

# A Case Study for Piloting Urban Green Infrastructure, Lynn, MA

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Connecticut Association of Flood Managers 10<sup>th</sup> Annual Conference | November 1, 2023



# Strawberry Brook Watershed



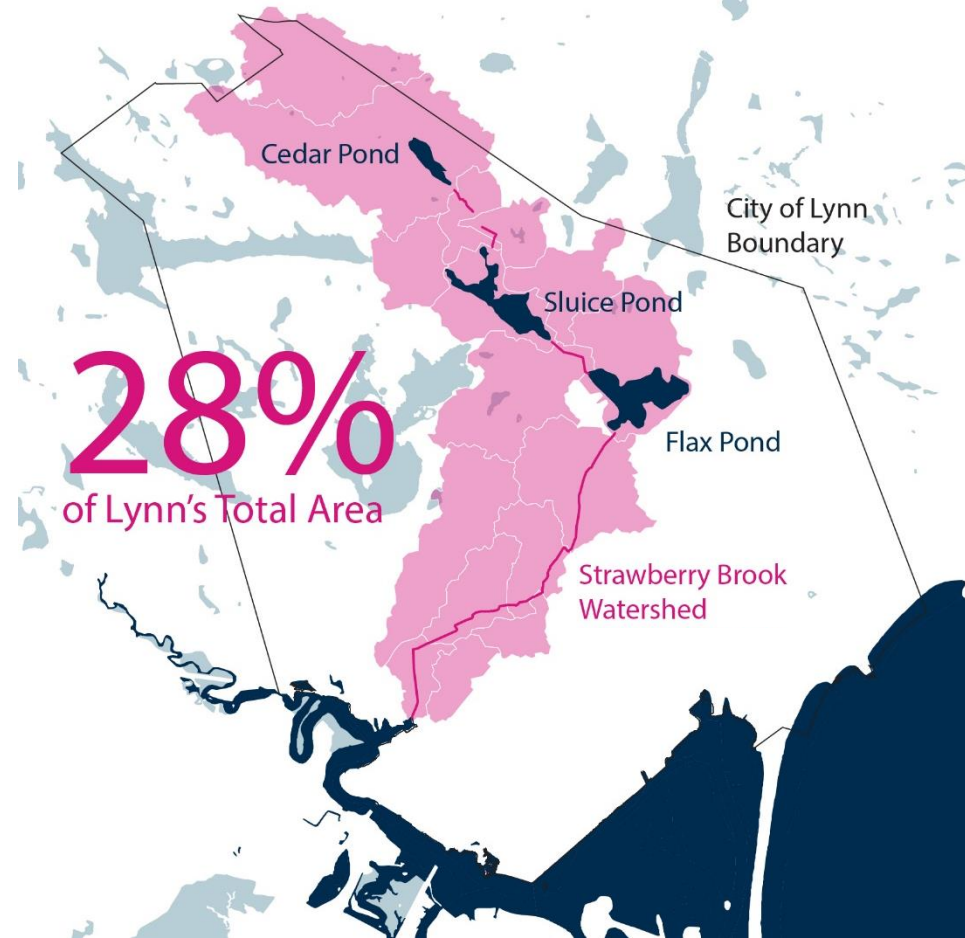
**2,400** acres



Over 45% impervious

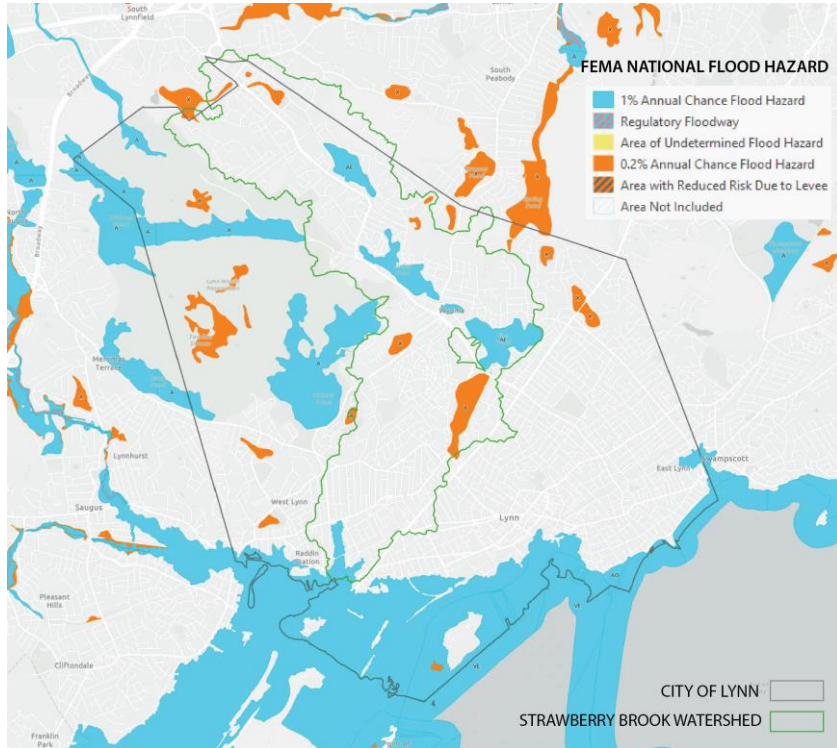


Culverted Stream

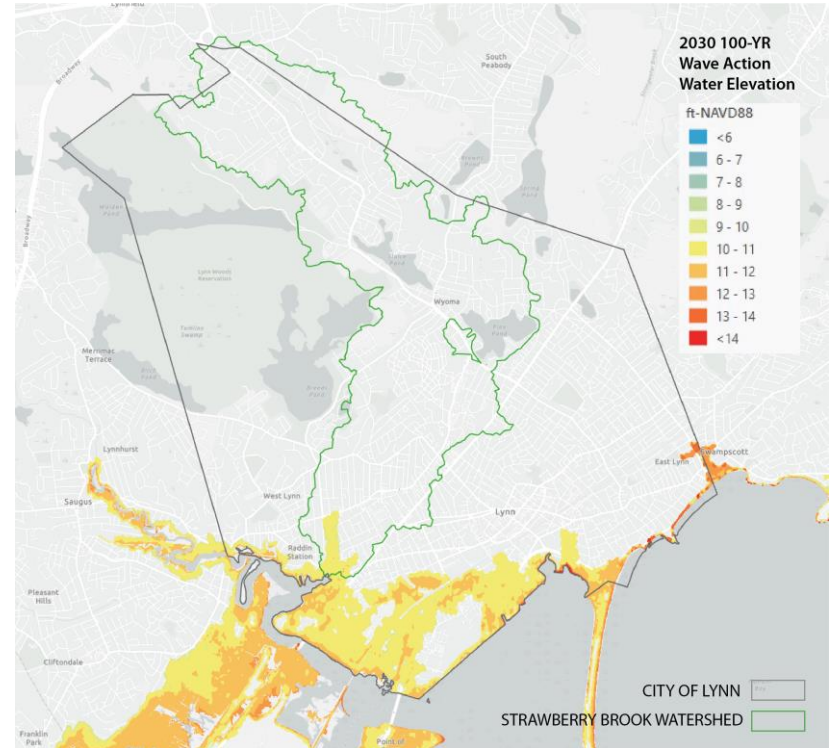


