Municipal Vulnerability Preparedness Program Action Grant Case Study

Municipality: City of Waltham
Project Title: Designing a Resilient Chester Brook
Award Year (FY): FY2023
Grant Award: $ 143,900
Match: $ 53,600
Match Source: Cash- City of Waltham
One or Two Year Project: One Year
Municipal Department Leading Project: Engineering
Project Website URL: https://www.city.waltham.ma.us/engineering/pages/chester-brook-mvp-project

Community Overview:

Waltham is a City in Middlesex County and has a population of approximately 65,000 people. According to the US Census Community Survey 5-year estimates (2015-2019), compared to the state, Waltham has a higher percentage (5% more) of residents that identify as people of color and a higher Asian/Asian American population. Waltham also has a higher Hispanic or Latino population compared to the state.

Waltham has been called "watch city" because of its association with the watch industry. Waltham Watch Company opened its factory in Waltham in 1854 and was the first company to make watches on an assembly line. It won the gold medal in 1876 at the Philadelphia Centennial Exposition. The company produced over 35 million watches, clocks and instruments before it closed in 1957. The city is now a center for research and higher education, home to Brandeis University and Bentley University as well many industries such as Raytheon Technologies, Novell, Inc., National Grid, Fresemius Medical, and constant contact, Inc.

Project Description and Goals:

The goal this MVP project is to mitigate flooding along Chester Brook by enhancing the natural storage capacity of a wetland near the YMCA in Waltham, which is adjacent to Lexington St, between Bishop Forest Dr and the access drive to the YMCA at 725 Lexington St.

Wetlands have a natural capacity to store excess water during storm events. However, the wetlands along Chester Brook have been modified significantly over the years, most significantly by the flow control structures that function as dams, impounding water in the wetland. By keeping the wetlands full, the wetlands act as ponds and have diminished capacity to store additional water volumes during storm events.

This project updated a Chester Brook hydraulic model and identified that a modified flow control structure at the YMCA wetland could be modified to return the wetlands to a more natural state, one in which water is no longer impounded during normal dry weather conditions. Restoring the capacity of the wetlands to store excess water during storms will help reduce the impact of flooding downstream.

This project included the final design for a modified flow control structure and also included the design of a boardwalk to provide access for maintenance of the flow control structure and improving access to view the wetland resource area.

Many people in the project area are currently impacted by flooding, including environmental justice populations (minority, low income, and English-isolated populations). In addition, multiple critical community assets are impacted downstream of the YMCA, such as the City's Middle School, the Chapel Hill Chauncy Hall School, and businesses, and private homes.

The project also included an education session with high school students to discuss stormwater, flooding, engineering, and climate resiliency. This was very successful and five of the students are performing follow-up summer work for the City, including field investigations of Chesterbrook and the YMCA site, and developing an updated characterization profile of the brook.

Results and Deliverables:

- The project successfully obtained flow and brook water level and rainfall data required to updated the Chesterbrook hydraulic model.
- The updated hydraulic model was successfully calibrated and provided required information concerning potential wetland sites for flood mitigation and flow storage.
- The project identified the YMCA wetland site as the best location for updating the flow control structure. The updated flow control structure will restore wetland function and also provide for flow storage and flood mitigation.
- The project completed the final design for updating the YMCA Flow Control Structure and also the design of a boardwalk to provide access for maintenance and to view the wetland resource area.
- The project deliverables can be found on the Waltham Engineering website.

Lessons Learned:

- Although the project was able to educated high school students about stormwater, flooding, engineering, and climate resiliency, it was difficult coordinating to hire students to work during the busy school year. Therefore, it was decided to have the students work with the city during the summer.
- Environmental permitting can be a long lead item, so although the design is complete, it may need to be modified based on permitting review.
- Although we were fortunate with good rain events during the 3-month monitoring period, rain is variable so the monitoring period should likely extend to 4-6 months.
- Chesterbrook travels through private property and several of the wetland and dams along the brook are private. Therefore, coordinating with these private entities early is a must but also keeping them informed during the process is important.
- Although modifying the YMCA flow control structure will not completely mitigate downstream flooding, it will help minimize flooding and will also help to restore wetland

function and future fish passage. Other communities should consider the enhancement of wetland resources for flood control. It can result in very cost-effective flood control while providing enhances to the ecology.

Partners and Other Support:

- YMCA- Allowed assessment work on site and agreed to allow modification of the flow control structure.
- Chapel Hill School- Allowed assessment work on site.
- Garden Crest Apartments- Allowed assessment work on site.
- Waltham School Department- Allowed for training session with students and assessment on property.
- Waltham High School Students- Trained on stormwater, flooding, engineering, and climate resiliency and currently assisting by characterizing Chesterbrook.