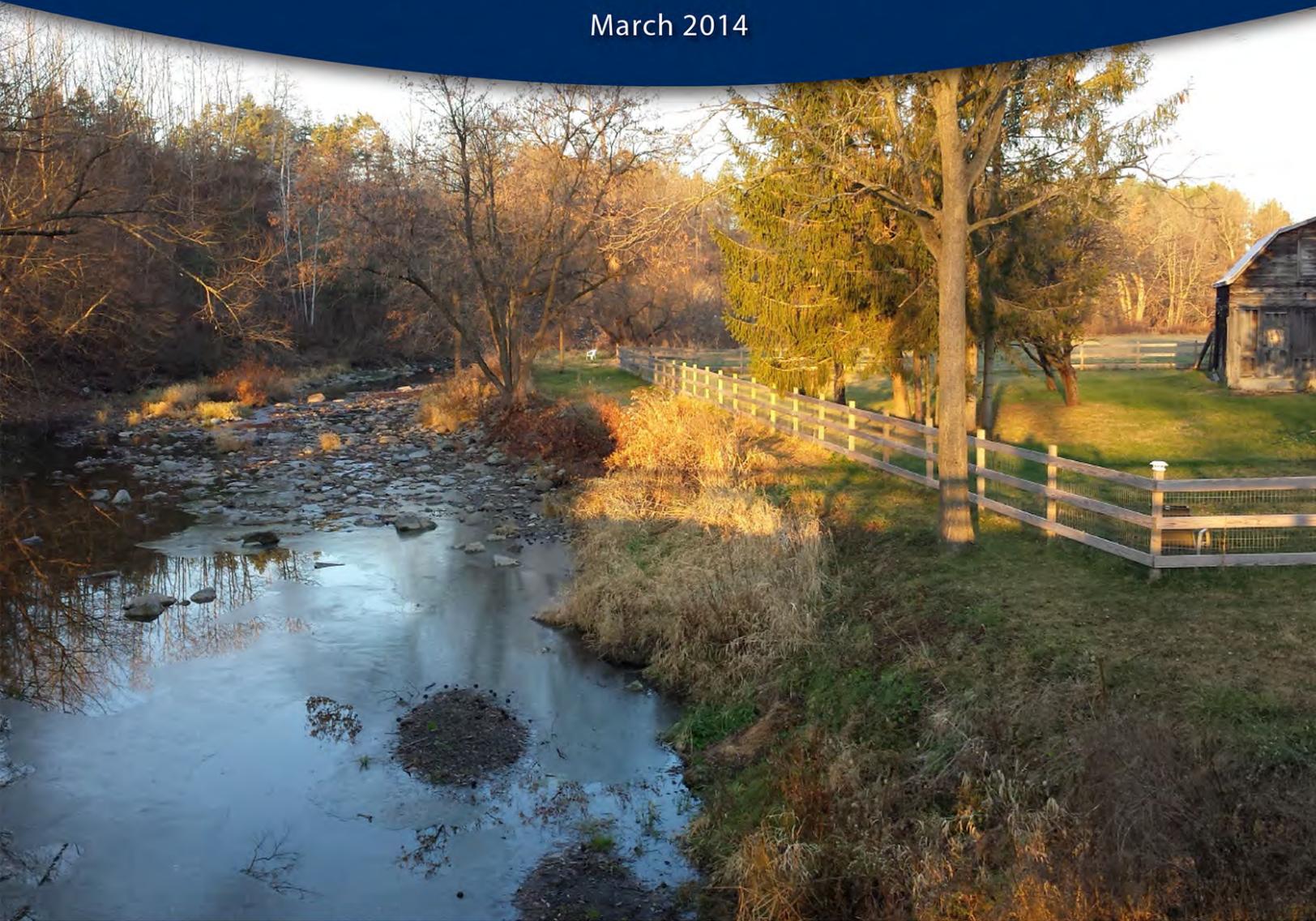




NY Rising Community Reconstruction Plan for the **CITY AND TOWN OF AMSTERDAM AND TOWN OF FLORIDA**

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) City of Amsterdam, Town of Amsterdam, and Town of Florida 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 through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program¹.

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



Foreword

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.

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.

The NYRCR Community of the City of Amsterdam, Town of Amsterdam, and Town of Florida is eligible for up to \$12 million in CDBG-DR implementation funds.²

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. 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.

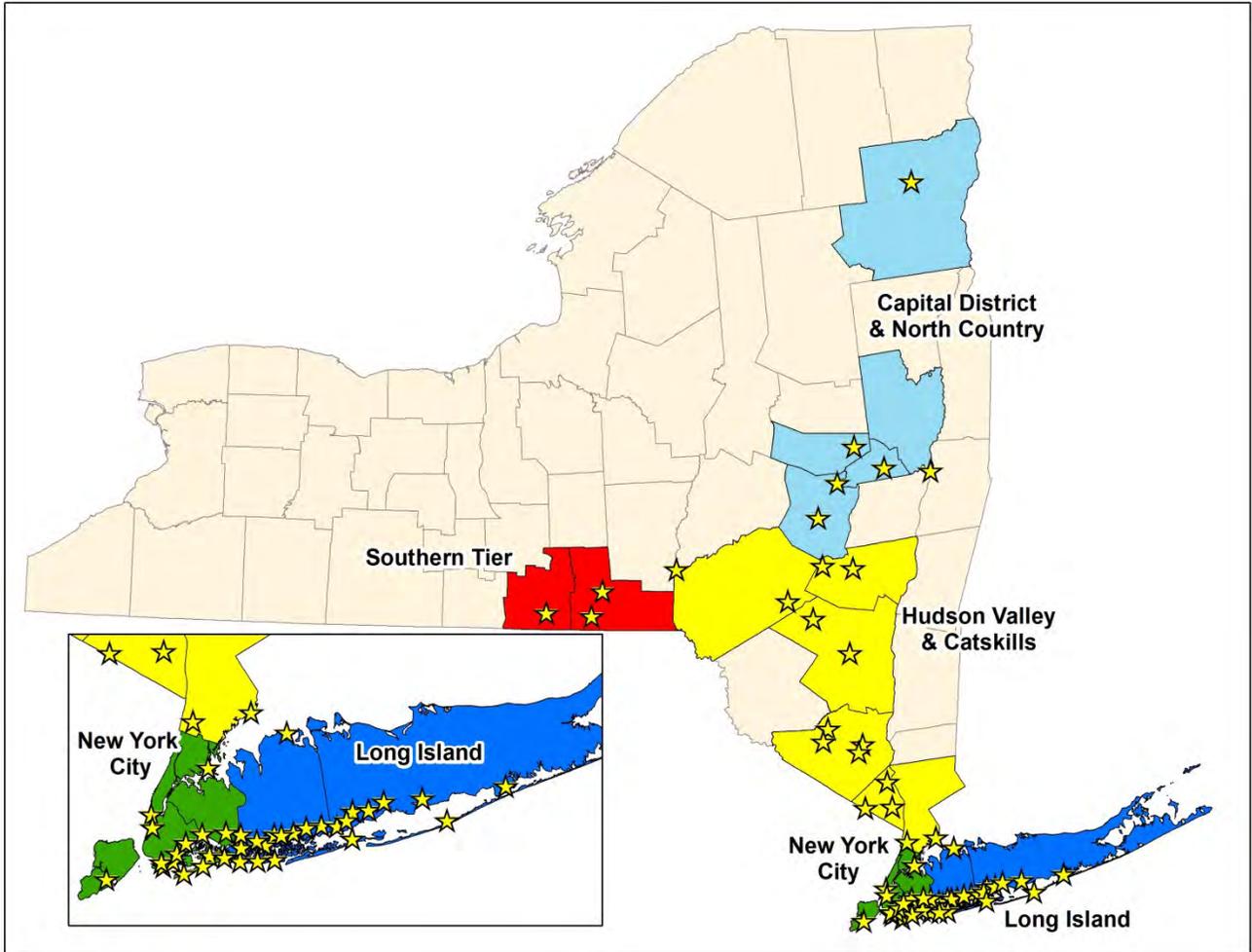
² The following localities' allocations comprise the NYRCR Community's total allocation: City of Amsterdam \$3.0 million; Town of Amsterdam - \$3.0 million; Town of Florida - \$3.0 million.



Foreword

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 Communities³

³ Note: map includes those NYRCR Communities funded through the CDBG-DR program, including the NYRCR Communities announced in January 2014.



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Remnants of the historic Schoharie Crossing Aqueduct can be seen from the protective berm in Fort Hunter, NY.

Source: Ecology and Environment, Inc.

Executive Summary

Governor Andrew M. Cuomo established the New York Rising Community Reconstruction (NYRCR) program to provide additional rebuilding and revitalization assistance to communities damaged by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. The Governor's Office of Storm Recovery is managing the NYRCR program in partnership with the NYS Department of State. Additional support has been provided through the Regional Economic Development Council's State Agency Review Teams.

The NYRCR Program has provided a unique opportunity for residents of the City of Amsterdam and Towns of Amsterdam and Florida (also referred to as the Community) to engage in a thoughtful discussion about their collective future. Under this program the Community is eligible for up to \$12 million from the federal Community Development Block Grant Disaster Relief (CDBG-DR) program.

Overview

The City of Amsterdam and Towns of Amsterdam and Florida sit on the north and south banks of the Mohawk River. The Town of Florida is also bounded on the west by the Schoharie Creek. The Mohawk River historically formed part of the Erie Canal in the New York State Canal System. The growth and evolution of these communities are deeply connected to the area's waterways.

Flood Impacts

Although the entire study area felt the effects of Hurricane Irene, the Village of Fort Johnson in the Town of Amsterdam and the hamlet of Fort Hunter and neighborhood of Lost Valley in the Town of Florida sustained some of the most significant damage.

City of Amsterdam: The City of Amsterdam's government buildings lost power which shut down all communications between the Department of Public Works (DPW) and City Hall. At the City's DPW, loss of power meant the repair facilities could not be used, limiting the capabilities of the DPW and their vehicle fleet. Communications to City residents were significantly obstructed after the loss of power, compounding the existing challenge of aiding residents with limited ability to speak English.



Key infrastructure including the City's Amtrak station was inundated during Hurricane Irene.
Source: City of Amsterdam Fire Department



The Amtrak Station was flooded and had to close. The riverbank by Dove Creek eroded, undercutting the retaining wall and placing St. Mary's Hospital at risk of falling into the river. At historic Guy Park Manor, floodwaters carried away portions of the building and numerous artifacts housed in the Walter Elwood Museum.

Town of Amsterdam: In the Town of Amsterdam, the banks of local creeks eroded and roads were washed out from flooding. Stormwater collection and drainage systems were damaged. In the Village of Fort Johnson, the first floor of the Old Fort Johnson National Historic Landmark was damaged with five feet of flood water. Homes in Fort Johnson were also flooded.

Town of Florida: In the Town of Florida, floodwaters breached the protective berm that parallels Schoharie Creek in two locations, flooding most of the hamlet of Fort Hunter. Lost Valley, a small neighborhood on the Schoharie Creek with 20 homes, was almost entirely destroyed and is unlikely to be rebuilt.

Critical Issues and Needs

Critical issues and Community needs were identified through conversations with Planning Committee members and during public outreach events.

Continuity of Government Services

After Irene, Montgomery County offices were shut down for several weeks. Power losses at City Hall in Amsterdam impeded storm response and communications. Investments are needed to reduce the likelihood of a power failure for municipal and county facilities, and to reduce the vulnerability of county offices.

Communications

With the large Spanish-speaking population in the Community, there is a need for emergency preparedness and emergency alert information to be developed and distributed in Spanish.

Sheltering

Both the City and the Town of Amsterdam have identified the need for permanent shelter facilities to be used during a power outage. These facilities should have the capacity to receive vulnerable populations and to support satellite operations for emergency and municipal services.

Healthcare

In the City of Amsterdam, St. Mary's Hospital satellite facility and annex sit close to Dove Creek, where a retaining wall is in danger of collapse. Repairs to the wall will protect the hospital and nearby homes. There is a need for medical services on the south side of the Mohawk River in the event bridge crossings are closed.

Drainage Infrastructure

Portions of the existing stormwater management systems in all three municipalities were damaged by Hurricane Irene, or proved insufficiently sized. Some areas of the Community are not served by stormwater infrastructure or rely on ineffective drainage ditches to carry away stormwater.

Waterfront Protection and Revitalization

The storm events damaged and eroded sections of bank along the Community's numerous tributaries as well as the Mohawk River and Schoharie Creek. Riverbank stabilization is necessary in order to preserve and secure these areas. Creating greenways and parks on the Communities waterfront provides an opportunity for stabilization and an attractive amenity for residents, visitors, and businesses.

Historic and Cultural Asset Protection

The Community's historic assets, including Guy Park Manor, the Fort Johnson House, and the Schoharie Crossing Historic Site, were damaged from Irene and have not been fully restored. Cultural resources in flood prone areas need protection to prevent the loss of irreplaceable artifacts.

Community-Driven Process

A Planning Committee made up of civic leaders helped guide the development of this NYRCR Plan. Planning Committee members represented all three communities began meeting in September 2013 to discuss how to create a truly resilient Community that is better able to withstand the impacts of future storms and protect its vulnerable populations, businesses, and historic heritage. Their first step was to develop a Community Vision statement, which was presented to the public for their input. Feedback suggested that it should convey the potential for both economic and recreational waterfront opportunities, demonstrate a positive outlook for economic growth, and present the Mohawk River as an asset rather than a liability. The final Community Vision statement is:

Community Vision

"The City of Amsterdam, Town of Amsterdam, and the Town of Florida will maximize the economic and recreational opportunities of our waterfront assets. We will anticipate and mitigate flood risks, limit impacts to property and infrastructure when flooding is unavoidable, and respond efficiently and recover quickly, in a manner that protects vulnerable populations and our quality of life."

A Blueprint for Implementation

The Planning Committee met regularly to discuss Community needs and drafted a list of strategies to help guide the project development process. They spoke with others in the Community, including municipal officials and the public, to come up with an initial list of projects for the plan. A comprehensive Needs Assessment and Risk Assessment were also completed to support project development. Projects were then screened for feasibility, risk-reduction, and cost effectiveness prior to final selection. Projects in the plan were assigned into one of three categories:

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 projects listed below are grouped by strategy, and are not ranked or prioritized. All projects in the list below are proposed projects unless otherwise noted.

Strategy 1: Facilitate communication from emergency response organizations to residents before, during, and after emergency events

Project:

- Develop a county-wide emergency communications system p.

Strategy 2: Improve emergency response through community-wide coordination and positioning of critical resources and services

Projects:

- Establish permanent emergency shelter facilities in the Town and City of Amsterdam.
- Maintain power to critical City buildings (during an outage) to enable continuity of services.



The protective berm at Fort Hunter was breached at the Schoharie Crossing Historic Site which also suffered extensive damage. Source: NYS Canal Corporation

Strategy 3: Maintain essential medical services to all populations during an emergency event

Projects:

- Protect and reinforce the Dove Creek retaining wall near St. Mary’s Hospital.
- Provide pre-positioned medical services on the south side of the Mohawk River (Featured).

Strategy 4: Create and sustain a “Business Friendly Climate” to encourage businesses to remain, locate, grow, and develop

Projects:

- Demolish the abandoned Carpetland building and replace it with a public recreational space.
- Design the Waterfront Heritage Area on the City of Amsterdam’s south side (Featured).

Strategy 5: Stabilize and revitalize neighborhoods and protect them from flooding.

Projects:

- Remove the Old Brookside Reservoir dam and redevelop the site for recreational use.
- Reinforce the protective berm on the east bank of the Schoharie Creek in Fort Hunter.
- Acquire and demolish three abandoned homes in Fort Hunter to create public recreational space and prevent future development on these at risk sites.

Strategy 6: Mitigate damage to transportation corridors and infrastructure

- Create a detailed site plan for the Amtrak station relocation project.
- Install stormwater conveyance infrastructure along Guy Park Avenue on the west side of the City.

Strategy 7: Improve drainage in key areas known to flood.

- Create a green infrastructure and flood mitigation master plan for the City.
- Repair and restore damaged stormwater infrastructure on west Route 5 in the City.
- Enhance stormwater conveyance and increase detention volume in Fort Hunter.
- Enlarge undersized culverts in the Town of Florida.
- Install stormwater infrastructure on Midline Road in the Town of Amsterdam (Featured).

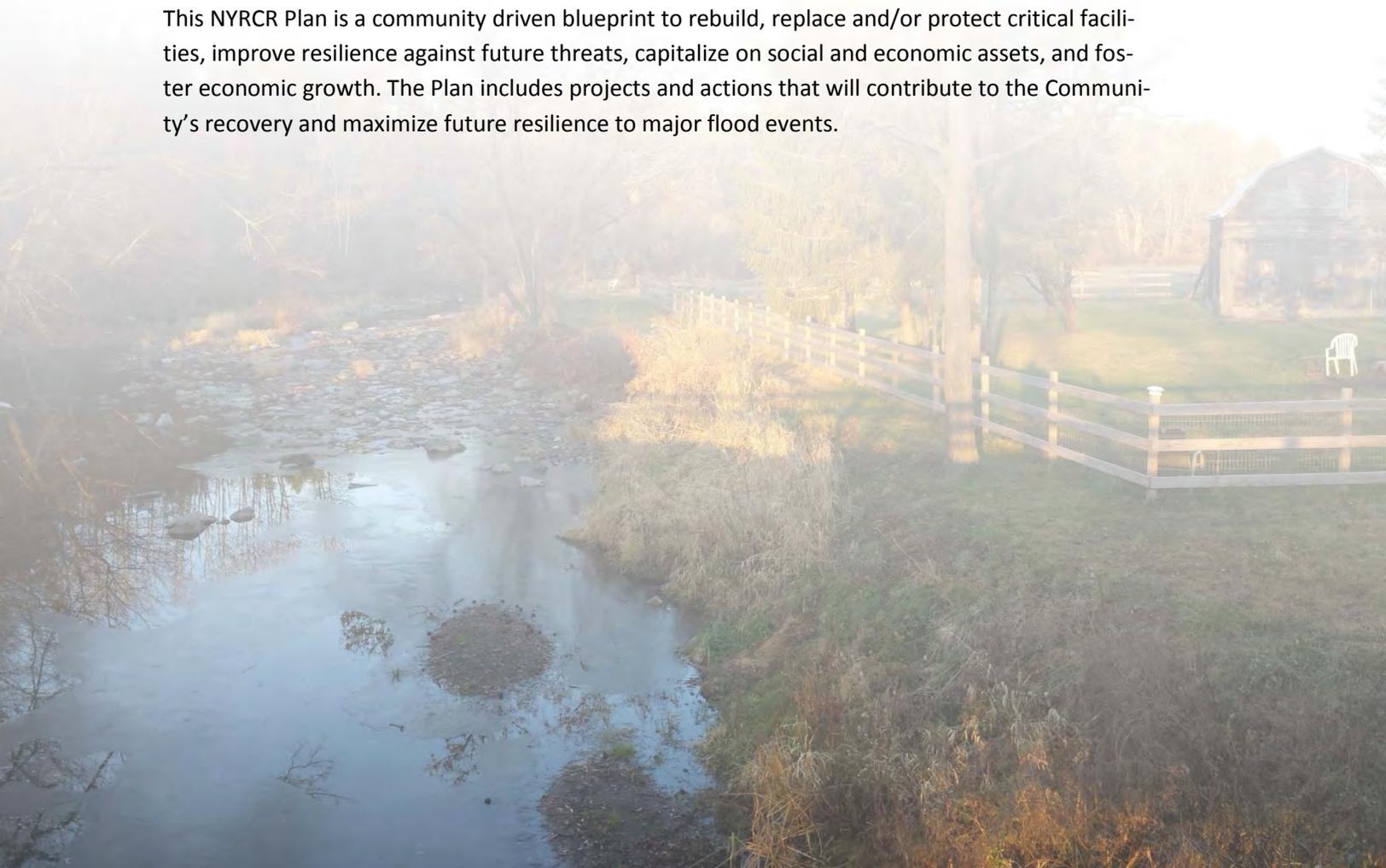
Strategy 8: Augment natural and cultural resources to support flood resiliency

- Stabilize and repair the South Chuctanunda Creek banks and streambed.
- Stabilize and repair the Bunn Creek banks and streambed.
- Stabilize and repair the North Chuctanunda Creek banks and streambed.
- Construct the shoreline stabilization features of the Amsterdam Riverwalk project (Featured).

Strategy 9: Protect cultural artifacts, historic sites and archives from damage and loss

- Perform an interior conditions assessment of the Old Fort Johnson House.
- Rebuild collapsed retaining wall on Kayaderosseras Creek next to Old Fort Johnson.

This NYRCR Plan is a community driven blueprint to rebuild, replace and/or protect critical facilities, improve resilience against future threats, capitalize on social and economic assets, and foster economic growth. The Plan includes projects and actions that will contribute to the Community's recovery and maximize future resilience to major flood events.





Flooded cornfield near Newkirk Road, Town of Florida.
Source: Town of Florida

I. Community overview

Section I sets the stage for the City of Amsterdam, Town of Amsterdam, and Town of Florida NY Rising Community Reconstruction (NYRCR) Plan. It includes:

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



I. Community overview

The City of Amsterdam and Towns of Amsterdam and Florida (together referred to as the Community) sit on the north and south banks of the Mohawk River, which flows east through the Community before joining the Hudson River. The Mohawk River is the largest tributary of the Hudson, and historically formed part of the Erie Canal in the New York State Canal System.

Despite their proximity to each other, the City of Amsterdam and Towns of Amsterdam and Florida are markedly different. The City of Amsterdam is predominantly urban; the Town of Florida, immediately south of the City, is a rural, agricultural community. The Town of Amsterdam, which borders the City to the City's north, east and west, is primarily suburban in character and features one of the area's newer commercial centers.¹

Despite their distinct character, these communities share a history of growth and change that is deeply connected to the area's waterways. With the start of the industrial age in New York, the Mohawk River and Chuctanunda Creek powered early forms of industry. Industrial manufacturing, including textiles and paper goods, was an important economic engine. The Community's location along the Erie Canal fostered a robust commercial sector. The decline of industrial manufacturing since World War Two and the virtual end to shipping along the Erie Canal has resulted in difficult economic times, particularly for the City of Amsterdam.

The waterways that proved to be such a valuable economic resource have also been perceived as a "mixed blessing." The Community has historically suffered from flooding on the Mohawk and its tributaries, most recently due to Hurricane Irene and Tropical Storm Lee, which pummeled the Community in August and September 2011.

In the two years since Hurricane Irene and Tropical Storm Lee, the Community has done its best to rebuild, but has not fully recovered. The NY Rising Community Reconstruction (NYRCR) Program provided a unique opportunity for members of the Community to engage in a thoughtful discussion about their collective future. Stakeholders² representing all three communities came together between August 2013 and April 2014 to talk about how to create a truly resilient Community, one that is better able to withstand the impacts of future storms and protect its vulnerable populations, small businesses, and significant historic heritage.

A. Geographic scope of NYRCR Plan

The project study area lies completely within Montgomery County, which is located in the Mohawk Valley in east-central New York State (NYS). Amsterdam is the only city within the County, located approxi-



mately 30 miles northwest of Albany and 60 miles east of Utica. The Town of Amsterdam surrounds the northern portion of the City of Amsterdam and includes the Villages of Hagaman and Fort Johnson. South Chuctanunda Creek, a tributary of the Mohawk, runs north to south through the Town of Amsterdam before bisecting the Town of Florida, which includes the hamlets of Minaville, Scotch Bush, Fort Hunter and the neighborhood of Lost Valley. The Town of Florida is adjacent to the southern border of both the City and Town of Amsterdam. It is located on the south bank of the Mohawk River and is bisected by the South Chuctanunda Creek. It is bordered on the west by the Schoharie Creek, a major tributary of the Mohawk River. Fort Hunter is at the confluence of the Schoharie Creek and Mohawk River, with Lost Valley lying farther south along Schoharie Creek.³

The City of Amsterdam is the largest city in the mid-Mohawk Valley. The Thruway is connected to the Amsterdam area by NYS Route 30, which bisects the City. State Route 30 is a major north-south route from the Adirondack Mountains to the Catskill Mountains and is heavily used for recreational travel. The City is served by rail transportation, with CSX freight and an Amtrak station for passenger service.⁴ The Erie Canal passes through Amsterdam, with many recreational boaters traveling through Lock 11 each year as part of their exploration of the Canal. The Erie Canalway Trail runs through the south side of the City. More than three-quarters of the 365-mile long multi-use Canalway trail is currently open for recreation. When finished it will be the longest multi-use trail in the Country.⁵

i. Definition of the NYRCR Plan study area

The NYRCR Plan study area (geographic scope) for the Community was defined to focus the planning efforts on areas within the Community that were impacted by flooding due to Hurricane Irene and Tropical Storm Lee, as well as those considered at risk of flooding. Initially, the Planning Committee reviewed 500-year floodplain maps produced by FEMA. These were deemed insufficient for expressing the real flood risk, in part because they did not cover all the tributaries, which are a major source of flooding.

After gathering input from the Planning Committee and the public, the study area was defined to include all land area within 1,000 linear feet of the 500-year floodplain along the Mohawk River and the Schoharie Creek. Additionally, the study area was defined to include all land area within 660 feet of the centerline of Chuctanunda Creek, Dove Creek, Bunn Creek, Willow Creek, and Eva's Kill. The study area is delineated in Figures 1 and 2 and Appendix A.

