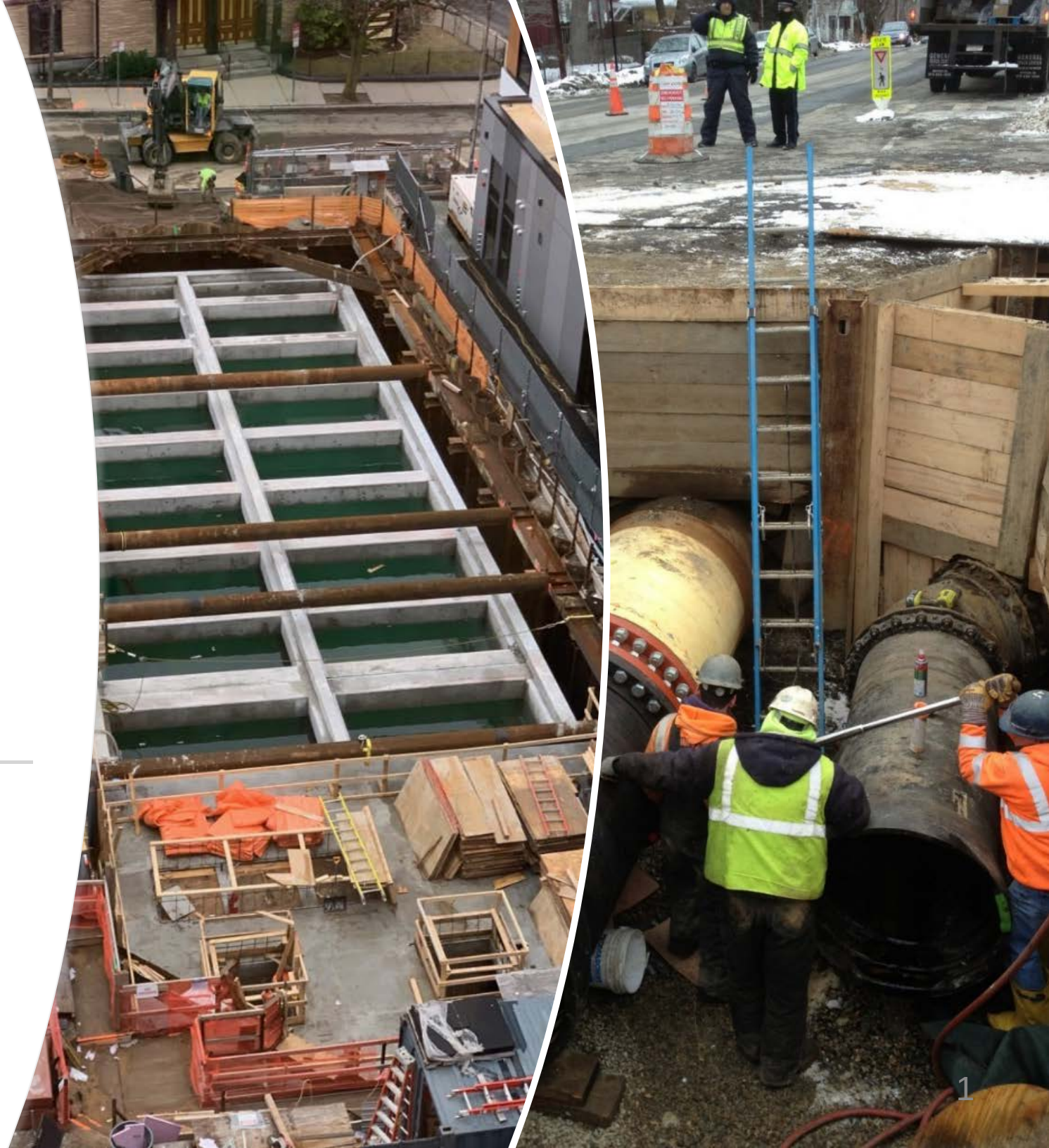
June 10, 2025

Planning Board
Utility Infrastructure Planning

Public Works
James Wilcox, City Engineer
jwilcox@camridgema.gov

City Resources:

www.cambridgema.gov/fiveyearplan
www.cambridgema.gov/tenyearplan



CAMBRIDGE DEPARTMENT OF PUBLIC THE WORKS

City of Cambridge
Department of Public Works

Five Year Sidewalk and Street Reconstruction Plan

June 2025

INTRODUCTION | COMPLETE STREETS

VISION ZERO CAMBRIDGE

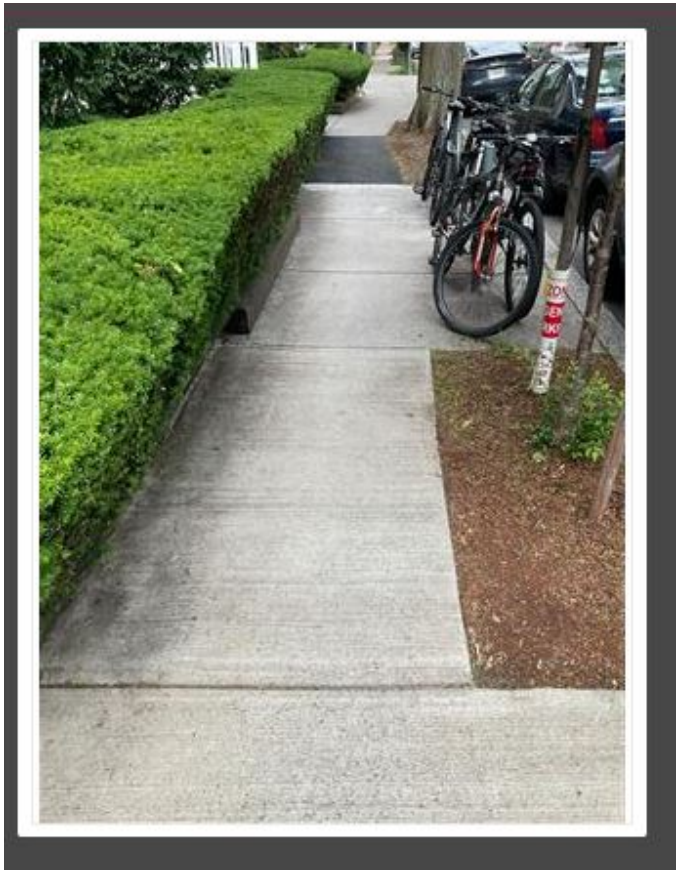
Complete Streets are **streets for everyone**. They are designed and operated to enable **safe access for all users**. Pedestrians, bicyclists, motorists, and public transportation (transit) users of all ages and abilities are able to safely move along and across a Complete Street. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They help buses run on time and make it safe for people to walk to and from train stations.

Vision Zero calls for the elimination of fatalities and serious injuries resulting from traffic crashes, and emphasizes that they can and should be prevented.

On March 21, 2016, the Cambridge City Council unanimously passed resolutions put forth by the City Manager to formally adopt Complete Streets and Vision Zero policies, showing that the City is committed to achieving these goals, assuring safe access for all users.

Pedestrian Network Inventory and Assessment

- City-wide inventory of City owned public right of ways
- All sidewalks, curb ramps and crosswalks
- Assessed condition based on PROWAG criteria
- Work completed during the Summer of 2024
- Did not include State right of ways and private ways

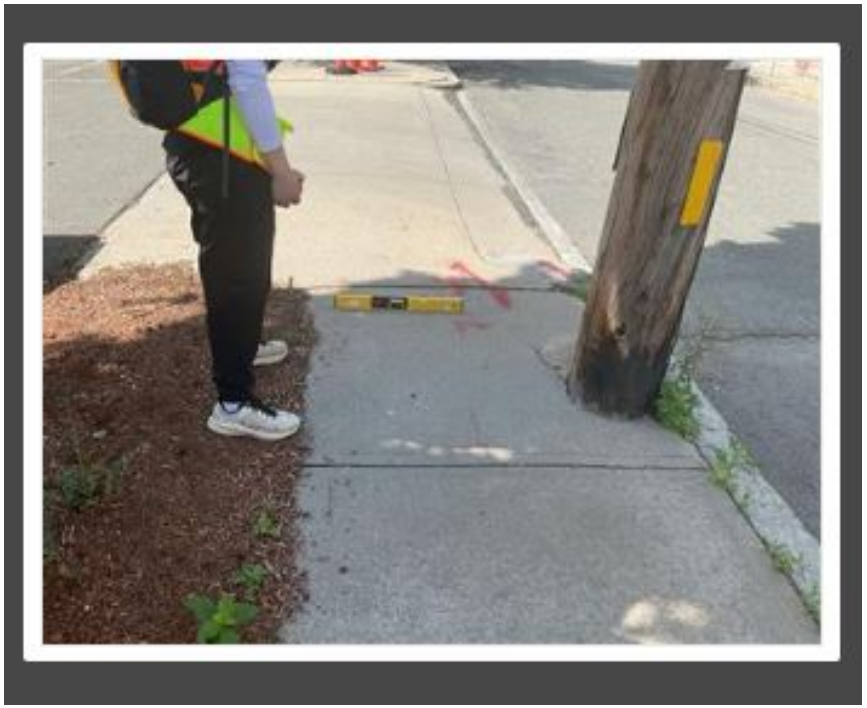


CAMBRIDGE DEPARTMENT OF PUBLIC THE WORKS

Pedestrian Network Inventory and Assessment

PROWAG Criteria for Sidewalks

- Continuous clear width = 48” (exclusive of curb)
- Passing Spaces required if clear width is less than 60”
- Grade (running slope)= 5.0% or not to exceed grade of street
- Cross Slope= 1:48 (2.1%) maximum
- Surface must be stable, firm and slip resistant
- Changes in Level= ¼ inch



CAMBRIDGE DEPARTMENT OF PUBLIC 'THE WORKS

Pedestrian Network Inventory and Assessment

Condition Ratings for Sidewalks

Good condition

- No surface distresses other than minor blemishes
- Less than 10% of sidewalk segment needs to be replaced

Fair condition

- Surface distresses present, but minimal impedance
- 10% - 50% of sidewalk segment needs to be replaced

Poor condition

- Frequent surface distresses
- Many cracks, depressions, bumps, patches, tree roots
- 10% - 50% of sidewalk segment needs to be replaced

THE CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

Pedestrian Network Inventory and Assessment

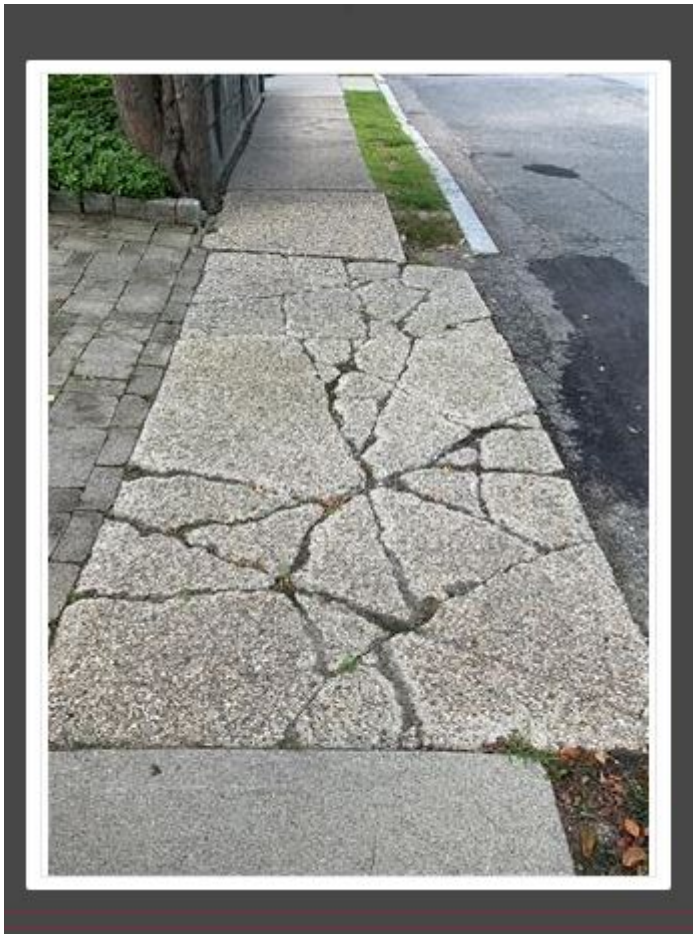
Sidewalk Results – 185 miles inspected

Materials

- 138.35 miles of concrete sidewalk
- 43.44 miles of brick sidewalk
- 3.25 miles of asphalt sidewalks

