

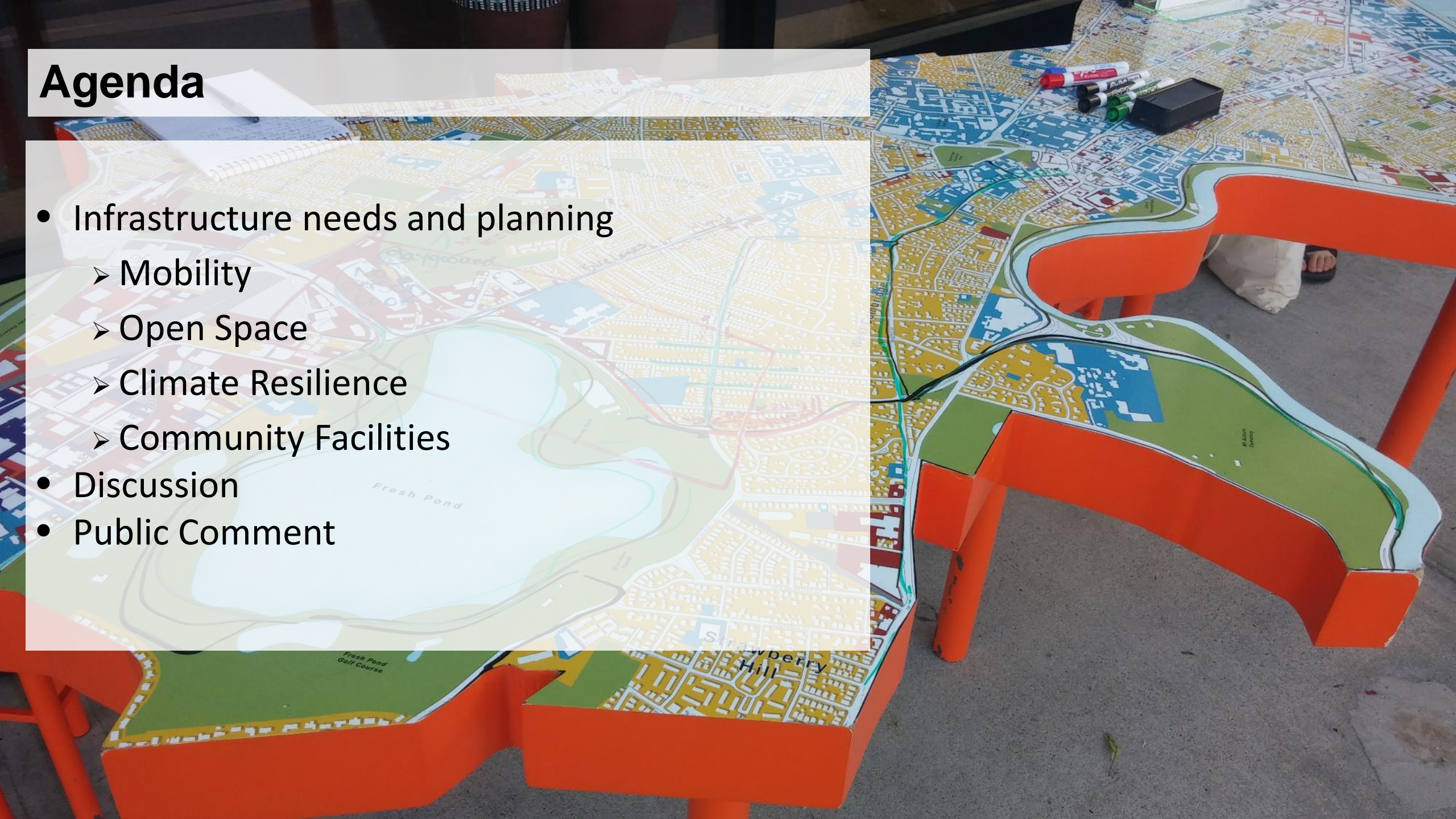
Alewife Zoning Working Group

An aerial architectural rendering of a city block. The scene shows a dense arrangement of multi-story buildings with various rooflines and colors, including red, orange, and white. Green trees are scattered throughout the block, particularly along the streets and in open areas. A small blue river or stream flows through the lower-left portion of the block. The overall style is a detailed, hand-drawn architectural sketch.

Meeting #4: Mobility, Open Space, Climate Resilience, and Community Facilities
September 29, 2022

Agenda

- Infrastructure needs and planning
 - Mobility
 - Open Space
 - Climate Resilience
 - Community Facilities
- Discussion
- Public Comment



Overall Schedule



Working Group Schedule

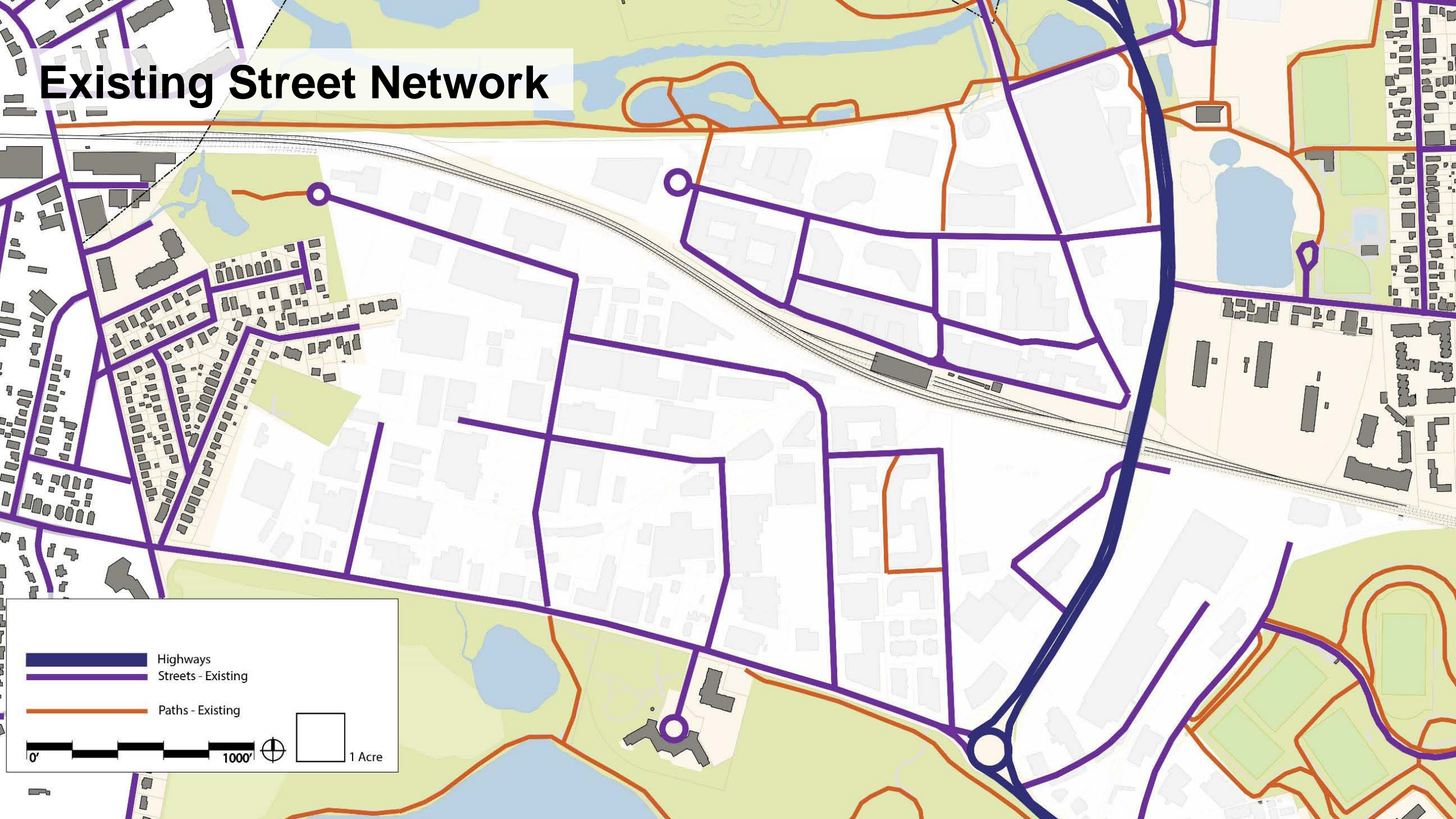


01	02	03	04	05	06	07
JUNE 29	AUG 10	SEPT 14	SEPT 29	OCT 12	NOV 9	DEC 14
Overview of Alewife District Plan	Land Use & Zoning	Developer presentations	Mobility, Open Space, Climate Resilience, and Community Facilities	Draft Zoning Framework	Updated Zoning Recs	Final Zoning Recs
Zoning Primer						

Mobility



Existing Street Network

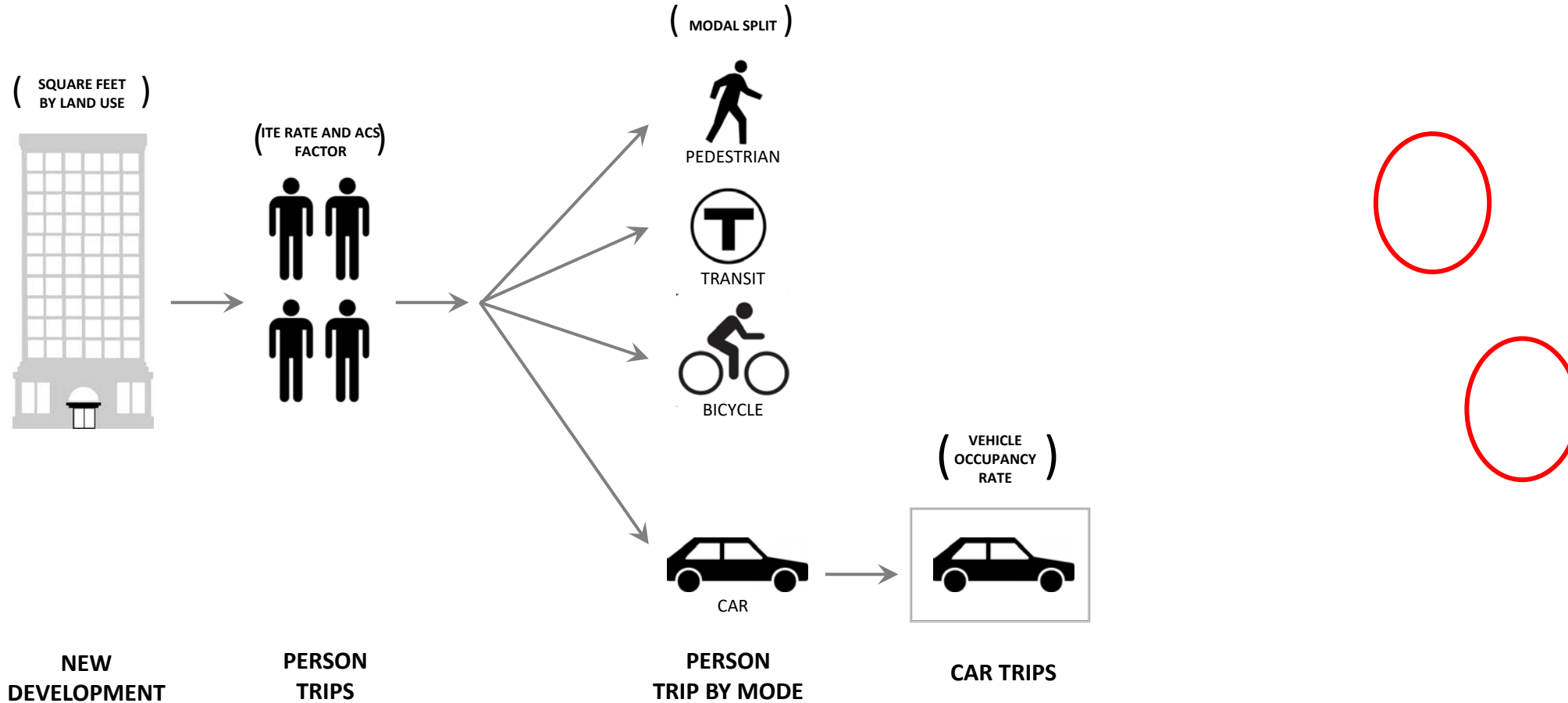


Legend:

- Highways
- Streets - Existing
- Paths - Existing

Scale: 0' to 1000' | North Arrow | 1 Acre

Transportation impacts from development



Critical Sums analysis compares how development impacts specific intersections in general way

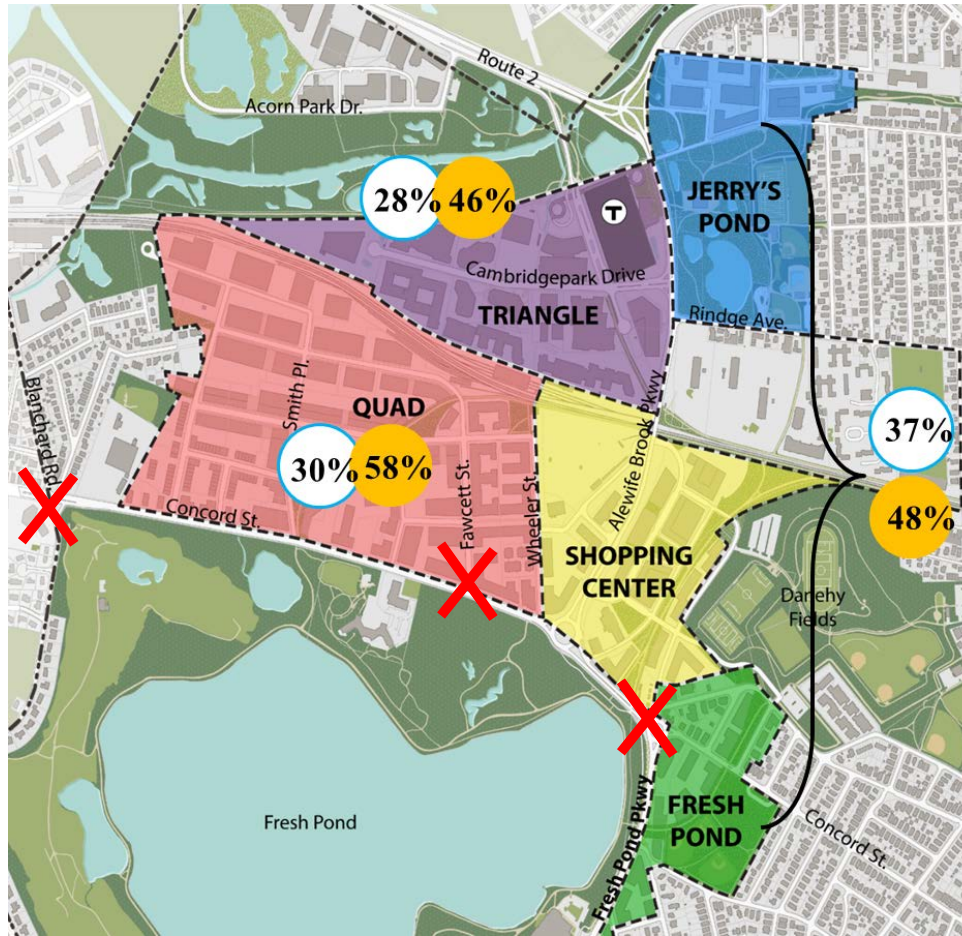
Critical Sums By Intersection

Intersection	Existing (2016)		2030 Existing Zoning		2030 Proposed Zoning	
	Total Volume	Critical Sum	Total Volume	Critical Sum	Total Volume	Critical Sum
1. Alewife Brook Parkway & Route 2	5498	1699	5814	1853	5872	1863
2. Alewife Brook Parkway & Cambridge Park Drive	3844	1267	4380	1436	4441	1430
3. Alewife Brook Parkway & Rindge Ave.	3769	1305	4353	1433	4426	1427
4. Alewife Brook Parkway & Concord Ave Rotary	3388	2152	4460	2640	4781	2670
5. Concord Ave & Fresh Pond Parkway Rotary	3033	1375	3921	1786	4117	1840
6. Concord Ave & Fawcett St.	1350	708	2261	1335	2693	1687
7. Concord Ave & Blanchard Rd.	1955	1096	2702	1490	3080	1640

Red = over threshold

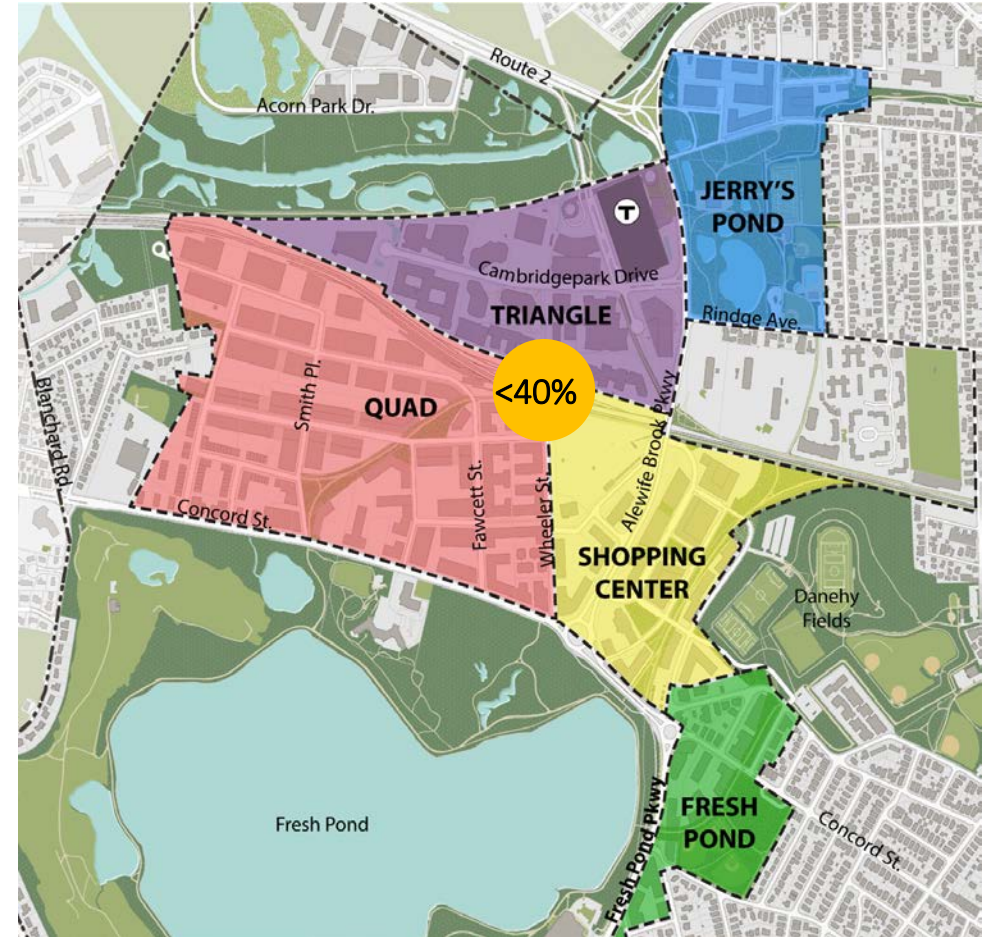
Mode Share without plan's mobility recommendations

3 new intersections exceed threshold



Mode Share achieved with plan's mobility recommendations

0 new intersections exceed threshold



Percentage of trips by car (SOV and HOV)

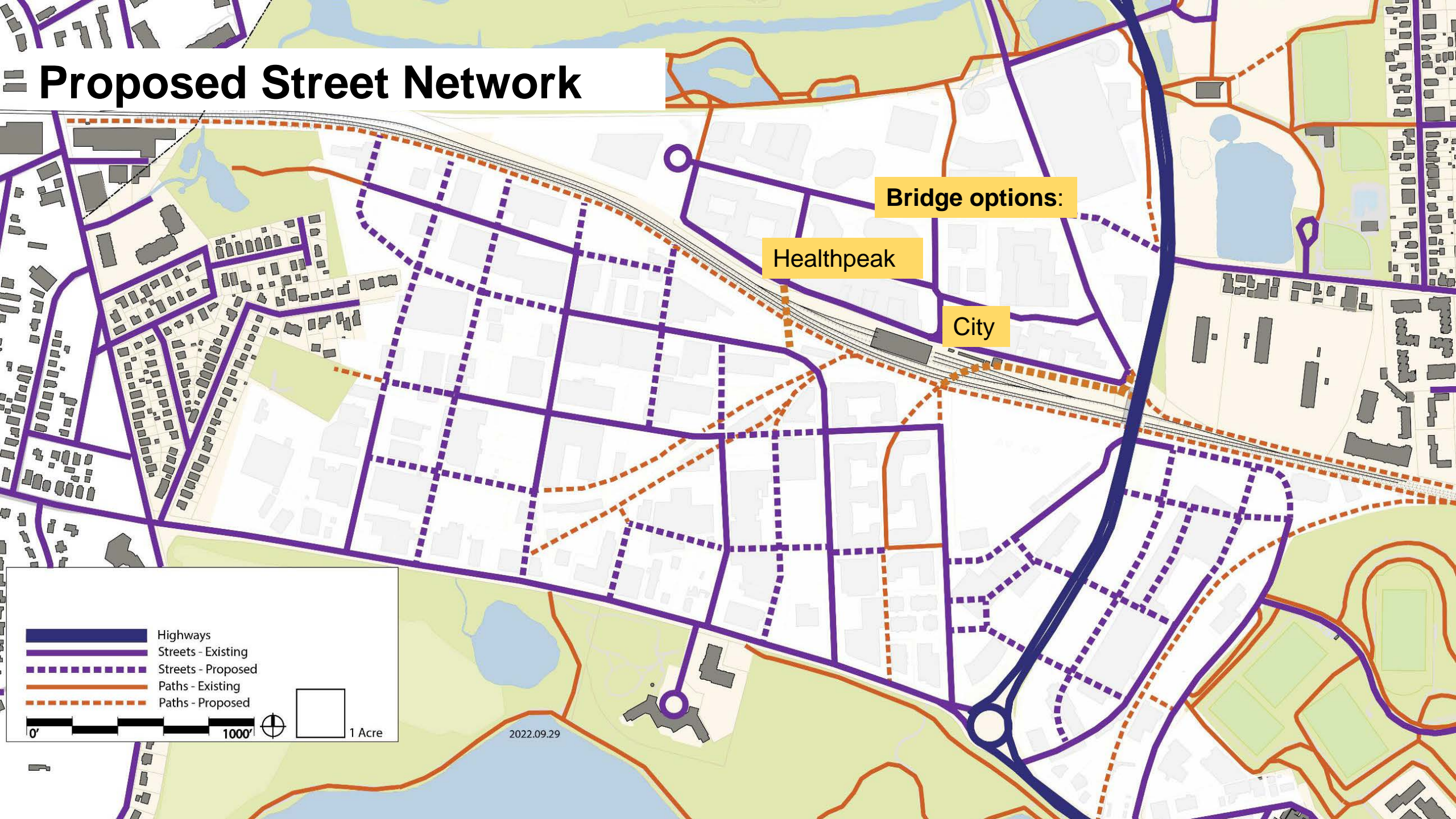
○ Residential

● Employee

Strategies

- New denser and connected street grid
- New multi-use paths
- Bike/ped bridge connecting Quad and Triangle
- Aggressive TDM measures
- Reduced parking ratios

Proposed Street Network



Bridge options:

Healthpeak

City

- Highways
- Streets - Existing
- Streets - Proposed
- Paths - Existing
- Paths - Proposed