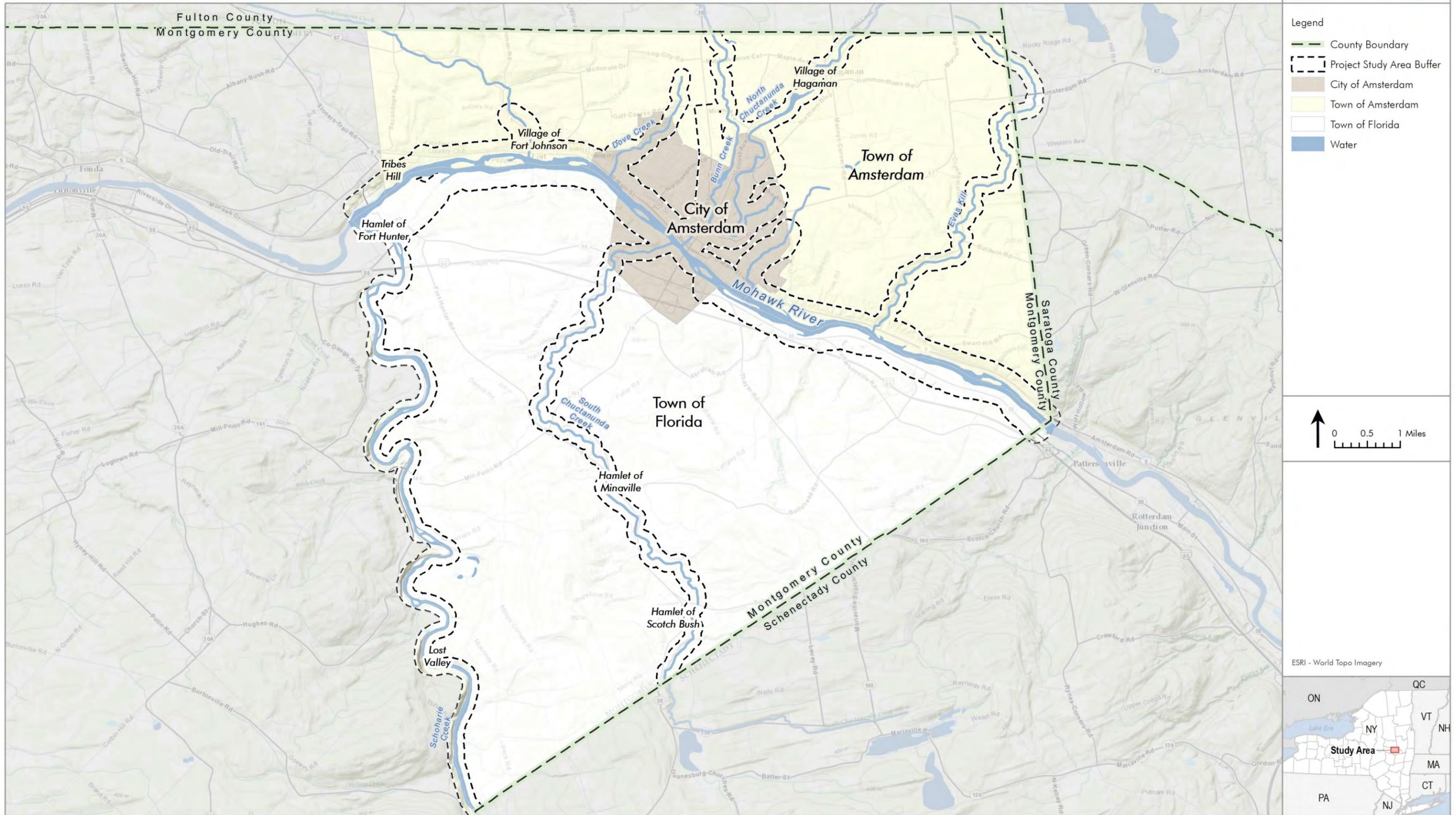
"Low Bridge, Everybody Down"

The Erie Canal and the Mohawk River are one in the same in the City of Amsterdam. Current-day canal locks E-10, E-11, and E-12 span the Mohawk across the study area.

The iconic waterway established settlement patterns for most of the United States during the 19th century, made New York the financial capital of the world, provided a critical supply line which helped the North win the Civil War, and precipitated a series of social and economic changes throughout a young America.

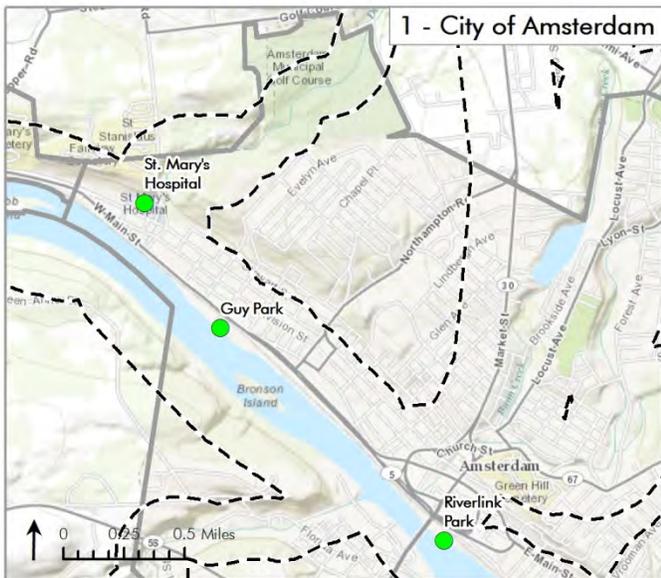
—New York State Canals, Canal History
<http://www.canals.ny.gov/history/history.html>
accessed on March 13, 2014

Figure 1: The study area
City and Town of Amsterdam
Town of Florida





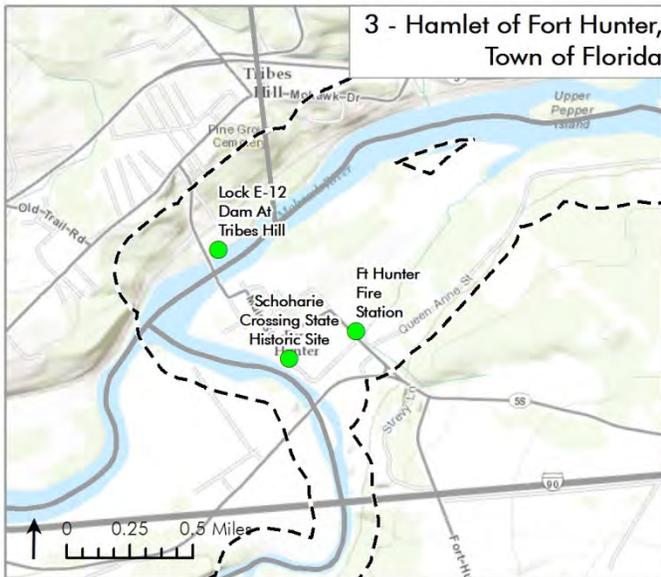
**Figure 2: Key locations within the study area
City and Town Amsterdam
Town of Florida**



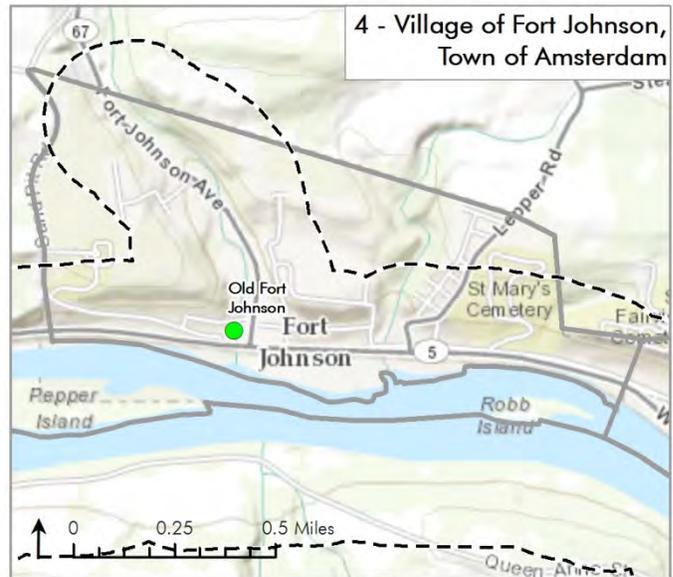
During Irene, the north bank of the Mohawk experienced flooding along the Route 5 corridor, which included the Amtrak Station and Riverlink Park. St. Mary's Hospital adjacent to Dove Creek was at risk as the creek continued to undercut its retaining wall.



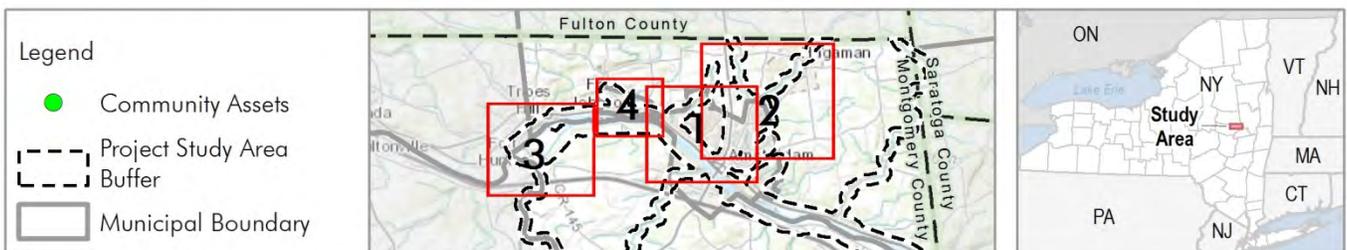
North Chuctanunda Creek gained volume and speed as the rains came down during Irene and the creek traveled over steep downhill slopes towards the City of Amsterdam. Steep grades within the town led to runoff overwhelming critical stormwater infrastructure.



The hamlet, located at the confluence of the Mohawk River and Schoharie Creek, was inundated when floodwaters breached a retaining wall on the Creek's north bank.



Floodwaters rose up just beyond Main Street in the eastern portion of the Village. The Old Fort Johnson house, a 1749 National Landmark, was filled with several feet of water.





I. Community overview

Major tributaries to the Mohawk were included in the study area because flooding along the tributaries is as much of a threat to the Community as flooding from the Mohawk River. When the tributaries overflow, they can block local roads, flood homes, erode banks, and deposit sediment and debris in undesirable locations such as agricultural fields.

The study area also includes all land area within 1,000 feet of State Route 30 from where it leaves the City to its intersection with County Route 18. This area was included to take account of an important shopping corridor. The Planning Committee wanted to ensure that the potential impact of the shopping centers as sources of stormwater runoff was taken into consideration during the planning process.

ii. Demographic and socioeconomic profile of the study area

With the loss of manufacturing jobs and the shrinking of available agricultural land, Montgomery County's population declined from 59,594 persons in 1950 to 49,708 in 2000. From 2000 to 2010, the population stabilized and even grew slightly, to 50,219 persons.⁶ Despite the slight uptick over the last decade, population estimates project a loss of 5,997 people between 2010 and 2040.⁷ As of August 2013, Montgomery County was among the five counties with the highest unemployment rates in NYS.⁸



Middle drop of Kirk Douglas Park waterfall. View from Guy Park Avenue near the City's Public Safety Building, looking north, Amsterdam, NY. Source: The LA Group.

More than one-half of the population gain in Montgomery County between 2000 and 2010 occurred in the City of Amsterdam, with an increase of 265 people (see Table 1).⁹ This represents a modest turnaround for the City. An increasing part of the population is Spanish-speaking, which adds a layer of complexity during emergency response and recovery, as services must be provided in more than one language.

The median age of the City's population is 37.4 years, just under the NYS median age of 38. It is the second youngest of the 11 municipalities in Montgomery County. In the City of Amsterdam, the percentage of the population under the poverty level is 26.3% whereas the County rate is 8.2% and the State rate is 16.3%. Median household income, as illustrated in Table 1, is reported at \$38,699 for 2011, compared with \$43,254 for the County and \$56,951 for NYS. Given the relatively high poverty rate, economic development is a high priority for the City of Amsterdam.



The Town of Amsterdam has a high median age of 49.2 years, with one-quarter of its residents over the age of 65. From 2000 to 2010, the Town experienced a significant (4.4%) loss of population. The Town of Florida has a median age of 44.8 years and lost 1.3% of its population between 2000 and 2010.¹⁰ Both Towns have higher median household incomes than the County, and are closer to the average reported for NYS. While poverty is not as acute a problem as it is in the City of Amsterdam, both Towns have aging populations that may require particular support and assistance during an emergency.

Table 1 Statistical comparison of selected demographics

Community	Population (Pop. Change 2000-2010)	Median Age (Years)	Census Pop. 65+	Census Pop. Below Poverty	Median Household Income*	Poverty Rate	Unemployment Rate August 2012/2013
Amsterdam (City)	18,620 (+265)	37.4	22.1%	26.3%	\$38,699	19.9%	-
Amsterdam (Town)	5,566 (-254)	49.2	25.3%	6.4%	\$52,553	11.0%	-
Florida (Town)	2,696 (-35)	44.8	14.7%	5.0%	\$56,458	8.4%	-
Montgomery County	50,219 (+511)	40.8	19.2%	8.2%	\$43,254	16.3%	9.9/8.5%
New York State	19,378,102 (+401,291)	38.0	13.5%	16.3%	56,951	14.5%	8.5/7.5%

*2007-2011 American Community Survey

iii. Housing profile of the study area

The City of Amsterdam has more housing units than the two Towns combined, but it has a higher vacancy rate as well as a higher percent of renter-occupied housing (see Table 2). Over 51% of the total housing units were occupied by renters, which is more than three times that of the surrounding towns and one and one-half times that of the County.

Table 2 Housing characteristics

Type of Housing	City of Amsterdam		Town of Amsterdam		Town of Florida		Montgomery County	
Total Housing Units	9,218	100%	2,520	100%	1,209	100%	23,063	100%
Occupied Housing Units	7,861	85.3%	2,289	90.8%	1,101	91.1%	20,272	87.9%
Vacant Housing Units	1,357	14.7%	231	9.2%	108	8.9%	2,791	12.1%
Homeowner Vacancy Rate	-	3.0%	-	1.2%	-	1.7%	-	2.5%
Rental Vacancy Rate	-	8.7%	-	6.6%	-	2.2%	-	8.1%
Owner-occupied	3,833	48.8%	1,920	83.9%	956	87.7%	13,584	67.0%
Renter-occupied	4,028	51.2%	369	16.1%	135	12.3%	6,688	33.0%

Sources: City of Amsterdam Northern/Eastern Neighborhoods Draft Pre-Nomination Report, NYS Brownfield Opportunity Area Program, August 2013. United States Census, 2010.



I. Community overview

High vacancy rates along with low housing values and high property taxes are persistent problems in the Community. The age of housing stock, lack of investment, and high percentage of renter-occupied properties contribute to the low housing values. Until recently, a declining population was an additional factor, although population has recently stabilized. Housing in the Town of Amsterdam widely varies and is reflective of its function as a suburb to the City of Amsterdam. Its residential areas are comprised primarily of year-round single family homes and multifamily apartment complexes. Homeownership rates in the Town are much higher than in the City or the County. Land for expansion of housing is available off Route 30 where sewer and water service is available.

Housing in the Town of Florida reflects its mostly rural character. Homes outside the hamlet of Fort Hunter are on large lots; many are farmsteads. In the hamlet of Fort Hunter, residential development is generally denser than in the rest of the Town. Statistics indicate that most are owner-occupied and few are vacant.

iv. History

Centuries before Dutch settlers arrived in the area in the early 17th century, Native Americans used the Mohawk River corridor as a principal east-west route. The corridor continued to be an important travel route for fur traders in the early 1700's and later was traversed by Revolutionary War troops. Many troops returned after the War to settle in the fertile lands of the Mohawk Valley.¹¹

With the increase in settlement came the need for improved roads. In 1800, the Mohawk Turnpike Company was incorporated and a road was built from Schenectady to Utica. The Erie Canal began construction in 1817, eventually opening in 1825.¹² The Utica and Schenectady Railroad connected Amsterdam with distant points in 1836.

The region's historic integration into major trade routes, such as the Erie Canal, fostered a dynamic commercial and industrial sector. Industrial products once manufactured in the region included carpet and other textiles, brooms, buttons, linseed oil, and paper products. Industrial manufacturing has declined significantly since 1940, with negative impacts on the local economy. In addition to the region's industrial legacy, farming has always been an important part of the regional economy. While farming remains important, some farms are facing encroachment by residential development.



Remnants of the Schoharie Crossing Aqueduct,
part of the historic Erie Canal.
Source: Canal Corp.



B. Description of storm damage

Hurricane Irene began its course of destruction on August 20, 2011, in the Caribbean, hitting the United States in North Carolina as a Category 1 hurricane. Then it moved northward, making landfall in New York City on August 28 as a Category 1 hurricane.^{14, 15} Communities from the Catskills through the Schoharie Valley to Essex County received the brunt of its wind and rainfall. On August 31, 2011, President Obama issued a Major Disaster Declaration for NYS for counties impacted by Hurricane Irene. On September 7, 2011, Tropical Storm Lee deluged the Northeast.¹⁶ Rivers that had just overrun their banks as a result of Hurricane Irene reached flood stage again.

Hurricane Irene brought record water levels, but the storms of 2011 were only the latest in a number of flood events linked both to large storms and ice jams experienced by these riverine communities. Four of the nine Federal Emergency Management Agency (FEMA) disaster declarations for flood events issued for Montgomery County between 1987 and 2006 affected the study area.¹³



The City's Amtrak station and surrounding area was submerged in several feet of water during Irene.

Source: City of Amsterdam Fire Department

In Montgomery County more than 150 people were displaced by flooding from Hurricane Irene.¹⁷ The Montgomery County office buildings in the nearby Village of Fonda were shut down for several weeks, which made delivery of critical County services difficult. The Community managed to surmount the challenges of washed out roads and bridges, electric outages, and flooding to deliver services to the worst hit neighborhoods, but found the response process more difficult without the ability to reach out to their County Office of Emergency Management for support.

Although the entire study area felt the effects of Hurricane Irene, the Village of Fort Johnson in the Town of Amsterdam and the hamlet of Fort Hunter and neighborhood of Lost Valley in the Town of Florida sustained some of the most significant damage. The toll of the storms was not just the immediate physical damage. Many homeowners could not afford the repairs needed and abandoned their properties, further compounding the threat to the economic viability of these communities.



I. Community overview

i. City of Amsterdam

Critical infrastructure was severely affected by the 2011 storms in the City of Amsterdam (see Figure 3), revealing several important emergency preparedness vulnerabilities.

The City's government buildings lost power and employees had to scramble to provide needed services. Power outages at the City's Department of Public Works (DPW) shut down all communication between the Department Supervisor and City Hall and other local government entities. The provision of services was hampered by the lack of internet and cellphone coverage in some of the rural areas surrounding the City, as well as the challenge of aiding residents with limited ability to speak English.

At the City's DPW, loss of power required that garage doors be opened manually, heating and air conditioning systems did not function, and the repair facilities could not be used, limiting the capabilities of the vehicle fleet.

During the floods, residents sheltered in-place, sheltered at a central location, or evacuated the area. Evacuation was not always possible because many roads were flooded and access to bridges was cut off.

Flooding in parts of the City of Amsterdam impacted homes and businesses, particularly on the west end along Route 5. The Amtrak Station was flooded and had to close and Canal Lock 11 was severely damaged. Bank erosion on Dove Creek was extensive, undercutting its retaining wall which placed St. Mary's Hospital facilities at risk. St. Mary's Hospital's basement flooded, causing portions of the hospital to be evacuated.

Flooding involving residential housing in the City of Amsterdam consisted primarily of basement flooding. A few homes sustained flood damage to the first floor. The two neighborhoods that sustained the majority of flood damage were:

- The hamlet of Port Jackson in South Amsterdam which consists of mostly wood frame one- and two-family structures. Homes along Bridge Street and Erie Terrace were impacted with damage generally limited to basement flooding.
- The west side along the Route 5 corridor which contains mixed-use two to three story residential and commercial buildings. Flooding along Route 5 resulted in several feet of water entering most buildings.



The Walter Elwood Museum, formerly housed at Guy Park Manor in the City of Amsterdam, was torn open and a portion of the building was washed away by Hurricane Irene.

Source: Walter Elwood Museum



Figure 3 City of Amsterdam flood impacts from Hurricane Irene



Figure 3 City of Amsterdam Flood Impacts from Hurricane Irene

1. The Amsterdam Amtrak station and surrounding tracks were submerged under several feet of water, resulting in the temporary loss of important transportation infrastructure.
2. Storm sewers along west Route 5 were overwhelmed and unable to function.
3. The former Carpetland site, a repetitive loss property, was once again inundated.
4. Approximately 70 patients were evacuated from St. Mary's Hospital as flooding on Dove Creek put the hospital's retaining wall at risk.
5. The City's Riverlink park was submerged during Irene, as was the Route 5 corridor along much of the north bank of the River between the City and Fort Johnson.
6. A portion of historic Guy Park Manor was washed away, tearing a hole in the Walter Elwood Museum, resulting in the loss of irreplaceable artifacts.

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I. Community overview

At historic Guy Park Manor, floodwaters carried away portions of the home and at least 10% of the artifacts housed in the Walter Elwood Museum.¹⁸ Before the flood, the museum contained 20,000 artifacts documenting the history of this small City: arrowheads and beadwork created by the Mohawk Indians; crystal radios and tools from the region's once-thriving carpet mills; family directories from 1850; and hundreds of scrapbooks documenting life in Amsterdam.¹⁹

Floodwaters overwhelmed the City's combined sewer system, resulting in discharges to local water bodies that exceeded allowable concentrations of pollution. The stream banks of South Chuctanunda Creek eroded and the retaining walls were damaged, leading to a collapse of the bank and failure of a section of retaining wall between Route 5 and the Florida Avenue crossing.

ii. Town of Amsterdam

In the Town of Amsterdam, the flood waters from Hurricane Irene eroded the banks of local creeks and caused property damage to residences. Many roads were washed out. Steep grades in the Town caused stormwater runoff to flow down hillsides and collect and backup at undersized culverts. This occurred most significantly at Dove Creek on the west side of the City at the Town's boundary, and along Eva's Kill on the east side of the Town. Portions of the existing stormwater management system became clogged with debris and did not function during the storm events, resulting in localized flooding near Chapman Drive. Residents along Midline Road and Maple Avenue in the Town of Amsterdam were concerned that their private wells and septic systems may have been compromised, and that septic leachate may have potentially contaminated the local groundwater (see Figure 4).



, <http://www.dailygazette.com/photos/2011/aug/29/28034/>,
accessed on March 19, 2014.

Front entrance at Old Fort Johnson following flooding in August 2011.

Source: The Daily Gazette The Daily Gazette



Figure 4 Town of Amsterdam flood impacts from Hurricane Irene

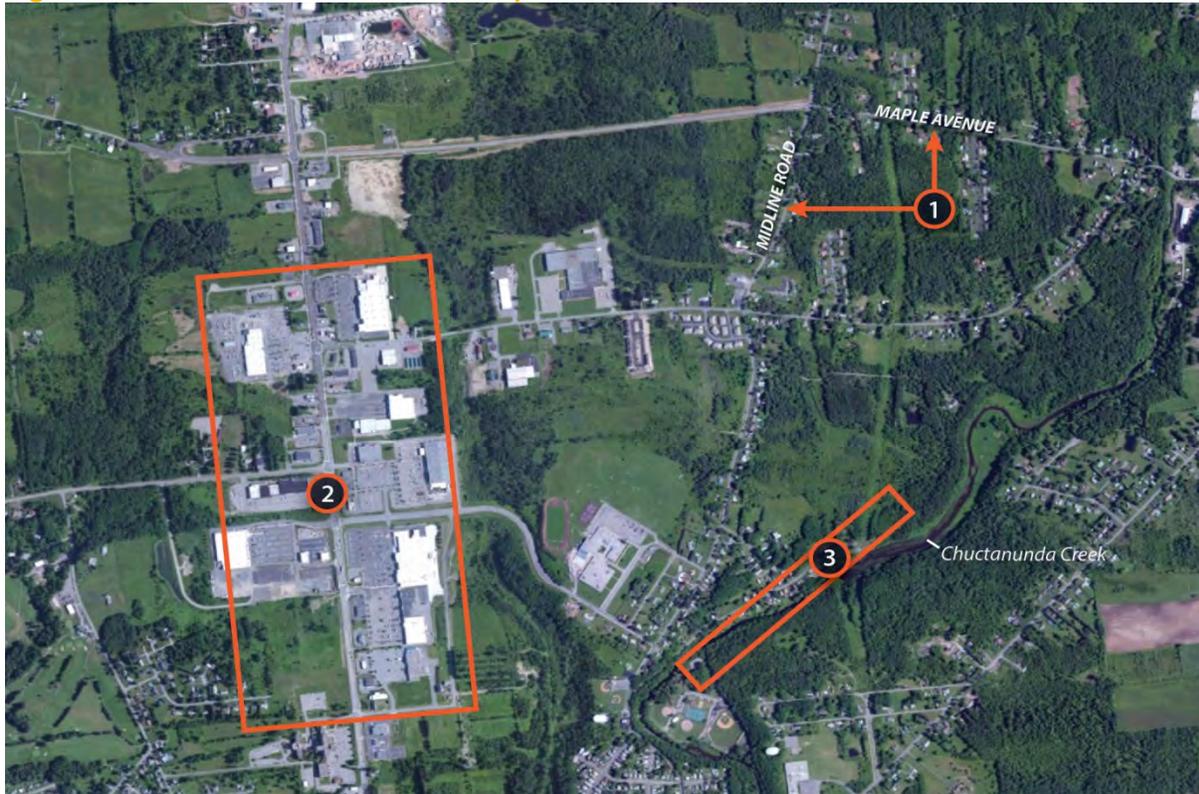


Figure 4 Town of Amsterdam Flood Impacts from Hurricane Irene

1. Midline Road and Maple Avenue properties use septic systems and private groundwater wells. Concerns arose related to the potential contamination of groundwater from septic leachate during Irene and Lee.
2. The shops along Route 30 make up the areas commercial center; storm detention basins along this corridor require routine maintenance.
3. Steep grades in the Town caused runoff during Irene and Lee to accumulate and flood lower lying areas, such as along Pioneer Street.

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Flood damage to residential housing in the Town of Amsterdam was limited to the southeast end of Town along one section of Eva's Kill on Crane's Hollow Road. Flooding occurred in two homes because of an accumulation of debris blocked critical culverts along Crane's Hollow Road. Debris from the storms also compromised stormwater flows under Route 5 and the railroad tracks.

In the Village of Fort Johnson, the first floor of the Old Fort Johnson National Historic Landmark was damaged when some five feet of water rushed in, reaching the tops of the mantels on the first floor. The Visitor's Center had close to two feet of water inside and the Fort's original 18th century privy was knocked over and lodged against a concrete wall (see Figure 5).²⁰ The Village of Fort Johnson fire house also was also damaged by flooding, but has since been repaired.



I. Community overview

Figure 5 Village of Fort Johnson (Town of Amsterdam) flood impacts from Hurricane Irene

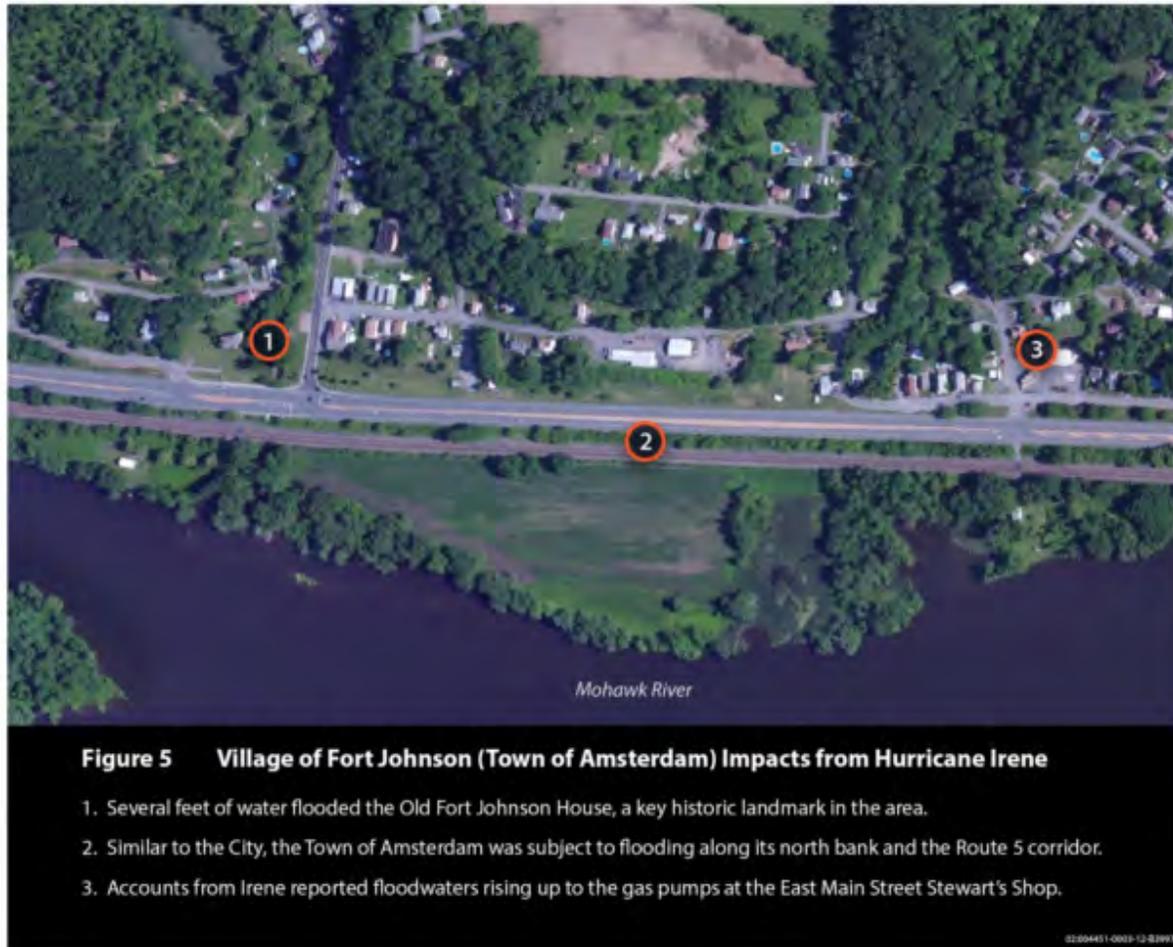


Figure 5 Village of Fort Johnson (Town of Amsterdam) Impacts from Hurricane Irene

1. Several feet of water flooded the Old Fort Johnson House, a key historic landmark in the area.
2. Similar to the City, the Town of Amsterdam was subject to flooding along its north bank and the Route 5 corridor.
3. Accounts from Irene reported floodwaters rising up to the gas pumps at the East Main Street Stewart's Shop.

