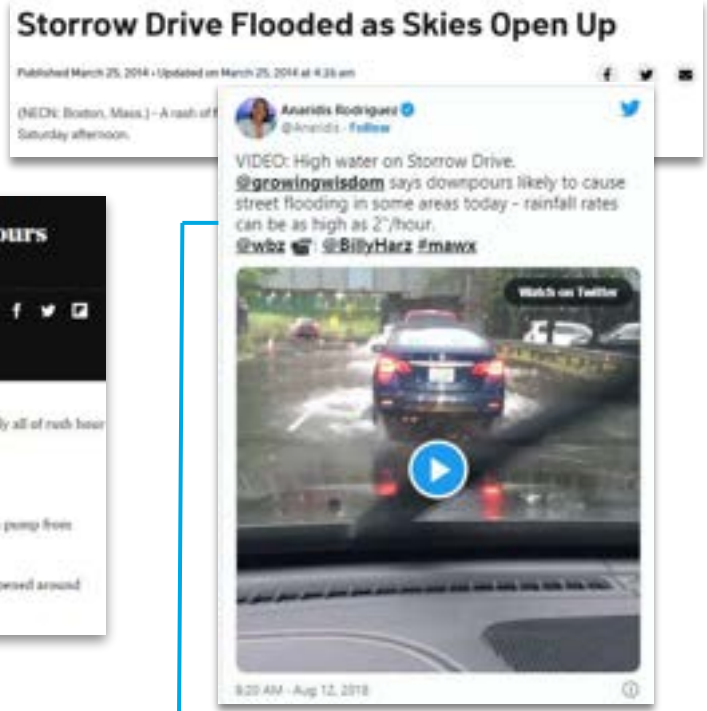
Storrow Drive Inbound Tunnel Closed Hours For Flooding

BOSTON (CBS) – The inbound side of the Storrow Drive tunnel was closed for nearly all of rush hour Thursday morning due to minor flooding.

Check: Traffic Updates

State police shut down the eastbound side at 6 a.m. after a frozen pipe prevented a pump from pushing water into a catch basin.

Traffic was diverted at the Copley Square exit until one lane of the tunnel was re-opened around 9:30 a.m.



Storrow Drive Flooded as Skies Open Up

Published March 25, 2014 • Updated on March 25, 2014 at 4:26 am

(NECN: Boston, Mass.) – A rash of f
Saturday afternoon.

Anaridis Rodriguez
@Anaridis · Follow

VIDEO: High water on Storrow Drive. @growingwisdom says downpours likely to cause street flooding in some areas today - rainfall rates can be as high as 2"/hour. @wbz @BillyHarz #mawx

Watch on Twitter

9:20 AM - Aug 12, 2018



Josh Brogadir
@JoshBrogadirTV · Follow

Breaking: Car stuck in flood waters on Storrow Drive under Mass Ave. bridge in Boston's Back Bay. Emergency crews say one woman was inside, she is out now and ok. #WCVB

