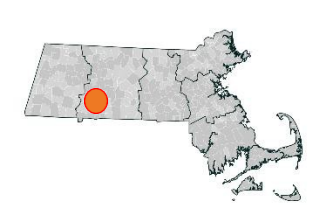
FY21 Completed Action Grant Summaries

Municipal Vulnerability Preparedness Program
MA Executive Office of Energy and Environmental Affairs

Agawam Stormwater Master Plan

Agawam FY21



Learn More:

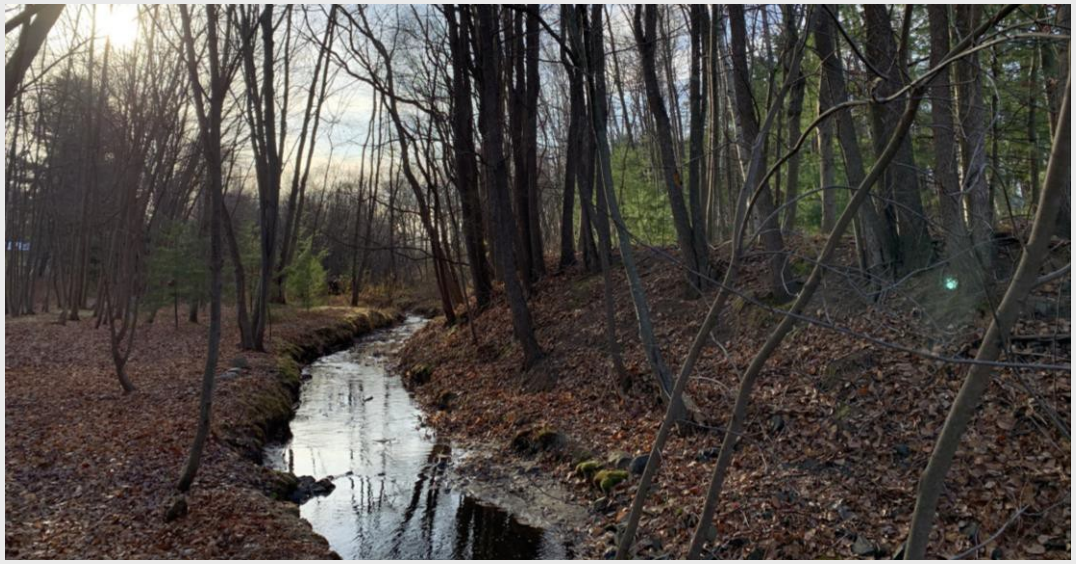
AWARD $216,750

PROJECT TYPE Stormwater Master Plan/Capital Improvement Plan

CORE PRINCIPLES DEMONSTRATED Conducting Robust Community Engagement; Achieving Broad and Multiple Community Benefits

DESCRIPTION

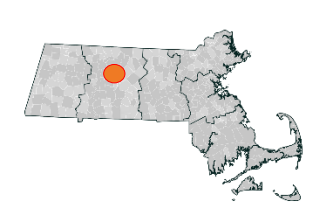
- Addresses community concern of flooding due to climate change
- Includes stormwater infrastructure assessments of the Towns most impacted areas
- Provides recommendations on stormwater infrastructure improvements, costs, and development of a stormwater management program



Greening Lord Pond Plaza

MVP
Municipal Vulnerability Preparedness

Athol & North Quabbin Community Coalition FY21



Learn More:

- Lord Pond Plaza Website
- Athol Planning Department

REGION Greater Connecticut River Valley

AWARD $117,760 (FY21); $40,625 (match)

PROJECT TYPE Planning, Assessments, Capacity Building and Regulatory Updates

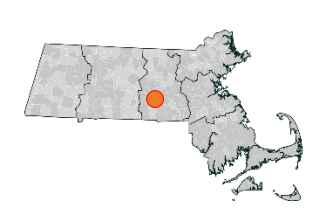
CORE PRINCIPLES DEMONSTRATED Employing Nature-Based Solutions (NBS); Achieving broad and multiple community benefits:

DESCRIPTION Five-acre paved area with a buried stream running beneath it; heat island without vegetation. Daylighting this stream and re-connecting the community with it will result in multiple benefits in the form of improved air quality, cooler temperatures and less intense heat.

Leesville Pond Water Quality Protection and Community-Wide Resiliency Improvements

MVP
Municipal Vulnerability Preparedness

Auburn FY21



Learn More:
https://storymaps.arcgis.com/stories/eb1dd8e42b574a509cacd8c80433b50d and
https://www.auburnguide.com/682/MVP

AWARD $209,895

PROJECT TYPE Planning, Design

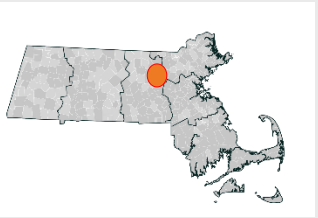
CORE PRINCIPLES DEMONSTRATED Furthering a community identified priority action to address climate change impacts.

DESCRIPTION The focus of the project is to increase awareness of public behavioral uses which impact water quality, provide education on ways to prevent water contamination, and plan for future infrastructure improvements to strengthen community resilience to natural disasters within the Auburn community.

Apple Country Natural Climate Solutions

MVP
Municipal Vulnerability Preparedness

Bolton, Harvard, Devens FY21



Learn More:
https://climateresilient.wixsite.com/applecountry/project-data-viewer

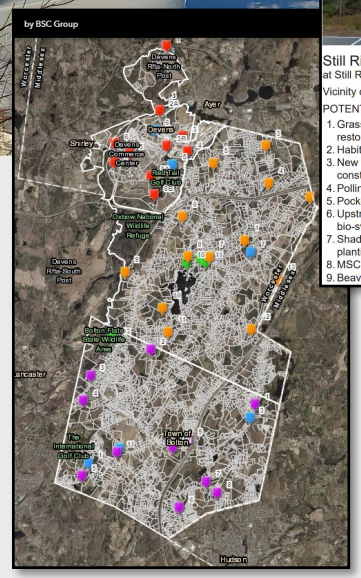
AWARD $250,000

PROJECT TYPE Planning, Assessments

CORE PRINCIPLES DEMONSTRATED Employing Nature-Based Solutions
Achieving Broad and Multiple Community Benefits

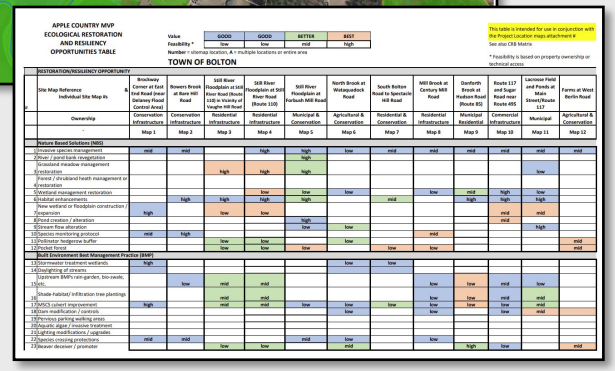
DESCRIPTION

- Leveraged a multitude of partners and funding sources to make a broad impact in the greater community.
- Included carbon sequestration analysis across varying land use and land cover types while integrating aspects of the Healthy Soils Initiative Project.
- Community engagement included a self-guided tour, site visits, and educational information shared through the project website.