# Current Flooding in the Watershed

## FEMA

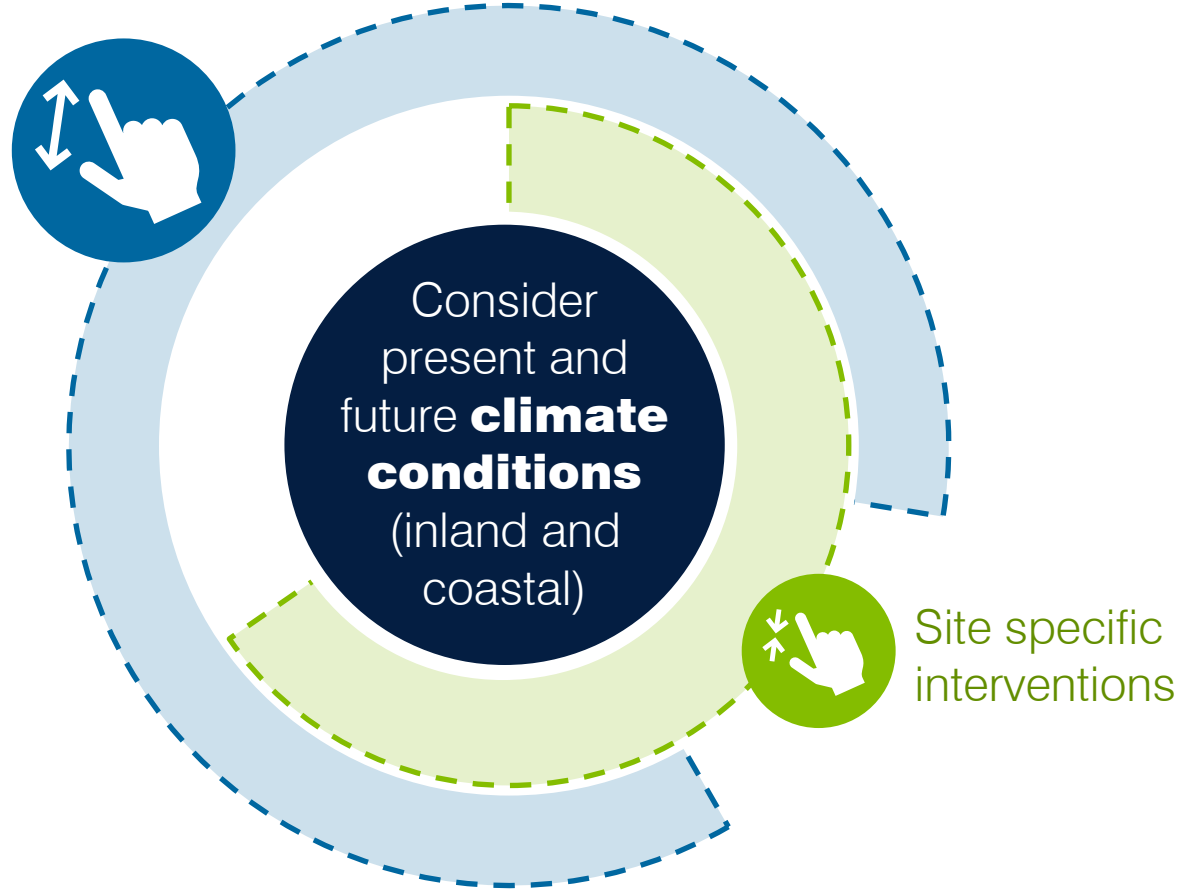


## Predicted Coastal from MC-FRM



# Flood Mitigation Strategy

Watershed  
scale planning



# Timeline



## 2019-2020 (FY20)

Community Resilience  
Building Planning

## 2020-2021 (FY21)

Strawberry Brook  
Resilient Stormwater  
Management and  
Implementation Plan

## 2021-2022 (FY22)

Boston Street Green  
Infrastructure Design  
and Construction  
Barry Park Green  
Infrastructure Design  
GEAA Field Vision