4:24 AM - Sep 2, 2021

88 Reply Share

Read 9 replies

Frozen Pipes & Infrastructure

Flash Flooding Storms Events

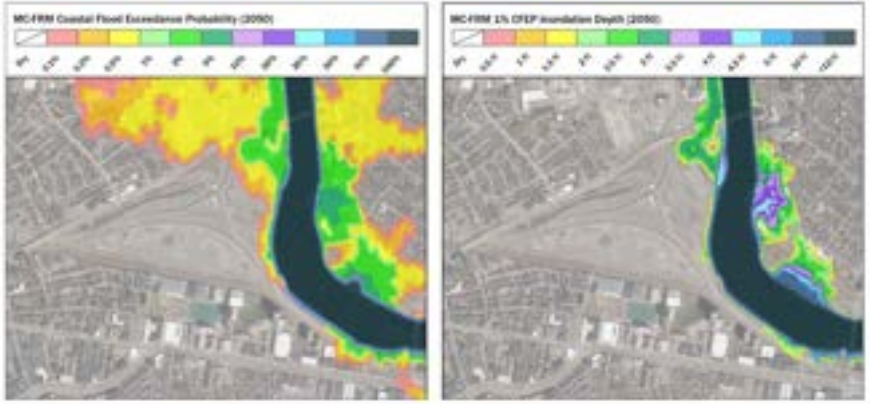
Severe Storm Events & Hurricanes

Flooding: Role of the Charles River Dam

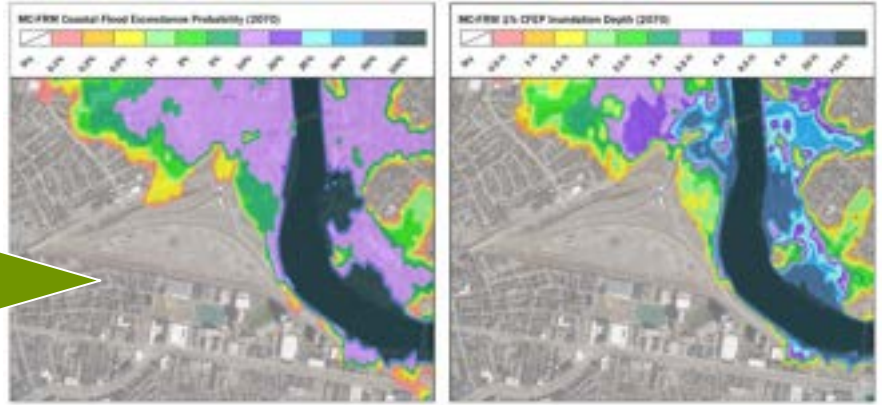
Charles River Watershed Association



- Rated as a High Hazard Dam
- In “poor” condition by the Office of Dam Safety
- Likely to be overtopped by 2065 with a 100-year storm



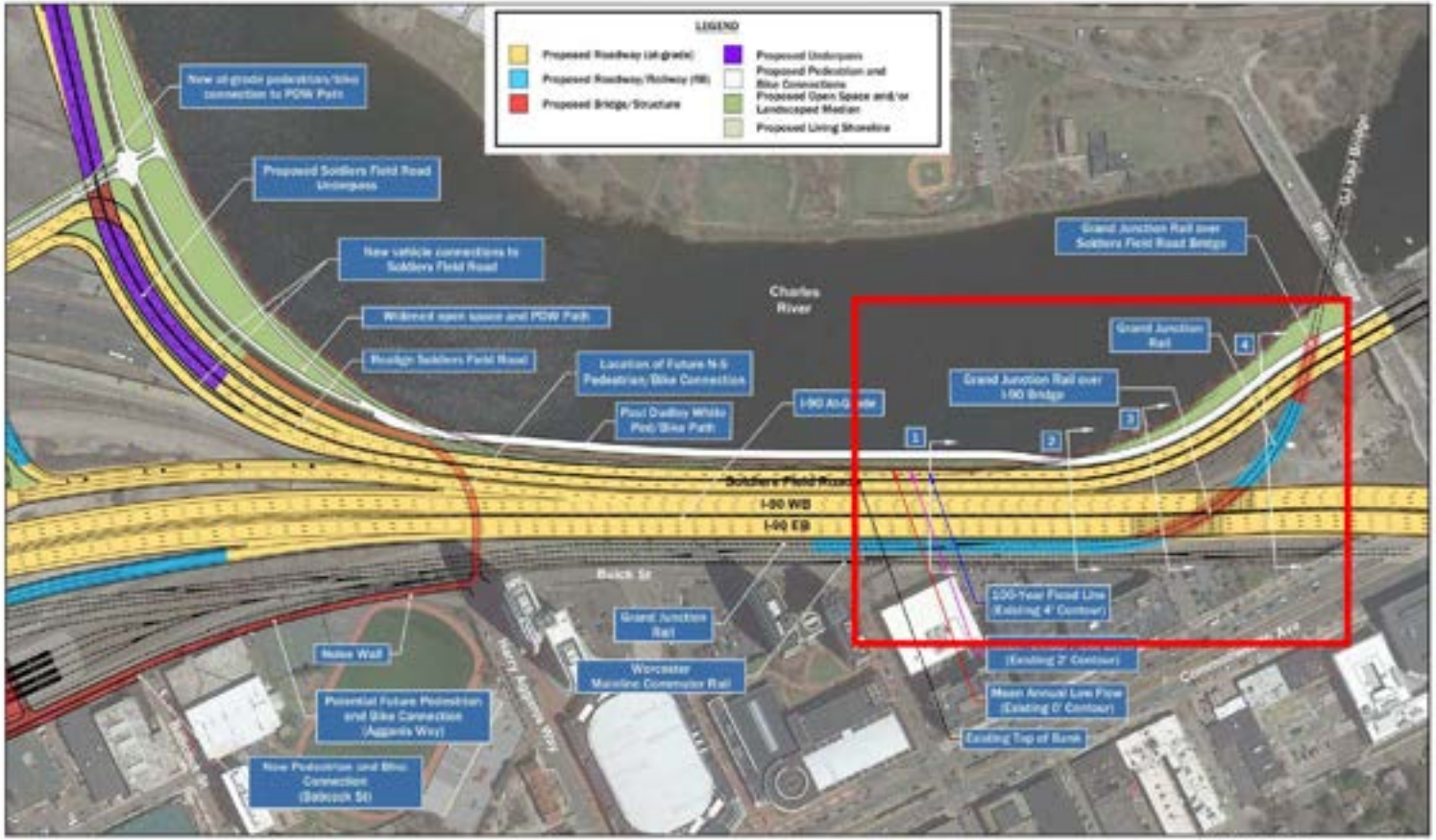
Graphic 2.1.2-3: MC-FRM Coastal Flood Exceedance Probability and 1% CFEP Inundation Depth – 2050



