

## **Municipal Vulnerability Preparedness Program Action Grant Case Study**

**Municipality:** Town of Sandwich

**Project Title:** Dynamic Adaptation Pathways and Prioritized Resilient Design Solutions for Historic Sandwich Village

**Award Year (FY):** 2022

**Grant Award:** \$ 79,789

**Match:** \$ 51,275 (\$23,945 in-kind + \$27,330 cash)

**Match Source:** in-kind and cash (from Community Preservation Fund)

**One or Two Year Project:** 1-year

**Municipal Department Leading Project:** Sandwich Department of Natural Resources

**Project Website URL:**

<https://storymaps.arcgis.com/stories/0cc1b190abbc40058219d66b2f355eaa>

### **Community Overview:**

The Town of Sandwich is located along the southwest shoreline of Cape Cod Bay. The Town includes approximately 8 miles of coastline where its residents and seasonal visitors can enjoy the beaches and salt marshes, and the scenic views of the iconic boardwalk and Cape Cod Bay. Historic Sandwich Village is a walkable commercial, municipal and cultural hub providing access to various retail shops, restaurants, Town offices and facilities, museums, and historic buildings. The Route 6A corridor, which is in the center of Historic Sandwich Village, serves as a major east-west artery, linking people in low-lying hurricane evacuation zones A and B with higher ground to the south and west.

The coastline of Sandwich is exposed to the damaging effects of nor'easters, which bring elevated water levels and high energy waves from the Atlantic Ocean as well as local storm waves generated within Cape Cod Bay to vulnerable low-lying areas of Town. The natural shorelines and barrier beaches of Sandwich east of the Cape Cod Canal are especially prone to erosion which may cause the retreat of the beaches, dunes, and barrier beaches that would otherwise provide vital protection for low lying areas of Town. Future climate change impacts, including sea level rise and increased storm frequency and intensity, will only exacerbate this problem.

### **Project Description and Goals:**

The goal of the proposed project was to develop design alternatives and dynamic adaptation pathways for reducing vulnerability to sea level rise and coastal storm surge at key assets in Historic Sandwich Village. Building on the Town's climate change vulnerability/risk assessment of municipal facilities and assets, this project initiated an extended coastal vulnerability assessment for roadways and private structures. The results of this assessment were shared with the community in a process designed to develop an understanding of stakeholder preferences and goals for the Village. The vulnerability assessment and stakeholder engagement informed the development of potential adaptation strategies and dynamic adaptation pathways for

infrastructure, municipal/commercial/residential properties and natural resources in Historic Sandwich Village. The project also advanced conceptual design of three priority adaptation demonstration projects on municipal properties showcasing strategies for adaptation, including (1) removal of a parking lot to facilitate high marsh migration, (2) realignment of a road segment to reduce future exposure to storm surge and provide space for stormwater infiltration adjacent to a salt marsh, and (3) development of a tiered open space park to provide coastal storm protection for facilities and Route 6A.

The project included several outreach and engagement initiatives, including two public forums, a public survey, several stakeholder interviews, local newspaper and television coverage, and exhibits at Heritage Museum and Gardens as well as Town Hall. Additionally, a business resiliency guide was created to provide resources to business owners on flood risk, best practices and options for increasing their own resiliency.

### **Results and Deliverables:**

The extended vulnerability assessment showed that property and roads face increasing flood vulnerability. For example, a 1% chance event could flood up to 54 buildings and 0.6 road miles in 2030, 76 buildings and 1.4 road miles in 2050, and 90 buildings and 1.8 road miles 2070.

Interactive web maps were developed to share results of the extended vulnerability assessment and engage stakeholders:

<https://tinyurl.com/SandwichVillageMapImportant>

<https://tinyurl.com/SandwichVillageMapFlooding>

<https://tinyurl.com/SandwichVillageMapAdaptation>

A series of stakeholder interviews and public survey were conducted and a summary memo was prepared. These interactions revealed that people value the historic character, business activity and access to open space in Sandwich Village. Widely held sentiments were that Sandwich Village is valued as a community and cultural hub and tourism attraction, and that businesses and historic places should be protected. There was a preference for using nature based solutions, moderate support for engineered protection and elevation, and low support for retreat.