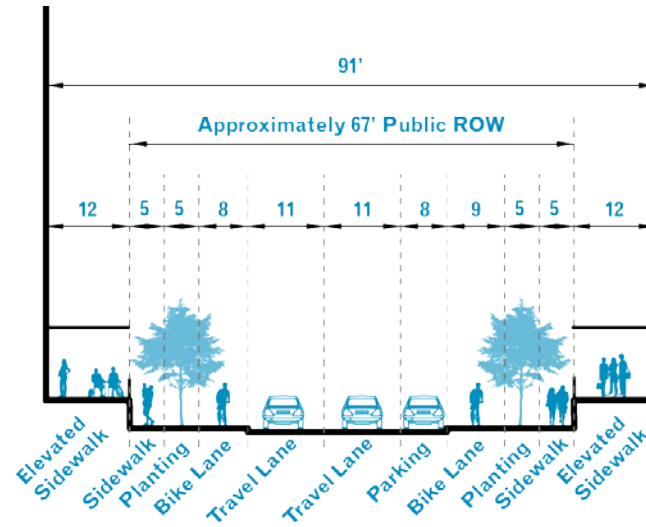
0' 1000'

1 Acre

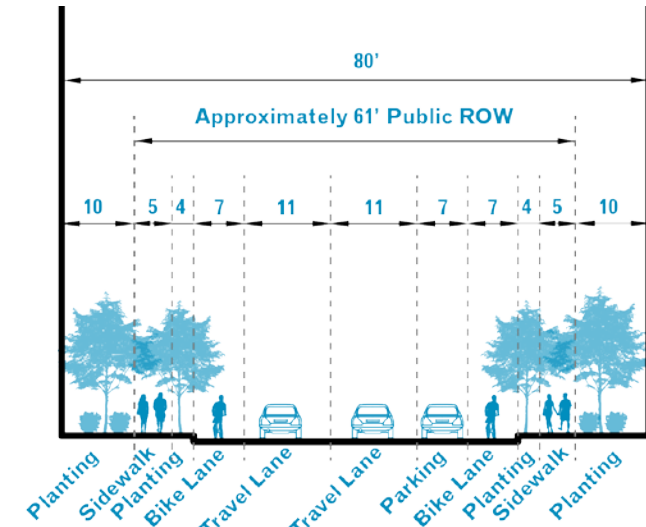
2022.09.29

Street cross sections

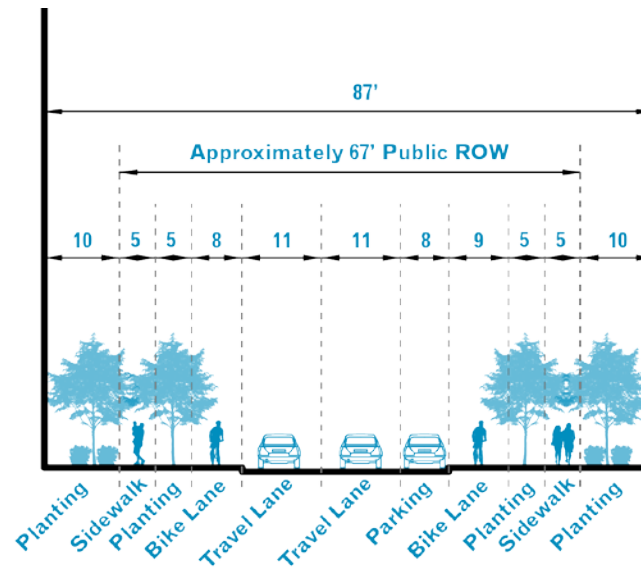
- Establish front build-to lines to create continuous streetwall
- Guide project review to ensure consistent urban form outcomes



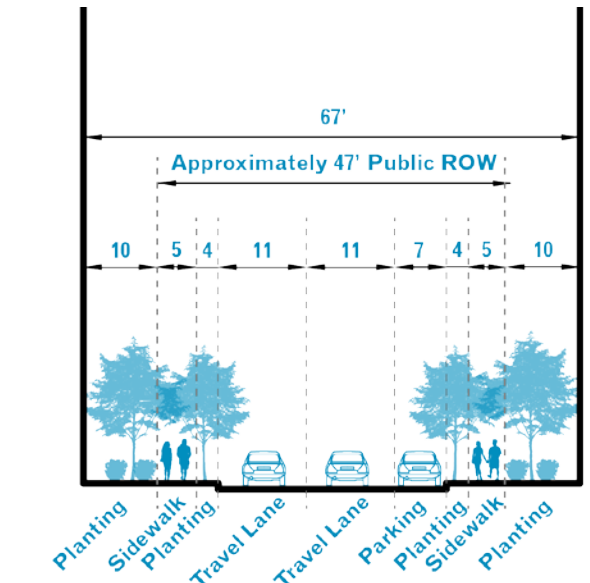
--- Elevated walkway with grade-separated bicycle lane



— Bicycle lane



--- Grade-separated bicycle lane



--- Shared lane pavement marking

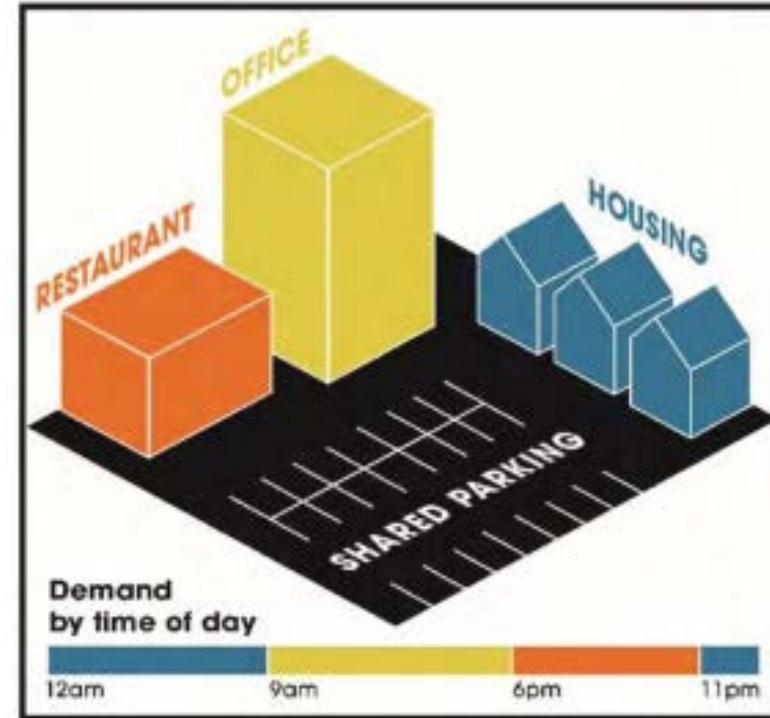
Zoning Strategies

- Alewife has a higher proportion of single-occupancy vehicle commuting than the rest of Cambridge. Goal of planning to reduce SOV trips by reducing/eliminating parking minimums, except for residential development and establish low parking maximums. Must be balanced by creating infrastructure for other modes – walking, biking, transit.
- There is currently a zoning petition under review which would eliminate off-street parking minimums for all uses, including residential.

Maximum Number of Parking Spaces	
Retail	maximum 1.5 per 1,000 SF
Office	maximum 1.1 per 1,000 SF
R&D	maximum 0.8 per 1,000 SF
Industrial	maximum 0.5 per 1,000 SF
Residential	maximum 0.75 per dwelling unit minimum .25 per dwelling unit

Zoning Strategies

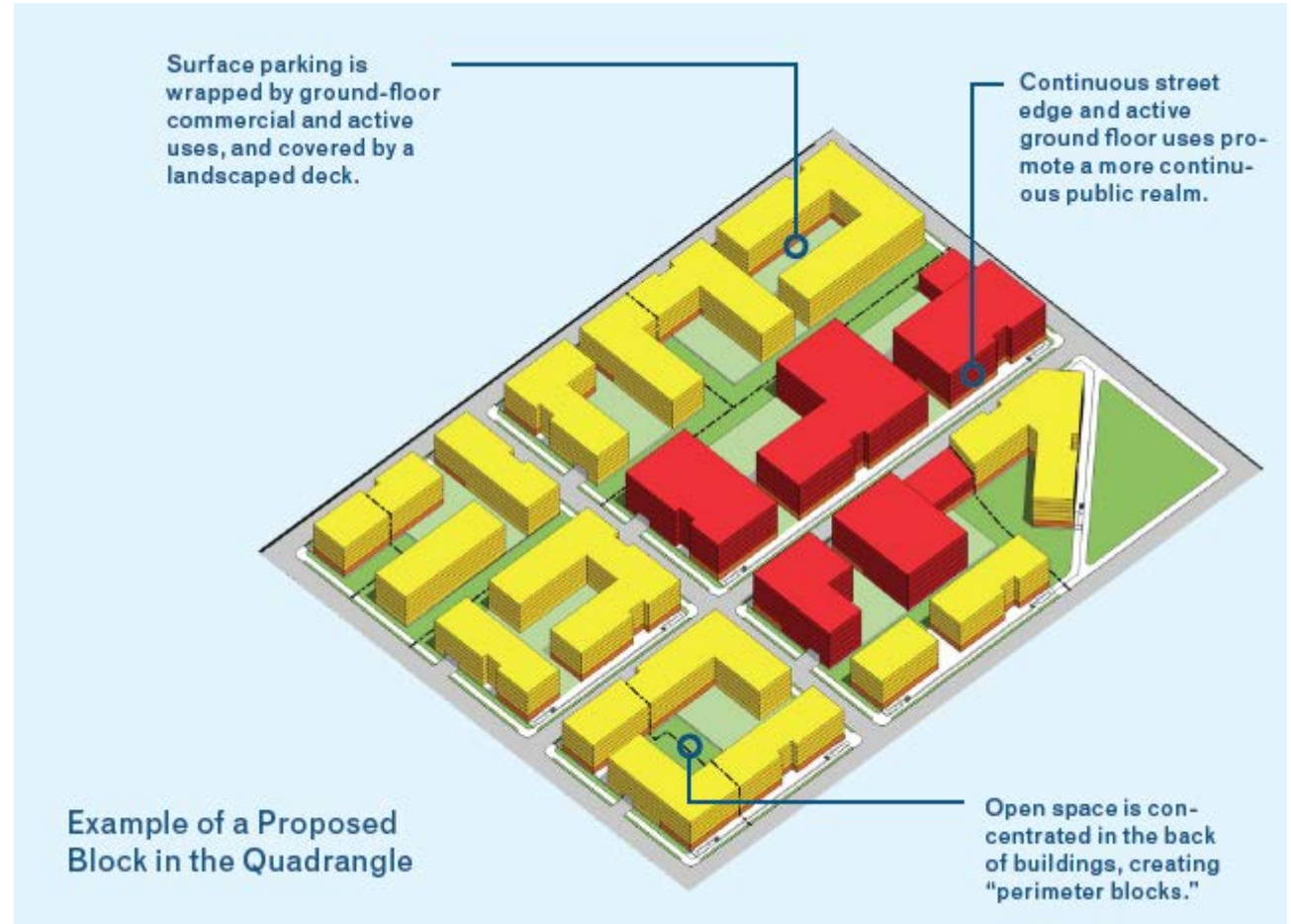
- Enhanced Transportation Demand Management (TDM) Measures
- Allow Pooled/Shared parking
 - Encourage via special permit criteria
- Create transportation improvement fund for the District (\$5/sf for commercial development) or contribute in-kind



Shared parking allows privately owned parking spaces to serve different uses as demand peaks throughout the day.

Zoning Strategies

- Internalize surface parking (wrapped by ground-floor commercial and active uses) so that it is hidden from view from streets and open spaces.
- Locate parking below first occupiable floor, or cover with landscape deck.