Graphic 2.1.2-4: MC-FRM Coastal Flood Exceedance Probability and 1% CFEP Inundation Depth – 2070

Flooding Vulnerability by Option

Charles River Watershed Association

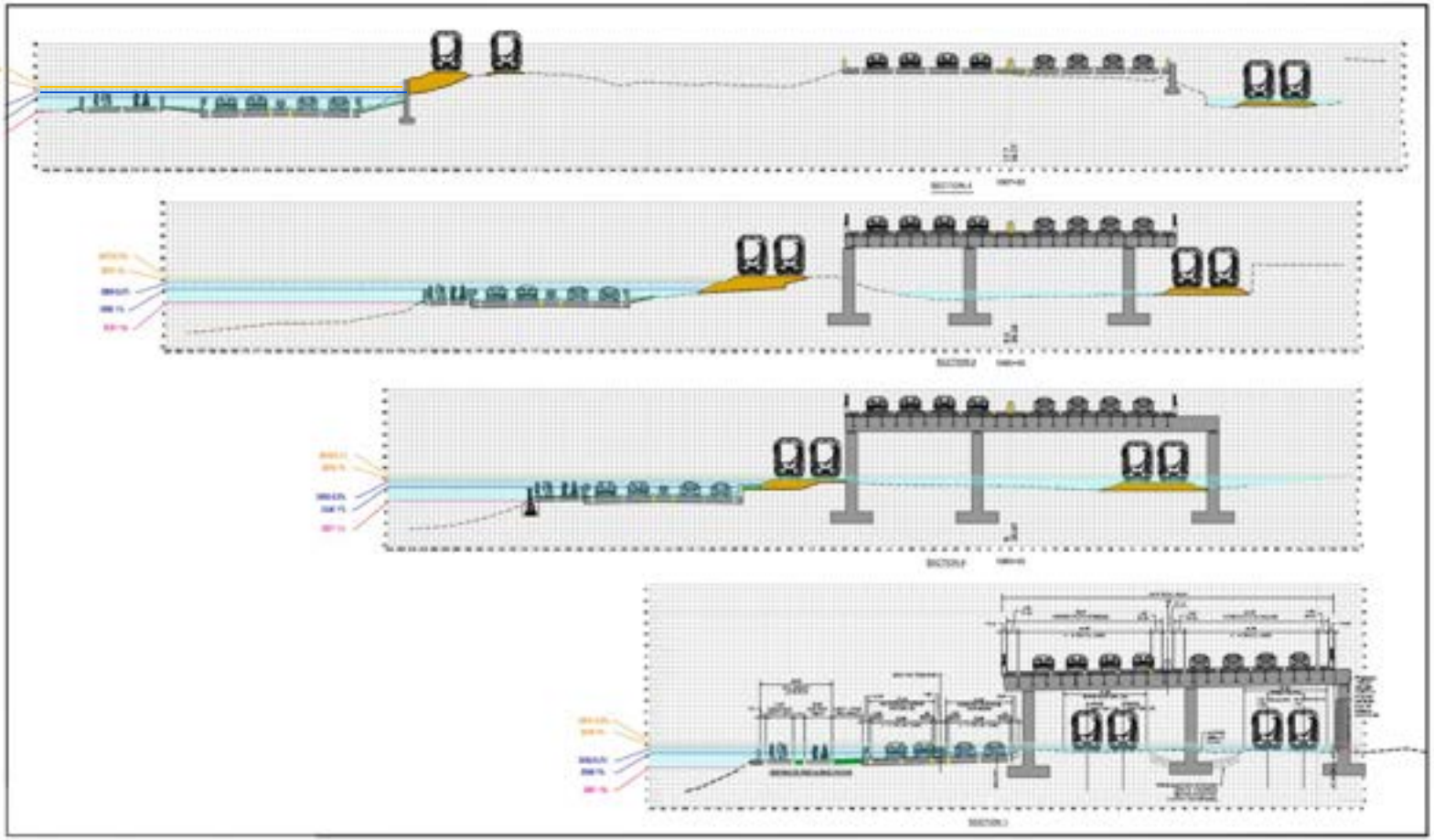


Flooding Vulnerability: Modified Hwy Viaduct

