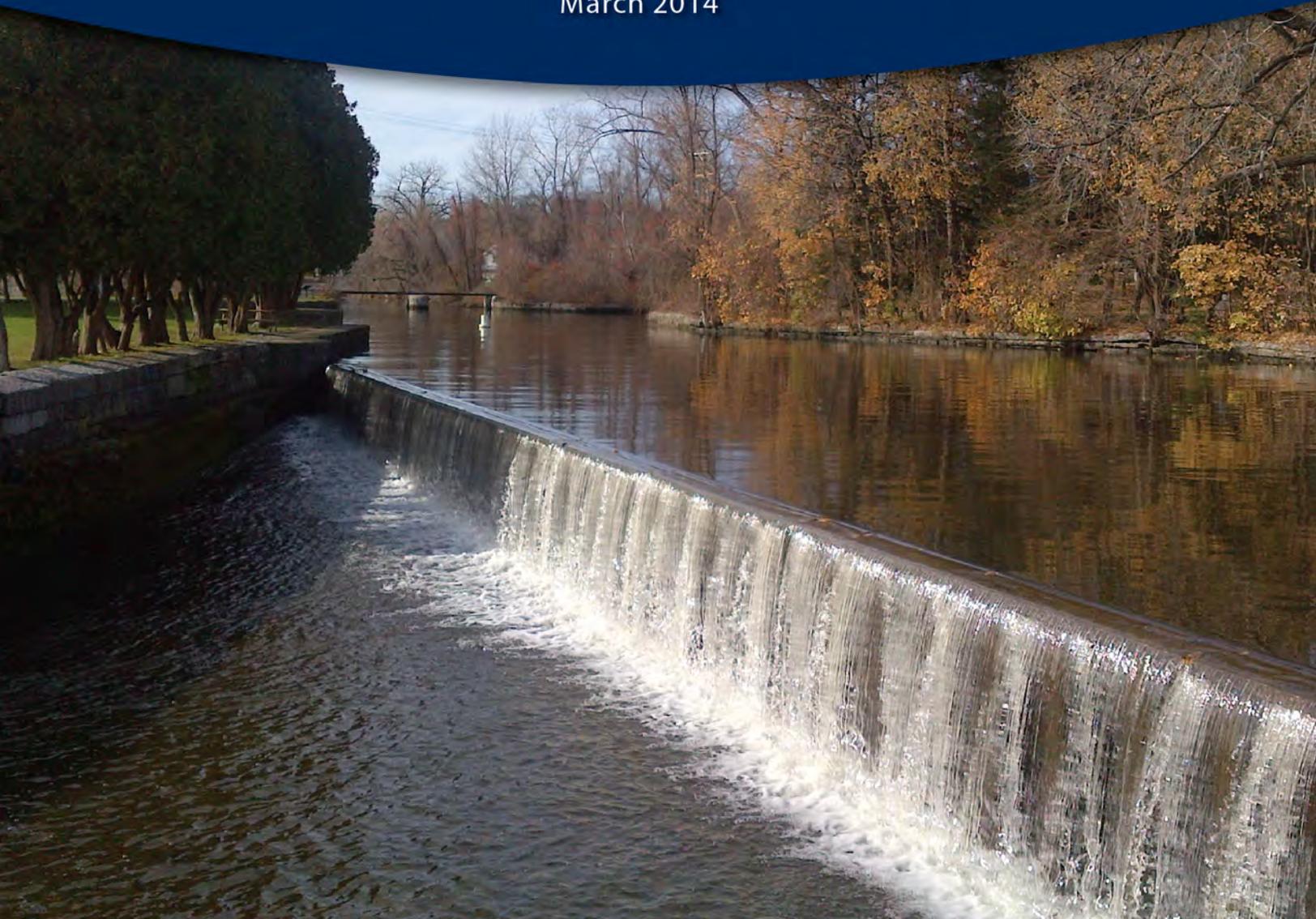




NY Rising Community Reconstruction Plan for the
VILLAGE OF WATERFORD

Prepared for the
NY Rising Community Reconstruction Program

March 2014





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This document was developed by the NY Rising Community Reconstruction (NYRCR) Waterford Planning Committee as part of the NYRCR Program within the Governor’s Office of Storm Recovery. The NYRCR Program is supported by NYS Homes and Community Renewal, NYS Department of State, and NYS Department of Transportation. The document was prepared by the following consulting firms:





Foreword

Introduction

In the span of approximately one year, beginning in August 2011, the State of New York experienced three extreme weather events. Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy wreaked havoc on the lives of New Yorkers and their communities. These tragic disasters signaled that New Yorkers are living in a new reality defined by rising sea levels and extreme weather events that will occur with increased frequency and power. They also signaled that we need to rebuild our communities in a way that will mitigate against future risks and build increased resilience.

To meet these pressing needs, Governor Andrew M. Cuomo led the charge to develop an innovative, community-driven planning program on a scale unprecedented and with resources unparalleled. The NY Rising Community Reconstruction (NYRCR) Program empowers the State's most impacted communities with the technical expertise needed to develop thorough and implementable reconstruction plans to build physically, socially, and economically resilient and sustainable communities.

Program Overview

The NYRCR Program, announced by Governor Cuomo in April of 2013, is a more than \$650 million planning and implementation process established to provide rebuilding and resiliency assistance to communities severely damaged by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy. Drawing on lessons learned from past recovery efforts, the NYRCR Program is a unique combination of bottom-up community participation and State-provided technical expertise. This powerful combination recognizes not only that community members are best positioned to assess the needs and opportunities of the places where they live and work, but also that decisions are best made when they are grounded in rigorous analysis and informed by the latest innovative solutions.

One hundred and two storm-affected localities across the State were originally designated to participate in the NYRCR Program. The State has allocated each locality between \$3 million and \$25 million to implement eligible projects identified in the NYRCR Plan. The funding for these projects is provided



Foreword

through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program.¹

Forty-five NYRCR Communities, each comprising one or more of the 102 localities, were created and led by a NYRCR Planning Committee composed of local residents, business owners, and civic leaders. Members of the Planning Committees were identified in consultation with established local leaders, community organizations, and in some cases municipalities. The NYRCR Program sets a new standard for community participation in recovery and resiliency planning, with community members leading the planning process. Across the State, more than 500 New Yorkers represent their communities by serving on Planning Committees. More than 400 Planning Committee Meetings have been held, during which Planning Committee members worked with the State’s NYRCR Program team to develop community reconstruction plans and identify opportunities to make their communities more resilient. All meetings were open to the public. An additional 125-plus Public Engagement Events attracted thousands of community members, who provided feedback on the NYRCR planning process and proposals. The NYRCR Program’s outreach has included communities that are traditionally underrepresented, such as immigrant populations and students. All planning materials are posted on the NYRCR Program’s website (www.stormrecovery.ny.gov/nyrcr), providing several ways for community members and the public to submit feedback on materials in progress.

Throughout the planning process, Planning Committees were supported by staff from the Governor’s Office of Storm Recovery (GOSR), planners from New York State (NYS) Department of State (DOS) and NYS Department of Transportation (DOT), and consultants from world-class planning firms that specialize in engineering, flood mitigation solutions, green infrastructure, and more.

With the January 2014 announcement of the NYRCR Program’s expansion to include 22 new localities, the program comprises over 2.7 million New Yorkers and covers nearly 6,500 square miles, which is equivalent to 14% of the overall State population and 12% of the State’s overall geography.

The NYRCR Program does not end with this NYRCR Plan. Governor Cuomo has allocated over \$650 million of funding to the program for implementing projects identified in the NYRCR Plans. NYRCR Communities are also eligible for additional funds through the program’s NY Rising to the Top Competition, which evaluates NYRCR Communities across eight categories, including best use of technology in the planning process, best approach to resilient economic growth, and best use of green infrastructure to bolster resilience. The winning NYRCR Community in each category will be allocated an additional \$3 million of implementation funding. The NYRCR Program is also working with both private and public institutions to identify existing funding sources and create new funding opportunities where none existed before.

¹ Five of the 102 localities in the program—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program.



The NYRCR Program has successfully coordinated with State and Federal agencies to help guide the development of feasible projects. The program has leveraged the Regional Economic Development Council's State Agency Review Teams (SARTs), comprised of representatives from dozens of State agencies and authorities, for feedback on projects proposed by NYRCR Communities. The SARTs review projects with an eye toward regulatory and permitting needs, policy objectives, and preexisting agency funding sources. The NYRCR Program is continuing to work with the SARTs to streamline the permitting process and ensure shovels are in the ground as quickly as possible.

On the pages that follow, you will see the results of months of thoughtful, diligent work by NYRCR Planning Committees, passionately committed to realizing brighter, more resilient futures for their communities.

The NYRCR Plan

This NYRCR Plan is an important step toward rebuilding a more resilient community. Each NYRCR Planning Committee began the planning process by defining the scope of its planning area, assessing storm damage, and identifying critical issues. Next, the Planning Committee inventoried critical assets in the community and assessed the assets' exposure to risk. On the basis of this work, the Planning Committee described recovery and resiliency needs and identified opportunities. The Planning Committee then developed a series of comprehensive reconstruction and resiliency strategies, and identified projects and implementation actions to help fulfill those strategies.

The projects and actions set forth in this NYRCR Plan are divided into three categories. The order in which the projects and actions are listed in this NYRCR Plan does not necessarily indicate the NYRCR Community's prioritization of these projects and actions. **Proposed Projects** are projects proposed for funding through a NYRCR Community's allocation of CDBG-DR funding. **Featured Projects** are projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. **Additional Resiliency Recommendations** are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects. The Proposed Projects and Featured Projects found in this NYRCR Plan were voted for inclusion by official voting members of the Planning Committee. Those voting members with conflicts of interest recused themselves from voting on any affected projects, as required by the NYRCR Ethics Handbook and Code of Conduct.

NYRCR Waterford is eligible for up to \$3 million in CDBG-DR implementation funds.

While developing projects for inclusion in this NYRCR Plan, Planning Committees took into account cost estimates, cost-benefit analyses, the effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. Planning Committees also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding. Projects and actions implemented with this source of Federal funding must fall into a Federally-designated eligible activity category, fulfill a national objective (meeting an urgent need, removing slums and blight, or benefiting low to moderate income individuals), and have a tie to the natural disaster to which the funding is linked.

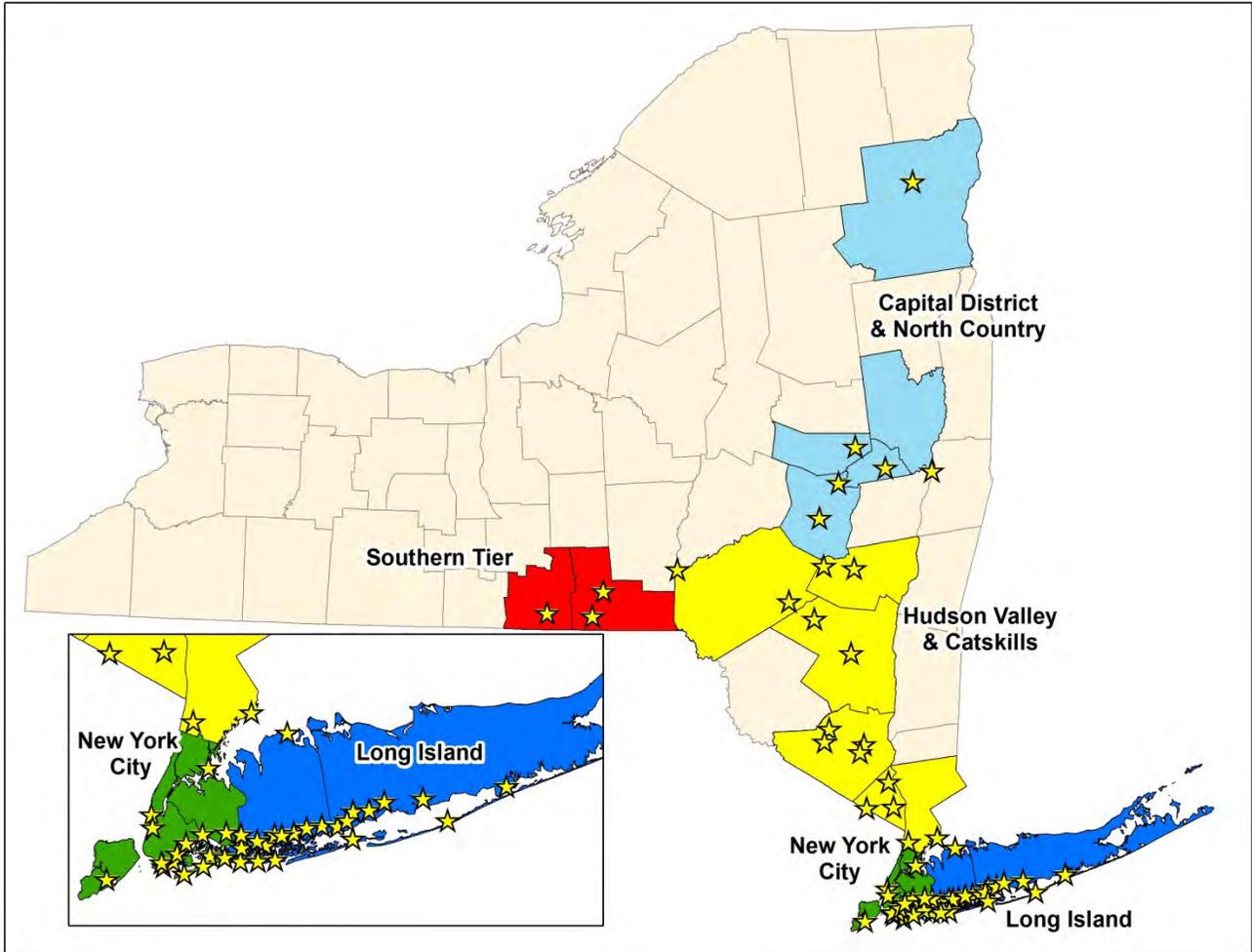


Foreword

These are among the factors that the Governor’s Office of Storm Recovery will consider, in consultation with local municipalities and nonprofit organizations, when determining which projects and actions are best positioned for implementation.

The total cost of Proposed Projects in this NYRCR Plan exceeds the NYRCR Community’s CDBG-DR allocation to allow for flexibility if some Proposed Projects cannot be implemented due to environmental review, HUD eligibility, technical feasibility, or other factors. Implementation of the projects and actions found in this NYRCR Plan are subject to applicable Federal, State, and local laws and regulations, including the Americans with Disabilities Act (ADA). Inclusion of a project or action in this NYRCR Plan does not guarantee that a particular project or action will be eligible for CDBG-DR funding or that it will be implemented. The Governor’s Office of Storm Recovery will actively seek to match projects with funding sources.

In the months and years to follow, many of the projects and actions outlined in this NYRCR Plan will become a reality helping New York not only to rebuild, but also to build back better.



www.stormrecovery.ny.gov/nyrcr

NYRCR Communities²

² Note: map includes those NYRCR Communities funded through the CDBG-DR program, including the NYRCR Communities announced in January 2014.



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The Village is characterized by dense neighborhoods with many attractive and historic homes.



Peeble's Park Bridge connects the Village to Peeble's Island State Park.

Executive Summary

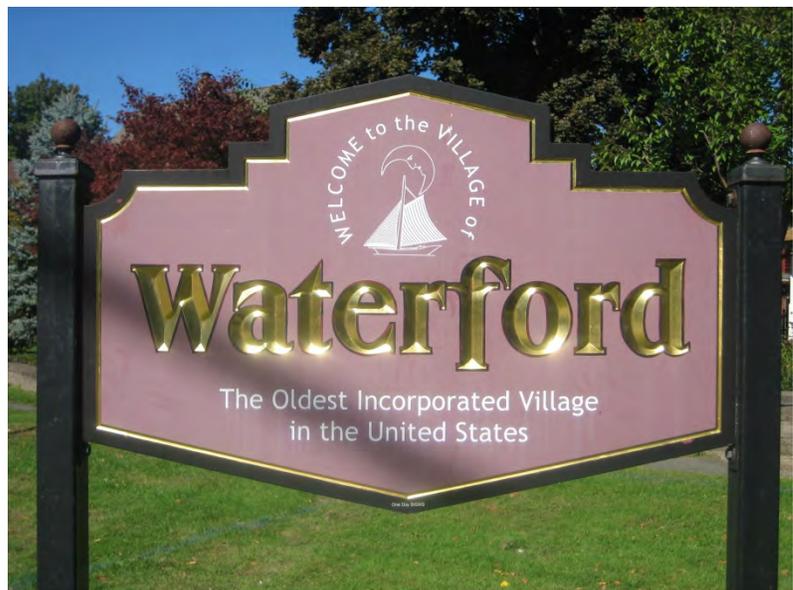
Background

The historic Village of Waterford is located approximately ten miles north of the City of Albany at the southeastern tip of Saratoga County. Three water bodies converge at the Village: the northernmost branch of the Mohawk River, the Hudson River, and the eastern terminus of the Erie Canal. The Village's harbor is a key community landmark and a destination for recreational boaters. The neighborhood adjacent to the harbor is subject to regular flooding when the Mohawk reaches flood stage. But Waterford experienced some of the most extreme floods on record when Hurricane Irene hit in August of 2011.