## 2022-2023 (FY23)

Barry Park Green  
Infrastructure  
Construction  
  
GEAA Field  
Concepting

## 2023 Onward

GEAA Field Pre-Permit  
Design

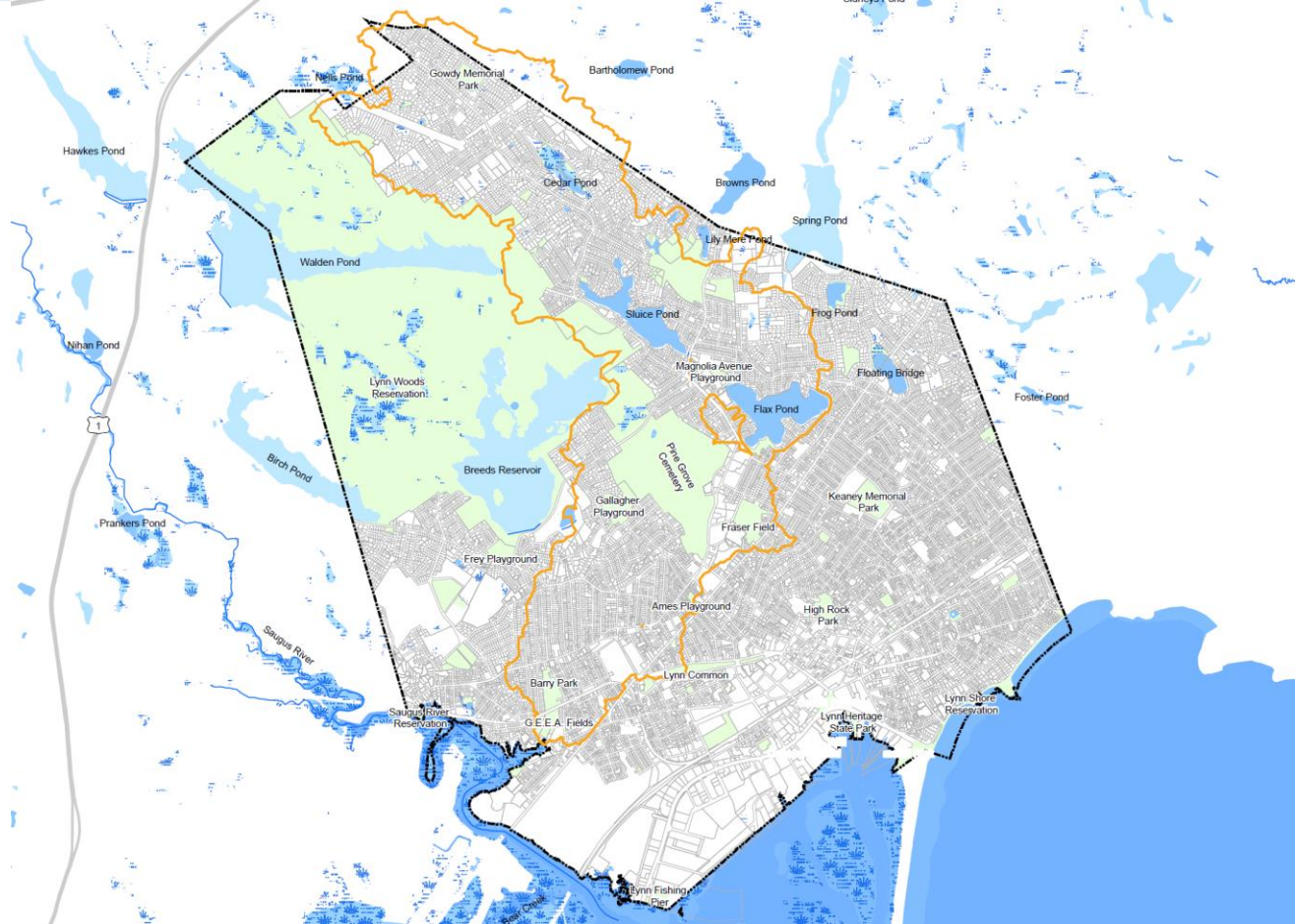
# Watershed Assessment Overview



**H&H  
modeling**



**Over 200  
projects  
identified**



# Watershed Assessment

## H&H modeling



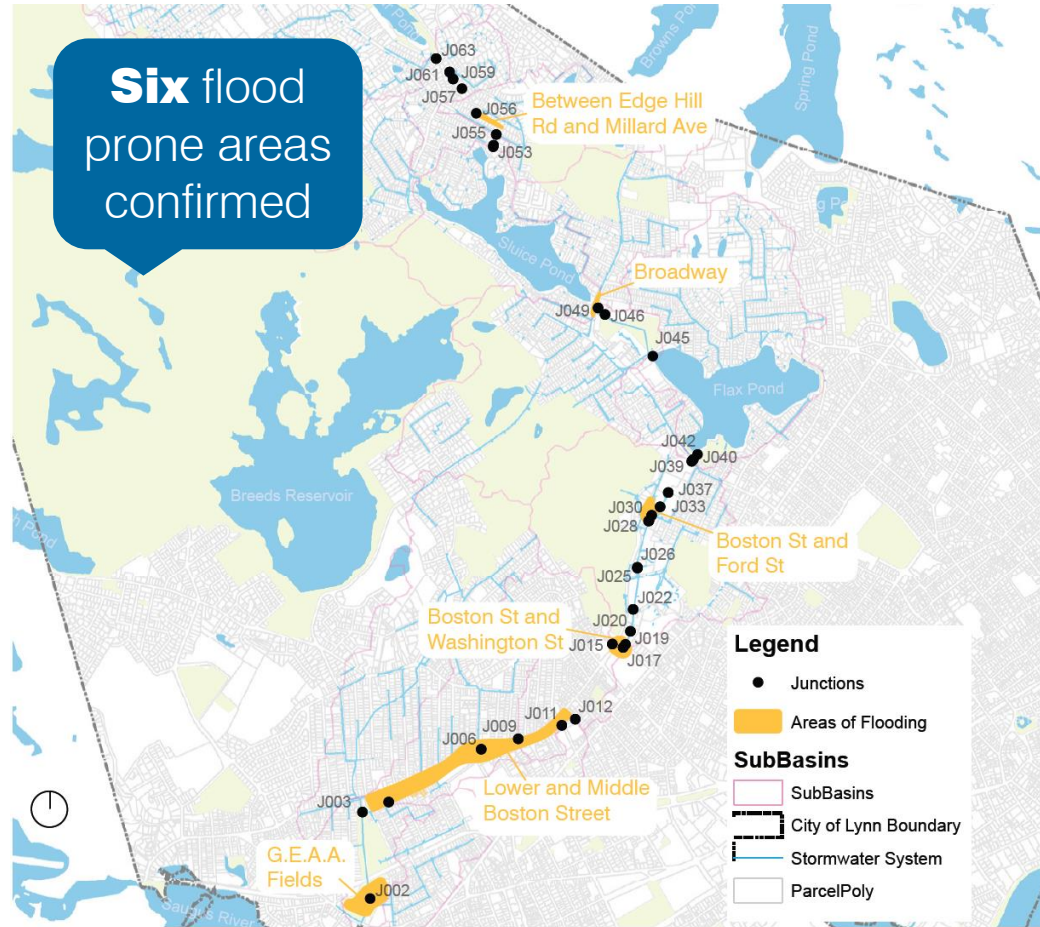
Present day and 2070 conditions



24-hour, 2-hour, and 6-hour storms



2, 5, and 10-year recurrence intervals



# Watershed Assessment

## Over 200 projects identified



Look at ways to capture and convey stormwater throughout the watershed



Implement surface solutions to delay flow and reduce peak to maintain capacity of existing stormwater system

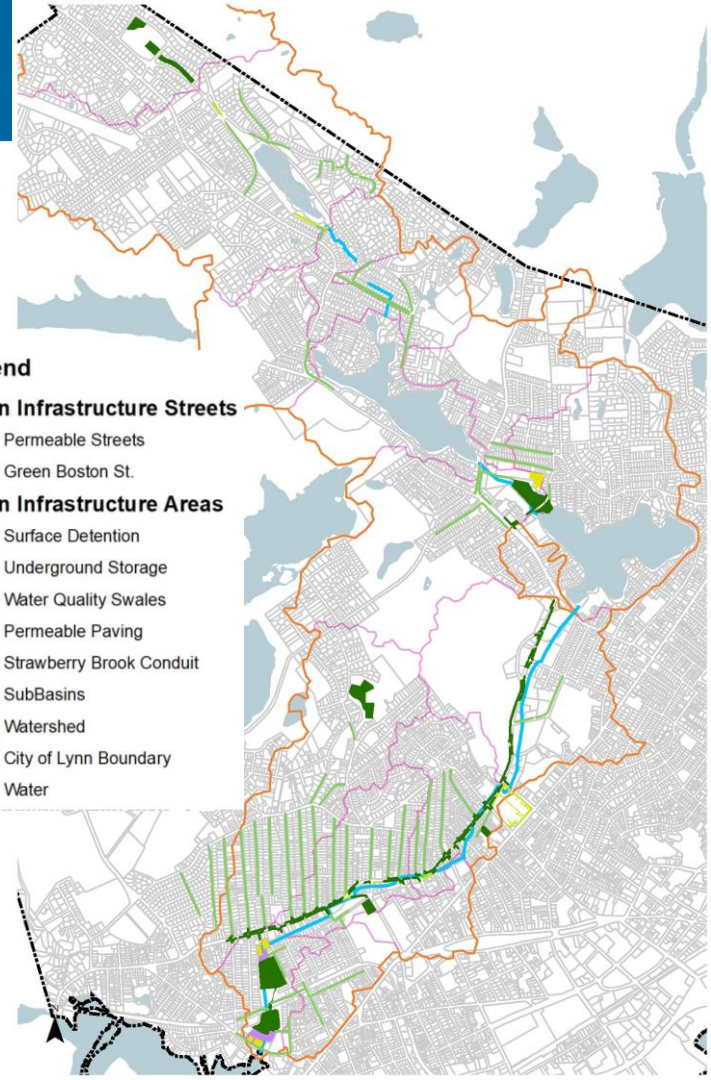
### Legend

#### Green Infrastructure Streets

- Permeable Streets
- Green Boston St.