Potential adaptation actions were developed and evaluated throughout the study area along four themes (maintain character, nature-based focus, protect/connect, and adaptive realignment). Tables, maps and dynamic adaptation pathways diagrams were presented at a community workshop for community review and comment. The final project report presents this work and community feedback. The Town identified three priority adaptation projects on municipal property to carry forward in conceptual design and rendering to demonstrate community adaptation in the Village.

Finally, the project team prepared a guide for business resilience. The document provided water surface elevation maps for businesses to self-evaluate flood risk, guidance on potential

flood protections and resilience practices, and sets of exposure data and recommendations for different types of businesses in the Village.

#### **Lessons Learned:**

- Having a variety of strategies in the toolkit is essential for effective community engagement. Project managers and partners must have knowledge of the community and its citizens, but it is equally important to utilize multiple partners and strategies to reach people where they are. This project partnered with the local council on aging and chamber of commerce, plus a local museum to engage village stakeholders. Additionally, the project leveraged email blasts, newspaper articles, social media, digital maps and the local television station to communicate about the project. This project viewed iterating on communication strategies as a way to build local awareness and trust.
- From a technical perspective, having a project team that really knows the community and its history (either through many years of municipal service or from growing up in Town, or both) is paramount to developing representative and accurate assessments and plans.
- Through this project and other local resiliency efforts, it has become increasingly clear that the Town would benefit from a Climate Change Officer, who could lead the many detailed assessments and design processes necessary throughout Town, support grant writing, and work across departments and with the community.
- On similar projects in the future, the project manager intends to engage the core team of Town staff early and often, including during the development of the grant application, so that less catch up is needed during the course of the project.
- As every town is different, and even every village within each town has its own character and unique set of relationships, the lessons learned above should be applicable to other municipalities facing similar issues.

#### **Partners and Other Support:**

- Heritage Museum and Gardens
- Sandwich Chamber of Commerce
- Sandwich Council on Aging
- Sandwich Historical Commission
- Sandwich Town Manager's Office
- Sandwich Department of Planning and Economic Development
- Sandwich Engineering Department
- Sandwich Town Archives
- Sandwich Fire Department
- Sandwich Community Television
- Woods Hole Group
- Kleinfelder

