Municipal Vulnerability Preparedness Program Action Grant Case Study

Municipality: Town of Southborough
Project Title: Planimetric Impervious Surface Mapping Project
Award Year (FY): FY22
Grant Award: $ 22,875 → $15,058 (used)
Match: $ 7,625 → $5,019 (used)
Match Source: In-Kind & Match
One or Two Year Project: One
Municipal Department Leading Project: Conservation Commission
Project Website URL: https://www.southboroughtown.com/conservation-commission/pages/mvp-program

Community Overview:

The Town of Southborough is located along the eastern border of Worcester County, adjacent to the MetroWest area, and has a population size of over 10,000 residents with a total land area of 15.7 square miles. A large portion of the Sudbury Reservoir resides in Southborough and encompasses approximately 1.5 square miles of area. While there are no mapped Environmental Justice populations within Southborough, there are Climate Vulnerable communities such as youth, seniors, and low-income populations/housing. The Fayville Dam was constructed in 1898 to produce several reservoirs to provide Boston with drinking water and the Sudbury Reservoir is currently designated as a back-up drinking water supply for Boston. An MBTA Commuter Rail Train Station that runs on the Framingham/Worcester line is located on the southern border adjacent to Hopkinton and Interstate 495 and Interstate 90 (Mass Pike) both pass through.

Project Description and Goals:

This project was located town wide as it created a GIS layer of all impervious surfaces throughout the town. As a town wide project, this project helped to address and better understand actions to combat climate change impacts that have a correlation with impervious surfaces, such as localized flooding, increased rainfall or precipitation amounts, extreme weather events, and rising and and/or extreme (high and low) temperatures.

The specific goals and tasks that were set out for this project were to:

1. Understand the amount (percent/sf/acreage) of impervious surfaces;
2. Understand the differences in commercial versus residential and in comparison, to open space lands in Southborough;
3. Create educational materials for town wide distribution regarding the effects of stormwater runoff, limiting impervious surfaces, and pervious alternatives;

4. Analyze if implementing a fee based structure for impervious surface per property would be a feasible and economical way to aid in future funding of stormwater management and compliance actions with Southborough's MS4 permit.
5. Analyzing information for inclusion in updates to local bylaws & regulations when possible.

The project did meet the goals set forth in the application in that there was great feedback on the Nature Based Solutions webinar held on June 15, 2022 that provided examples on both a residential and commercial scale of changes that can be implemented in Southborough. A better understanding of nature based solutions is had by those that attended or watched the recording after the fact. It also aided in increasing attendance at local native plant initiative events that were held during a similar time frame. We were hoping for a greater turnout of Climate Vulnerable Populations but information on the event and nature based solutions can now be found in the Senior Center.

In terms of regional benefits, we are thankful for our ongoing relationship with DCR and the information that this will also pertain to them. Any successes that we have for impervious surface reduction will be felt regionally by those who share the watershed.

Due to recent feedback, all public forums and informational sessions were held via webinar on Zoom, were recorded, and now made publicly available. We have created a page that houses all MVP information that can be referred to at any time. Pamphlets can found at the most trafficked buildings throughout town so that residents and visitors may take educational materials on nature based solutions and impacts of impervious surfaces within Southborough. List servs and public communication outlets were utilized such as Town website, MySouthborough (local blog), Twitter, and independent department communication lists to reach a broader audience.

There were some delays in obtaining the final deliverable from the vendor, but all deadlines to complete the grant were met. The delay in receiving the final deliverable did delay some of the informational materials by a month, but deliverables and necessary information was completed by the grant deadline. There is some internal work left to continue to clean up the raw statistical data for a better understanding of a proposed fee structure if the town decides to implement a Stormwater Impact Fee or similar.

Results and Deliverables:

The vendor outlined eleven (11) different types of impervious surfaces which are: trails, sidewalks, roads, recreational areas, pools, parking lots, pads & patios, large tanks, driveways, building roofs, and airports. Of the eleven (11) impervious types, building roofs, roads, parking lots, and driveways made up the majority of cover with them totaling 86% of the impervious surfaces within town.

The following is a breakdown of amount of impervious in square feet per impervious type:

Impervious Surface Type	Total Square Feet
Trails	427,381
Sidewalks	1,915,170
Roads	16,188,300
Recreational Areas	3,480,230
Pools	452,103
Parking Lots	9,104,520
Pads & Patios	1,435,960
Large Tanks	8,369.15
Driveways	9,264,520
Building Roofs	12,891,200
Airports	68,804.3
Total	55,236,557.45

Total Acres in Southborough: 10,048
Total Acres of Water: 960 (9.5%)
Total Acres of Land: 9,088
14% Impervious Coverage (based on total acres of land)
12.6% Impervious Coverage (total acres)

Two pamphlets were created for distribution to the general public and within letters sent to new homeowners. One pamphlet discussed what impervious surfaces can be found around residential properties and some easy changes to reduce impervious surfaces and/or their impacts. The second pamphlet was similar but targeted to commercial businesses or larger scale town-wide projects.

Two webinars were presented with the first being an overview of nature based solutions and how they are implemented in Southborough on both a residential and commercial scale with local examples. The second was a public forum on the information provided by the data layer including statistical data for the four (4) largest contributing impervious types and overall analysis of impervious surface percentages and water quality health. Both webinars were recorded are linked on the MVP website.

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Lessons Learned:

Lessons that were learned as a result of this project is that GIS projects can be difficult to analyze and manipulate when there is no designated GIS staff person within the Town. As Southborough has had limitations on IT support due to the change over in the position. As Southborough does not have desktop versions of ArcGIS or similar, a free version, QGIS, was utilized to manipulate data and export to image versions. This was sometimes difficult to complete due to limited capabilities of both computer equipment and services.

We also faced delays in getting the deliverable materials from the vendor in final format. While this is a standard issue, it is important that for future projects to allow time as a buffer in case one item does get behind schedule.

Communities that move forward with a similar project should be sure to have at least one person on staff who has recent experience with GIS in order to manipulate the layers or data to fit the needs of the community.

Partners and Other Support:

- Karen Galligan, DPW Director – review of stormwater requirements, overview of MS4 changes, assisted in discussions with Pare
- Kelly Boyd, Administrative Assistant – print, fold, and distribution of pamphlets
- Andrew Pfaff, Advisory Committee – overview and discussion of fee based system
- Kelley Freda, DCR – support for application grant, GIS assistance, & information sharing

Project Photos:

1. Route 9
2. Southville & Cordaville
3. Southborough – total
4. Residential, no aerial
5. Main St & Cordaville