New York Governor Andrew M. Cuomo created the NY Rising Community Reconstruction (NYRCR) Program to assist communities like Waterford that were devastated by Superstorm Sandy, Hurricane Irene and/or Tropical Storm Lee to develop plans that identify strategies, projects and actions which will contribute to community resiliency and reduced vulnerability to flooding. .

The Waterford NYRCR Plan assesses the risk posed to key community assets, identifies strategies to address flood risk and other critical issues, and presents projects that will make Waterford more resilient in the face of future flooding. Under the NYRCR Program the Village of Waterford is eligible for up to \$3 million to implement these projects.

The planning process was informed by the community's experience during Hurricane Irene in August 2011, when the Mohawk River rose to one of the highest levels recorded in the last 100 years. More than 90 homes were damaged by Irene, which directly affected a significant number of the Village's 2,000 residents. In the wake of the storm, the Village fire department coordinated the efforts of 18 fire departments that worked together to meet residents' immediate needs and to clean up from the disaster. While the Vil-



Village of Waterford: The oldest continuously incorporated village in the United States



lage appears to have recovered from the devastation brought by Irene, there is still unmet need, and significant sections of the Village are still vulnerable to flood damage during future storms.

Critical issues for the Village

A number of critical issues were taken into consideration in development of the NYRCR plan for the Village of Waterford:

- Houses in the 100-year floodplain must be better protected against flooding. The community is generally well adapted to flooding based on its history of flooding, but with the observed increase in major storm events in recent decades, addressing risk to the most vulnerable homes is critical. Actions to strengthen and protect the housing stock should contribute to the preservation and improvement of the Village’s historic character and charm.
- Fire and emergency services need to be fortified with a new, consolidated facility and additional equipment.
- Drainage issues that contributed to flooding during Irene must be addressed to protect nearby homes against future flooding.
- Recreational and streetscape improvements should increase resilience while also improving accessibility.
- The community should pursue economic development measures that complement actions to increase long-term resiliency against floods.



View of Waterford Canal Harbor and Visitor’s Center



The second of three public meetings conducted during the planning period was held in November 2013.

A Community-Driven Planning Effort

The NYRCR planning effort was spearheaded by the Village of Waterford NYRCR Planning Committee (Committee), made up of Village residents, stakeholders, and community leaders. The Committee worked together to develop a vision of resilience for the Village of Waterford, which was presented to the public for comment and feedback.

Community Vision

The Village of Waterford envisions a Community Reconstruction Program that will provide a strategy for addressing past flood damage and for developing long-term solutions aimed at making the Village better able to manage and cope with future storm and flooding events. In developing the program, we will recognize the unique character of the Community, including its historic building stock and the economic and recreational assets of its waterfront resources along the State Canal System, Hudson River, and Mohawk River.

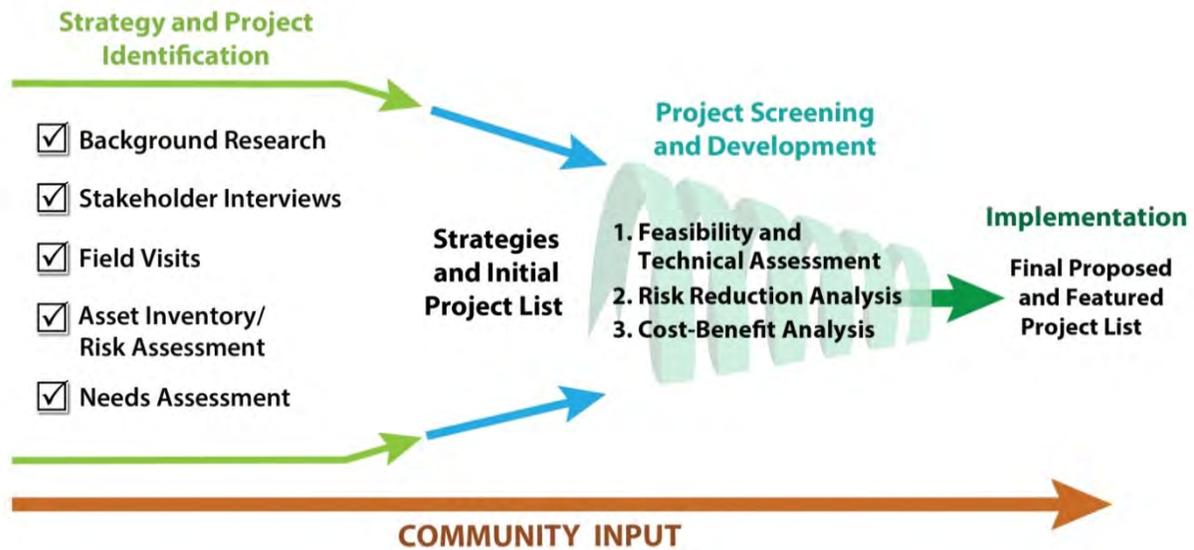
Public outreach was essential to the planning process, both to educate community members and to receive public input. Residents, public and private agencies, and community organizations provided direction through public meetings and via social media. Three public meetings were held during the eight-month planning period, with a fourth public meeting scheduled to present the completed plan. The meetings were well attended, with no less than 40 people at each public meeting. To complement the public meetings, the Governor's Office of Storm Recovery's website was used to provide updates and receive comments, and the Planning Committee created a Facebook page to provide an additional venue for communication with community members.

A blueprint for implementation

The NYRCR planning process culminated in the development of strategies and the selection of projects. The Planning Committee developed these strategies and projects based on a comprehensive inventory of community assets, an assessment of risk to those assets in the event of a flood, and identification of needs and opportunities to make assets more resilient and support the social and economic vitality of the Village.

The Planning Committee identified more than 50 community assets and assessed the flood risk to each. The Waterford Village Historic District was found to be the asset at greatest risk, validating an emphasis placed by the Committee on addressing flood risk to housing stock in the 100-year floodplain.

The figure below outlines the process taken by the Planning Committee to develop resiliency strategies and projects.



Projects were then divided among three categories: Proposed, Featured, and Additional Resiliency Recommendations.

- Proposed Projects are projects proposed for funding through a NYRCR Community’s allocation of CDBG-DR funding.
- Featured Projects are projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program.
- Additional Resiliency Recommendations are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects.

Proposed and Featured projects in the Waterford NYRCR plan are listed below, organized by strategy. Projects are all “Proposed” except for those marked “Featured.” Projects are not ranked, or listed in priority order.

- Strategy: Strengthen the Village’s emergency response capacity through enhanced communications, expanded community awareness, and improved response services.
 - ❖ Emergency Response Measures Project
 - ❖ Consolidated Firehouse Phase I Project
 - ❖ Consolidated Firehouse Phase II Project (Featured)
- Strategy: Reduce flood risk to housing stock in the 100-year floodplain.
 - ❖ Building Resiliency Program
 - ❖ Home Buyout Program

- Strategy: Improve Village infrastructure to better manage flood waters.
 - ❖ Street Resiliency Project
 - ❖ Wetland Drainage System Improvements
- Strategy: Support community development through activities that encourage the engagement of tourists and residents in the community.
 - ❖ (No Proposed or Featured projects pertain to this strategy.)

The Waterford NYRCR Plan provides a blueprint for implementing strategies and projects that together strengthen and protect Community assets, address critical issues, and contribute to the long-term vibrancy of the Village of Waterford.





Scene from the Tugboat Roundup held in Waterford every September
Source: Fred Wehner

I. Community overview

Section I sets the stage for the Village of Waterford's NY Rising Community Reconstruction (NYRCR) Plan. It includes:

- A description of the Village of Waterford (the geographic scope);
- A description of storm damage and the recovery process;
- A discussion of critical issues facing the Community;
- The Community vision; and
- A discussion of the relationship of the NYRCR Plan to other regional plans and initiatives.



I. Community overview

The Village of Waterford is located in the southeastern corner of Saratoga County, at the confluence of the Hudson River, the northernmost branch of the Mohawk River, and the eastern terminus of the Erie Canal (see Figure 1).

Initially settled in 1633 and incorporated in 1794, it is the oldest continually incorporated village in the United States. The Village is less than a half square mile in total area and primarily residential with a population over 2,000 residents. The history of the Village is evident in its buildings, streets, historic markers, canals and museum, as well as in its close knit community comprising many families whose presence extends across generations.



View of Broad Street, the Village's commercial corridor

Along the waterfront are mostly residential streets with the exception of several parks, and a harbor and visitor's center that hosts festivals, public gatherings, and a summer farmer's market. The Village's main commercial corridor, Broad Street, lies three blocks from the Mohawk River. The annual Tugboat Roundup pays tribute to the Village's historically significant location at the east end of the Erie Canal, features dozens of tugboats and brings in as many as 25,000 people over the course of the weekend following Labor Day.

The Old Champlain Canal divides the Village in two halves. While the western half is above the floodplain, nearly the entire eastern half of the Village is located in a 100-year floodplain, with some added areas in the 500-year floodplain. The Waterford Village Historic District, a 31-acre neighborhood largely east of the Old Champlain Canal (see Figure 1), contains structures built as early as 1799 and features Greek revival, Federal and late Victorian architecture. The historic district was listed on the National Register of Historic Places in 1977.

The Village's three principal waterways and the Old Champlain Canal converge at its southern tip (see Figure 1). This section of the Village, known locally as "the Battery", after the site's former strategic location and fortification during the American Revolutionary War, is subject to recurring floods. It is especially susceptible to damage during storm events and during the spring thaw when ice jams block flow along the Hudson and Mohawk Rivers. It is bounded to the north by Middle Street, to the east by the Hudson River, to the south by the Erie Canal, and to the west by the Old Champlain Canal. The narrow streets within this neighborhood contain charming, well maintained wood-framed homes laid out in a grid pattern. Broad Street is largely protected from regular flooding due to its elevation. Nevertheless, portions of Broad Street fall in the 100-year floodplain.



Figure 1: Geographic Scope
Village of Waterford



- County Boundary
- Geographic Scope
- Park Boundary
- Historic District



ESRI - World Topo Imagery





I. Community overview

The Waterford Flight of Locks, comprising the first five locks of the Erie Canal, provides an impressive 169-foot lift, connecting the Hudson River to the Mohawk. The New York State (NYS) Canal Corporation, in partnership with the Village, has constructed substantial public improvements at the canal, establishing the Village as one of eight major harbor centers across the NYS Canal System catering to recreational boats and generating economic and recreational benefits for residents. The Village works in close partnership with the NYS Canal Corporation, NYS Department of State, and other State agencies to further strengthen the Community's major waterfront asset.

The residents of the Village of Waterford have had their resolve tested time and again by rising waters, and yet the community continues to bounce back. The risk of serious flooding is a way of life in Waterford and residents routinely refer to previous floods simply by year: the flood of '77, '48, '36, '13. Parents and grandparents have passed stories of destruction and recovery down through generations. Perseverance and resilience are as much a part of the Waterford community character as the canal system and the annual Tugboat Roundup.

A. Geographic scope of the NYRCR Plan

The NYRCR planning effort was led locally by the Waterford NYRCR Planning Committee, which consists of Village residents, stakeholders, and community leaders. The Committee carefully considered the geographic study area and flood areas, and determined that it would be most appropriate to include the entire Village in this planning process (see Figure 1).



Photo credit: Fred Wehner

Tugboats at the Waterford Canal Harbor during the annual Tugboat Roundup

By including both the parts of the Village that are susceptible to regular flooding and those that are at higher elevation, the committee recognizes the impact of flooding on the entire community. For example, even though the Broad Street corridor is not prone to regular flooding, it is within the 100-year floodplain. The corridor is critical to the Village's economic viability, and its businesses are affected by flooding in the area. While the study area does not extend beyond the Village boundaries, the plan does recognize the importance of infrastructure such as roads and the wastewater treatment facility located outside Village boundaries that serve the Village.

It should also be noted that the Waterford Village Historic District cuts across both areas at high risk of flooding and at lower risk of flooding. As shown in Figure 2, nearly the entire eastern half of the Village is in a floodplain, with most of it in the 100-year floodplain, including many homes in the historic district.

**Figure 2: Flood Zones
Village of Waterford**



Geographic Scope

- 500-Year Flood Zone
- 100-Year Flood Zone
- Extent of Irene Flooding
- Park Boundary
- County Boundary

0 125 250 500 Feet

ESRI - World Topo Imagery



I. Community Overview

B. Description of damage from Hurricane Irene

The Village's familiarity with flooding events and the slow path of destruction that they witnessed as Hurricane Irene tore through the Gulf and up the eastern seaboard put the residents in Waterford on notice in August 2011. They responded with the inherent understanding of the storm's potential and the focused resolve of a community that knows the power of floodwaters.

An emergency response meeting was held Sunday evening at 6 pm and an emergency declaration was issued. On Monday, August 29, the Mohawk River crested at 27 feet, leaving destruction in its wake. A central command post was established in the meeting room at Kavanaugh Hook & Ladder Company, where emergency crews made available the best of the equipment they had, drawing on their resourcefulness and their sense of common purpose. Crews used portable radios and accessed the internet on smart phones.

Handwritten notes on the wall monitored progress and identified need. Despite the challenge of coordinating multiple agencies, 18 fire departments and 180 firefighters came together to help pump water out of homes and clean up debris.



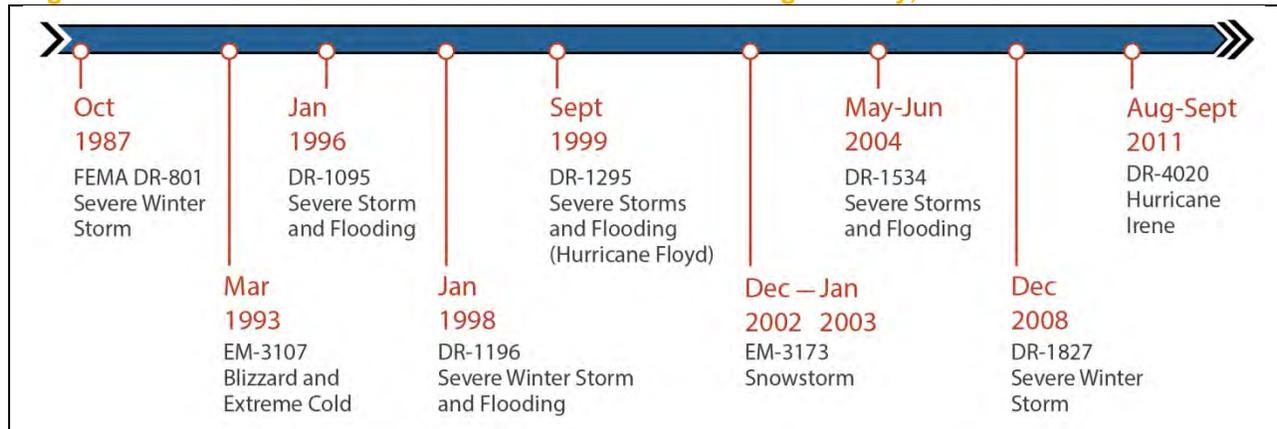
Photo credit: J. Bert Mahoney

Flooding on Second Street after Hurricane Irene

Water levels reached during Irene were some of the highest since the legendary flood of 1913, but it is not uncommon for severe weather events and flooding to impact the Village of Waterford. In the period from 1987 to 2011, the Village was hit by nine events for which FEMA disaster declarations were issued in the County (see Figure 3).¹



Figure 3 FEMA Disaster Declarations issued in Saratoga County, 1987-2011



Source: Saratoga County Multi-Jurisdictional All-Hazard Mitigation Plan (2009).

In the wake of Irene, every house south of Middle Street and east of Fourth Street experienced flooding which in many homes rose several feet into the first floor. Homes on adjacent streets experienced fully flooded basements and damage to property. Sections of the Village north of Broad Street also experienced flooding between Second Street and the Hudson River, and by the Old Champlain Canal near State Street, due to deficiencies in the infrastructure that drains stormwater from wetlands to the Hudson River (see Figure 2).

For residents Grant and AnneMarie Morrissey, the sheer force of the water was too much for their house to bear. They were able to get to safety before the waters came, but the floodwaters raised the house they had lived in for 40 years and slammed it back down on its foundation, leaving it turned sideways on the lot. People in Waterford like the Morrisseys are committed to and invested in the community; however, this time rebuilding would have cost more than the Morrissey’s home was worth, so they made the decision to level the home, sell the lot to their neighbor, and relocate within the Village.

More than 90 residential structures were damaged by Hurricane Irene, and 84 insurance claims totaling \$2,386,077 were filed. In the immediate aftermath of the storm, several flooded residents took first steps to move recovered belongings into storage units on their properties. Days later Tropical Storm Lee brought heavy sustained winds and inches of additional rain to already saturated ground and overflowing riverbanks. Several among those who had moved their salvageable belongings to storage after Hurricane Irene found their units flooded by Tropical Storm Lee.