Zoning Strategies

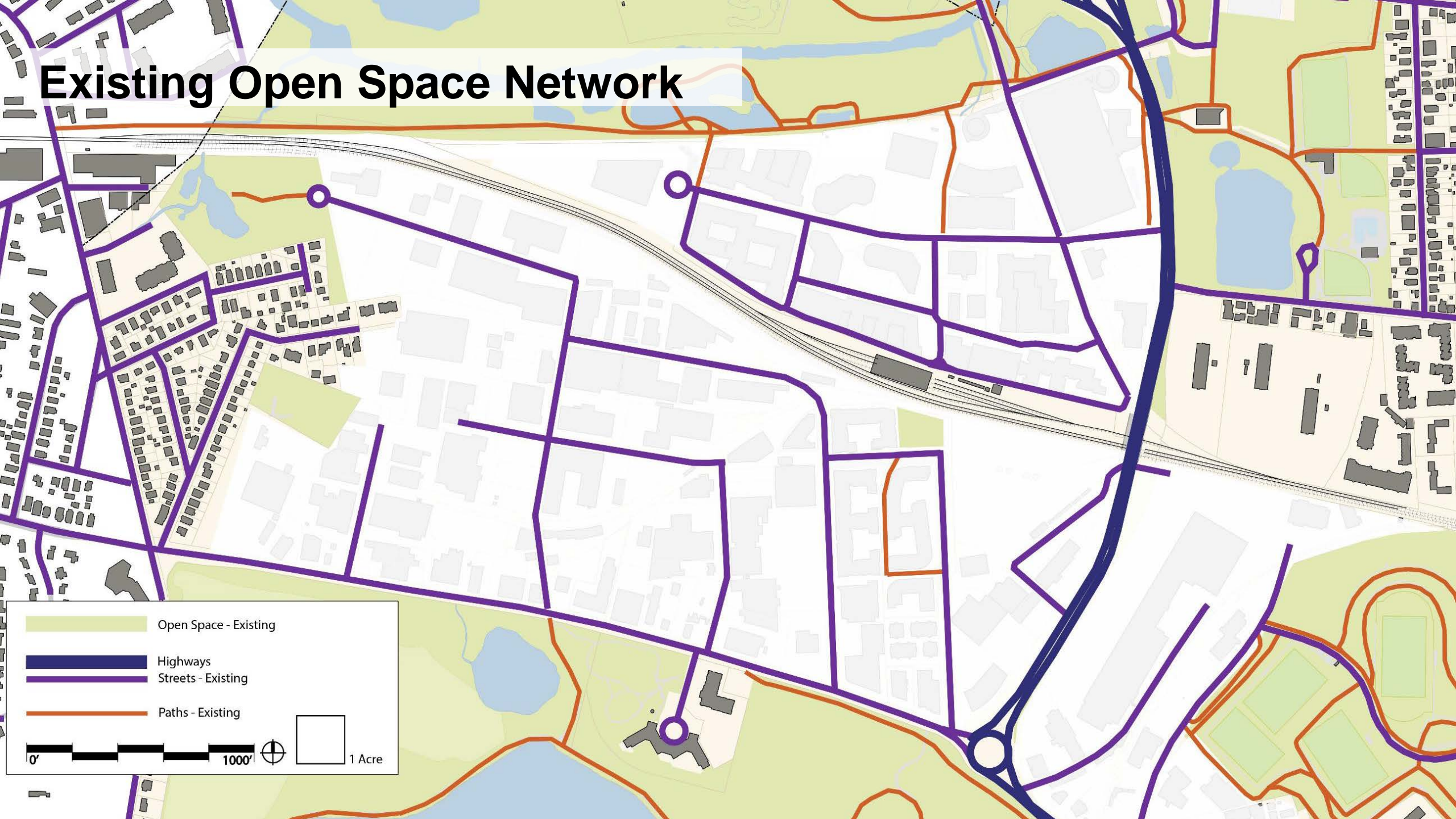
- Preserve/enhance existing density bonus for construction of a publicly-accessible pedestrian bridge connection between the Triangle and the Quad
- Preserve/enhance existing density bonus for Public Improvements (construction of roadway segments, pedestrian paths, public parks, or other open space/recreation features)
- Existing bonus = +0.25 Floor Area Ratio (FAR)



Open Space



Existing Open Space Network



Open Space - Existing

Highways

Streets - Existing

Paths - Existing

0' 1000'

1 Acre

Open Space Needs Assessment - Park Types

Citywide Parks (1/2 mi)



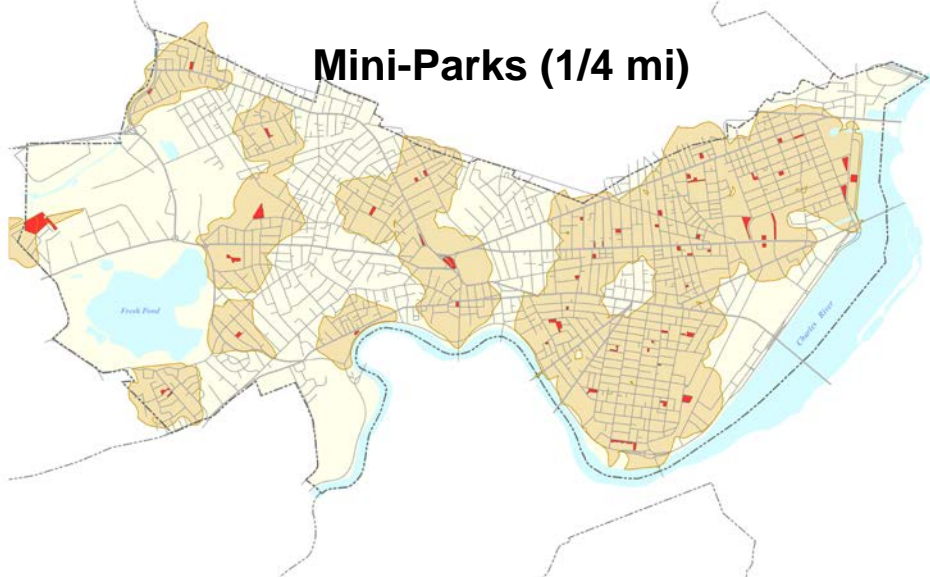
Community Recreation Parks (1/2 mi)



Neighborhood Parks (1/2 mi)



Mini-Parks (1/4 mi)



Neighborhood Parks (1/2 mi)

- Multiple types of park uses, of scale to host neighborhood events like movie nights, but not league sports
- Rafferty Park has relatively low connectivity to rest of area



Mini-Parks (1/4 mi)

- Smaller-scale spaces like tot lots, passive areas, community gardens
- Smaller service area reflects more local nature of these spaces



Strategies

- Improve access to existing open spaces
- Provide more diversity in types of open spaces
 - Large neighborhood park
 - Multiple mini parks
- Design open space for resilience benefits (stormwater retention, shade)



Landscape with bioswale to capture stormwater



Microforest, Alewife Linear Park



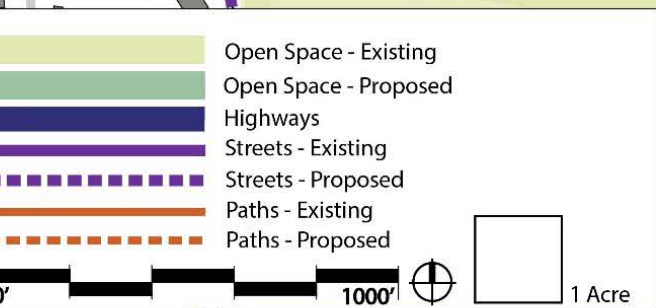
Triangle Park



- 1 acre of dense urban forest plantings
- Located in neighborhood with lowest tree canopy
- 400 new trees, 15 species
- In construction

Proposed Open Space Network

Large (1-acre)
neighborhood
park in Quad



2022.09.29

Zoning Strategies

- Increase minimum open space to lot area (%) from 15% to 20%.
- Maintain 25% minimum permeable area requirement and pooled open space option.
- “Promote” more private and public open space – incentives?
 - Contiguous open space, additional publicly-beneficial open space
 - Designated public space use
 - Defined types of open spaces
- Incentivize accessible green roofs
- Retain density bonus for land conveyed to the City for public use.



Roof garden is a green roof and an accessible public space

Climate Resilience



Climate Change: Shifting Risks

Extreme Heat



Days over 90°F to triple by 2030. By 2070, there could be more than 2 months in a year over 90°F.

Extreme Rain



Flooding from rain more frequent and more severe

Coastal Flooding



Sea level rise and larger storm surge in Boston Harbor will overtop and flank the Mystic and Charles River dams causing increased coastal flooding

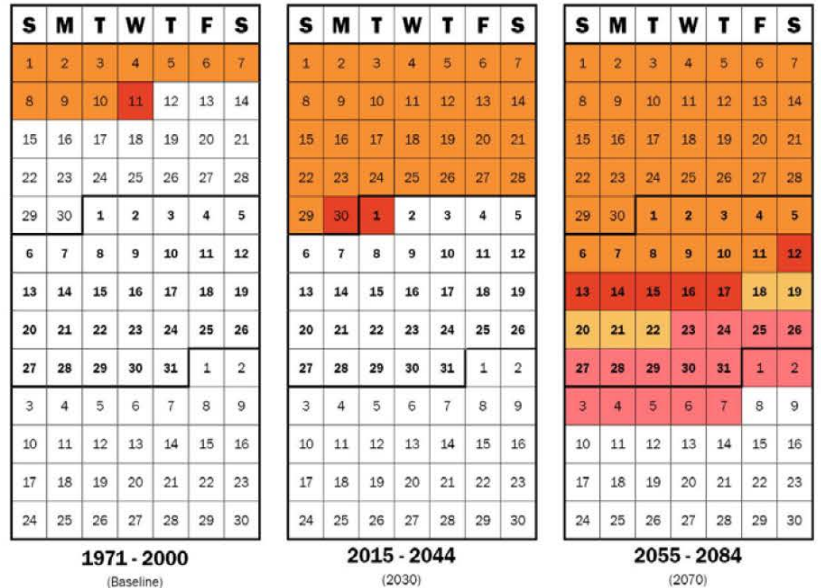
Approach to climate change preparedness & resilience

Reduce Risk Prepare for Unavoidable Risks

- Reduce urban heat islands
- Increase flood storage & conveyance
- Install storm surge barriers
- Elevate structures

- Be transparent and open about risks, share data
- Plan for extremes and new normals
- Coordinate planning initiatives
- Engage stakeholders & community
- Develop strategies for people, buildings, infrastructure, and ecosystem
- Implement at different scales
- Coordinate and engage regionally

Increasing Heat



■ Above 90°F - Low Scenario
 ■ Above 90°F - High Scenario
 ■ Above 100°F - Low Scenario
 ■ High 100°F - High Scenario

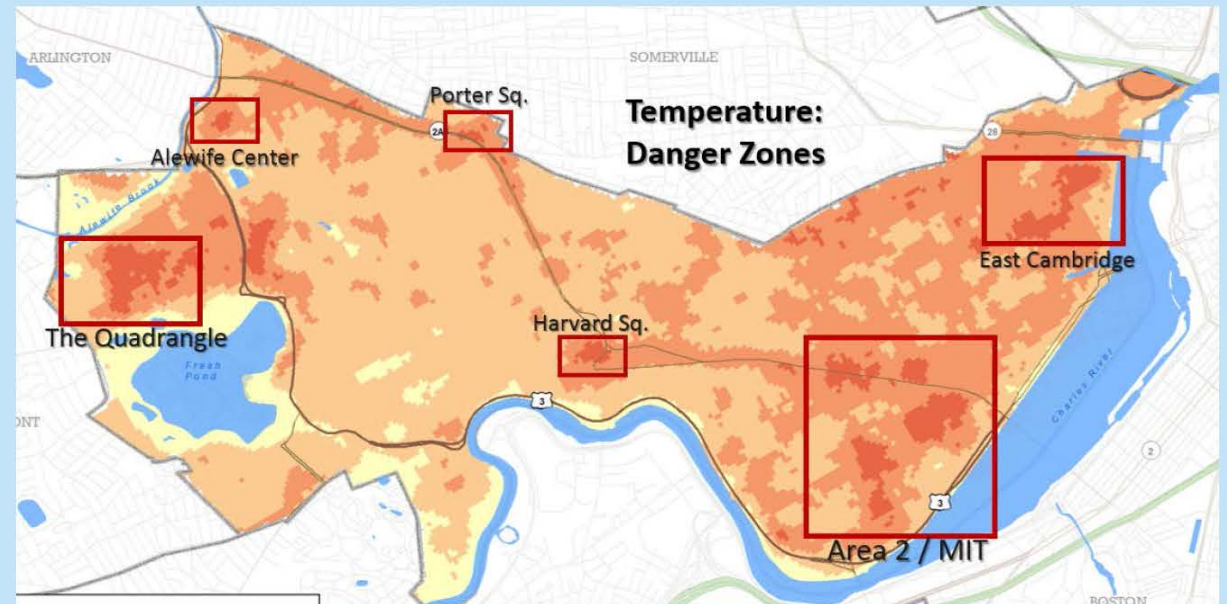
*Summer is considered to be the 91 days of June through August