Still River Floodplain
at Still River Road (Route 110) in Vicinity of Vaughn Hill Road

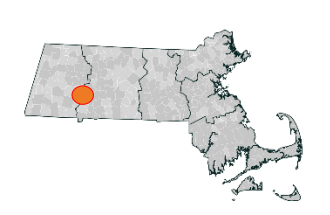
POTENTIAL PROJECTS:
1. Grassland meadow management restoration
2. Habitat enhancements
3. New wetland or floodplain construction / expansion
4. Pollinator hedgerow buffer
5. Pocket forest
6. Upstream BMPs rain-garden, bio-swale, etc.
7. Shade-habitat/ Infiltration tree plantings
8. MSCS culvert improvement
9. Beaver deceiver / promoter



Green Infrastructure Planning & Resiliency Design for Cherry Street

MVP Municipal Vulnerability Preparedness

Easthampton FY21



Learn More:

easthamptonma.gov/mvp

REGION Greater Connecticut River Valley

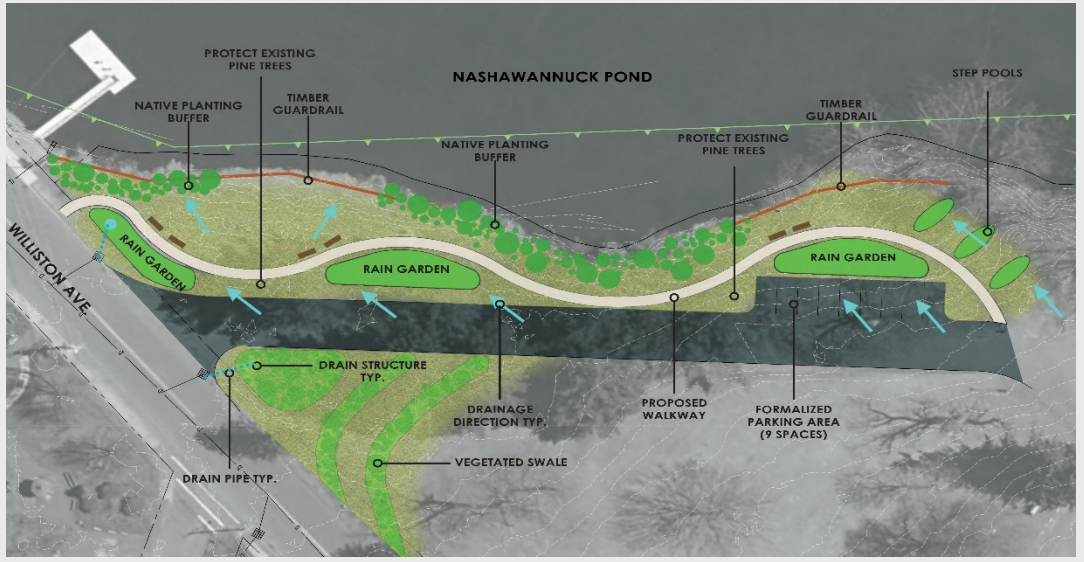
AWARD $175,957 (FY21); $58,773 (match)

PROJECT TYPE Design & Permitting

CORE PRINCIPLES DEMONSTRATED Utilizing Climate Change Data for a Proactive Solution; Employing Nature-Based Solutions; Increasing Equitable Outcomes for EJ Populations; Achieving Broad and Multiple Community Benefits; Robust Community Engagement

DESCRIPTION

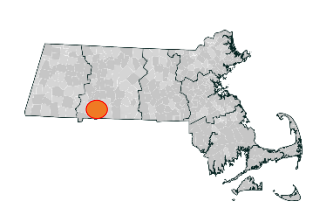
- Designed and permitted green infrastructure for Cherry Street neighborhood and slope restoration at Brickyard Brook
- Developed a City-Wide Green Infrastructure Master Plan with 20 site-specific concepts and standard engineering details
- Conducted community outreach through neighborhood meetings, a 'virtual field trip' with the 5th grade, and information booths at community events



Resilient Comprehensive Master Plan

MVP
Municipal Vulnerability Preparedness

East Longmeadow FY21



Learn more:

- East Longmeadow Master Plan Story Map
- East Longmeadow Resilient Master Plan Project Website

AWARD $84,833

PROJECT TYPE Planning, Assessments, and Regulatory Updates

CORE PRINCIPLES DEMONSTRATED Creation of a Resilient Master Plan; Widespread Community engagement resulting in a new vision statement and strategy for implementation of resilient planning strategies

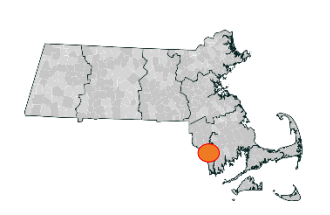
DESCRIPTION

- Engaged multiple stakeholders, residents, and students in both visioning and implementation workshops
- Included an additional Master Plan chapter specifically to address Climate Adaptation and Sustainability challenges and opportunities
- Conducted regulatory review with recommendations to increase climate resiliency practices within East Longmeadow's Zoning Bylaws, Subdivision Rules and Regulations and Stormwater Management Rules & Regulations

Regional Emergency Water System Interconnectivity Analysis
Fall River, Somerset, Swansea, and Dighton

MVP
Municipal Vulnerability Preparedness

City of Fall River FY2021



Learn More:

- Watuppa Reservation & Southeastern MA Bioreserve
- Interconnection Study

AWARD $100,650

PROJECT TYPE Planning, Assessment, and Regulatory Update

CORE PRINCIPLES DEMONSTRATED Utilizing regional solutions toward regional benefit, increasing equitable outcomes for and supporting strong partnerships with Environmental Justice Populations and Climate Vulnerable Populations

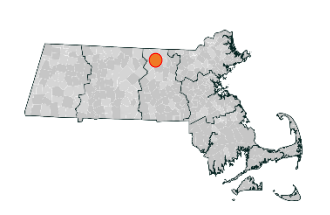
DESCRIPTION

- Developed regional hydraulic model, including communities of Fall River, Somerset, Swansea, and Dighton
- Evaluated the ability of combined water supplies to provide redundancy during periods of critical need
- Assessed the volume of water available within each system under various drought and demand conditions
- Documented the condition and capacity of the various interconnections and recommended improvements to provide a resilient, redundant regional system that will benefit all four communities