I. Community Overview



Photo credit: J. Bert Mahoney

Damaged items removed from a flooded home

Through difficulties and setbacks, Waterford remains a community with a deep sense of self and a strength that comes from having weathered collective challenges. Together, its residents have experienced the kind of loss that makes the extraneous fall away and leaves in its place a clear perspective and an appreciation of what really matters. Even those facing the most daunting recovery scenarios chose to stay in the community.

Two years later, most residents have fully recovered from the flood, but markings made on structures to document

the highest level the water reached are a constant reminder of Hurricane Irene. The NYRCR Planning process has brought Waterford residents together to begin a dialogue and explore options that will allow their Village to not only bounce back, but to do so in a more resilient and sustainable way.

C. Summary of critical issues

The following critical community issues were identified based on input from the Committee, public events, discussions with Community leaders, research, and results from the Needs and Opportunities Assessment described in Section II. This section summarizes these critical issues according to the Federal Emergency Management Agency (FEMA) National Disaster Recovery Framework (NDRF). The NDRF, organized by six FEMA Recovery Support Functions, provides communities impacted by a disaster a structure to follow to determine the appropriate mitigation efforts that restore, redevelop, and revitalize the health, social, economic, natural and cultural resources components of the affected community. These issues are further explained and defined in Sections II and III. Some are directly addressed by the projects proposed in Section IV.

i. Community planning and capacity building

The issue of greatest concern to the Village is the homes located in the 100-year floodplain, many of which experience regular flooding. The Committee expressed concern that increasing costs and risks of ownership are creating a hardship for the homeowners, which may accelerate foreclosures and abandonment of properties, depress real estate values, and dampen the historic charm and character of the Village. For the Community to build resiliency, it will need to engage in continued efforts to find ways to mitigate flood impacts.



A key constraint for the Village is related to local emergency response and the delivery of emergency services. The Village has three fire response facilities located within a quarter mile of each other. This fragmentation led to logistical difficulties during Hurricane Irene and can cause longer response times during all events. During Hurricane Irene various fire districts from Saratoga County and neighboring municipalities came to aid the Village. This outpouring of support posed additional operational challenges and required for the first time that a command center be established to coordinate official orders. This experience suggests that the consolidation of the Village's three fire response facilities into a single facility would improve emergency response efforts and streamline emergency response operations. Consolidation into a modern facility would also eliminate the need for costly custom-built fire apparatus presently required because of the age and limitations of the three fire facilities. A site plan for the consolidated fire services was developed in 1997, and potential sites for the new firehouse have been identified.

Village officials and emergency responders to Hurricane Irene were commended for their work, but there was a realization that there may be opportunities to improve communication between Village officials and residents during emergency events, as well as between local emergency responders and responders from neighboring communities. Committee members and attendees of public meetings, as well as the Saratoga County Multi-Jurisdictional All-Hazard Mitigation Plan (2009), have identified the need for a better communications system. This would include tapping into social media, reverse 911, and text alerts to notify everyone potentially affected by an event, as well as coordinating with the new Canal Corridor Flood Warning System being developed by New York State. The Committee also proposed the establishment of a database to provide a tool for neighborhoods in FEMA-mapped flood zones to collaborate and to allow residents to check in and check out when evacuation was deemed necessary. This would give responders a better idea of who was still at risk and save time in going door to door. This system would have to be accessible remotely to allow those who were out of town or had already fled to check and alert responders of their status.



Period street lamps on Broad Street reflect the Village's historic character.

Although many residents have dealt with flood issues for years, periodic training and public education would help significantly increase community resiliency and preparedness. A public workshop series could be held to educate residents on topics such as flood insurance methodology, waterway management, procedures during flood events, how to make structures more flood resilient, and available funding opportunities.



I. Community Overview

ii. Economic development

The Village of Waterford is primarily residential and nearly completely developed. As such, it must maximize its existing resources and build on its strengths. Core economic strengths include a dense, walkable community with a vibrant “main street” corridor, proximity to major waterways, and the community’s strong historic character.

Specifically, the Broad Street commercial corridor, which runs from east to west through the center of the Village, can be strengthened through strategic investment. The Village’s Local Waterfront Revitalization Program (2008) proposes attracting neighborhood-oriented and tourism-related businesses to Broad Street that cater to the needs of current residents as well as tourists. An understanding of the existing local economy, including consumer goods and services not currently available, would help strategically target potential businesses to establish themselves in the Village and help keep local dollars within the Community.

While tourism alone cannot be relied upon as the backbone of the Village’s economy, more money from tourism can be captured if the area is properly marketed and branded by leveraging the historic and cultural resources of the Village. A local branding or marketing campaign would support this goal.

Finally, the continuing and consistent threat of flooding in the neighborhoods that adjoin the Mohawk River is a basic economic concern. This poses a direct threat to property values because repeated loss from flooding has led to disinvestment in flood-prone homes. The loss of value on the residents’ primary financial asset—their homes, whether real or perceived, would destabilize the Village economy as the overall budget of the Village government would be impacted through decreased revenues from the property tax levy. There also is the fear that one day flood insurance rates may become a driver for loss of value. This is one reason why the residents seek to pursue flood mitigation measures which will also strengthen neighborhood-oriented and tourism-related business.

iii. Health and social services

The Village enjoys a low poverty rate and high employment rate, limiting the need for Village-operated health or social services. To increase the resiliency of existing Village health and social services, it will be necessary to ensure that the resident population most at risk during flooding events is protected and has continued access to shelter, food, and emergency services.

The Village has a senior center that also acts as a public meeting space, but this center is located in the 100-year floodplain, has limited capacity inside and limited parking outside. The Committee and the public identified the need for a community center outside of the floodplain that could potentially double as a relief site during storm events for Village residents and vulnerable populations such as seniors.



Village residents have also identified the need for a one-stop information center with a physical location within the Community that would be open during storm and emergency events. This center would provide residents with accurate and official information leading up to and during a storm. In the aftermath of an event, personnel at the center could instruct residents on whether or not they qualify for FEMA relief, provide instruction and assistance with paperwork related to flood insurance, and provide information about other programs for flood victims. While the Saratoga County Multi-Jurisdictional All-Hazard Mitigation Plan (2009) identified the need for periodic lectures as a means of community education and outreach, no formal center where residents can receive information specific to insurance, available grants, or other related paperwork is currently available. Although several buildings exist that could potentially be retrofitted or reused for this purpose, incorporating this one-stop information portal into a new centralized firehouse as discussed above could offer co-benefits and reduce the overall costs.

As part of the National Flood Insurance Program (NFIP), the Community Rating System (CRS) provides discounted flood insurance premiums to communities that undertake floodplain management activities beyond the minimum required by the NFIP. Through the implementation of eligible activities a participating community is awarded a number of points which places them in a class. Each class corresponds with discounts to premiums; with Class 1 rated communities eligible for the highest premium discounts of 45%. Eligible activities are organized under four categories: 1) public information activities, 2) mapping and regulations, 3) flood damage reduction activities, and 4) flood warning and response.

iv. Housing

According to the 2010 U.S. Census, the Village of Waterford contains 1,055 housing units, 91% of which are occupied; of the occupied units, 44% are owner occupied. The geographic land use pattern of the Village places residential areas within the most flood-prone areas of the Village. Many of the planning documents reviewed, some of which are highlighted in Section I.E., identified minimizing flood damage to residential structures as a primary need, which was further corroborated by resident input. This has resulted in a better understanding of the extent of the need to build resilience into local homes.

The events surrounding Hurricane Irene in August 2011 brought some of the highest water crests that the Village of Waterford has ever seen. Although not a historic high, Hurricane Irene's crest reached 27 feet, causing significant damage to the Battery neighborhood and overflowing a wetland to the north of Broad Street, causing damage to homes there as well. Eighty-four insurance claims were submitted for Hurricane Irene and Tropical Storm Lee, for a combined total of \$2,386,077. The average claim was \$28,406, while the median was \$16,206. Two homes that had been owner-occupied were lost as a result of Hurricane Irene.

The Village is not currently eligible to participate in FEMA's Community Rating System (CRS) due to the number of unmitigated repetitive loss properties. However, by taking pro-active measures to increase community resiliency against flooding such as those recommended in this Plan, the Village would potentially become eligible, which could lead to reductions in residents' flood insurance rates while also educating residents, reducing vulnerability to flooding, and addressing repetitive loss issues. Enrollment



I. Community Overview

would require development of a plan to address properties that have suffered substantial damage on multiple occasions.

Opportunities related to the implementation of structural improvements have been identified as another option to build resiliency. Those opportunities include addressing the structural and elevation inadequacies of the homes within the floodplain to guarantee that a safe living condition is maintained throughout a future flood event. To estimate the number of properties that could benefit from structural improvements, a housing assessment was performed in areas of the Village identified as having high flood risk. The determination of high risk areas was made by examining the distribution of flood insurance claims going back to 1968. In total, 185 structures were documented. The areas assessed were:

- All buildings south of Middle Street between the Hudson River and the Old Champlain Canal; and
- The northern end of the Village on both sides of Fourth Street from Hudson Street to the north, State Street, and the homes on Third Street north of State Street.

The housing assessment took place in two phases, an exterior assessment performed on a large number of homes and a more detailed interior assessment performed on a sample of homes selected by the committee as representative of the Village's housing stock. For the exterior assessment, a standardized form was completed for each property containing a structure. The form scored 13 categories on a 1–5 scale, with 1 indicating that the feature was in need of replacement and 5 indicating that it was new or very well maintained. The categories were foundation, roof, chimney, soffits and fascia, windows, gutters, siding, entryway, accessory structures, sidewalk conditions, and curb condition. Additionally, the type of structure (single family, two-family, multifamily, etc.) and the construction type as recognized by the International Building Code were recorded. This assessment was not performed by code enforcement or a tax assessor and in no way will impact tax assessments in the Village. The ratings reflect the best judgment of the individuals who undertook the assessment, a subcontractor to the consultant team.

The objective of this exercise was to:

- 1) Record the existing conditions of the neighborhoods most prone to flood damage;
- 2) Establish the needs of those neighborhoods, which can then be used to set the parameters of a community rehabilitation program;
- 3) Create a database of housing conditions. This can be imported into mapping software, and more information can be added to in the future as the needs or conditions of the Community change.



Because of the topography of the Village, not all homes located within the 100-year floodplain experience significant flooding, and some structures have never experienced flood or groundwater issues. For structures at risk of extensive damage and water inundation in the first floor, the best option would be the elevation of the structure to a historically safe level. For those homes where floodwaters came into the basement but have no history of water inundating the first floor, moving mechanicals and utilities out of the basement may be the most economically feasible option. Finally, for structures where groundwater seeps into the basement through older foundations that are not water-tight, foundation work to keep out groundwater may be the most feasible solution and would offer the type of protection the homeowner needs without a costly elevation of the structure. It should be noted that modification to structures located within the Village's Historic District may require review and approval under Section 106 of the National Historic Preservation Act and Section 14.09 of the New York State Historic Preservation Act.



Sample home with a relatively higher, vented foundation.

To increase the flood resiliency of Village homes, the Planning Committee determined that there is a need for Village homeowners to know the elevations of the first floors of their homes by having their homes surveyed to produce elevation certificates. It is important for the homeowner to know the elevation of the home to understand how many feet the home would need to be elevated to move above the Base Flood Elevation. The elevation data would be shared with Village leaders and emergency responders for whom it would be a valuable planning tool. Understanding home elevations would allow public officials to better inform their preparations regarding which homes are likely to be flooded at each elevation as the water level rises during a flood, and to direct resources accordingly.

v. Infrastructure

Hurricane Irene caused damage to the Village of Waterford's infrastructure, including portions of the road network, utility lines and meters, and stormwater drainage systems. While some of these systems, such as utility lines and meters, were promptly repaired after the storm events, other Village infrastructure systems are in need of upgrades to reduce ongoing flooding as well as upgrades that would increase the resiliency of emergency services.



I. Community Overview



View of canal harbor dock and walkway and Peebles Park Bridge.

The flooding from Hurricane Irene caused damage to the road network south of South Street estimated at \$700,000, and repairs are still needed. In addition, flooding impacted streets in the northern end of the Village as well as the pavement and adjacent trail along Steenburgh Avenue. At the southern edge of Steenburgh Avenue, closest to Lock 2 on the Erie Canal, part of the converted towpath (now a bicycling and walking trail) was breached with flood-water. The water that breached the berm in that area followed the pavement along the street and collected at the corner of Steenburgh Avenue and

Middle Street. Elevating the berm and constructing a single direction drainage valve would ensure that water does not pool and stagnate following heavy rains or flooding events and also will not enter the area when the canal rises. Improvements to the bike path that sits atop the tow path would keep floodwaters out. This would increase resilience while providing economic and community health benefits related to recreation and tourism.

Deficiencies in the wetland drainage system in the north end of the Village resulted in the flooding of approximately 30 homes during Hurricane Irene when the system backed up and the excessive water drained toward the residential neighborhood. Implementing a redesigned system that would hold stormwater in the wetlands until the level of the Hudson River subsided and the water could be drained without overwhelming the system would reduce or eliminate the likelihood of future flooding in this neighborhood.

The Village of Waterford has many uneven streets and sidewalks that impede drainage after a storm event. Streetscape improvements to sidewalks and curbs and the installation of green infrastructure to channel minor floodwaters away from homes and into storm sewers are needed to protect against severe flooding. Improvements have taken place on most of the north-south streets south of Broad Street, but little has been done on the east-west oriented streets south of Broad Street or the streets to the north of Broad Street.

The lack of backup power for critical assets such as fire and police headquarters was also identified as a need in the Village. The installation of backup power generation at critical facilities would help ensure that emergency services remain operational in the event of storm and other emergency events. The potential installation of renewable energy alternatives to provide power has been identified as a potential opportunity.



vi. Natural and cultural resources

Natural and cultural resources abound in this small geographic space. The Village of Waterford has the distinction of being the oldest continually incorporated Village in the United States, and a large portion of the Village is listed on the National Register of Historic Places, which can be both a benefit and a challenge.² The Waterford Village Historic District is located between the Hudson River to the east, the Old Champlain Canal to the West, South Street to the south, and the Village boundary to the north and lies almost entirely within the 100-year floodplain (see Figure 2).

As such, there is a need to undertake structural flood mitigation measures, while preserving the historic character of the Village. The Village's designation on the National Register of Historic Places, as well as local laws passed by the Village in the 1980's place restrictions on demolishing or renovating historic structures necessitating a crea-



Signs and plaques call attention to the Village's historic structures.

tive solution to fortifying these historic assets from flood damage. The New York State Historic Preservation Office (SHPO), a division of the New York State Office of Parks, Recreation and Historic Preservation, allows for the elevation of historic structures as long as the historic character is kept intact, and stresses that each project has unique challenges and no one single approach is applicable to all historic structures. Any modification would require review and approval under Section 106 of the National Historic Preservation Act and Section 14.09 of the New York State Historic Preservation Act.

In addition to the Village's historic resources, the natural resources found in and around the Village are among its primary assets. These natural resources include the surrounding waterways, Peebles Island State Park, and the Village's proximity to the Erie and Champlain Canals. The pedestrian scale of the Village and the close proximity of the Broad Street commercial district to the waterfront make it ideal for waterway tourists traveling without an automobile. Improvements to way finding aids and signage that alert tourists to the historic and cultural resources within walking distance such as Peebles Island State Park and the Northside Historic District in the adjoining Town of Waterford are needed to help draw those arriving by boat away from the waterfront and into the community. Signage could also be improved to better alert visitors of the extent of the mixed-use trail network that radiates from the Village. The need for improved signage and way finding throughout the Village is also identified in The Champlain Canalway Trail Action Plan (2011).



I. Community Overview

The Battery Park boat launch is also part of the Village’s natural and cultural resources, but remains in disrepair and thus unsafe for use. Improving water access for recreational boaters and kayakers, including the repair of the Battery Park boat launch, which is owned by the NYS Canal Corporation, is an opportunity to increase the capacity of the Village’s natural and cultural resources.

D. Community vision

As part of the NYRCR planning process, the Committee drafted a Community vision statement that reflects the Village’s long history, acknowledges that the Village will continue to be susceptible to flooding, and focuses attention on the historic district and its valuable waterfront resources. The Committee presented this vision to the broader public to solicit feedback early in the process. The Vision Statement as agreed upon is as follows:

“The Village of Waterford envisions a Community Reconstruction Program that will provide a strategy for addressing past flood damage and for developing the long-term solutions aimed at making the Village better able to manage and cope with future storm and flooding events. In developing the program, we will recognize the unique character of the Community, including its historic building stock and the economic and recreational assets of its waterfront resources along the State Canal System, Hudson River, and Mohawk River.”



Three public meetings were held to gather input during the planning process. The final plan will be presented at a fourth public meeting to be held in May 2014.