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iii. Town of Florida

Hurricane Irene's floodwaters entered the Town of Florida through two breaches in the protective berm that parallels Schoharie Creek in the hamlet of Fort Hunter. The breaches occurred southwest of Main Street and at Railroad Avenue at the NYS Parks Schoharie Crossing Historic Site (see Figure 6). The hamlet is flat, so there is very little natural drainage. When the berm was breached the waters flooded much of the area, resulting in losses of both topsoil and crops and damage to businesses and homes.



Figure 6 Hamlet of Fort Hunter (Town of Florida) flood impacts from Hurricane Irene

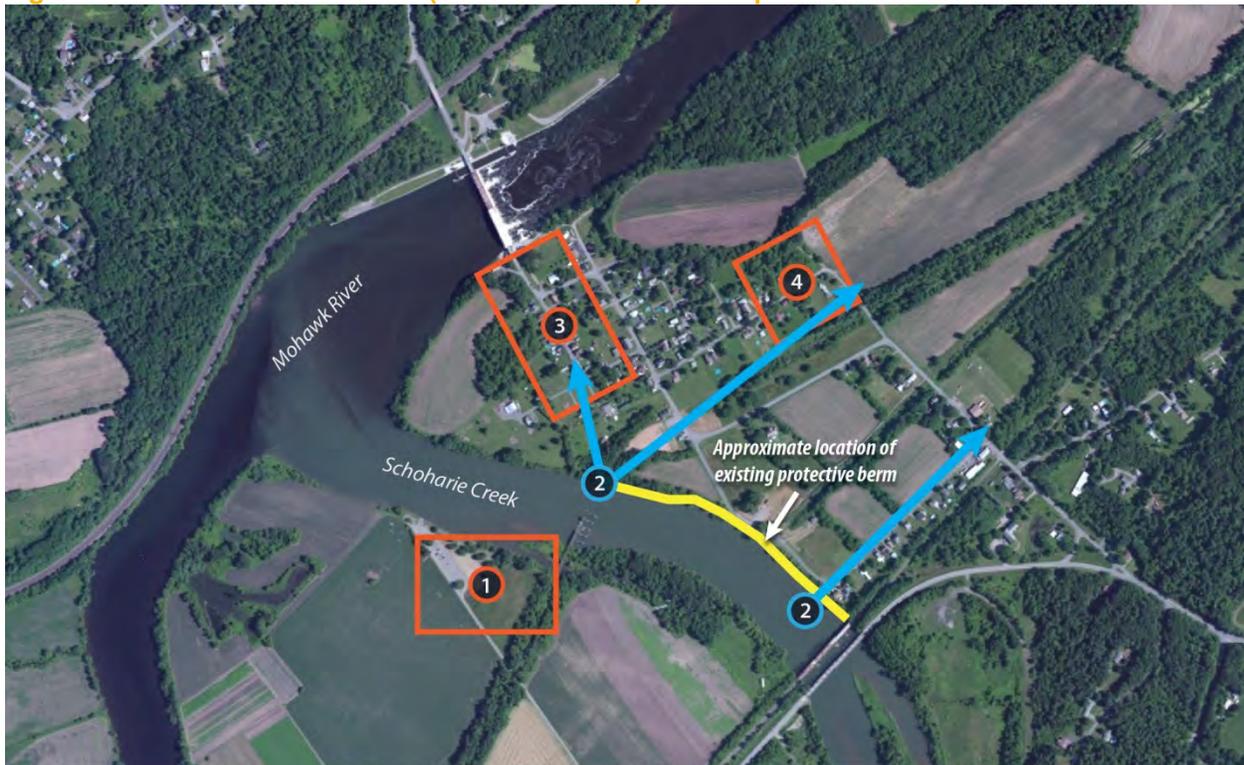


Figure 6 Hamlet of Fort Hunter (Town of Florida) Flood Impacts from Hurricane Irene

1. Floodwaters from Schoharie Creek overflowed onto farmland on the south bank of the creek first.
2. Floodwaters from Schoharie Creek breached the berm in two places – southwest of Main Street, and at Railroad Avenue at the NYS Parks Schoharie Crossing Historic Site. The blue arrows show the dominant pathways where water flowed upon entering the community.
3. About 90% of the floodwaters flowed northeast towards the historic Erie Canal channels and across farmland. About 10% flowed north towards Quackenbush Street where approximately 8-10 homes were flooded and destroyed.
4. Current Town of Florida Supervisor Eric Mead surveyed the hamlet while riding in the bucket of a front end loader. By his accounts most of the hamlet was covered in 1 to 2 feet of water. At this location, water levels rose to about 6 feet and they had to turn back for safety reasons.

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According to the Town Supervisor, most of the hamlet was covered in one to two feet of water with a few areas reaching depths of up to six feet. The hamlet uses drainage channels for stormwater and does not have hard stormwater management infrastructure. The drainage channels were overwhelmed during Hurricane Irene, resulting in widespread flooding.

As a result of Hurricane Irene, five houses in Fort Hunter were reported as substantially damaged. Three of these homes have been bought out through the FEMA program, one home has been repaired, and one home has been abandoned and is unsafe. The Town is presently considering options for addressing this abandoned structure. Approximately four more homes along Quackenbush Street in the hamlet



I. Community overview



Abandoned home in Fort Hunter, NY.

have since been abandoned by their owners and are sitting empty. Other homeowners in the hamlet are still struggling to bring their homes back to pre-flood condition.

Many acres of active farmland and crops were lost to the flooding of the Mohawk River and Schoharie Creek, due to inundation of crops, deposition of sediment, and in some cases topsoil being washed away.

Lost Valley, a small neighborhood on the Schoharie Creek with approximately 20 residences, was almost entirely destroyed and is unlikely to be rebuilt.²¹ The Minaville fire-

house, located on a bank of South Chuctanunda Creek, was also flooded from the storm events. The Fort Hunter Volunteer Fire Department withstood flood damage while keeping the critical County Route 27 Bridge across the Mohawk River operational.

The Erie Canal Lock at Fort Hunter collapsed, after debris and water bent the lock out of shape. Water destroyed small islands and the sides of the river bed all the way down to Cranesville, where the water went around an artificial barrier and damaged portions of Route 5.²²

According to Robert Kuhn, assistant regional director of the NYS Office of Parks, Recreation and Historic Preservation (OPRHP), the Schoharie Crossing Historic Site sustained significant damage. Buildings were flooded, and pedestrian bridges and interpretive signs were washed downstream. The mule barn was moved from its original location by flood water and was dropped in the middle of the road. It had to be demolished because it became structurally unstable.²³ The visitor's center paved parking area was ripped up, and the site's observation deck was carried away in floodwaters; on a positive note, this loss revealed the limestone foundations of a fort built by the British in the early 1700s and evidence of the nearby Mohawk Indian village known as Tiononderoge.^{24, 25}

Debris from the storms littered the banks of Schoharie Creek. Debris included vegetation, construction and demolition materials, large household appliances, televisions, computers, and



In line with the National Disaster Recovery Framework, the plans will consider the needs, risks, and opportunities related to the following six recovery support functions:

Community Planning and Capacity Building

Economic Development

Health and Social Services

Housing

Infrastructure

Natural and Cultural Resources



household hazardous wastes such as paints and cleaners.²⁶ The March 2013 Schoharie Creek Debris Assessment prepared by the firm AECOM noted that the storms caused significant scour and deposition of soil, mud, and sand along the banks of Schoharie Creek and its adjacent lowlands.

C. Critical issues

The critical issues facing the Community were identified through research, field visits, and discussion with the Planning Committee members. Critical issues have been grouped according to the six Federal Emergency Management Agency (FEMA) Recovery Support Functions (RSFs). The Recovery Support Functions are part of FEMA’s National Disaster Recovery Framework.²⁷ The RSFs are listed in a sidebar and discussed below in the context of defining the Community’s critical issues.

i. Community planning and capacity building

The City of Amsterdam and Town of Florida both have comprehensive plans (released in 2003 and 2011, respectively), and the Town of Amsterdam has a master plan published in 1964 that is undergoing an update. Community planning efforts in recent years have centered on unifying the waterfront revitalization efforts of communities along the Mohawk. The City of Amsterdam has its own Department for Community and Economic Development that focuses on revitalizing the waterfront by securing funding assistance to construct key building blocks to the City’s waterfront redevelopment area.

As well, the City’s Department of Emergency Management has focused on designing and implementing disaster mitigation programs as a means to curb the negative effects that could result from a City-wide, or even State-wide disaster or emergency. These plans helped the City provide effective communication and coordination between its internal services during Hurricane Irene and Tropical Storm Lee events. Neither the Town of Amsterdam nor the Town of Florida has an equivalent department.

The Community depends on regional scale resources to effectively and efficiently respond to disasters. As such, disaster readiness relies on a hierarchy of good communication and the delivery of the right set of services and equipment over a large geographic area. In large part, the existing system worked extremely well during the response to Hurricane Irene and Tropical Storm Lee.

Continuity of Services

As a result of Hurricane Irene and Tropical Storm Lee, several Montgomery County office buildings located in the Village of Fonda sustained flooding and were shut down for several weeks. Since these of-

Community Planning and Capacity Building

The goal of this RSF is to support and build recovery capacities and community planning resources of local, State and Tribal governments to effectively plan for, manage and implement disaster recovery activities in large, unique or catastrophic incidents.



I. Community overview

fices house the Office of Emergency Management and the County DPW, these services could not respond at their fullest capacity during the flood events. These buildings remain vulnerable to future flood impacts.

When power was lost during Hurricane Irene, critical government operations were severely impacted. Power losses at the City of Amsterdam's City Hall interfered with the administration of community services and storm response, and reduced effective communication among local officials and with the public. Investments are needed to reduce the likelihood of a power failure and to keep government operations functional and effective.

Communications

The inability of emergency officials to effectively communicate with the Spanish speaking public is a regional issue that created confusion and hampered the public's ability to understand evacuation plans and instructions during Hurricane Irene and Tropical Storm Lee. With the large and growing Spanish-speaking population in the Community, there is a need for emergency preparedness and emergency alert information to be developed and distributed in Spanish. A formal emergency communication system and accompanying protocols are needed for the region.

Sheltering

The City of Amsterdam has limited emergency shelter capacity, and access to shelters is further constrained since the City is divided by the Mohawk River. Fully-equipped shelters are needed on both sides of the Mohawk. Shelter facilities should be able to receive vulnerable populations, treat mass casualties, and provide plug-and-play resources to support satellite operations for police, fire, and other emergency services. At present, these services are headquartered on the north side of the Mohawk River at the R.J. McNulty Academy for International Studies and Literacy, and can only be provided from there. However, this facility does not have provisions for a standby generator.

In the Town of Amsterdam, the High School and Town Hall would be suitable shelter locations on the north side of the Mohawk; both would require a generator. On the south side of the Mohawk, the William H. Barkley Micro Society Magnet School has been proposed as a shelter and would also require a permanent generator.

ii. Economic development

Economic development is coordinated by two primary organizations: the Mohawk Valley Regional Economic Development Council (MVREDC), which coordinates the Consolidated Funding Application (CFA) process, and the Fulton-Montgomery Chamber of Commerce, which focuses on business development in the two-county area. Economic challenges like persis-

Economic Development



The goal of this RSF is to support and build recovery capacities and community planning resources of local, State and Tribal governments to effectively plan for, manage and implement disaster recovery activities in large, unique or catastrophic incidents.



tent high unemployment, job losses, and high property taxes have led the County to focus on marketing available shovel-ready sites in its industrial/business parks. Hurricane Irene and Tropical Storm Lee brought increased economic hardship to residents and businesses.

As a result of the storms, the downtown of the City of Amsterdam, which was already struggling, sustained a further blow, undermining ongoing initiatives to develop tourism and attract new residents. The re-purposing of abandoned industrial buildings in the City of Amsterdam could become part of larger planned waterfront redevelopment in the City, supporting existing regional and local initiatives.

Montgomery County and the MVREDC strongly support improving access to the Erie Canal/Mohawk River and establishing linkages to centers for economic development. To this end, the City of Amsterdam’s Department for Community and Economic Development is seeking to secure funding for the Mohawk Valley Gateway Overlook, the Amsterdam Passenger Rail Station Project, and the reconstruction of the Chalmers Site in South Amsterdam. Amsterdam’s Waterfront Park and Public Docks sustained significant damage during the floods. While they have subsequently been repaired, the extent of damage highlights the need to consider flood resilience in future development on the waterfront.

iii. Health and social services

Health and social services are generally centered in the City of Amsterdam and service a wide area, including rural areas outside the City. Among these services are hospitals, emergency operations centers, police, fire, and emergency medical services (EMS).

In the City of Amsterdam, central emergency services are coordinated by the City’s Department of Emergency Management. Police, EMS and fire services are all housed in a single facility and services are coordinated from this building. Outside the City, emergency services are usually combined and provided by voluntary organizations.

The reinforced concrete wall on the west side of Dove Creek was compromised by Hurricane Irene and is in danger of collapse. It currently sits at an angle of approximately 40 degrees from vertical, bowing in towards the creek. The stone wall on the east side of the Creek has failed in numerous locations during high water flows. The St. Mary’s Hospital annex sits adjacent to Dove Creek, and holds all hospital records and computer systems. If the retaining walls fail completely, Dove Creek would be blocked, possibly causing flooding of the hospital annex and damage to the infrastructure south of the damaged walls. Reinforcing the Dove Creek flood wall and removing debris in the stream would protect not only the adjacent hospital facility, but also nearby residential homes and businesses.

Health and Social Services



The goal of this RSF is to restore and improve health and social services networks to promote the resilience, health, independence and wellbeing of the whole community.



I. Community overview

iv. Housing

Substantial portions of several neighborhoods in the Community are located within the 100-year floodplain, including large areas in the hamlet of Fort Hunter, the Village of Fort Johnson, and the (former) neighborhood of Lost Valley. Future development and rebuilding must consider this, and appropriate zoning and building codes should be developed to protect houses and encourage development in less flood prone areas. Additionally, the City of Amsterdam has an ongoing need for housing rehabilitation to promote urban revitalization.

City of Amsterdam

Many of the homes damaged from Irene and Lee have been repaired through FEMA grants, insurance payments, and homeowner investment. Some have been abandoned, and others require additional repairs to restore them to pre-flood conditions.

Town of Amsterdam

Repairs have been made to the few homes in the Town that flooded during Hurricane Irene. The Town proposes to mitigate future flooding with a program targeted at debris removal and long-term stream maintenance. While this will help mitigate flooding, Eva's Kill is also subject to serious erosion. To prevent mudslides along the Kill's steep embankments and protect the homes that are downstream, Montgomery County is undertaking design for a bank stabilization project. Funding and timing for implementation of this project are unknown.

Town of Florida

Housing damage in the Town of Florida was generally limited to the hamlet of Fort Hunter and the neighborhood of Lost Valley, where it was significant. The Town is presently considering options for abandoned homes, including acquiring them for demolition to convert the properties into recreational space with permeable parking areas. Some homeowners in the hamlet are still struggling to repair their homes to pre-flood condition.

Houses in the hamlet may be protected by implementing structural improvements to the protective berm along the east side of the Schoharie River and through drainage improvements to better evacuate and infiltrate stormwater.





v. Infrastructure

Portions of the existing stormwater management infrastructure in the Community need repairs or upgrading. For examples, parts of the existing stormwater management systems in all three municipalities were either damaged as a result of Hurricane Irene and Tropical Storm Lee or proved insufficiently sized.

Some areas of the Community are not served by stormwater infrastructure and rely on drainage ditches and natural drainage corridors to contain and carry away stormwater. These areas would benefit from additional study to determine stormwater management needs.

City of Amsterdam

As noted earlier, infrastructure in several locations within the City was subject to significant damage from Hurricane Irene and Tropical Storm Lee. The City's old infrastructure of combined stormwater and sewer lines often flood and overwhelm the filtration plants because there are no overflow tanks. In addition, the west end of the City is underserved in its existing stormwater conveyance capacity and requires upgrades.



South Chuctanunda Creek in the City Amsterdam. Source: The LA Group.

Infrastructure Systems



The goal of this RSF is to efficiently restore infrastructure systems and services to support a viable, sustainable community and improves resilience to and protection from future hazards.

The South Chuctanunda Creek flows through South Amsterdam. Its existing flood wall provides limited protection for the adjacent neighborhood. As a result of the major storms in 2011, the banks of South Chuctanunda Creek have eroded and a portion of its retaining wall has been damaged. The houses located above the bank are threatened with potential slope failure, which has occurred in the past. These failures are also threatening the sewer and water lines which cross the creek near the Florida Avenue crossing.



I. Community overview

Loss of access to the Amsterdam Rail Station from Hurricane Irene disrupted transportation in and out of the area. The damage sustained means that the building has to be completely rebuilt. This station was historically located in downtown Amsterdam and was moved two miles to the west to make way for the NYS Route 30 Bridge. The City plans to build a new, accessible intermodal station in a downtown location.

Town of Amsterdam

A number of local roads were washed out during Hurricane Irene and Tropical Storm Lee and have since been repaired by the Town. With improved stormwater management systems, these roads would not flood so readily. For example, Midline Road lacks adequate stormwater drainage.

Steep hillsides generate stormwater runoff that then accumulates in the areas below, backing up drains and culverts. This occurs most significantly at Dove Creek on the west side of the City at the Town's boundary, and along Eva's Kill on the east side of the Town. Improved stormwater management systems are needed in these areas. In addition, routine maintenance of catch basins, drains, and outfalls, such as along Chapman Drive, would reduce the likelihood of flooding, as would maintenance of the storm detention ponds at the Route 30 shopping mall.

Many residents on Midline Road have septic systems, raising concerns of septic leachate infiltrating private groundwater wells. Installing a sewer system in this area could alleviate this issue.

Town of Florida

Infrastructure needs in the Town of Florida generally consist of culvert replacement and enlargement. The Town has identified a number of problem culverts that were impacted by Hurricane Irene and are in need of repair.

The hamlet of Fort Hunter relies on open drainage channels to carry stormwater away from properties. These channels were severely impacted by Hurricane Irene and Tropical Storm Lee and are no longer functioning properly. Work is needed to improve stormwater conveyance through the hamlet. In addition, all of the properties in Fort Hunter have private wells and septic systems. As a result of the flooding that occurred from Hurricane Irene many of the septic systems were damaged and concerns were raised that groundwater wells may have potentially been contaminated by leachate. Private well testing to verify a safe water supply should be considered in the interim.

The protective berm along the Schoharie Creek that was breached during Hurricane Irene in two places requires additional repairs and reinforcement.



vi. Natural and cultural resources

The Community has strong ties to the Schoharie Creek and Mohawk River, and their historical importance as regional travel and shipping corridors.

Sections of Schoharie Creek and the Mohawk River were impacted by Hurricane Irene and Tropical Storm Lee and it is necessary to evaluate these areas as well as other tributaries to determine the need for restoration. Undeveloped areas provide flood protection and buffering as well as recreational opportunities, and so preservation and targeted enhancement of these areas can serve multiple purposes.

Multiple parks, trails, and scenic areas parallel the Mohawk. Riverbank stabilization is necessary in order to preserve and secure these areas. Linking the greenways and parks together provides an opportunity to create a substantial tourist destination. For example, the proposed Riverwalk trail would be an approximately one and a half mile long walkway along the north bank of the Mohawk River from Riverlink Park, through the Mohawk Valley Gateway Overlook (MVGO) landing, to Guy Park Manor, with possible connections to a proposed Chuctanunda Creek Trail, Veterans Field, Shuttleworth Park and the Sassafra Nature Preserve. Tying this greenway into the system of parks and trails would create a mix of urban and green space that would be attractive to visitors and to potential residents and businesses.

The Community’s historic assets, including Guy Park Manor, Old Fort Johnson, and the Schoharie Crossing Historic Site have not been fully restored since Hurricane Irene. Cultural resources currently housed in flood prone areas need additional protection or relocation to prevent the loss of irreplaceable historic and cultural artifacts.

Natural and Cultural Resources



The goal of this RSF is to protect natural and cultural resources and historic properties through appropriate response and recovery actions to preserve, conserve, rehabilitate, and restore them consistent with post-disaster community priorities and in compliance with appropriate environmental and cultural resources laws.



The historic Old Fort Johnson and its surroundings, in the Town of Amsterdam, were inundated from Irene.



I. Community overview

The Old Erie Canal locks along the Mohawk River that are part of the Erie Canalway Heritage Corridor were also significantly damaged. The NYS Canal Corporation (Canal Corp) has since been allotted funding to repair and improve the current canal lock system, which is not part of the heritage canal. This work will take a number of years to complete.



The Schoharie Crossing Historic Site suffered significant damages from Irene.
Source: Canal Corp.

D. Community Vision

A draft Community Vision statement was presented to the public and Planning Committee members early in the NYRCR planning process. Feedback emphasized the importance of addressing the potential for both economic and recreational waterfront opportunities, demonstrating a positive outlook for economic growth, and presenting the Mohawk River as an asset rather than a liability. The final Community Vision statement is:

“The City of Amsterdam, Town of Amsterdam, and the Town of Florida will maximize the economic and recreational opportunities of our waterfront assets. We will anticipate and mitigate flood risks, limit impacts to property and infrastructure when flooding is unavoidable, and respond efficiently and recover quickly, in a manner that protects vulnerable populations and our quality of life.”

E. Relationship to regional plans

The Community shares many goals with other regional plans, notably to improve infrastructure to support economic development, enhance flood resiliency, increase opportunities for recreation, attract tourists, and revitalize historic downtowns. Strategies identified in this Plan were reviewed for alignment with ongoing regional and local efforts, to help the Community better leverage funding opportunities and support committees and planning groups already working toward similar goals.

Regional as well as local plans and studies were reviewed and incorporated into this Plan, as appropriate. Regional plans that were directly applicable are described below.



i. Regional plans

- **Erie Canalway National Heritage Corridor 2011-2016 Strategic Plan**

This heritage area management plan offers a regional vision, from the perspective that investment in development is best accomplished by emphasizing each corridor community's unique, existing historical assets. Similarly, the NYRCR Plan emphasizes the importance of protecting the Community's historical assets. The plan also recommends creation and expansion of waterfront recreational areas in the Community which will expand recreational opportunities along the Heritage Corridor.

- **Mohawk Valley Regional Economic Development Council Strategic Plan 2011, and Action Plan, 2012**

This plan identifies goals and strategies to support regional economic development. Their strategy to "Increase Spatial Efficiencies" includes two priority projects that tie closely to the needs of the Community: 1) create the Mohawk Valley Brownfield Opportunity Area fund, and 2) establish the Mohawk Valley waterfront development opportunity fund. The 2012 REDC plan update includes project recommendations to fund sewer infrastructure, main street revitalization and redevelopment, and to attract new manufacturing companies to the City of Amsterdam. The NYRCR Planning Committee included two members who also participate in the REDC.

- **Mohawk Valley Regional Sustainability Plan 2013**

This plan identifies both broad goals and specific strategies to achieve a more sustainable future for the people of the Mohawk Valley region. The NYRCR Plan includes proposed projects that support the following MVRSP goals:

- Restore infrastructure and increase spatial efficiencies that will revitalize existing urban and town centers
- Improve and connect regional multi use trails
- Promote transportation alternatives
- Redevelop main streets, waterfronts, and brownfields
- Maintain water quality
- Improve existing (water) infrastructure



I. Community overview

- **Regional Business Plan for Fulton and Montgomery Counties August 2011**

The Regional Business Plan promotes goals such as improving infrastructure, lowering property taxes, and improving quality of life, all of which align closely with the goals of the NYRCR Plan. The NYRCR Planning Committee included representation from the Fulton Montgomery Regional Chamber of Commerce for knowledge transfer.

- **Montgomery County Coordinated Transportation Plan March 2009**

This plan provides a comprehensive evaluation of the region's long-term transportation needs across most modes of travel and includes an extensive public outreach process. The study effort involves an update to the current status of the transportation system in Montgomery County, identifies future needs and strategies, outlines financing options and incorporates public priorities. The NYRCR Plan focuses on one key location in the Community – the Amtrak station – which is currently located in the floodplain. The potential for the City of Amsterdam to relocate this station and replace it with a new multi-modal transit facility incorporating retail space, and improving pedestrian access, will benefit transportation in the area and be an economic driver.

- **Montgomery County Multi-Jurisdictional All-Hazard Mitigation Plan of October 2008**

This plan contains input received from the 21 municipalities and regional partners. Montgomery County has been awarded grant funding to update the 2008 Plan. A major focus of the updated plan is the development of detailed mitigation projects, which will be utilized to secure Hazardous Mitigation Grant funds. The NYRCR Planning Committee included members representing Montgomery County Emergency Management to enable knowledge transfer.

- **Mohawk River Comprehensive Watershed Management Plan (2014 in progress)**

The Mohawk River Watershed Management Plan involves 14 County Soil and Water Conservation District and 127 municipalities and is currently being written. It will address agricultural runoff, nonpoint source pollution, and habitat protection. The Plan is funded by NYS Department of State's Local Waterfront Revitalization Program through the Environmental Protection Fund. The Department has developed an integrated, comprehensive approach to watershed management planning which is a major component of its Inter-municipal Watershed Management Program. This NYRCR Plan recognizes the importance of regional watershed planning, which is beyond the capacity of the individual municipalities that make up the Community. The NYRCR Planning Committee included representation from the Montgomery County Soil and Water Conservation District for knowledge transfer.