#### Green Infrastructure Areas

- Surface Detention
- Underground Storage
- Water Quality Swales
- Permeable Paving
- Strawberry Brook Conduit
- SubBasins
- Watershed
- City of Lynn Boundary
- Water





# Strawberry Brook Watershed

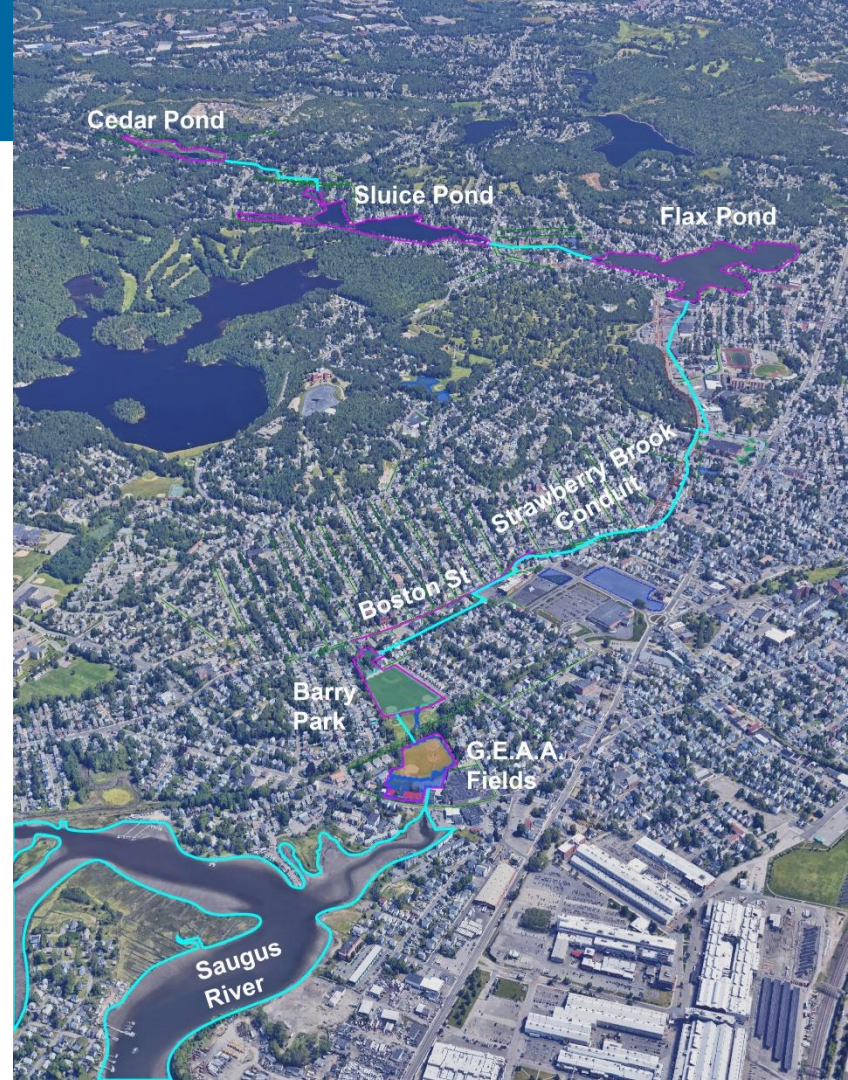
## Prioritized Pilot Projects

Cedar Pond

Boston Street GSI

Barry Park GSI

G.E.A.A. Fields



# Strawberry Brook Watershed

## Prioritized Pilot Projects

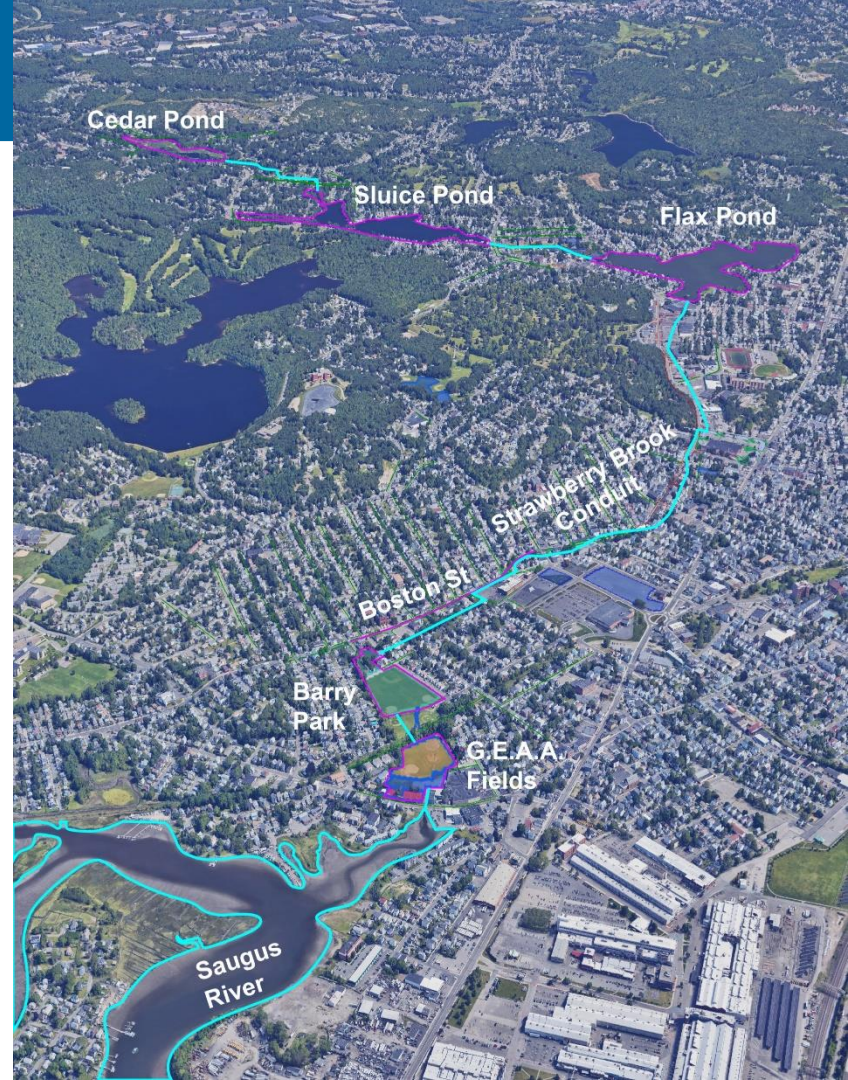


Cedar Pond

Boston Street GSI

Barry Park GSI

G.E.A.A. Fields



# Cedar Pond



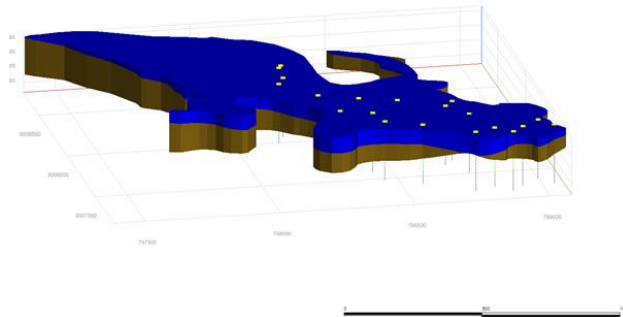
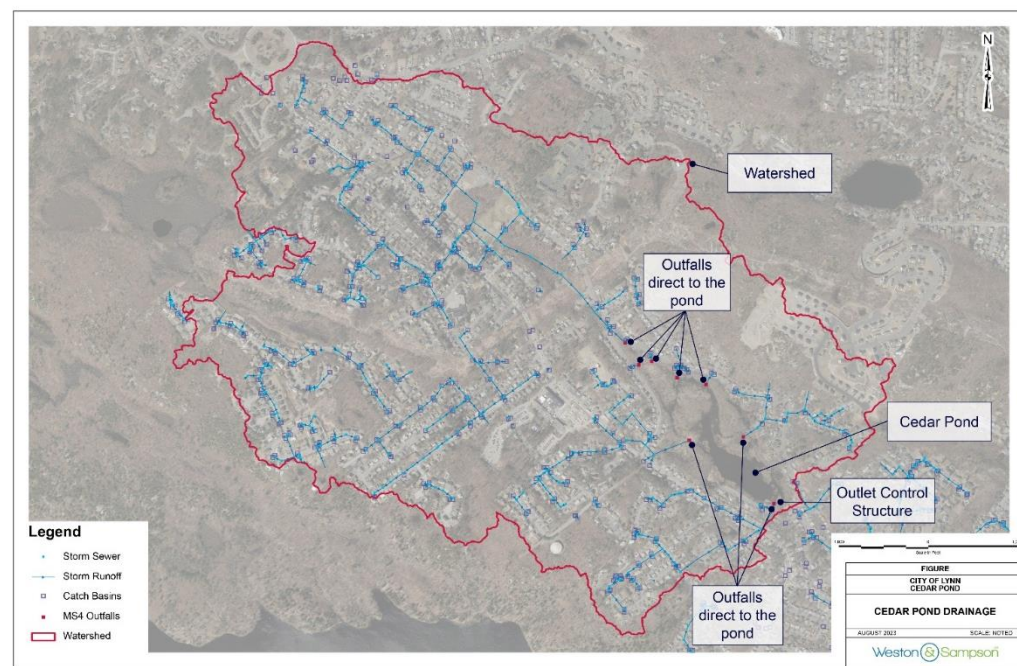