Condition

- 79.57 miles in good condition
- 91.49 miles in fair condition
- 13.98 miles in poor condition



Pedestrian Network Inventory and Assessment

Sidewalk Results – Observed Issues

Obstruction Issues= 6,004-point locations

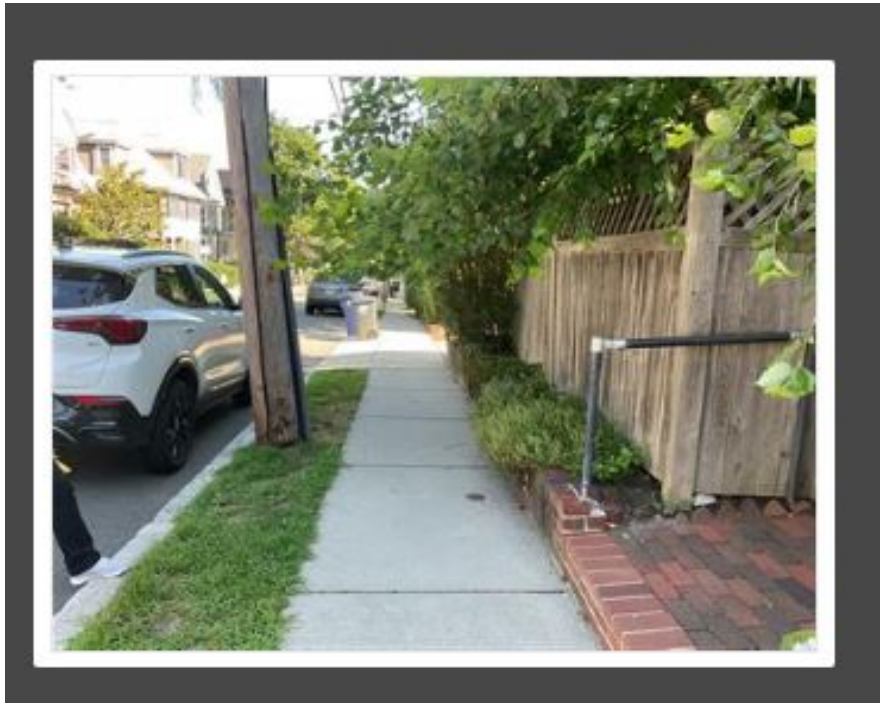
- Hydrants
- Utility poles
- Trees

Structural Issues = 4,038-point locations

- Depressions
- Lifting Panels
- Cracking

Maintenance Issues = 309-point locations

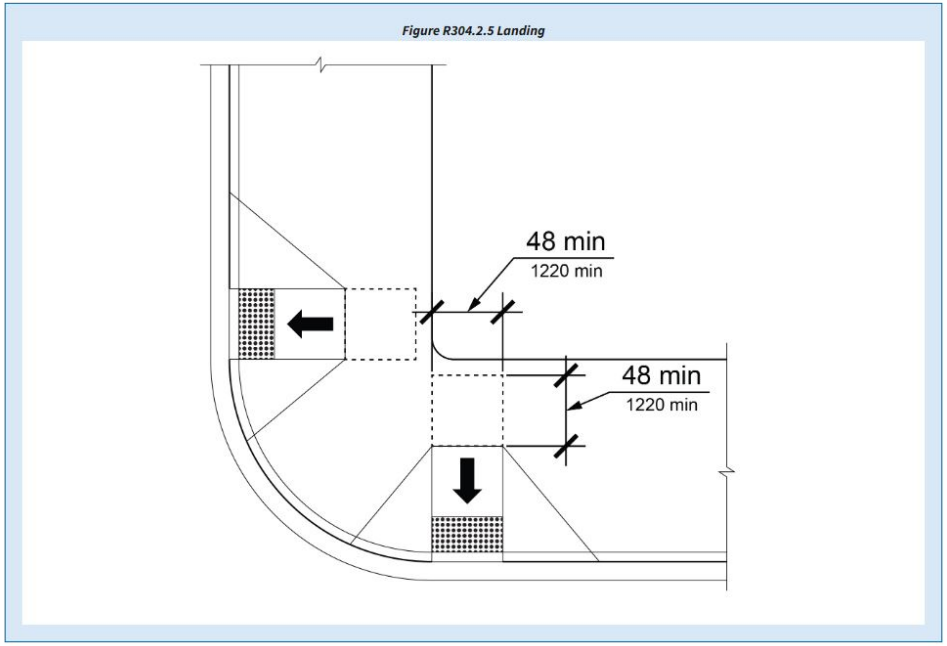
- Overhanging trees
- Overhanging shrubs
- Cracking



Pedestrian Network Inventory and Assessment

PROWAG Criteria for Curb Ramps

- Continuous clear width = 48”
- Grade (running slope)= 8.3% maximum
- Cross Slope= 1:48 (2.1%) maximum
- Landing= 48” x 48” minimum
- Surface must be stable, firm and slip resistant
- Must have a detectable warning surface



CAMBRIDGE DEPARTMENT OF PUBLIC THE WORKS

Pedestrian Network Inventory and Assessment

Curb Ramp Types

Perpendicular Ramp

Continuous Ramp

Parallel Ramp

CAMBRIDGE DEPARTMENT OF PUBLIC THE WORKS

Pedestrian Network Inventory and Assessment

Curb Ramp Results – 5,193 inspected

Materials

- 4,740 concrete ramps
- 263 brick ramps
- 118 asphalt ramps

Condition

- 2,305 in good condition
- 2,373 in fair condition
- 443 in poor condition

Compliance (PROWAG criteria)

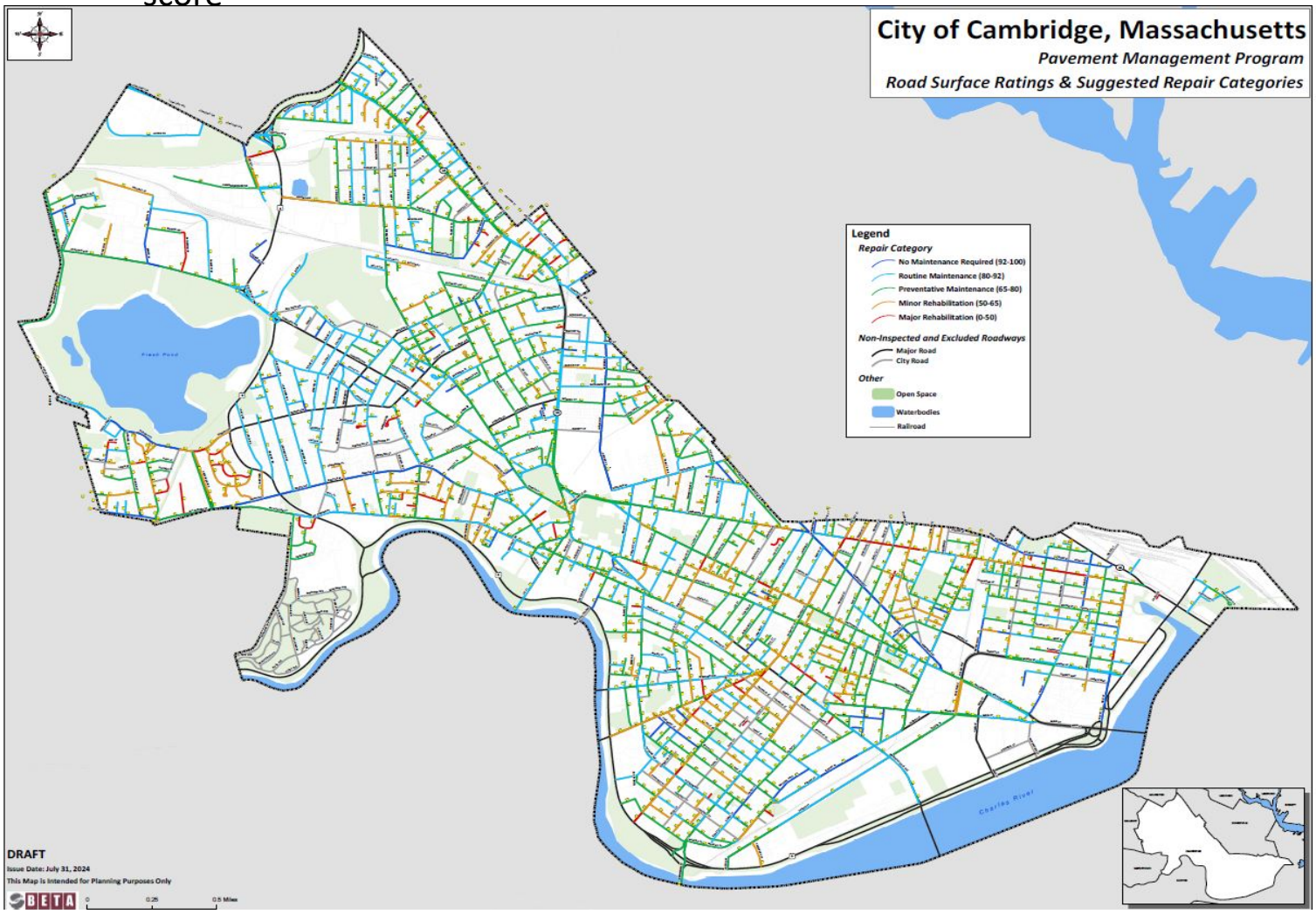
- 1,114 compliant ramps
- 3,362 non-compliant ramps
- 645 retrofit ramps

CAMBRIDGE DEPARTMENT OF PUBLIC THE WORKS

Pavement Management – Summary of Findings

- 118 miles of City owned roadways inspected
- Data collected during Spring 2024
- Road Surface Rating based on score of 0 to 100
- Survey completed using LIDAR and images collected by specialty vehicle
- Artificial Intelligence (AI) technology used to assess pavement and assign score