NYS Canal Corporation personnel inspecting the damage from breached retaining wall along Schoharie Creek in Fort Hunter (Town of Florida).

Source: NYS Canal Corporation



West Main Street in the City of Amsterdam was under several feet of water after Irene.

Source: City of Amsterdam

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 NYRCR Plan.



II. Assessment of risk and needs

A. Description of community assets and assessment of risk

i. Community asset identification

At the start of this planning process, and over several months, the NYRCR Planning Committee helped identify and inventory the Community’s assets. The asset inventory was also provided for review and comment at public outreach events. The Community has a variety of assets such as housing, transportation infrastructure, schools, hospitals, wastewater infrastructure, parks, and more. As part of developing the NYRCR Plan, these assets were identified and classified in an inventory process. This inventory served as the basis for the risk assessment, described in Section II-B.

Assets were divided into the six categories and subcategories noted in Table 3.

Table 3 Types of assets

Asset Class	Asset Example
Economic Development	Office buildings, business and industrial parks, manufacturing, warehouses, storage facilities, grocery stores, restaurants, banks, lodging, storefronts, downtown center, and 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, and performing arts venues.
Vulnerable Populations	Assets predominantly providing housing and services for people with disabilities, low and very-low income populations, the elderly, young children, homeless, and people at risk of becoming homeless.



II. Assessment of risk and needs

Assets were also classified based on their value to the community, as well as whether the asset was a “critical facility” or “significant facility.” An asset was defined as a “critical facility” if it meets FEMA’s definition, which notes that “critical facilities are essential to the health and welfare of the whole population and are especially important following hazard events. Critical facilities may include emergency service facilities such as hospitals and other medical facilities, jails and juvenile detention centers, police and fire stations, emergency operations centers, public works facilities, evacuation shelters, schools, and other uses that house special needs populations.” If an asset did not meet this definition but is still considered significant to the Community, then it was classified as a “significant facility.”

ii. Description of community assets

Ninety five community assets were identified, including: fire stations, police department, and sewer pumping stations; infrastructure, such as dams, electrical substations, bridges, and drinking water systems; recreational assets, such as bike paths and community parks; and other assets, such as senior housing and churches, which in some cases also serve as shelters. See Figures 8 and 9 for maps showing the key locations of Community Assets, and Appendix B for the full series of Community Asset Maps.

The majority of assets in the study area fall into the health and social services class or infrastructure class (see Figure 8). Natural and cultural resource assets also comprise a substantial percentage of the total assets.

Figure 7 Percentage of assets by asset class

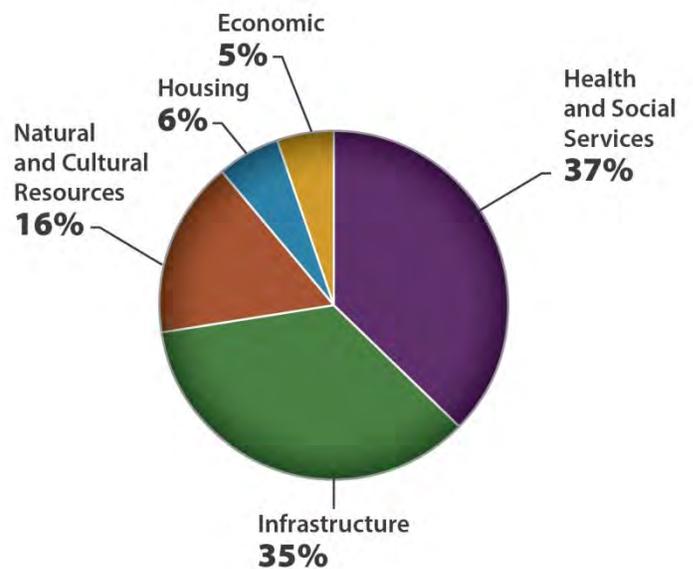


Figure 8: Key locations of Community assets
City and Town of Amsterdam

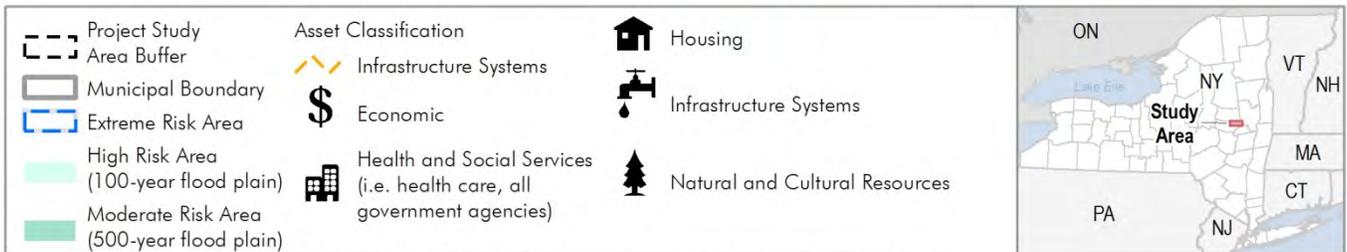
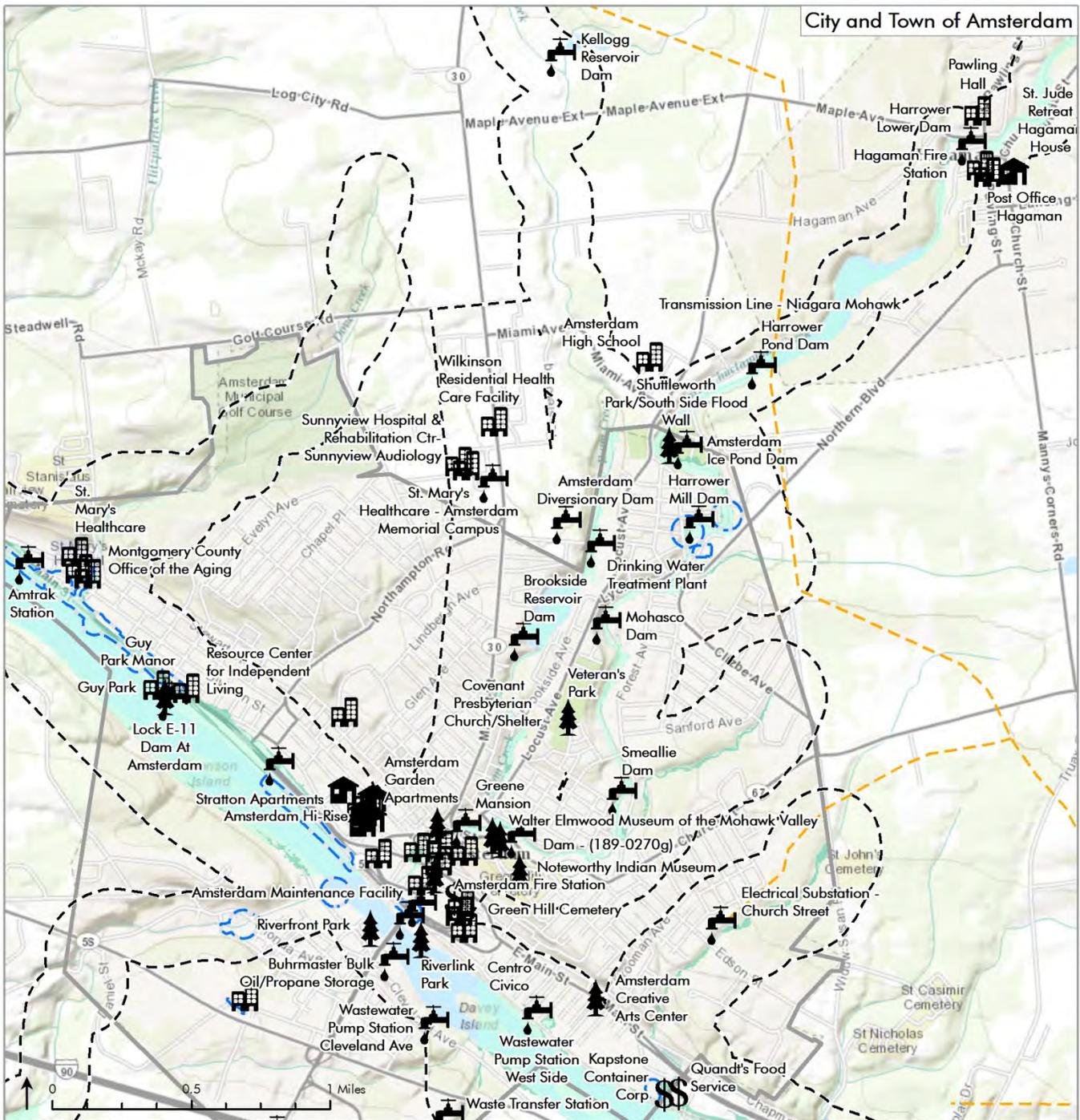
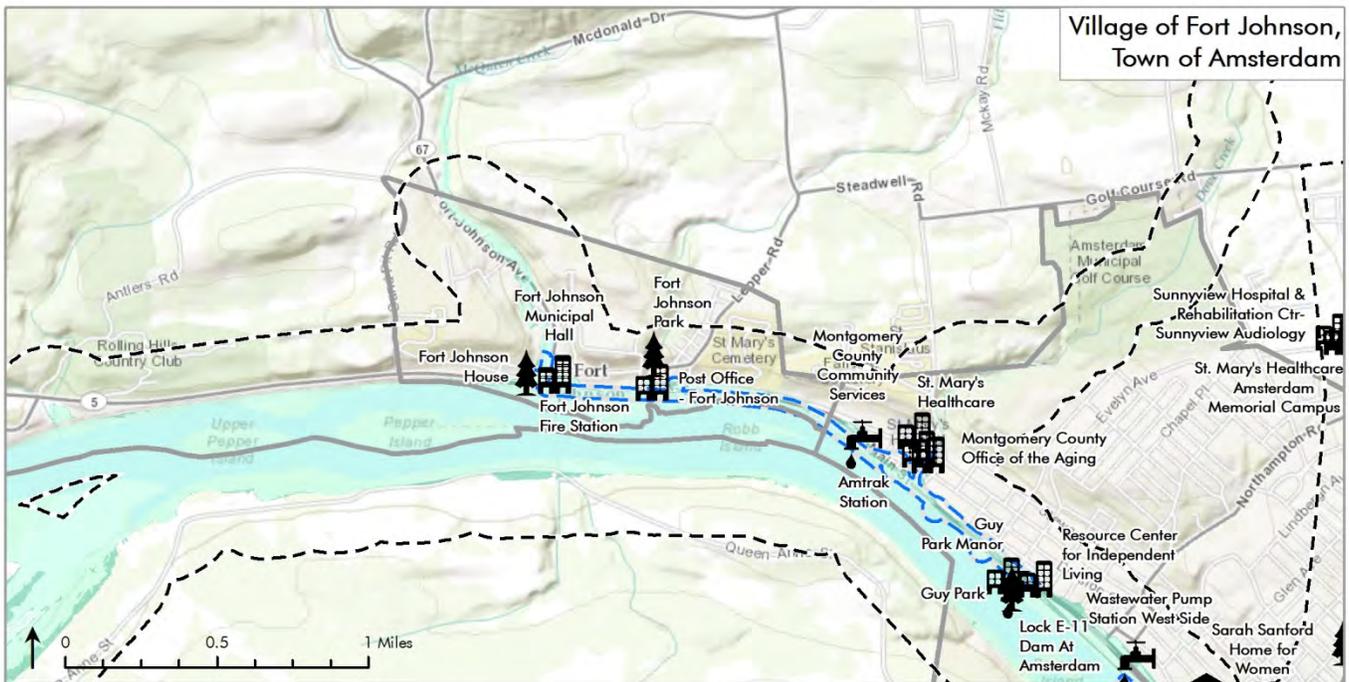
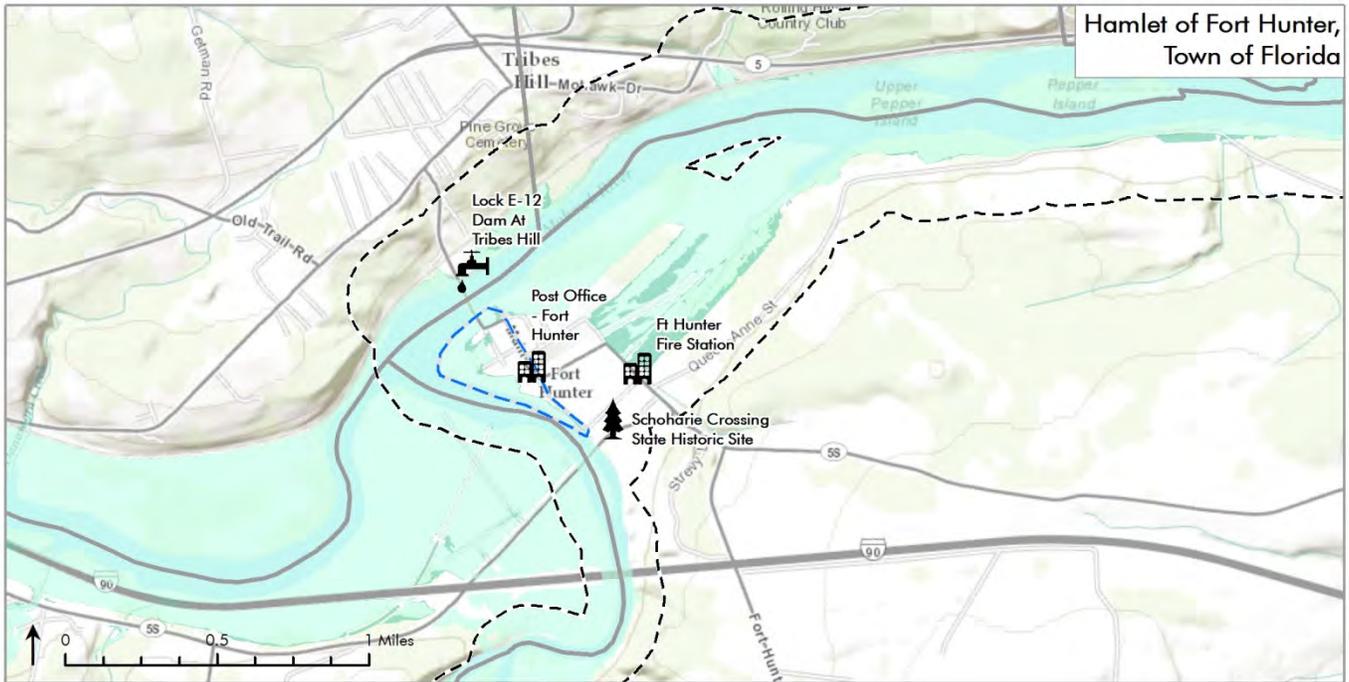


Figure 9: Key locations of Community assets
Town of Amsterdam
Town of Florida



<ul style="list-style-type: none"> Project Study Area Buffer Municipal Boundary Extreme Risk Area High Risk Area (100-year flood plain) Moderate Risk Area (500-year flood plain) 	<p>Asset Classification</p> <ul style="list-style-type: none"> Infrastructure Systems Economic Health and Social Services (i.e. health care, all government agencies) 	<ul style="list-style-type: none"> Housing Infrastructure Systems Natural and Cultural Resources 	
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ESRI - World Topo Imagery, NYS DOS, NYS DEC, FCC, NPS, NYS DOH, NYS ED, Platts, NYS DEC-FEMA Mohawk Flood Project - Assets



II. Assessment of risk and needs

iii. Assessment of risk to assets and systems

The risk to assets was assessed using available floodplain datasets and data collected through the asset inventory process. The risk assessment process was intended to identify which assets are at the greatest risk of damage or disruption due to riverine flooding so that strategies and projects could be identified to protect these assets.

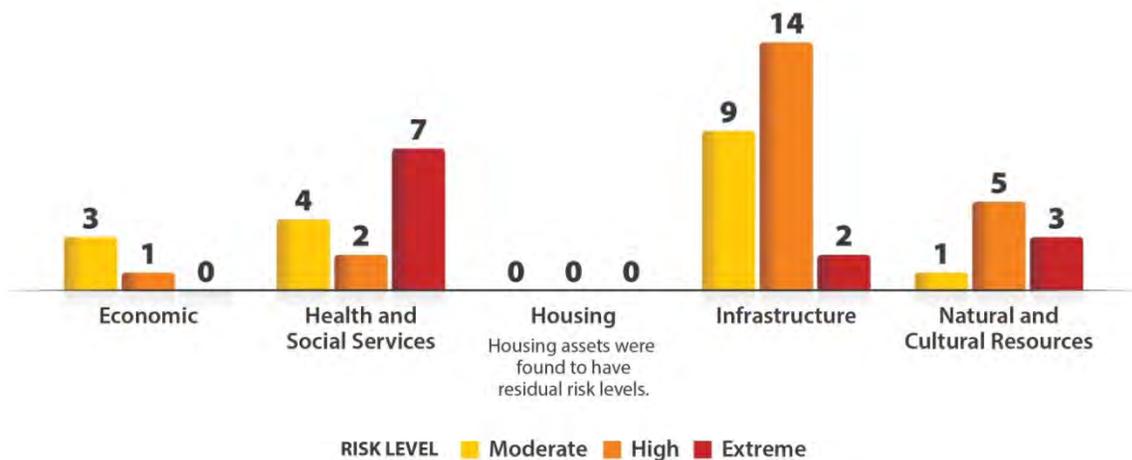
Within the Community, 100-year and 500-year flood zones have been designated for the Mohawk River and Schoharie Creek, and the tributaries of Bunn Creek, North Chuctanunda, South Chuctanunda, Dove Creek, and Kayaderosseras Creek. A countywide preliminary flood study was conducted in 2011 for the entire span of the Mohawk River within Montgomery County and is currently under FEMA review.

Based on available data, the risk assessment defined the following risk areas:

- **Extreme Risk Area** – This corresponds to areas of frequent flooding, as defined by the Planning Committee.
- **High Risk Area** – This corresponds to the 100-year floodplain, as delineated by FEMA.
- **Moderate Risk Area** – This corresponds to the 500-year floodplain, as delineated by FEMA.
- **Residual Risk Area** – Since risk can never be entirely eliminated, all assets in the inventory are assumed to be at some residual risk of impact from future flooding or natural hazards.

All inventoried assets located within the NYRCR Plan study area were included in the risk assessment. Out of 95 total assets inventoried, fifty one are located within the extreme, high, or moderate risk areas. Of these, seventeen are in the moderate risk area, twenty two are in the high risk area, and twelve are in the extreme risk area.

Figure 10 Number of assets in floodplain risk areas by asset class





iv. Risk assessment results

For each asset, relative risk was assessed based on exposure, vulnerability, and risk area where an asset is located. Exposure is a function of the local environmental attributes that contribute to flood risk, such as an asset’s elevation with regard to Base Flood Elevation, its location with regard to points of confluence (where multiple streams intersect) and stormwater outfalls, and whether or not it is protected by vegetative buffers. Vulnerability is a function of the type of asset and the length and severity of disruption to the asset’s function that is likely to arise from flood damage.

A final risk score was computed for each asset using the risk assessment tool provided by the NYS DOS. Table 4 presents the risk scores categories and their definitions.

Table 4 Risk Score Categories and Definitions

Category	Definition
Severe	Risk scores in this category indicate that assets are probably in a dangerous situation. Both exposure and vulnerability should be reduced, if possible. Consider relocation a priority option for these assets.
High	Risk scores in this category are indicative of conditions that could lead to significant negative outcomes from a storm. For many assets this may be unacceptable. Actions should be taken to reduce vulnerability, such as elevating or flood proofing the asset, to help avoid a long-term loss of function.
Moderate	Risk scores in this category pose moderate to serious consequences, but adaptation may be of lower priority due to one factor, exposure or vulnerability, remaining relatively low.
Residual	Risk scores in this category occur when both exposure and vulnerability are relatively low. This situation suggests floods would pose minor or infrequent consequences. Note that risk is never completely eliminated. Some residual risk still remains even after management measures have been implemented.

Figures 11 and 12 illustrate FEMA flood risk areas with respect to key Community assets. These maps also show the relative risk score (high, moderate, and residual) of the assets shown. A complete set of maps for the entire study area is provided in Appendix C.

Table 5 provides a summary of assets that were found to have severe or high risk scores. A full list of Community Assets that were inventoried for this plan can be found in Section V.



II. Assessment of risk and needs

Table 5 Community assets with severe and high risk scores

Community Asset	Socially Vulnerable Populations	Critical Facility	Community Value
St. Mary’s Hospital*	Yes	FEMA	High
Guy Park Manor*	No	Locally Significant	High
Old Fort Johnson*	No	Locally Significant	High
Montgomery County Community Services*	Yes	Locally Significant	High
Montgomery County Office of the Aging	Yes	No	Medium
Brookside Reservoir Dam	No	No	Medium
Lock E-10 Dam at Cranesville	No	Locally Significant	High
Lock E-11 Dam at Amsterdam	No	Locally Significant	High
Lock E-12 Dam at Tribes Hill	No	Locally Significant	High
Schoharie Crossing State Historic Site	No	Locally Significant	High
Kapstone Container Corp	No	No	Medium
Amsterdam Travel Service - Bus Station	Yes	Locally Significant	High
Resource Center for Independent Living	No	Locally Significant	Medium
Guy Park	No	No	Medium
Harrower Pond Dam	No	Locally Significant	Medium
Amtrak Station – Amsterdam	No	Locally Significant	High
Post Office - Fort Johnson	No	Locally Significant	Medium
Fort Johnson Fire Station	No	FEMA	High
Fort Johnson Municipal Hall	No	Locally Significant	Medium
*Indicates a severe risk asset			

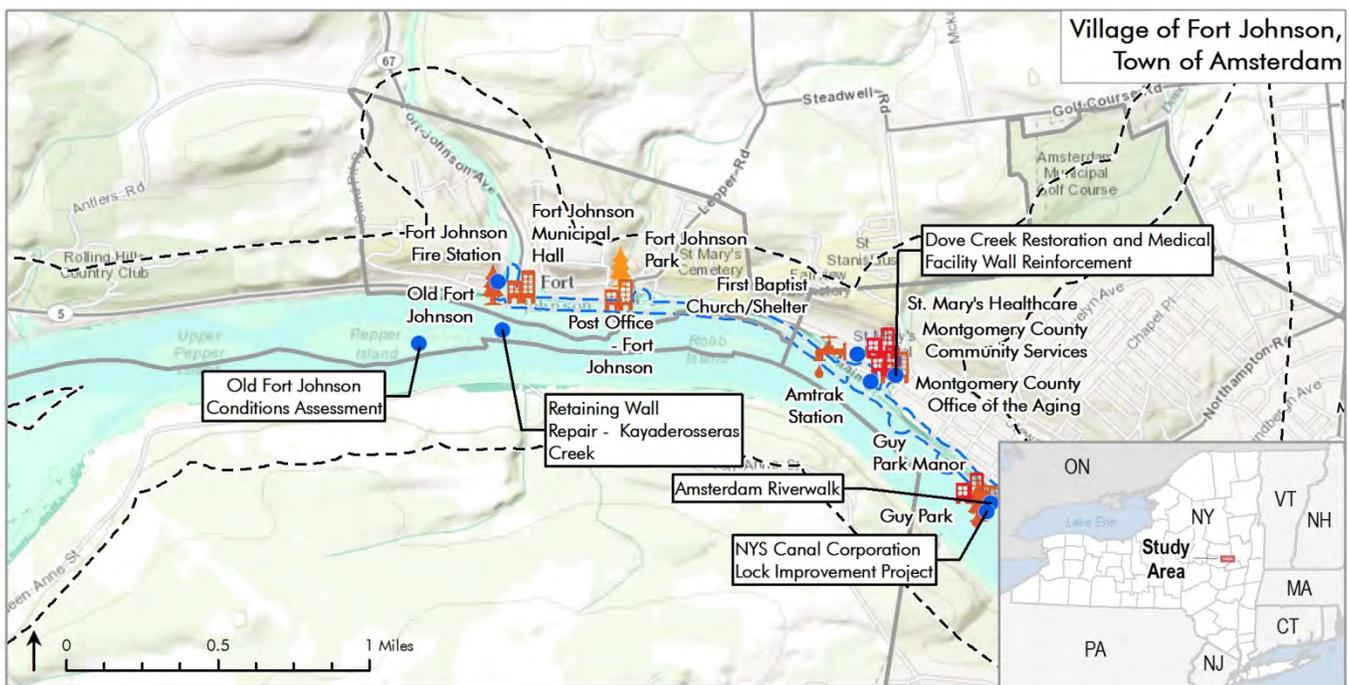
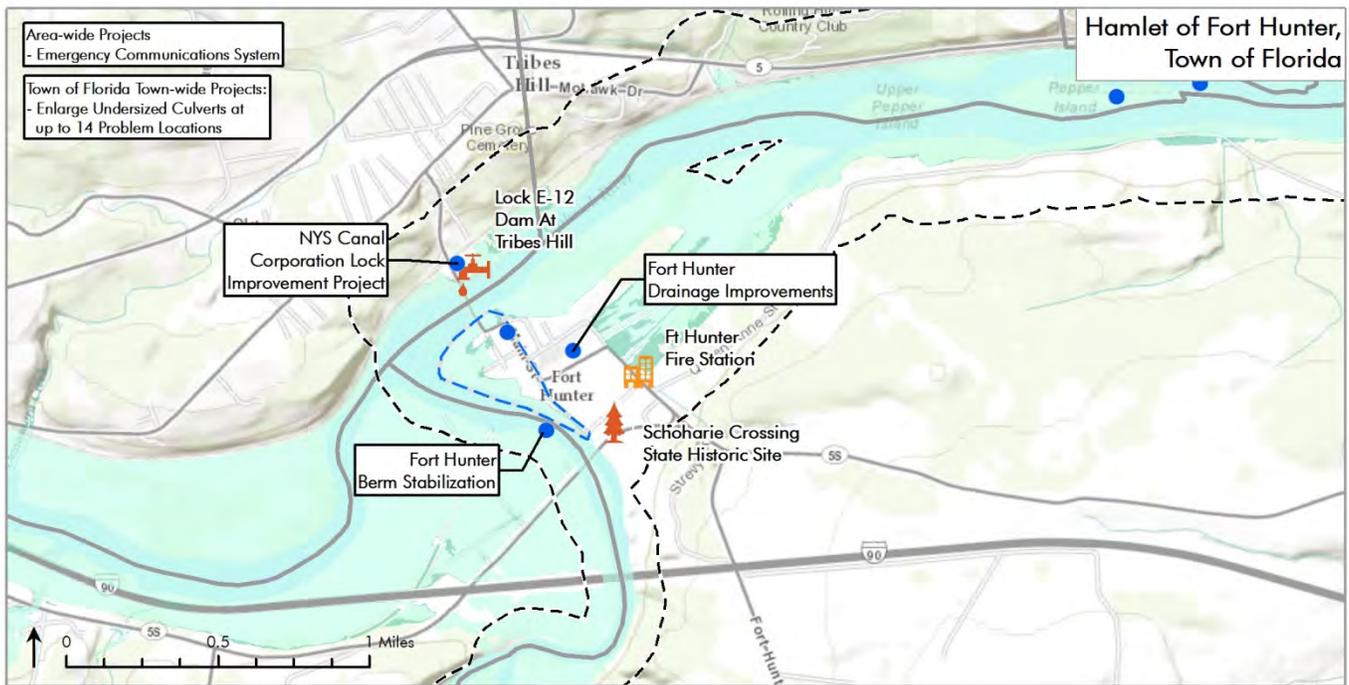
Four assets were classified as severe risk: St. Mary’s Hospital Annex, Guy Park Manor, Old Fort Johnson, and Montgomery County Community Services. St. Mary’s Hospital is a FEMA Critical Facility and the others are Significant Facilities. Montgomery County Community Services serve vulnerable populations.

