

Cambridge Water Department Drainage & Community Gardens Project: Conceptual Design



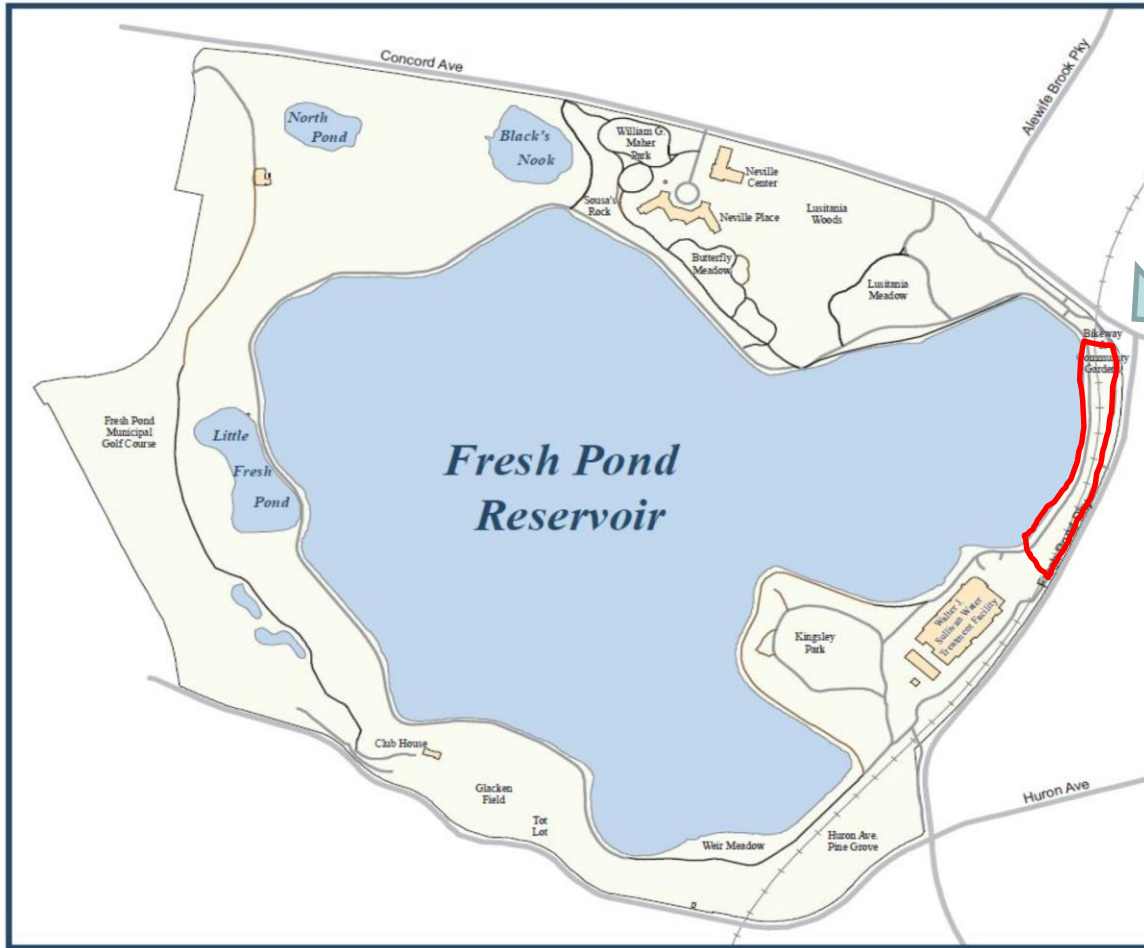
Kirsten Ryan & Brian Friedlich - Kleinfelder
Kaki Martin, ASLA – Klopfer Martin Design Group