Charles River Watershed Association

2070

2050

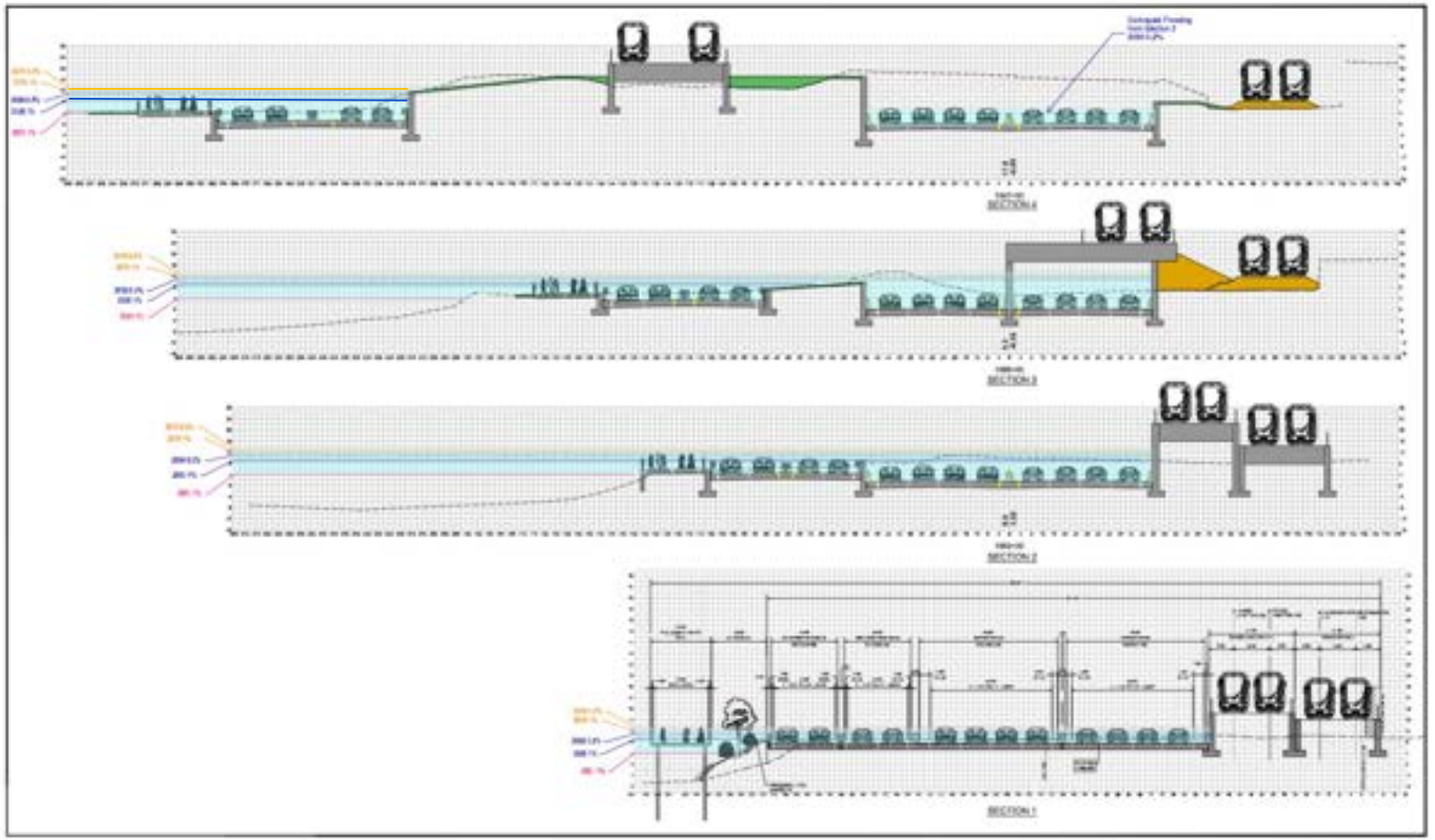


Flooding Vulnerability: Modified At-Grade

Charles River Watershed Association

2070

2050

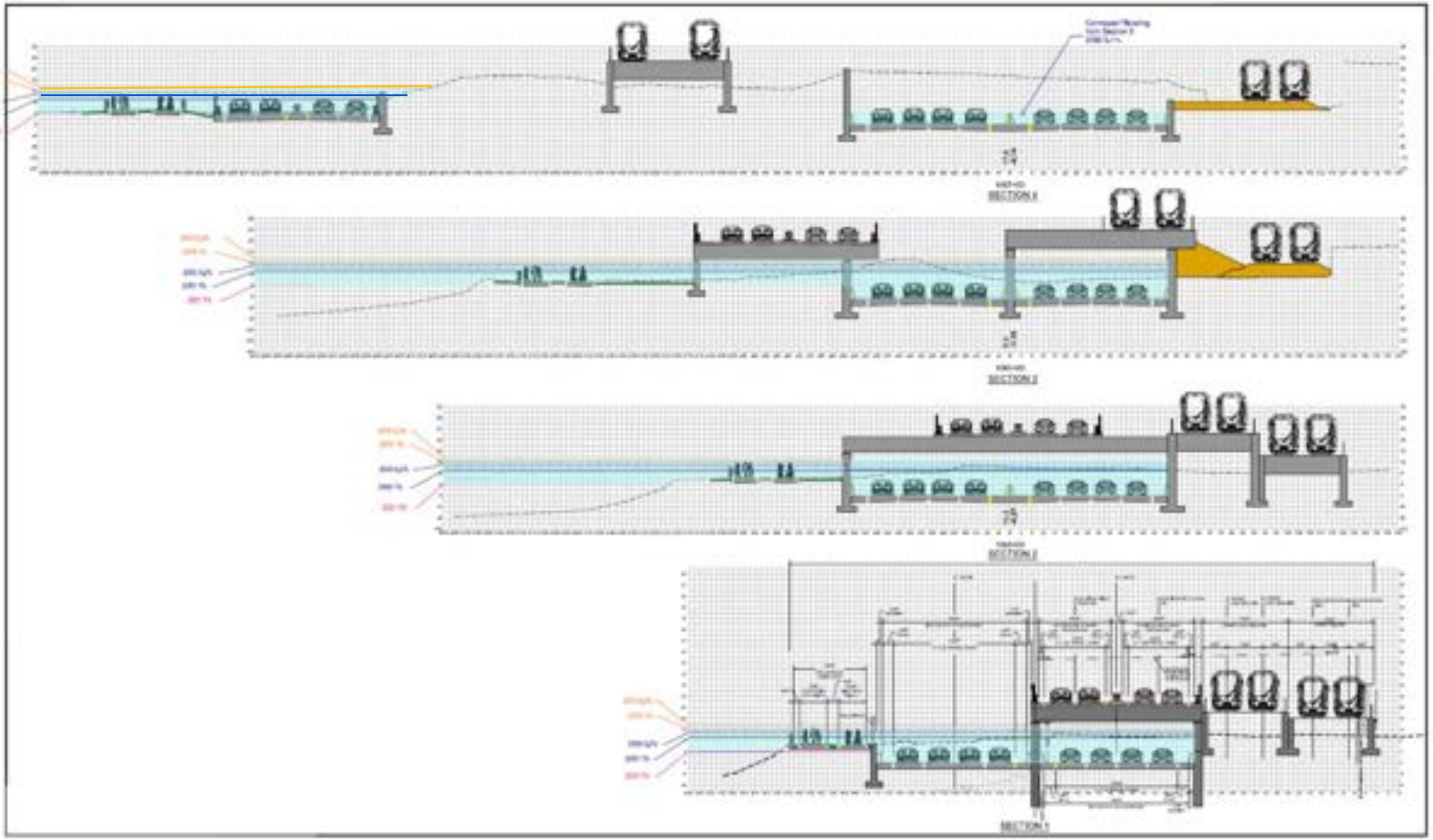


Flooding Vulnerability: SFR Hybrid

Charles River Watershed Association

2070

2050



Impacts to Charles River Health

Charles River Watershed Association

Water quality rating of a 'B' (EPA study from 2018)

River is vulnerable to algae blooms due to excess phosphorus from stormwater runoff





