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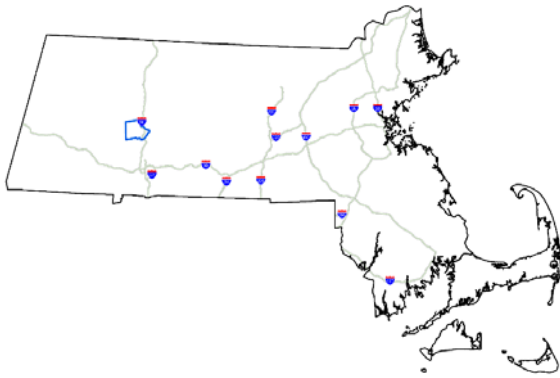
Northampton Designs with Nature to Reduce Storm Hazards Implementation of Climate Resiliency Planning

2019 CAFM Conference

October 30, 2019

Rosalie Starvish, M.S., PE, CFM, CPMSM

City's Planning Approach for Climate Resiliency



www.northamptonma.gov

THE CITY OF NORTHAMPTON MULTI-HAZARD MITIGATION PLAN

S U S T A I N A B L E
N O R T H A M P T O N
Comprehensive Plan, January 2008

Open Space, Recreation & Multi-Use Trail Plan (2018-2025)



let's talk now
a warmer Northampton
a wetter Northampton
southern invasive plants
climate adaptation
resiliency planning
sustainability
...and more

Stakeholder meetings

Mon. September 28 at 2:00 pm
City Hall

Next steps-Report to Community

Wed. September 30 at 7:00 pm
Senior Center

Public Workshop- be heard!