Public Presentation, June 11, 2015

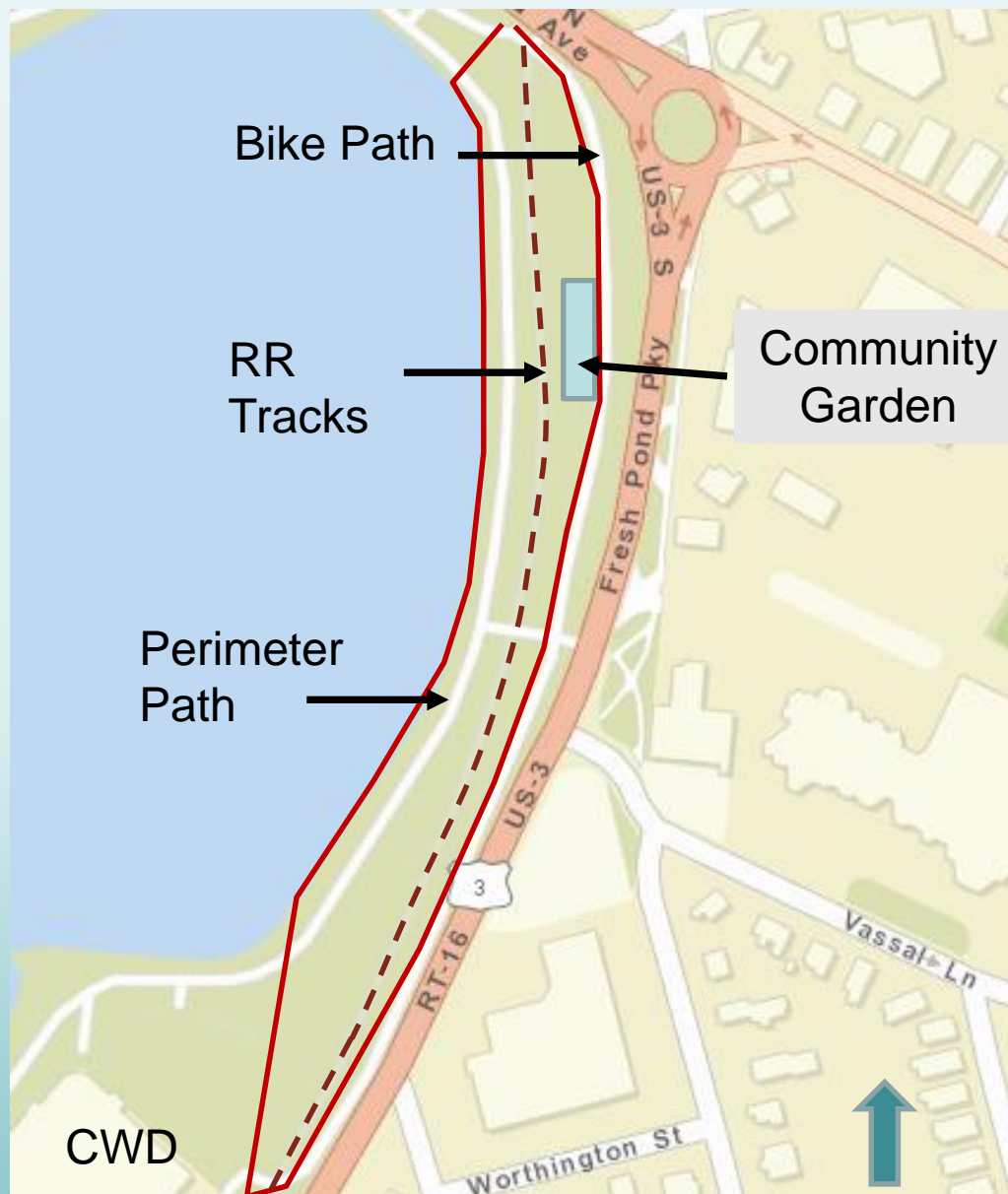
Agenda

- Introduction – David Kaplan, Cambridge Water Dept.
- Project Issues, Goals, & Design Approach – Kirsten Ryan
- Stormwater Design Alternatives – Brian Friedlich
- Community Gardens Design – Kaki Martin, KMDG
- Discussion & Next Steps
- Site Walk (Time / Weather permitting)