E. Relationship to regional plans

The Committee aimed to build on other planning efforts that address similar themes, such as flood resilience, economic development, tourism, and protection of historic assets. These plans and datasets included:

- **Capital Region Economic Development Council (CREDC), Strategic Plan (2013).** The CREDC plan focuses on economic development strategies and projects for the Capital Region (Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, and Washington Counties). The Village’s NYRCR Plan and projects advance the CREDC’s goals to increase tourism and promote local businesses on Broad Street.
- **Erie Canalway National Heritage Corridor 2011–2016 Strategic Plan.** Subjects addressed in this strategic plan were also considered by the NYRCR Committee include heritage development, tourism, promoting the historical significance of the Village’s assets, promoting Canal-focused events to increase visitation, and multimodal access and linkages, including bicycle and pedestrian options.



I. Community overview

- **Saratoga County, Multi-Jurisdictional All-Hazard Mitigation Plan (2009).** The County’s plan identifies specific hazard mitigation projects for each community. The projects identified for the Village include various measures to increase flood resilience of structures, improve community education, and enhance emergency response capabilities—all of which were priorities for the NYRCR Committee and are advanced by the projects in the Village’s NYRCR Plan.
- **Town and Village of Waterford Comprehensive Plan (2002).** The NYRCR planning process builds on the Comprehensive Plan’s goals for strengthening assets, especially housing, as well as protecting the long-term economic vitality of the Village.
- **Town and Village of Waterford Local Waterfront Revitalization Program (2008).** The Local Waterfront Revitalization Program recognizes the value and success of efforts to develop the canal harbor. It seeks to build on the value of the waterfront by better connecting the harbor to the Broad Street commercial district. These goals are reflected in the NYRCR plan.



Knickerbocker Park overlooking the Hudson River

II. Assessment of risk and needs

Section II includes a comprehensive overview of community assets, risks, and broader community needs. This includes a description of the process undertaken to identify and inventory assets of community value and its results. These assets were then analyzed to determine the risk of damage or disruption to each asset due to flooding. The risk assessment results are also presented in Section II.

Finally, Section II includes an analysis and discussion of community needs and opportunities.

The results of the asset inventory, risk assessment, and needs and opportunities assessment informed the development of strategies and the identification of projects to implement the New York Rising Community Reconstruction (NYRCR) Plan.



II. Assessment of risk and needs

A. Description of community assets and assessment of risk

i. Description of community assets

a. Asset inventory methods

While small in geographic scope, the Village of Waterford boasts many community assets, ranging from historic structures to community facilities to critical infrastructure. An inventory of these assets was compiled based on a review of local, state and federal databases as well as input from the Committee and the public. Community assets were classified into one of the six FEMA designated Recovery Support Functions (RSFs) to facilitate further planning efforts, including a subsequent risk assessment, needs and opportunity assessment, project identification process, and a cost-benefit analysis (see Table 1).

Table 1 Assets Classification

Asset Class (Recovery Support Function)	Asset Example
Community Planning and Capacity Building	Not Applicable.
Economic Development	Office buildings, business and industrial parks, manufacturing, warehouses, storage facilities, grocery stores, restaurants, banks, lodging, storefronts, downtown center, seasonal/tourism destinations
Health and Social Services	Schools, health care, day care, elder care, emergency operations, government and administrative services, media and communications, police, fire and rescue
Housing	Single-family and multi-family dwellings, supportive housing/group homes, senior housing and affordable housing
Infrastructure	State Canal System facilities, pedestrian, bicycle and vehicular ways, transit, bridges, airports, rail, ports, ferries, gas stations, water supply, stormwater, wastewater, solid waste and recycling
Natural and Cultural Resources	Natural habitats, wetlands and marshes, recreation facilities, parks, public access, open spaces, agricultural areas, religious establishments, libraries, museums, historic landmarks, performing arts venues

The Committee then classified assets more finely by assigning each asset the following additional identifying characteristics where applicable: designation as a critical facility; vulnerable populations served; and/or locally significant. Assets were identified as critical facilities according to FEMA’s definition, as follows:



II. Assessment of risk and needs

- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials;
- Hospitals, nursing homes, and housing likely to have occupants who may not be sufficiently mobile to avoid injury or death during a flood;
- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for flood response activities before, during, and after a flood; and/or
- Public and private utility facilities that are vital to maintaining or restoring normal services to flooded areas before, during, and after a flood.

b. Description of community assets

The inventory identified 55 community assets as shown in Figure 4. The assets found within the Village include police headquarters, an emergency response facility, a local physician’s office, fire stations, municipal building and a post office. The Village also contains senior housing, a school, day-care facilities, and churches, some of which provided assistance to residents during Hurricane Irene. Community infrastructure assets include multiple bridges, two canal locks, sewer pumping stations, a wastewater treatment facility, and a water system plant. Multiple natural and cultural assets were also identified, including parks, trails, a boat launch, a library, and the Waterford historic district.

Figure 4 illustrates the location of the identified assets and their Asset Class (Recovery Support Function, see Table 1). Additional information gathered for each asset is presented in Figure 5 (see below) and in Section V.D.

ii. Assessment of risk to assets and systems

In order to assist the Committee in the development of strategies, programs and projects to address flood risk in the Village of Waterford, the Consultant Team conducted an evaluation of the risk due to flooding to each community asset. This assessment began by delineating four risk areas within the Village, and determining the relative risk to each asset based on location. The four risk areas, shown on Figure 5, include extreme, high, moderate, or residual risk zones, per the following definitions.



Extreme Risk Areas have been identified as those known to have repetitive flooding issues;



High Risk Areas have assets in the 100-year flood plain;

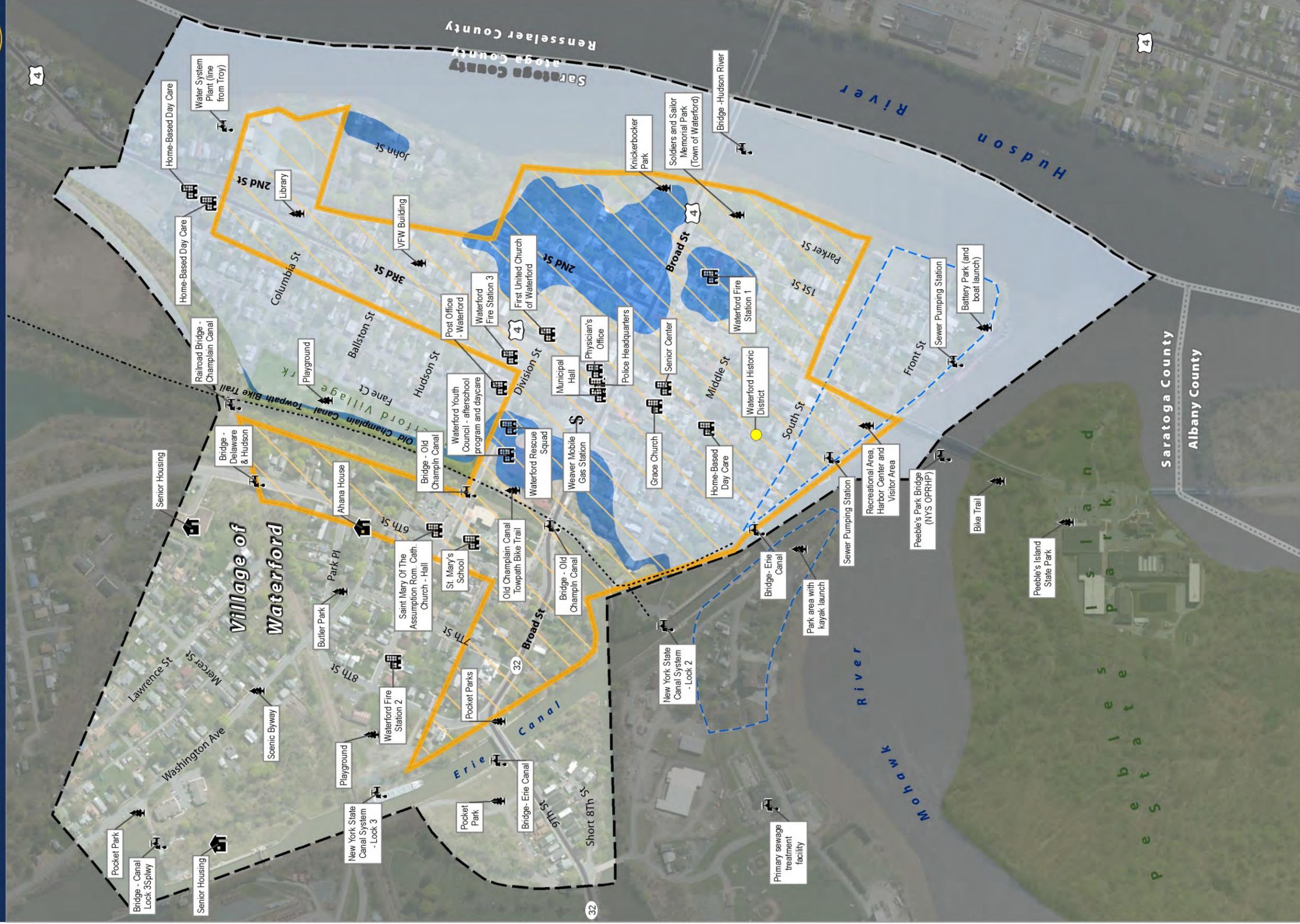


Moderate Risk Areas have assets in the 500-year flood plain; and



Residual Risk areas are not known to flood and are located outside of the 100- and 500-year flood plains.

Figure 4: Community Assets and Asset Classes
Village of Waterford



Asset Class

- Economic Development: \$
- Health and Social Services: House icon
- Housing: House icon
- Infrastructure: Factory icon
- Natural and Cultural Resources: Tree icon

Geographic Scope

- Historic District: Orange outline
- 500-Year Flood Zone: Light blue shading
- 100-Year Flood Zone: Darker blue shading
- Frequent Flooding: Dashed blue outline

Infrastructure

- Park Boundary: Green outline
- Old Champlain Canal: Dotted line
- Towpath Bike Trail: Dashed line
- County Boundary: Dashed line

Scale: 0, 125, 250, 500 Feet

Inset Map: Shows the study area location within the Northeastern United States (VT, NY, MA, CT, PA, ON).

ESRI - World Imagery

Figure 5: Flood Risk Areas and Community Assets
Village of Waterford





II. Assessment of risk and needs

In the Village of Waterford, five community assets are within the extreme flood risk area: the two sewer pumping stations, the waterfront harbor center and visitor area, and two additional waterfront parks and boat launches. An additional 24 community assets are located within high risk areas, while four are located in moderate risk areas.

The NYRCR Risk Assessment Tool, described below, was then used to further evaluate the risk to the community assets based on mitigating factors such as existing flood defenses. The resulting risk score for each asset was used to help evaluate and prioritize projects that would best protect assets at risk and also contribute to long-term community and economic growth.

Description of NYRCR Risk Assessment Tool Methodology

The NYRCR Risk Assessment Tool calculates risk by multiplying three primary factors, hazard, exposure and vulnerability, in order to obtain the relative risk to each asset in the event of a 100-year storm, meaning a severity of storm that has 1% chance of occurring in any given year. A value was assigned to each factor according to the following criteria.

A **hazard value** described the likelihood and magnitude of future storm events. Since the primary purpose was to determine the relative risk for each asset based on a 100-year flood event, a pre-determined hazard value (multiplication factor) of three was assigned to each asset.

The **exposure value** was assigned for each asset based on the sum of a group of attributes. This group of attributes includes the risk area in which the asset is included, and six landscape attributes that influence the potential for storm impacts. A score of 0.5 was assigned for each landscape attribute that received a “yes” and summed together to produce the exposure value. The six landscape attributes that were evaluated include:

- **Defensive Flood Protection Measures:** Are they absent, below base-flood-elevation, in poor condition, and/or do they lack a maintenance commitment?
- **Elevation:** Is the elevation of the asset site below Base Flood Elevation?
- **Freeboard:** Is the elevation of the habitable or occupied portion of the asset less than 2 feet above Base Flood Elevation?
- **Point of Confluence:** Is the asset subject to increased flooding due to the confluence of merging streams?
- **Storm Water Discharge:** Is the asset subject to increased flood risk due to storm water system discharge?

Base Flood Elevation refers to the computed elevation to which floodwater is anticipated to rise during the base flood. Base Flood Elevations (BFEs) are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles.

Source: FEMA



II. Assessment of risk and needs

- **Vegetated Stream Bank Buffers:** Is the asset within the Floodway Fringe, and without adequate vegetated buffers?

Vulnerability refers to the level of impairment or consequences that a given asset may experience from a storm event and the ability of an asset to resist damage from a storm. Table 2 describes the methodology by which the vulnerability scores were assigned for each asset.

Table 2 Vulnerability Based on Impact on Service or Function of Community Assets

Impact	Insignificant 1	Minor 2	Moderate 3	Significant 4	Major 5
A. Economic Development Assets	Limited interruption in service or short term reduced service	Service loss for up to 1 week or longer term reduced service	Service loss for more than 1 week up to 1 month or longer term reduced service	Service loss for more than 1 month or permanent reduced capacity	Permanent loss of service of the economic asset
B. Health and Social Services Assets	Limited interruption in service or short term reduced service; Services under more than usual stress but manageable	Service loss for up to 1 week or longer term reduced service; Services under more than usual stress on several fronts	Service loss for more than 1 week up to 1 month or longer term reduced service; Services under severe pressure	Service loss for more than 1 month or permanent reduced capacity	Permanent loss of service of any one of the essential services listed
C. Housing Assets	Limited inconvenience	Out of use for up to 1 week	Out of use for more than 1 week up to 1 month	Out of use for up to 6 months [OR] permanent loss of 15% or less of housing in a group asset	Out of use for more than 6 months [OR] permanent loss of more than 15% of housing in a group asset
D. Infrastructure Assets	Limited interruption in service or short term reduced service	Service loss for up to 1 week or longer term reduced service	Service loss for more than 1 week up to 1 month or longer term reduced service	Service loss for more than 1 month or permanent reduced capacity	Permanent loss of service of any one of the facilities listed
E. Natural and Cultural Resources Assets	Limited interruption in service or short term reduced service [OR] Limited loss of access, habitat, or use	Service loss for up to 1 week or longer term reduced service; Minimal natural habitat impacts, temporary loss of public access, temporary loss of open space/tourism assets	Service loss for more than 1 week up to 1 month [OR] Moderate impacts on natural habitats, sustained loss of public access, long term loss of private open space	Service loss greater than 1 month [OR] Permanently diminished capacity of natural resource; substantial damages of important natural habitats	Permanent loss of service of the cultural asset [OR] complete loss of important natural habitats
F. Assets Providing Services for Socially Vulnerable Populations	Limited service interruption	Service interruption for up to 1 week	Service interruption of more than 1 week up to 1 month	Permanent service interruption of more than 1 and less than 6 months	Service interruption of 6 or more months



II. Assessment of risk and needs

Description of Risk Scores

The NYRCR Risk Assessment Tool was run after the values for each of the factors described above were determined for each asset. This tool multiplied the hazard, exposure and vulnerability scores and assigned a final risk score for each asset. The risk score helps to identify the assets within the Community that may be at an increased potential for storm damage and to establish how quickly risks need to be addressed. In addition to the risk scores which are described below, the following factors were considered when evaluating risks:

- the asset's contribution to life safety;
- whether the asset is a critical facility;
- the community value of the asset;
- the environmental services provided by the asset;
- the economic value of the asset;
- the available alternatives; and
- the capacity of the asset to adapt.

The risk scores were ranked according to the following scale:

- **Severe (53 or higher):** The asset is in a dangerous situation as a severe risk score indicates that at exposure and/or vulnerability is high for the asset and should be reduced, if possible. Relocation may be a priority option for these assets.
- **High (24 to 53):** Conditions exist that could lead to significant negative outcomes from a storm, with the likely loss of service of an asset for an extended period of time. For many assets, this may be unacceptable. If a high risk score is the result of a high vulnerability, actions such as elevating or flood-proofing the asset to help avoid a long-term loss of function should be taken. If the high risk score is the result of a high exposure, many local landscape attributes that would help protect an asset against storm damages are not present. This would necessitate actions to restore landscape attributes. If the overall risk score is higher than 24, exposure and/or vulnerability are higher than may be acceptable. A score greater than 24 may necessitate relocation in the future if other possible adaptation or management actions are not effective in protecting against flood damage.
- **Moderate (6 to 23):** Conditions related to this asset pose moderate to serious consequences, but assets may have lower vulnerability or exposure scores. A combination of measures should be used to reduce exposure and/or vulnerability.
- **Residual (Less than 6):** Floods would pose minor or infrequent consequences. However, risk is never completely eliminated. Some residual risk still remains even after management measures



II. Assessment of risk and needs

have been implemented. It should be noted if an asset receives a residual risk score but is considered a critical facility, even this small amount of risk may not be acceptable. If this is the case, management actions should be undertaken to eliminate risks.

