

Municipal Vulnerability Preparedness Program Action Grant Case Study

Municipality: City of Fitchburg

Project Title: Bolstering Public and Private Action to Improve Flood Resilience in Baker Brook

Award Year (FY): 2022

Grant Award: \$ \$173,000

Match: \$ 58,800

Match Source: Cash funding and in-kind services. The City's in-kind match includes time to collection information, support site visits, review deliverables and provide feedback, participate in and help coordinate public engagement events, and submit monthly progress reports.

One or Two Year Project: One Year

Municipal Department Leading Project: Department of Public Works

Project Website URL: <https://www.fitchburgma.gov/979/DESIGNING-A-CLIMATE-RESILIENT-FalulahBak>

Community Overview:

- What is the population size of your community and where is it located?
 - *The population of Fitchburg, MA is about 40,318 (according to the 2010 MA Executive Office of Energy and Environmental Affairs statistics that were referenced in the study). The town of Fitchburg is in Worcester County near Leominster, off of Route 2.*
- Do you have any [Environmental Justice](#) or other Climate Vulnerable communities? (Think about both those who live and work in your town.)
 - *Fitchburg is a Gateway City, with lower household income and educational attainment than the state average, and it has a significant environmental justice (EJ) population near the project site that are lower income and from minority groups. Almost two-thirds (61.2%) or 24,680 people reside in environmental justice block groups.*
- Other unique traits of your municipality like who the top employers are, geography, history, etc.
 - *Fitchburg is located in northern Worcester County, in central Massachusetts. Before colonization and associated epidemics and exiles, this land was home to the Nipmuc, Nashaway, and the Pennacook, tribes within the Algonquian Indians. After the Revolutionary war, citizens settled near the Nashua River. A dam was constructed, and the river was utilized to power mills and shops that allowed the town to prosper as an industrial community. Once a railroad was built connecting Boston to Fitchburg, rapid development and growth occurred in the manufacturing industry. Automobiles gave way to suburban development, the General Electric plant closed, and the downtown area slowly declined during the 20th century but it remains a commercial area with rich history. Top employers include Fitchburg State University and other educational institutions, healthcare and biomedical research, paper products (Avery Dennison) and metal fabrication.*

Project Description and Goals:

- Where was the project located?
 - *The project is located within the Baker Brook subbasin. The Falulah/Baker Brook (Baker Brook) subbasin is predominately located within the City of Fitchburg, but also includes areas of Ashby, Lunenburg, and Ashburnham. Our project limit extends from the northern border of Fitchburg to the intersection of John Fitch Highway and Lunenberg Street (2A) in the south.*
- What climate change impacts did the project address?
 - *Natural and Infrastructure Flooding, Stormwater controls retrofits, Urban Heat Island, Implementation of Nature Based Solutions*
- What were the specific goals and tasks of the project as stated in your application?
 - *Revise and enhance the existing stormwater model to further evaluate potential flood prone areas and solutions by:*
 - *Extending the existing representation of Baker Brook from its current downstream limit at Summer Street to its confluence with the North Nashua River*
 - *Enhancing the level of detail within the upper reaches of the watershed to include subcatchments, as well as the City's reservoirs and other dammed impoundments, to better represent and evaluate H&H flows and potential runoff reduction measures;*
 - *Incorporating as many storm drains of 12" or larger as feasible to better understand potential capacity issues of the existing infrastructure and how it might be modified to reduce localized and/or downstream flooding.*
 - *With this information, identify potential concepts for improvements on both private and public lands. The improvements were scored and prioritized for the benefits to environmental justice populations, reduction of urban heat island, and other co-benefits to the community.*
 - *Based on this data several preliminary conceptual designs were generated for future development of Nature Based Solutions.*
 - *The final product is a targeted capital improvement plan for identified and assessed public properties and pilot retrofit program for specific private properties. The feasibility of financing this program through a stormwater and climate resilience utility was also explored.*
 - *The overall goal within the subbasin would be to reduce impervious surface by 50%, which would substantially reduce flooding at major commercial plazas within this Gateway City and reduce urban heat island effect.*
- Did your project meet the goals set forth in your application in terms of:
 - Employing nature-based solutions
 - *Yes, we identified over 30 NBS projects and brought 7 through preliminary/conceptual design.*
 - Improving equitable outcomes for and fostering strong partnerships with EJ and other Climate Vulnerable Populations