Mon. September 28 at 7:00 pm
Senior Center

Join the Effort

NORTHAMPTON CLIMATE CHANGE ADAPTATION PLAN

www.northamptonma.gov

Stormwater and Flood Control Utility FY 2018 Budget ~\$2 million



City of Northampton

Department of Public Works



Bing Maps

Massachusetts Municipal Vulnerability Preparedness (MVP) Program

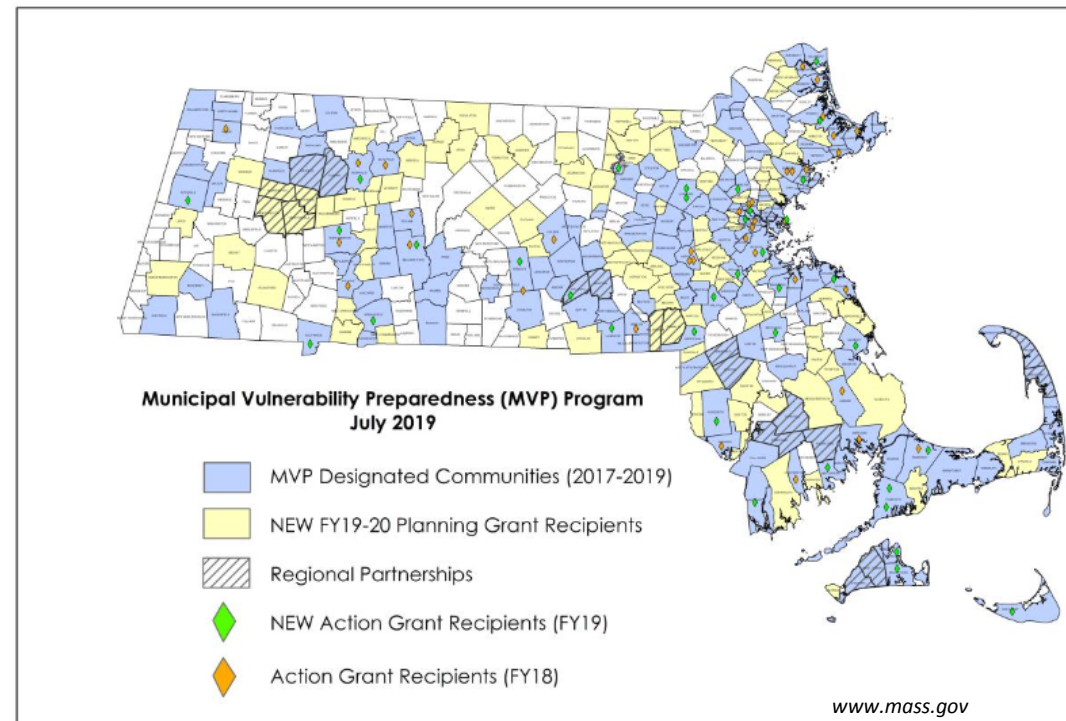
MVP Program Status Map - July 2019

MVP Planning Grants

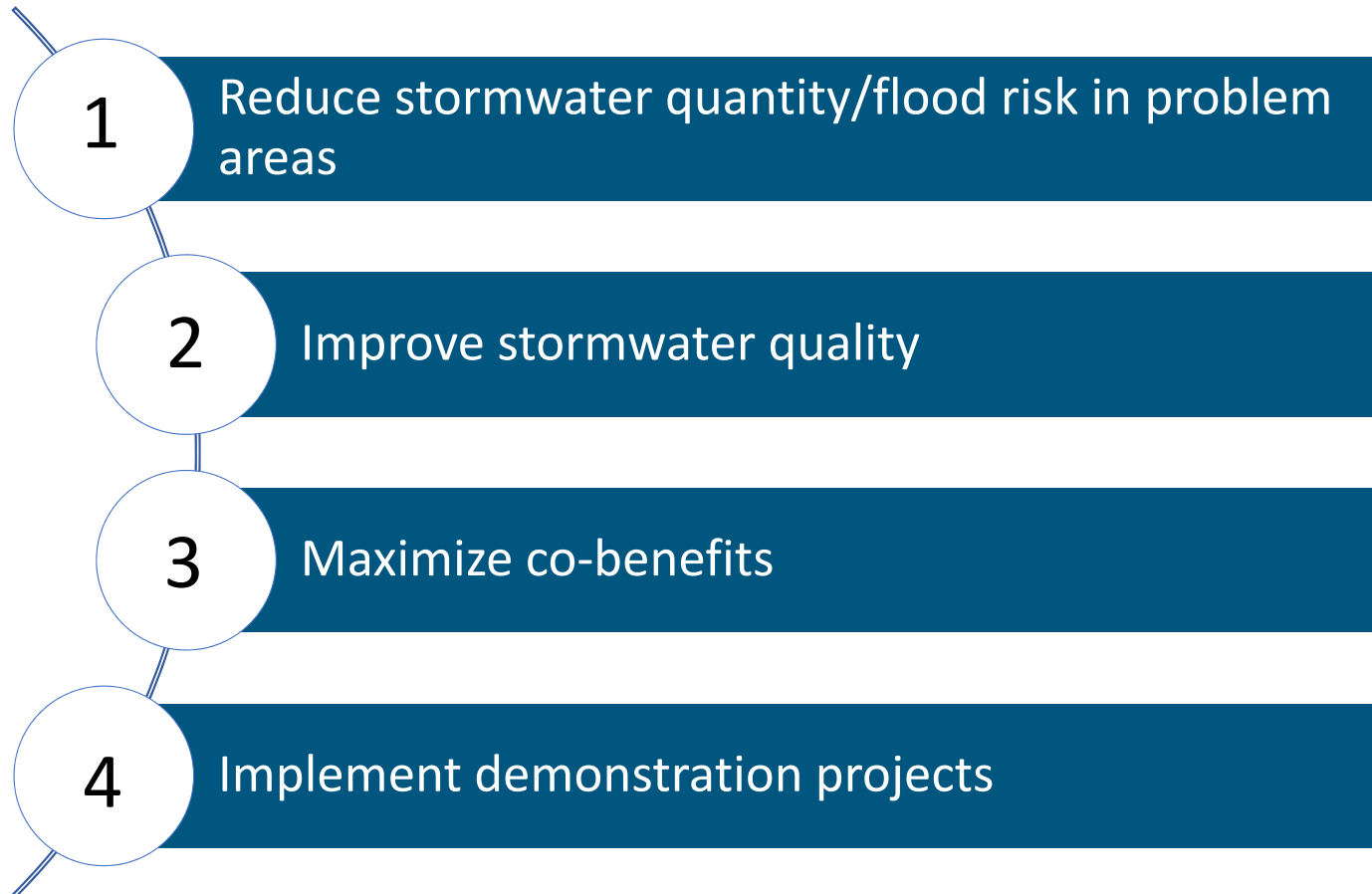
- $\frac{3}{4}$ of MA Cities and Towns enrolled
- CRB Process

MVP Action Grants

- June 2019: \$10.3 million statewide
- Northampton Designs with Nature MVP Action Grant award \$400,000



Northampton Designs with Nature Project Objectives

- 
- 1 Reduce stormwater quantity/flood risk in problem areas
 - 2 Improve stormwater quality
 - 3 Maximize co-benefits
 - 4 Implement demonstration projects

Scope of Work

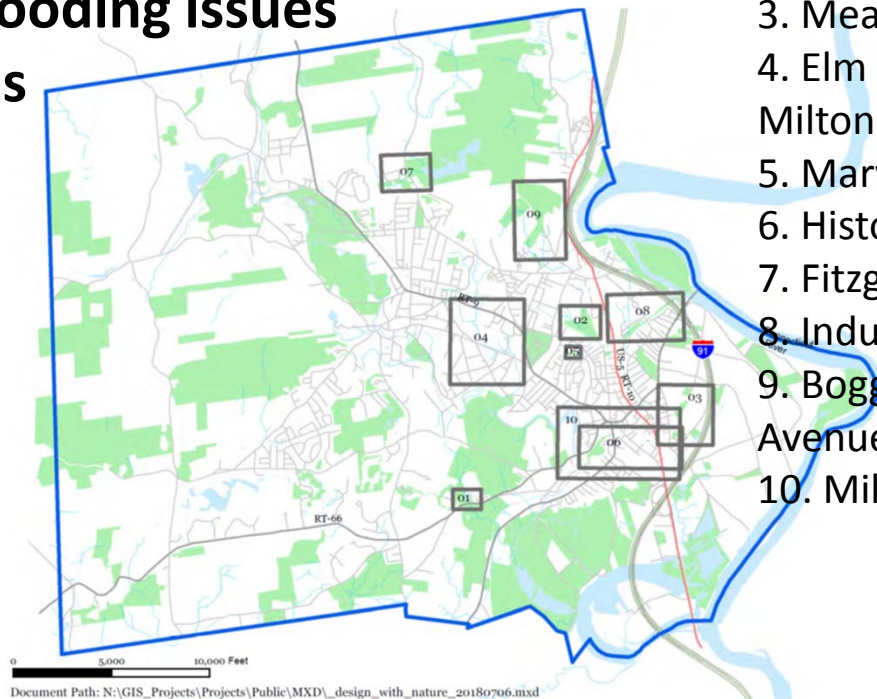
- Field review
- Preliminary site assessments
- Select sites for conceptual designs
- Prepare conceptual designs
- Public engagement
- Wetland delineation/permitting
- Survey
- 25% through 100% Design and bid documents