Most upstream pond in watershed



Piloting evaluation of potential pre- and post-storm controls at the outlet structure



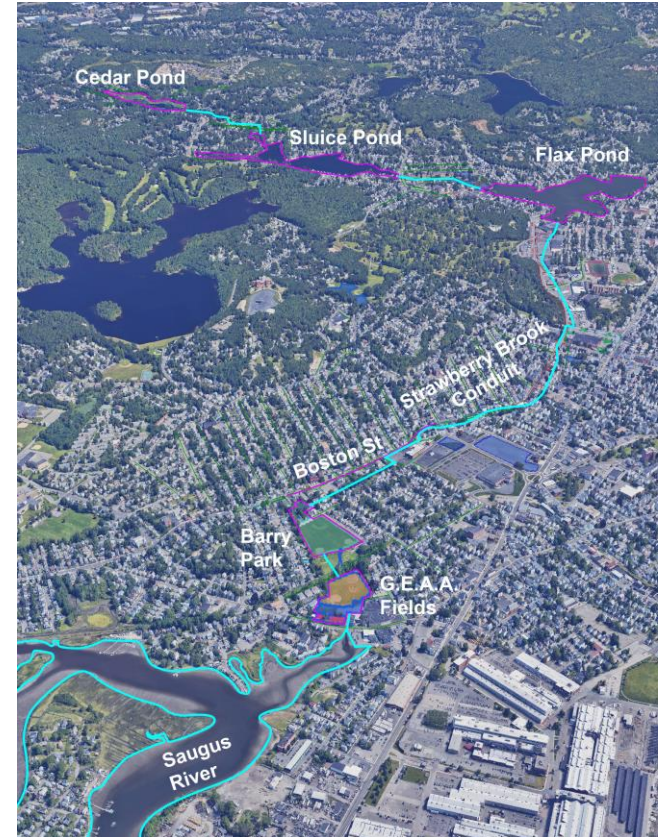
Permitting discussions with regulators



# Cedar Pond

| Waterbody           | Cedar | Sluice | Flax  | Total |
|---------------------|-------|--------|-------|-------|
| Drainage Area (ac.) | 1,020 | 1,245  | 1,954 |       |
| 6" Volume (MG)      | 5.4   | 36.4   | 26.1  | 68    |
| 12" Volume (MG)     | 10.8  | 72.7   | 52.3  | 136   |

- Sluice and Flax have 5-7 times more storage capacity
- Additional flood storage
- Use multiple ponds?