- *Investment in the neighborhood will directly benefit EJ and Climate Vulnerable Populations by increasing their public safety, access to the corridor including nearby schools and grocery stores. The reduction in impervious surface will also reduce the urban heat island effect. The entire community will benefit from the potential economic development opportunities that could be spurred by public investment. Engagement strategies included providing Spanish translated-materials and alternative forms of participation (pop-up events, website, STEM outreach) to engage a broader swath of the community.*
 - Providing regional benefits
 - *The project limits follow a major regional connector through this region. Mitigating flooding of the roadway and commercial buildings is beneficial to the broader public that uses this corridor. Improving water quality in Baker Brook and air quality will also have regional benefits for the North Nashua River and neighboring communities.*
 - Implementing the public involvement and community engagement plan set forth in your application
 - *We received community feedback on the vision and design for the NBS projects through the range of engagement strategies proposed, including online public meetings, in-person pop up events, STEM outreach at the high school, online surveys, and website and eblast communication. The input collected informed the design team and city's choices and priorities in the selected preliminary and conceptual designs.*
 - Finishing the project on time
 - *The preliminary design concepts and public engagement activities have all been completed on schedule. All reports and memos have also been completed.*

Results and Deliverables:

- Describe, and quantify (where possible) project results (e.g. square footage of habitat restored or created, increase in tree canopy coverage, etc.). Report out on the metrics outlined in your application.
 - *Updated and expanded existing H+H Memo to include the upper watershed of Baker/Falulah Brook.*
 - *Collected and catalogued Existing Conditions within watershed including instream work (erosion, dam conditions, bank issues, blockages, debris, etc.) as well as stormwater infrastructure details.*
 - *Developed Urban Heat Island (UHI) Analysis with Memo*
 - *Developed Nature Based Solutions (NBS) Analysis and Prioritization Matrix*
 - *Identified 39 NBS projects*
 - *Classified into 10 Scenarios*

- *Developed seven (7) projects into preliminary/conceptual designs (3 Public and 4 Private)*
 - *Developed Long-term Retrofit Program Feasibility Assessment to assess funding sources such as Enterprise Funds to support future retrofits.*
- Provide a brief summary of project deliverables with web links, if available.
 - *See Table on last page*

Lessons Learned:

- What lessons were learned as a result of the project? Focus on both the technical matter of the project and process-oriented lessons learned.
 - *There were a lot of unknowns in the City's GIS pertaining to stormwater infrastructure. This led to spending more time on filing in data gaps.*
 - *Having an in-house team doing both the H&H study as well as the NBS process was hugely beneficial. Those two items are so closely linked that a lot of back and forth work was needed during the analysis process.*
 - *Real time mapping on a screen at the virtual public meeting was an effective way to hear from residents about areas of concern and design considerations at specific sites.*
 - *The pop-up event (attending the Trick or Treat) was a great way to reach residents with light prep, but it was hard to get substantive input about areas of concern because most of the participants did not live in the Northern part of Fitchburg, where the watershed is located, and given the nature of the event, people wanted to just walk by quickly (vs. spending time looking at a map with us.) Some parents and kids were enthusiastic to learn about the watershed and use the interactive enviroscape model.*
 - *Surveys were an effective tool for reaching people when we were unable to do in-person activities, because we had an existing list of interested stakeholders and help from the City to get the word out. It was difficult to develop relationships with local property owners/partners for outreach via email communications.*
 - *For the high school STEM event, starting communications with schools as early as possible helped identify an appropriate timeline ideal because educators are extremely busy, and many people have to be involved and sign off on the project. One champion at the school made it possible to reach a variety of teachers and classes. On the other hand, gathering in the cafeteria made it difficult to hear over the loud HVAC system!*
 - *Materials and lesson plans were passed on for the educators to use in future classes: At the end of our activity, the teachers were excited to take our materials (maps, print outs, etc) with them.*
 - *When talking to kids about STEM education, there is value in sharing diverse backgrounds and winding paths: the teachers seemed to really appreciate how many of our staff members found their way to STEM through unconventional backgrounds, this could be something to spend more time on in future efforts.*