When considered in conjunction with the features described above (e.g. critical facility, community value, etc.) the risk scores produced by the Risk Assessment Tool are a vital component of the project identification process.

a. Distribution of assets and risk scores

Table 3 summarizes the risk scores of the Village’s assets as well as the number of assets within each risk score category that are considered critical assets, locally significant assets, and assets serving vulnerable populations. The risk score for each asset may be found in Section V.D.

By employing the risk assessment tool, the Planning Committee was able to more objectively evaluate and identify projects that would best protect the assets deemed most valuable to the Community as well as those projects that would contribute to long-term community and economic growth.

Table 3 Summary of Risk Scores, Waterford

Risk Score	Total Assets (#), Village of Waterford	Critical Assets (#)	Locally Significant (#)	Serve Vulnerable Populations (#)
Severe	-	-	-	-
High	1	-	1	-
Moderate	23	5	2	4
Residual Risk	8	3	-	1

Summary of results of the asset-based risk assessment

Of the assets located in the 100-year floodplain, all were found to be at moderate risk, with the important exception of the Waterford Historic District which received a high risk score. The moderate-risk assets included the two sewer pumping stations, several day care facilities and parks, the municipal hall, and the post office. Important emergency response facilities, including the police headquarters and one of the fire stations, are also considered to be at moderate risk. While emergency response efforts were generally effective during Hurricane Irene, the need to consolidate the fire stations in a location outside the 100-year floodplain has been identified as a priority by several community planning documents and by the Committee.

The entire historic district, which encompasses most of the Village below the Old Champlain Canal, was found to be at high risk, generating a risk score of 36. This is due to the fact that few of the homes have been elevated above Base Flood Elevation (BFE) and there are no natural or constructed barriers to reduce flooding once the water rises above the banks of the Mohawk River. The heightened risk score for



II. Assessment of risk and needs

the historic district, indicative of the flood risk to housing, is consistent with the Committee's emphasis throughout the planning process on the need to better equip vulnerable homes to resist flooding.



Historic marker for the Battery, a small park at the confluence of the Hudson and Mohawk Rivers.

Several blocks containing residential housing near Battery Park are located just outside the Historic District but are also within the 100-year floodplain. These housing units also face high risk. A separate housing assessment was completed for all neighborhoods within the 100-year floodplain to better assess the overall condition of the housing stock and its vulnerability to flooding, the results of which can be found in the Needs and Opportunities section below.

The few assets in the 500-year floodplain were all found to be at a residual level of risk. The Community's assets outside the floodplain are not exposed to flooding and returned a flood risk score of 0.

The risk scores were used as factors to identify the needs and opportunities within the Village of Waterford and to compare and identify projects that would address those needs. It is important to note that there was and always will be some degree of subjectivity when evaluating risk, as there is no way to objectively determine issues such as the community value of a locally significant asset. Therefore, in addition to calculating risk scores for the Community's assets, a qualitative assessment of the risk reduction potential of the recommended projects was also performed to help the committee compare the relative merits of the projects.

B. Assessment of needs and opportunities

After inventorying the Community's assets and assessing the risks to assets and systems, the Committee conducted a needs and opportunities assessment to serve as a foundation for the development of strategies, projects, and actions that could address flood risk and strengthen community assets to help Waterford thrive. The assessment of needs and opportunities used a two-pronged approach: first was a review of existing planning efforts and plan documents, followed by a public outreach effort centered around three public meetings and the use of a dedicated Facebook page to promote the planning process, announce public meetings, and receive public input. Finally, direct dialogue with residents, particularly those impacted by Hurricane Irene, was used to gain a greater understanding of the Community's perspective on priority needs and opportunities, notably what projects could best address the needs.

This process resulted in the identification of projects that directly address the needs and opportunities defined by residents in the Village within each of the six Recovery Support Function (RSF) areas (see Ta-



ble 1). The intent was to help ensure that available resources would strengthen the Village as a whole, while working towards providing better safeguards for the parts of the Community directly affected by Hurricane Irene.

A summary of the results is provided below.

Community planning and capacity building

Need: The fire department is fragmented among three firehouses. One of the firehouses is located in the 100-year floodplain, and one station requires purchase of specialty equipment to fit in its small garage. None of the firehouses have back-up generators, and the Town Hall, which also functions as the police headquarters, has only one.

Opportunity: Consolidate firehouse and rebuild outside of the floodplain.

Need: Land use options are limited, since the Village has been built to near capacity with little room for expansion of the built environment, especially outside the 100-year floodplain.

Opportunity: Work with homeowners to elevate and flood proof their homes.

Economic development

Need: The Broad Street business district must be strengthened, leveraging its proximity to waterways and state parks while maintaining and protecting its unique historical and geographic assets. The Village must create conditions favorable for small businesses and entrepreneurs to retain its existing businesses and attract new ones.³

Opportunity: Maintain and grow community tax base and encourage local tourism.

Need: The Village should be known as a tourism destination, focusing on waterfront development and accessibility. This issue is reflected in the Village's Comprehensive Plan, the Local Waterfront Revitalization Program, and all canal- or trail-related plans.

Opportunity: Continue to beautify Village through streetscape improvements.

Health and social services

Need: The Community needs a one-stop emergency information and resource center with an identified physical location, such as in a new centralized firehouse. This center would only need to operate during storm and emergency events during which it would provide residents with accurate and official information. It would provide important social support to vulnerable populations, including seniors. In the aftermath of an event, the center could instruct residents on whether or not they qualify for FEMA relief, provide instruction and assistance with paperwork related to flood insurance, and provide information about other programs for flood victims.



II. Assessment of risk and needs

Opportunity: Enhance emergency response operations through a new centralized firehouse and emergency information and resource center.

Housing

Need: While the majority of homes in the Village are well maintained, some houses that are at the most extreme risk of flooding have been abandoned by owners who are no longer able to bear the costs associated with frequent and substantial flood damage.

Opportunity: Purchase homes that have been abandoned or are at risk of repetitive flooding and re-purpose the property for public open space and additional flood storage.

Need: The damage to local homes in the wake of Hurricane Irene demonstrated that they must be made more resilient to flooding. Flood proofing options in a densely populated historical district are limited and present myriad challenges. Constraints can be overcome through proper engineering and the application of modern flood-proofing techniques appropriate to historic resources.

Opportunity: Support homeowners with home resiliency measures.

Infrastructure

Need: Drainage deficiencies in the northeastern part of the Village have led to flooding in approximately 30 homes in that area. The Village needs to strengthen its drainage infrastructure to avoid risk of failure and ensure that its emergency services have the ability to react to the critical needs of residents and businesses during emergencies.

Opportunity: Improve drainage through modifications of existing stormwater conveyance system.

Need: The flooding from Hurricane Irene caused damage to the roadways along South Street and points south (see Figure 2).

Need: Streetscape improvements, especially on South Street which was damaged by Hurricane Irene, would improve the appeal of homes and spur investment in existing property. Through the incorporation of green infrastructure, such projects would also better mitigate the impacts of flooding.

Opportunity: Implement streetscape improvements and incorporate green infrastructure to help mitigate impacts of flooding.



Old Champlain Canal Sidecut Locks



Broad Street businesses are located only a few short blocks from the harbor

III. Reconstruction and resiliency strategies

Section III includes a description of the New York Rising Community Reconstruction (NYRCR) Village of Waterford Planning Committee’s proposed reconstruction and resiliency strategies. Strategies are intended to help mitigate risk and address community needs. The proposed strategies are to:

- Strengthen the Village’s emergency response capacity through enhanced communications, expanded community awareness, and improved response services;
- Reduce flood risk to housing stock in the 100-year floodplain;
- Improve Village infrastructure to better manage flood waters; and
- Support community development through activities that encourage the engagement of tourists and residents in the Community.



III. Reconstruction and resiliency strategies

The Planning Committee used the results of the needs and opportunities assessment to identify critical issues faced by the Village and to develop four key strategies. The issues are categorized according to the six Recovery Support Functions described in Section II. The strategies developed during the NYRCR planning process are intended to guide the development and implementation of projects that contribute to the Village's long-term resiliency in the form of strengthened physical assets, improved emergency preparedness and responsiveness, successful economic development initiatives, and overall quality of life improvements for residents, stakeholders and visitors.

The Village's overarching goal is to build upon the unique character of the Community and provide the Village with the capacity to withstand future extreme weather events and emergencies. The strategies developed by the Committee are outlined below.

Strategy 1: *Strengthen the Village's emergency response capacity through enhanced communications, expanded community awareness, and improved response services.*

In the wake of Hurricane Irene, many residents expressed gratitude toward local emergency responders and felt that local responders had an action plan that was unified in its approach. This speaks volumes for the skill, professional attitude and commitment of the responders, who were operating without the benefit of a centralized communication system or one single center of operations. The fragmentation of the Village's fire department among three disparate firehouses also contributed to operational challenges for emergency responders during storm response efforts. One of the stations is unable to accommodate regular-sized fire trucks.

The implementation of this strategy requires projects and actions to improve communications and emergency response capabilities during and after major storm events. The Committee developed a firehouse consolidation project and a project that includes a suite of emergency response measures. The proposed consolidated firehouse will accommodate modern equipment and provide a secure facility for equipment storage, as well as serve as a temporary emergency shelter. Additionally, the consolidation of fire services in a single location will facilitate improved communication among emergency responders as there will be a single command post.

The proposed emergency response measures project will improve communications through the development of a communications plan, continuity of operations plan, a resident evacuation reporting system, and a database of residents with special needs to help provide aid to the Village's vulnerable resident population. Community awareness of flood issues will be enhanced through the project's provision of flood education awareness programs for homeowners, business owners, and residents. Finally, this project will improve the emergency response capacity of the Village through the purchase of rescue and life-saving equipment needed for emergency response efforts.



Table 4 Strategy 1: Strengthen the Village’s Emergency Response Capacity Through Improved Communications, Expanded Community Awareness, and Increased and More Efficient Response Services

Recovery Support Functions Reinforced: Community Planning and Capacity Building				
Project Name	Short Project Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Emergency Response Measures	Institute a suite of projects that include planning efforts, community education programs, and equipment purchases.	\$950,000	Proposed	N
Consolidated Firehouse Phase I Project	Design, permitting, and site acquisition for a new firehouse.	\$550,000	Proposed	N
Consolidated Firehouse Phase II Project	Construction of a new firehouse.	\$3,500,000	Featured	N

Strategy 2: Reduce flood risk to housing stock in the 100-year floodplain.

Over 60% of Village residents live in the 100-year floodplain. In addition many homes close to the Mohawk River or to a wetland in the northeastern part of the Village experience regular flooding. As previously noted, over 90 residential structures suffered damages during Hurricane Irene, and 84 insurance claims were filed. As a result, strengthening the resilience of the Village’s residential structures is a critical need for the Community.

Many properties are good candidates for flood resiliency measures that would allow residents to stay in their homes during flood events. Village leaders and NYRCR Committee Members encouraged homeowners whose homes were damaged by Hurricane Irene to apply for assistance, including from the NY Rising Housing Recovery Program, which provided funding for home elevations or other flood mitigation measures, as well as for the costs of repair and rebuilding.

For all homes in the 100-year floodplain, i.e., not just those damaged by Hurricane Irene, the Committee developed a project that involves conducting elevation surveys for every home within the 100-year floodplain where the homeowner agrees to participate. Knowing first floor elevations will better equip residents and emergency responders to react to flood events, as they will know at what level the water will begin to flood their first floors, and homeowners who might consider elevating their houses will know how many feet their homes need to be elevated.



III. Reconstruction and resiliency strategies

Where homes are at extreme risk of significant flood damage, homeowners are often not able to continue to withstand the cost associated with repetitive recovery. For these homeowners, a buyout may be the best option. Homes at extreme flood risk present challenges to the community as well as the homeowner since the community must bear the disproportionately high cost of providing emergency services to these high risk properties. In addition, these homes may be abandoned if the homeowner simply can no longer afford the carrying cost and cannot sell due to the risk associated with ownership. Vacant, abandoned homes are a liability to the community as they tend to drive down adjacent housing prices and negatively impact community character. In these situations, a buyout would benefit the homeowner and the community. The homeowner would receive pre-storm value for their home and have the opportunity to relocate out of the risk area. The community would not be at risk of blight associated with abandoned properties; and if the buyout properties are repurposed for a public use such as green space or off-street parking, property values and community character may actually be strengthened.

The second program recommended by the Committee would support the acquisition of homes at extreme flood risk by offering a relocation incentive on top of the pre-storm value typically offered. Acquired properties would be repurposed as additional parking or community greenspace.



Photo credit: J. Bert Mahoney

Flooding on First Street after Hurricane Irene



Table 5 Strategy 2: Reduce Flood Risk to Housing Stock in the 100-year Floodplain

Recovery Support Functions Reinforced: Housing, Economic Development, and Community Planning and Capacity Building				
Project Name	Short Project Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Building Resiliency Program	Perform elevation surveys for homes in the 100-year floodplain to enhance emergency preparedness and inform homeowners as they consider flood mitigation options.	\$200,000	Proposed	N
Home Buyout Program	Purchase and demolish flood-prone properties that have been damaged severely and/or repetitively, reusing properties for additional community green space or parking with green infrastructure elements incorporated. Property owners could be offered a relocation incentive in addition to the fair market value of the home.	\$1,300,000	Proposed	N

Strategy 3: Improve Village infrastructure to better manage flood waters.

This strategy focuses on the need to address infrastructure issues relating to housing, economic development, and transportation. Flooding during Hurricane Irene was exacerbated in northern parts of the Village because of a deficient drainage system and in the southern part of the Village because a portion of the Old Champlain Canal Towpath was breached when the Mohawk River crested. Additionally, the road surface of South Street was damaged by the flooding and has not yet been repaired. The Committee developed projects to address these particular issues.

The drainage system conveys stormwater from wetlands in the northeastern part of the Village to the Hudson River, but deficiencies in the system direct stormwater away from the drainage infrastructure to the neighborhood nearby, causing basements to flood in approximately 30 homes. The Proposed project includes various structural improvements to the stormwater drainage infrastructure, including modifications to headwalls, wingwalls, culverts, a vegetated open channel, and catchment structures, as well as elevating a low-lying section of Fourth Street where water pools.

The Village Streetscape Program includes a streetscape project on South Street and the elevation of the low-lying section of the Old Champlain Canal towpath. The Village has the opportunity to improve the street by incorporating streetscape features to match those already implemented on adjacent streets and to include green infrastructure elements that eliminate the pooling that now occurs after normal



III. Reconstruction and resiliency strategies

(non-extreme) storm events. In addition to addressing drainage issues and improving the visual aspect of the street, the improvement of the streetscape can be expected to help increase home values along the street and encourage homeowners to invest in their properties.

When breached, the low section of the canal towpath, located at the foot of Steenburgh Avenue where the Mohawk River feeds into Lock 2 of the Erie Canal, allowed water to flood Steenburgh Avenue. The towpath is owned by the NYS Canal Corporation, and the Village would work closely with the Canal Corporation on the project to elevate the towpath while meeting accessibility requirements.

Table 6 Strategy 3: Improve Village Infrastructure to Better Manage Flood Waters

Recovery Support Functions Reinforced: Housing, Infrastructure, and Economic Development.				
Project Name	Short Project Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Street Resiliency Project	Complete repair and improvements to the streetscape of South Street and the elevation of a low-lying section of the Old Champlain Canal tow-path.	\$1,100,000	Proposed	N
Wetland Drainage System Improvements	Build structural improvements to a stormwater drainage and wetland system in the northeastern part of the Village.	\$1,000,000	Proposed	N

Strategy 4: Support community development through activities that encourage the engagement of tourists and residents in the Community.

Village residents benefit from living in a safe, historic, and attractive community, and tourists enjoy visiting the Village’s locks, canal harbor, and Broad Street establishments. The needs and opportunities assessment suggests that additional programs and activities should be developed to improve quality of life in the Village even more for residents and visitors, especially by increasing recreational and tourism opportunities.

As further detailed in Section V, no Proposed or Featured Projects are advanced under this strategy, but it supports a number of the committee’s Additional Resiliency Recommendations.



Line marking the maximum height of flooding on Front Street



The Knickerbocker Steamer fire company moved into their existing station in 1867.

IV. Proposed and featured project profiles

Section IV includes a description of the project identification and screening process. It also features detailed project profiles for each Proposed and Featured project identified by the NYRCR Village of Waterford Planning Committee. Project profiles include:

- Project name, location, and jurisdiction;
- Associated strategies and recovery functions;
- Description of the project purpose, scope and expected outcomes;
- Project cost;
- Project benefits including an analysis of risk reduction;
- Project implementation timeframe;
- Potential regulatory requirements (review, permits, etc.); and
- Potential alternate funding sources for Featured projects.