# Strawberry Brook Watershed

## Prioritized Pilot Projects

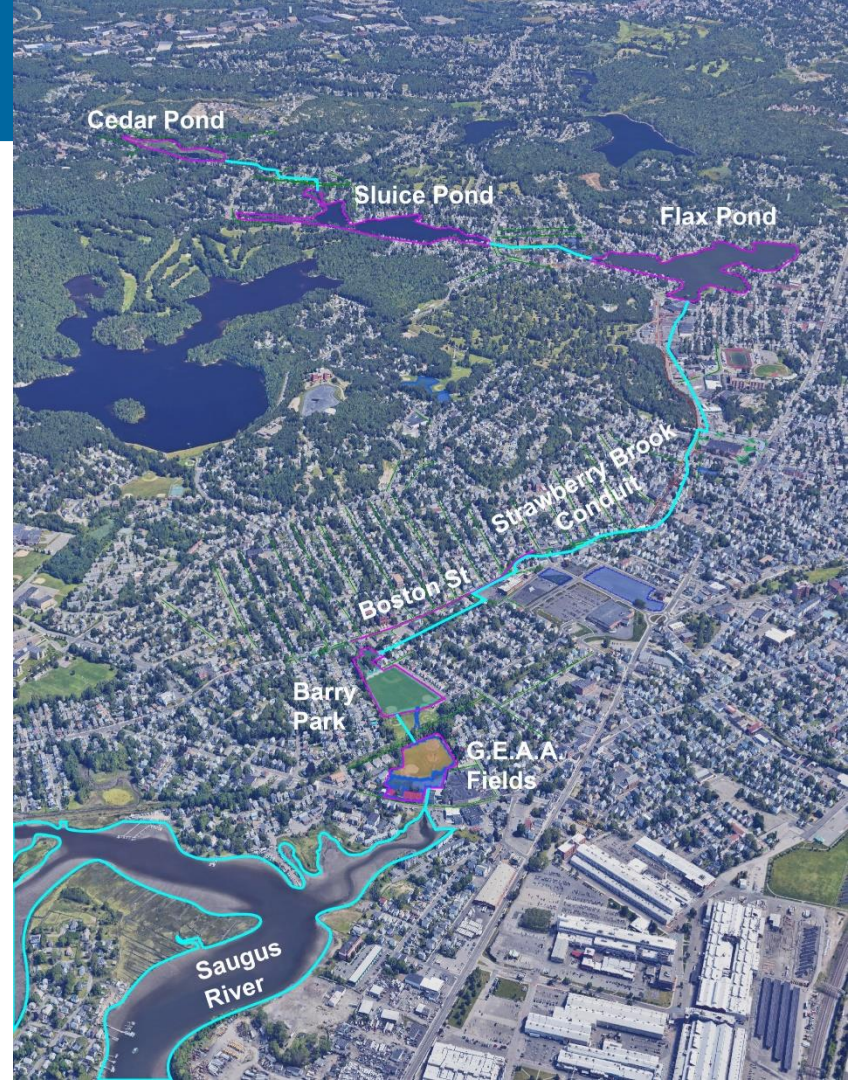
Cedar Pond



Boston Street GSI

Barry Park GSI

G.E.A.A. Fields



# Boston Street Green Infrastructure



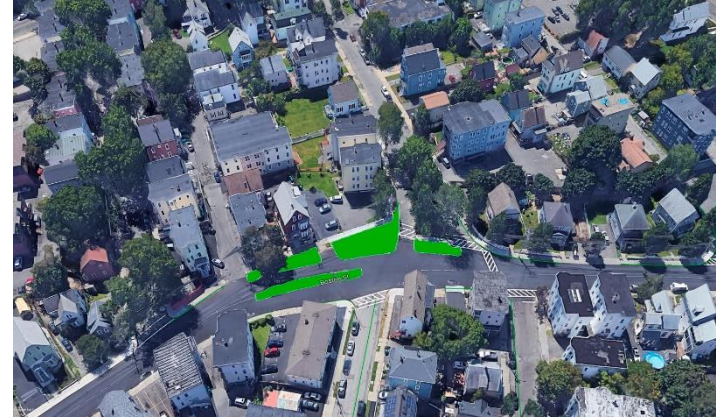
**Stakeholder engagement**  
throughout the design process



