Municipal Vulnerability Preparedness Program Action Grant Case Study

Municipality: Revere, MA
Project Title: Coastal Resiliency Feasibility Study for the Point of Pines and Riverside Area
Award Year (FY): 2021
Grant Award: $ 210,689.00
Cash Match: $31,000
Total Cash Cost: $241,689
Total Match: $ 74,734.74
Match Source:
One or Two Year Project: One Year Project
Municipal Department Leading Project: Office of Strategic Planning and Community Development
Project Website URL: https://www.revere.org/business-development/projects-and-initiatives#mvp

Community Overview:

The City of Revere is a developed municipality in Suffolk County, Massachusetts located between the North Shore and Boston proper. The City's current population is approximately 63,000. The project study area (Study Area) is located within the City of Revere, at the northeastern edge of the municipal boundary adjacent to the City of Lynn. The Study Area is located on a peninsula bounded by the Pines River, the Saugus River, and the Atlantic Ocean and has a population density of over 7,800 people per square mile. Based on 2010 Census data, 36 of the 42 block groups (85.7% of block groups) in Revere are considered EJ block groups, and a total of 87.4% of the City's population lives in an EJ block group.

The Study Area is located in Census tract 1705.02, which comprises Census block group 1, located in the Point of Pines area and block group 2, located in the Riverside Area. Block group 2, which is approximately 172.8 acres, is an EJ block group with a population of 1,684 according to 2006-2010 American Community Survey estimates. The median household income of block group 2 is $34,135, compared to the median household incomes of $49,759 in Revere, $50,597 in Suffolk County, and $64,509 in the Commonwealth. Over 25% of households within this block group have a median household income at or below 65% of the statewide median income for Massachusetts ($41,930). Therefore, this block group meets the EJ criteria for income. On a scale of 0 to 1, with 1 being the most vulnerable, Census tract 1705.02 has an overall social vulnerability score of 0.5556, as ranked by the Center for Disease Control. The ranking is relative to other Census tracts in the state.

Census outreach effort shows 20% population increase in Revere resulting in more Federal, State, and local resources for the city. The City of Revere is now officially the fastest-growing city in Massachusetts. Yesterday municipalities throughout the United States received their 2020 Census Data – The data shows Revere outpacing other cities across the Commonwealth with their population rising more than twenty percent since the last census a decade ago. Revere's new population is 62,186 as of the latest census. Revere has been recognized as the fastest growing City on the Commonwealth. Recently Amazon opened a distribution facility in Revere at the former NECCO and are interested in opening

another Amazon Distribution facility at the former Showcase Cinema site. HYM is also developing a life Science facility at the former Suffolk downs site.

Project Description and Goals:

The Point of Pines and Riverside Area is a peninsular coastal community in the City of Revere that is vulnerable to coastal erosion, flooding, and coastal storm surge. In recent years the project area has been flooded due to increasingly intense coastal storms that have overtopped existing sea walls, inundating interior roads, threatening municipal drainage and sewer utilities, flooding houses, and restricting emergency access and egress. The Riverside Area is impacted several times a year by the overtopping of the Pines River onto roadways, including Mills Avenue, River Avenue, and John Avenue. The aftermath of these storm events has deposited sand along interior roadways, which poses a risk of sediment entering the municipal drainage system and diminishing its conveyance capacity, as well as safety hazards, and has required municipal clean-up efforts.

The goals of the project were to conduct a coastal resilience feasibility study to identify solutions to avoid or minimize damages associated with coastal storms and sea level rise for the Point of Pines and Riverside Area. The six tasks identified in the MVP Action Grant application and subsequently implemented were:

- Task 1: Stakeholder outreach and engagement
- Task 2: Assessment of current and future conditions
- Task 3: Identification of short-term resilience measures
- Task 4: Development of a coastal resilience toolkit
- Task 5: Assessment of feasibility of coastal resilience options
- Task 6: Preparation of a coastal resilience feasibility report that summarizes the findings from Tasks 1 through 5 and includes an implementation plan.

As summarized in the final Task 3 Memorandum Attachment A, Beach Management Plan, the Task 5 Memorandum, and the Task 6 report, the project met the goals of the application by identifying a number of potential measures that can be taken to implement nature-based solutions, including a variety of dune protection measures; potential dune restoration; living shorelines along the Riverside District coast; and a number of green infrastructure stormwater management Best Management Practices (BMPs), including rain gardens, impervious cover reduction, wetland restoration, and bioswales.