Identifying Appropriate Projects

Site Selection

- City control
- Historical flooding issues
- Prior studies



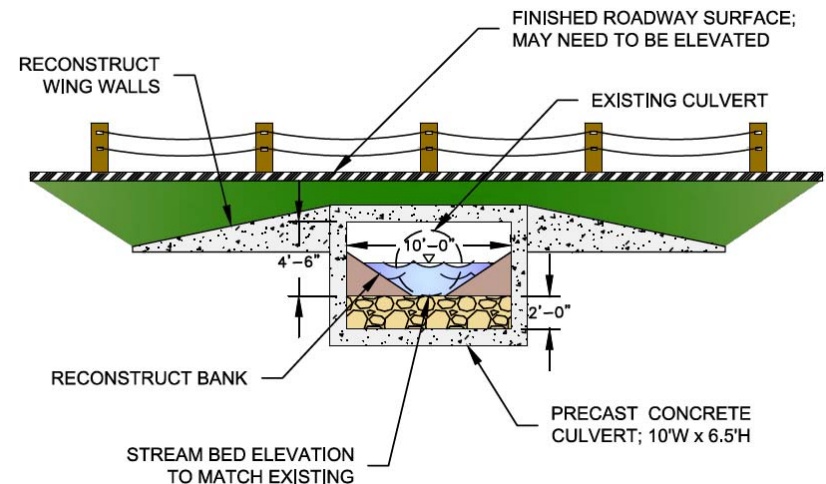
1. Rocky Hill Greenway- Ice Pond site
2. Barret Street Marsh
3. Meadows/Venturers Field and Pomeroy Terrace
4. Elm Street Brook/Locust Street to Elm Street to Milton Street
5. Mary Brown's Dingle
6. Historic Mill River (downtown)
7. Fitzgerald Lake-Broad Brook
8. Industrial Drive/Boston and Maine Railroad
9. Boggy Meadow Road to North Hatfield to Cooke Avenue
10. Mill River and Historic Mill River

Identifying Appropriate Projects

Site Selection

Project Types

- Wetland restoration
- Flood storage
- Improved culvert crossings
- Drainage enhancements
- Green infrastructure for stormwater management



Identifying Appropriate Projects

Field Review



Public Engagement

- Flooding reduction
- Pollinators
- Public education
- Carbon sequestration
- Wildlife and habitat connectivity
- Water quality improvement
- Pedestrian and bicycle – friendly
- Recreation



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QUESTIONS

1. FAMILIARITY & USE

*What is your familiarity with this site?
Do you use this site? If so, how?*

2. POSITIVES

What do you like about this site?

3. PROBLEMS

*What do you currently see as a problem with
this site?*

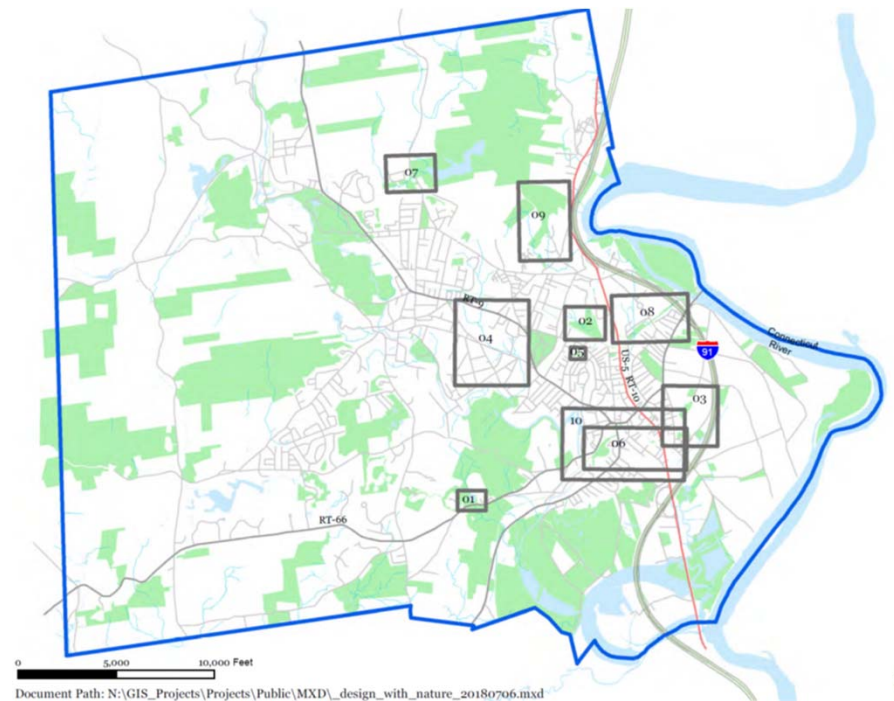
4. OPPORTUNITIES & CO-BENEFITS

*How could a green infrastructure project on
this site be used to transform the potential of
this site? What co-benefits are you interested
in seeing?*

Identifying Appropriate Projects

Started with this list in RFP...

1. Rocky Hill Greenway- Ice Pond site
2. Barret Street Marsh
3. Meadows/Venturers Field and Pomeroy Terrace
4. Elm Street Brook/Locust Street to Elm Street to Milton Street
5. Mary Brown's Dingle
6. Historic Mill River (downtown)
7. Fitzgerald Lake-Broad Brook
8. Industrial Drive/Boston and Maine Railroad
9. Boggy Meadow Road to North Hatfield to Cooke Avenue
10. Mill River and Historic Mill River