76.43
CURRENT city NETWORK
Road Surface Rating (RSR)
(July 2024)



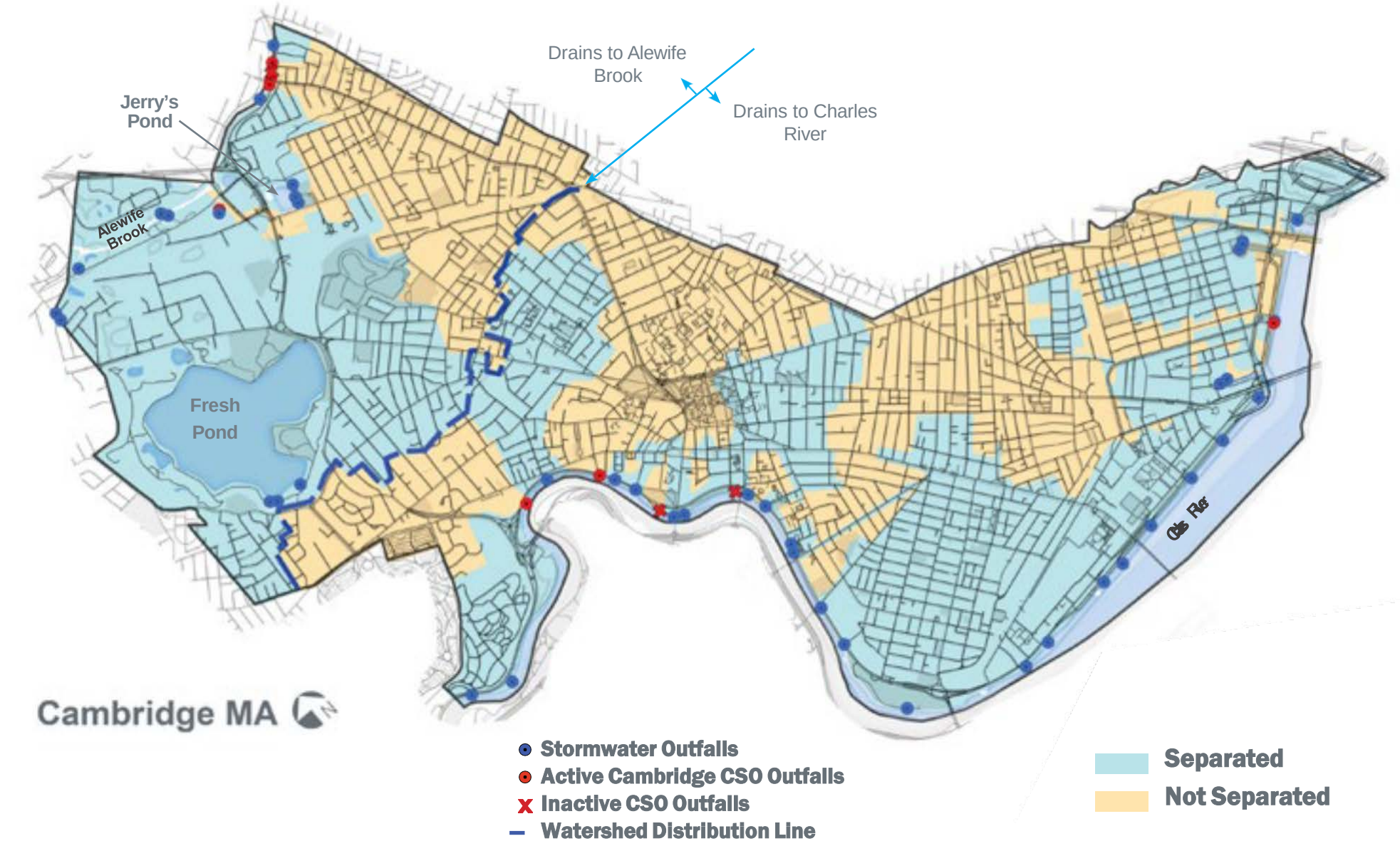
CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

Ten Year Sewer and Drain Infrastructure Plan

January 2026

City of Cambridge
Department of Public Works

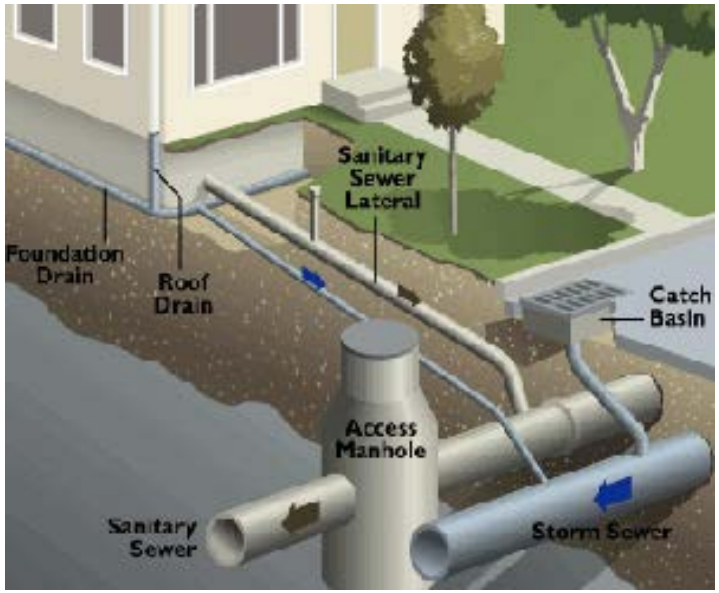
PRIORITIES | SEWER SYSTEM



This map shows the areas of Cambridge's sewer system that are separated and are not separated and the active City-owned outfall locations. The City is 55% separated and 45% not yet separated.

City of Cambridge Sewer System

- 115 miles sanitary sewer
- 78 miles separate storm drain
- 43 miles combined sewer
- 7 Combined Sewer Overflows
- 4500 catch basins
- 84 pumps (stations and within buildings)

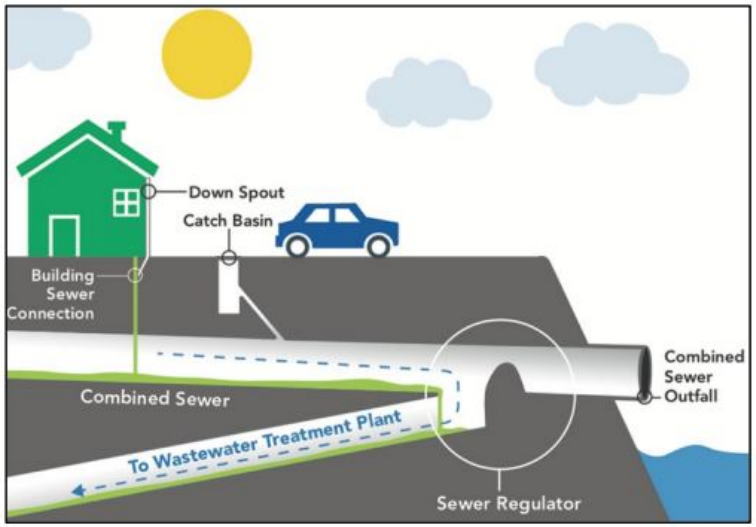


MWRA Community for Wastewater Treatment
City Owned Water Supply and Treatment Plant
EPA NPDES Permit for CSO Discharges
EPA NPDES MS4 Permit for Stormwater Discharges

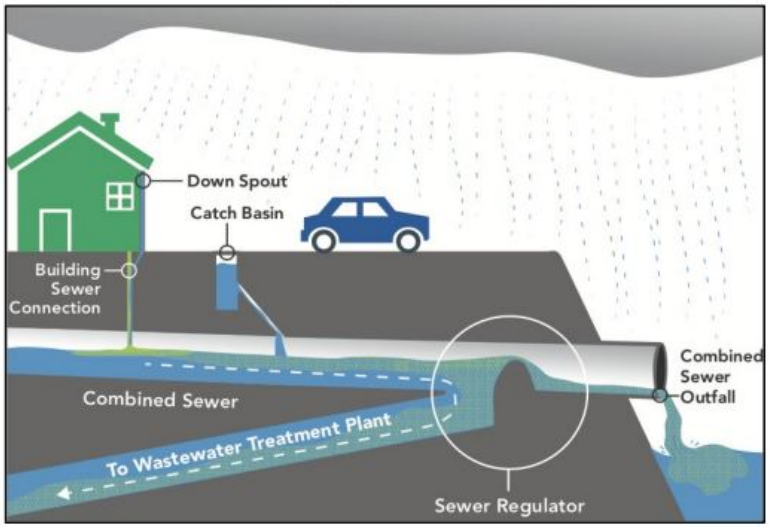
Combined Sewer Overflow Planning

What is a Combined Sewer Overflow (CSO)?