Project Location

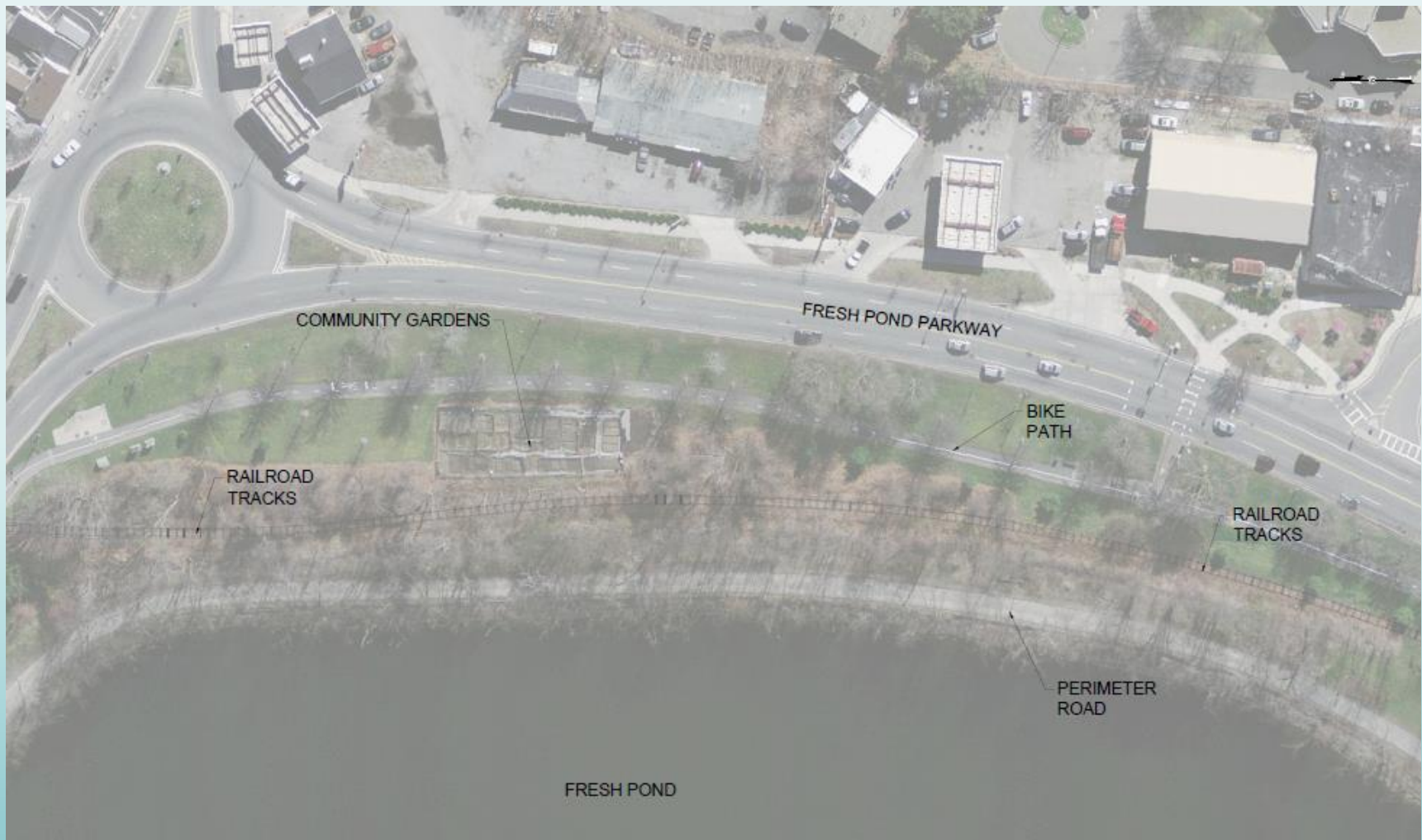


Project Extent



- East: MassDCR Bike Path
- West: Fresh Pond shoreline
- North: Concord Ave Rotary
- South: Water Department Parking Entrance
- Railroad tracks run through center of project area

Existing Conditions & Issues



Issue: water quality & drainage



Flooding and poor drainage causes untreated stormwater to flow to Fresh Pond; puddles, uneven pavement and winter icing safety hazards

Issue: old railroad corridor



**Cut through path – exposed & compacted soils;
not ADA compliant**



**Debris and invasive plants
in rail bed**

Issue: Community Garden



poor drainage, hard to access, poorly defined plots, not ADA compliant

Fresh Pond Master Plan Vision Statement:

“...protecting and enhancing both the water quality of the Fresh Pond Reservation and its open space and naturalistic character”

“....preservation of water quality, recreational open spaces, natural green spaces, wildlife habitat and a refuge from hectic urban life”



Project Consistency with Existing Plans:

Fresh Pond Master Plan – “Bikeway Corridor” Priorities

- Corridor naturalization
- Visual buffering
- Removal of invasive plants
- New plantings from Approved List
- Community Garden ADA compliance
- Pond visibility

Consistency with other recent FPR Projects:

- Perimeter Path drainage & safety improvements
- Added amenities (benches, jogging path)
- Improved / natural aesthetics
- Balance of user needs
- Universal accessibility

Drainage / Community Garden Project Goals:

1. Protect Fresh Pond water quality.
2. Re-purpose & improve former rail corridor.
3. Improve Perimeter Path drainage & safety.
4. Buffer Path users from Parkway noise.
5. Expand & improve Community Garden.
6. Make Garden accessible for all.
7. Create & restore habitat.

Project Constraints & Opportunities:

Constraint:

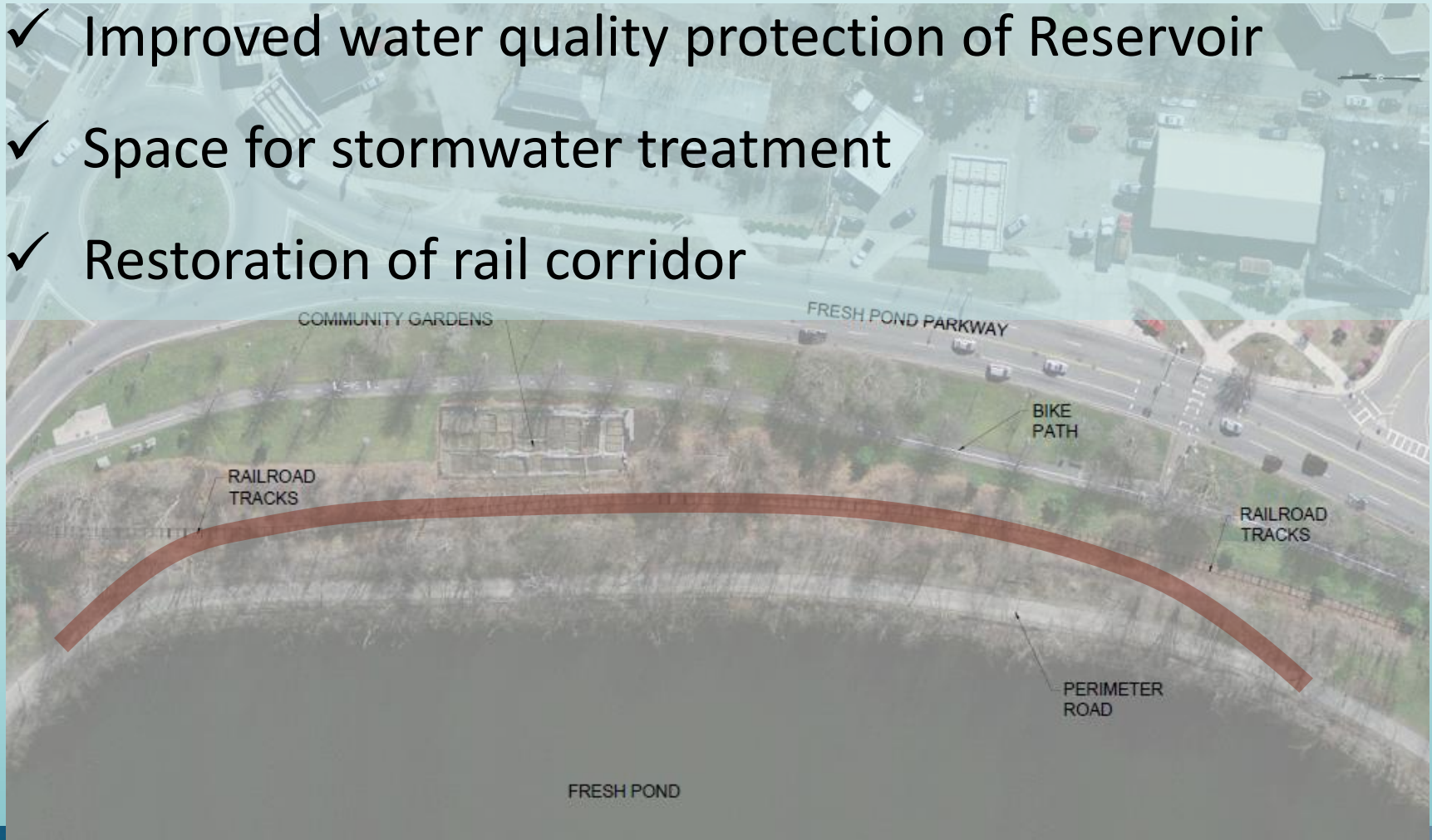
- Narrow, limited space for drainage improvements
- Repurposing rail corridor must follow Rail-to-Trail Best Practices