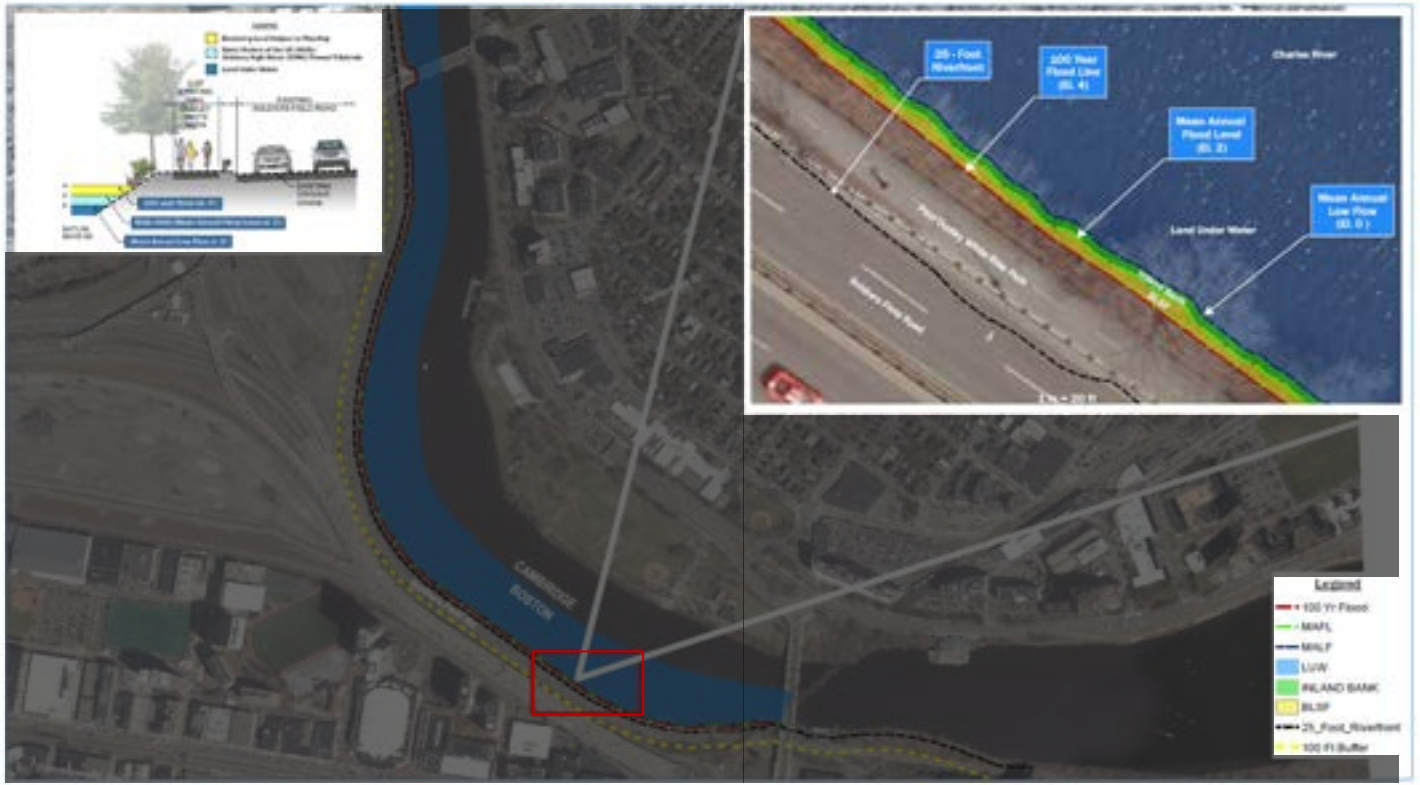
Climate change will make this worse as we see more extreme weather events

Resiliency to future weather events is key to maintaining the Charles River as a safe recreational location and ecological habit



Waterways, Wetland, and Ecological Impacts

Charles River Watershed Association



ALLSTON

massDOT

Notes
1. Basemap Source 2013 USGS Aerial
2. All Elevations NAVD88 Feet

State Wetland Resources FIGURE 2.3.12-1

Waterways, Wetland, and Ecological Impacts

Charles River Watershed Association



Waterways, Wetland, and Ecological Impacts

Charles River Watershed Association

Modified Highway Viaduct

- Permanent impacts to tidelands for outfalls
- Energy dissipation structures will **require 500 to 1,000 sq-ft of land under water** (LUW) and ~100 linear feet of the bank
- **No permanent fill** within BLSF
- Riverbank improved with native species
- **No permanent impacts** to navigation

Modified At-Grade

- Permanent impacts to tidelands for outfalls
- Walkway permanently impacts **500 sq-ft of LUW, 200 sq-ft of bank**
- **No restoration of existing riverbank** possible without filling in river and losing navigable river
  - solid fill of **43,000 sq-ft**
- **300 sf of fill in BLSF** for SRF
- Potential to remove feeding zones for seasonal fish runs
- **50 year flood will likely flood portions** of the proposed I-90

SFR Hybrid Option

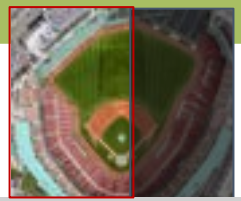
- Permanent impacts to tidelands for outfalls
- Temporary **road in riverway for 8-9 years**
  - Fisheries impacted
  - Impacts to navigation
-

Open Space and Recreational Impacts

Charles River Watershed Association

Modified Highway Viaduct

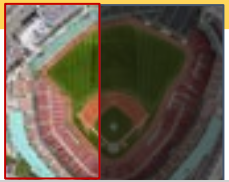
- 500 sq-ft permanent impacts
- Indirect effect on 4,900 sq-ft of parkland through overhang
  - **Inaccessible parkland**
- Create 4.5 acres of new parkland
- PDW Path widened



New parkland available
4.5 acres = 53 % of Fenway Park

Modified At-Grade

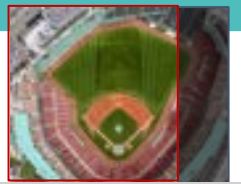
- PDW Path relocated into the Charles River, **removing 1 acre of recreational water**
- 1.3 acres of permanent parkland to highway conversion
- 3.6 acres of parkland through removal of Houghton Chemical land and addition of boardwalk pn water