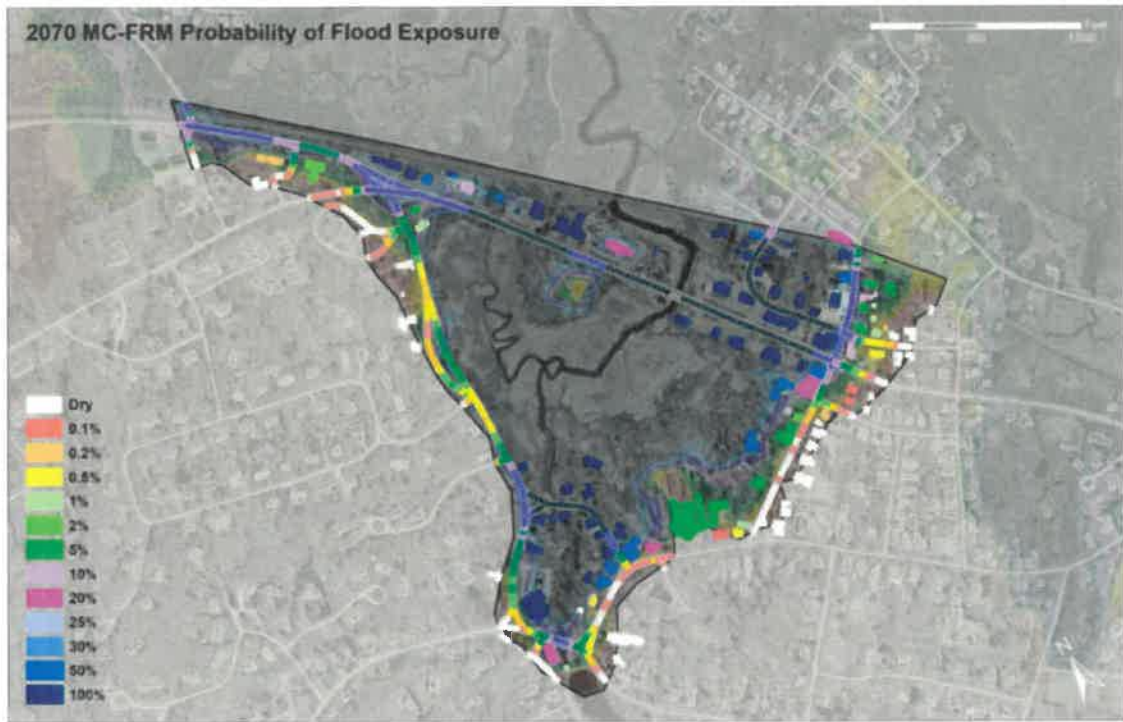
**Project Photos:**



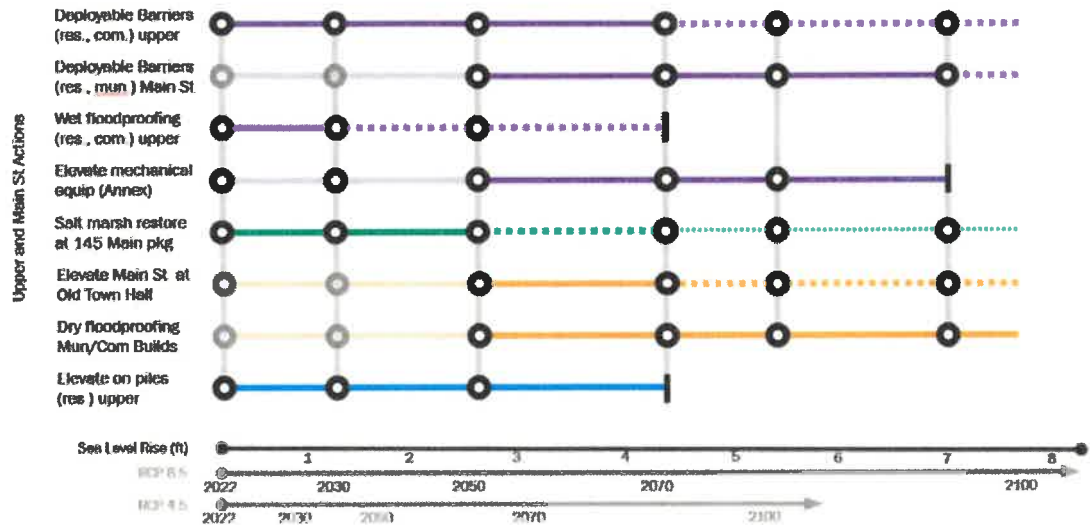
**Willow Street (2018)**



**River Street (2018)**



## River Street Corridor (Upper and Main St)







# Resilient Design Solutions for Historic Sandwich Village



## Sandwich FY22



### [Sandwich Coastal Resilience Program StoryMap](#)

[tinyurl.com/SandwichVillageMapImportant](https://tinyurl.com/SandwichVillageMapImportant)  
[tinyurl.com/SandwichVillageMapFlooding](https://tinyurl.com/SandwichVillageMapFlooding)  
[tinyurl.com/SandwichVillageMapAdaptation](https://tinyurl.com/SandwichVillageMapAdaptation)

**AWARD** \$79,789

**MATCH** \$51,275

**PROJECT TYPE** Planning, Assessments, Capacity Building, and Regulatory Updates

**CORE PRINCIPLES DEMONSTRATED** Utilizing climate change data for a proactive solution

- DESCRIPTION**
- Community-wide vulnerability assessment
  - Dynamic adaptation pathways planning
  - Business resilience guide
  - Concept plans and renderings for municipal demonstration projects, including road realignment, salt marsh migration, and protective landscape berm