- *Given the number of longer-term projects of this sort that the city has going on, it would be helpful to establish a more ongoing citizen committee who could more easily track the overall initiative and give informed input.*
- What is the best way for other communities to learn from your project/process?
 - *Utilize the website that we have developed for the project*
 - *The Long-Term Retrofit Program Feasibility Assessment that looks at potential funding solutions to implement these projects provides a roadmap for any municipality to incorporate.*

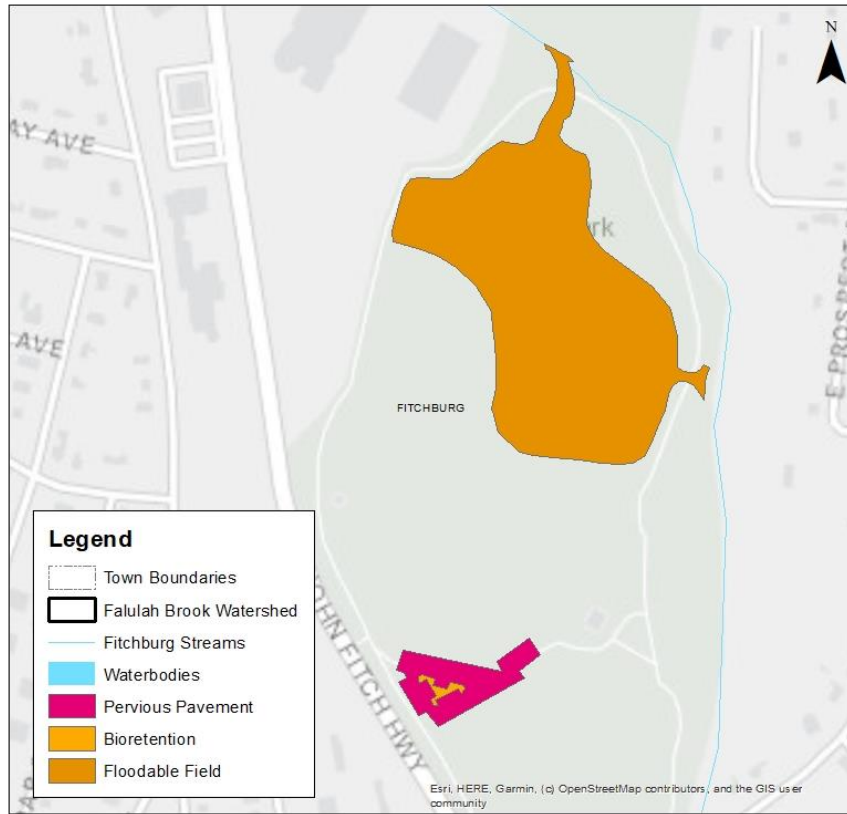
Partners and Other Support:

- Include a list of all project partners and describe their role in supporting/assisting in the project.
 - *Weston & Sampson Engineers*
 - *City of Fitchburg Department of Public Works*
 - *City of Fitchburg Public Schools*
 - *Fitchburg State University*
 - *Multiple participants in Public Hearings, Online Survey and Pop-up Event*
 - *See the attached stakeholder list for a list of all project partners and steering committee members.*

Project Photos:

- In your electronic submission of this report, please attach (as .jpg or .png) a few high-resolution (at least 300 pixels per inch) representative photos of the project. Photos should not show persons who can be easily identified, and avoid inclusion of any copyrighted, trademarked, or branded logos in the images. MVP may use these images on its website or other promotional purposes, so please also let us know if there is someone who should receive credit for taking the photo.