New parkland available
3.6 acres = 43 % of Fenway Park

SFR Hybrid Option

- 1.5 acres of parkland occupation from relocated highways
- 4.2 acres of **watersheet temporarily impacted** during 8-10 year construction
- Increase existing parkland by 6.1 acres of new parkland



New parkland available
6.1 acres = 72 % of Fenway Park

Proposed Stormwater Management

Charles River Watershed Association

Project qualifies as redevelopment under the Massachusetts Stormwater Standards because it results in a decrease in impervious cover under proposed conditions

General stormwater treatment methodology prioritizes the use of low impact green infrastructure

- Rain Gardens
- Bioretention Areas

Regulation Requirements

- Peak Rate Attenuation
- Recharge
- Water Quality Treatment
  - Nitrogen; Phosphorus; Metals; Pathogens; Total Suspended Solids (TSS)



Modified Highway Viaduct Option – Stormwater Treatability

Charles River Watershed Association



Treats **97%** of the impervious area within the Throat before discharging to the Charles River

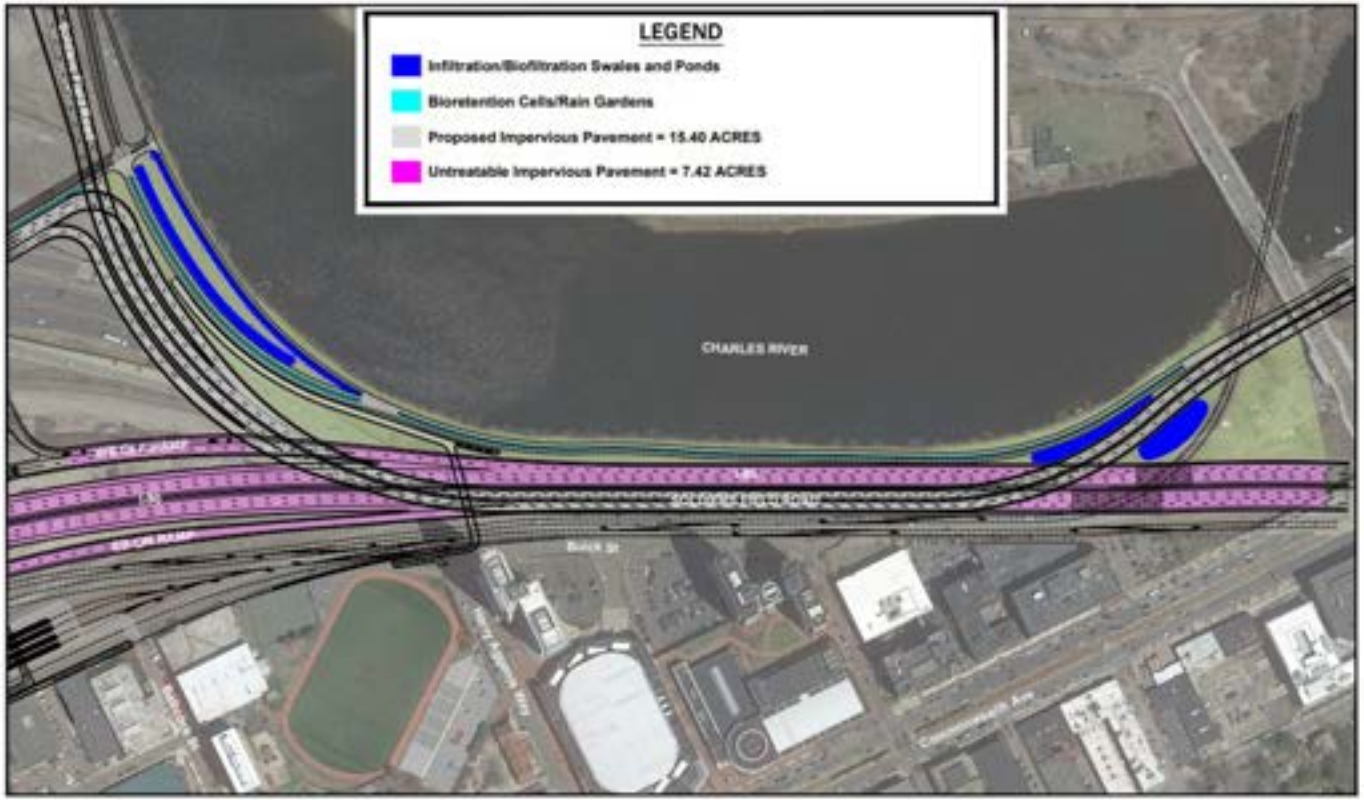
Modified At-Grade Option – Stormwater Treatability