Combined System – No or Moderate Rain



Combined System – Heavy Rain

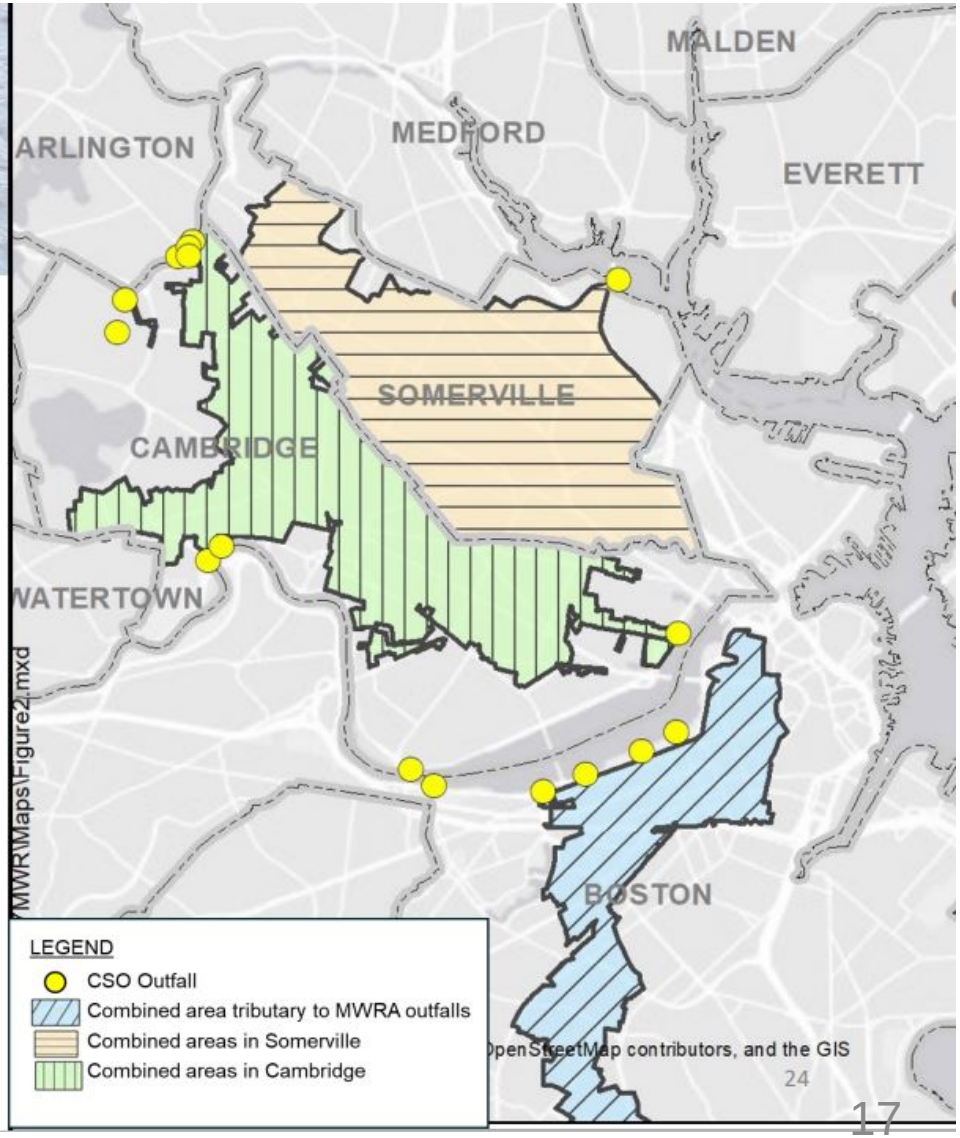


Sewage + Stormwater = Combined Sewer Overflows

Combined Sewer Overflow Planning

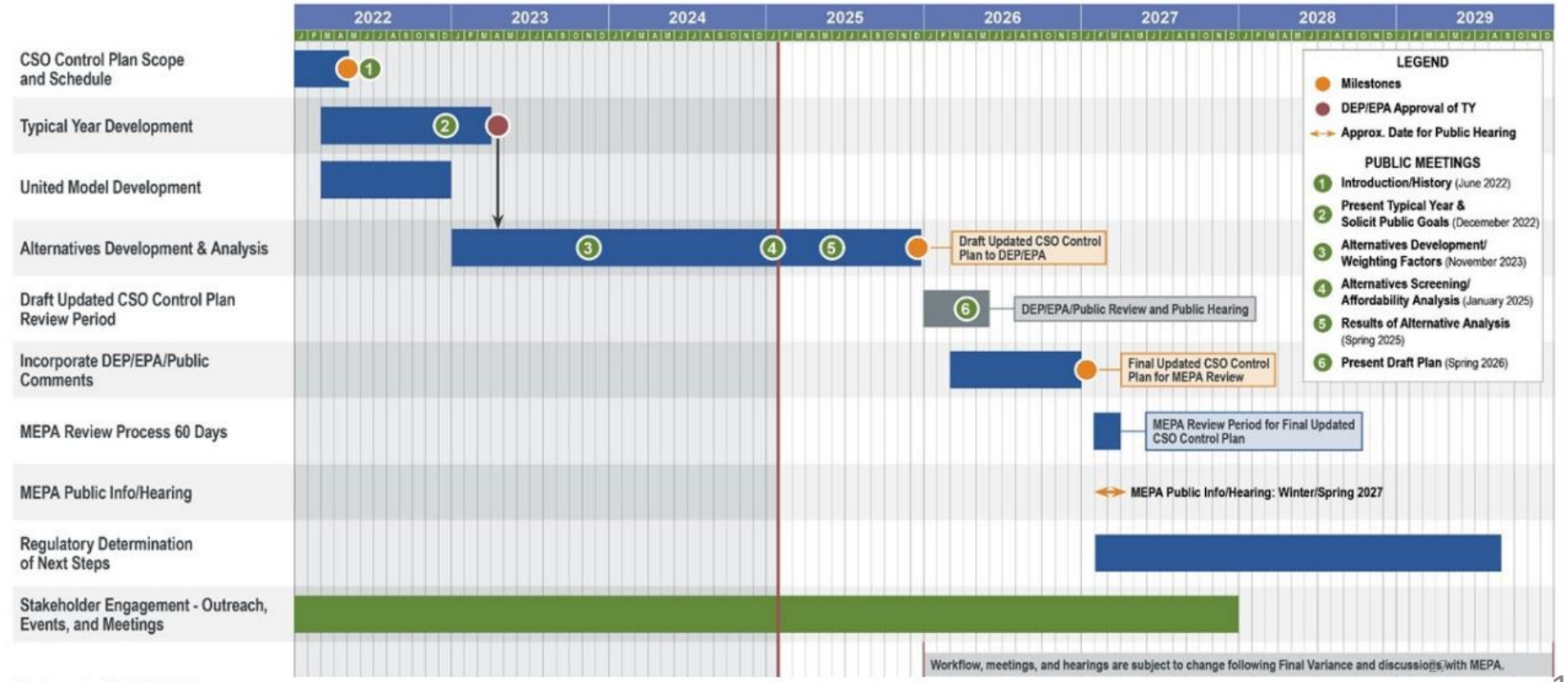
What Are We Doing **Now** About CSOs?

- Cambridge, Somerville, and MWRA are developing Updated CSO Control Plans with the overall goal to reduce or eliminate CSOs.
- The new plans focus on the Charles River, Alewife Brook, and Upper Mystic River (the variance waters).
- New plans incorporate the impacts of climate change.



Combined Sewer Overflow Planning

Updated CSO Control Plan Schedule

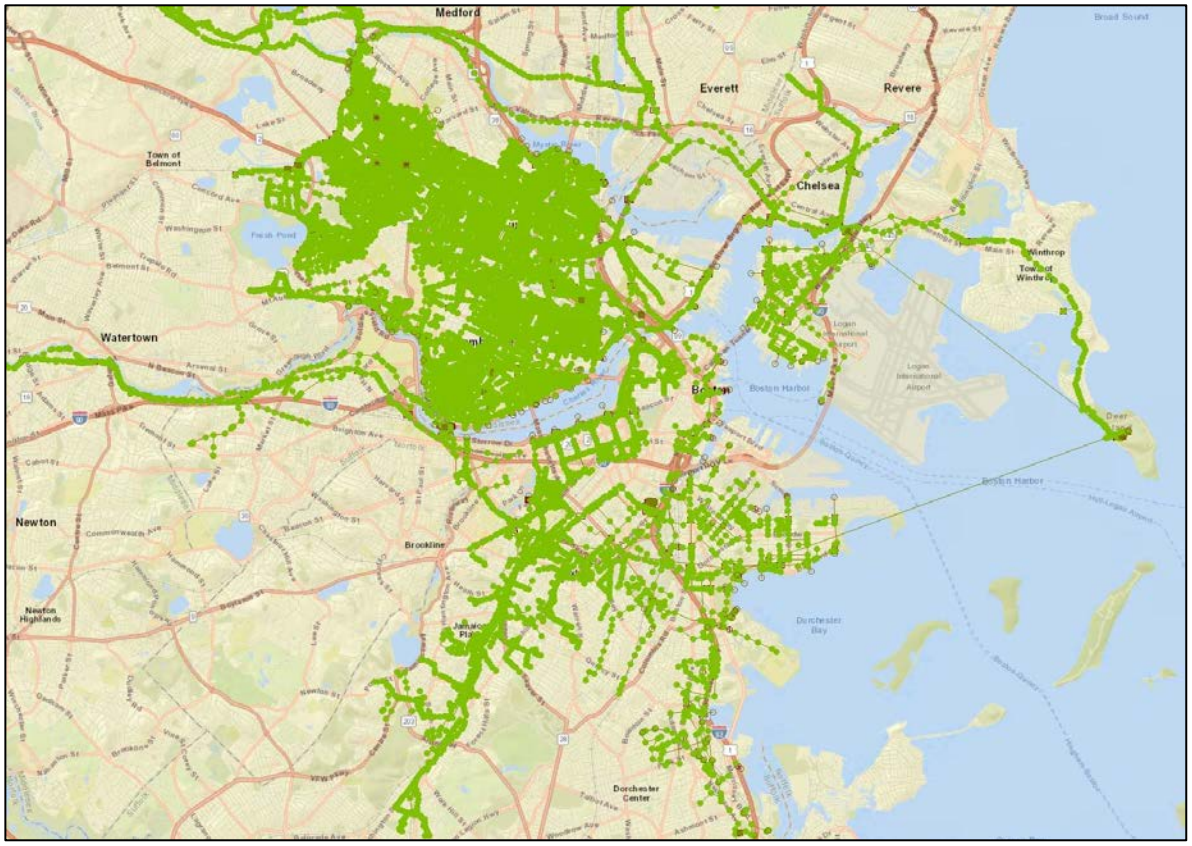


Updated 1/02/2025

Combined Sewer Overflow Planning

Unified (Compiled) Computer Model

- Digital model of pipes, combined sewer overflow outfalls, pump stations, and treatment facilities
- MWRA, Cambridge, and Somerville each have their own models
- Combined the three models to produce consistent results



Pipe Network in the Unified Model

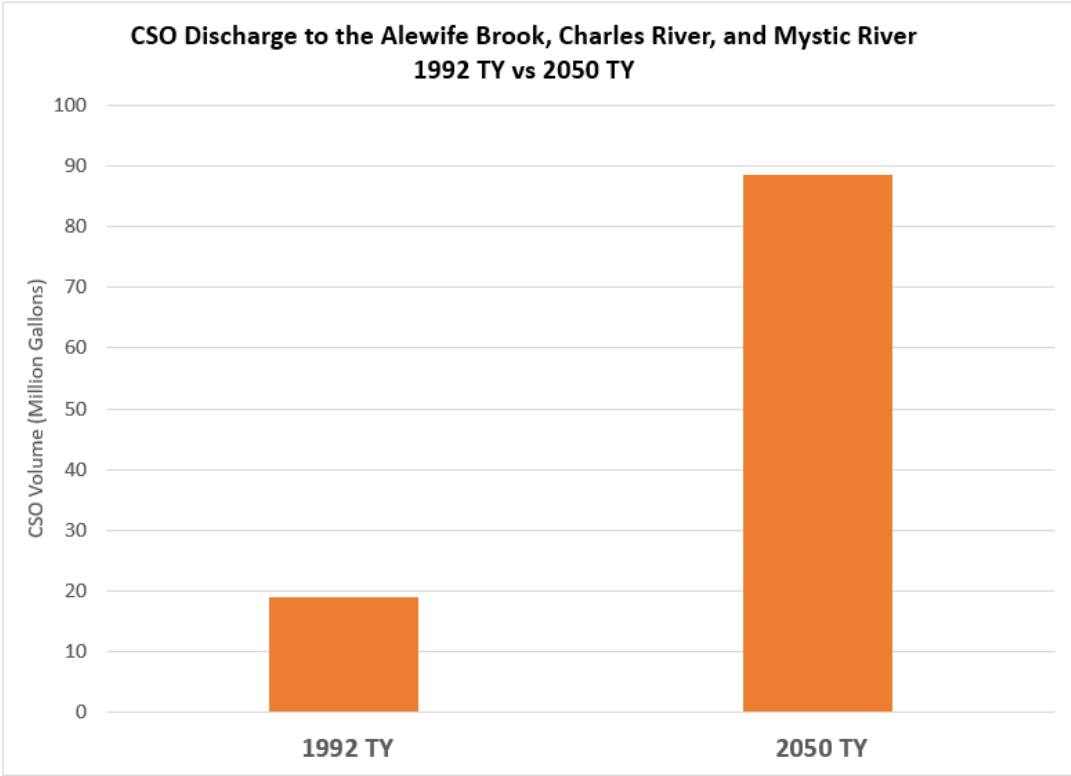
Combined Sewer Overflow Planning

2050 Typical Year (TY) and beyond?

2050 Typical Year:
One year of rainfall that reflects the future
Developed using future climate change projections for precipitation, temperature, and tides
Consistent way to compare alternatives
Way to measure progress once plan is in place
Improves on EPAs CSO Policy

Design Storms:

- Rainstorms larger than those included in the 2050 TY.
- Will also be used to evaluate alternatives



System Conditions are the same for both model results. Only precipitation, temperature, and tides have changed.