Opportunity:

- Moving limited portion of Perimeter Path to rail corridor caps part of rail bed and opens up space for stormwater treatment

“Rail to Trail” Path Relocation Benefits:

- ✓ Improved water quality protection of Reservoir
- ✓ Space for stormwater treatment
- ✓ Restoration of rail corridor



Design Approach Summary:

Challenge:

- Treat stormwater & create habitat
- Preserve vistas from new Path to Pond
- Provide buffer / screen between new Path and Parkway
- Garden remote; inaccessible

Potential Solution:

- Use green infrastructure bioswales
- Elevate new Path slightly to provide sightlines; use lower plantings
- Berms/ hummock features planted with native upland trees & shrubs for visual / sound barrier
- Relocate Garden more centrally; reconfigure for accessibility

Stormwater Management Overview

- Project and Design Goals
- Bioretention Concept
- 2 Alternative Designs
 - Bioswale on Fresh Pond Side of Relocated Perimeter Path
 - Bioretention Cells on Parkway Side of Relocated Perimeter Path
- Comparison of Alternatives

Project Stormwater Management Goals

- Fix existing drainage issues
- Mimic natural hydrology
- Improve water quality treatment of stormwater discharging to Fresh Pond
- Minimize discharges to City storm drains
- Use natural, “green” stormwater technologies that blend in with the landscape

What is Green Infrastructure?

- **Green infrastructure** uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up and storing water. (EPA)