John Fitch Highway – A Resilient Road Corridor

MVP
Municipal Vulnerability Preparedness

City of Fitchburg FY21



Learn more:

http://www.fitchburgma.gov/955/John-Fitch-Highway

Envision JFH Artwork Challenge and Comment Page

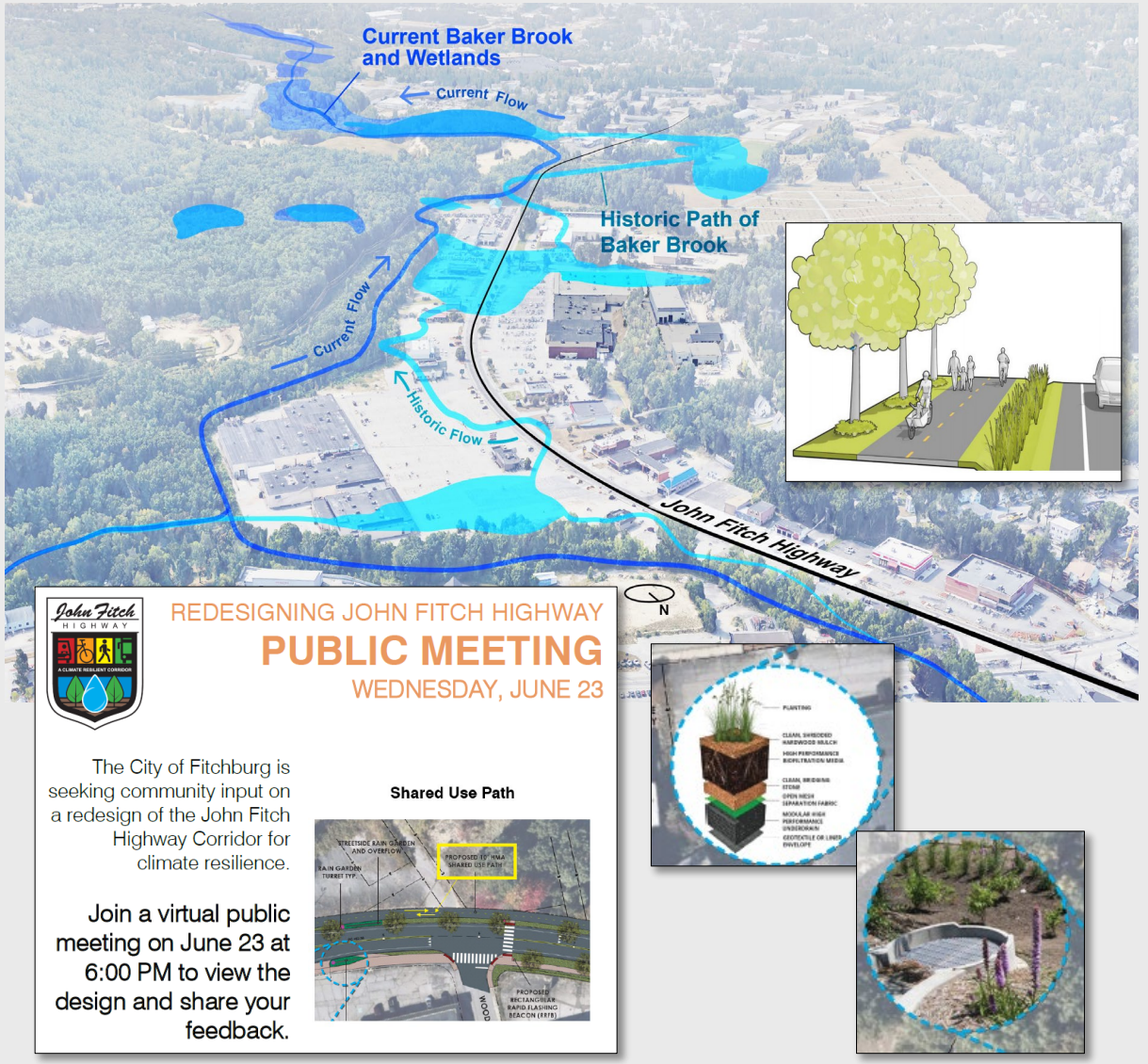
AWARD $271,787

PROJECT TYPE Design and Permitting

CORE PRINCIPLES DEMONSTRATED Pursuing innovative, transferable approaches

DESCRIPTION Designing a resilient commercial corridor with improved mobility (dedicated biking/walking facilities), plantings for cooling, and green infrastructure elements to capture and treat roadway stormwater.

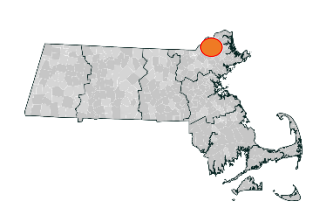
Focus on community context design and outreach for equitable engagement through art competition, focus groups, and online events



Little River Dam Removal Feasibility Study

MVP
Municipal Vulnerability Preparedness

Haverhill/FY21



Learn More:

[Little River Dam Project Information]

AWARD $129,693

PROJECT TYPE Planning, Assessments, and Regulatory Updates

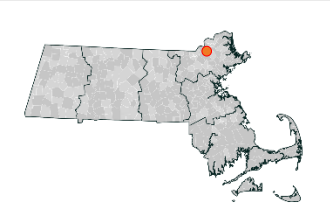
CORE PRINCIPLES DEMONSTRATED Employing Nature-Based Solutions; Supporting strong partnerships with Environmental Justice Populations; Conducting robust community engagement; Achieving broad and multiple community benefits

DESCRIPTION

- Completed full feasibility study for removal of Little River Dam, including sediment management, structural recommendations, and hydraulic/hydrologic modeling
- Developed concept graphics and photo renderings for the proposed dam removal and river restoration
- Utilized a Community Liaison model for successful engagement with the EJ community and hosted bi-lingual public forums with over 100 attendees

City of Lawrence Flood Study and DPW Yard Adaptation Plan

MVP
Municipal Vulnerability Preparedness



Lawrence, MA – FY2021

Learn more:

- Groundwork Lawrence Project Website

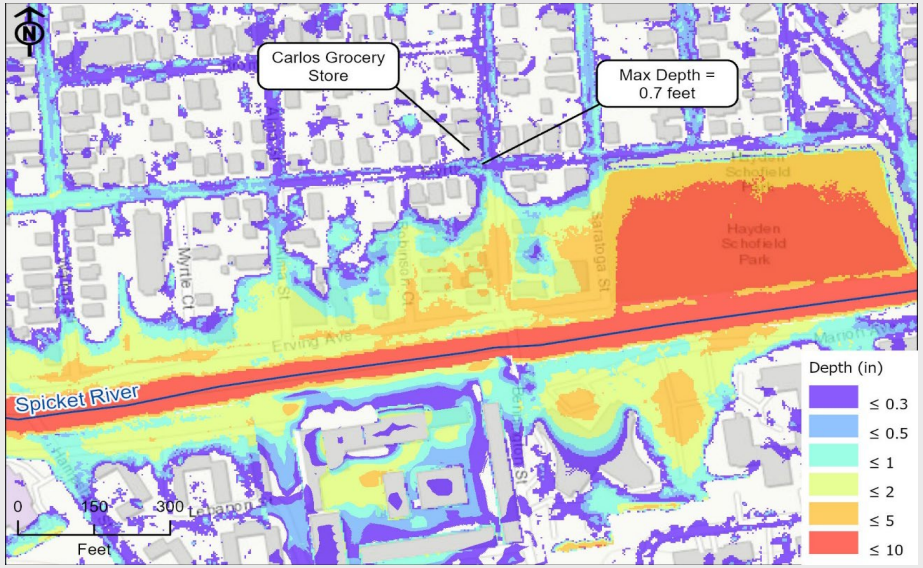
AWARD $213,418

PROJECT TYPE Flood Study and Mitigation Alternatives Analysis

CORE PRINCIPLES DEMONSTRATED Utilizing Climate Change Data for a Proactive Solution; Increasing Equitable Outcomes for Environmental Justice and Climate Vulnerable Populations

DESCRIPTION

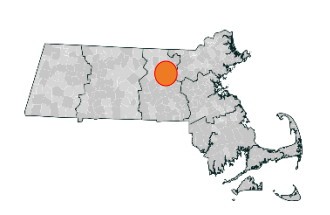
- Identified existing and future flood risks for the DPW Yard and communities surrounding the Spicket River
- Analyzed four flood mitigation alternatives for the DPW Yard
- Created a public art mural and installed vertical flood elevation markers to educate and inform the public of the flood risks associated with the Spicket River and the anticipated future impacts of climate change



Monoosnoc Brook Bank Stabilization Project

MVP
Municipal Vulnerability Preparedness

Leominster FY21



AWARD $200,661

PROJECT TYPE Design and Permitting

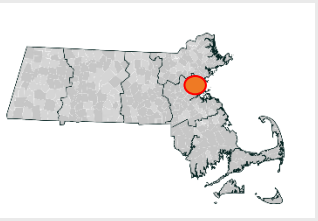
CORE PRINCIPLES DEMONSTRATED Furthering a community identified priority action to address climate change impacts

DESCRIPTION The primary goal of the project was to design a resilient solution to stabilize the brook against current (2020) and future flow conditions (2070) resulting from climate change. The projected precipitation totals for each storm analyzed during the project were calculated by using a baseline precipitation total from Atlas 14 and adding a 7.8% increase to account for the 2070s projected change in inches of total precipitation.

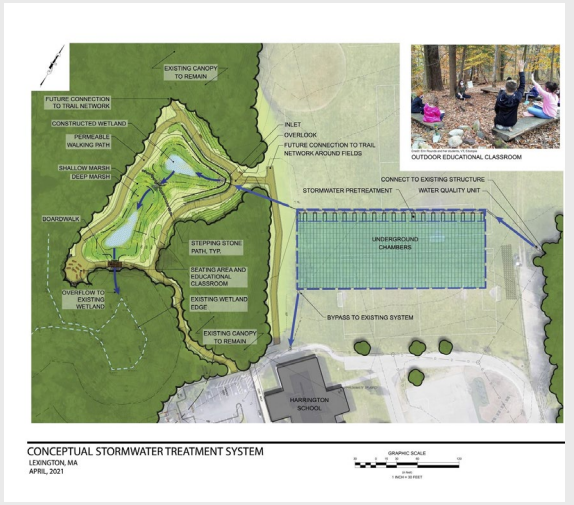
Managing Regional Flooding with Stormwater Wetlands

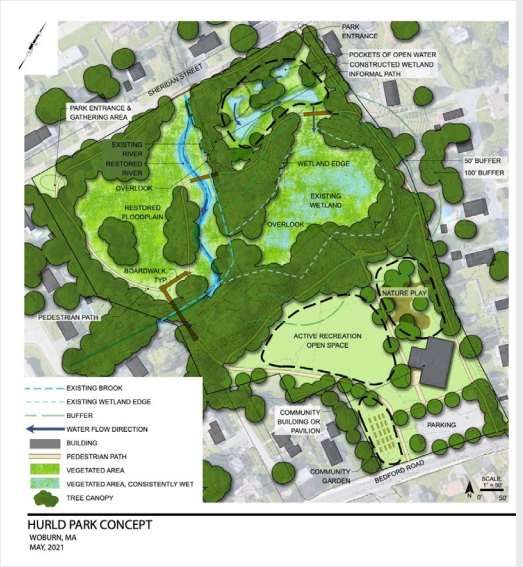
MVP
Municipal Vulnerability Preparedness

Wetlands Construction and Restoration in Lexington, Reading, and Woburn



All project information is available at https://mysticriver.org/wetlands. Learn more about the Resilient Mystic Collaborative at https://resilient.mysticriver.org/.



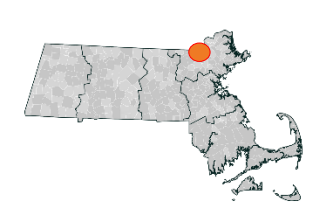


AWARD	$670,000
PROJECT TYPE	Design and Permitting (1 year)
CORE PRINCIPLES DEMONSTRATED	Employing Nature-Based Solutions; Achieving Broad and Multiple Community Benefits
DESCRIPTION	The Resilient Mystic Collaborative - in partnership with the Towns of Lexington and Reading, City of Woburn, and the Mystic River Watershed Association - identified three sites for regional and local stormwater and flood management. Through a comprehensive public engagement process and environmental assessment, these sites were designed for constructed wetlands and restored wetlands, with local benefits including open space enhancement.