By 2030, the number of days above 90° F could triple

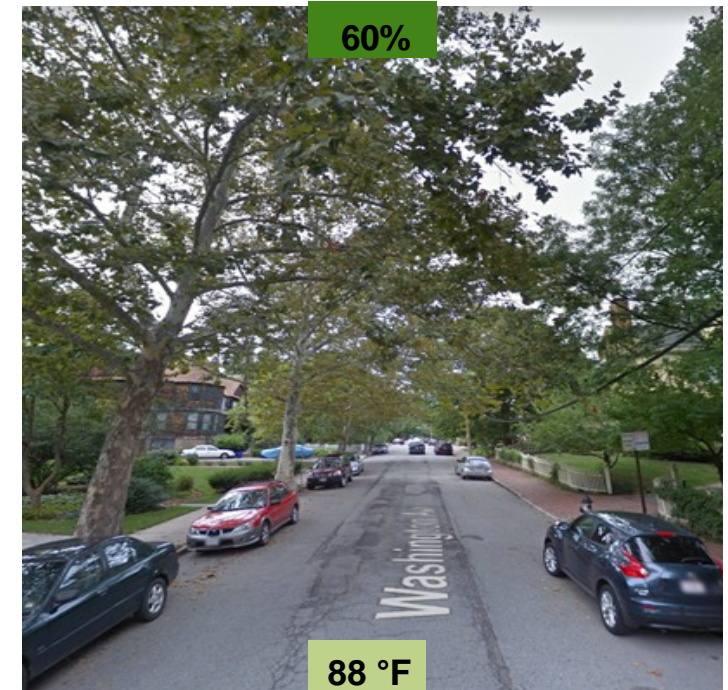
- Stress on human health
- Stress on infrastructure

Urban Heat Island Effect Magnifies Ambient Temperature

- Darker impervious surfaces – pavement & roofs -- absorb heat
- Areas with large amounts of impervious surface and lacking tree canopy tend to be heat islands

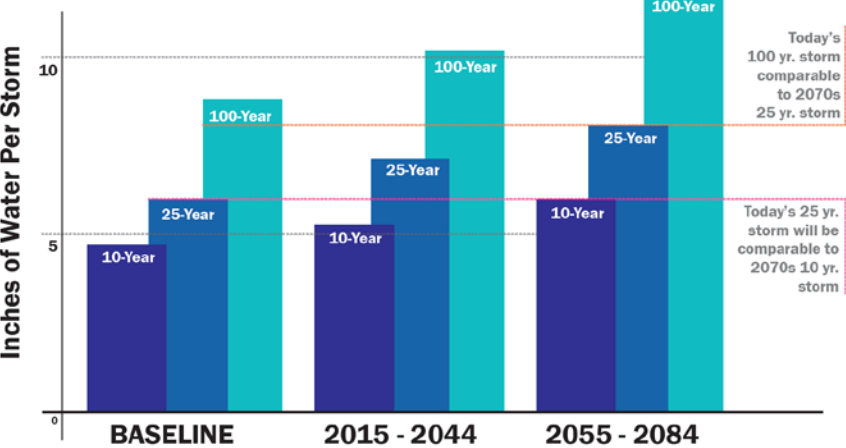


Warm Averages, Higher Temps, More Heat Waves

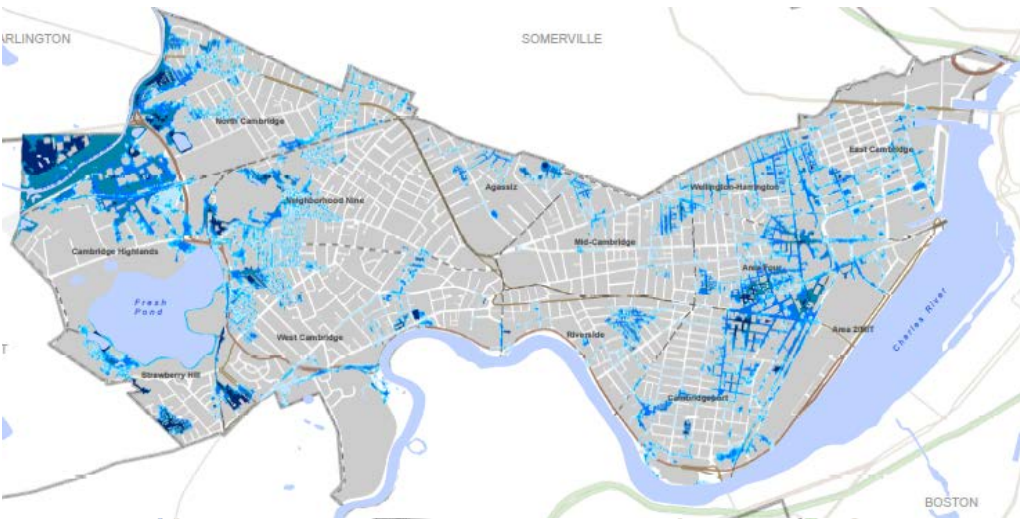


The images above show the cooling impact on a 90-degree day relative to streetscape. As the tree canopy increases, the “feels like” temperature decreases.

Increasing Precipitation

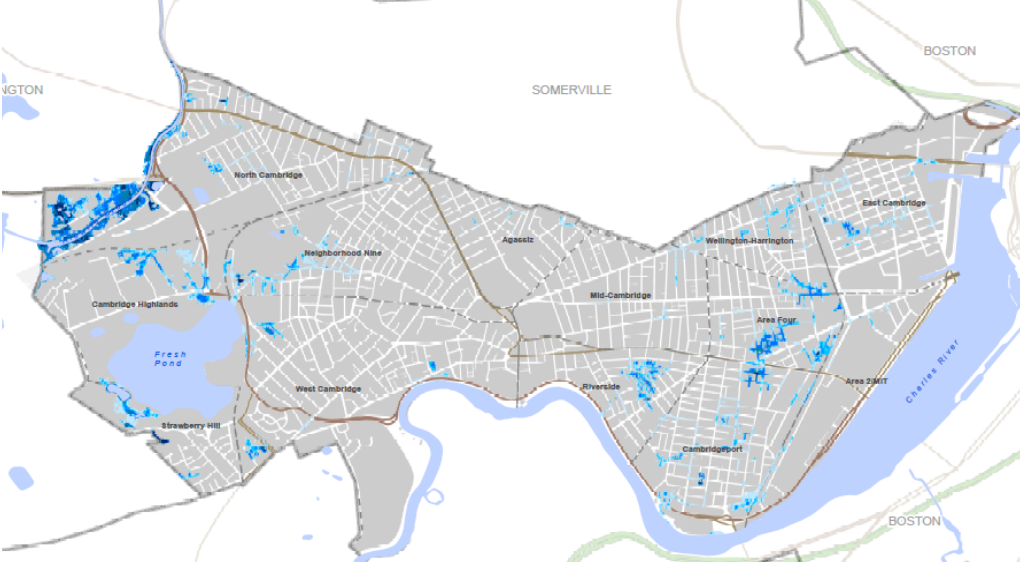


(per 24 hr. event)



1% probability in 2070

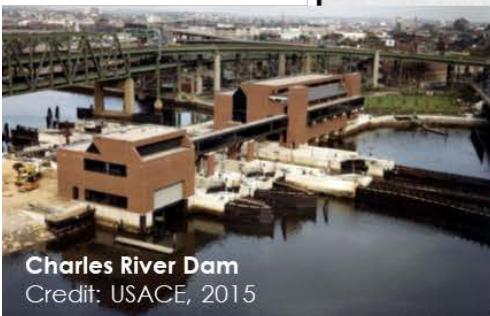
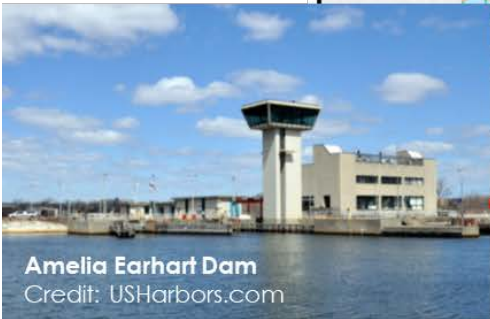
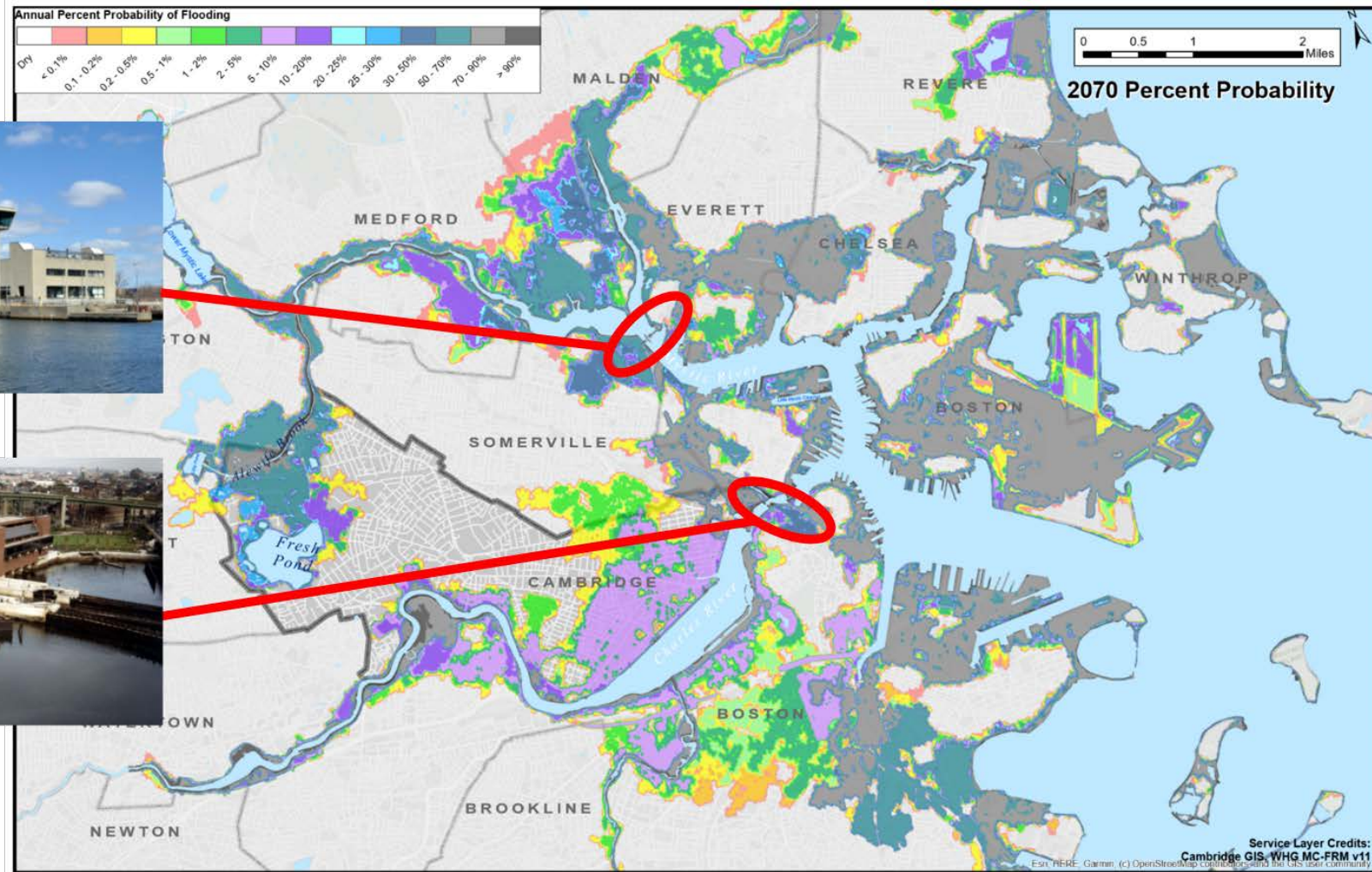
(per 24 hr. event)