Complexity due to construction in  
**dense old urban environments**



**Proprietary systems** and their  
limits



# Boston Street Green Infrastructure



# Strawberry Brook Watershed

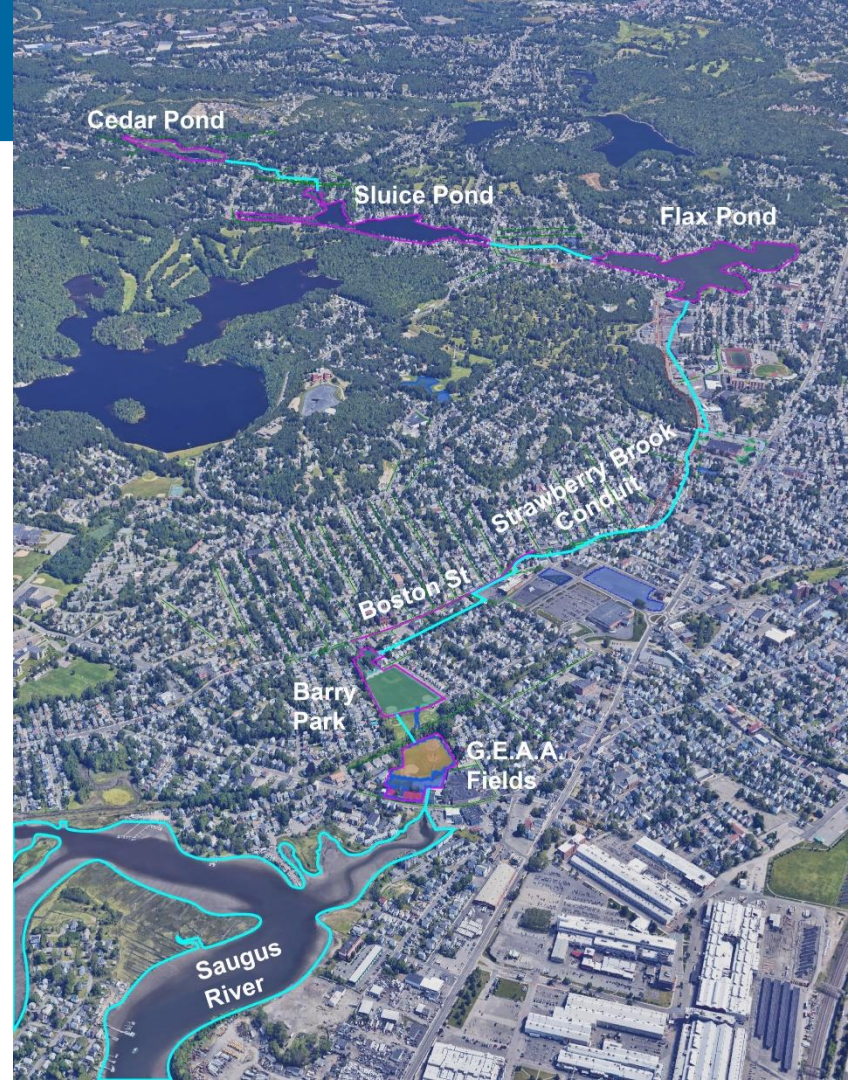
## Prioritized Pilot Projects

Cedar Pond

Boston Street GSI

 Barry Park GSI

G.E.A.A. Fields





# Vision for Barry Park & G.E.A. Fields

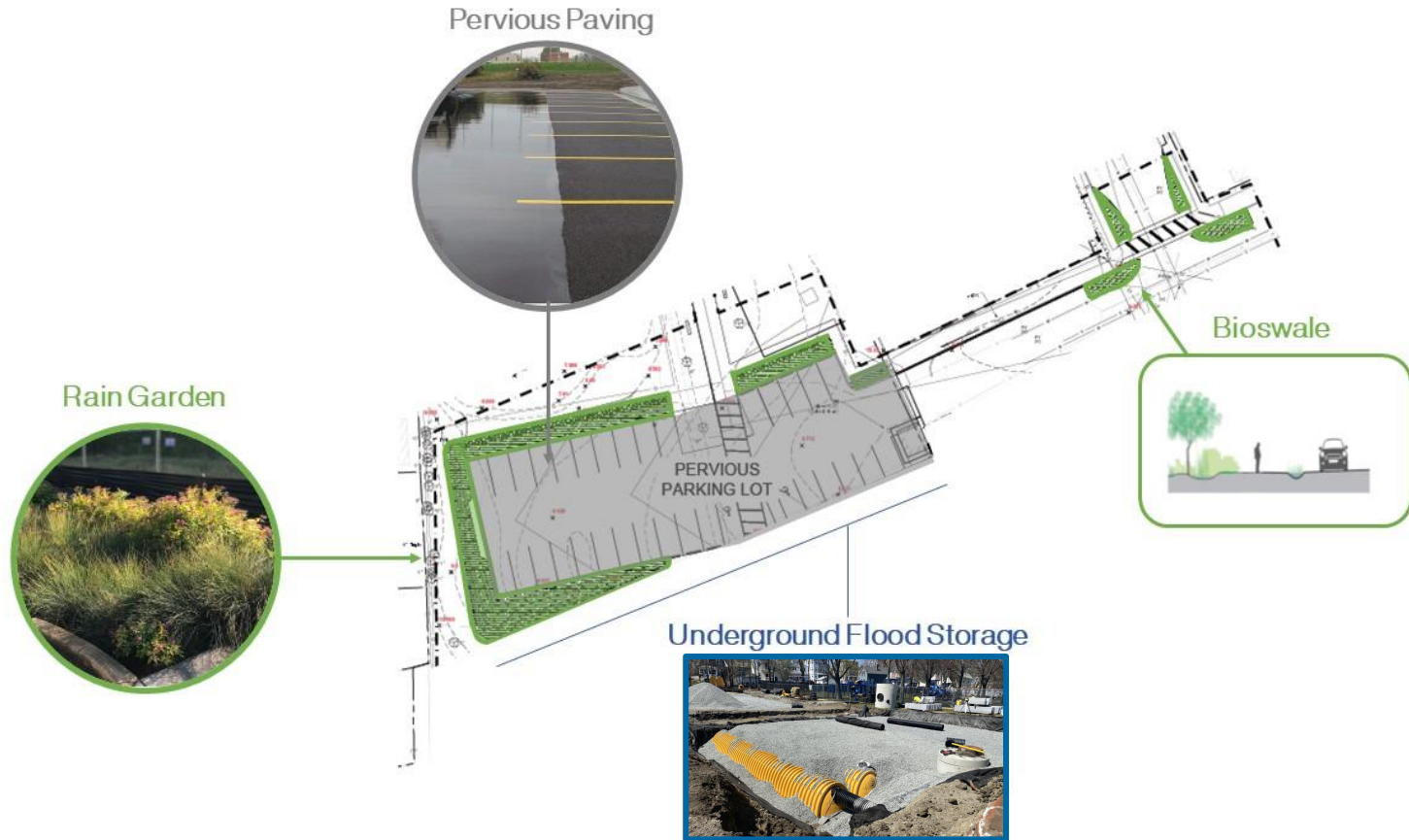


Barry Park Vision

# Barry Park Existing Conditions



# Barry Park Green Infrastructure



# Barry Park Green Infrastructure



# Barry Park Green Infrastructure



# Barry Park Green Infrastructure



# Barry Park Green Infrastructure



# Barry Park Green Infrastructure





# Barry Park Green Infrastructure



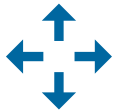
# Barry Park Green Infrastructure



Increased capacity works



Baseline storms allow for monitoring



Adaptative design



*Photos at right: Barry Park Construction*

# Strawberry Brook Watershed

## Prioritized Pilot Projects

Cedar Pond

Boston Street GSI

Barry Park GSI

 G.E.A.A. Fields



# G.E.A.A. Fields



**1903:**

Strawberry brook and wetlands remain