Identifying Appropriate Projects

Resulted in 20 project ideas

Flood Control

- Berm
- Flood storage
- Detention

Stormwater Green Infrastructure

- Bioretention

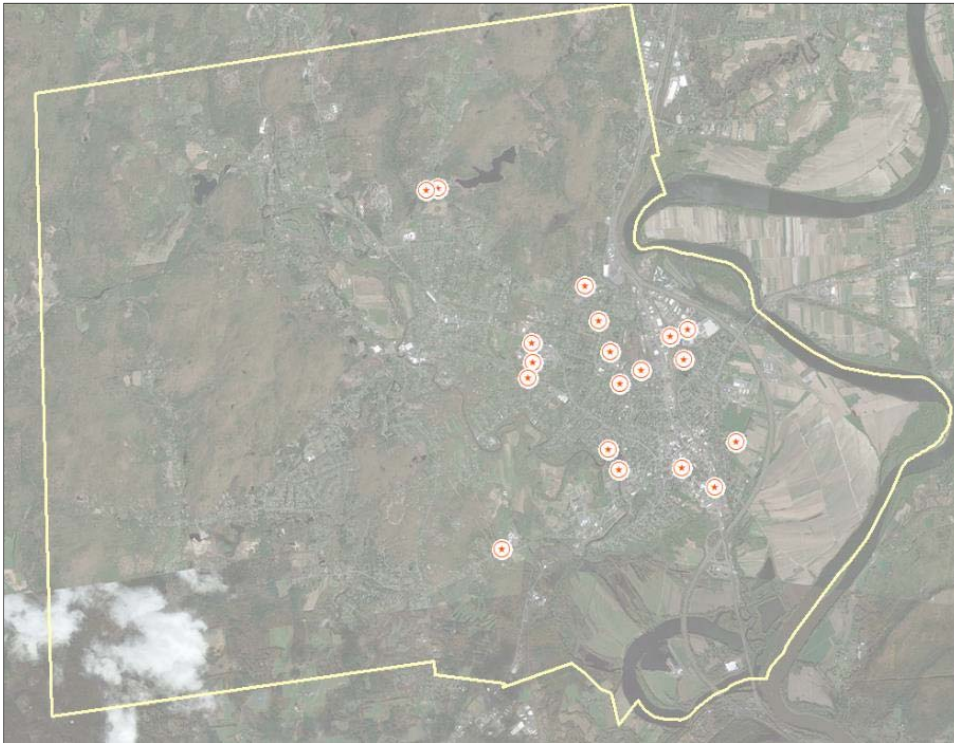
Stream and Wetland Improvements

- Outfall erosion repair
- Stream channel restoration
- Floodplain creation/ reconnection
- Dredging
- Culvert enlargement