Fourteen assets had high risk scores. Two of these are FEMA Critical Facilities: St. Mary’s Hospital and the Fort Johnson Fire Station. Three of these high risk assets serve vulnerable populations: St. Mary’s Hospital, Montgomery County Office of the Aging, and the Amsterdam Travel Service Bus Station. Seven of these assets have a high community value.

A total of twenty six assets were classified as being at moderate risk. Many of these assets are technically out of the floodplain, as defined by FEMA. Some, such as Fort Johnson Park and Riverlink Park, were submerged during Hurricane Irene. However, park assets have the ability to act as a floodplain buffer and typically do not have enclosed structures. A number of the moderate risk assets are dams, such as the Harrower Pond Dam, remaining from the Community’s manufacturing days.

Risk scores were used as factors in identifying and scoping projects for implementation. It is important to note that there was and always will be subjectivity when evaluating risk.

Figure 12: Key locations of at-risk assets and mitigative projects
 Town of Amsterdam
 Town of Florida





B. Assessment of needs and opportunities

i. Community needs and opportunities

Needs and opportunities were identified through an in-depth review of existing conditions in the Town and City of Amsterdam and the Town of Florida. Local and regional plans were reviewed and interviews were conducted with stakeholders and municipal and County-level representatives as part of the process. The needs and opportunities are organized by FEMA Recovery Support Function:

- Community planning and capacity building;
- Economic development;
- Health and social services;
- Housing;
- Infrastructure; and
- Natural and cultural resources.

a. Community planning and capacity building

This recovery function addresses the Community's ability to implement storm recovery activities and to plan how to mitigate the effects of storms. Community planning and capacity building needs are tied to the agencies and organizations and their various roles and responsibilities in disaster preparedness, response, and recovery.

Need: Continuity of services at the County and local level during and after an event.

Opportunities:

- Provide secondary locations for government operations outside of the floodplain.
- Maintain records, archives, and computer systems in upper floors of buildings or in buildings safely outside the floodplain.
- Equip employees with a continuity plan and proper training so they can continue to perform their jobs effectively during and after an emergency.
- Provide back-up power supplies for critical municipal facilities so that they can continue to provide essential services during an outage. This is necessary not only during a flood, but also during winter months when building heating systems must function for employees and to prevent pipes from freezing.



Public outreach helped inform the NYRCR Plan



II. Assessment of risk and needs

Need: Permanent shelter facilities at multiple locations throughout the Community.

Opportunity:

- Build new shelters in schools and municipal buildings that have been identified within the Community as suitable shelter locations.

Need: Emergency preparedness and alert information in multiple languages, particularly English and Spanish.

Opportunity:

- Support the development of an area-wide emergency communications system and protocols to better serve the public during future events, including the Spanish-speaking population.

b. Economic development

There are multiple challenges to economic development in the region, aside from the impacts of the flood damage. Coordination with the MVREDC and the Fulton Montgomery Regional Chamber of Commerce is essential. Both organizations were established to further economic development within the Community. Wherever possible, economic development should take advantage of the natural and cultural resources in the area.

Need: A vibrant center of commerce in the City of Amsterdam to provide needed jobs and economic growth.

Opportunities:

- Revitalize and redevelop the City's former industrial and business parks, some of which have shovel ready plans available.
- Support the development of BOAs within in the City.
- Relocate the flood-prone Amtrak station into the City's downtown core and provide multi-modal functionality to enhance transportation options for residents and commuters.

Need: Access to expanded economic and recreational opportunities along the Mohawk River waterfront.

Opportunity:

- Complete the various waterfront projects in planning or underway, including the Mohawk River Gateway Overlook (bridge and public art exhibit connecting north and south), the Amsterdam Riverwalk (north side), and the Waterfront Heritage Area (south side).
- Use the recently completed Riverlink Park in the City for outdoor music and theatre events under a pavilion.



- Repair the Schoharie Crossing Site in Fort Hunter to fix damage sustained during Irene.
- Adapt waterfront park features to increase resilience to flood damage.

c. Health and social services

St. Mary's Hospital is the only hospital in the Community, and it is located on the north side of the Mohawk River. The Community is bisected by the Mohawk River, leaving it effectively divided in a flood event, and limiting access to emergency and medical services for residents living on the south side of the River.

Need: Continuity of hospital operations at St. Mary's Guy Park Avenue satellite facility and safety for its patients and employees.

Opportunity:

- Repair Dove Creek retaining wall to protect the St. Mary's Hospital satellite facility as well as a separate building that houses the hospital's records and computer systems.

Need: Medical services on the south side of the Mohawk River for use when bridge crossings are inaccessible.

Opportunity:

- Pre-position medical trailers in one or more locations on the south side of the River. Unlike a permanent facility, which has high operations and maintenance costs and requires full time staffing, temporary trailers can be moved to accommodate need and thus can serve as a regional asset.

Need: Protection or relocation of fire houses and emergency response facilities located within the floodplains.

Opportunity:

- Relocate or flood-proof fire departments and other emergency response assets located in the floodplain in the Community's smaller villages and hamlets. During Hurricane Irene and Tropical Storm Lee, first responders heroically continued operations even though many of their facilities were inundated. All received FEMA assistance and have since been repaired, but remain at risk of future flood damage.

d. Housing

Substantial portions of several neighborhoods within the Community are located within the 100-year floodplain (notably the hamlet of Fort Hunter and Village of Fort Johnson). Future development and rebuilding must consider this, and appropriate zoning and building codes should be developed for these areas. Additionally, community planning should seek to encourage development in areas less at risk of flooding. In the Town and City of Amsterdam, housing within the floodplain is limited to a few specific



II. Assessment of risk and needs

areas. More importantly in the City, is the need for a reduction in blighted areas due to abandoned manufacturing sites, and housing stock in disrepair.

Need: Alleviation of stormwater-related flooding in the City of Amsterdam's east end and west side neighborhoods.

Opportunity:

- Implement various infrastructure improvements, including sewer and water line replacements and the separation of storm and sanitary sewers along West Main Street.

Need: Protection of residential properties along Eva's Kill that are subject to continued erosion due to the steep stream embankments.

Opportunity:

- Stabilize the stream bank, as is being planned by Montgomery County. A plan should be developed to assess the removal of existing debris in Eva's Kill, secure private property agreements, and obtain funding for bank stabilization activities.

Need: Flood protection for the hamlet of Fort Hunter, much of which lies within the floodplain.

Opportunities:

- Implement structural improvements to the protective berm along the west side of the Schoharie River and stormwater improvements throughout the hamlet to better control and safely infiltrate or disperse stormwater.
- Educate homeowners on strategies to flood proof existing structures through elevation.
- Build new structures above the base flood elevation where possible and practical.

Need: Housing stock improvements, and the reduction of blighted properties and abandoned warehouses in the City of Amsterdam.

Opportunities:

- The City continually inventories buildings that are in need of removal as well as properties that could be improved through façade and other renovations. Projects are being promoted to generate mixed-use housing designed to retain and attract professionals and others to Amsterdam, such as redevelopment of the Chalmers Site, a former industrial property.
- The Amsterdam Urban Renewal Agency is facilitating a broad range of community renewal and investment projects in the City including: neighborhood revitalization and housing rehabilitation programs, Main Street revitalization, waterfront, and public works projects. The City is working on several Brownfields Opportunity Area (BOA) projects which will redevelop brownfields and vacant lots in the City's downtown, south side, and north end neighborhoods.



e. Infrastructure

Hurricane Irene and Tropical Storm Lee highlighted weaknesses in existing stormwater management and sewer systems in the Community. The excessive rainfall from Hurricane Irene exceeded the design capacity of the existing systems, causing portions of the stormwater infrastructure to perform inadequately or fail completely. As a result, floodwaters damaged residences, buildings, and other infrastructure. River and stream banks also need to be protected and in some cases drainage infrastructure needs to be rebuilt or enhanced.

Need: Upgrades to the stormwater and sewer infrastructure throughout the Community.

Opportunities:

- Replace sewer and water lines and separate the storm and sanitary sewers along West Main Street in the City of Amsterdam.
- Create a green infrastructure and drainage master plan to further evaluate and improve drainage in the City.
- Improve stormwater collection along Midline Road to benefit the Town of Amsterdam.
- Enhance buffers and protect stream banks along key tributaries such as the Chuctanunda Creek and Eva's Kill.
- Provide additional stormwater detention capacity to protect the hamlet of Fort Hunter and also develop enhancements to the protective berm along Schoharie Creek on the hamlet's western boundary.

Need: Reliable transit systems located outside of the floodplain.

Opportunity:

- Construct a new Americans with Disabilities Act (ADA) compliant multimodal hub outside of the floodplain that improves aesthetics and operational capacity. This will also enhance economic development opportunities by relocating the new passenger station closer to the downtown business district.

f. Natural and cultural resources

In Montgomery County, prime farmland is an economically important natural resource. Enormous quantities of sediment from agricultural fields and eroded stream banks were washed into local streams and the Mohawk River. Farmers have indicated their interest in participating in removing debris and re-planting the stream banks and creating a vegetated buffer area along the streams to prevent flooding.

Flooding also resulted in debris entering waterways. Natural habitats were destroyed both along the banks and in the streams themselves.



II. Assessment of risk and needs

Need: Increased use of natural and manufactured green infrastructure to withstand storm inundation and provide greater flood protection.

Opportunity:

- Incorporate opportunities for green infrastructure, bank stabilization, and enhanced buffers in recreational projects. A number of waterfront recreational projects are planned in the Community, including the Amsterdam Riverwalk and Chuctanunda Trail, the Mohawk Valley Gateway Overlook, a proposed trail along the Chuctanunda Creek to Shuttleworth Park, and the Sassafras Nature Preserve. These projects offer opportunities to incorporate green infrastructure, bank stabilization, and enhanced buffers for additional flood mitigation.

Need: Regional watershed management plans that consider flood risk reduction and resiliency and the capacity to restore natural ecological function.

Opportunity:

- Engage existing watershed management coalitions and forums. The Mohawk Watershed Coalition of Conservation Districts is focused on improving regional watershed management. Their annual symposium brings together regional stakeholders to discuss topics such as resilience, erosion control, land use management, and green infrastructure.

Need: Protection of Historic and Cultural Assets in the floodplain.

Opportunity:

- Collaborate with the Canal Corp to repair and restore cultural resources along the Mohawk River, including Guy Park Manor, which is an 18th century state historic site just west of Erie Canal Lock E-11, as well as Yankee Hill and Putman's Store at old Lock 28.

Need: A better understanding of farmland vulnerabilities to flooding.

Opportunity:

- Assess farmland in the Community to identify protective measures or alternative farming strategies that would benefit the agricultural economy.



Significant flooding occurred on the City of Amsterdam's South Side from Irene.
Source: City of Amsterdam



The Walter Elwood Museum, formerly housed at Guy Park Manor in the City of Amsterdam, was torn open as a portion of the building was washed away by Irene.
Source: Walter Elwood Museum



III. Reconstruction and resiliency strategies

Section III includes a description of the NYRCR Planning Committee’s proposed reconstruction and resiliency strategies. Strategies are intended to help mitigate risk and address community needs. The proposed strategies are to:

1. Facilitate communication from emergency response organizations to residents before, during, and after emergency events.
2. Improve emergency response through Community-wide coordination and positioning of critical resources and services.
3. Maintain essential medical services to all populations during an emergency
4. Create and sustain a “Business Friendly Climate” to encourage businesses to remain, locate, grow, and develop.
5. Stabilize and revitalize neighborhoods and protect them from flooding.
6. Mitigate damage to transportation corridors and infrastructure.
7. Improve drainage in key areas known to flood.
8. Augment natural and cultural resources to support flood resiliency.
9. Protect cultural artifacts, historic sites and archives from damage and loss.



III. Reconstruction and resiliency strategies

The NY Rising Community Reconstruction (NYRCR) Planning Committee identified strategies and specific projects to support the City of Amsterdam, Town of Amsterdam, and Town of Florida in the Community’s efforts to recover from the effects of Hurricane Irene and Tropical Storm Lee. These strategies and projects are specifically targeted to promote reconstruction, resilience to future storm events, and economic development.

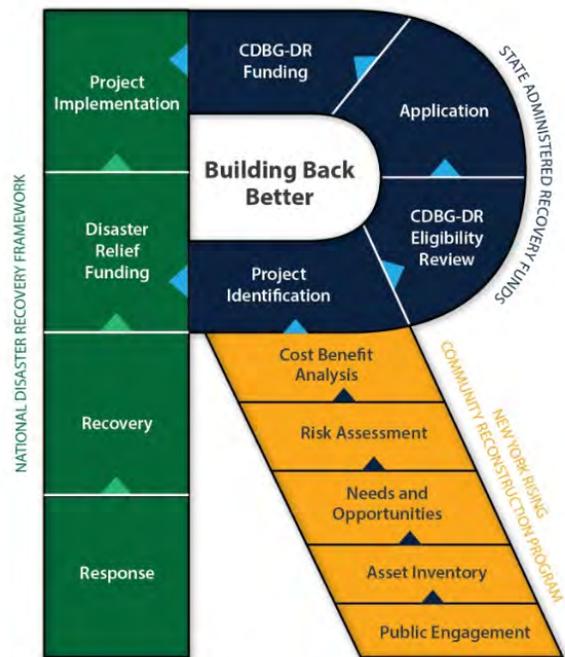
The strategies were developed through desktop research and analysis, field work, interviews, and consultation with the Planning Committee and other local and regional stakeholders and the public.

Each strategy includes a table that lists the major projects recommended to support the strategy. Additional projects can be found in Table 15. Additional Resiliency Measures, presented in section V.A, of this document. The list of projects is expected to evolve through implementation of this plan, and through collaboration with other local and regional planning efforts.

i. Facilitate communication from emergency response organizations to residents before, during, and after emergency events.

Agencies and municipalities within the Community are working to improve emergency communications among themselves and their residents and with County and regional entities. Having identified weaknesses in communications during the response to Hurricane Irene, these entities are seeking to better serve their populations by providing bilingual communication to benefit the large Spanish speaking population in the Community.

The strategy involves developing robust and sustainable systems to communicate with and inform area residents, including vulnerable populations, before, during and after an emergency. This will require in-



Development of reconstruction and resiliency strategies and projects



ter-municipal agreements and standardization and regional coordination of emergency response protocol.

Implementation of this strategy is expected to increase community emergency response and recovery capacity, benefitting emergency responders, municipal leaders, and residents during storm events.

Table 6 Strategy 1: Facilitate communication from emergency response organizations to residents before, during, and after emergency events

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Emergency Communications System	The project aims to be more inclusive of the diverse community population including those who do not speak English, or represent vulnerable populations. An emergency communications protocol will be established which includes elements such as a formal multi-lingual communications system to inform municipalities and residents. This will require inter-municipal instruments such as Memoranda of Understanding and standardized regional coordination to effectively transmit information among jurisdictions.	\$315,000	Proposed	Yes

ii. Improve emergency response through community-wide coordination and positioning of critical resources and services.

The police, fire, and other emergency services for the City of Amsterdam are located on the north side of the Mohawk River. When there is severe flooding, as during Hurricane Irene and Tropical Storm Lee, the normal river crossings can become unusable. As such, there is a serious need for satellite operations of the police, fire, and other emergency services on the south side. For example, there are no ambulances on the south bank, and the ambulance services from the north have no way of servicing residents south of the Mohawk River during severe flood events.

More generally, few emergency shelters in the Community are equipped with permanent back-up generator or adequate provisions.

This strategy focuses on decreasing the risk to emergency response assets by moving them outside of flood prone areas while also ensuring that emergency response resources and services are positioned where they are needed prior to floods.

In the City of Amsterdam, government support of emergency response operations was severely challenged with the loss of power during Hurricane Irene. The Department of Public Works was not able to open its garage doors. To support continuity of government operations during power outages, auxiliary power systems need to be pre-positioned at locations housing emergency response functions.



III. Reconstruction and resiliency strategies

Emergency shelters play an essential role during all types of disasters. These shelters have to be accessible and functional to serve populations displaced from their homes. These shelters must be equipped with back-up power, in case of extended power outages resulting from disaster events. The Planning Committee determined that additional emergency shelters were necessary in both the City and Town of Amsterdam.

This strategy will equip the Community to more effectively respond to floods.

Table 7 Strategy 2: Improve emergency response through community-wide coordination and positioning of critical resources and services.

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Maintain Power to Critical City Buildings – City of Amsterdam	Critical government operations came to a halt with the loss of power during Hurricane Irene. This project will purchase generators for City Hall and the Department of Public Works buildings to support continuity of government operations during events with power outages.	\$300,000	Proposed	No
Establish Emergency Shelter locations – City of Amsterdam	The City requires additional sheltering operations to support residents during storms. Two school facilities have been identified and each requires the permanent installation of an emergency generator.	\$300,000	Proposed	No
Establish an Emergency Shelter at Town Hall and the High School – Town of Amsterdam	Both Amsterdam Town Hall and Amsterdam High School have been identified as suitable for use as emergency shelters. They will each require a permanent installation of an emergency generator.	\$300,000	Proposed	No



iii. Maintain essential medical services to all populations during an emergency event.

This strategy has been designed to address two needs of the Community: 1) the lack of medical services on the south side of the Mohawk River, and 2) the structural issues that threaten the Dove Creek retaining wall next to St. Mary’s Hospital. Both require action so that essential medical services are available to all populations during an emergency event.

No in- or outpatient facility currently exists on the south side of the Mohawk River. During the 2011 storm events, residents on the south side had to travel 40 miles to Little Falls in order to access medical facilities because they has no means of crossing the flooded Mohawk River. A South Side Medical Support Facility would alleviate this need and provide populations in this area access to emergency medical care.

St. Mary’s Hospital in the City of Amsterdam sits adjacent to Dove Creek, protected from the waters by a retaining wall which is failing because of severe undercutting, placing critical hospital infrastructure at risk. The Dove Creek retaining wall needs to be improved to prevent the loss of hospital records, infrastructure systems, and to retain the ability to safely provide essential medical services. This project would address flood risks associated with a FEMA-critical facility with a severe risk score. Since the project was announced in the Governor’s press release in January 2014, the City of Amsterdam assumes this project will be funded outside of its \$3 million NYRCR Plan project allocation.

Table 8 Strategy 3: Maintain essential medical services to all populations during an emergency event.

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Dove Creek Restoration and Medical Facility Wall Reinforcement City of Amsterdam	St. Mary’s Hospital computer systems and paper records are at risk because the retaining wall adjacent to the hospital is severely undercut and at risk of collapse. The project will be to restore Dove Creek, which requires stabilization, restoration, and debris removal/management, and to reinforce the retaining wall.	\$1,400,000 (Funding expected under alternate source)	Proposed	No
South Side Medical Support - City of Amsterdam	St. Mary’s is the only local hospital, and it is located on the north side of the river. When bridges become impassable due to flooding, there is limited access to medical services for those on the south side. The project will establish pre-positioned emergency medical resources on the south side of the river to support medical needs.	\$120,000	Featured	No



III. Reconstruction and resiliency strategies

iv. Create and sustain a “business friendly climate” to encourage businesses to remain, locate, grow and develop.

Creating and sustaining a “Business Friendly Climate” is critical to the Community’s economic success and will encourage businesses to locate, remain, grow, and develop. With this strategy, the Planning Committee sought to build on the history of the area while incorporating innovative techniques to build a sustainable community. This strategy aligns with Strategy 5 identified in the Mohawk Valley Regional Economic Development Council 2011 plan to:

“Strengthen Government and Civic Effectiveness - Modernize the region’s system of governance and civic institutions to: create a business climate that will promote entrepreneurship, attract private investment capital, and nurture the expansion and attraction of new business activity.”

An essential part of creating a business friendly environment is increasing the desirability of locating businesses in the downtown area of the City of Amsterdam. This strategy assumes that removing urban blight and increasing aesthetic appeal of the downtown area will help revitalize the area, attract businesses such as retail and restaurants, and nurture tourism. Repurposing and repairing abandoned buildings in the City of Amsterdam’s downtown is the first component of this strategy.

The second component is to foster the creation of destination locations, such as parks and the waterfront, as another means to not only draw businesses and tourists and make the communities more livable, but also to reinforce green infrastructure that builds flood resiliency.

Table 9 Strategy 4: Create and sustain a “Business Friendly Climate” to encourage businesses to remain, locate, grow and develop

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Gateway Park	This project is to demolish the Carpetland building that was severely damaged during Hurricane Irene. The property will be repurposed for public recreational use.	\$370,000	Proposed	No
Waterfront Heritage Area City of Amsterdam	This waterfront heritage area is undergoing Phase II of the BOA Program. This project will provide the planning and design of the area so that it can be constructed to attract visitors, support commerce, and provide green infrastructure as a buffer for flooding. The Waterfront Heritage Area will connect to the Mohawk Valley Gateway Overlook and Amsterdam Riverwalk.	\$400,000	Featured	No



v. Stabilize and revitalize neighborhoods and protect them from flooding.

Residential neighborhoods throughout Amsterdam and Florida are still suffering the lingering effects of flood damage from Hurricane Irene and Tropical Storm Lee. There is a need throughout Amsterdam and Florida to continue to address these impacts as well as to protect the communities from future flood damage. In several locations throughout the Community, failures or damages to retaining walls have resulted in flooding and damages to homes and Community assets, flooding of roads and farmland, and erosion which have put utilities, roads, and homes at risk. The Committee has proposed a number of projects (presented in Table 10) which will make necessary repairs to protect and reduce the flood risks of its neighborhoods.

Table 10 (continued) Strategy 5: Stabilize and revitalize neighborhoods and protect them from flooding.

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Remove the Old Brookside Reservoir Dam and Repair Bunn Creek Bypass – City of Amsterdam	This project will breach the earth embankment Old Reservoir Dam, which confines the City’s old reservoir that is no longer in use, and re-grade the area for municipal and recreational use. This project will also rehabilitate the nearby Bunn Creek Bypass, which diverts stormwater from the old reservoir.	\$1,125,000	Proposed	No
Fort Hunter Berm Stabilization – Town of Florida	The existing berm on the east bank of the Schoharie Creek at Fort Hunter was damaged and breached during Hurricane Irene, and was identified by the Canal Corp as the area that contributed to the flooding in Fort Hunter. This project will repair the existing berm and, if deemed necessary, extend the berm approximately 1,250 feet. In partnership with the Canal Corp, the current berm will be evaluated for structural integrity.	\$760,000	Proposed	No
Acquisition and Demolition of Abandoned Flooded Properties and the Design and Construction of a Public Park – Town of Florida	This project will acquire and demolish three houses in the hamlet of Fort Hunter and build a park and a gravel parking lot in their place.	\$760,000	Proposed	No
South Chuctanunda Creek Bank Stabilization – City	Erosion of stream banks and damage to the retaining walls along the South	\$560,000	Proposed	No



III. Reconstruction and resiliency strategies

Table 10 (continued) Strategy 5: Stabilize and revitalize neighborhoods and protect them from flooding.

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
of Amsterdam	Chuctanunda Creek has occurred as a result of major storms in 2011 and subsequent years. This is causing a collapse of the stream bank and failure of a section of retaining wall between the Route 5S and Florida Avenue crossings. This project aims to stabilize the steam banks to protect nearby homes, and sewer and water lines which cross the creek near the Florida Avenue crossing.			
Streambed and Retaining Wall Inspection and Repair North Chuctanunda Creek - City of Amsterdam	This project will address a portion of the creek, which needs the bedrock streambed cleared of displaced rock debris and stabilization of the natural stream banks, and a quarter of the retaining wall length will need low-level repairs on both sides of the Creek.	\$815,000	Proposed	No
Streambed and Retaining Wall Inspection and Repair Bunn Creek – City of Amsterdam	This project will address a portion of the creek, which needs the bedrock streambed cleared of displaced rock, the stabilization of approximately a quarter of the stream bank length, and the repairs of various sections of the length of retaining walls on both sides of the Creek.	\$705,000	Proposed	No



vi. Mitigate damage to transportation corridors and infrastructure.

During Hurricane Irene, critical transportation routes were inundated and rendered impassable and stormwater infrastructure was damaged. Infrastructure such as rail and power utility corridors along the river was also affected. Loss of or damage to this infrastructure impacts to the Community; this strategy seeks solutions to mitigate flood damage and increase infrastructure resiliency.

Table 11 Strategy 6: Mitigate damage to transportation corridors and infrastructure

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Amtrak Station Relocation Site Plan – City of Amsterdam	The Amtrak station, located in the floodplain, was inundated by flood waters during Hurricane Irene. Loss of rail service not only prevents the evacuation of locals and visitors but also disrupts intra- and inter-state passenger travel across a critical transportation corridor. The project is to create a site plan for the relocation of the station out of this high risk flood area.	\$250,000	Proposed	No
Stormwater System Installation Guy Park Avenue between State Route 5 and Steadwell Avenue- City of Amsterdam	This project will install an underground stormwater conveyance system along Guy Park Avenue from State Route 5 all the way east to Steadwell Avenue in order to attenuate current flooding during major storm events. The stormwater system will outlet into Dove Creek, which crosses Guy Park Avenue between Merrit Street and Steadwell Avenue.	\$925,000	Proposed	No
Sewer Service Extension on Midline Road – Town of Amsterdam	The project will install sewer along a 1 mile corridor on Midline Road. It is expected to reduce concerns regarding the potential for septic leachate to contaminate groundwater wells in the area during times of heavy rainfall.	\$2,500,000	Featured	No



III. Reconstruction and resiliency strategies

vii. Improve drainage in key areas known to flood.

The Planning Committee developed this strategy to improve or upgrade drainage infrastructure for problem areas where flooding repetitively occurs. Needs for these areas, which are scattered throughout the project study area, include repairing damaged piping, enlarging culverts, enhancing storage capacity of detention ponds, and constructing new stormwater management infrastructure.

Catch basins, culverts, stormwater sewers, and drainage channels became filled with debris or were otherwise damaged during Hurricane Irene. Additionally, some areas in the Community do not have storm sewers and use open ditches to convey stormwater.

Drainage and stormwater conveyance projects will lower the risk of damage. Improved flood resiliency will improve the prospects for economic growth.