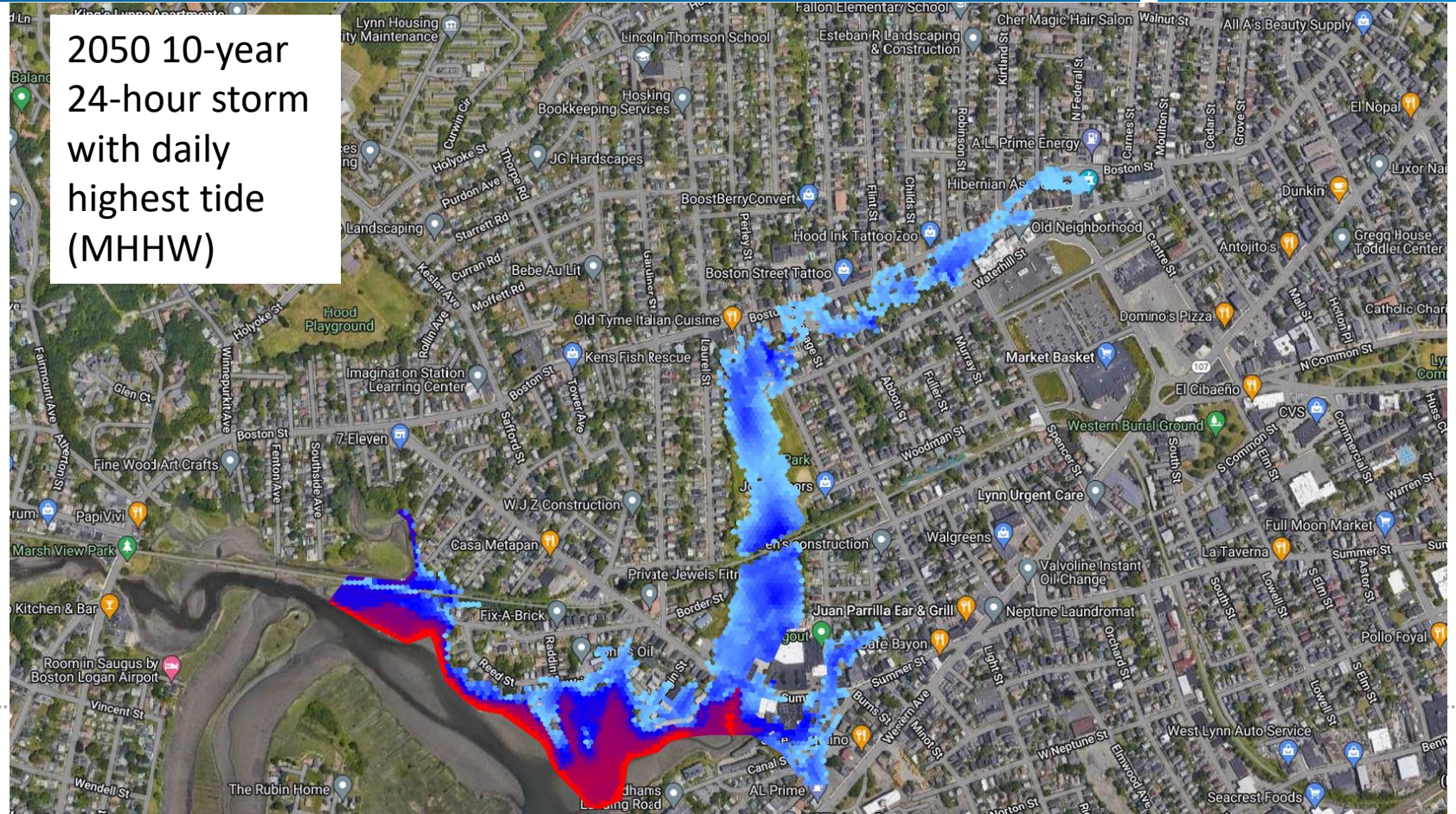


**1946:**

GEAA Field Filled,  
Strawberry Brook in conduit

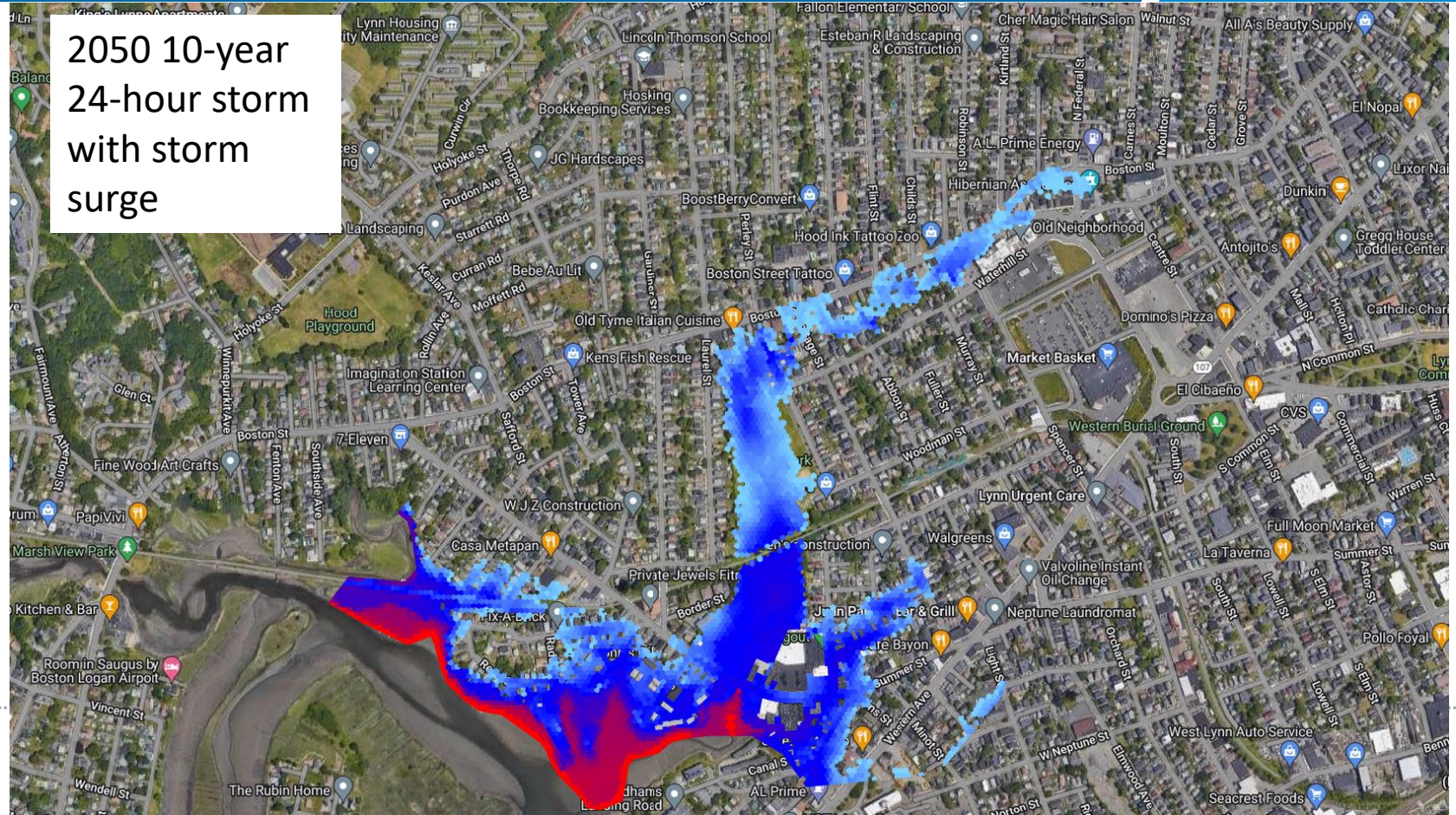
# G.E.A.A. Fields

2050 10-year  
24-hour storm  
with daily  
highest tide  
(MHHW)



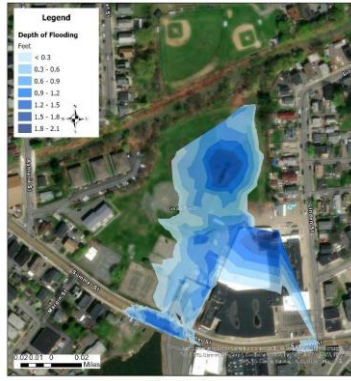
# G.E.A.A. Fields

2050 10-year  
24-hour storm  
with storm  
surge



# G.E.A.A. Fields

**2-3 feet** of flooding in FEMA zone



With storm surge + 10-year, 24-hour precipitation:  
Likely to flood  
**4 feet**

With storm surge + 10-year, 24-hour precipitation:  
Likely to flood  
**6 feet**

**Present day**

**2050**

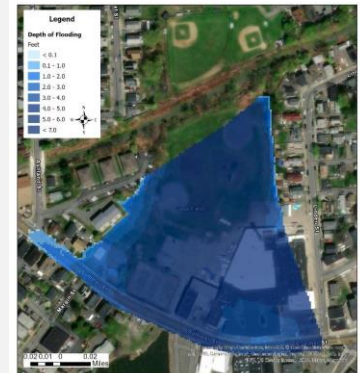
**2050**

**2070**

**2070**

Likely to flood at both high tides each day by **1-2 feet** on a “sunny day”

Depth of high tide flooding  
**doubles**



# G.E.A.A. Fields





# Key Take Aways



Flooding mitigation strategy is evolving



Reactive and proactive solutions are necessary



Localized benefits extend beyond just flood mitigation and positively impact surrounding communities



**Thank you!**

Questions?

[westonandsampson.com](http://westonandsampson.com)

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