ROADMAP OF IMPLEMENTATION



Project Task # and Description (from Att. B):	Deliverables (from Att. B)	Progress description:	Estimated % complete:
Sub-task 0.1: Kick-off meeting with Town, EEA, and Consultant	Meeting notes, sign-in sheet	Uploaded "Kickoff call attendance and Meeting Notes" word Document	100%
Sub-task 0.2 Monthly Reports	Monthly progress reports	Uploaded Monthly Reports from Oct 2021 – June 2022,	100%
Sub-task 0.3 Project Case Study	Final case study report, power point slide, project photos	Uploaded to OneDrive	100%
Sub-task 1.1 Review Existing Information	List of data gaps	Uploaded "Data Gap Figures and Tables" which show progress from SEPT – NOV	100%
Sub-task 1.2 Field Investigations for Ecological Restoration	Stream Field Investigations and Ecological Restoration Memo	Uploaded "Field Investigation Memo" Draft and Final along with NAACC forms and cost table	100%
Sub-task 1.3 Filling Data Gaps	Field Notes and Updated Drainage Maps	Uploaded field maps, Field Investigation Export excel table of field locations and data, Photos, and data layers	100%
Sub-task 2.1 Hydrologic and Hydraulic Assessment	H&H Report	Uploaded "Hydrologic and Hydraulic Memo" w/attachments and figures .pdf	100%
Sub-task 2.2 Upstream Flood Storage Assessment and Nature-based Solutions	Upstream Flood Storage and Nature-based Solutions Assessment	Uploaded "Flood Storage NBS Memo" and Appendix A – GI Scenario Summary Tables	100%
Sub-task 2.3 Urban Heat Island Assessment	UHI memo	Uploaded "UHI Memo"	100%
Sub-task 2.4 Climate Resilience Report	Draft and Final Project Report and Cost Tables	Uploaded 2 drafts of the Report (4.12.22 and 6.17.22), along with Final Report (6.29.22).	100%
Sub-task 3.1 Public Property Alternatives Investigation	Alternatives Analysis	Uploaded "GI Prioritization Matrix" which is the Alternative Analysis Table (resulted in TOP 10), Test Pit Location Figure, Test Pit Memo that further evaluated the sites	100%
Sub-task 3.2 Preliminary Design – Public Properties	Preliminary Design for 2 sites	Uploaded Plan Set of three (3) Public Projects – Coolidge Park Floodable Field, Coolidge Park Pervious Pavement, JFH Bioretention area at Coolidge Park	100%
Sub-task 4.1 Development of "High Value" Concepts	3-6 High Value Concepts	Uploaded 2 PDF's of the Private Concepts. Four (4) concepts selected: Lutheran Church Pervious Pavement, Saima Park subsurface chambers, Elliott Field bioretention, Civic Center pervious pavement.	100%
Sub-task 4.2 Meetings with Possible Private Partners	Meeting Notes with 3-5 Private Partners	Uploaded Memo of Private Owner contacts (4 owners) and Meeting Notes from conversations	100%
Sub-task 4.3 Long-term Retrofit Program Feasibility Assessment	Enterprise Fund Feasibility Assessment and Technical Memo	Uploaded "Fitchburg Stormwater Assessment" .pdf report	100%
Sub-task 5.1 Community Kickoff	Fact sheet, press release, video/comment form/FAQ page, 2 pop-up events	Uploaded folders with documents for 1) Fact Sheets 2) Pop-up event 3) Press Release 4) Video 5) Survey (replaced 2 nd pop-up event)	100%
Sub-task 5.2 Community Conversation	1 event, 1 presentation to school	Uploaded folders for 1) Community Meeting 2) STEM Event	100%
Sub-task 5.3 Promotional Support	2 Flyers, 5 social media, website updates, e-blast	Uploaded folders with documents for 1) Flyers (1+2) 2) Social Media and Eblasts 3)Website updates 4) Stakeholder lists	100%
Sub-task 5.4 Monthly meetings	Meeting Notes	Uploaded Meeting Agenda and Notes from the monthly meetings Oct 2021 – May 2022, June 2022 pending the meeting	100%