Conventional vs. Green Infrastructure

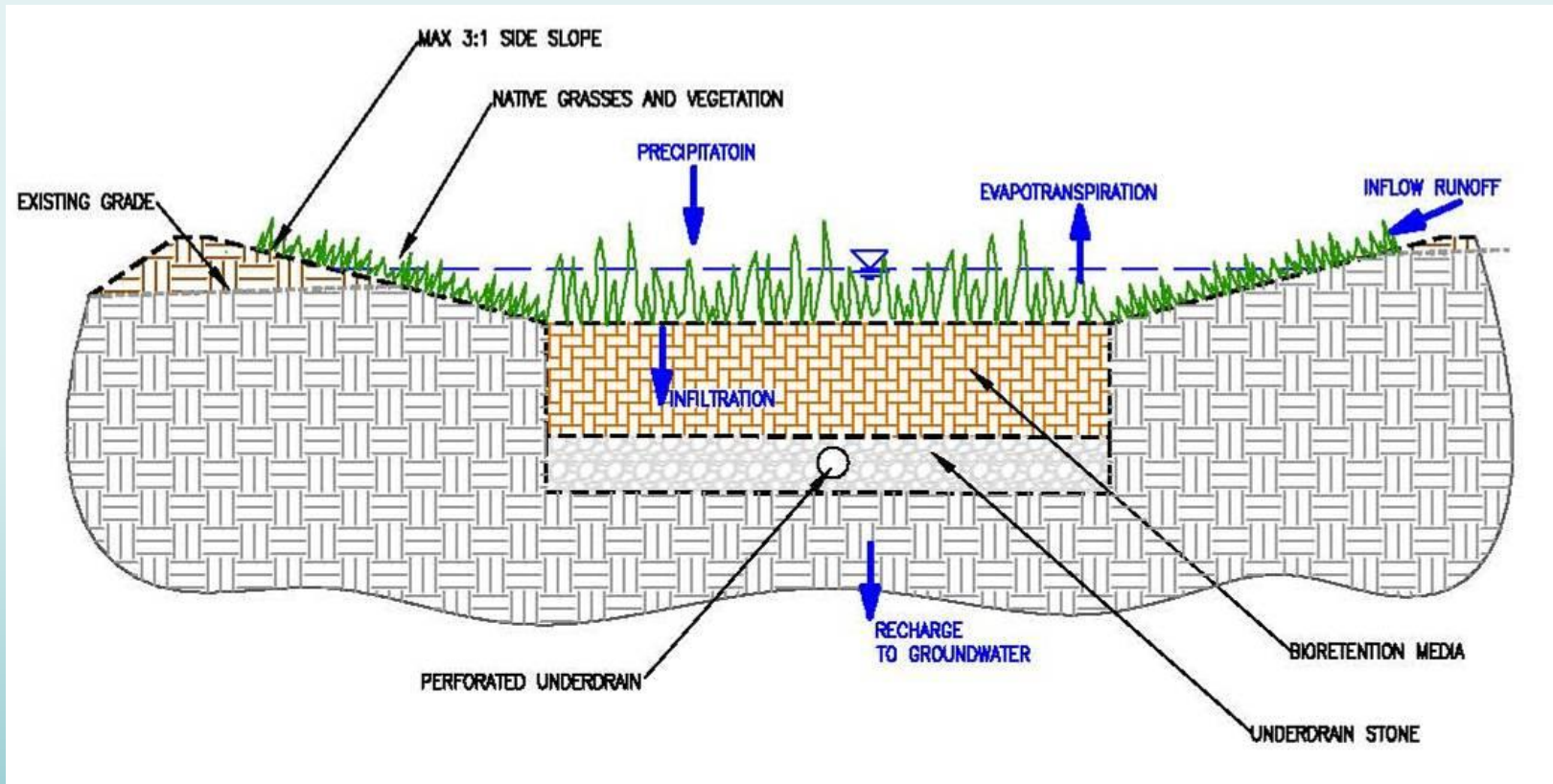


Conventional Concrete-Lined Channel



Bioretention Swale in “Green” Design

Bioretention Concept



Bioretention/Green Infrastructure Examples



Bioretention Vegetation

- Mix of Vegetation Acceptable
 - Tall Grasses
 - Shrubs
 - Herbaceous Species
 - Trees
- Native vegetation
- Diverse species
- Salt tolerant
- Flood adaptable