IV. Proposed and featured project profiles

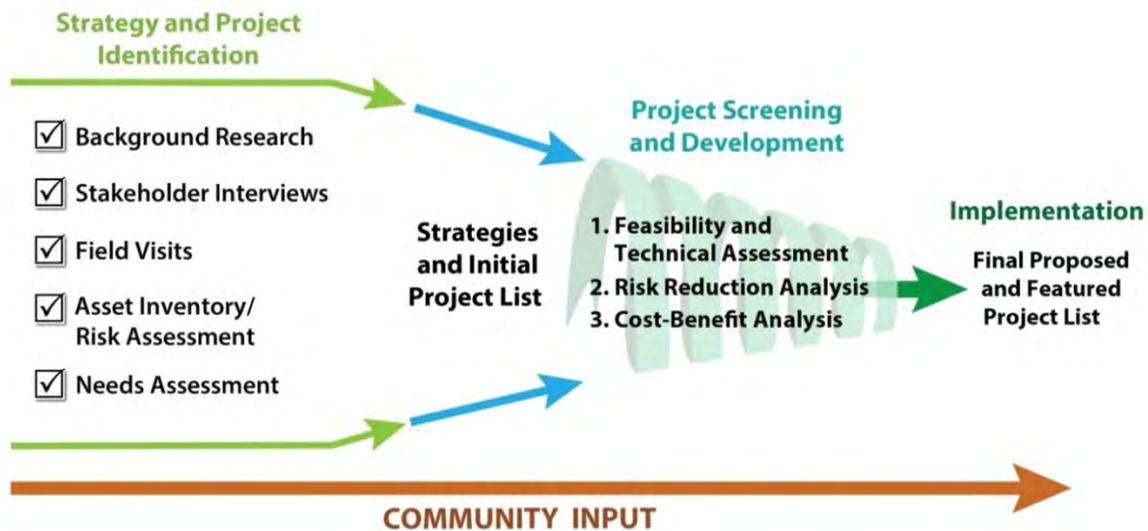
This Section includes a detailed profile of all Proposed and Featured projects identified by the NYRCR Planning Committee during the planning process. Proposed Projects are projects proposed for funding through a NYRCR Community’s allocation of CDBG-DR funding. Featured Projects are projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. Additional Resiliency Recommendations are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects.

A. Project identification and screening process

The NYRCR Plan for the Village of Waterford seeks to achieve multiple benefits through well-designed projects that address economic, environmental, and social/health aspects of resilience and sustainability. Each project was evaluated with regard to its technical feasibility and possible regulatory requirements. Attendees of a public meeting were invited to indicate which projects they felt were the most important, and the results were presented to the Committee.

Figure 6 presents an overview of the project identification and screening process. Figure 7 illustrates the Proposed projects identified by the Planning Committee by identifying geographic locations or areas that pertain to each project.

Figure 6 The Project Identification and Screening Process



**Figure 7: Proposed Projects
Village of Waterford**



**Wetland
Drainage System
Improvements**

Building Resiliency Program
Homes in the 100-year floodplain

Consolidated Firehouse Phase I and II Projects
Fire Station 3 (of 3) located in the 100-year floodplain;
New firehouse location TBD

Home Buyout Program
For damaged homes, especially
severe and repetitive loss properties

**Streetscape
Resiliency
Project**

Emergency Response Measures
Pertain to Entire Village



Proposed Projects
●

Geographic Scope
Historic District

Flood Zones
■ 500-Year Flood Zone
■ 100-Year Flood Zone
■ Frequent Flooding

Geographic Features
■ Park Boundary
--- Old Champlain Canal
--- Towpath Bike Trail
--- County Boundary

Scale
0 125 250 500 Feet

ESRI - World Topo Imagery



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B. Proposed Project Profiles

i. Proposed Project: Emergency Response Measures

Strategies

- Strengthen the Village’s emergency response capacity through improved communications, expanded community awareness, and increased response services.

Location

- Village of Waterford

Recovery Functions

- Community Planning and Capacity Building
- Health and Social Services

Jurisdiction

- Village of Waterford

Project Description

The impacts of Hurricane Irene highlighted the need to strengthen the Village’s emergency response services and better prepare first responders and residents for flooding. Storm response efforts during and after Hurricane Irene were viewed as largely successful, as 18 fire departments, led by the Village’s fire department, coordinated to pump water out of flooded homes and address residents’ other needs. However, Village officials and emergency responders identified opportunities to improve in three aspects of the storm response.



Photo credit: J. Bert Mahoney

Waterford Fire Department’s Kavanaugh Hook & Ladder Company responding to the Irene flood.

First, it was apparent that emergency responders could improve communication with residents through better coordination and use of additional communication channels such as social media. For example, responders could benefit from a system to keep track of whether residents had evacuated their homes, and later whether they had returned. This would enable first responders to more effectively manage their resources and if necessary pre-position assets. In addition, responders could more efficiently support vulnerable populations during a major flood event if they had access to a database of residents with special medical needs who might need assistance evacuating or require medications while at a shelter.

Second, the response to Hurricane Irene made it clear that public education is critical to mitigate flood impacts and also to support a faster recovery. To address this need, the Village intends to conduct a series of flood education workshops that address relevant subjects, such as providing residents with best practices for flood mitigation measures for homes and reviewing the process for filing insurance claims and understanding which assistance programs might be available to residents in need.



IV. Proposed and featured project profiles

Third, the fire department is in need of specific rescue and lifesaving equipment for use during flood events. Equipment needs include such things as new vehicles, protective gear, and communications equipment.

Together, the combination of planning measures, education, and equipment will strengthen the effectiveness of the Village's emergency response during major storm events and emergencies. Additional detail is provided below.

Planning measures include:

- Develop a multi-media communications plan that coordinates emergency information between response organizations, agencies, and residents. The plan development will include coordination of information with the NYS Thruway Authority and NYS Canal Corporation and the Upstate New York flood warning system. The multimedia plan will address coordination of information with the following:
 - Village of Waterford and Town of Waterford websites;
 - Emergency phone notifications (Reverse 911);
 - Emergency Alert System via AM/FM radio;
 - Social media updates through NYS Thruway Authority and Canal Corporation's Twitter and Facebook accounts;
 - TRANSalerts; and other media.
- Establish a reporting system for residents to check in and out when evacuating and returning to their homes. The database will include all residential addresses in the Village, including each unit of multi-unit residences, and be accessible remotely to residents and emergency services. System functionalities will include mechanisms for protecting privacy, messaging and posting alternate contact information for evacuating residents.
- Establish a voluntary program that creates a database of residents with special medical needs to protect vulnerable resident populations. This database would serve as a planning tool to prepare for emergencies, evacuation, and sheltering of individuals with special medical needs. To aid in planning for these vulnerable populations, a geographic information system associated with the database would provide additional information for planning for evacuations. The database should include information about whether individuals need:
 - Transportation to/from evacuation shelters;
 - Emergency backup power requirements, e.g. for individuals on life support;
 - Service animals, e.g. for individuals with special medical needs;
 - Special foods, for those with dietary needs; and
 - Medications.



Education measures include:

Initiate a series of flood education workshops for residents.

Potential speakers include subject matter experts, representatives from state and federal agencies, and public officials. Workshop series should be offered semi-annually or as decided by the Village Board of Trustees.

Topics covered may include:

- Means available to make structures more resilient, and technical and funding opportunities;
- Financial and technical assistance available to property owners including navigating the required administrative processes (completion of required forms, information required, etc.); and
- Creation of a storm essentials kit/go bag for evacuation or shelter in place (contents to include phone numbers, process for check-in and -out with emergency services, list of personal items to include, checklists/reminders/quick reference guides).

Equipment purchases include:

- Purchase rescue and life-saving equipment for the fire department.

Project Cost Estimate

The estimated total project cost is \$950,000. The planning measures, consisting of the multi-media communications plan, a system for residents to report when they have evacuated and returned to their homes, and a database of residents with special medical needs, are estimated to cost \$125,000. The estimated cost for the education program, which entails a series of flood education workshops for residents, is \$50,000. Most of the cost for this project, approximately \$775,000, would be used to purchase a variety of rescue and life-saving equipment for the Village fire department.

Project Benefits

Social and Health Benefits

Improved communications with residents and better situational awareness regarding special needs populations will allow first responders to manage resources more effectively and pre-position assets based on the expected need. This will help protect life and property.

A homeowner flood education program will encourage residents and homeowners to adopt and implement personal flood protection measures, increasing the resilience of flood-prone neighborhoods.

Necessary rescue equipment used in flood events will improve the fire department's ability to respond and could save lives.

Risk Reduction Benefits

Homes in the 100-year floodplain, many of which are in the historic district, are the Village's most important vulnerable assets. The combination of planning, education, and equipment will contribute to a



IV. Proposed and featured project profiles

general reduction in risk to homes through better preparation for floods, improved emergency response, and readiness for the recovery phase.

Cost Benefit Analysis

This project is expected to increase community planning and capacity building capabilities, better preparing emergency responders, municipal leaders, homeowners and other residents for future storm events. While it does not contribute to direct risk reduction for a particular structure, system or other asset, it offers social, health, economic and general risk reduction benefits. The economic value of these benefits has not been quantified, but is anticipated to greatly exceed the estimated cost of \$950,000.

Implementation Strategy
Timeframe 2 month RFP process, 12 month program delivery
Regulatory Requirements None identified



ii. Proposed Project: Consolidated Firehouse Phase I Project

Strategies

- Strengthen the Village’s emergency response capacity through improved communications, expanded community awareness, and increased and more efficient response services.

Recovery Functions

- Infrastructure
- Community Planning and Capacity Building

Location

- Village of Waterford

Jurisdiction

- Village of Waterford

Project Description

This project encompasses a feasibility analysis, preparation of bid-ready design documents, permitting, and site acquisition for a new firehouse. It will serve as Phase I, leading to Phase II construction of the firehouse (an NYRCR Featured Project described below).

The Waterford Fire Department operates out of three existing fire stations, which have an average age of more than 100 years.

During Hurricane Irene and Tropical Storm Lee, the fire department found it necessary to establish a command center at the Kavanaugh Firehouse, where it coordinated the efforts of the 18 fire departments that worked together to respond to the flood. The facility was found to be too small for this function. Firefighters met the challenges of the disaster but the limitations of the station were apparent, such as an undersized meeting room and lack of sufficient parking for trucks and private vehicles.

The experience further confirmed that, for effective command and control, having a centralized location from which to direct emergency response efforts is more efficient than three disparate stations. Efficiencies of scale will also be achieved since none of the three existing stations is large enough to serve as a single consolidated facility for the fire department for emergency operations and temporary shelter for Village residents.

The advanced age and locations of the existing stations do not contribute to efficient operations. The garage bay on one of the existing stations is too small to accommodate a regular-sized fire truck, so, at extra expense, the department must purchase and maintain a specially sized truck for the station. While none of the stations was flooded by the hurricane, one is located in the 100-year floodplain and a sec-



Kavanaugh Hook and Ladder Company Firehouse



IV. Proposed and featured project profiles

ond is in the 500-year floodplain. Limited parking is a regular concern as firefighters must find available parking when responding to a call. Finally, the department does not have the benefit of a single meeting point and base of operations.

A new consolidated firehouse will accommodate modern equipment and provide a secure facility for equipment storage, and have capacity to serve as a temporary emergency shelter for residents during a flood or other major event. Several potential locations for the new facility have been identified, all of which are outside the floodplain. A preferred site will be identified in the feasibility study that is part of this project.

Future use of the existing fire stations also has not been determined, although it has been suggested that one could be used as a museum.

Project Cost Estimate

The Phase I project is estimated to cost \$550,000. The estimate for site acquisition costs is \$250,000. An additional \$250,000 will be directed toward a feasibility analysis (\$50,000) and preparation of bid-ready design documents (estimated at \$200,000 dollars). An allocation of \$50,000 is included for any additional items that may be required, such as preliminary schematic designs or soil borings at the project site.

Project Benefits

Social and Health Benefits

Operating from a single modern facility with adequate parking will allow the fire department to respond more efficiently to the urgent needs of residents and to better protect the Village's assets. Displaced residents will find temporary shelter at the new facility when evacuated from their homes.

Economic Benefits

The new firehouse will be constructed according to Essential Facilities Code and the Village would not expect to replace it for at least 50 years. The future use of the three existing properties has not yet been decided, but given the advanced age of the existing fire stations, avoiding the costs of operating and maintaining one or more of these facilities (depending on the future use of the properties) would be expected to provide an economic benefit.

Risk Reduction Benefits

The Village's asset most prone to flooding is its housing stock, including homes in the historic district. Residents and homeowners of flood-prone homes count on the fire department to protect their personal safety during emergencies and to help respond when their homes flood, such as by pumping out floodwater. This project will provide a general reduction in risk to flood-prone homes and to all residents through improved emergency response.



Co-Benefits

The Village is marked by a strong sense of community and a spirit of volunteerism. The fire department is an important community institution, and being able to offer its high-quality emergency response services from a modern facility supports the long-term vibrancy of the department.

The Village Fire Department also provides services to the Town of Waterford, so Town residents and non-resident homeowners will also benefit from improved emergency response.

The three existing properties can be used for other valuable purposes. The sites could be cleared and used for pocket parks or off-street parking; the old firehouses could be renovated and repurposed for retail, office or community use; or they could be demolished and replaced with new commercial or mixed use buildings. It has been suggested that the oldest firehouse, occupied by the Knickerbocker Steamer Company in 1867, be converted to a fire museum, which would build on the Village's historic identity and serve as a draw for visitors.

Cost Benefit Analysis

The benefits described above assume that Phase I is followed by Phase II construction, so the cost-benefit analysis compares these benefits to the full costs of Phases I and II. The benefits are expected to exceed the costs based on the expectation that the new firehouse and resulting enhancement to the fire department's emergency response capabilities will benefit the Village for multiple decades to come as well as providing more efficient operations and reduced operations and maintenance costs.

Implementation Strategy

Timeframe

Phase I - six months

Regulatory Requirements

Village building permits and inspection; adherence to codes and guidelines for firehouse construction. SEQRA review is required.



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iii. Proposed Project: Wetland Drainage System Improvements

Strategies

- Improve Village infrastructure to better manage floodwaters.

Recovery Functions

- Natural and Cultural Resources
- Housing
- Infrastructure

Location

- Northeastern part of the Village

Jurisdiction

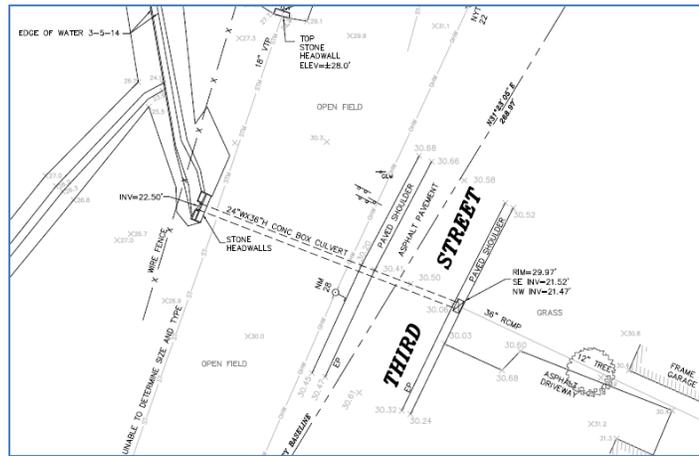
- Village of Waterford
- Saratoga County

Project Description

This project includes permitting and construction of drainage system improvements to address deficiencies in an existing stormwater conveyance system. Wetlands north of the Village are delineated by the Old Champlain Canal Trail and a railroad line. The stormwater system drains water from the wetlands to the Hudson River.

During Hurricane Irene, the drainage system backed up when the Hudson River rose above the level of the stormwater outlet, causing river water to flow into the system. When combined with the water that continued to drain from the wetlands into the storm drains, the capacity of the system was exceeded. As a result, the stormwater system overflowed and drained toward adjacent homes, leading to flooding in the basements of approximately 30 homes.

While Irene was an extreme event, this type of flooding is not an uncommon occurrence in this area. The intent of the project is to reduce flooding in this neighborhood by detaining the stormwater from the wetlands long enough to allow Hudson River flood crests to pass. Reducing the potential for the storm sewer system to back up by directing stormwater through a redesigned and rebuilt drainage system will mitigate flooding in this area.



Snapshot from March 2014 survey of existing drainage system showing culvert that passes under Third Street en route to the Hudson River



IV. Proposed and featured project profiles



Water draining from the wetlands before it passes through a culvert under a railroad embankment

Expected improvements include modifications to or replacement of features of the existing system including headwalls, wingwalls, culverts, a vegetated open channel, and catchment structures. Back-flow prevention valves will be installed. Additionally, a water pooling issue on Fourth Street that occurs when the drainage system backs up will be addressed by elevating a low section of the road and implementing drainage improvements including new catch basins.

Project Cost Estimate

The estimated total project cost is \$1,000,000, including design and implementation of modifications to the drainage system and improvements to Fourth Street. Expectations regarding the requirements for the project are based on analysis of a survey of the existing drainage system undertaken in March 2014 and estimated rainfall runoff and detention volumes for the wetland basin. Modifications to the drainage system are estimated to cost \$915,000, and the improvements to Fourth Street are estimated at \$85,000.

Project Benefits

Social and Health Benefits

The project will protect residences by addressing the cause of flooding to approximately 30 homes. Most of the impacted homes are located within the historic district; hence the project also contributes to the protection of one of the Village's important cultural assets.