Table 12 Strategy 7: Improve drainage in key areas known to flood

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Green Infrastructure and Flood Mitigation Master Plan – City of Amsterdam	Plan for the traditional urban core of the City of Amsterdam to identify appropriate green infrastructure measures and flood mitigation techniques, develop enhanced stormwater and other regulations that will require and/or incentivize green infrastructure throughout the urban core, and flood mitigation measures in areas prone to flooding.	\$240,000	Proposed	No
Route 5 Stormwater Reconstruction – City of Amsterdam	During Hurricane Irene, flood waters rose onto Route 5 at the west end of the City and overwhelmed the stormwater infrastructure causing damage to the system. This project will make the necessary repairs to make the system functional again.	\$1,040,000	Proposed	No
Fort Hunter Stormwater Detention Pond and Schoharie Crossing Drainage Improvements – Town of Florida	The project will construct two or more stormwater detention ponds in the northeast area of the hamlet of Fort Hunter. Repairs and enlargements to culverts, and other drainage conveyance improvements will be performed at various locations in the hamlet. In addition to the drainage improvements, several footbridges and interpretative signage will be restored at culvert repair locations within the Schoharie Crossing State Historic Site, to help restore damage to the Site’s facilities and multi-use trails that were damaged during Irene.	\$1,850,000	Proposed	No



Table 12 (continued) Strategy 7: Improve drainage in key areas known to flood

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Enlarge Undersized Culverts – Town of Florida	This project proposes enlargements of culverts at up to fourteen road crossings in the Town of Florida that were flooded out during Hurricane Irene and Tropical Storm Lee in 2011. Exact needs for each location should be evaluated during design. For planning purposes, it has been assumed that all the crossings along the roadways, with exception of major streams flowing under bridges, will require a typical upgrade to dual 24-inch reinforced concrete pipe culverts.	\$840,000	Proposed	No
Enhance Stormwater Conveyance Systems – Town of Amsterdam	This project will install appropriate stormwater conveyance system improvements and expansion along Midline Road, extending out on Wallins Corners Road, and Crouse Drive, which were heavily flooded during Hurricane Irene.	\$900,000	Featured	No

viii. Augment natural and cultural resources for flood resiliency.

The recent and past floods have eroded the banks of creeks and rivers and damaged flood retention walls, leaving critical facilities, houses, and other assets at risk. This strategy seeks to repair this damage while also, where possible, creating new recreational opportunities.

Functional floodplain buffers are critical to help reduce flood impacts. Buffers can be used for recreation, helping create a recreational asset out of a natural flood protection asset. For example, creation of a bike path along Chuctanunda Creek would create a valuable recreation asset and provide an opportunity to integrate swales and other stormwater retention features. It would also provide a pedestrian link between Hagaman and Shuttleworth Park. Creation of the Amsterdam Riverwalk will augment riverbank stabilization along the Mohawk River and will link other trails and greenways.



III. Reconstruction and resiliency strategies

Table 13 Strategy 8: Augment natural and cultural resources for flood resiliency.

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Floodplain Buffers, Bikeway, and Dam Rehabilitation along Chuctanunda Creek – Town of Amsterdam	This project has 3 components: 1) assessment of Harrower Pond Dam, to establish whether it will be feasible to rehabilitate the dam, 2) evaluation of areas upstream of the dam and create floodplain buffers in suitable locations, and 3) design and construction of a bikeway along Chuctanunda Creek, from Hagaman to Shuttleworth Park.	\$1,500,000	Proposed	No
Amsterdam Riverwalk - City of Amsterdam	This project is for a portion of the overall Riverwalk project. It will construct shoreline resiliency improvements that will be required for 1,200 linear feet of the trail where flood damage from Hurricane Irene has compromised the shoreline.	\$700,000	Featured	No

ix. Protect cultural artifacts, historic sites and archives from damage and loss.

Multiple historic resources, in particular, Guy Park Manor, Fort Johnson, and the Schoharie Crossing Historic Site, were badly damaged during Hurricane Irene. These locations have not yet been restored. The Canal Locks along the Mohawk River that are part of the Erie Canalway Heritage Corridor were also significantly damaged in Hurricane Irene. The Canal Corp has since been allotted funding to repair and improve the canal lock system; this work will take several years to complete.

In order to preserve the history of the area, specific measures need to be undertaken to protect and reinforce these historic sites. In general, cultural resources currently housed in flood-prone areas need additional protection or relocation to prevent losses of irreplaceable historic and cultural artifacts.



Table 14 Strategy 9: Protect cultural artifacts, historic sites and archives from damage and loss

Project Name	Short Project Description	Estimated Cost	Proposed or Featured	Regional Project (Y/N)
Old Fort Johnson – full conditions assessment – Village of Fort Johnson, Town of Amsterdam	Montgomery County Historical Society received a small grant to do and exterior assessment of Old Fort Johnson, but there is still a need to do a full assessment of the building – including the interior. This project will include an assessment of the interior of the building, and potentially implementation of some of the findings.	\$80,000	Proposed	No
Rebuild Retaining Wall on Kayaderosseras Creek next to Old Fort Johnson - Village of Fort Johnson, Town of Amsterdam	The project will be to evaluate, design and rebuild the retaining wall along Kayaderosseras Creek that was built to provide erosion control. This project will stabilize the stream bank and protect Old Fort Johnson from flooding.	\$450,000	Proposed	No



Residences line the North and South Chuctanunda Creeks, along with the remnants of former factories and the dams they left behind from the industrial days.

Source: E & E



IV. Proposed and Featured project profiles

Section IV features detailed project profiles for each Proposed and Featured project identified by the NYRCR Amsterdam – Florida 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.)
- Potential alternate funding sources (for Featured projects)



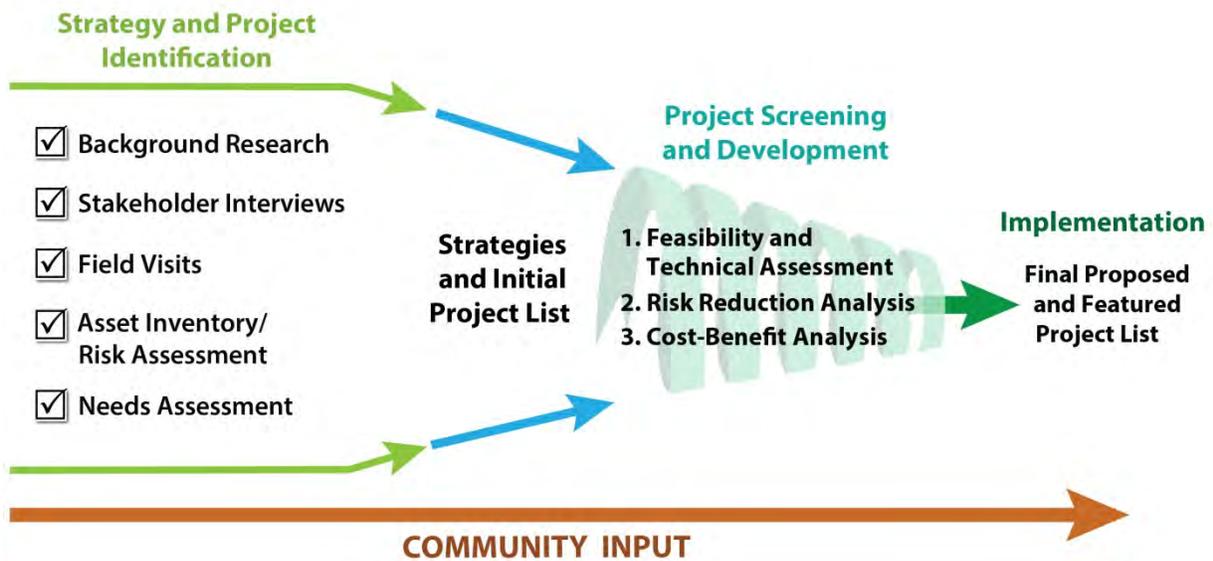
IV. Proposed and Featured project profiles

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 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. A “Featured Project” may include regulatory reforms and other programs that do not involve capital expenditures.

A. Project identification and screening process

The NYRCR Plan for the City of Amsterdam, Town of Amsterdam, and Town of Florida seeks, wherever possible, to achieve multiple benefits through well-designed projects that address economic, environmental, and social/health aspects of resilience and sustainability. Figure 13 presents an overview of the project identification and screening process.

Figure 13 The project identification and screening process





Project ideas and concepts came from a multitude of sources. The Planning Committee and consultant team reviewed existing reports and plans and interviewed stakeholders including academics, government employees, and others to compile ideas and information. Field visits were used to document conditions on the ground. The asset inventory and risk assessment process provided important insights that helped focus attention on the most flood-prone areas and assets. Finally, a comprehensive needs assessment identified both recent (post-flood) and long-term (pre-existing) community needs related to the six recovery functions.

Once an initial set of project ideas had been compiled, the Planning Committee and consultant team commenced a screening process to narrow down the list of potential projects. This process included a feasibility and technical assessment, in which projects were analyzed from a scientific and engineering perspective to determine their suitability, as well as a feasibility screening.

Projects were also evaluated for their risk reduction potential. Where appropriate, projects were modeled in the Hydrologic Engineering Center's River Analysis System (HEC-RAS) model to determine their impact on flood elevations up and downstream as well as to determine their potential for protecting targeted assets in specific flood scenarios.

Finally, a cost-benefit analysis (CBA) process was undertaken. The CBA was used to compare the costs and benefits of individual projects so as to eliminate from consideration projects with costs that outweigh the potential benefits.

During each step in the screening process, project ideas were removed from further consideration if the results of the analysis determined that they would not achieve their intended objectives. Community input informed the entire project identification and screening process.

B. Overview of Proposed and Featured project profiles

The project profiles seek to present the best available information regarding a project, such as its cost, technical feasibility, timeframe for implementation, and potential regulatory requirements. All of these projects are at an early stage of design and development, and so this information is liable to change as projects advance in the design and development process.

The Proposed and Featured projects have been grouped by geographic scope. Community-wide and regional initiatives are presented first.



IV. Proposed and Featured project profiles

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Area-wide – Proposed Projects



IV. Proposed and Featured project profiles

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Emergency Communications System

Project Type: Proposed

Strategies

- Facilitate communication from emergency response organizations to residents before, during, and after emergency events.

Recovery Functions

- Community Planning and Capacity Building
- Health and Social Services

Location

- Regional

Jurisdiction

- Montgomery County

Project Description: This project seeks to improve emergency communications and coordination in the Community, building on lessons learned during Hurricane Irene. The project will address the following needs: better multi-lingual communications to reach non-English speaking populations; redundancy in all forms of communication (e.g., person-to-person, telephone, text, and Internet) to avoid disruption by flooding (e.g., due to power outages and impassable roads); and, better communication of alternatives for evacuation and emergency response routes.



Inter-agency training workshop for emergency communications.

It is estimated some 25 to 35% of the population in the study area can be categorized as vulnerable because of frailty, language or other reasons. For example, the Spanish-speaking community in the City represents 25% of the total population, and there is a significant elderly population as well. English broadcasts of information up to, during, and after an event may not be understood by or reach all community members, especially those who leave their homes, do not use computers, do not listen to the radio, or do not watch television routinely.

The project will establish an emergency communications protocol that implements a formal multi-lingual communications system to inform municipalities and residents of an upcoming event, during an event, and in the aftermath of a disaster. The project will incorporate American Association of Retired Persons (AARP) and Americans with Disabilities Act (ADA) recommended protocols for outreach to elderly and otherwise vulnerable populations. This will require inter-municipal collaboration (e.g., Memoranda of Understanding) and standardized regional coordination to effectively transmit information among upstream and downstream communities. Not only will a clear protocol ensure that a unified



IV. Proposed and Featured project profiles

message is sent at appropriate intervals, but it will also help in determining which media is best used for transmitting content effectively to the targeted populations.

Project costs include the funding of a full-time inter-municipal coordinator position for one year; inter-agency workshops; site and facility visits; and communication plan development. A task force of representative stakeholders should be convened at the start of the project to inform the plan.

This project is expected to assist with capacity building, increase community planning capabilities, and better prepare emergency responders, municipal leaders, and residents for future storm events.

Risk Reduction: This project is not intended to directly reduce the flood risk to physical assets; however, it will address the health and safety of residents, visitors, and emergency response personnel within Montgomery County who may be impacted by impending flooding. Early warning to residents in the floodplain allows them to safely evacuate or find shelter on higher ground. Identifying areas that may be isolated by flooding, or vulnerable populations who cannot self-evacuate in advance will help responders make good decisions early on in the response on the deployment and/or sharing of assets. This will not only protect them, but also reduce the demands placed on emergency response services during and immediately after an event, such as emergency medical services which are historically stretched to capacity. This project also includes planning to increase the efficiency with which response organizations can collaborate to better use resources across the region.

Social and Health Benefits: The project will improve life-safety protection, notably for multi-lingual populations. It is intended to better match the resources this Community needs during an emergency event. The need for more effective communication was based on the response to Hurricane Irene, and post-event discussions among emergency planners in the area which were relayed to the Planning Committee.

Economic Benefits: Overall the project will support community recovery activities by increasing the efficiency of response, and better targeting resources used to respond. With the area-wide notification system, residents will be able to plan to evacuate or shelter-in-place using real-time information; emergency services will be able to focus on vulnerable populations and locations known to be isolated by flooding; and increased response capacity through increased redundancy, more volunteers and better memoranda of understanding will mean enhanced efficiency. Each of these elements will generate economic benefits for the community by streamlining the need for services, reducing loss to residents through more informed preparation, and pre-planned pre-location and sharing of services.

Cost Benefit Analysis: Investment in this project will reduce the cost of future response activities in terms of real response costs, as well as individual costs to local populations who are better able to prepare in advance of an event. **This project is estimated to cost \$315,000.**

Implementation Strategy

Timeframe

Anticipated completion date: 12 months from project start date

Regulatory Requirements

None identified



City of Amsterdam – Proposed Projects



IV. Proposed and Featured project profiles

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Maintain Power to Critical City Buildings

Project Type: Proposed

Strategies

Improve emergency response through community-wide coordination and positioning of critical resources and services.

Location

- City of Amsterdam

Recovery Functions

- Community Planning and Capacity Building

Jurisdiction

- City of Amsterdam

Project Description: During Hurricane Irene, power outages across the City of Amsterdam, particularly in the South Side and West Side, resulted in the closure of critical government operations for several days after the storm. Many emergency support functions and other critical government activities are dependent upon a reliable source of energy. This project will purchase generators for City Hall and the Department of Public Works buildings in the City of Amsterdam to support continuity of government operations during storms with power outages.



Map: Project Locations Amsterdam City Hall and the Department of Public Works.

As part of the project, a team will identify critical functions within the buildings and scope what type of generator can best fill that need for power. The project will ensure that the generators are located in a flood-protected area, and will develop a protocol for refueling, maintenance, and servicing. A 200kW generator will be permanently installed at each building.

Risk Reduction: This project is expected to reduce the risk to the community by enabling critical government activities to continue in the event of a power outage. City Hall and the Department of Public Works buildings in the City of Amsterdam are critical locations during an emergency. Continuity of operations is important to enable the City government and DPW to respond and communicate effectively during an emergency.

Social and Health Benefits: The primary direct benefits of this project are the protection and preservation of access to critical services during an emergency. Temporary loss of access to these services will result in increased risk to life and property due to the inability of officials to respond quickly to problems.



IV. Proposed and Featured project profiles

Economic Benefits: During an emergency, the continuity of operations for government and other critical agencies is vital to protecting life and property during a disaster. Maintaining access to these essential services will also help speed up the recovery process as officials will be able to more quickly assess damages and dispatch resources. These actions are likely to result in reduced overall costs associated with storm damage repairs for both residents and municipalities.

Cost Benefit Analysis: This project is expected to assist with capacity building, increase community planning capabilities, and better prepare emergency responders, municipal leaders, and residents for storm events. This project is not intended to directly reduce the flood risk of physical assets; it supports continuity of operations for municipal services. **The project is estimated to cost \$300,000.** Through the cost-benefit analysis conducted as part of this plan, the project's benefits to the community were determined to outweigh its costs.

Implementation Strategy

Timeframe

Anticipated completion date: 6 months from project start date.

Regulatory Requirements

Municipal building permits and coordination with Montgomery County Emergency Management and NYS Department of Health



Establish Emergency Shelter Locations

Project Type: Proposed

Strategies

- Improve emergency response through community-wide coordination and positioning of critical resources and services.

Location

- City of Amsterdam

Recovery Functions

- Community Planning and Capacity Building

Jurisdiction

- City of Amsterdam

Project Description: The City of Amsterdam is divided by the Mohawk River. During Hurricane Irene, it was not possible to cross the river in order to access pre-existing sheltering services, and service could not be made accessible to the entire City population. Fully-equipped shelters are needed on both sides of the Mohawk. Shelter facilities should be able to receive vulnerable populations, treat mass casualties, and provide plug-and-play resources to support satellite operations for police, fire, and other emergency services. Therefore, this project will develop two emergency community shelters, one on the north and one on the south side of the river. The shelters will be equipped with permanent generators. The shelters will be able to serve the City of Amsterdam’s Low/Moderate Income community, which is the population least likely to have a place to go in an emergency and often the most reliant on shelters. The shelters will be compliant with the 2010 Department of Homeland Security/FEMA/American Red Cross sheltering guidance for local and state agencies and the NYS Division of Homeland Security and Emergency Services guidance for Functional Needs Support Services (FNSS).



Cots ready in an emergency shelter.
Source: iStock Photo

Two Greater Amsterdam School District locations have been identified as appropriate shelters: the William H. Barkley MicroSociety Magnet School (south side of Mohawk River at 66 DeStefano Street); and the R.J. McNulty Academy for International Studies and Literacy Magnet School (north side of the river at 60 Brandt Place). The City and the Greater Amsterdam School District both support this initiative and are willing to enter into a Memorandum of Understanding (MOU) for the use of these schools as emergency shelters. The schools were identified as potential shelters because they have suitable, accessible premises, so no structural changes are required. But emergency shelters should have reliable power, and neither school is currently equipped with a generator. The project includes the permanent installation of a 200kW back-up generator at each facility in order to provide a consistent source of power dur-



IV. Proposed and Featured project profiles

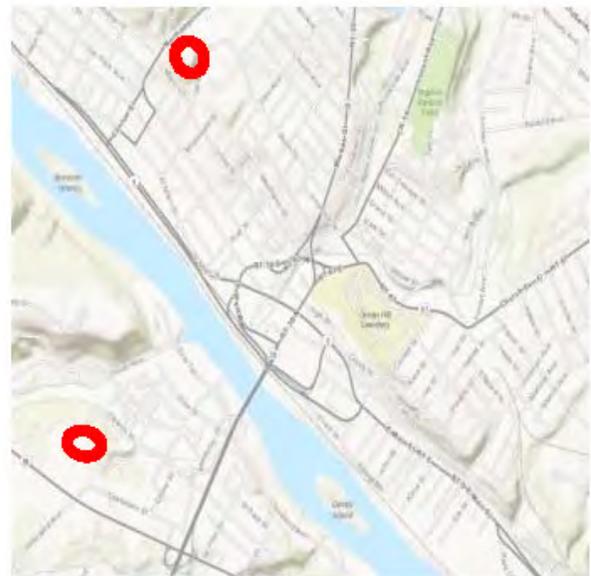
ing an outage. A fuel supply tank will also be provided with capacity to operate each generator for up to one week.

Risk Reduction: This project is expected to assist with capacity building, increase community planning capabilities, and better prepare emergency responders, municipal leaders, and residents for storm events. This project is not intended to directly reduce the flood risk of physical assets. However, having a safe place to shelter will benefit and protect the residents of the community.

Social and Health Benefits: The project will provide a safe location for residents that are under threat of evacuation from flooding and other disasters. It will respond to the community need that was identified during and after the recent storms.

Economic Benefits: Providing a safe location for at risk residents will reduce the risk of lost work days and productivity due to homelessness. People in shelters have the opportunity to identify their alternatives and optimize their outcome. Access to human resources will help organize their situation and receive appropriate resources to address their issues.

Cost Benefit Analysis: This project will provide access to emergency shelter to City residents on both sides of the Mohawk River, increasing the City's capacity to provide shelter and reducing the likelihood that residents will be unable to reach shelter locations due to flooded roadways. **This project is estimated to cost \$300,000.**



Project Locations William H. Barkley
MicroSociety Magnet School and
R.J. McNulty Academy.

Implementation Strategy

Timeframe

Anticipated completion date: 12 months from project start date

Regulatory Requirements

Municipal building permits and coordination with Montgomery County Emergency Management and NYS Department of Health



South Chuctanunda Creek Bank Stabilization

Project Type: Proposed

Strategies

- Stabilize and revitalize neighborhoods and protect them from flooding

Recovery Functions

- Natural and Cultural Resource Strategies
- Infrastructure Strategies

Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: Hurricane Irene and Tropical Storm Lee in 2011 caused significant erosion of the South Chuctanunda Creek bank along its north side, and damage to the retaining wall along its south side. The erosion has undermined the retaining wall and led to a partial collapse, and there has been significant scouring of the Creek bank. The residences located on both sides of the Creek bank are threatened by slope failure, which reportedly occurred in the past. The damage is also threatening the sewer and water lines which cross the Creek near the easterly Florida Avenue crossing.

This project will stabilize the bank along the north side of South Chuctanunda Creek, remove a portion of the damaged retaining wall and stabilize the south side of the Creek bank near the intersection of Florida Avenue and State Route 5S in the City of Amsterdam. This will protect residences and the sewer and water infrastructure in the project area.

Recommendations for stabilization of the creek bank include the following:

- Restoring approximately 700 linear feet of creek riprap consisting of medium and large size rock, at a width of 40 feet.
- Removal of approximately 20 feet of the damaged retaining wall and restoration of the bank with large riprap in that section.



South Chuctanunda Creek looking west from Florida Avenue, Amsterdam, NY. The damaged retaining wall can be seen on the right hand side, bowing into the creek.
Source: The LA Group



IV. Proposed and Featured project profiles

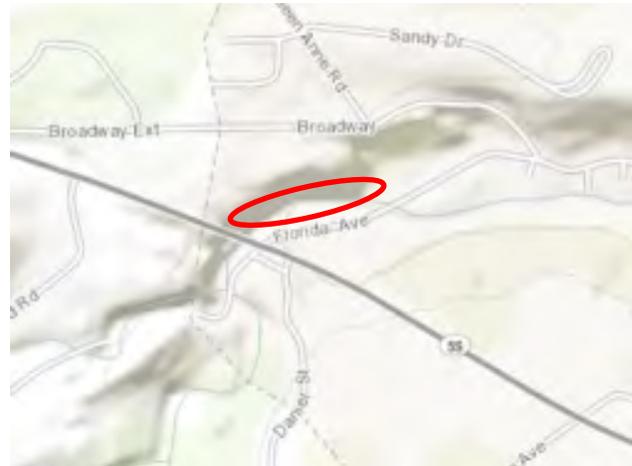
Risk Reduction: This project will reduce risks to residential properties in the vicinity of the project and protect critical water and sewer infrastructure at risk of damage from continued bank erosion. Reduction of erosion may also prevent potential future risk to the Florida Avenue and State Route 5S bridge crossings of the South Chuctanunda. This project will directly benefit five residences in the project area. These properties are currently subject to loss of land from erosion; continued erosion would eventually put the homes themselves at risk.

Social and Health Benefits: The primary direct benefits of this project are the protection of water and sewer services in this area. Temporary loss of access to these services will result in public and environmental health threats and require quick action by the City to repair or provide alternative solutions (such as providing bottled water to residences while repairs are made).

Environmental Benefits: Stabilizing the creek bank will reduce ongoing erosion and secure sewer and water lines, minimizing the risk of accidental sewage discharge into the creek due to a pipe break. The discharge of raw sewage would be a serious and highly undesirable environmental and public health concern.

Economic Benefits: This project will minimize risk to the water and sewer lines as they cross the creek, and therefore reduce potential future cost to the City and taxpayers for repair or replacement.

Cost Benefit Analysis: The benefits of this project will significantly outweigh the costs. In addition to protecting five residences located in this area, this project will protect critical sewer and water infrastructure currently at risk due to bank erosion and slope failure in this area. **This project is estimated to cost \$560,000.**



Project Location: South Chuctanunda Creek Bank Stabilization.

Implementation Strategy

Timeframe

Anticipated completion date: one year from project start date

Regulatory Requirements

NYSDOT roadway permit, USACE Section 404 permit (general permit if 500 feet or less of repair), NYSDEC Protection of Waters permit



Dove Creek Restoration and Medical Facility Retaining Wall Reinforcement

Project Type: Proposed

Strategies

- Maintain essential medical services to all populations during an emergency event.

Recovery Functions

- Infrastructure Strategies
- Health and Social Services Strategies

Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: St. Mary’s Hospital Medical Annex Building in the City of Amsterdam sits immediately adjacent to Dove Creek. The hospital satellite facility is across the street, and its parking lot abuts Dove Creek. Flood damage to residential and business properties located along the creek is also of concern. The main area of concern extends from just north of Guy Park Avenue, through the downstream residential area to West Main Street and the railroad tracks. The culvert under Guy Park Avenue was damaged and recently repaired by the City. The reinforced concrete retaining wall on the west side of the creek abutting the Hospital Annex building, which extends from Guy Park Avenue to Division Street, has been undermined and is failing, and is lying at an angle of approximately 40 degrees. This condition critically jeopardizes the stability of the Annex building foundation. The laid-up masonry stone wall on the east side of the creek, abutting residential structures, also failed in numerous locations.



Dove Creek and its failing retaining wall next to St. Mary’s Hospital, Amsterdam, NY.
Source: The LA Group

This project will repair and reconstruct the failing retaining wall along Dove Creek in the vicinity of St. Mary’s Hospital where it is severely undercut. The project will also repair and enlarge culverts to improve Dove Creek’s flow into the Mohawk River and reduce the potential for future damage. The 20 foot wide creek runs alongside St. Mary’s Hospital and floods almost every year.

This project will repair and reconstruct the failing retaining wall along Dove Creek in the vicinity of St. Mary’s Hospital where it is severely undercut. The project will also repair and enlarge culverts to improve Dove Creek’s flow into the Mohawk River and reduce the potential for future damage. The 20 foot wide creek runs alongside St. Mary’s Hospital and floods almost every year.

An analysis of stormwater flows and rainfall events, and geotechnical investigations will be required to determine the engineering design criteria for any improvements to Dove Creek. The following work is recommended to make the necessary repairs:

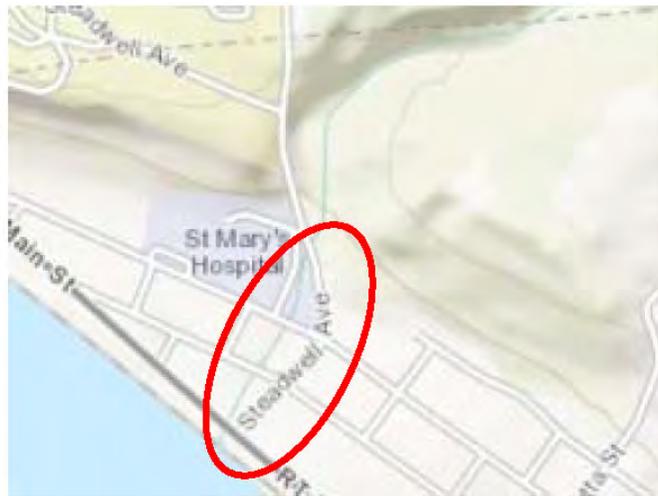
- Replacement of the failed retaining wall with a new structural reinforced concrete retaining wall tied to the vertical walls at Guy Park Avenue and Division Street.



IV. Proposed and Featured project profiles

- Replacement of the stone masonry channel wall with stone gabion units.