Combined Sewer Overflow Control Tools

Reducing CSO volumes

Sewer Separation

Green Stormwater Infrastructure

Inflow/infiltration reduction

Storage

Conveyance

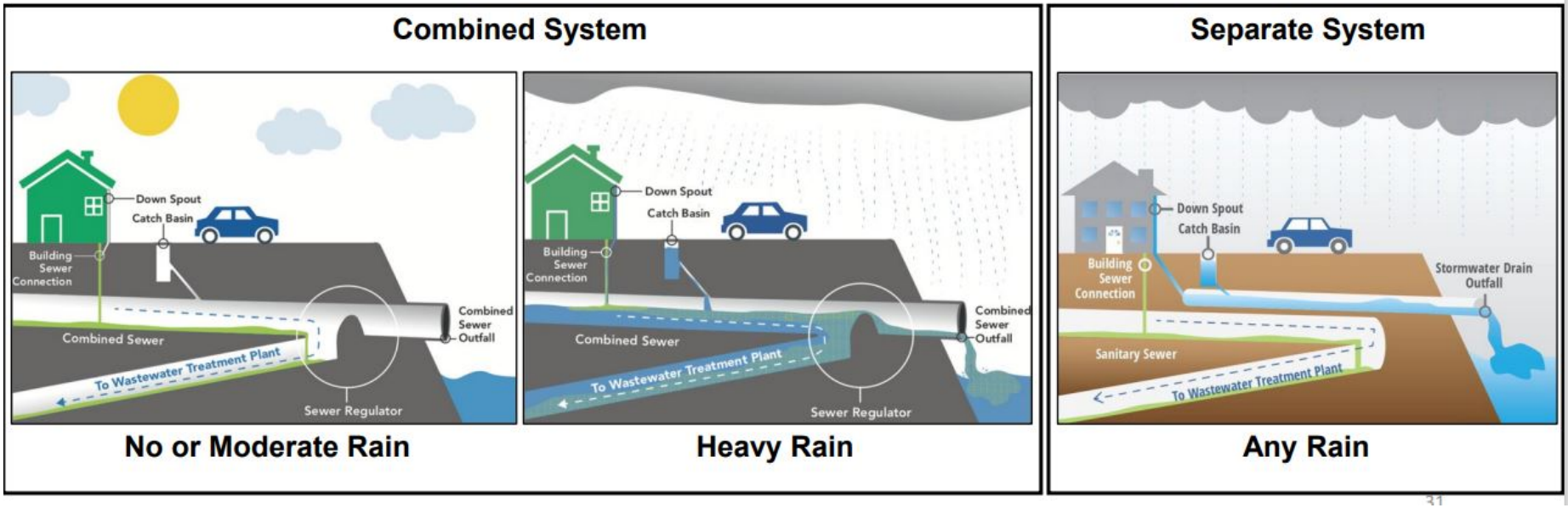
Treating CSO discharges

Treatment

Combined Sewer Overflow Control Tools

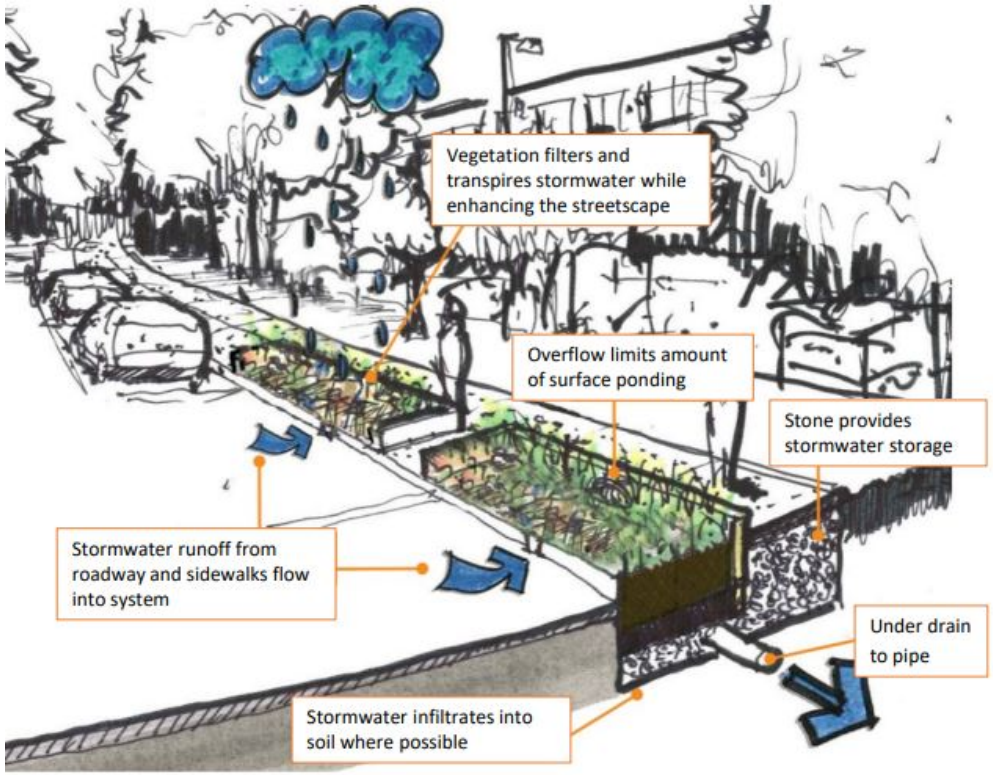
Reducing CSOs Tool: **Sewer Separation**

- Build separate/ parallel pipe networks
- Removes stormwater from combined system into a separate pipe
- All stormwater discharges directly to river untreated



Combined Sewer Overflow Control Tools

Reducing CSOs Tool:
Green Stormwater Infrastructure



- Captures/infiltrates some of the stormwater runoff before it enters the pipe network system
- Can treat stormwater to reduce pollutants

Stormwater Bumpout on Somerville Ave, Somerville (200 sf footprint, 250 cf storage)

Combined Sewer Overflow Control Tools

Reducing CSOs Tool: **Infiltration/Inflow Reduction**

Fix old pipes to reduce groundwater and stormwater entering the pipe network

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Combined Sewer Overflow Control Tools

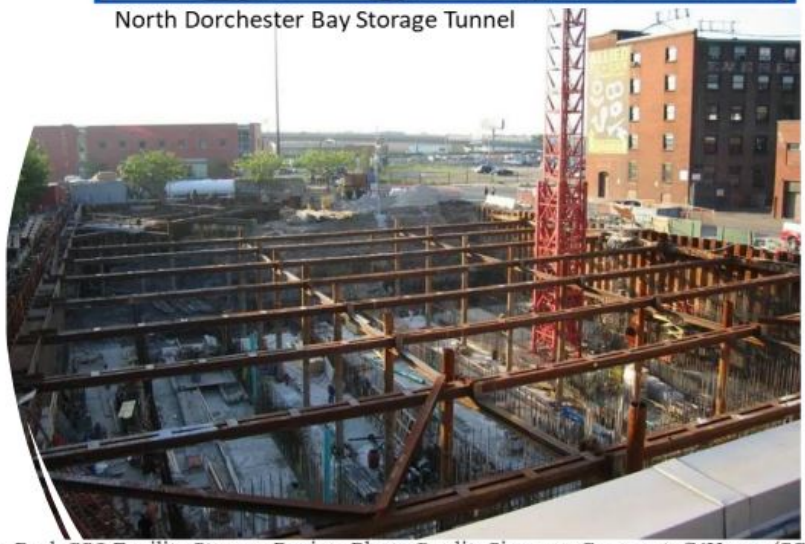
Reducing CSOs Tool: **CSO Storage**

Hold combined sewer overflows until after the storm by:

- Increasing pipe size
- Building a new storage tank or tunnel

Release it back to the system for full treatment at Deer Island Wastewater Treatment Plant.

North Dorchester Bay Storage Tunnel



Union Park CSO Facility Storage Basins: Photo Credit: Simpson Gumpertz & Heger (SGH)
https://www.sgh.com/project/union-park-detention-facility/

Combined Sewer Overflow Control Tools

Reducing CSOs Tool: **Conveyance**

Improve the flow through the pipes by:

- Increasing pipe size
- Increasing size of pumps
- Improve pump station operations

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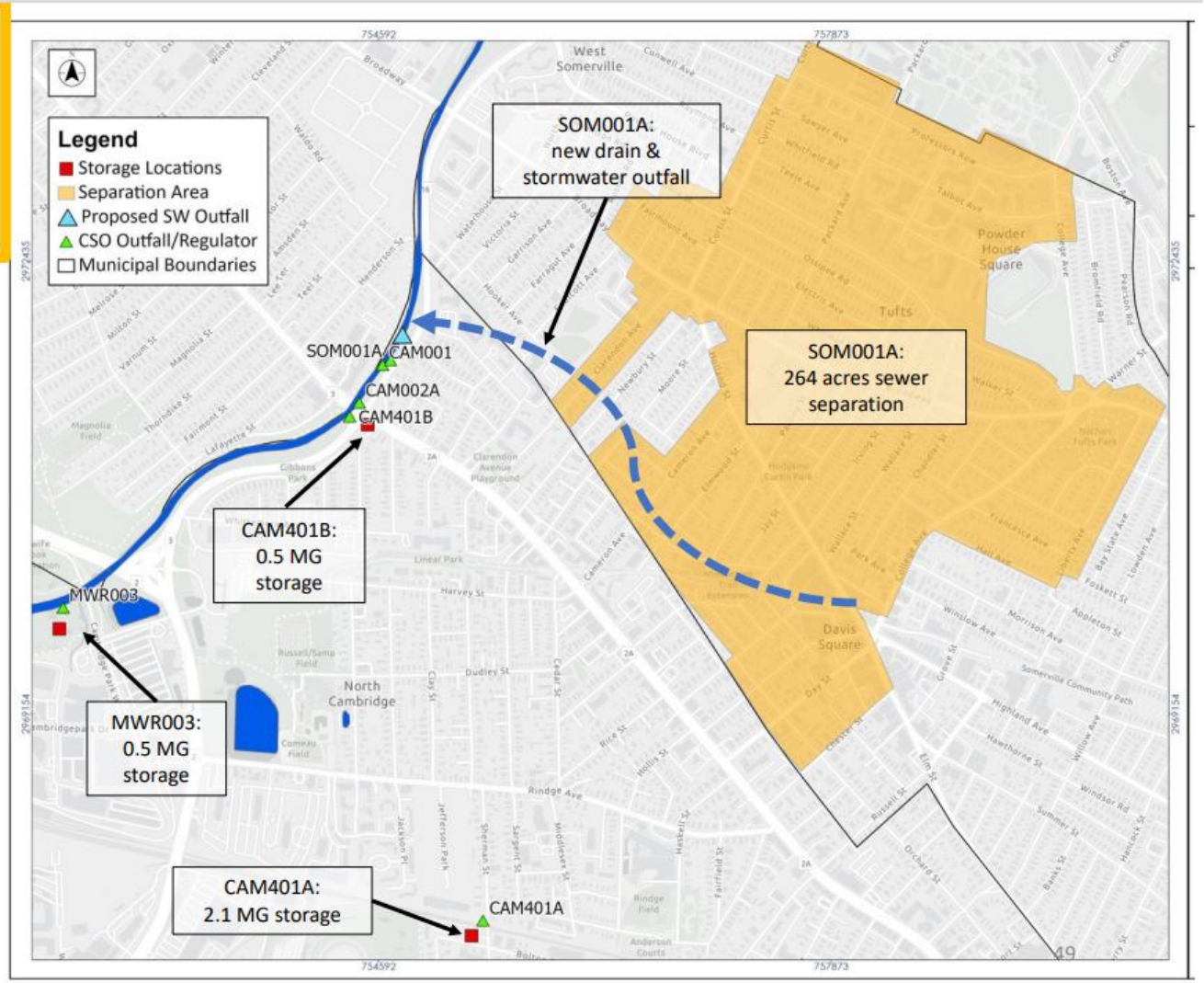
Combined Sewer Overflow Control Tools