Economic Benefits

Addressing this cause of flooding will decrease homeowner costs to repair after flooding, thus lowering carrying costs for homeowners and contributing to stabilization of neighborhood property values. Savings accrue to the Village as a result of reduced need to provide emergency aid to residents, such as help in pumping out basements.

Environmental Benefits

The project ensures proper drainage of the wetland complex and reliable conveyance of stormwater to the Hudson River.



Risk Reduction Benefits

The risk of flooding will be reduced for approximately 30 homes that flooded during Hurricane Irene, as well as other houses in the neighborhood that could experience flooding during a similar event if the drainage system is not modified.

Cost Benefit Analysis

Engineering evaluation was used to determine a conceptual design and cost estimate for this project. This project is expected to minimize flooding and reduce risk to approximately 30 homes located within the drainage area of the project's infrastructure for an estimated cost of \$1,000,000. The social, economic, environmental and risk reduction benefits are expected to substantially outweigh the estimated cost.

Implementation Strategy

Timeframe

15 months

Regulatory Requirements

SEQRA review will be required. This project may also require a wetlands permit from the U.S. Army Corps of Engineers.



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iv. Proposed Project: Building Resiliency Program

Strategies

- Reduce flood risk to housing stock in the 100-year floodplain.

Recovery Functions

- Housing
- Economic Development

Location

- Homes within the 100-year floodplain

Jurisdiction

- Village of Waterford

Project Description

More than 90 homes in the Village of Waterford were damaged from flooding that resulted from Hurricane Irene and Tropical Storm Lee. Approximately 300 Village homes are located within the 100-year floodplain.

The Village will implement a Building Resiliency Program in which elevation surveys are conducted for all residences in the 100-year floodplain. Homeowners who agree to participate will receive at no cost an elevation certificate declaring the first floor elevation of their house.

The structural elevation data will aid the Village and its homeowners in preparing for and reacting to flooding, as they will have data regarding which homes will be affected at any given elevation to which flood waters might rise. The comprehensive structural elevation data will also help the Village understand relative risk of its housing stock and inform prioritization of mitigation measures. Elevation certificates will also be helpful to homeowners who are considering elevating their houses to reduce their risk of flooding, as they will know how many feet their homes need to be raised to lift them above the base flood elevation (BFE) determined by FEMA.



Few homes in the Village have been elevated like the two shown.

Project Cost Estimate

The estimated project cost is \$200,000. The average cost of an elevation certificate for a house in the Village is estimated at \$600, and it is assumed that up to 250 homeowners will take advantage of the program, necessitating \$150,000 for the elevation certificates. An additional \$50,000 is budgeted for implementing the program, including selection or screening of contractors, eligibility screening, marketing, and program administration.



IV. Proposed and featured project profiles

Project Benefits

Social and Health Benefits

Village leaders and emergency response personnel will gain a clearer understanding of which first floors of homes will be flooded at any given height, making it easier to predict when and how many homes are likely to be flooded as the rivers crest, and thus make more informed decisions regarding when residents should evacuate and return to their homes. Homeowners will benefit from the same clearer understanding of whether and when their homes are likely to flood during a major storm event, which will influence their decisions regarding how to prepare and whether to evacuate. Homeowners also will be equipped to make more informed decisions regarding home elevation.

Risk Reduction Benefits

This project is expected to contribute to a general reduction in the risk to homes in the 100-year floodplain, including homes in the historic district. It provides relevant information to emergency response personnel and residents as they make plans for an impending flood. For homeowners deciding how to best address the flood risk of their homes, the first floor elevation of a home is an important piece of information when deciding whether to elevate the home and whether to undertake other flood mitigation measures such as moving utilities from basements to higher floors.

Cost Benefit Analysis

There is a broad spectrum of beneficiaries of the Building Resiliency Program, both direct (the 250 homeowners expected to participate) and indirect (emergency responders and Village leaders). The estimated cost of the project (\$200,000) is low relative to the large number of beneficiaries. The project's social and risk reduction benefits are anticipated to outweigh the costs.

Implementation Strategy

Timeframe

12 months

Regulatory Requirements

Village building permits and inspections; State Historic Preservation Office compliance. The program will complement, but not duplicate, existing home repair and improvement programs.



v. Proposed Project: Home Buyout Program

Strategies

- Reduce flood risk to housing stock in the 100-year floodplain.

Recovery Functions

- Housing
- Natural and Cultural Resource

Location

- Homes within the 100-year floodplain

Jurisdiction

- Village of Waterford

Project Description

The Village will implement a buyout program to purchase properties in the highest risk areas of the Village and that have been damaged severely and repetitively due to flooding. The existing structures will be demolished and green infrastructure elements will be integrated into reuse of the properties as additional porous surface parking or community green space.

More than 90 homes were damaged by flooding caused by Hurricane Irene. The damage to most homes has been addressed, but some homeowners have expressed interest in selling their properties. The program is an investment in the long-term value and quality of Village housing stock that also benefits homeowners facing the daunting challenges of repetitive loss.

This program will include purchase of homes that were seriously damaged due to flooding from willing sellers. In addition, the program will incentivize participation by homeowners at the highest risk in target areas by offering a relocation bonus on top of the pre-storm appraised value. The amount of the additional incentive will be determined based on how many homeowners participate, using a similar program on Staten Island as an example.



View of Battery Park at the confluence of the Hudson River and the Fourth Branch of the Mohawk River. The most flood-prone houses in the Village are located nearby.

Project Cost Estimate

The estimated cost for the project is \$1,300,000, which includes acquisition of homes, relocation incentives and redevelopment of the properties as green space or porous parking.

Project Benefits

Economic Benefits

Replacing flood-prone houses with green space is expected to have a long-term positive effect on home values on the affected streets, reducing the risk of blight caused by homes that are abandoned or no



IV. Proposed and featured project profiles

longer well maintained. The streets which flood regularly are fully built out, and the addition of green space will be viewed as an enhancement. In some cases it may be appropriate to use a portion of an acquired property for porous parking spaces, which would help address a dearth of parking and thus also improve quality of life in the affected neighborhood.

In the short term, the addition of the incentive funds to the fair market value offers homeowners whose houses have been severely or repeatedly damaged a purchase price that will allow them to relocate within the community. Homeowners who participate also avoid the risk of putting their homes on the market and not being able to find buyers, as prospective buyers may not want to live in a floodplain and may be concerned about the future costs of flood insurance.

Environmental Benefits

The project will increase green space in a dense residential neighborhood, reducing runoff by replacing houses and driveways with porous surfaces.

Risk Reduction Benefits

The project will eliminate houses at severe or high risk of flooding, thus reducing the number of residents that will be affected in a major storm, some of which may be in the historic district. This directly addresses the Village's strategy to reduce flood risk to housing in the 100-year floodplain.

Cost Benefit Analysis

The project offers benefits to both the participating homeowners and their neighbors and directly addresses the Village's strategy focused on reducing flood risk to housing. Furthermore the program will eliminate the possibility of blight that will assist in improving the economic vitality of the Village. The estimated cost of \$1,300,000 is relatively low compared to the combined anticipated short and long-term benefits.

Implementation Strategy

Timeframe

19 months

Regulatory Requirements

Consistency with FEMA home buyout program guidelines; building/demolition permits; and SEQRA.



vi. Proposed Project: Street Resiliency Project

Strategies

- Improve Village infrastructure to better manage flood waters.

Recovery Functions

- Infrastructure
- Economic Development

Locations

- Northeastern section of the Village
- Old Champlain Canal Towpath at foot of Steenburgh Avenue by Erie Canal Lock 2

Jurisdiction

- Village of Waterford
- New York State Canal Corporation

Project Description

This project will improve and protect two streets that were flooded during Hurricane Irene. The streetscape of South Street will be rebuilt and a low-lying section of the Old Champlain Canal towpath will be elevated to reduce exposure to flooding on Steenburgh Avenue.

South Street runs in a predominantly east-west direction, and the perpendicular cross streets connect the canal harbor to Broad Street, the Village’s commercial corridor. The streetscapes of the cross streets that receive most of the foot traffic between the harbor and Broad Street have already been updated, incorporating items like rebuilt sidewalks and period lighting. This project will implement similar streetscape improvements on South Street, improving its condition and permeability as well as contributing to the visual aspect of the historic Village.

The South Street component of the project includes improvements to the storm drainage system to incorporate “green infrastructure” elements that would reduce stormwater runoff flowing into the stormdrains. These may include:

- Three-foot wide bio-swales in the pervious strip between the curb and sidewalk edge, to improve the natural infiltration and absorption of storm water;
- Trees positioned at regular intervals to improve absorption and infiltration through utilization of open ended concrete vaults with overflow connection to the Village storm drainage system;
- Improved storm inlets positioned at regular intervals to provide improved capacity to manage storm flows.

As funding becomes available, the streetscape design has been specifically developed for replication throughout the Village.

The second component of the Street Resiliency Project entails elevation of a low-lying section of the Old Champlain Canal towpath, which was breached by Hurricane Irene. As the floodwater rose through the adjacent part of Steenburgh Avenue, the residents of the immediate area observed that their homes could have been spared from flooding had a barrier to the rising waters been provided along the towpath. A modest increase to the elevation of the towpath trail will block rising flood waters while providing for an improved grade through this section of the trail. The design as envisioned improves access for



IV. Proposed and featured project profiles

persons with disabilities through expanding ramped access to this section of the waterfront and trail. The proposed improvements represent a “win-win” opportunity to the Village by both improving storm resiliency and improving pedestrian access for all residents and visitors to this section of the waterfront. Specific improvements include:

- Elevating the towpath trail itself, thereby creating a berm against future flooding event;
- Installing a drain system with backflow prevention that allows water to flow out of the neighborhood but not into the neighborhood during a period of rising water;
- Creating a ramping structure that will allow for handicapped accessibility into an area of the waterfront that is currently difficult to negotiate.

Renderings of the changes to South Street and the changes to the towpath were prepared to give residents and stakeholders a sense of what the project areas will look like once the project is complete (see Figures 8 and 9).

Project Cost Estimate

The total estimated project cost is \$1,100,000, including required surveying, design, permitting, project management, as well as the construction. The estimated cost for the South Street streetscape improvements is \$850,000. The estimated cost for modifications to the towpath trail is \$250,000. Optional features which may be pursued, such as the use of porous paving materials, would incur an additional cost.

Project Benefits

Social and Health Benefits

The towpath trail modifications will improve handicapped accessibility from Steenburgh Avenue to that portion of the trail, making a smooth connection between Steenburgh Avenue and the canal harbor walkway.

Most of South Street and all of Steenburgh Avenue are located within the Village’s historic district. Improving the streetscape of South Street, including the installation of period lighting to match that installed on cross streets, will contribute to the historic character of this portion of the Village.

Economic Benefits

The waterfront area is a unique destination in the Capital region that attracts boaters as well as visitors walking to Battery Park via the Canal Towpath or driving to the Village. The improved streetscape will facilitate the movement of people between the waterfront area and the Village’s central business district. The visitors are a source of revenue to the shops and restaurants along Broad Street, and the improved streetscape elements encourage visitors to stroll through a pleasant and welcoming atmosphere as they experience the rich history of the waterfront area and the neighborhood that adjoins it.

The values of the homes in the neighborhood will be positively impacted as the improved streetscape will complement and enhance the functional and aesthetic characteristics of the entire area.



Environmental Benefits

The implementation of green infrastructure features on South Street will be limited by the physical constraints of the narrow street, but the benefits of those features that can be incorporated include storm-water filtration, improved air quality and CO2 sequestration, and reduction of the “heat island” effect. .

Risk Reduction Benefits

The towpath modifications will reduce the risk of flooding on Steenburgh Avenue like that experienced during Hurricane Irene, which affected more than 20 homes. Had the towpath project been implemented prior to Hurricane Irene, the impacted homes would not have been flooded.

Cost Benefit Analysis

The project will provide benefits to residents of South Street, residents of the affected portion of Steenburgh Avenue, as well as other Village residents and visitors traveling through the project areas. The project will also provide handicapped access of the towpath trail and increase tourist traffic for Broad Street businesses. A strong mix of social, economic, environmental, and risk reduction benefits will accrue as a result of the two components of the project. These combined benefits are expected to outweigh the total estimated project cost of \$1,100,000.

Implementation Strategy

Timeframe

12 months

Regulatory Requirements

The Old Champlain Canal towpath is owned by the NYS Canal Corporation. The Canal Corporation would need to be engaged (for example, to approve designs for the towpath elevation project). SEQRA review will likely be required.



Figure 8 Perspective Rendering of South Street





Figure 9 Perspective Rendering of Towpath Trail at Steenburgh Avenue





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C. Featured Project Profiles

i. Featured Project: Consolidated Firehouse Phase II Project

Strategies

- Strengthen the Village’s emergency response capacity through improved communications, expanded community awareness, and increased and more efficient response services.

Recovery Functions

- Infrastructure
- Community Planning and Capacity Building

Location

- Village of Waterford

Jurisdiction

- Village of Waterford

Project Description

Phase I of the Consolidated Firehouse Project is presented as a Proposed Project which would encompass a feasibility analysis, preparation of bid-ready design documents, permitting, and site acquisition for the new firehouse.

Phase II encompasses construction of the consolidated firehouse according to Essential Facilities Code requirements. The new facility is expected to be an approximately 12,000 square foot building with four bays. The new station will house one engine, one engine rescue, one tower, one brush truck, two utility vehicles, one boat and one rescue trailer. The station will also be equipped to serve as a temporary shelter and central command center in case of extreme emergencies.



J.W. Ford Hose Company Station, one of three existing fire stations.

The new firehouse will replace three smaller existing firehouses, the average age of which is more than 100 years. The three companies that occupy the existing stations each have their own cherished histories, and the facilities are an integral part of their histories and company identities. However, the ages and locations of the existing stations do not present the advantages of a single, larger, modern facility. The garage bay on one of the existing stations is too small to accommodate a regular-sized fire truck, so the department must purchase and maintain a specially sized truck for the station. None of the stations were flooded during Hurricane Irene, but one is located in the 100-year floodplain. The future use of the existing stations has not yet been determined, but possible uses might include conversion of the buildings to residential units, repurposing for commercial or non-profit endeavors, use of the space for storage of fire department equipment or other municipal equipment, or reuse of the properties for other creative purposes such as a museum.



IV. Proposed and featured project profiles

During Hurricane Irene and Tropical Storm Lee, the fire department established a command center at the Kavanaugh Firehouse, where it coordinated the activities of 18 fire departments responding to flooding in the Village. The new firehouse would serve as the command center during future disasters or other significant events. The new firehouse will also serve as a temporary emergency shelter for residents when one is needed.

The location of the new facility has not yet been selected, but it is anticipated that acquisition of all or part of a parcel will be required, and will occur during phase I of the project. The facility will not be located in the floodplain or a flood-prone area.

Project Cost Estimate

The phase II project is estimated to cost \$3,500,000. The estimate does not include costs for site acquisition, which is included in phase I. Inclusion of items such as generators, presentation equipment, and advanced ventilation equipment for removal of vehicle exhaust may incur additional costs.

Project Benefits (also presented in the phase I project profile above)

Social and Health Benefits

Operating from a single modern facility with adequate parking will allow the fire department to respond more efficiently to the urgent needs of residents and to better protect the Village's assets. Displaced residents will find temporary shelter at the new facility when evacuated from their homes.

Economic Benefits

The new firehouse will be constructed according to Essential Facilities Code and the Village would expect to use it for at least 50 years. The future use of the three existing properties has not yet been decided, but given the advanced age of the existing fire stations, avoiding the costs of operating and maintaining one or more of these facilities (depending on the future use of the properties) would be expected to provide an economic benefit.

Risk Reduction Benefits

The Village's asset most prone to flooding is its housing stock, including homes in the historic district. Residents and homeowners of flood-prone homes count on the fire department to protect their personal safety during emergencies and to help respond when their homes flood, such as by pumping out floodwater. This project will provide a general reduction in risk to flood-prone homes and to all residents through improved emergency response.

Co-Benefits

The Village is marked by a strong sense of community and a spirit of volunteerism. The fire department is an important community institution, and being able to offer its high-quality emergency response services from a modern facility supports the long-term vibrancy of the department.



The Village Fire Department also provides services to the Town of Waterford, so Town residents and non-resident homeowners will also benefit from improved emergency response.

The three existing properties can be used for other valuable purposes, such as by converting the stations to housing or commercial space, using them for storage, finding other creative uses for them such as turning one station into a museum, or rebuilding on the properties.

Cost Benefit Analysis (also presented in the phase I project profile above)

The benefits described above assume that Phase I is followed by Phase II construction, so the cost-benefit analysis compares these benefits to the full costs of Phases I and II, together estimated at up to \$4,050,000. The benefits are expected to exceed the costs based on the expectation that the new firehouse and resulting enhancement to the fire department's emergency response capabilities will benefit the Village for multiple decades to come as well as more efficient operations and reduced operations and maintenance costs.