Risk Reduction: Failure of the Dove Creek retaining wall would result in structural and/or flood damage to St. Mary's Hospital, the office of Montgomery County Community Services, the Resource Center for Independent Living, and several residential properties. Repairing and rebuilding the wall will reduce the risk of this damage. The associated stormwater improvements, including reconstructing and enlarging culverts to allow the creek adequate room to flow under roadway crossings and into the Mohawk River, will also protect the wall from future degradation.



Project Location Dove Creek Restoration and Medical Facility Retaining Wall Reinforcement NY

Social and Health Benefits: Protection of St. Mary's hospital facilities is of crucial importance to the Community, which relies on access to the essential medical services that St. Mary's provides. In addition, this project will protect two high risk social services assets, Montgomery County Community Services, and the Resource Center for Independent Living. Loss of any of these three assets would have serious adverse impacts to the Community.

Environmental Benefits: Improving Dove Creek's conveyance through this area with stabilization of the creek bank, retaining wall repairs, and replacement of undersized culverts will allow creek flow to adequately drain into the Mohawk River and prevent back-ups and the build-up of debris in the creek channel.

Economic Benefits: This project will prevent significant economic losses that could result from repairs and reconstruction of hospital infrastructure, the temporary loss or relocation of health care jobs, and lost revenue to the hospital while repairs are made.

Cost Benefit Analysis: The flooding in the last several years has resulted in at least \$4.5 million of documented damage. Total failure of the wall, which is currently eroding at many points, could result in substantial more flood damage to the hospital and other infrastructure. **This project is estimated to cost \$1.4 million.** In the 2014 Governor's State of the State, New York State committed to reinforcing parts of the Dove Creek Wall. The benefits of this project will largely outweigh the cost of the loss of essential hospital infrastructure, and medical and social services in the community. In addition to the other benefits, this project will also protect approximately seven residences located on the bank of Dove Creek in the project area. Funding for this project is anticipated under another source.



Implementation Strategy

Timeframe

Anticipated completion date: 18 months from project start date

Regulatory Requirements

Local and NYSDOT roadway permits, building permits for reconstruction of the retaining wall, NYSDEC Protection of Waters permit, USACE Section 404 permit or general permit (for less than 500 linear feet of work)



IV. Proposed and Featured project profiles

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Amtrak Station Relocation Site Plan

Project Type: Proposed

Strategies

- Mitigate Damage to Transportation Corridors and Infrastructure

Recovery Functions

- Infrastructure Strategies
- Economic Development

Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: The current Amtrak Station is located off of State Route 5 and Division Street, and within the 100-year floodplain. The station and surrounding area were flooded with several feet of water during Hurricane Irene. Several locations are being evaluated for a new multi-modal transit facility, all of which are outside of the floodplain.

The proposed project is to develop a detailed site plan for a new multi-modal transit station in the historic downtown section of the City of Amsterdam. This project will be the next step in an ongoing effort by the City to relocate the existing Amtrak station out of a high risk flood area. The creation of a multi-modal transit facility that includes retail services will also help facilitate economic growth and tourism in the City’s downtown.



The current station lies in the floodplain and was several feet under water during Hurricane Irene. Source: Amsterdam Fire Department

The City is nearing the end of its multi-year planning process to select the alternative station location under Step 2 of its Waterfront Heritage Area Brownfield Opportunity Area process. The process of relocating the station is beyond the scope of the NYRCR Program, but one component, developing a detailed site plan, is included to provide necessary information in order to advance the relocation of the Amtrak Station. The detailed site plan will be used to prepare an application for the United States Department of Transportation (USDOT) Transportation Investment Generating Economic Recovery (TIGER) grant program.

It is recommended that following completion of construction of the new inter-modal transit center, the current station be demolished and its impermeable parking area removed to provide permeable park land for the City.



IV. Proposed and Featured project profiles

Risk Reduction: This project is expected to reduce the risk of future flooding for the existing station, and add resiliency to this vital transportation asset. When complete the relocation will help improve reliability of regional infrastructure, and reduce the number of at risk Community assets in the floodplain.

Social and Health Benefits: This project will help pave the way for a multi-modal transit center in the City, a key asset that will improve transportation access for all residents. The transit center, once complete, will spur economic activity in the downtown area of Amsterdam, improving pedestrian access, reducing vehicular congestion, and increasing economic growth.

Economic Benefits: The eventual closure and relocation of the existing Amtrak station will lower the number of City assets located within the floodplain, eliminating the costs associated with repetitive repairs and reducing service interruptions. Increased economic benefits will be realized by downtown businesses and the City. Relocating the Amtrak Station will also provide connection to other means of public transportation in the City, serving as an economic engine for the City. A public-transit center in the downtown offers improved access to the City and its services, an increase in tourism potential, and increased walkability.

Cost Benefit Analysis: During and after Hurricane Irene, loss of rail service disrupted intra- and inter-state passenger travel and freight capabilities across a critical transportation corridor. The relocation will help facilitate tourism and encourage businesses to locate or re-locate downtown to serve a growth in pedestrian traffic. **This project is estimated to cost \$250,000.** The benefits of this project outweigh the cost of repetitive repairs to the facility and loss of service.

Implementation Strategy

Timeframe

Anticipated completion date: one year from project start

Regulatory Requirements

Project design will have to consider local building codes and USDOT TIGER grant requirements. The project will require review for applicability of SEQRA under Part 617 of the NYS Environmental Conservation Law.



Gateway Park

Project Type: Proposed

Strategies

- Create and Sustain a ‘Business Friendly Climate’ to Encourage Businesses to Remain, Locate, Grow and Develop

Recovery Functions

- Economic Development

Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: This project will demolish a waterfront commercial building that is located in an extreme risk flood area, was damaged in Hurricane Irene, and abandoned shortly thereafter. In its place, a public park and permeable parking lot will be built. This project also helps further the goals of the City of Amsterdam’s Brownfield Opportunity Area program.



Existing abandoned former Carpetland building.

The project is located on State Route 5 between Steadwell Avenue and Herrick Street, in the City of Amsterdam’s west end.

The property owner has agreed to deed the site to the City of Amsterdam at no cost. Upon transfer of the property, the buildings will be demolished and the property will be turned into a public park, with amenities such as benches and walkways. The existing paved parking lot will be removed and replaced with permeable materials.

Risk Reduction: The Carpetland property has been repeatedly damaged by flooding and was closed permanently after the 2011 floods from Hurricane Irene. Dove Creek runs behind the property, which results in flooding to the site from both the creek and the Mohawk River. Unless it is acquired and repurposed it is likely to add to urban blight in that area. This project will reduce the risk to the community by removing a potentially dangerous structure with a history of suffering flood damage that was finally abandoned after Hurricane Irene.

Social and Health Benefits: This project provides an open green recreational space for a low to moderate income community and will provide an opportunity for a healthier lifestyle.



IV. Proposed and Featured project profiles

Environmental Benefits: The removal of the abandoned building and parking lot and replacement with parkland and permeable surfaces increases the available floodplain buffer along the Mohawk River in the City.

Economic Benefits: By removing this repetitive loss and abandoned building, the City mitigates future risk of damages to an unsustainable former commercial site, saving the property owners, and insurers from paying for costly future repairs. It reduces blight in the City by eliminating an abandoned property which may have a positive impact on surrounding property values.

Cost Benefit Analysis: This project will reduce urban blight and meet a community need for green space. Removal of the structure will provide open space for the community, and a permeable parking area, reducing the number of built structures in the City's floodplain. Redevelopment of the site as a park and permeable surface will contribute to increased buffers around the Mohawk River. The property also sits at the western "gateway" to the City, providing an image of a place left behind. Revitalizing this location will turn an eyesore into both a community benefit and further flood mitigation in the City. **This project is estimated to cost \$370,000**, a low cost compared to the benefits the Community will realize.

implementation Strategy

Timeframe

Anticipated completion date: 9 months from start of project

Regulatory Requirements

Local building permits



Route 5 Stormwater Reconstruction

Project Type: Proposed

Strategies

- Improve drainage in key areas known to flood

Recovery Functions

- Infrastructure

Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: During Hurricane Irene, a low lying area of Route 5 between Division Street and Caroline Street in the City of Amsterdam was inundated with flood waters that entered the storm sewers and sanitary sewers through frames, covers, grates, manhole seams, and pipe joints. The back pressure exerted on the clay tile pipe joints washed out pipe bedding material at these locations, causing loss of pipe support, creation of voids, and partial to full collapse in sections. It appears that both sanitary and storm conveyance systems used by the City of Amsterdam have been compromised by the flooding event, resulting in backups of the system and continued flooding of the manholes in the low lying areas along Route 5.



Undersized stormwater infrastructure on the City's west side exacerbated flooding during Irene, Amsterdam, NY.

Source: City of Amsterdam

This project involves the reconstruction of storm sewer and sanitary sewer infrastructure. Overflows from sanitary sewers are a potential health risk. The immediate necessary actions include television inspection of the pipes, manhole inspections, and a study of system capacity and connectivity through the review of available drawings and analysis of the videos collected. This will help identify points of failure within the conveyance systems as well as the portions of the stormwater and sanitary sewer infrastructure that can be rehabilitated or that will require complete replacement in order to increase conveyance capacity to aid in flood mitigation.

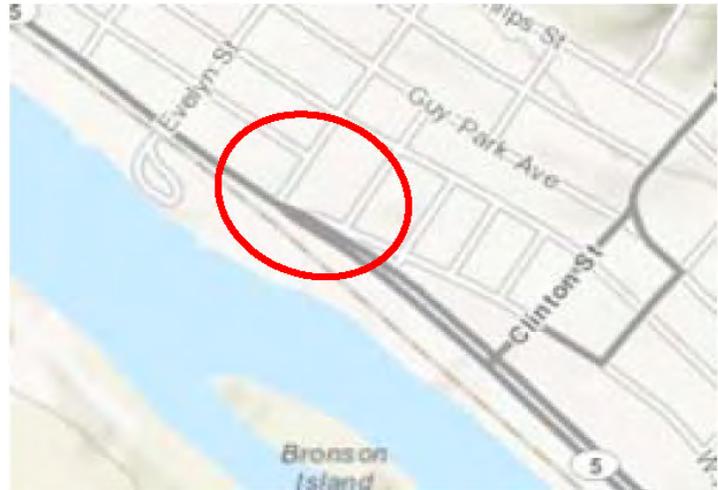
Based on the expected existing pipe and manhole materials, the proposed construction work will involve replacement of approximately 12 sanitary sewer manholes, replacement of one storm sewer catch basin, installation of approximately 100 feet of new storm sewer pipe and lining of approximately 3,500 feet of sanitary sewer pipe. In areas where full replacement of piping would be impractical due to existing site conditions, relining damaged piping may be a cost-effective alternative, essentially performing the same function as a full replacement. Additionally, the sanitary sewer manholes in the flood damaged



IV. Proposed and Featured project profiles

area will receive new water-tight frames and covers to prevent flood waters from entering the sanitary sewer system. These improvements will disconnect the existing sanitary sewer line from the stormwater system and as a result will reduce the potential for overflow.

Risk Reduction: This project is expected to lead to a direct reduction of flood risk for approximately 40 residences and 4 local businesses, which were impacted by Hurricane Irene and Tropical Storm Lee. This project will also offer protection to the Resource Center for Community Living, a high risk social services asset in the project area. It will prevent further damage to infrastructure and reduce the potential for damage to roads in the project area.



Project Location Route 5 Stormwater Reconnection.

Social and Health Benefits: This project will directly benefit the approximately 40 homes and 4 businesses in the project area, keeping a thriving mixed-use community intact, preventing damage to homes, and maintaining economic and employment opportunities in the Community. Emergency responders will be protected from the risk of driving into unsafe conditions while responding to calls during storm events, as will residents attempting to but unable to evacuate their homes.

Environmental Benefits: This project will reduce the risk of sanitary overflow during flooding by the addition of water tight frames and covers on manholes, and reduction of infiltration and inflow along damaged sewer mains.

Economic Benefits: Protecting business assets will maintain employment opportunities within the Community by reducing potential damage to local small businesses, manufacturers, and other facilities. It will reduce the risk of lost work days and income due to closures from flooding, and reduce. A reduction in flood risk to the area also protects agricultural land uses and prevents crop losses. Installing adequate stormwater conveyance will also reduce the potential for damage and repairs necessary to local roads, which may result in unplanned but necessary repairs by the City, and put undue burden on taxpayers.

Cost Benefit Analysis: This project is estimated to cost **\$1,040,000**. Investment in this project will benefit the residents and local businesses in this area by reducing loss of business activity and work days from flooding and expensive home repairs. It will also prevent the loss of road infrastructure, and expenses associated with emergency repairs.



Implementation Strategy

Timeframe

Anticipated completion date: 18 months from start of project

Regulatory Requirements

Local and NYSDOT roadway permits, NYSDOH review, NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity



IV. Proposed and Featured project profiles

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Green Infrastructure Master Plan

Project Type: Proposed

Strategies

- Improve drainage in key areas known to flood

Recovery Functions

- Infrastructure Strategies
- Natural and Cultural Resources Strategies

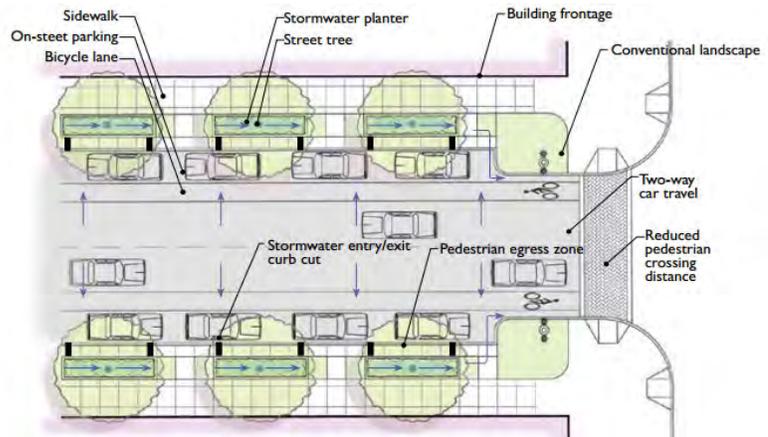
Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: The City of Amsterdam’s stormwater system was overwhelmed as a result of the torrential rains brought by Hurricane Irene and Tropical Storm Lee. Many communities have found that green infrastructure is a viable alternative to incorporate alongside appropriate drainage system upgrades. Green infrastructure components such as swales, stormwater planters, and increased permeable surfaces can allow greater infiltration of stormwater and reduce the volume of flow directed to hard infrastructure.



Example of a two-way street with stormwater planters. Source: USEPA, Stormwater Management Handbook – Implementing Green Infrastructure in Northern Kentucky Communities, May 2009.

This plan will discuss evaluation procedures to identify locations within the City in need of and suitable for the integration of green infrastructure features. Siting evaluations may consider land uses and available space within the City’s downtown, topography, existing parks and open space, and the locations of current stormwater collection and conveyance systems.

The plan will also identify opportunities to introduce green infrastructure into public projects, and recommend regulations and incentives to promote green infrastructure in private development.

The proposed project will cover the urban core of the City, which is exposed to flooding during heavy storm events. Through the development of a green infrastructure master plan, measures will be identified to manage stormwater, develop and incentivize green infrastructure throughout the City’s urban



IV. Proposed and Featured project profiles

core, as well as implement flood mitigation in areas prone to flooding. This plan will be submitted for adoption under the City's comprehensive plan upon completion.

This planning project will not require any permits; however, it will require access to City and County plans, reports, studies, and records, as well as identifying required permitting for any proposed construction.

Risk Reduction: The City is prone to flooding during heavy storm events, from the Mohawk River and its many tributaries, as well as from an abundance of hardscape surfaces. Flood attenuation measures and drainage infrastructure planning are necessary to guarantee the safety of the residents and integrity of City and private infrastructure and assets. The stormwater management improvements that will be realized as a result of this project will reduce the risk of flooding for residences throughout the City.

Social and Health Benefits: The improved stormwater and flood management practices anticipated as a result of this project will likely result in the reduction of hardscape surfaces and the addition of green spaces throughout the City, which will in turn provide a healthier environment for its residents.

Environmental Benefits: Green infrastructure practices used throughout the City will contribute to a healthier watershed, improved stream function, and enhanced connectivity between the City's parks and open spaces.

Economic Benefits: Effective drainage planning and the incorporation of green infrastructure offer improved stormwater management at a lower cost to the City. A reduction in flooding will also result in fewer costs to homeowners, businesses, and the City for repairs due to flood damages.

Cost Benefit Analysis: After flood events brought by storms Irene and Lee in 2011, the City realized the need for comprehensive flood mitigation planning. This project will provide a comprehensive plan for flood management to protect the City and its assets in the future. **This project is estimated to cost \$240,000.**

Implementation Strategy

Timeframe

Anticipated completion date: one year from project start

Regulatory Requirements

Access to City and County plans, reports, studies, and records. The project may require review for applicability of SEQRA under Part 617 of the NYS Environmental Conservation Law



Streambed and Retaining Wall Inspection and Repairs on Bunn Creek

Project Type: Proposed

Strategies

- Stabilize and revitalize neighborhoods and protect them from flooding.

Recovery Functions

- Infrastructure Strategies

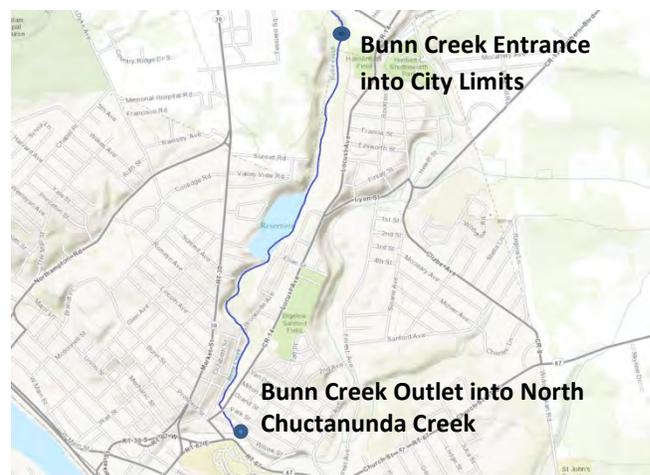
Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: Bunn Creek originates in Fulton County and flows in a southerly direction towards the City of Amsterdam. The Creek enters the City limits near the intersection of Valley View Road, Highland Road, and Zanella Road, dividing the City until it joins with North Chuctanunda Creek near the intersection of Prospect Street and Locust Avenue. As a result of Hurricane Irene and Tropical Storm Lee, there has been significant erosion of the creek’s natural stream banks, as well as damage to various parts of the retaining walls along the creek. Damages to private properties and public infrastructure were reported following the storms.



Map: Project Location City of Amsterdam.

This project involves the inspection of 1.7 miles of Bunn Creek to determine which areas are most at risk for future damages due to erosion, slope or retaining wall failures, and flooding. This project includes the implementation of necessary repairs (streambed and bank stabilization and/or retaining wall rehabilitation) to manage erosion and structural integrity and create a more flood resilient environment.

Detailed inspection and assessment of the creek’s streambed, banks, and concrete and stone retaining walls will determine the extent of any damage, and will assist in the development of required repairs in order to create a more flood resilient environment for the City. Retaining walls line Bunn Creek a total of approximately 1.5 miles (3/4 a mile on either side). The retaining walls consist of both cast-in-place concrete and laid up stone, ranging in height from 4 to 8 feet. The retaining walls are segmented along the length of the creek and may sometimes be present on one side or the other. The remaining length of the creek consists of natural stream banks that are mostly vegetated slopes.

For the purposes of preliminary cost estimation, it has been assumed that at least third of the creek length will need the bedrock streambed cleared of displaced rock and that stabilization will be needed for approximately a quarter of the stream bank length. This work is as follows:



IV. Proposed and Featured project profiles

- Rock debris clearing of approximately 3,000-feet of the creek’s bedrock streambed
- Repairs of approximately 2,650-feet of the creek’s vegetated stream banks (includes both sides)
- Low-level repairs of approximately 2,000-feet of concrete and stone retaining walls, consisting of an average of 6-feet high from footing to the top of the wall (includes both sides)

Risk Reduction: Currently, the residences, businesses, and roadways located along both sides of the creek are threatened with potential flooding and bank erosion. Residential properties most at risk will include those closer to the center of the City, as properties sit closer to the creek, and those situated along a channel bend or culvert where the creek crosses under a roadway. Stabilization of the creek banks will help prevent future damages and risks to homes, businesses and infrastructure. A result of the inspections will be the development of targeted repairs to address the areas of most concern.

Social and Health Benefits: Projects developed out of the assessment will potentially protect a number of residences and businesses situated along the creek, including the City’s drinking water treatment facility, an asset that was found to be at moderate risk. Water, sewer, and storm infrastructure in the selected project areas will also be protected, resulting in continuity of essential services to the Community.

Environmental Benefits: Stabilizing the stream banks will prevent against future erosion and loss of land, and reduce the risk of slope instability. For much of its length Bunn Creek’s buffers are largely intact and vegetated. Projects developed out of the assessment should aim to keep those buffers intact and reduce further encroachment in order to maintain water quality and habitat.

Economic Benefits: Protecting assets along the creek will mitigate future damages to homes, businesses and infrastructure. This will save private property owners, insurers, and taxpayers from paying for costly repairs.

Cost Benefit Analysis: Repairs identified are expected to have a variety of benefits depending on location, including protection of residences, businesses, and public property, protection of water, sewer, and storm infrastructure, protection of road crossings, and the overall mitigation of risk from flooding and erosion along the entire creek channel. **This project is estimated to cost \$705,000.**

Implementation Strategy

Timeframe

Anticipated completion date: approximately 15 months after the start date

Regulatory Requirements

NYSDEC Protection of Waters permit, USACE Section 404 permit or general permit (for less than 500 linear feet of work)



Streambed and Retaining Wall Inspection and Repair North Chuctanunda Creek

Project Type: Proposed

Strategies

- Stabilize and revitalize neighborhoods and protect them from flooding.

Recovery Functions

- Infrastructure Strategies

Location

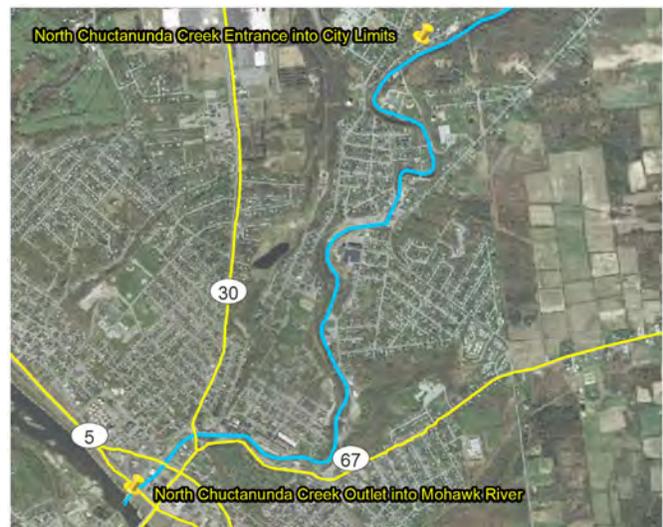
- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: North Chuctanunda Creek flows from Harrower Pond, where it enters the City limits, dividing the City until it outlets into the Mohawk River near the intersection of State Routes 5 and 30. As a result of major storms Hurricane Irene and Tropical Storm Lee, there has been significant erosion of the creek’s natural stream banks, as well as damage to various parts of the retaining walls along the creek.

This project will inspect 3.4 miles of North Chuctanunda Creek and determine which areas are most at risk for future damages due to erosion, slope or retaining wall failures, and flooding.



Detailed inspection and assessment of the creek’s streambed, banks, and concrete and stone retaining walls along the creek will determine the extent of any damage, and assist in the development of required repairs in order to create a more flood resilient environment for the City. Retaining walls line a total of approximately 1.5 miles. This distance accounts for both sides of the Creek’s stream banks. The retaining walls consist of both cast-in-place concrete and laid up stone, ranging in height from 10 to 15 feet. The retaining walls are segmented along the length of the creek and may sometimes be present on one side or the other. The remaining 2.7-miles consist of natural stream banks that are mostly vegetated slopes. The entire creek’s streambed typically consists of exposed bedrock. For the purposes of this feasibility study and for the creek within City limits, it has been assumed that at least a third of the creek length will need the bedrock streambed cleared of displaced rock debris and stabilization of the natural stream banks, and a quarter of the retaining wall length will need low-level repairs, as follows:

- Rock debris clearing of approximately 6,000-feet of the creek’s bedrock streambed
- Repair of approximately 7,000-feet of the creek’s vegetated stream banks (includes both sides)



IV. Proposed and Featured project profiles

- Low-level repairs of approximately 2,000-feet of concrete and stone retaining walls, consisting of an average of 13-feet high from footing to the top of the wall (includes both sides)

Risk Reduction: Residential properties most at risk will include those closer to the center of the City, as properties sit closer to the creek, and those situated along a channel bend or culvert where the creek crosses under a roadway. A result of the inspections will be the development of targeted projects to address the areas of most concern.

Social and Health Benefits: Projects developed out of the assessment will potentially protect a number of residences and businesses situated along the creek, including the City's drinking water treatment facility, an asset that was found to have moderate risk using the risk assessment tool. Water, sewer, and storm infrastructure in the selected project areas will also be protected, resulting in continuity of essential services to the Community.

Environmental Benefits: Stabilizing the stream banks will prevent against future erosion and loss of land, and reduce the risk of slope instability. Residential and industrial are the primary land uses that surround the creek, and in many places stream buffers have been impacted. Projects developed out of the assessment should aim to keep existing buffers intact and reduce further encroachment in order to maintain water quality and habitat.

Economic Benefits: Protecting assets along the creek will mitigate future damages to homes, businesses and infrastructure. This project will also save private property owners, insurers, and taxpayers from paying for costly repairs due to future flooding.

Cost Benefit Analysis: Repairs identified are expected to have a variety of benefits depending on location, including protection of residences, businesses, and public property, protection of water, sewer, and storm infrastructure, protection of road crossings, and the overall mitigation of risk from flooding and erosion along the entire creek channel. **This project is estimated to cost \$815,000.**

Implementation Strategy

Timeframe

Anticipated completion date: approximately 18 months after the start date

Regulatory Requirements

NYSDEC Protection of Waters permit, USACE Section 404 permit or general permit (for less than 500 linear feet of work)



Remove the Old Brookside Reservoir Dam and Repair Bunn Creek Bypass

Project Type: Proposed

Strategies

- Stabilize and revitalize neighborhoods and protect them from flooding

Recovery Functions

- Infrastructure Strategies
- Natural and Cultural Resource Strategies

Location

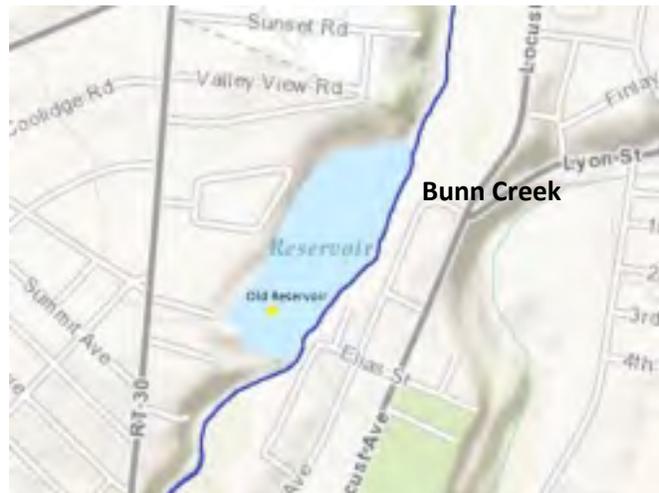
- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: Bunn Creek flows in a southerly direction and enters the City limits near the intersection of Valley View Road, Highland Road, and Zanella Road and bypasses the Old Reservoir and dam near 250 Brookside Avenue. Bunn Creek then continues flowing south until it joins North Chuctanunda Creek near the intersection of Prospect Street and Locust Avenue.