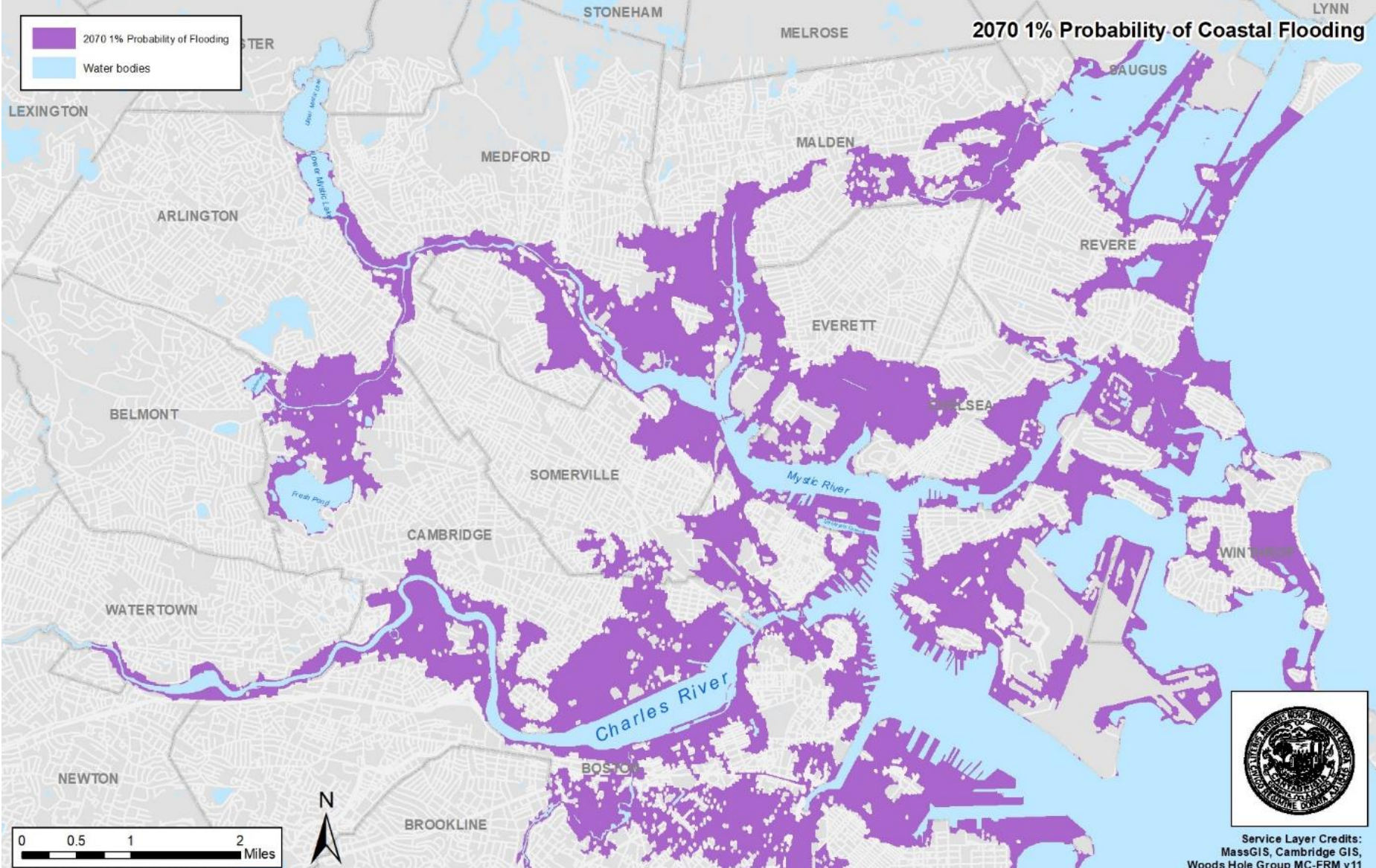
10% probability in 2070

(Source: Kleinfelder based on ATMOS projections November 2015)

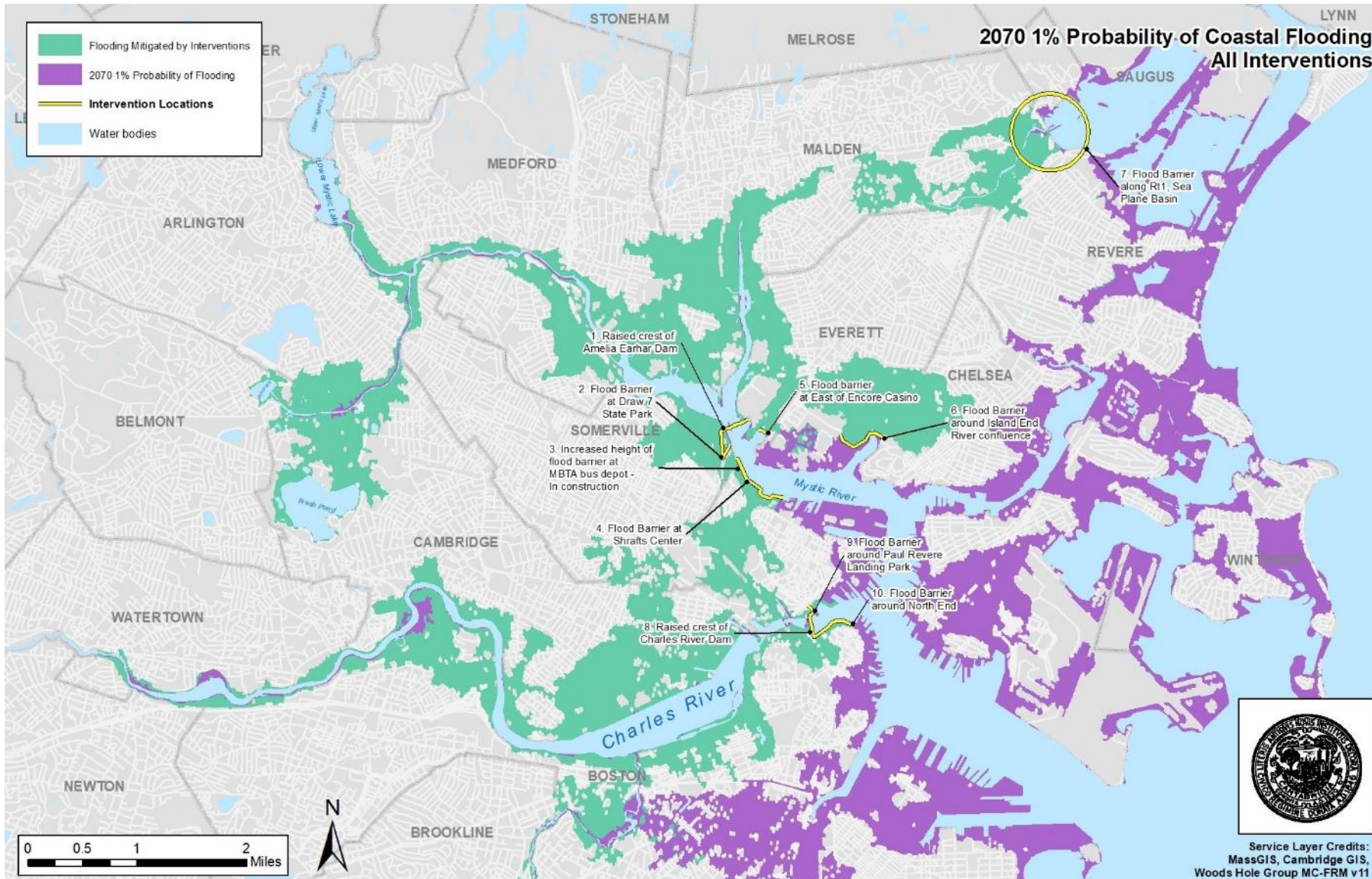
Increasing Coastal Flooding – Sea Level Rise / Storm Surge



Area Flooded by 1% Coastal Storm in 2070



Area Flooded by a 1% Coastal Storm in 2070 with 10 Regional Interventions



Just notified of award of \$750,000 FEMA Planning Grant!!

For a 2070 1% coastal storm

- 10 Targeted Interventions
- 12 Communities
- 108,000 Residents
- \$60B of Real Estate Value

City-led Strategies

- Dense vegetation and tree canopy on city-owned land (parking lots, parks)
- Bioswales / rain gardens
- Underground infiltration systems
- Stormwater storage
- Continued combined sewer separation



Stormwater infiltration system installed under new Toomey Park in East Cambridge.



Rain garden / bioswale on Fresh Pond Parkway at Larch Rd.

Alewife Stormwater Wetland



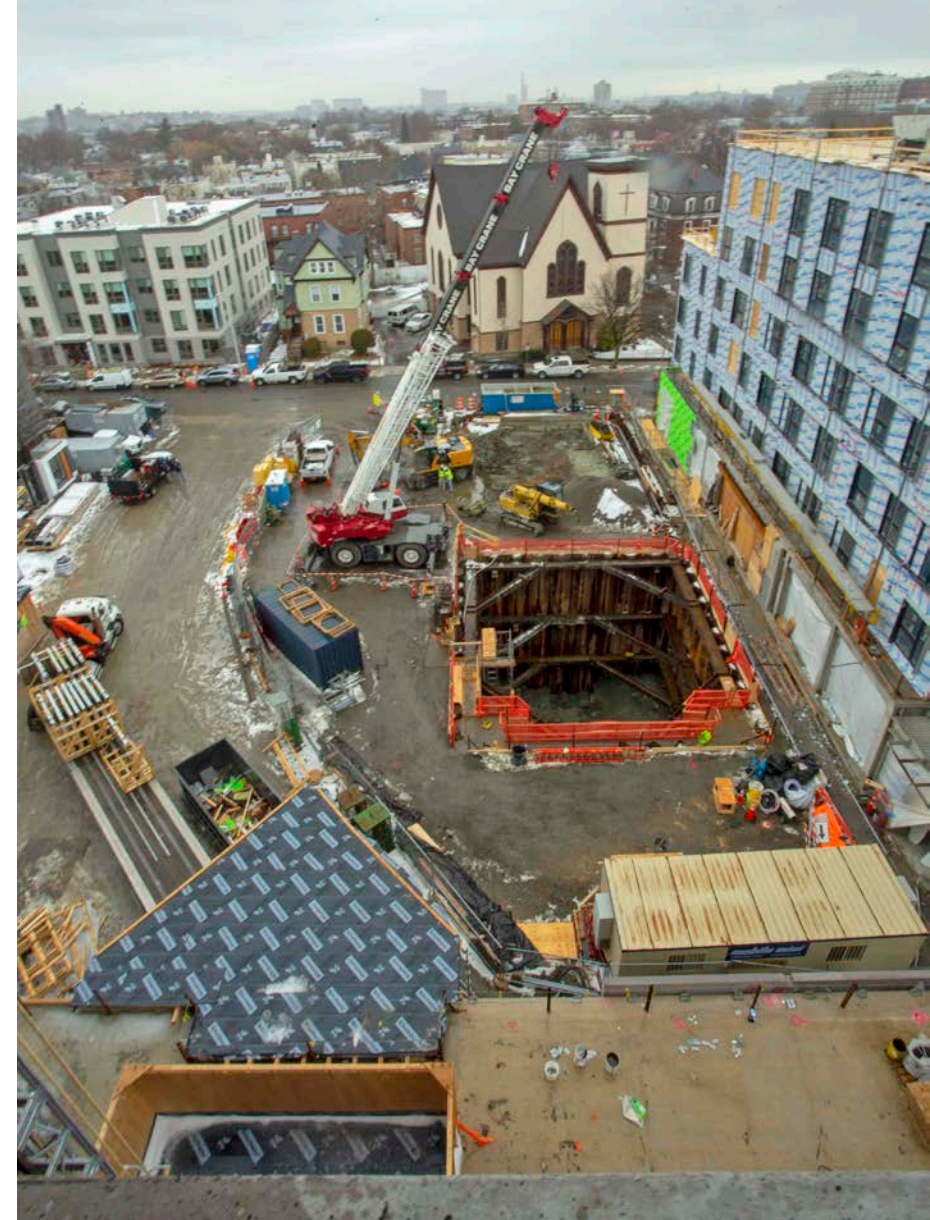
Constructed wetland in North Cambridge

- 3.4 acre constructed wetland
- Provides flood mitigation, enhanced water quality and wildlife habitat, and public access to green space
- Support the sewer separation in the 211-acre Huron and Concord neighborhood.
- Closed CSO outfall, reconstructed over 55,000 LF of sewer and storm drains. Completed in 2015, over \$200M.