Treats **35%** of the impervious area within the Throat before discharging to the Charles River

SFR Hybrid Option – Stormwater Treatability

Charles River Watershed Association



Treats **52%** of the impervious area within the Throat before discharging to the Charles River

Potential Impacts of Human Connectivity to the Charles River

Charles River Watershed Association

All Throat Area options have very similar connections to River Street and over SFR at the new development site

- Cambridge Street South
- Future Agganis Way (and West Station via Agganis Way)
- PDW Path under the BU bridge



Image source: I-90 Allston Multimodal Project Notice of Project Change, EEA #15278

Is your ***view*** from Allston really connecting you to the river if you can **see *cars in front of the Charles?***

Is a ***footbridge*** easier and more ADA accessible than direct walking ***at grade?***

Are ***road noises more connecting than nature*** and having easy walking access to the Charles?

Summary Review of the I-90 Project

Charles River Watershed Association

	Future Flooding Potential	Stormwater Management + Water Quality	Waterways, Wetlands + Ecological Impacts	Open Space and Recreation	Noise and Aesthetics
Modified Highway Viaduct	**Low**	Treats **97%** of impervious cover	Improved riverbank; no fill in the river	7 acres	Some noise reduction; increased green space
Modified At-Grade	**High**	Treats **35%** of impervious cover	Fill + boardwalk in the river; removal of fish feeding ground	6.6 acres + 29,000 square feet in the river	Cars in ground level eyeline; no noise reduction; least amount of green space increase
Soldiers Field Road (SFR) Hybrid	**Moderate**	Treats **52%** of impervious cover	Road in river for 8-9 years	8.1 acres	Some cars in eyeline; some noise reduction; increase in green space

Opportunities: Create Resilience to Flooding

Charles River Watershed Association

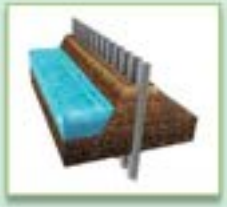
1

Elevate roadways or the PDW Path to be less exposed to future flooding



2

Build a flood barrier between roadways



3

Increase elevation of landscape elements

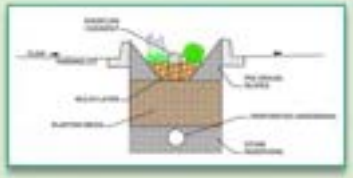


Opportunities: Maximize Treatment of Stormwater Runoff from the Site

Charles River Watershed Association

1

Increase green/pervious areas for runoff treatment



2

Treat pumped stormwater before discharge



3

Allow no temporary roads over the Charles River



Opportunities: Minimize Construction and Permanent Impacts to Charles River

Charles River Watershed Association

No permanent fill impacts.

- Implement a Throat Area option with no permanent fill within BLSF.



Impacts to Navigation.

- The Charles River is a prized resource for the community and used by boaters daily
- Implement a Throat Area option with no permanent impacts to navigation in the Charles River



The Modified At-Grade option

- Most permanent impacts to waterway and wetland resources
- Provide mitigation
  - will result in reduced recreational use
  - Select a Throat Option that reduces the overall long-term impacts to the waterway and wetland resources



Living Shoreline

- Living shorelines or a retaining wall will provide permanent impacts to fisheries
  - removes feeding zones for anadromous and catadromous seasonal fish runs
- Need additional details to understand impacts and potential environmental tradeoffs



Outstanding Questions for MassDOT

Charles River Watershed Association

Consider Charles River Dam Overtopping and Flanking

- these risks are predicted to be within the **next 30 years**
- no commitments to upgrading the dam and **resolving these future risks**
- the schedule
  - substantially complete the environmental review process by summer of 2024
  - commence construction activities in 2025.
  - **implement a design that provides redundancy** and reduces the future risk of flooding, other than relying on the Charles River Dam

Incorporate Mitigation Measures

- MassDOT should be required to
  - design to **accommodate future** measures
  - better understand of the **potential environmental impacts and tradeoffs** to make transportation infrastructure more resilient.
- Federal and State highway and DOT strategic plans and regulations commit to **early planning to access extreme weather vulnerabilities**

Protect Public Safety

- MassDOT does **not describe how during extreme rain events, hurricanes, SLR, and storm surge, the public will evacuate** if portions of the proposed roadways are flooded or inundated.

Make Your Voice Heard

Charles River Watershed Association

2022

Notice of Project Change (NPC) Review Period

Public comments due
September 13th

Massachusetts Environmental Policy Act
(State process)

2014: Environmental Notification Form
2017: Draft Environmental Impact Report
2022: Notice of Project Change
2023(?): Supplemental Draft Environmental Report
2024(?): Final Environmental Impact Report

Charles River Watershed Association

Questions?

If you have any other question, please contact Dira Johanif at *djohanif@crwa.org*