Alewife Integrated Alternative: 2050 Typical Year CSO Control

- CAM401A: 2.1 MG storage
- CAM401B: 0.4 MG storage
- MWR003: 0.5 MG storage
- SOM001A: 264 acres separated + inline storage with throttles

Prelim. Estimated Cost: ~$600 million



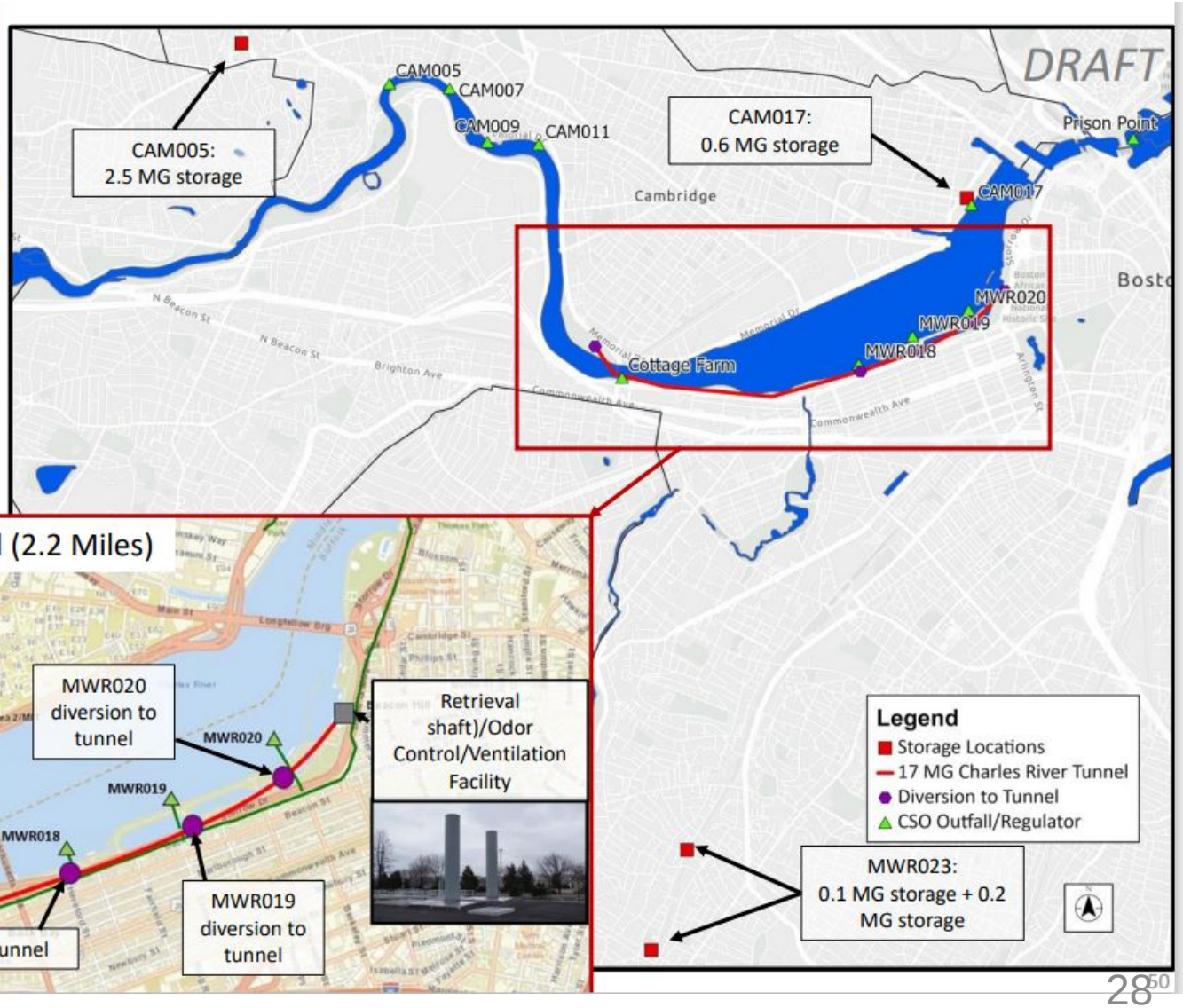
Combined Sewer Overflow Control Tools

Charles Integrated Alternative: 2050 Typical Year CSO Control

- CAM005: 2.5 MG storage
- CAM017: 0.6 MG storage
- MWR201/MWR018/019/020: 17.2 MG tunnel
- MWR023: 0.3 MG storage

Prelim estimated Capital Costs: ~$1 Billion*

*2024 dollars unescalated to construction period. Costs do not include land acquisition and may be further refined.



The Tobin School Project

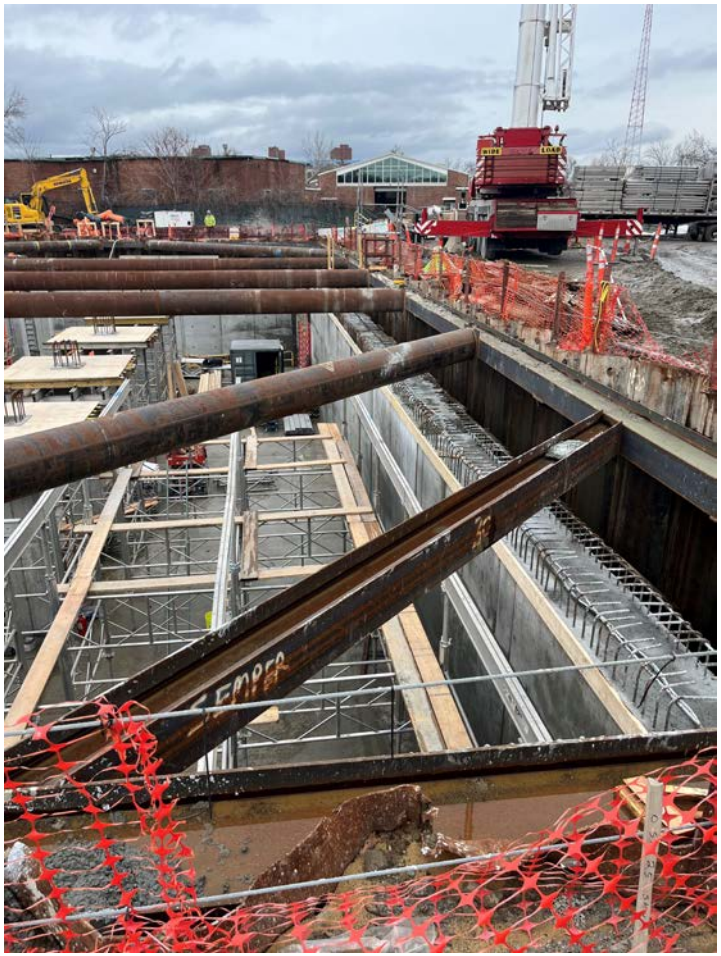
Bioretention system at Vassal Lane entrance

100,000 gallon bioretention system

- Project Level Quality/Quantity Control

The Tobin School Project

Stormwater Tank

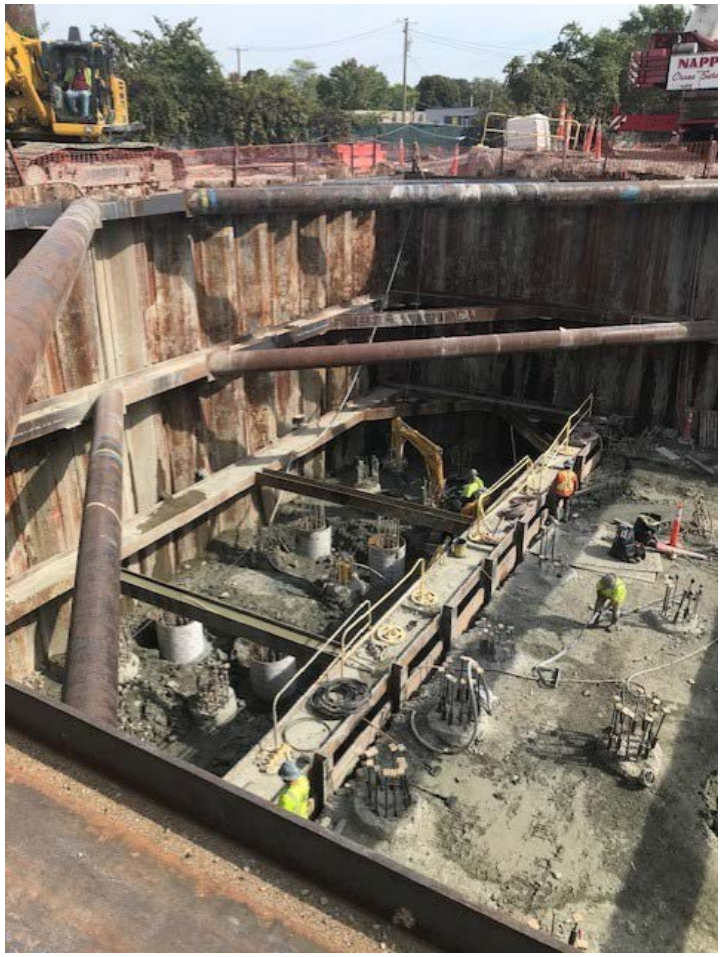


1.25 MG stormwater tank

- Regional Flood Control
- 10-yr-24-hr 2070 storm event in Vassal Lane & Concord Ave