Claypit Brook Climate Resilience Stormwater Management Capital Improvement

MVP Municipal Vulnerability Preparedness

City of Lowell FY21



Website: tinyurl.com/LowellMVP

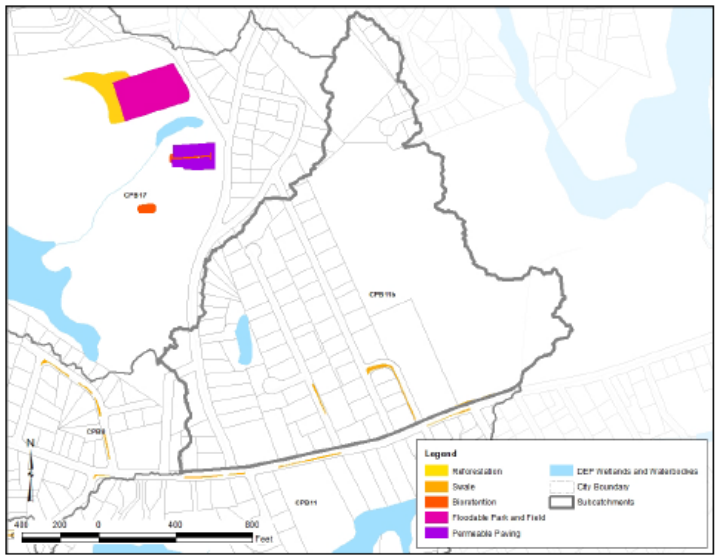
AWARD $138,000

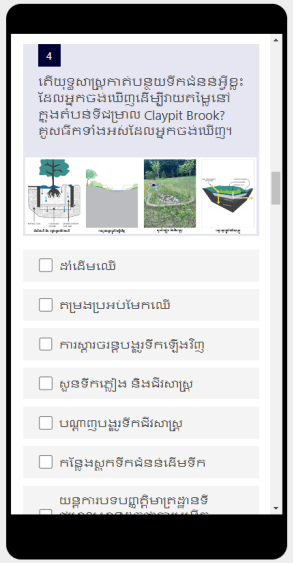
PROJECT TYPE Assessment, Preliminary Design and Permitting

CORE PRINCIPLES DEMONSTRATED Utilizing Climate Change Data for a Proactive Solution:, Employing Nature-Based Solutions; Achieving Broad and Multiple Community Benefits

DESCRIPTION

- Identified opportunities for nature-based stormwater controls, flood mitigation projects, and grey infrastructure upgrades
- Developed a stormwater capital improvement to reduce flooding and urban heat island effect
- Designed the upgrade of a failing culvert in an environmental justice neighborhood and developed a permitting strategy

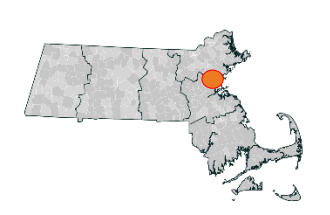




Malden River Works: 25% Design

MVP
Municipal Vulnerability Preparedness

Malden FY21



- https://www.maldenriverworks.org/
- https://mysticriver.org/maldenriver

AWARD $150,015

PROJECT TYPE Design and Permitting

CORE PRINCIPLES DEMONSTRATED Employing Nature-Based Solutions; Increasing equitable outcomes for EJ populations

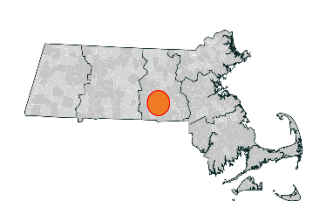
DESCRIPTION

- Preserved 16 mature trees and added over 200 new trees to the site.
- Restored 1/3 acre of Malden River shoreline with native plantings.
- Developed strong partnerships with environmental advocates, community groups, and residents to engage nearly 1,000 people

Armory Village Green Infrastructure Project: Phase II

MVP
Municipal Vulnerability Preparedness

Millbury FY21



Learn More:

https://www.millbury-ma.org/planning-development/pages/armory-village-revitalization-project

AWARD $125,600

PROJECT TYPE Design and Permitting

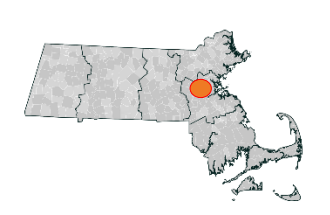
CORE PRINCIPLES DEMONSTRATED Employing Nature-Based Solutions; Achieving Broad and Multiple Community Benefits

DESCRIPTION Vegetated bump outs, rain gardens, bioswales, deep sump catch basins, porous pavers, and street trees featured within the Phase II design will reduce heat island effects and stormwater runoff volumes / pollutant loads (sediment, nutrients and other pollutants such as pathogens) to the Blackstone River, increase groundwater recharge, and help address routine localized flooding and system capacity issues.

Building Resilience Across the Charles River Watershed

MVP
Municipal Vulnerability Preparedness

Natick FY21



Learn more and explore the flood viewer:

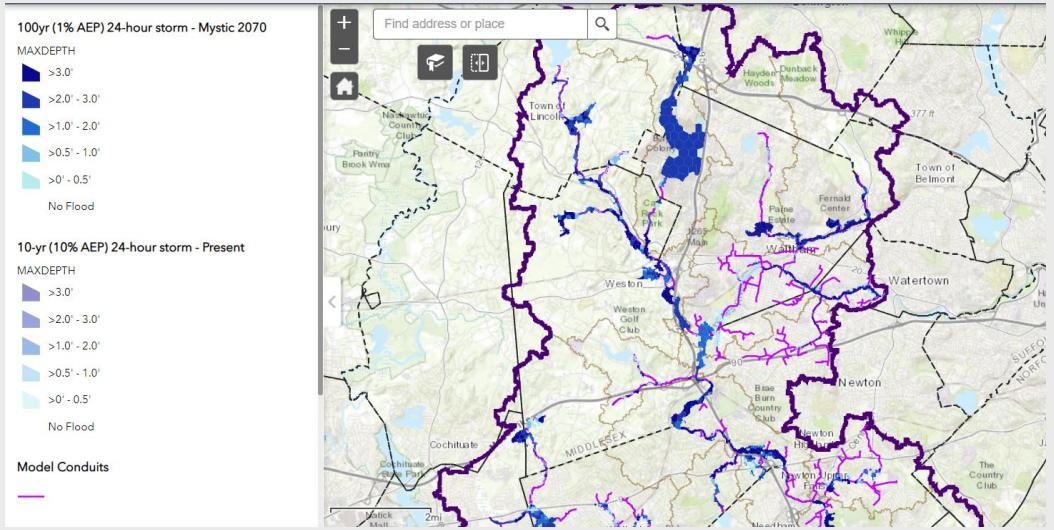
www.crwa.org/watershed-model.html

AWARD $264,171

PROJECT TYPE Planning project

CORE PRINCIPLES DEMONSTRATED Employing Nature-Based Solutions; Achieving Broad and Multiple Community Benefits, Furthering a community identified priority action to address climate change impacts, Utilizing climate change data for a proactive solution, Conducting robust community engagement, Utilizing regional solutions toward regional benefit

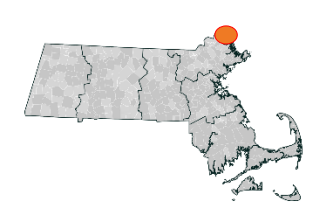
DESCRIPTION Fifteen communities in the Charles River watershed partnered to developed a watershed scale flood model focused on the upper/middle watershed. The Charles River Flood Model demonstrates the potential impacts of future storm events and was used to assess the flood mitigation benefits of multiple nature- based solution strategies.