Bioretention Planting Examples



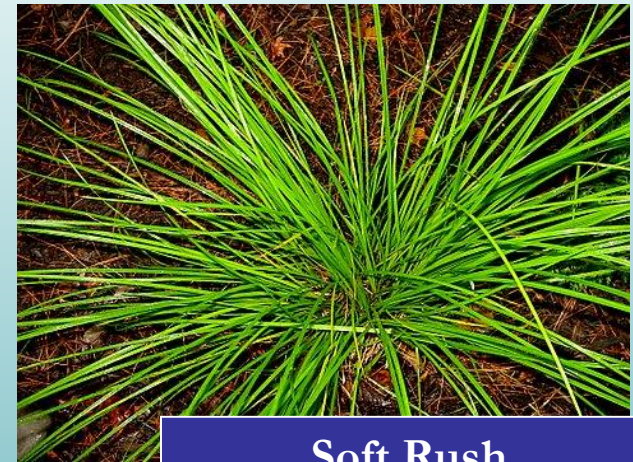
Swamp Milkweed



Cardinal
Flower

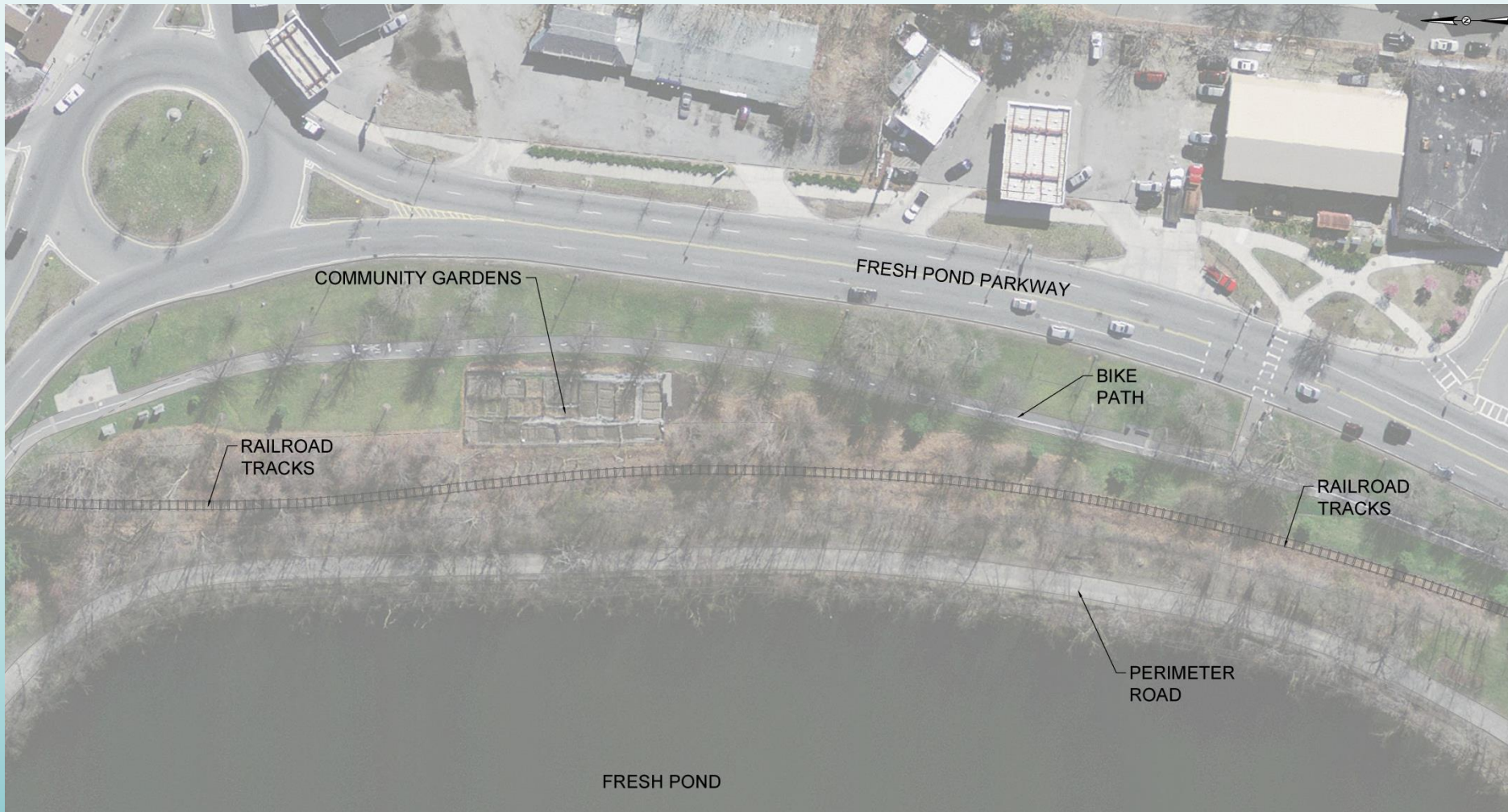


Blue Flag Iris

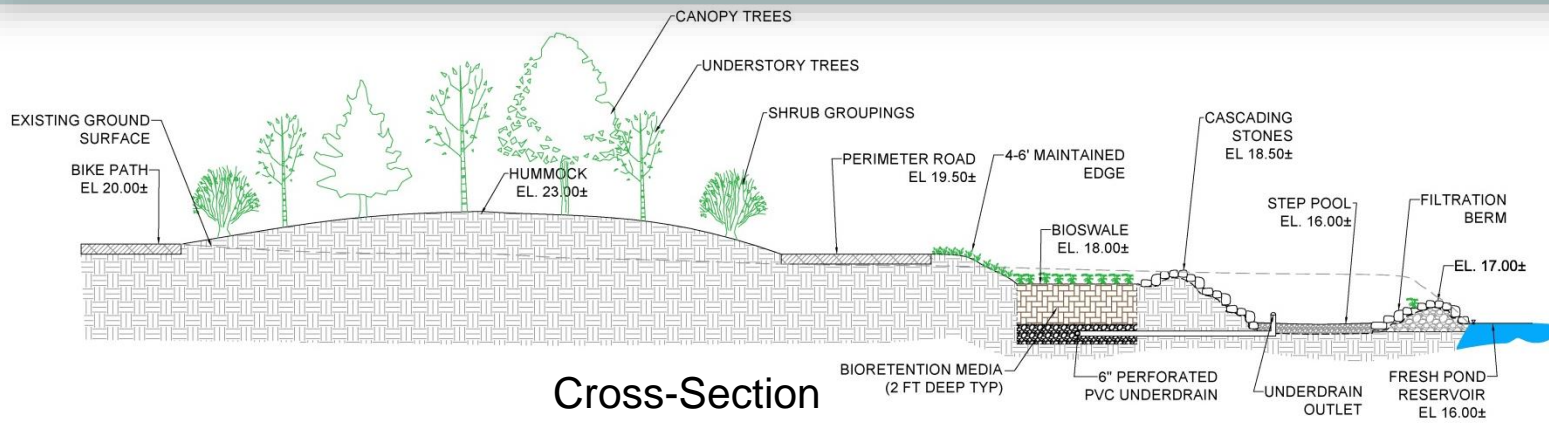
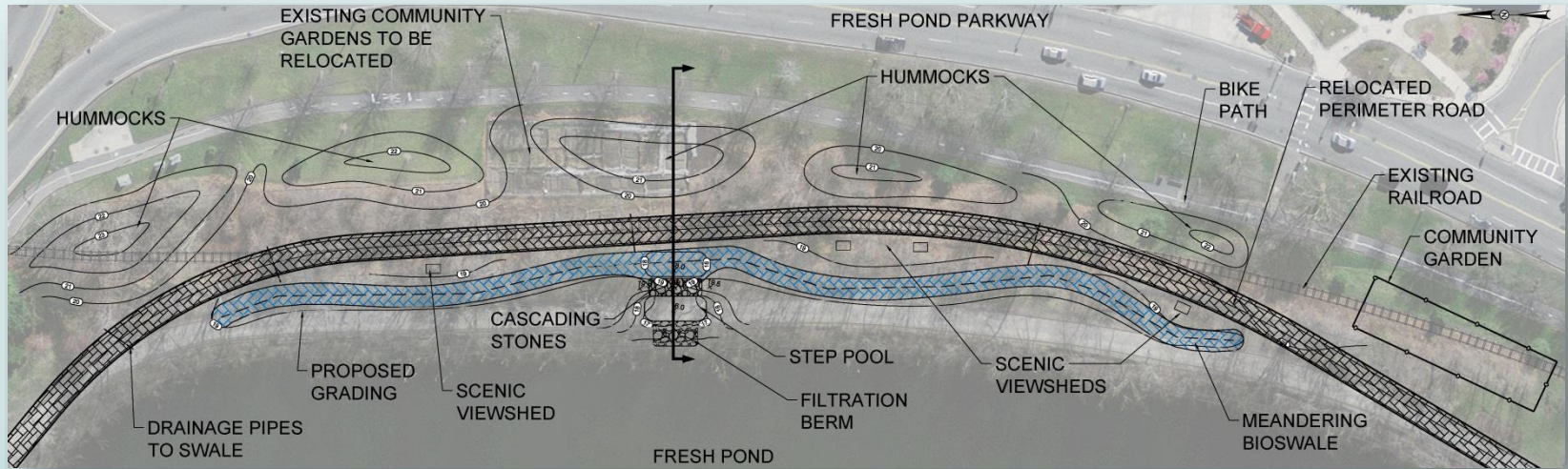