Stormwater Storage

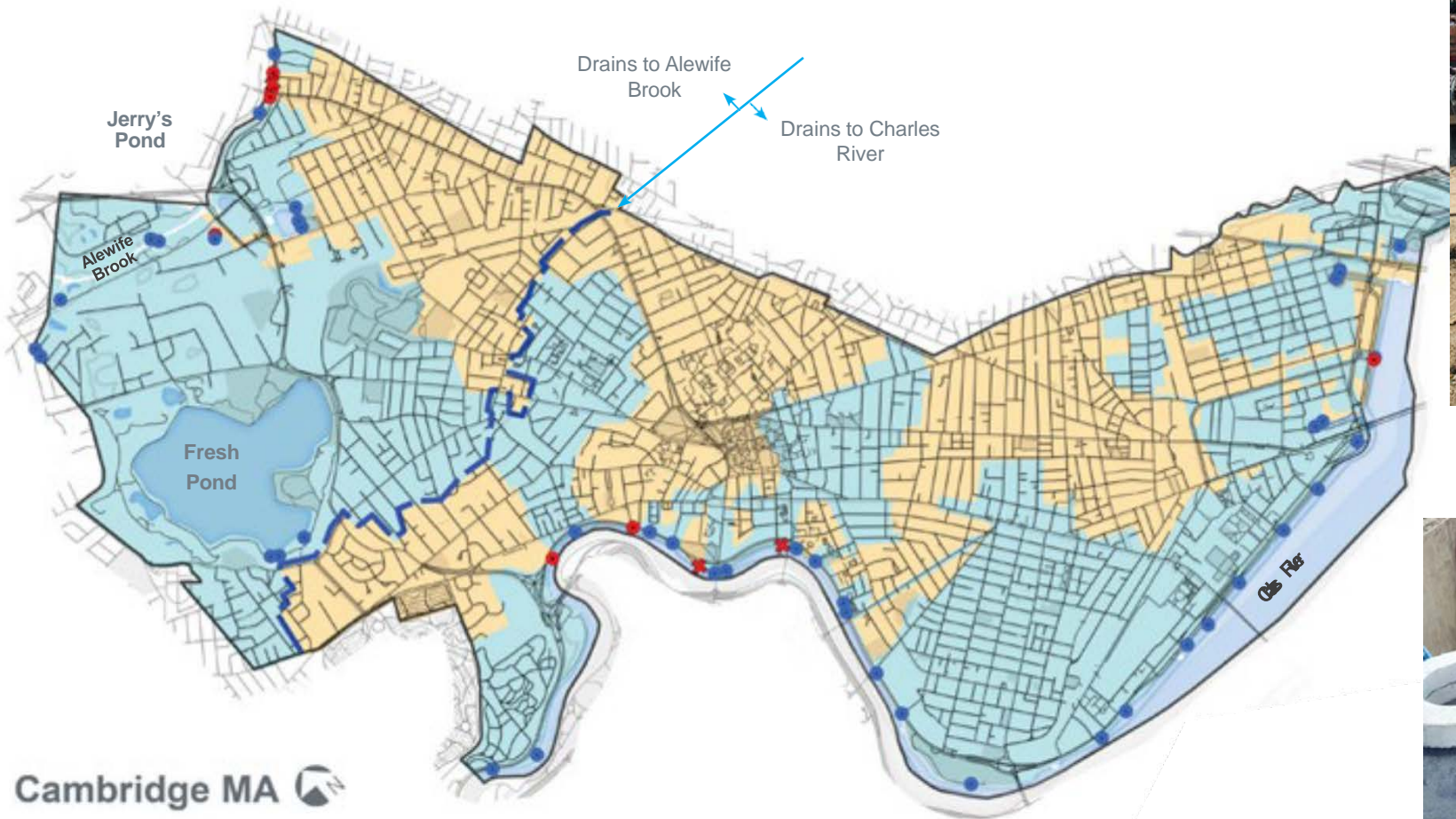


Tobin Project – under construction
1 million gallon underground stormwater storage tank and bioswales



480,000-gallon stormwater tank under public parking lot in Central Square

Sewer Separation



Combined Sewers

Combined
(55% of the City)

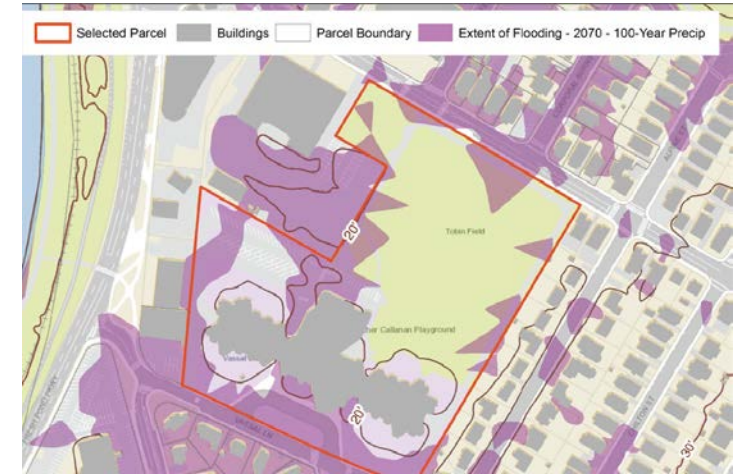
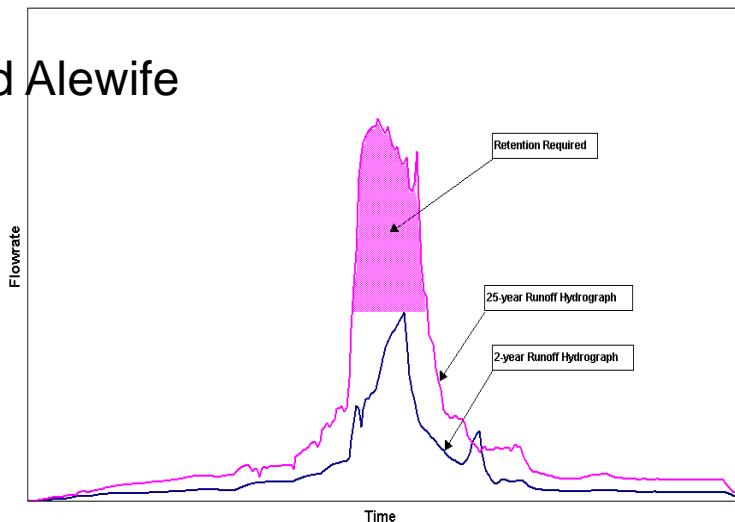


Separated
(45% of the City)



Regulatory Requirements

- Tree protection ordinance
- Stormwater and Sewer Regulations
- Combination of green and grey infrastructure.
- 25:2 Requirement. Post-development discharge hydrograph for the 25-year event \leq to the 2-year rainfall event pre-development. Stored or recharge difference on site. Using 2070 rainfall projections.
- Water quality improvements – TSS and phosphorus.
- Sewer flows over 15,000 gallons per day must be offset 4:1.
- Sewer Holding tanks in Kendall Sq and Alewife areas; 8-hour volume.



Address: 197 Vassal Ln
Map-Lot: 260-80



(Elevations in ft-CCB¹) **Flood Elevation Data**

Minimum Ground Elevation:	16.9
Maximum Ground Elevation:	28.6
2070 100-Year SLR/SS Flooding:	22.5
2070 100-Year Precipitation Flooding:	24.1
2070 10-Year SLR/SS Flooding:	22.1
2070 10-Year Precipitation Flooding:	22.6
2030 100-Year Precipitation Flooding:	23.9
2030 10-Year Precipitation Flooding:	22.2
Present Day 100-Year Precipitation Flooding:	23.5
Present Day 10-Year Precipitation Flooding:	21.9

FEMA 100-year Flood Elevation:	N/A
FEMA 500-year Flood Elevation:	22.4



The Flood Viewer has been developed as an informational tool for the Cambridge community to assess climate change threats from flooding and to prepare for it by implementing specific strategies.

Use this tool to help understand the risk of flooding to your property and how to protect against it.

Learn more at:
CambridgeMA.gov/FloodViewer

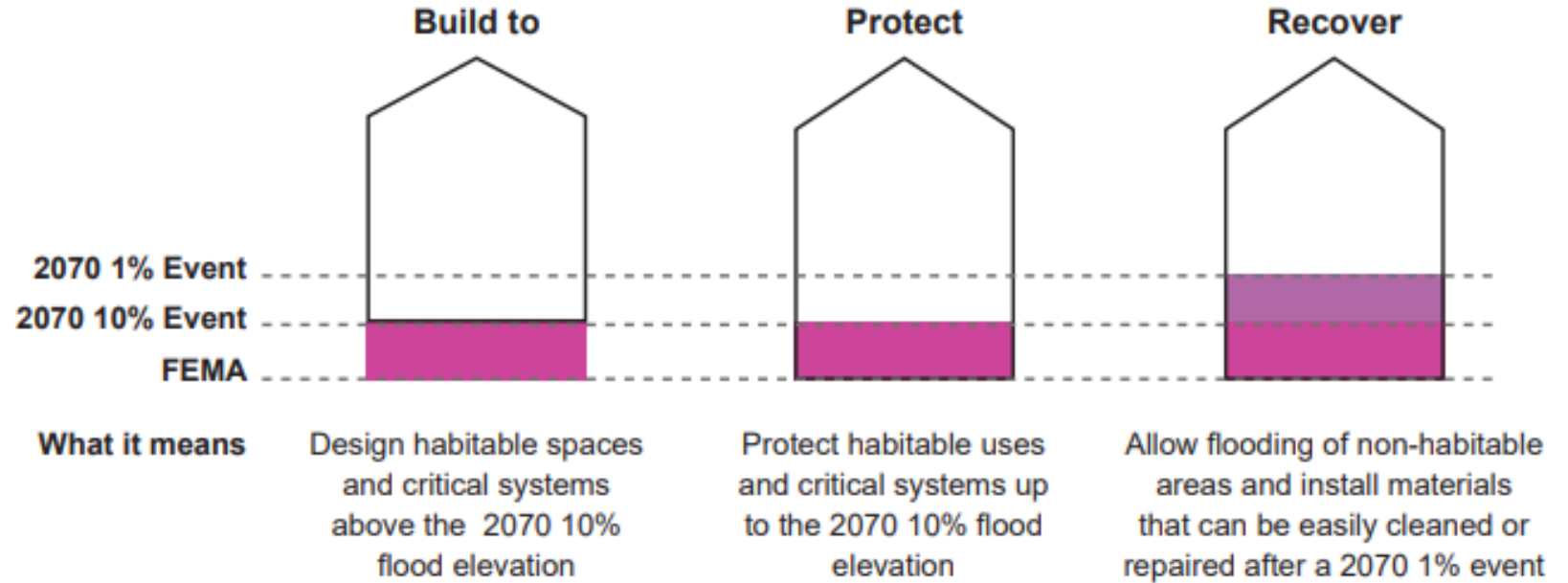
Zoning Strategies

- Require green or white roofs
- Require high albedo parking decks, pavements, and other surfaces (white roofs or canopy over mechanical equipment)
- Plant street trees every 20-30' where feasible
- Encourage solar roofs and green or white facades
- Green roofs ordinance