Resilient Critical Infrastructure: Adapting a Wastewater Treatment Facility, Underground Electric Lines and Public Rail Trail to Future Sea Level Rise and Storm Surge

MVP Municipal Vulnerability Preparedness

Newburyport FY21



Learn More:

- https://www.cityofnewburyport.com/planning-development/clipper-city-rail-trail-harborwalk

AWARD $1,000,000

PROJECT TYPE Construction

CORE PRINCIPLES DEMONSTRATED

- ➢ Furthering Community-Identified Priority Action to Address Climate Change Impacts
- ➢ Achieving Broad and Multiple Community Benefits

DESCRIPTION

- Constructed stone revetment, elevated berm, and public rail trail along 1200 feet of Merrimack River shoreline.
- Protects erosion-prone area adjacent to critical community asset for 50-year service life of wastewater plant.
- Provides multiple recreational, social, and economic community benefits in addition to climate change resilience.

May 2018 (“before”)

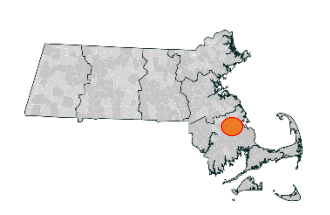
vs.

May 2021 (“after”)

Building a Municipal Resilience Portfolio: Assessment of Critical Land in the Winnetuxet River Corridor in Plympton

MVP
Municipal Vulnerability Preparedness

Plympton FY21



The Winnetuxet Watershed Project Page at: https://srpedd.org/comprehensive-planning/environment/climate-resilience-planning/municipal-vulnerability-preparedness-mvp-planning/winnetuxet-watershed-resilience-portfolio-2/

AWARD $41,930

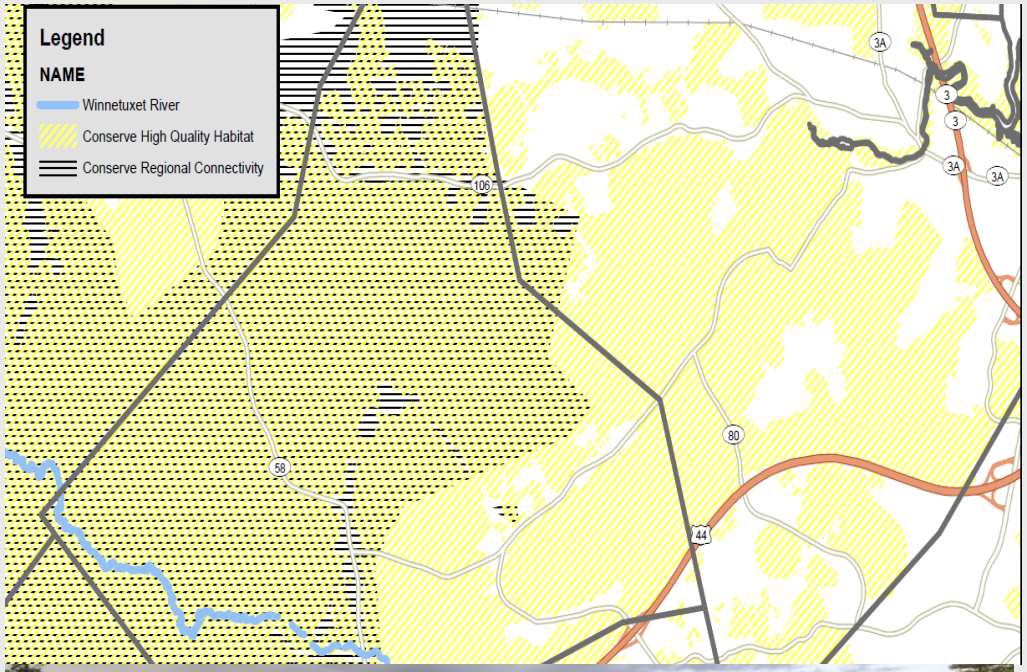
PROJECT TYPE Watershed Land Assessment

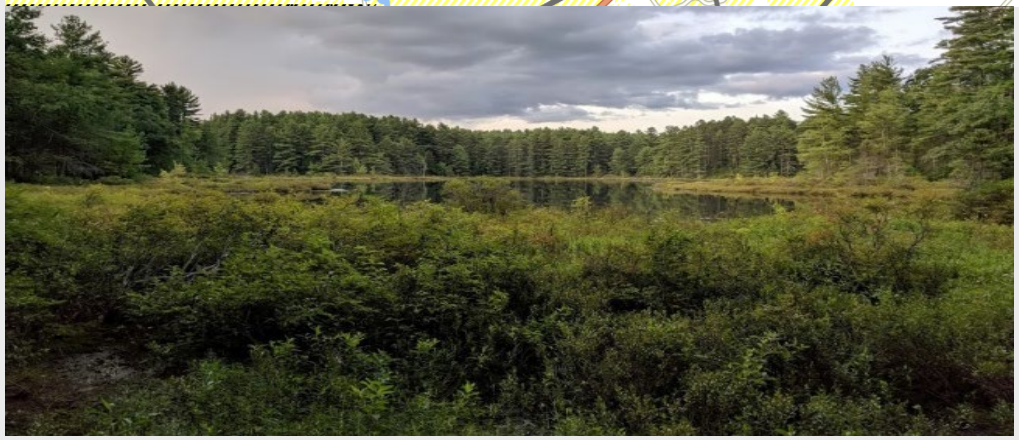
CORE PRINCIPLES DEMONSTRATED Promoting Nature Based Solutions; preserving natural resources critical to community and regional resilience

DESCRIPTION

The focus of this project is to:

- identify, assess and protect natural systems and open space in the Winnetuxet River corridor in Plympton.
- recognize the value of our natural green infrastructure in helping to address the potential impacts of climate change.
- establish a new standard for prioritizing open space for acquisition in Plympton, and a first step in **building a resilience portfolio for the Town.**

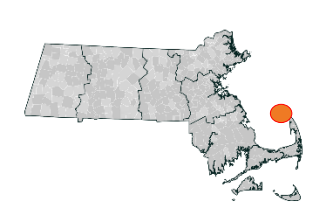




Permit Level Design of the Ryder Street Outfall Relocation and Drainage Improvements

MVP
Municipal Vulnerability Preparedness

Provincetown FY21



AWARD $70,465.00

PROJECT TYPE Permit Level Design

CORE PRINCIPLES DEMONSTRATED Resilient Redesigns and Retrofits for Critical Facilities and Infrastructure

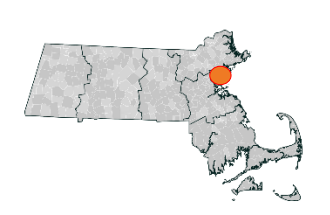
DESCRIPTION

- Plans include adding a stormwater pump station to an existing drainage system to alleviate flooding issues in downtown Provincetown.
- Stormwater pump station designed to protect critical components with sea level rise and base flood elevation taken into account.