Identifying Appropriate Projects

Initial Site Assessment

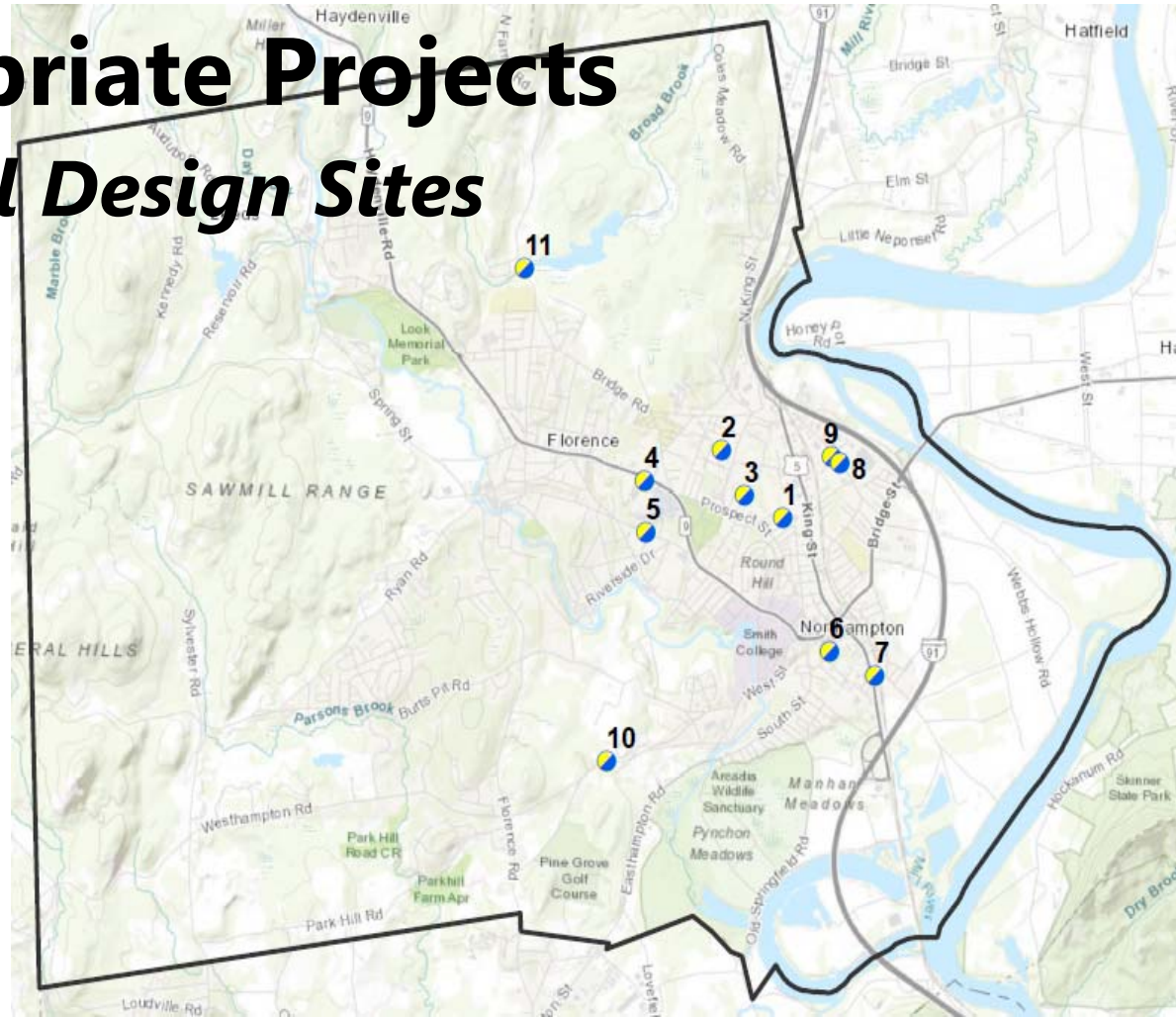


- Limited benefits
- Private property conflicts
- Urgency
- Maintenance

Identifying Appropriate Projects

Selection of Conceptual Design Sites

- 11 Projects Selected
- 6 Watershed Groupings



Identifying Appropriate Projects

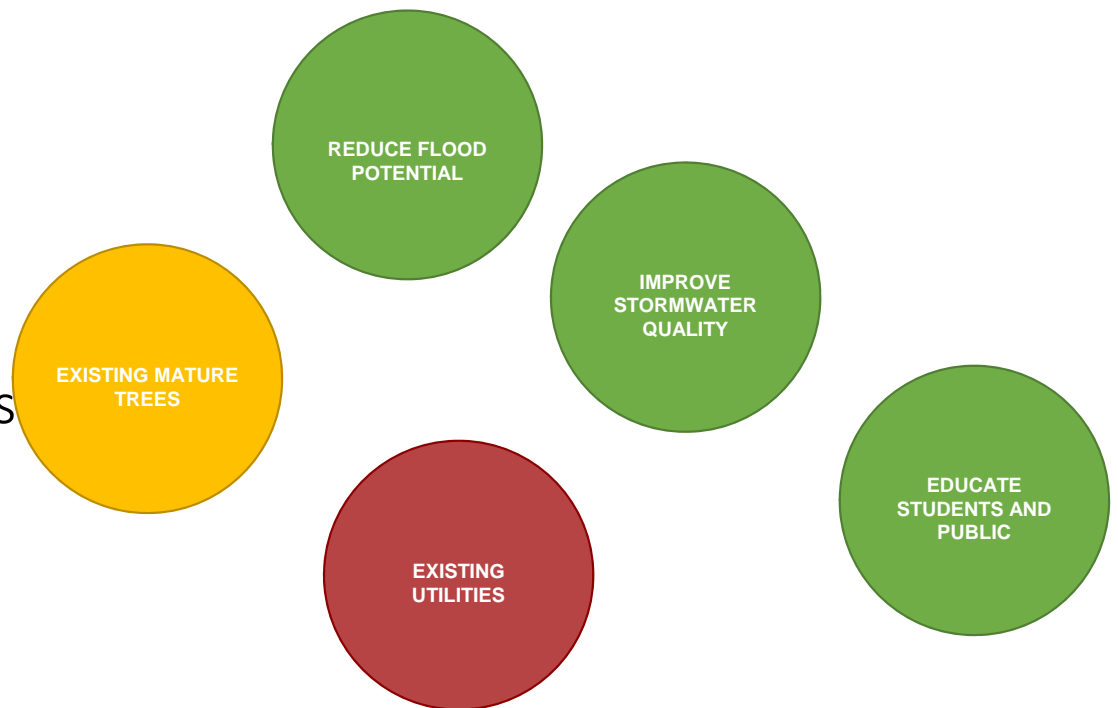
Selection of Conceptual Design Sites



Identifying Appropriate Projects

Conceptual Site Assessment

- Stormwater Management
- Human Impacts
- Infrastructure
- Environmental
- Feasibility/Design Challenges
- Financial
- Co-Benefits



Identifying Appropriate Projects

Site Assessment

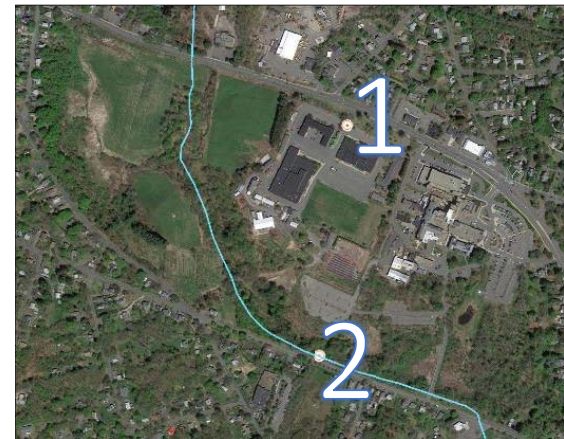
Co-Benefits

- Wildlife Habitat Enhancement/Restoration
- Wildlife Connectivity
- Water Quality Improvement
- Wetland Enhancement/Restoration
- Invasive Species Reduction
- Increasing the Urban Tree Canopy
- Consistency with Other City of Northampton Planning Goals



“Designs with Nature” Case Study – Elm Street Brook

- Frequent overtopping of brook at Elm Street
- Previous hard infrastructure design
 - Flood bypass culvert (\$6.5 million)
- Nature-based solution
 1. Stormwater mitigation (green infrastructure)
 2. Create natural floodplain
 - Will still require a berm/wall
 - Stream and wetland alterations
 - Costs - earthwork, restoration, berm/wall



Project Design and Permitting

Final Project Selection

- Stormwater Management
- Human Impacts
- Infrastructure
- Environmental
- Feasibility/Design Challenges
- Financial
- Co-Benefits



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Project Design and Permitting