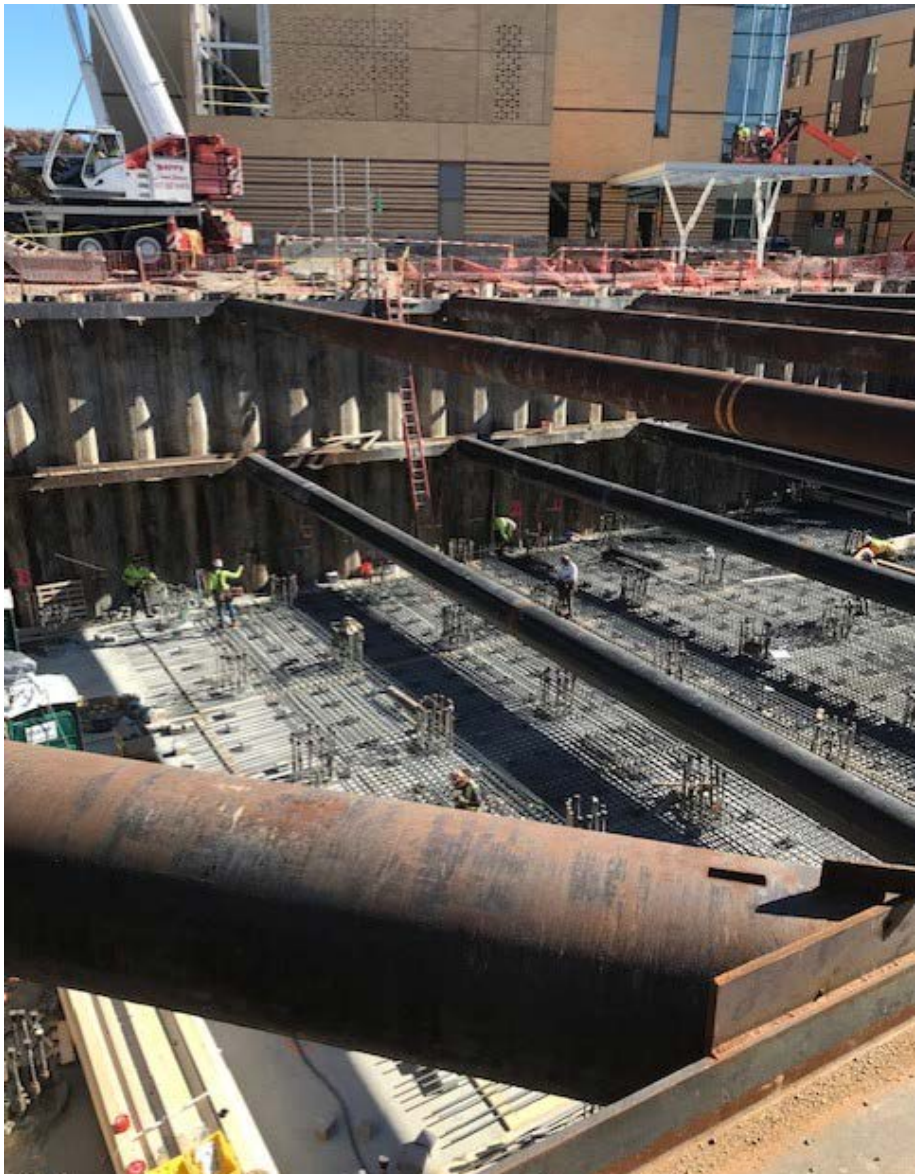
The Tobin School Project

Stormwater Tank

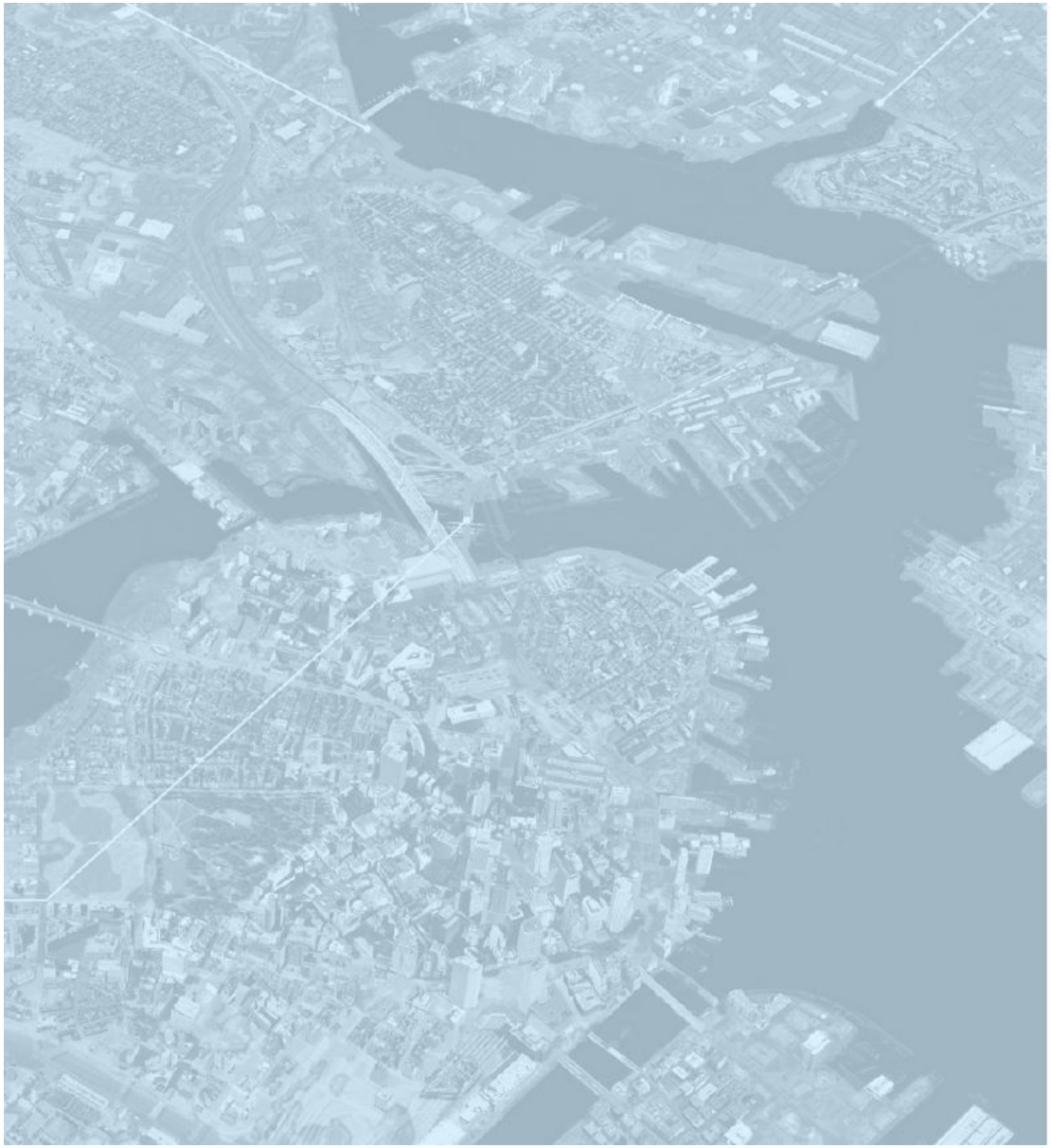


The Tobin School Project

Stormwater Tank



Regional Climate Resiliency

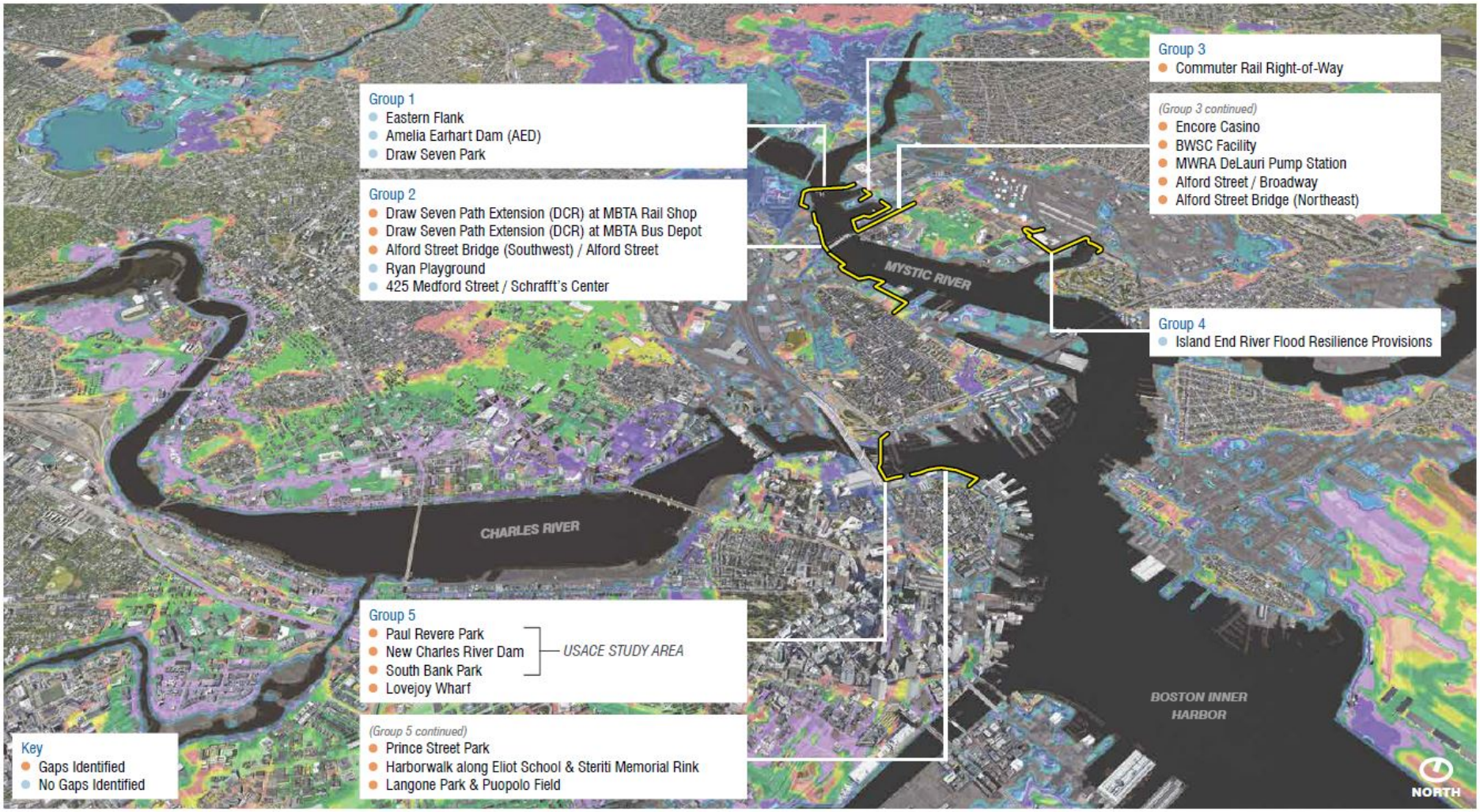


GAP ANALYSIS REPORT

Weston & Sampson | March 2025

Regional Climate Resiliency

GAP ANALYSIS OVERVIEW

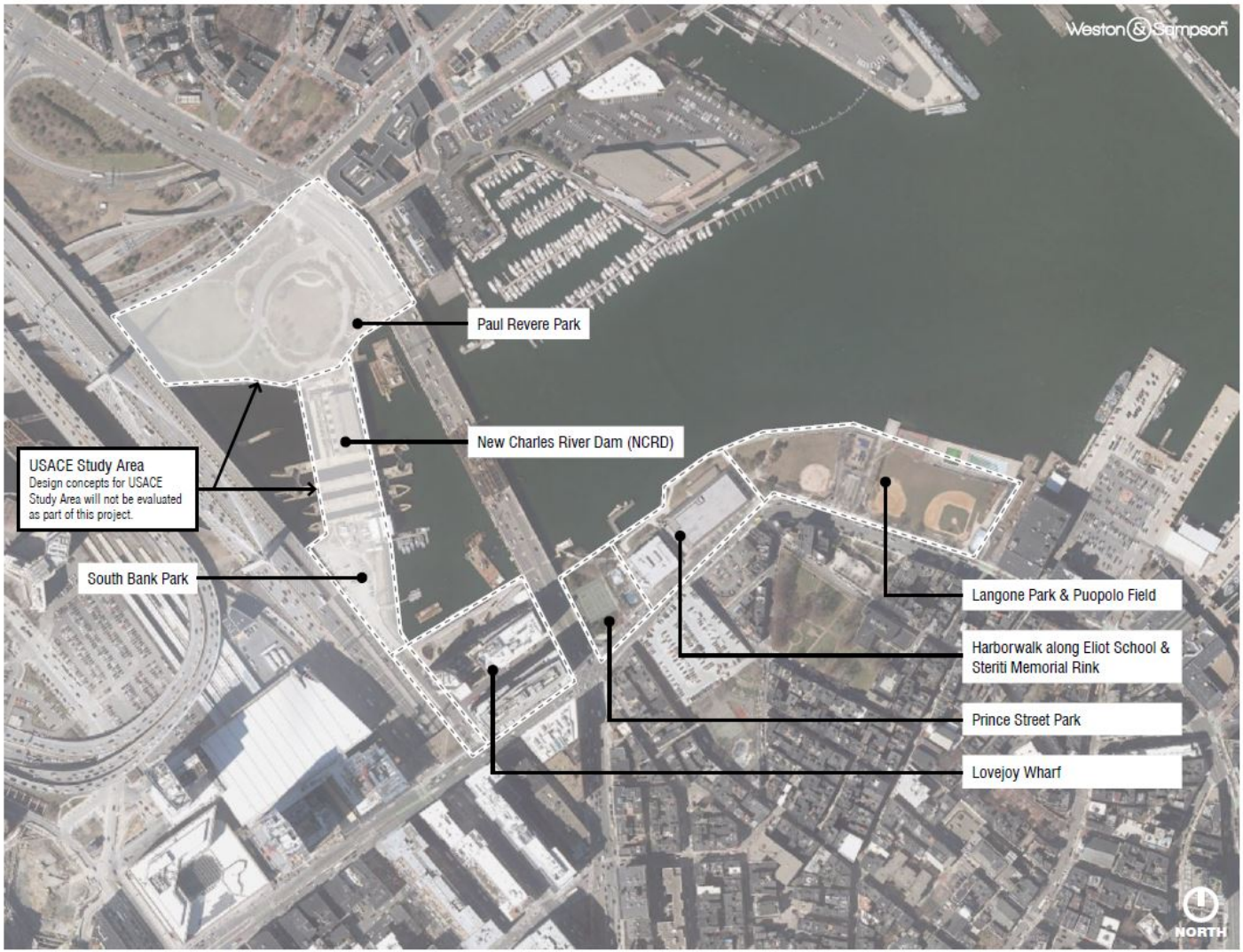


Regional Climate Resiliency

5.1 Group Areas

Plan Key

----- Site boundaries



Notes

1. All elevations noted are in ft-NAVD88.
2. DFE scenarios are based on Water Surface Elevation and Significant Wave Crest data as provided by WHG on September 17th, 2024.

Regional Climate Resiliency

5.2 Depth of Flooding

(2070 0.5% Storm Scenario)

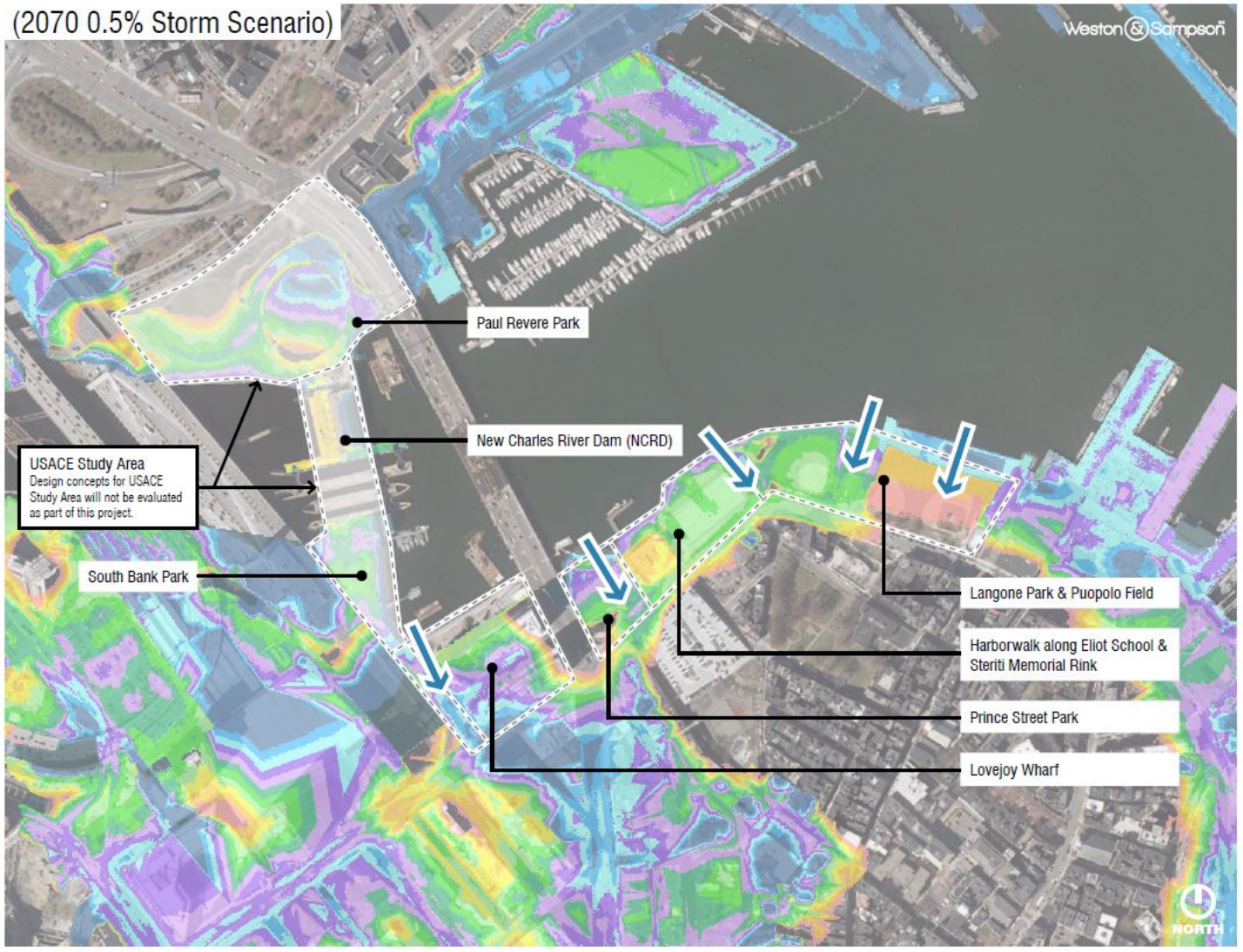
Plan Key

- Site boundaries
- Simulated Flood Path

Depth of Flooding

The difference between Water Surface Elevation (from 2070 0.5% Storm Scenario) and Ground Elevation (from 2021 LiDAR)

< 0.5 ft	3 - 3.5 ft
0.5 - 1 ft	3.5 - 4 ft
1 - 1.5 ft	4 - 4.5 ft
1.5 - 2 ft	4.5 - 5 ft
2 - 2.5 ft	5 - 10 ft
2.5 - 3 ft	>10 ft



Notes

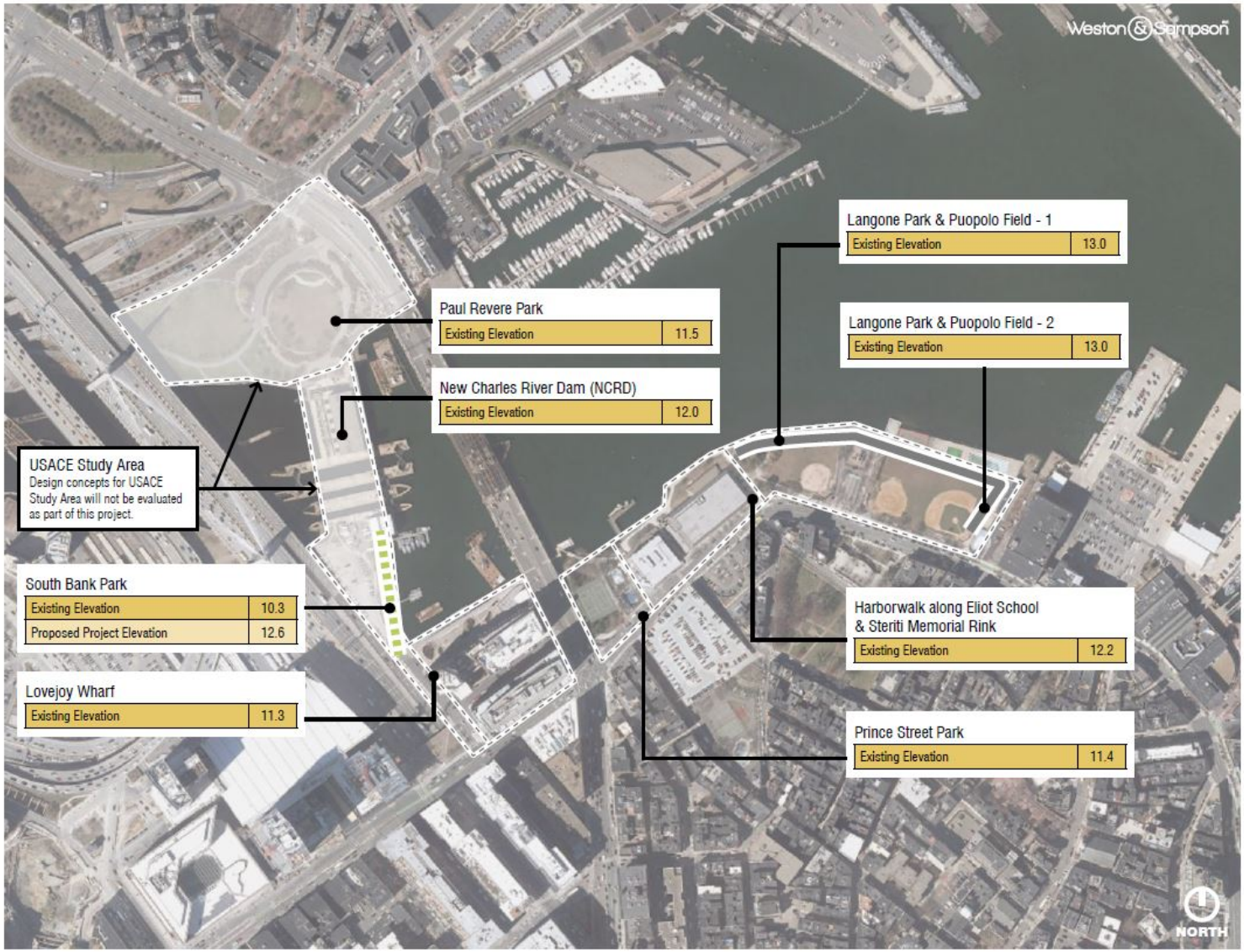
- All elevations noted are in ft-NAVD88.
- DFE scenarios are based on Water Surface Elevation and Significant Wave Crest data as provided by WHG on September 17th, 2024.

Regional Climate Resiliency

5.4 Elevations

Plan Key

- Site boundaries
- Existing Flood Mitigation Features
- Flood Mitigation Features in Design/Construction



Notes

- All elevations noted are in ft-NAVD88.
- DFE scenarios are based on Water Surface Elevation and Significant Wave Crest data as provided by WHG on September 17th, 2024
- Design concepts for USACE Study Area will not be evaluated as part of this project.

Electrical Division is now part of DPW

<u>The Electrical Division Responsibilities:</u>

- Street and Park lighting systems
- City Fire Alarm System – 43 City buildings, 400+ private buildings and public way pull boxes
- City fiber cable network- All City buildings
- Electric systems within City buildings
- Oversees installation of cables, conduits and equipment by utilities and other contractors over and within all public ways.

Electrical Division

Upcoming Projects:

- Replacement of street light poles and decorative poles at Lechmere Canal Park
- Expansion of City Fiber Network at Danehy Park
- City buildings- Fire Alarm and Elevator Maintenance
- Electric Vehicle Charging Stations
- Working with Eversource on overhead and underground distribution expansion
- Photovoltaic Panel- maintenance and upgrades at City buildings

CONCLUSION

Goal – infrastructure that serves **residents and businesses** today and in the future.
Resiliency of new development is a critical piece of this work.