City’s Planning Approach for Climate Resiliency
THE CITY OF NORTHAMPTON
MULTI-HAZARD MITIGATION PLAN

SUSTAINABLE NORTHAMPTON
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

Public Workshop - be heard!
Mon. September 28 at 7:00 pm
Senior Center

Next steps - Report to Community
Wed. September 30 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
Massachusetts Municipal Vulnerability Preparedness (MVP) Program

**MVP Planning Grants**
- ¾ 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

www.mass.gov
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

### QUESTIONS

<table>
<thead>
<tr>
<th>1. FAMILIARITY &amp; USE</th>
<th>2. POSITIVES</th>
<th>3. PROBLEMS</th>
<th>4. OPPORTUNITIES &amp; CO-BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is your familiarity with this site?</td>
<td>What do you like about this site?</td>
<td>What do you currently see as a problem with this site?</td>
<td>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?</td>
</tr>
<tr>
<td>Do you use this site? If so, how?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

Stormwater Green Infrastructure

Riverine Flood Management
Identifying Appropriate Projects

**Conceptual Site Assessment**

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

**Key Aspects**

- Improve stormwater quality
- Reduce flood potential
- Existing mature trees
- Improve stormwater quality
- Existing utilities
- Educate students and public
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

This Photo by Unknown Author is licensed under CC BY-SA-NC
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
Questions?

2019 CAFM Conference
October 30, 2019

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