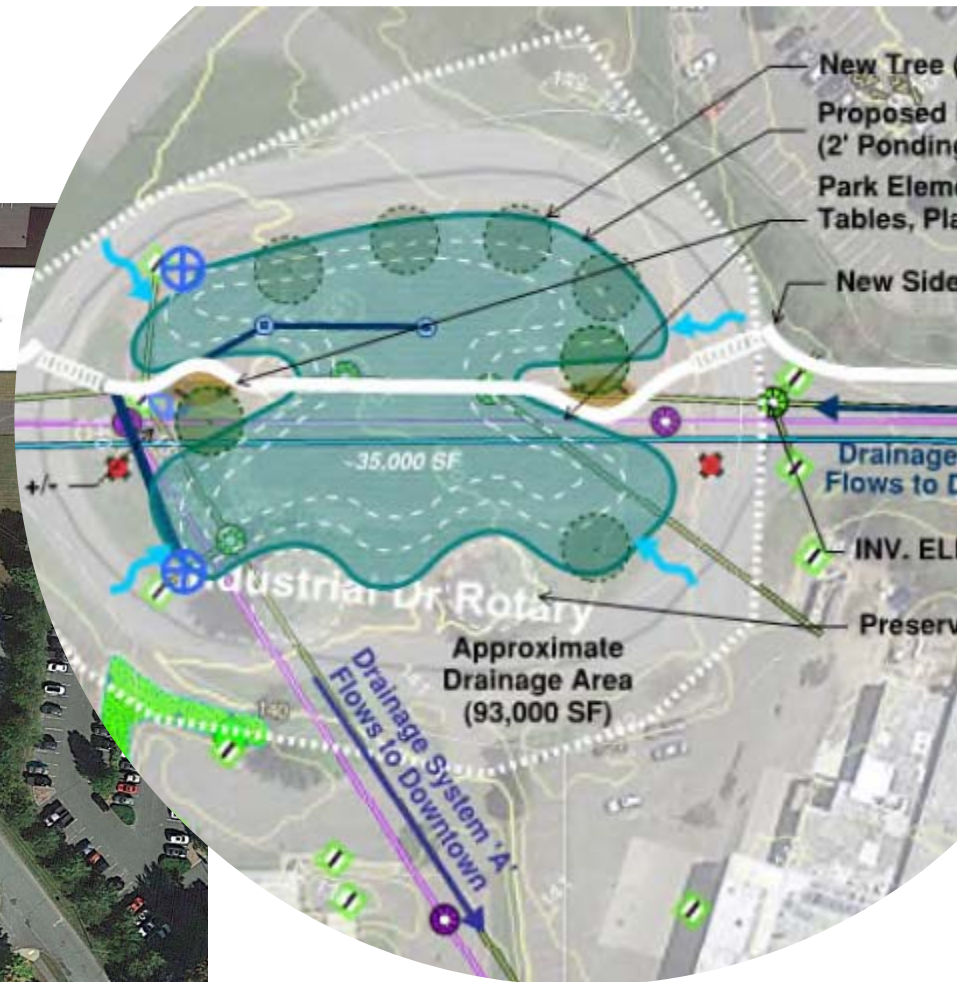
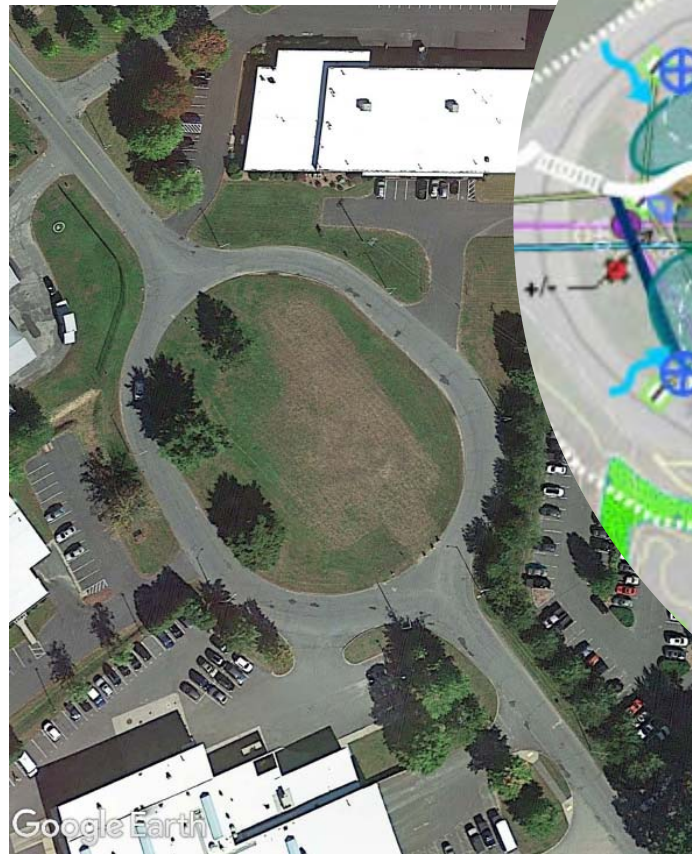
Final Project Selection