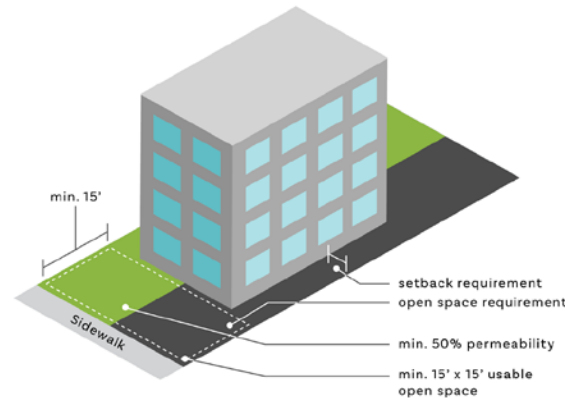


Zoning Strategies

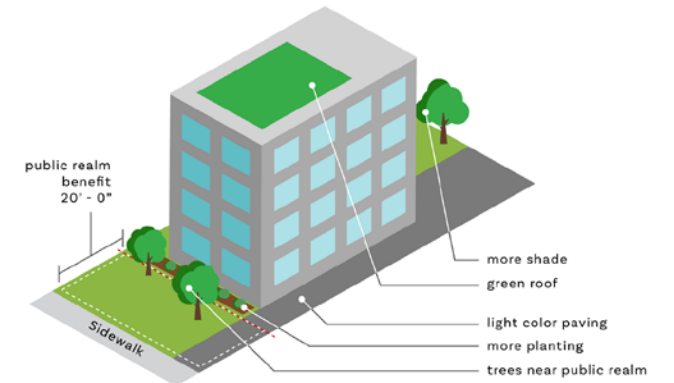
- Citywide standards applied to flood resilience
 - Build/protect to the 2070 10-year flood elevation and recover from 2070 100-year flood. Require all building utilities to be located above 2070 100-year flood.
- Green Building Requirements & Green Roofs
- Climate Resilience Zoning – Cool Factor



Traditional Zoning



Cool Factor



✓ Open Space
 ✓ Permeability
 +
 ✓ Shade
 ✓ Cool Surfaces
 ✓ Planting

Community Facilities



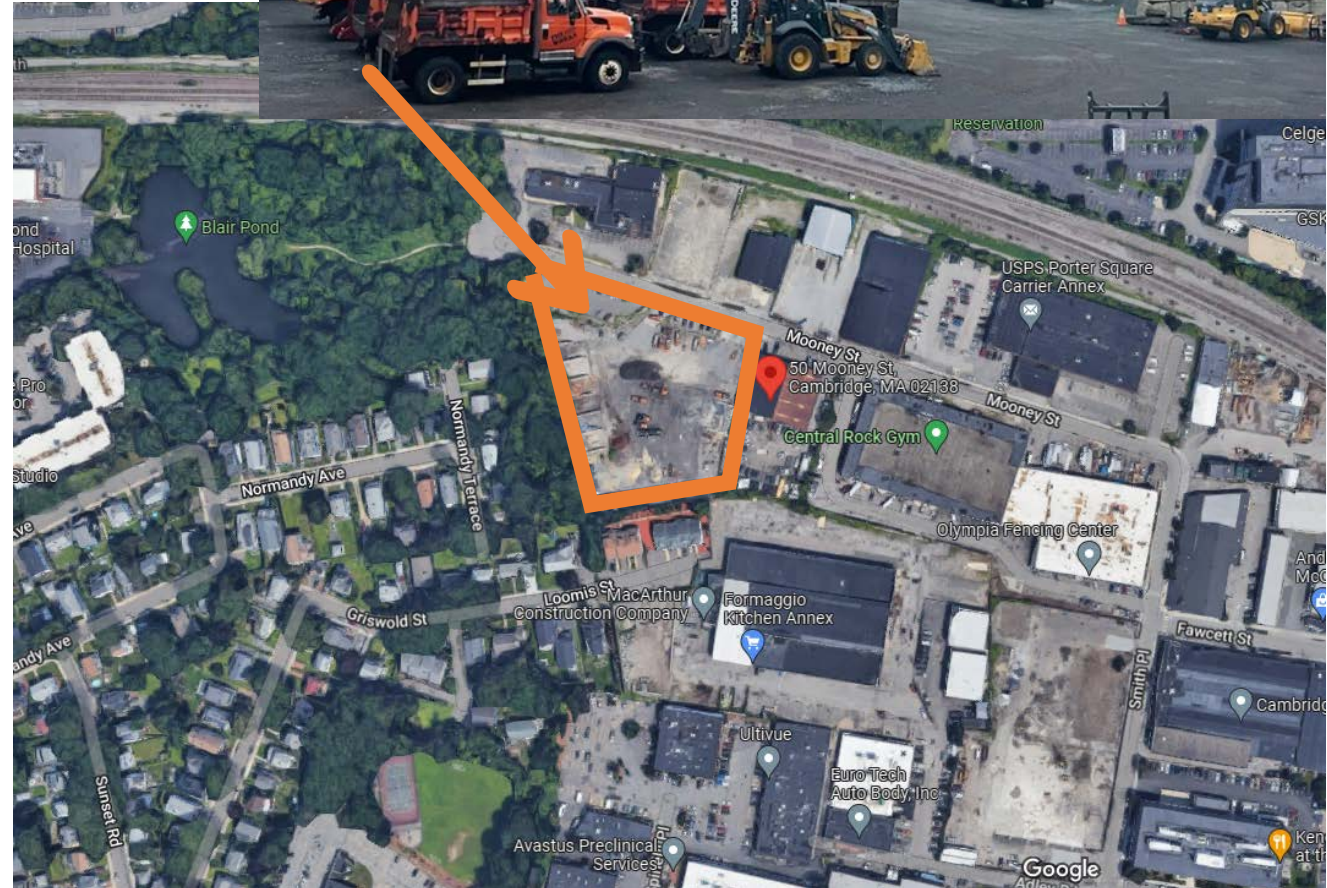
Community Facilities

- Community gathering space
- Library branch
- Schools
- Department of Public Works
- Parks
- Other?

Community Facilities

Department of Public Works

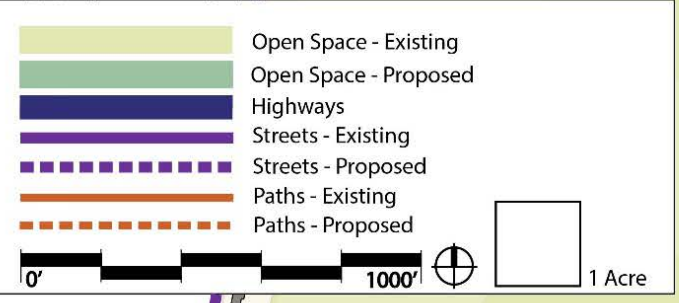
- **Very constrained** in operational space.
- Currently renting over 2-acres in the area for Streets, Parks and Buildings divisions (people, equipment and materials). Solid waste remains at 147 Hampshire St.
- 1 to 2 acres would help support our ability to provide high quality services in a safe manner.
- Space does not need to be contiguous.



Future community facilities

Current DPW

School, library, etc.

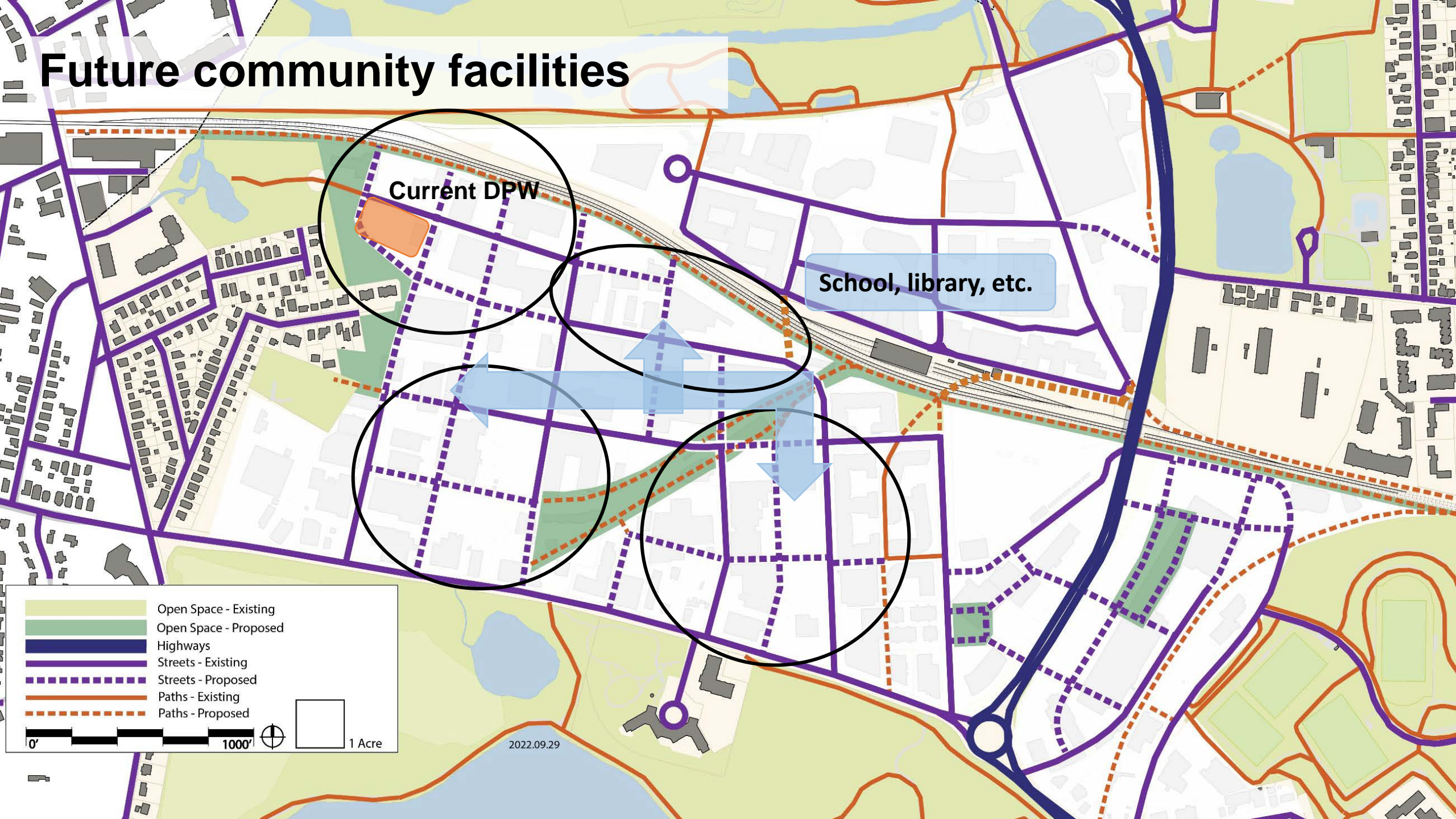


Legend:

- Open Space - Existing
- Open Space - Proposed
- Highways
- Streets - Existing
- Streets - Proposed
- Paths - Existing
- Paths - Proposed

Scale: 0' to 1000' (1 Acre)

North arrow and date: 2022.09.29



Strategies

- City capital planning process
- Leverage private development
 - Zoning incentives (e.g., “Community Benefits Bonus”)
 - Additional height/density
 - Prescribed list of benefits, subject to Planning Board approval
 - Benefits could include community gathering space, additional open space, infrastructure, preservation of industrial use, etc.

Discussion Questions

- What are the community's infrastructure priorities and needs for this area?
- How can we use zoning and other land use controls to achieve these priorities?
- Should development bonuses be increased to get additional public benefits?