Revere Point of Pines/Riverside Area Coastal Resiliency Feasibility Study

MVP
Municipal Vulnerability Preparedness

Revere FY21



Learn More

- https://www.revere.org/business-development/projects-and-initiatives

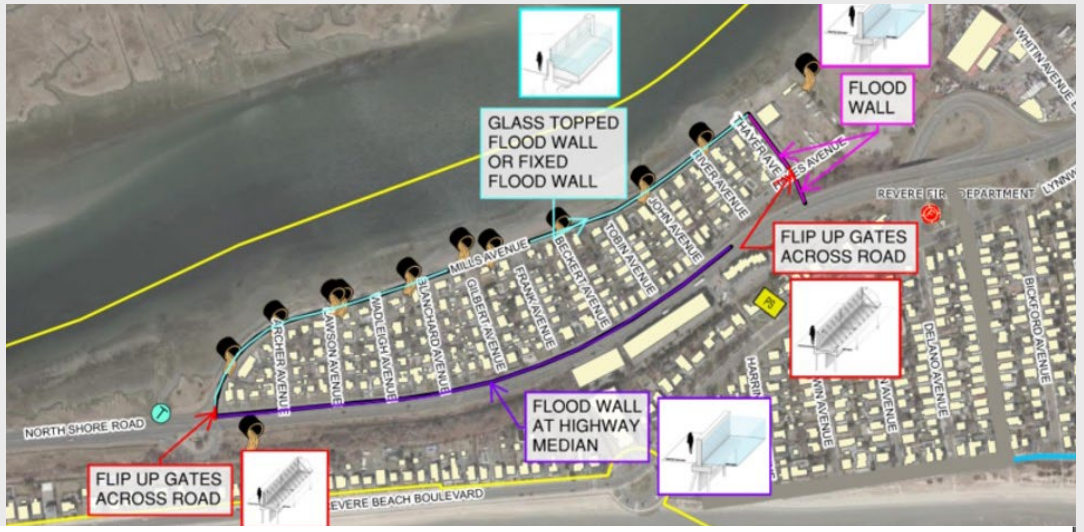
AWARD $ 210,689

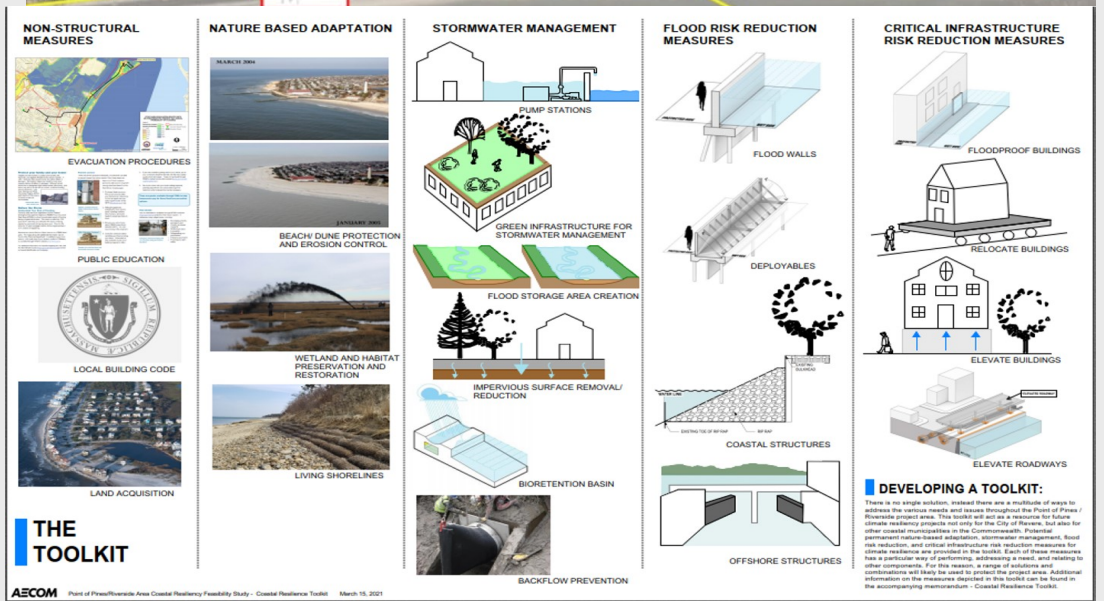
PROJECT TYPE Feasibility Study/Planning

CORE PRINCIPLES DEMONSTRATED Furthering community identified priority action; utilizing climate change data for a proactive solution; Nature-based solutions; Increasing equitable outcomes/partnerships with EJ and Climate Vulnerable populations

DESCRIPTION

- Used Commonwealth MC-FRM Flood Predictions to Evaluate Vulnerabilities
- Collaboration with Multiple Community, City, State and Federal partners
- Identified Conceptual Approaches to Protect EJ/non-EJ Populations with Combination of Structural and Nature-Based Solutions

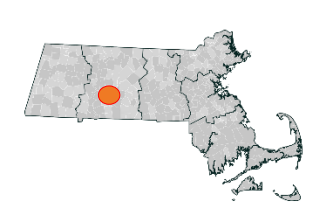




Climate Resilient South Hadley

MVP Municipal Vulnerability Preparedness

South Hadley FY21



https://www.southhadley.org/1096/Climate-Resiliency

AWARD $105,000

PROJECT TYPE Planning, Assessments & Regulatory Updates

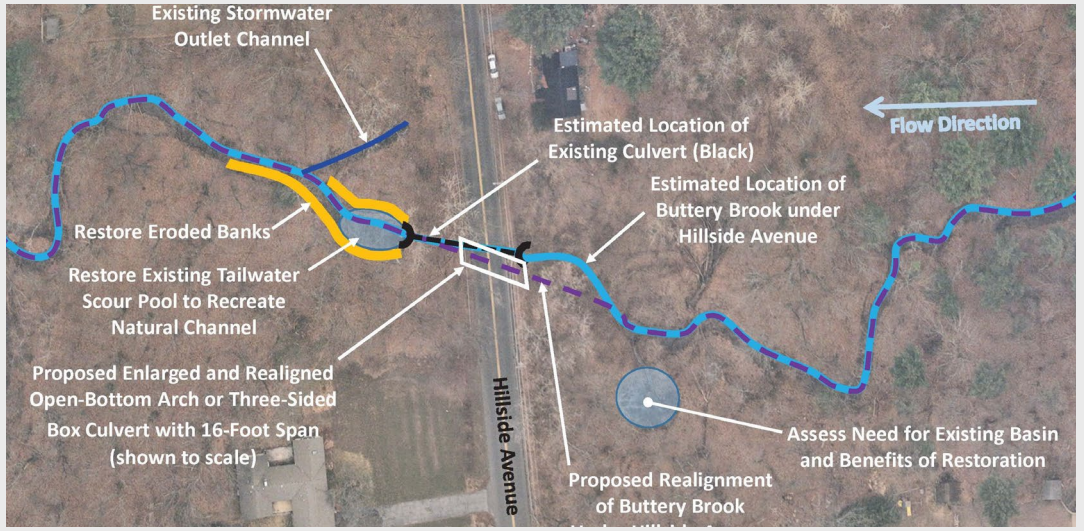
CORE PRINCIPLES DEMONSTRATED Employing Nature-Based Solutions; Achieving Broad and Multiple Community Benefits