Project Design and Permitting

6 Final Projects

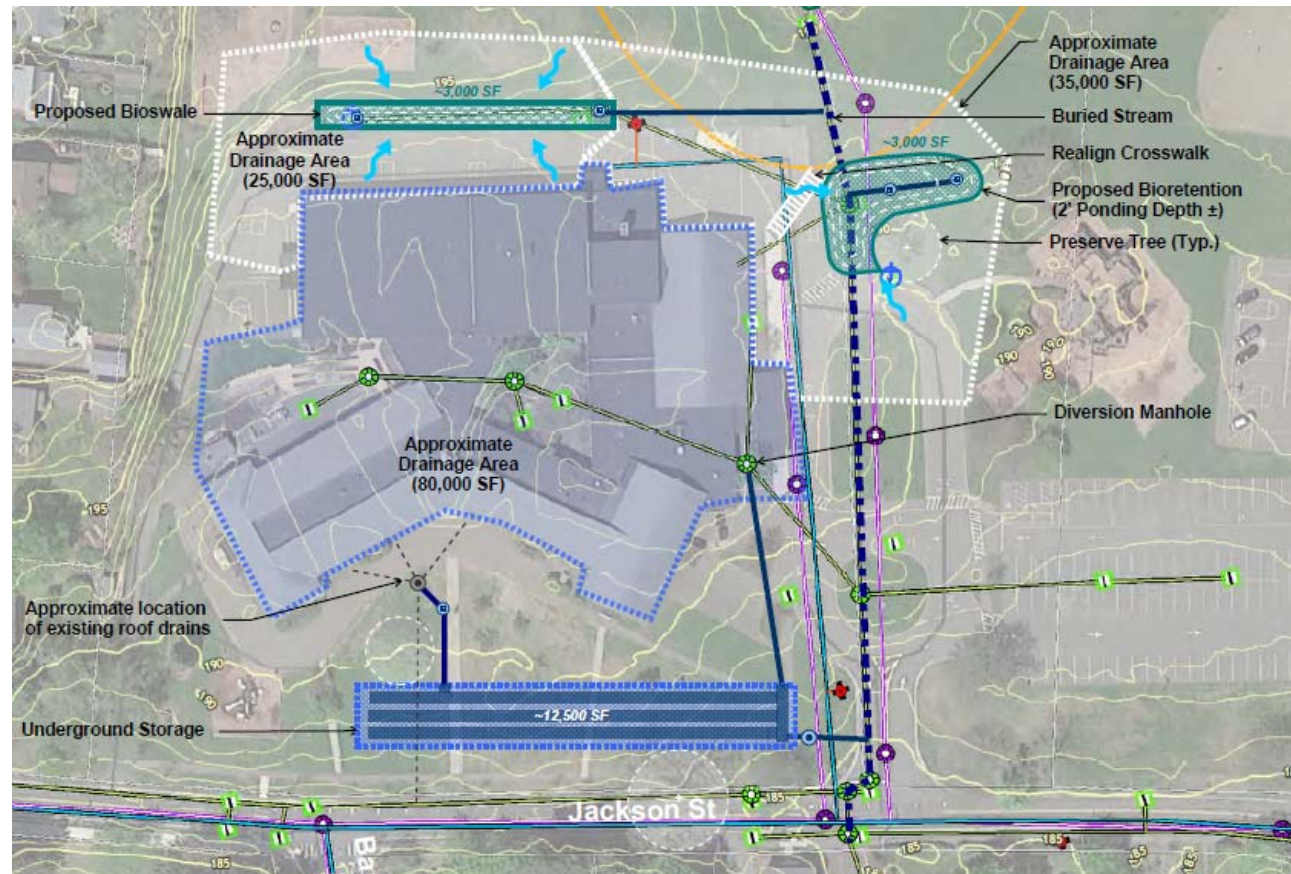
- Industrial Drive Rotary Stormwater Retrofits



Project Design and Permitting

6 Final Projects

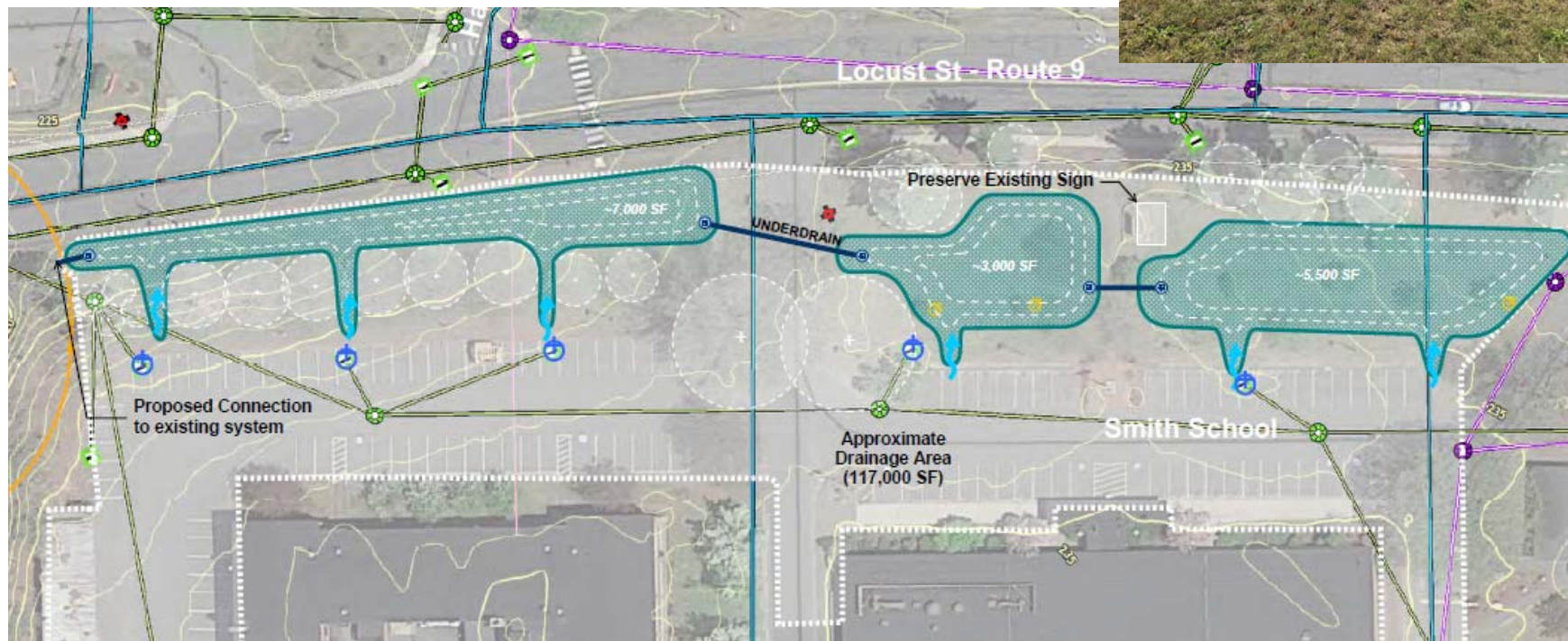
- Jackson Street Elementary School Stormwater Retrofits