Soft Rush

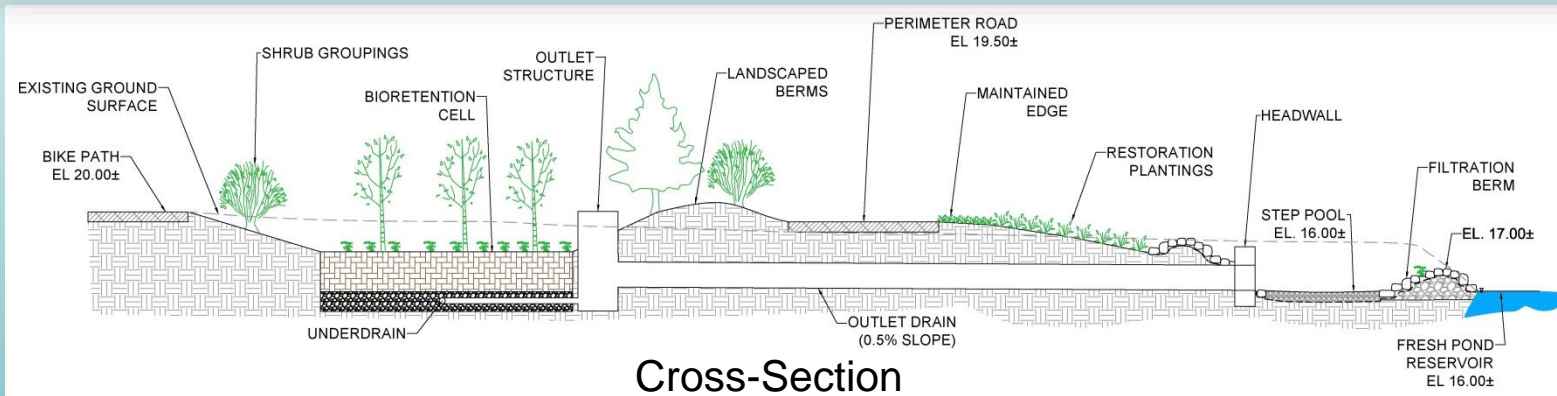
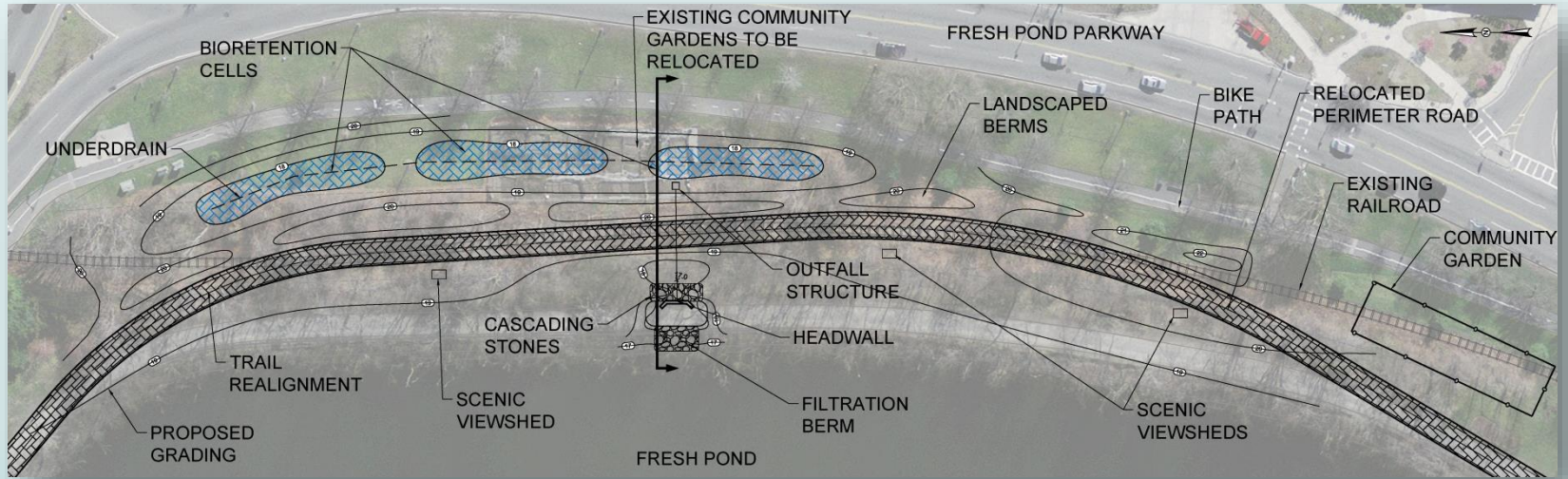
Existing Conditions