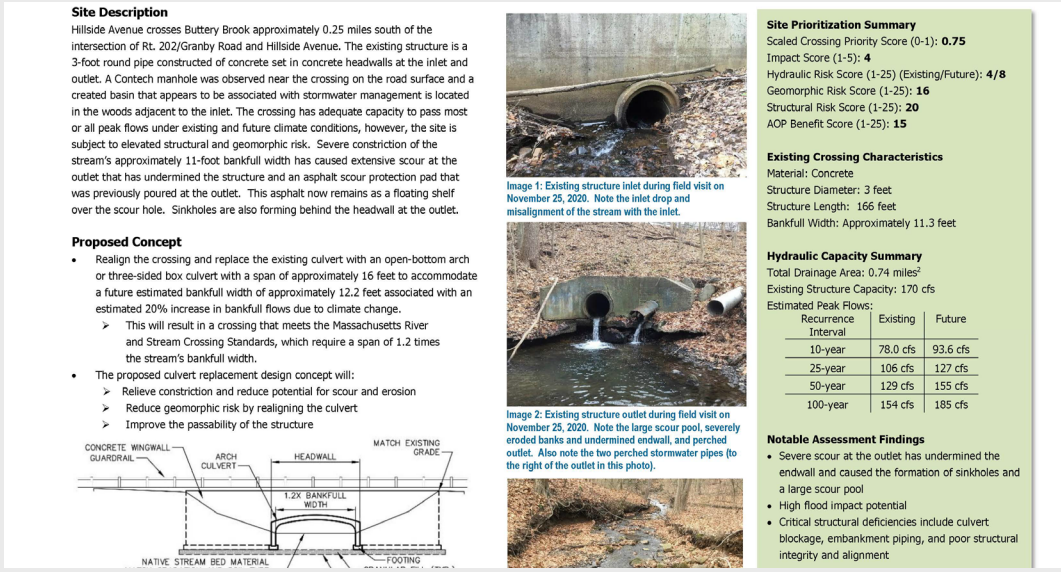
DESCRIPTION

Planted 800 trees at 160 public and private properties.

Assessed 48 road-stream crossings based on seven factors to derive vulnerability ratings and developed conceptual designs for replacement of 8 priority ranked crossings.

Reviewed local Stormwater Bylaw and other bylaws and regulations to determine feasibility of implementing green infrastructure practices and encourage climate resilient projects.





Site Description

Hillside Avenue crosses Buttery Brook approximately 0.25 miles south of the intersection of Rt. 202/Granby Road and Hillside Avenue. The existing structure is a 3-foot round pipe constructed of concrete set in concrete headwalls at the inlet and outlet. A Contech manhole was observed near the crossing on the road surface and a created basin that appears to be associated with stormwater management is located in the woods adjacent to the inlet. The crossing has adequate capacity to pass most or all peak flows under existing and future climate conditions, however, the site is subject to elevated structural and geomorphic risk. Severe constriction of the stream's approximately 11-foot bankfull width has caused extensive scour at the outlet that has undermined the structure and an asphalt scour protection pad that was previously poured at the outlet. This asphalt now remains as a floating shelf over the scour hole. Sinkholes are also forming behind the headwall at the outlet.

Proposed Concept

- Realign the crossing and replace the existing culvert with an open-bottom arch or three-sided box culvert with a span of approximately 16 feet to accommodate a future estimated bankfull width of approximately 12.2 feet associated with an estimated 20% increase in bankfull flows due to climate change.
  - This will result in a crossing that meets the Massachusetts River and Stream Crossing Standards, which require a span of 1.2 times the stream's bankfull width.
- The proposed culvert replacement design concept will:
  - Relieve constriction and reduce potential for scour and erosion
  - Reduce geomorphic risk by realigning the culvert
  - Improve the passability of the structure

Image 1: Existing structure inlet during field visit on November 25, 2020. Note the inlet drop and misalignment of the stream with the inlet.

Image 2: Existing structure outlet during field visit on November 25, 2020. Note the large scour pool, severely eroded banks and undermined endwall, and perched outlet. Also note the two perched stormwater pipes (to the right of the outlet in this photo).

Site Prioritization Summary

Scaled Crossing Priority Score (0-1): **0.75**
Impact Score (1-5): **4**
Hydraulic Risk Score (1-25) (Existing/Future): **4/8**
Geomorphic Risk Score (1-25): **16**
Structural Risk Score (1-25): **20**
AOP Benefit Score (1-25): **15**

Existing Crossing Characteristics

Material: Concrete
Structure Diameter: 3 feet
Structure Length: 166 feet
Bankfull Width: Approximately 11.3 feet

Hydraulic Capacity Summary

Total Drainage Area: 0.74 miles^2
Existing Structure Capacity: 170 cfs
Estimated Peak Flows:

Recurrence Interval	Existing	Future
10-year	78.0 cfs	93.6 cfs
25-year	106 cfs	127 cfs
50-year	129 cfs	155 cfs
100-year	154 cfs	185 cfs

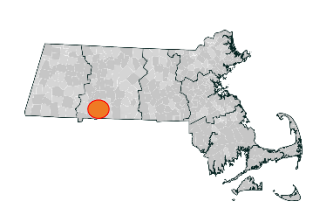
Notable Assessment Findings

- Severe scour at the outlet has undermined the endwall and caused the formation of sinkholes and a large scour pool
- High flood impact potential
- Critical structural deficiencies include culvert blockage, embankment piping, and poor structural integrity and alignment

Springfield: People-focused Resilience Redesign and Retrofits for Community/Civic Infrastructure and Critical Facilities

MVP
Municipal Vulnerability Preparedness

Springfield FY21



https://www.springfield-ma.gov/planning/index.php?id=636

AWARD $210,422.00

PROJECT TYPE Human/Civic Infrastructure Improvements

CORE PRINCIPLES DEMONSTRATED Improving equitable outcomes for and fostering strong partnerships with EJ and other climate vulnerable populations

DESCRIPTION

Created a Resilient Springfield Resident Advisor Council that consisted of non-profit, social justice stakeholders, residents and senior city staff and department heads. This group worked with a consultant on development of an improved communications/outreach strategy focused on more effectively reaching the City's most vulnerable populations.

Improved information to residents and neighborhood councils around actions undertaken to improve the City's resilience and implement the Climate Action and Resilience Plan.

Completed a racial equity in public employment assessment

Completed a microgrid feasibility study for the Springfield City Hall Complex.