Project Design and Permitting

6 Final Projects

- Smith Vocational and Agricultural High School Stormwater Retrofits



Project Design and Permitting

6 Final Projects

- Old South Street Parking Lot Stormwater Retrofits



Project Design and Permitting

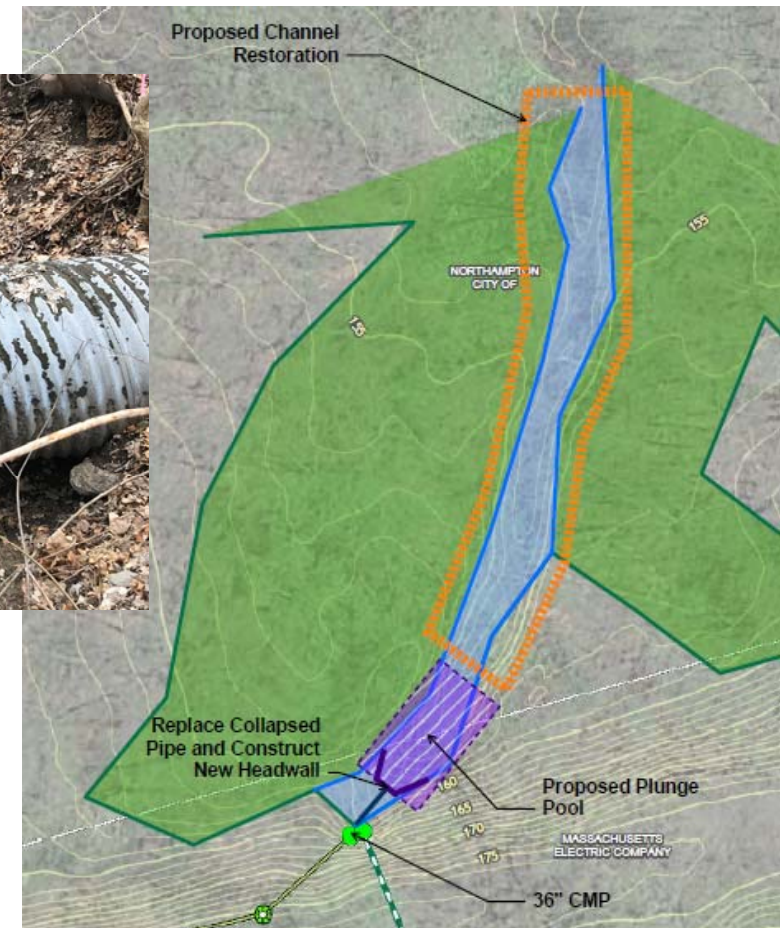
Final Project Selection



Project Design and Permitting

6 Final Projects

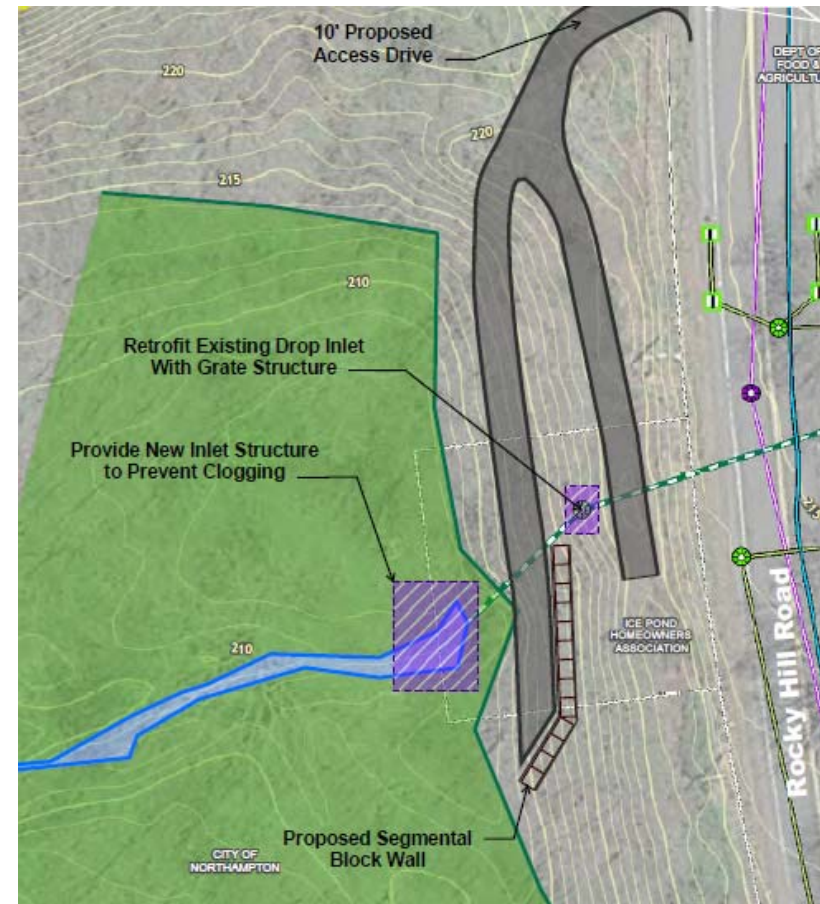
- Adare Place Outlet Improvements and Stream Channel Restoration



Project Design and Permitting

6 Final Projects

- Ice Pond Outlet Improvements



“Designs with Nature” Closing Thoughts

May be more cost effective...
(but maybe not...)



“Designs with Nature” Closing Thoughts

May be more cost effective...
(but maybe not...)
May not alone solve the problem



“Designs with Nature” Closing Thoughts

May be more cost effective...

(but maybe not...)

May not alone solve the problem

Permitting challenges





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Questions?

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