Implementation Strategy

Timeframe

12 months

Regulatory Requirements

Village building permits and inspection; adherence to codes and guidelines for firehouse construction.



**Erie Canal along the Waterford Flight of Locks
above the Village**

V. Additional materials

Section V includes additional materials that support and/or elaborate on content presented in Sections I – IV. This includes:

- Additional resiliency recommendations
- Master table of projects
- Description of the public engagement process
- Community asset inventory
- End notes
- Glossary
- Photo credits

V. Additional materials

A. Additional resiliency recommendations

Table 7 represents the additional resiliency recommendations identified by the Waterford NY Rising Community Reconstruction Program Committee (Committee).

Table 7 Additional Resiliency Recommendations

Strategy	Project Name	Short Description	Regional (Y/N)
Strengthen the Village’s emergency response capacity through improved communications, expanded community awareness, and increased and more efficient response services.	Community Emergency Response Team	Establish a Community Emergency Response Team.	N
Reduce flood risk to housing stock in the 100-year floodplain.	Flood Insurance Economic Analysis	Perform an economic analysis of the impacts of National Flood Insurance Program rate increases on the Village.	N
Reduce flood risk to housing stock in the 100-year floodplain.	Flood-prone Towns Online Community	Form an online community that invites and connects flood mapped individuals and municipalities to join and share information regarding flood resiliency.	Y
Improve Village infrastructure to better manage flood waters.	Canal Harbor Improvements	Identify improvements to strengthen canal harbor facilities and other waterfront access enhancements to be better able to cope with future flooding events, as well as to enhance water-related tourism.	N
Support community development through activities that encourage the engagement of tourists and residents in the Community.	Local Business Incentive Program	Reimburse boaters who pay for docking services up to ten dollars when they show a receipt from any Waterford business. (A similar program was recently implemented in Troy and was well received by both visitors and businesses.) An initial allocation of \$20,000 is suggested.	N



Table 7 (continued) Additional Resiliency Recommendations

Strategy	Project Name	Short Description	Regional (Y/N)
Support community development through activities that encourage the engagement of tourists and residents in the Community.	Walking and Biking Tours	Using hard copy and online media, expand/update the self-guided walking tour developed by the local museum and create self-guided biking tours in the Village and the Town of Waterford, which identify the business districts and links to historical sites, such as the museum, tow-path, various lock flights and places of interest; an approach which can also provide outreach on better public awareness of flood hazards and resilience.	N
Support community development through activities that encourage the engagement of tourists and residents in the Community.	Farmers Market Incentive Program	Upon proof of residency, provide Village residents with \$5 coupons each week for use at the farmers market.	N
Support community development through activities that encourage the engagement of tourists and residents in the Community.	Battery Park Boat Launch Repair	Work with the State Agency Resource Team to identify funding for repair of the boat launch and installation of additional kayak racks.	N
Support community development through activities that encourage the engagement of tourists and residents in the Community.	Community Water Management Program	Distribute rain barrels and conduct outreach in the Village and then to other Mohawk River communities to increase stormwater capture, modeled on the Save the Rain program in Onondaga County.	Y

V. Additional materials

B. Master table of projects

The following table represents the complete list of projects identified by the Committee.

Table 8 Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Strengthen the Village’s emergency response capacity through improved communications, expanded community awareness, and increased and more efficient response services.	Emergency Response Measures	Institute a suite of projects that include planning efforts, community education programs, and equipment purchases.	Proposed	\$950,000	N
Strengthen the Village’s emergency response capacity through improved communications, expanded community awareness, and increased and more efficient response services.	Consolidated Firehouse Phase I Project	Design, permitting, and site acquisition for a new firehouse.	Proposed	\$550,000	N
Reduce flood risk to housing stock in the 100-year floodplain.	Building Resiliency Program	Perform elevation surveys for homes in the 100-year floodplain to enhance emergency preparedness and inform homeowners as they consider flood mitigation options.	Proposed	\$200,000	N



Table 8 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Reduce flood risk to housing stock in the 100-year floodplain.	Home Buyout Program	Purchase and demolish flood-prone properties that have been damaged severely and/or repetitively, including a relocation incentive. Reuse properties for additional community green space or parking with green infrastructure elements incorporated.	Proposed	\$1.3 million	N
Improve Village infrastructure to better manage flood waters.	Street Resiliency Project	Complete repair and improvements to the streetscape of South Street and the elevation of a low-lying section of the Old Champlain Canal tow-path.	Proposed	\$1.1 million	N
Improve Village infrastructure to better manage flood waters.	Wetland Drainage System Improvements	Build structural improvements to a stormwater drainage and wetland system in the northeastern part of the Village.	Proposed	\$1 million	N
Strengthen the Village's emergency response capacity through improved communications, expanded community awareness, and increased and more efficient response services.	Consolidated Firehouse Phase II Project	Construction of a new firehouse.	Featured	\$3.5 million	N

V. Additional materials

Table 8 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Strengthen the Village’s emergency response capacity through improved communications, expanded community awareness, and increased and more efficient response services.	Community Emergency Response Team	Establish a Community Emergency Response Team.	Additional resiliency recommendation	\$50,000	N
Reduce flood risk to housing stock in the 100-year floodplain.	Flood Insurance Economic Analysis and Participation in Community Rating System	Perform an economic analysis of the impacts of the National Flood Insurance Program and participate in the Community Rating System.	Additional resiliency recommendation	\$75,000	N
Reduce flood risk to housing stock in the 100-year floodplain.	Flood-prone Towns Online Community	Form an online community that invites and connects flood mapped individuals and municipalities to join and share information regarding flood resiliency.	Additional resiliency recommendation	\$175,000	Y
Improve Village infrastructure to better manage flood waters.	Canal Harbor Improvements	Identify improvements to strengthen canal harbor facilities and other waterfront access enhancements to be better able to cope with future flooding events, as well as to enhance water-related tourism.	Additional resiliency recommendation	TBD	N



Table 8 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Support community development through activities that encourage the engagement of tourists and residents in the Community.	Local Business Incentive Program	Reimburse boaters who pay for docking services up to ten dollars when they show a receipt from any Waterford business. (A similar program was recently implemented in Troy and was well received by both visitors and businesses.) An initial allocation of \$20,000 is suggested.	Additional resiliency recommendation	\$50,000	N
Support community development through activities that encourage the engagement of tourists and residents in the Community	Walking and Biking Tours	Using hard copy and online media, expand/update the self-guided walking tour developed by the local museum and create self-guided biking tours in the Village and the Town of Waterford which identify the business districts and links to historical sites, such as the museum, tow-path, various lock flights and places of interest; an approach that can also provide outreach on better public awareness of flood hazards and resilience.	Additional resiliency recommendation	\$75,000	N
Support community development through activities that encourage the engagement of tourists and residents in the Community.	Farmers Market Incentive Program	Upon proof of residency, provide Village residents with \$5 coupons each week for use at the farmers market.	Additional resiliency recommendation	\$20,000	N

V. Additional materials

Table 8 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Support community development through activities that encourage the engagement of tourists and residents in the Community	Battery Park Boat Launch Repair	Work with the State Agency Resource Team to identify funding for repair of the boat launch and installation of additional kayak racks.	Additional resiliency recommendation	\$600,000	N
Support community development through activities that encourage the engagement of tourists and residents in the Community	Community Water Management Program	Distribute rain barrels and conduct outreach in the Village and then to other Mohawk River communities to increase stormwater capture, modeled on the Save the Rain program in Onondaga County.	Additional resiliency recommendation	TBD	Y



C. Public engagement process

A public and stakeholder engagement program was conducted as part of the planning process to ensure that the Community had an informed understanding of community needs, opportunities, perceived risks and priorities. Participation throughout the planning period significantly helped shape and enrich the village's NYRCR plan. The NYRCR Planning Committee, comprised of regional and local leaders, including two Co-Chairs, worked with planners from the New York State Department of State and the consultant team to validate the outreach program. Three public meetings conducted over a period of five months were used to educate residents and other stakeholders on the NYRCR planning process and related NY Rising programs, and to receive public input, especially regarding potential reconstruction and resiliency mitigation projects.



Public meeting participants were invited to comment on potential projects.

Residents, public and private agencies, and community organizations provided direction to the Planning Committee through the public meetings and via social media, including the Governor's Office of Storm Recovery website and Facebook page as well as a Facebook page created by the Committee members.

The Planning Committee held Public Engagement Events on:

- October 15, 2013;
- November 19, 2013; and
- February 25, 2013.



The third of four public meetings was held in February 2014.

At each of these open house style events, the public was provided with information on the NYRCR Program, key milestones of the planning process and draft components of the NYRCR Plan. They were encouraged to provide comments and ask questions. The public also had the option to submit comments on the Governor's Office of Storm Recovery NY Rising Community Reconstruction Program website.



V. Additional materials

In October of 2013, a Conceptual Plan for the village was posted to the Governor’s Office of Storm Recovery NY Rising Community Reconstruction Program website for public review and comments. This document represented a snapshot of the direction the committee was expecting to take to enhance community resiliency. Members of the public were invited to comment on the Conceptual Plan contents at the second public meeting. At the third public meeting, participants were invited to comment on projects and indicate which projects they felt were most important.

A fourth public meeting will be held during May 2014 to present the final NYRCR Plan for the village. It is expected that after the conclusion of the NYRCR planning process, continuing input and participation from engaged stakeholders will be solicited from the Community, especially as projects are implemented and additional funding sources are identified to advance projects identified in the plan.



D. Community asset inventory

The Community Asset Inventory was created in an Excel spreadsheet containing 15 columns of categorical data related to each asset. The full asset table indicating a risk score for each asset is shown in Table 9, and the map series in Section II.A.i provides visual details on each asset including its location and flood risk area (Extreme, High, Moderate, N/A).



V. Additional Materials

Table 9 Village of Waterford Asset Inventory and Risk Assessment Tool

Asset Information							Risk Assessment			
Map ID	Asset	Risk Area	Asset Class	Socially Vulnerable Populations	Critical Facility	Community Value	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
1	Peebles Island State Park	Residual	Natural and Cultural Resources	No	No	Medium	3	NA	1	0
2	Bike Trail	Moderate	Natural and Cultural Resources	No	No	Low	3	0.50	1	2
3	Sewer Pumping Station	Extreme	Infrastructure	No	Yes	Low	3	3.50	1	11
4	Peebles Park Bridge	Residual	Infrastructure	No	No, Locally Significant	Low	3	NA	1	0
5	Recreational Area, Harbor Center and Visitor Area	Extreme	Natural and Cultural Resources	No	No	High	3	3.00	1	9
6	Sewer Pumping Station	Extreme	Infrastructure	No	Yes	Low	3	3.50	1	11
7	Park area with kayak launch	Extreme	Natural and Cultural Resources	No	No	Low	3	3.50	1	11
8	Battery Park (and boat launch)	Extreme	Natural and Cultural Resources	No	No	Medium	3	3.50	1	11
9	Bridge - Erie Canal	Residual	Infrastructure	No	No	Low	3	NA	1	0
10	Bridge - Hudson River	Residual	Infrastructure	No	No, Locally Significant	High	3	NA	1	0
12	Soldiers and Sailor Memorial Park	High	Natural and Cultural Resources	No	No	Low	3	2.50	2	15
13	Waterford Fire Station 1	Moderate	Health and Social Services	No	Yes	Medium	3	0.50	1	2
14	Home-Based Day Care	High	Health and Social Services	Yes	No	Low	3	2.50	2	15
15	Primary sewage treatment facility	Moderate	Infrastructure	No	Yes	Medium	3	0.50	1	2
16	Senior Center/Shelter	High	Health and Social Services	Yes	No	Medium	3	2.50	2	15
17	Knickerbocker Park	High	Natural and Cultural Resources	No	No	Low	3	2.50	2	15
18	NYS Canal System - Lock 2	Residual	Infrastructure	No	No, Locally Significant	Medium	3	NA	1	0
19	Grace Church/Shelter	High	Health and Social Services	No	No, Locally Significant	Medium	3	2.50	2	15
20	Municipal Hall	High	Health and Social Services	No	No, Locally Significant	Medium	3	2.50	2	15
21	Police Headquarters	High	Health and Social Services	No	Yes	Medium	3	2.50	2	15
22	Weaver Mobile Gas Station	High	Economic Development	No	No	Low	3	2.50	2	15
23	First United Church of Waterford /Shelter	High	Health and Social Services	No	No	Medium	3	2.50	2	15
24	Physician's Office	High	Health and Social Services	No	No	Low	3	2.50	2	15
25	Bridge - Old Champlain Canal	Residual	Infrastructure	No	No	Medium	3	NA	1	0
26	Saint Mary Of The Assumption Rom. Cath. Church - Hall/Shelter	Residual	Health and Social Services	No	No	Medium	3	NA	1	0
27	Pocket Parks	Residual	Natural and Cultural Resources	No	No	Low	3	NA	1	0
28	Old Champlain Canal Towpath Bike Trail	Residual	Natural and Cultural Resources	No	No	Low	3	NA	1	0
29	Waterford Fire Station 3	High	Health and Social Services	No	Yes	Medium	3	2.50	2	15
30	Waterford Youth Council - afterschool program and daycare	Moderate	Health and Social Services	Yes	No	Low	3	0.50	1	2
31	Post Office - Waterford	High	Health and Social Services	No	No	Low	3	2.50	2	15
32	Bridge - Erie Canal	Residual	Infrastructure	No	No	Medium	3	NA	1	0
33	Pocket Park	Residual	Natural and Cultural Resources	No	No	Low	3	NA	1	0
34	Waterford Rescue Squad/Shelter	Moderate	Health and Social Services	No	Yes	High	3	0.50	1	2
35	St. Mary's School	Residual	Health and Social Services	No	No	Low	3	NA	1	0
36	Bridge - Old Champlain Canal	Residual	Infrastructure	No	No	Medium	3	NA	1	0
37	VFW Building	High	Natural and Cultural Resources	No	No	Low	3	2.50	2	15
38	Ahana House	Residual	Housing	Yes	No	Low	3	NA	1	0
39	Waterford Fire Station 2	Residual	Health and Social Services	No	Yes	Medium	3	NA	1	0



Table 9 (continued) Village of Waterford Asset Inventory and Risk Assessment Tool

Asset Information							Risk Assessment			
Map ID	Asset	Risk Area	Asset Class	Socially Vulnerable Populations	Critical Facility	Community Value	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
40	Playground	High	Natural and Cultural Resources	No	No	Low	3	2.50	2	15
41	Butler Park	Residual	Natural and Cultural Resources	No	No	Low	3	NA	1	0
42	Senior Housing	Residual	Housing	Yes	No, Locally Significant	Low	3	NA	1	0
43	Playground	Residual	Natural and Cultural Resources	No	No	Low	3	NA	1	0
44	Library	High	Natural and Cultural Resources	No	No	Low	3	2.50	2	15
45	Bridge - Delaware & Hudson	Residual	Infrastructure	No	No	Medium	3	NA	1	0
46	Scenic Byway	Residual	Natural and Cultural Resources	No	No	Low	3	NA	1	0
47	Home-Based Day Care	High	Health and Social Services	Yes	No	Low	3	2.50	2	15
48	Railroad Bridge - Champlain Canal	Residual	Infrastructure	No	No	Low	3	NA	1	0
49	Water System Plant (line from Troy)	High	Infrastructure	No	Yes	Medium	3	2.50	2	15
50	Senior Housing	Residual	Housing	Yes	No, Locally Significant	Low	3	NA	1	0
51	Home-Based Day Care	High	Health and Social Services	Yes	No	Low	3	2.50	2	15
52	Bridge - Canal Lock 3 Spillway	Residual	Infrastructure	No	No	Low	3	NA	1	0
53	Pocket Park	Residual	Natural and Cultural Resources	No	No	Low	3	NA	1	0
54	NYS Canal System - Lock 3	Residual	Infrastructure	No	No, Locally Significant	Low	3	NA	1	0
55	Waterford Historic District	High	Natural and Cultural Resources	No	No, Locally Significant	Medium	3	3.00	4	36

V. Additional Materials

E. End notes

¹ Saratoga County Multi-Jurisdictional All-Hazard Mitigation Plan (2009).

² Town and Village of Waterford Comprehensive Plan (2002).

³ Capital Regional Economic Development Council Strategic Plan (2013).

F. Glossary

BFE	Base Flood Elevation
CDBG-DR	Community Development Block Grant – Disaster Recovery
Committee	NYRCR Waterford Planning Committee
CREDC	Capital Region Economic Development Council
CRS	Community Rating System
FEMA	Federal Emergency Management Agency
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NYRCR Plan	NYRCR Village of Waterford Plan
NYRCR	NY Rising Community Reconstruction
NYS	New York State
RSF	Recovery Support Function
SHPO	State Historic Preservation Office
WALCC	Waterford Area Long-term Care Coalition

G. Photo credits

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CANALWAY TRAIL
CHAMPLAIN



ADOPT-A-TRAIL PROGRAM
Waterford Canal & Towpath Society
Maintains This Segment Of The Canalway Trail
NYS Canal Corporation

NO MOTOR VEHICLES

ANY TIME