Alternative 1 – Bioswale on Fresh Pond Side of Relocated Perimeter Road



Alternative 2 – Bioretention Cells on Parkway Side of Relocated Perimeter Road



Conceptual Planting Lists

Bioretention		Upland	Riparian
Swamp Milkweed	Dense Blazingstar	Sugar Maple	Red Maple
New England Aster	Cardinal Flower	Sweet Birch	Swamp White Oak
New York Aster	Blue Lobelia	White Spruce	Black Tupelo
Lurid Sedge	Woolgrass	American Holly	Serviceberry
Tussock Sedge	Three-Square Bulrush	Pagoda Dogwood	Eastern Redbud
Fox Sedge		Washington Hawthorn	Tall-Fescue Seed Mix
White Turtlehead		Eastern Red Cedar	Native Riparian Seed Mix
Joe-Pye Weed		Sweet Pepperbush	
Boneset		Inkberry	
Soft Rush		Mountain Laurel	
Blue Flag Iris		Drooping Leucothoe	

Comparison of Alternatives - Stormwater

Project Goal	Alternative 1 – Bioswale on Fresh Pond Side of Perimeter Road	Alternative 2 – Bioretention Cells on Parkway Side of Perimeter Road
Water Quality Benefit	✓	✓
Improvement to RR corridor	✓	✓
Fix Drainage Issues	✓	✓
Create / restore habitat	✓	✓
“Green” Decentralized Treatment	✓ +	✓
Visual, Physical and Sound Barrier	✓ +	✓ -
Sightlines to Fresh Pond	✓ +	✓
Natural Aesthetics	✓ +	✓
Low Maintenance	✓ +	✓

Community Garden Design

Kaki Martin, ASLA Klopfer Martin Design Group

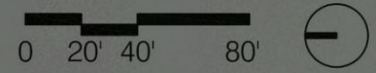
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2. Re-purpose & improve former rail corridor.
3. Improve Perimeter Path drainage & safety.
4. Buffer Path users from Parkway noise.
5. **Expand & improve Community Garden.**
6. **Make Garden accessible for all.**
7. Create & restore habitat.



Existing Garden

Proposed Garden

Community Garden Context Plan



FRESH POND PARKWAY

HUBWAY STATION
15 DOCKS

BIKEWAY PATH

BULLETIN BOARD
BENCH

COMPOST AREA

WOODLAND PLANTING

GARDEN FENCE

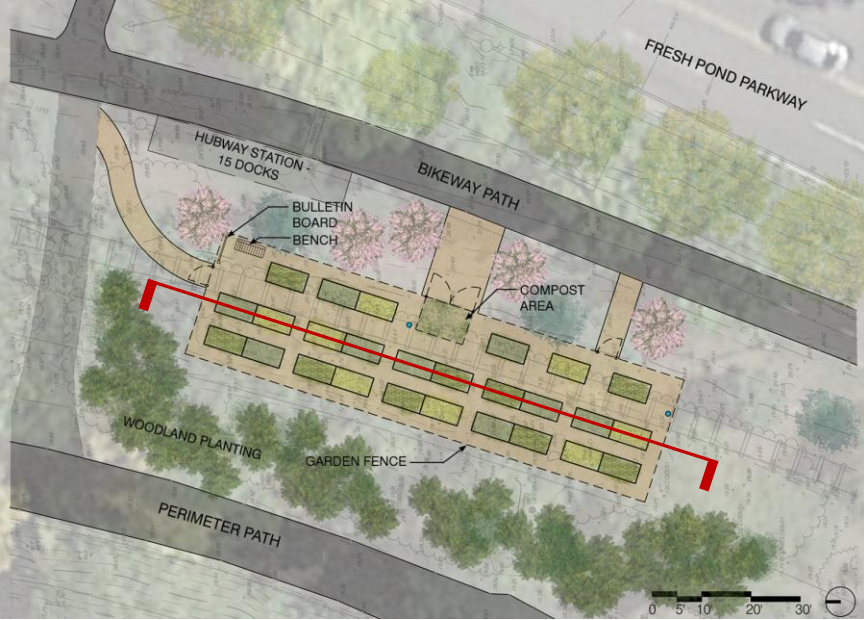
PERIMETER PATH

Detail Plan





Garden Amenities



Garden Cross Section



Discussion / Questions



Cambridge Water Department
Drainage & Community Garden Improvements Project