The project also improved equitable outcomes for EJ populations by identifying the need for flood protection barriers for the community in the Riverside Area along and near Mills Avenue in the northwestern portion of the Study Area. The measures identified for the EJ portion of the Study Area are similar to those identified for the non-EJ Point of Pines portion of the Study Area. Additional needs for the Riverside Area, EJ community, included development of a comprehensive drainage model, and potential need for drainage infrastructure upgrades and a pump station (pending model evaluation) to remove floodwaters from the EJ community. A representative from the EJ community was invited to all three stakeholder meetings for the project.

The project also provided regional benefits as it identified the need for improved evacuation measures (as part of the Task 3 deliverable), including measure that may affect the major Route 1A highway through the Study Area that serves areas to the north as well. In addition, the project

produced a one-page "Coastal Resilience Toolkit" flyer, that can be made available to other municipalities in the region for their reference when planning measures to improve resilience for other, nearby municipalities.

The project implemented the public involvement and community engagement plan set forth in the MVP Action Grant application. Three stakeholder workshops were held as outlined in the application, and results of the project have been made available on the City of Revere's website. Due to the COVID-19 pandemic, workshops could not be held in person and were instead held virtually and broadcast on the City's local cable television station to provide access to anyone who wished to view the proceedings.

The project was finished on time, with the final Task 6 Feasibility Report completed on June 30, 2021. All other interim deliverables were also completed within the general timeframes outlined in the MVP Action Grant application.

Results and Deliverables:

Because the project involved a planning study, no habitat restoration or other resilience measures were physically implemented. However, the various deliverables for the project identify next steps to be taken to protect numerous EJ and non-EJ residences from future inundation, including the layout of potential flood barriers for three residential areas (Riverside, Point of Pines, and Oak Island) as well as recommended dune protection measures for the Point of Pines. In addition, protection measures for the following four critical infrastructure buildings were identified in the Task 5 and 6 deliverables: Point of Pines fire station; Point of Pines stormwater pump station; Point of Pines wastewater pump station; and Riverside Area Adult Daycare facility. Finally, the study identified the general locations for dune restoration measures and numerous green infrastructure measures, including rain gardens, bioswales, living shorelines, and impervious cover reduction. The next steps for the project are to implement preliminary design of the conceptual recommendations identified.

Lessons Learned:

A variety of tools may be needed to increase the resilience of a coastal community, including barrier measures that control future floodwaters predicted to occur due to climate change as well as smaller stormwater management measures such as Green Infrastructure which may add additional co-benefits such as habitat and water quality improvement. Protection measures for the future conditions predicted to occur by the MC-FRM model may only be feasible for some future predicted nearer term years, while conditions predicted for 2050 and 2070 may be infeasible due to the heights of flood walls that would be required for protection and their associated cost as well as impact on quality of life for residents living in an increasingly isolated future condition surrounded by encroaching waters.

One of the products of the study was a one-page flyer that summarizes potential resiliency tools and applications, and this would be an efficient way to communicate information from the study to to other municipalities considering resiliency measures for their areas.

This study will lend to the exchange of data and dialogue surrounding the variety of mitigation measures discussed with Lynn, Saugus, Malden and Everett as stakeholders of the watershed. We have recently secured funding to contract MAPC to bring the communities together as a regional

working group to leverage our shared goals to mitigate flooding surrounding the Saugus and Pines River watershed.

It was surprising to realize the longer-term reality of the true impact of sea level rise on this specific region of Revere and the obstacles we face to provide protection to be withstanding beyond 2070.

The process of evaluating all potential flood mitigation opportunities including both nature based and infrastructure solutions provides the City the tools to evaluate and prioritize the most innovative and effective projects.

Partners and Other Support:

The following project partners were invited to stakeholder workshops, and some of the below provided comments on project deliverables and presentations:

- Loretta LeCentra – Riverside Area Resident

- Elaine Hurley – Riverside Area Resident
- John Polcari – Point of Pines Beach Association
- Angela Sawaya – Point of Pines Beach Association
- Stacy Livote – The Marina Restaurant
- Carolyn Meklenburg – MVP Regional Coordinator
- Greg Robbins – DCR Waterways
- Mary Lester – Saugus River Watershed Council
- Michelle O'Toole – MEMA, Hazard Mitigation Planning
- Brian Lajiness – MBTA, Manager of Emergency Operations
- Steve Miller –MassDOT, Climate Change Project Manager

Project Photos:

As indicated above, this project was a planning project rather than a construction project. Therefore, photos of constructed resilience measures are not applicable and not available. However, figures illustrating various recommendations regarding flood barriers, beach protection/restoration, and green infrastructure are provided.