Hurricane Irene and Tropical Storm Lee flooded the Old Reservoir and the area north of it causing severe erosion and damage to the Bunn Creek Bypass. It also impacted the area around the drinking water storage tank. The Reservoir is no longer used as a surface water supply by the City, and due to the age of the earthen dam, it has been classified as a high hazard dam by the New York State Department of Environmental Conservation (NYSDEC).



Project Location at Brookside Reservoir

In order to mitigate flooding in the area, eliminate the danger of an earthen dam failure, and improve the resiliency of the Bunn Creek Bypass, the project proposes to:

- Lower or remove the earthen embankment of the dam to eliminate stormwater storage capability
- Re-grade the spoil from the earthen dam into the abandoned reservoir area and slope the area to drain to Bunn Creek, as well as create a useful municipal open space
- Repair, rehabilitate, and stabilize the stream channel and banks for Bunn Creek Bypass in the area of the Old Reservoir



IV. Proposed and Featured project profiles

Risk Reduction: This project will remove the risks associated with the presence of this obsolete NYSDEC high hazard dam, which include the potential catastrophic flooding of downstream residences, businesses, and roads should a failure occur. The project will also stabilize creek banks in the vicinity of the reservoir, protecting approximately 14 homes along the creek and reducing erosion occurring next to the City's water storage tower.

Social and Health Benefits: The surrounding neighborhood will benefit from the conversion of the old reservoir into usable recreational land. Residents will be free of the concerns associated with a potential dam failure. The reduced risk will also lessen concerns for local emergency responders.

Environmental Benefits: Rehabilitation to the Bunn Creek bypass channel will restore habitat, stabilize creek banks, and reduce erosion concerns in the area of the Old Reservoir. It will also reestablish natural drainage pathways in the area which had been historically diverted away from Bunn Creek to supply the reservoir.

Economic Benefits: This project will eliminate the risk of catastrophic impacts to residences, businesses, roads, and infrastructure due to failure of the existing earthen dam. It will also save from potential costs associated with loss of life in the event of a dam failure. The project will reduce the long terms costs for the City to maintain and inspect the dam, and the costs of complying with NYSDEC stormwater reporting requirements at this location. It will prevent further erosion around the City's water storage tank, and reduce the cost of future repairs to this infrastructure.

Cost Benefit Analysis: Failure of the dam would cause significant flooding and damage to downstream residents and roadways. By eliminating the dam, the City would mitigate the danger of dam failure, and would also no longer need to comply with reporting requirements to the NYSDEC since storage of stormwater behind the dam would be eliminated. Currently, the residences and water storage tank located near the reservoir are threatened with possible flooding and soil erosion, which has been reported to have occurred in the past exposing local residents to potential harm. **This project is estimated to cost \$1,250,000.** The benefits of this project and reduction in risk to the surrounding neighborhood will exceed the cost of the work.

Implementation Strategy

Timeframe

Anticipated completion date: approximately 18 months after the start date

Regulatory Requirements

NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, NYSDEC Protection of Waters permit, USACE Section 404 permit or general permit (for less than 500 linear feet of work), USACE permit for dam removal. The project will require review for applicability of SEQRA under Part 617 of the NYS Environmental Conservation Law.



Stormwater System Installation at Guy Park Avenue between State Route 5 and Steadwell Avenue

Project Type: Proposed

Strategies

- Mitigate damage to transportation corridors and infrastructure.

Recovery Functions

- Infrastructure Strategies

Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: Approximately 1,800-feet along Guy Park Avenue from State Route 5 to Steadwell Avenue in the City of Amsterdam was flooded during Hurricane Irene and Tropical Storm Lee. Two of the Community's severe risk assets, St. Mary's Hospital and Montgomery County Community Services, and two high risk assets, the Montgomery County Office of the Aging and the Amsterdam Amtrak Station, are located in this area. Additionally, residences and businesses along Guy Park Avenue are threatened with flooding and the potential for damage to buildings and homes.



Project Location on Guy Park Avenue.

This project is to install an underground stormwater conveyance system along Guy Park Avenue in order to attenuate flooding. The stormwater system will outlet into Dove Creek, where it crosses Guy Park Avenue between Merrit Street and Steadwell Avenue.

To mitigate flooding on Guy Park Avenue, the project will include:

- 1,850 linear feet of 24-inch reinforced concrete pipe (RCP)
- 6 cleanouts
- 4 storm drain inlets/catch basins
- 1 concrete headwall with wingwalls, medium stone riprap apron, and creek rehabilitation extending 50-feet from the headwall at both the upstream and downstream ends

Project activities will be coordinated with the proposed project to repair the Dove Creek retaining wall.



IV. Proposed and Featured project profiles

Risk Reduction: This project will install stormwater conveyance infrastructure in the City's west end, reducing flooding in the vicinity of two severe risk and two high risk Community Assets. Benefits will be most realized by St. Mary's Hospital, Montgomery County Community Services, the Resource Center for Independent Living, and by approximately 25 residences in the project area.

Social and Health Benefits: Protection of St. Mary's hospital facilities is of crucial importance to the Community, which relies on access to the essential medical services that St. Mary's provides. In addition, this project will protect two high risk social services assets, Montgomery County Community Services, and the Resource Center for Independent Living. Loss of any of these three assets will have serious adverse impacts to the Community.

Economic Benefits: This project will prevent significant economic losses that could result from repairs and reconstruction of hospital infrastructure, the temporary loss or relocation of health care jobs, and lost revenue to the hospital while repairs are made. This project will also save private property owners, insurers, and taxpayers from paying for costly repairs due to damages from future flooding.

Cost Benefit Analysis: **The estimated project cost is \$925,000.** The benefits to both essential Community Assets and the protection of residences well outweigh the cost of the project.

Implementation Strategy

Timeframe

Anticipated completion date: approximately 12 months after the start date

Regulatory Requirements

NYS DOT roadway permits, NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, NYSDEC Protection of Waters permit, USACE Section 404 permit or general permit (less than 500 linear feet of work).



City of Amsterdam – Featured Projects



IV. Proposed and Featured project profiles

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Amsterdam Riverwalk

Project Type: Featured

Strategies

- Augment natural and cultural resources for flood resiliency

Recovery Functions

- Natural and Cultural Resource Strategies
- Economic Development Strategies

Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam
- Montgomery County

Project Description: This project involves the construction of shoreline resiliency improvements for 1,200 linear feet of the northern bank of the Mohawk River. Flood damage from Hurricane Irene compromised the integrity of the shoreline.

The shoreline resiliency improvements will contribute to a proposed 1.2 mile-long walkway, locally called Riverwalk, within the City of Amsterdam along the north bank of the Mohawk River. When built, the Riverwalk will tie in to an existing system of greenways, trails, and cultural/historic sites that will attract visitors and enhance the protection of structures along the Mohawk River by creating a flood buffer.



The City's north bank waterfront was severely flooded during Hurricane Irene, Amsterdam, NY.
Source: City of Amsterdam

Riverwalk will begin at Riverlink Park in the city center, follow the Mohawk through the Mohawk Valley Gateway Overlook landing, and continue to Guy Park Manor, a historic site currently closed to the public due to extensive damage it suffered from Hurricane Irene. The river itself is only a few feet lower in elevation near the west end of the corridor but steeply drops off moving east, creating a very narrow shoreline embankment in some areas. Damage to the shoreline is evident in areas where erosion is clearly visible including failing slopes and an exposed culvert at a storm water outfall. The shoreline resiliency improvements will take place just west of the Route 30 Bridge.

The scope of this project includes only the shoreline resiliency improvements. The shoreline conditions vary, depending on the exposure to scouring, grade and existing protective measures in place.

Risk Reduction: Riverbank stabilization provides a flexible solution to some of the flood damage in the City of Amsterdam. It will help decrease the amount of erosion along the banks of Mohawk and provide



IV. Proposed and Featured project profiles

increased structural stability for adjacent infrastructure. If carried out in the context of enhancing the character of the area, riverbank stabilization will help increase the aesthetic appeal of the river, leading to recreational and tourist opportunities that will support local economic development.

Social and Health Benefits: The Riverwalk project will create increased recreational activities by tying the existing system to cultural/historical sites through the proposed walkway. This type of recreational opportunity will bring residents to the city center and provide a safe and attractive location to walk or ride bicycles. The setting along the Mohawk River provides the added benefit of exposure to the water and waterfront activities. It will also tie into the new Mohawk Valley Gateway Overlook (MVGO) pedestrian bridge providing cultural and historic education benefits. This project in conjunction with other planned projects will increase the recreational opportunities and link the historic features of the City of Amsterdam, thus enhancing it as a destination for tourists. Tying this walkway into the existing system of greenways, trail systems, and cultural and historical sites will create a mixed urban and green environment that is attractive to visitors, residents, and businesses.



Project Location Amsterdam Riverwalk.

Environmental Benefits: The Riverwalk project will create needed and usable open space in the downtown waterfront area. It will contribute to regional environmental efforts through the construction of significant stream bank stabilization measures that will prevent erosion/sedimentation from minor to major flood events.

Economic Benefits: The Riverwalk has great potential to create an active recreational presence for Downtown Amsterdam and the Mohawk Valley at large. Most of the existing lands are owned municipally or by public utilities that

have a demonstrated public benefit interest. There will need to be flexibility for design of the trail, especially where shoreline stabilization is required, as well as creation of amenities. Creating a mixed urban and green space with a waterfront multi-use trail constructed above the floodplain will invigorate the local economy through the creation of an attractive environment for visitors, residents and businesses.

Cost Benefit Analysis: The project will provide measures to stabilize the riverbank and offer stormwater retention and other control measures along the raised walkway. **This project is estimated to cost \$700,000.** The benefits associated with building the shoreline resiliency features of this project exceed the cost of construction because it will protect the steep slopes of the shoreline from further erosion. When complete, the Riverwalk will provide tourism dollars to the local economy, and improve the quality of life for residents.



Implementation Strategy

Timeframe

Anticipated completion date: approximately 18 months from start date

Regulatory Requirements

NYS DOT roadway permits, NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, NYSDEC Protection of Waters permit, USACE Section 10 and 404 permits. Will require review for applicability of SEQRA under Part 617 of the NYS Environmental Conservation Law.

If work will be performed at Guy Manor Park, a permit may be required by the NYS Historic Preservation Office (also known as the NYS Office of Parks, Recreation, and Historic Preservation).

Potential Alternate Funding Sources

Local Waterfront Revitalization Program, NYS OPRHP Recreational Trails Program



IV. Proposed and Featured project profiles

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Waterfront Heritage Area

Project Type: Featured

Strategies

- Augment natural and cultural resources for flood resiliency.

Recovery Functions

- Infrastructure Strategies
- Natural and Cultural Resources
- Economic Development

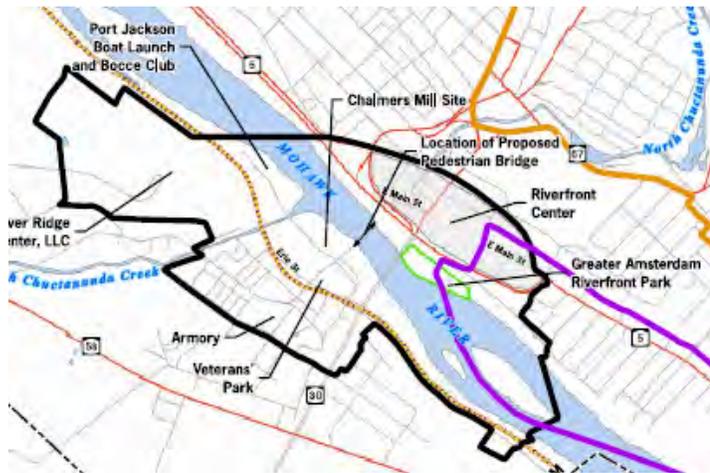
Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: This project will provide a design for permeable parkland in the City of Amsterdam’s Waterfront Heritage Area. The parkland is intended to serve as a vegetated buffer along the north and south sides of the City, where significant flooding occurred during Hurricane Irene. It will also incorporate other flood mitigation measures into the design of parking areas and open spaces. This project will support recreational opportunities within the project area, also benefiting low to moderate income populations.



The City’s Waterfront Heritage Area is illustrated in black outline.

Source: Draft Pre-Nomination Report, NYS BOA Program, Saratoga Associates, August 2013

The Waterfront Heritage Area is along the north and south banks of the Mohawk River. On the south side, the project area is in the vicinity of Bridge Street on former industrial land. On the north side, the area is along the waterfront and Main Street.

This project is in Step 2 of the Brownfield Opportunity Area program. Design of the Waterfront Heritage Area and construction of a City park are included in the cost estimate for this project. By its eventual connection with the Mohawk Valley Gateway Overlook and the Amsterdam Riverwalk, it is expected that the Waterfront Heritage Area will attract visitors and residents to the area to recreate, socialize, and shop.

Risk Reduction and Cost Benefit Analysis: The project will reduce flooding from both stormwater runoff and from the Mohawk River by providing increased permeable surface area, green infrastructure, and structural measures such as a protective berm that will offer stormwater and flood protection for new



IV. Proposed and Featured project profiles

development planned for this area. Flood mitigation measures and open spaces will ultimately serve to protect the residential and commercial property owners within the planned project area. This is a critical element to attract developers to the site and to give confidence that future flooding in this area will be adequately managed.

Social and Health Benefits: This project will help combine a mixed-use urban redevelopment with a number of currently planned public recreational resources such as the Amsterdam Riverwalk and the MVGO pedestrian bridge. It will provide much need recreational assets and waterfront access to the City's south side residents, and continue the initiative to connect the north side of the City with its waterfront.

Environmental Benefits: Flood protection of the waterfront assets of the south side will provide green space and flood buffer capacity in a former industrial area of the City. It will also increase habitat for birds and other wildlife along the river. Proposed berms will protect stream banks from erosion.

Economic Benefits: Creating a mixed urban and green space environment will invigorate the local economy through the creation of an attractive environment for visitors, residents and businesses. Redeveloping this site with integrated flood mitigation and green infrastructure measures will provide a successful example enable to future developers and other potential urban renewal sites in the City. Protecting assets through the riverbank stabilization will reduce flooding losses, saving taxpayers money.

Cost Benefit Analysis: This area is a significant component to the development of the Amsterdam waterfront and is an integral component of the pedestrian bridge that is nearly under construction. The benefits associated with building these green infrastructure measures will enable future developers to see how the area could be developed without flooding issues. **This project is estimated to cost \$400,000.** The benefits related to this exceed the cost of construction and maintenance because it will improve resiliency to future flooding and provide future revenues to the local economy through economic development initiatives.

Implementation Strategy

Timeframe

Anticipated completion date: approximately one year from project start

Regulatory Requirements

None at this time. Project design should consider: Local building codes, NYSDOT roadway permit requirements, NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, NYSDEC Protection of Waters permit, USACE Section 10 and 404 permits. The project will require review for applicability of SEQRA under Part 617 of the NYS Environmental Conservation Law.

Potential Alternate Funding Sources

Local Waterfront Revitalization Program



South Side Medical Support

Project Type: Featured

Strategies

- Maintain essential medical services to all populations during an emergency event

Recovery Functions

- Community Planning and Capacity Building
- Health and Social Services

Location

- City of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: St. Mary’s is the only hospital in the Community, and it is located on the north side of the Mohawk River. When bridges become impassable due to flooding, there is no access to medical services for those on the south side. The project will establish pre-positioned emergency medical resources on the south side of the river to support sheltering operations and urgent medical needs.



Availability of medical services on the south side of the Mohawk River is a Community need.

This project will provide St. Mary’s Hospital with two medical trailers and one truck to be deployed at locations south of the Mohawk River.

Outside of the scope of this project, the trailers will need to be supplied with basic medical equipment and disposable emergency supplies. Additional caches of disposable emergency medical supplies and sheltering-in-place resources should be provided to the Town of Florida Volunteer Fire Department and the Fort Hunter Engine and Hose Company, both located on the south side of the Mohawk River.

Locations for two medical trailers will be selected based on their accessibility during a storm (higher elevation, routes that will not flood), and on proximity to existing emergency response services.

Risk Reduction: This project is expected to increase community planning and capacity building capabilities, better preparing emergency responders, municipal leaders, and residents for future storm events. This project is not intended to directly reduce the flood risk of physical assets.

Social and Health Benefits: The project will provide medical facilities in a safe location for residents on the south side of the Mohawk River, who could be without these essential services if bridge closures occur. It will respond to the community need that was identified from the recent storms.



IV. Proposed and Featured project profiles

Economic Benefits: Providing needed medical facilities in a safe location on the south side will reduce costs and risks associated with unsafe travel by emergency responders and patients, and potential costs associated with the use of outside ambulance corps and medical facilities.

Cost Benefit Analysis: This project is expected to assist with capacity building, increase community planning capabilities, and better prepare emergency responders and health care facilities for storm events. This project is not intended to directly reduce the flood risk of physical assets. **This project is estimated to cost \$120,000.** The benefit to residents having available medical services on the City's south side well outweighs the cost of this project.

Implementation Strategy

Timeframe

Anticipated completion date: approximately 6 months from project start.

Regulatory Requirements

None anticipated



Town of Amsterdam – Proposed Projects



IV. Proposed and Featured project profiles

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Establish an Emergency Shelter at Amsterdam Town Hall and Amsterdam High School

Project Type: Proposed

Strategies

- Improve emergency response through community-wide coordination and positioning of critical resources and services

Recovery Functions

- Community Planning and Capacity Building

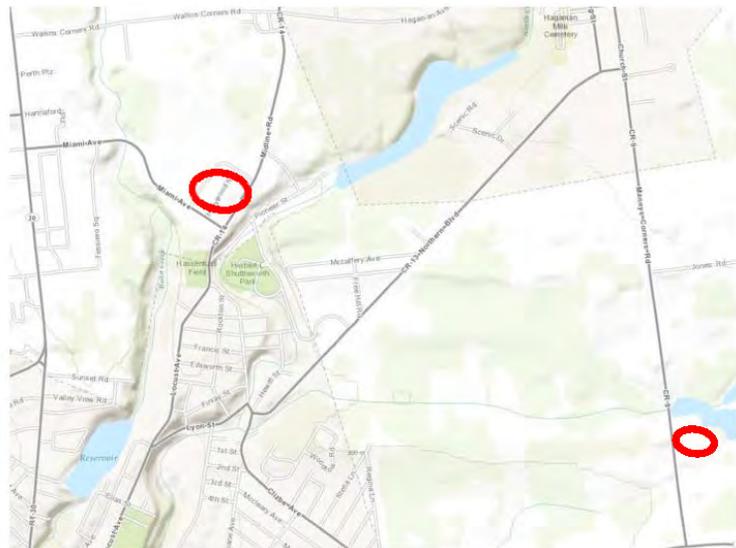
Recovery Functions

- Town of Amsterdam

Jurisdiction

- Town of Amsterdam

Project Description: The Town of Amsterdam requires additional formal sheltering operations to support residents during storms. Hurricane Irene and Tropical Storm Lee showed that the current arrangements were inadequate for the needs of the community. These locations need to be made resilient for a flood event by assuring they have backup power supplies. In addition, it is important that shelters in the Town accommodate elderly and other vulnerable populations during storm events.



Project Location: Amsterdam Town Hall and Amsterdam High School Emergency Shelters.

Two locations have been identified as appropriate shelters: Amsterdam High School and Amsterdam Town Hall. The Town and the Greater Amsterdam School District both support this initiative and are willing to enter into a Memorandum of Understanding (MOU) for the use of the school as an emergency shelter. The sites were identified as potential shelters because they have suitable, accessible premises, so no structural changes are required. But emergency shelters should have reliable power, and neither is currently equipped with a generator. The project includes the permanent installation of a 200kW back-up generator at each facility in order to provide a consistent source of power during an outage. A fuel supply tank will also be provided with capacity to operate the generator for up to one week.

This project is expected to increase community planning and build capacity, while improving the Town's ability to serve vulnerable populations.



IV. Proposed and Featured project profiles

Risk Reduction: This project is expected to assist with capacity building, increase community planning capabilities, and better prepare emergency responders, municipal leaders, and residents for storm events. This project will increase the Town's ability to serve vulnerable populations. This project is not intended to directly reduce the flood risk of physical assets.

Social and Health Benefits: The project will provide a safe location for residents that are under threat of evacuation from flooding and other disasters. It will respond to the community need that was identified during and after the recent storms.

Economic Benefits: Providing a safe haven for at risk residents will reduce the risk of lost work days and productivity due to homelessness and illness. People in shelters have the opportunity to identify their alternatives and optimize their outcome. Access to human resources will help organize their situation and receive appropriate resources to address their issues.

Cost Benefit Analysis: The project is expected to increase community planning and building capacity, while improving the Town's ability to serve vulnerable populations. This project will provide access to emergency shelter to Town residents in two locations, increasing the Town's capacity to provide shelter and reducing the likelihood that residents will be unable to reach shelter locations due to flooded roadways. **This project is estimated to cost \$300,000.**

Implementation Strategy

Timeframe

Anticipated completion date: 6 months from start of project

Regulatory Requirements

Municipal building permits, Coordination with Montgomery County Emergency Management and NYSDOH



Floodplain Buffers, Bikeway, and Dam Rehabilitation along Chuctanunda Creek

Project Type: Proposed

Strategies

- Augment natural and cultural resources for flood resiliency

Recovery Functions

- Infrastructure Strategies
- Natural and Cultural Resources Strategies

Location

- Town of Amsterdam

Jurisdiction

- Town of Amsterdam

Project Description: Flood waters eroded creek banks and damaged property in the Town of Amsterdam, washing away many roads. Portions of the existing stormwater management system became clogged with debris and, therefore, did not function during the storm events, exacerbating local flooding. The main objectives of this project are to: establish whether it would be feasible to rehabilitate Harrower Dam; create a bikeway along Chuctanunda Creek; and, create floodplain buffer areas upstream of the dam and within Harrower Pond.



Project Location Floodplain Buffers, Bikeway, and Dam Rehabilitation along Chuctanunda Creek.

Harrower Dam is located at the southern end of Harrower Pond which is an impoundment of the Chuctanunda Creek. The dam is a 25-foot-high structure and contains a 175-foot-long earth embankment, a 77-foot-long and 8-foot-thick spillway (assumed to be a gravity concrete structure). The area immediately upstream from the spillway is filled with accumulated sediment and the remnants of a timber crib dam. In 1980, NYSDEC declared Harrower Dam unsafe. According to a March 2013 DEC Record of Decision for this former industrial site, the dam spillway was lowered as a safety measure, decreasing the size and volume of Harrower Pond. Based on an initial evaluation of the published information on dam safety, complete replacement of the dam would be necessary if it were to be used for stormwater retention and as a floodplain buffer.

The proposed project will assess the feasibility for rehabilitation of Harrower Dam. The actual rehabilitation of the dam would have to be accomplished as a separate project and is not within the scope of the NYRCR Program.



IV. Proposed and featured project profiles

The NYRCR project would also include bank stabilization as part of creating a 3.4-mile loop bikeway along one bank of the Chuctanunda Creek. The bikeway could consist of a large loop, or along one side of the creek, with some fitness, fishing, and picnic areas, as well as other public service facilities. Crossings from one side of the creek to the other by small bridges would be a feasible element but are considered to be too expensive for inclusion. The final component of this project will be the creation of vegetated floodplain buffer areas upstream of the dam and within Harrower Pond.

Implementation Schedule

Once planning and studies are completed, in approximately one year, and if the assumptions considered in the preparation of the cost estimate are met, the construction of the bikeway may take up to one additional year. Thus implementation of this project is considered intermediate (between 2 to 3 years).

For infrastructure projects, seasonal constraints must be considered during construction. There is no defined wet or dry season in Upstate New York and the region reports a fairly uniform distribution of precipitation during the year. The winter season, with cold temperatures, produces abundant snowfall and subsequent spring runoff from snow melt, which can hamper construction activities. Work can typically be performed during the summer and fall seasons as long as low flows create optimum conditions.

Feasibility Issues

The major constraint identified for the feasibility of the dam rehabilitation portion of this project is related to detailed existing condition studies. It will be necessary to complete detailed analyses and studies that evaluate the best alternative for the dam rehabilitation, a detailed study to evaluate the use of turbines for power generations, and runoff determinations for stormwater retention capability. The major constraints that have been identified for construction of the bikeway and floodplain buffer areas are related to property ownership and design. First, siting the much needed buffer areas will have to be performed. Second, the lack of available technical information has implications for the design, since general assumptions have to be made to provide a preliminary estimate of effort, quantity and cost.

This preliminary feasibility study would be prepared under the following assumptions:

- All of the areas of interest are located within public right-of-way or public easements; or the land required can be obtained at reasonable cost.
- The existing dam site is privately owned and could be purchased at a reasonable cost.
- NYS DEC has noted that dam construction should be approved only when necessary.
- Re-establishment of a small hydroelectric facility at the dam is possible but is likely not economically feasible.
- Rehabilitation of the dam is unlikely but further investigations on feasibility are necessary
- Construction of retaining walls along the creek to protect properties built in the flood zone next to the creek banks were not considered due to insufficient information available.



Risk Reduction and Cost Benefit Analysis:

This project reduces risk by improving floodplain buffers and retention capacity for stormwater runoff in the area. The project will provide physical protection from flooding to the recreational resources in the surrounding park and the homes and businesses in the immediate area. Implementation of the dam study's recommendations could also reduce risk of dam failure.



Harrower Pond Dam at Chuctanunda Creek. Source: Ecology and Environment, Inc.

Social and Health Benefits: The project will fulfill a substantial need to provide recreational resources to residents. It will create increased recreational activities by constructing the proposed bikeway and providing an area for fishing and other related water activities. The bikeway will have the potential to connect to other town, city and regional bicycle and pedestrian networks thereby increasing the potential for use to all residents.

The bikeway will have the potential to connect to other town, city and regional bicycle and pedestrian networks thereby increasing the potential for use to all residents.

Environmental Benefits: Creating floodplain buffer areas will mitigate flooding. It will provide environmental benefits by retaining and infiltrating stormwater thereby minimizing the potential for erosion and the transport of pollutants from stormwater runoff. It will also minimize public and private property damage in this area due to flooding. New habitat for fish and wildlife will be created by redeveloping the ponded area.

Economic Benefits: Protecting the dam asset would reduce or eliminate future losses from flood damage and lower maintenance costs associated with the dam. Rehabilitating the dam would allow for possible provision of power for the Town's parks and other facilities near the dam. This may provide additional revenues for the town or reduce the Town's power bills. Shuttleworth Park, home of the Triple A Mohawks, and a local economic attraction, will become more accessible to residents and visitors due to the creation of the bikeway.

Cost Benefit Analysis: This project is estimated to cost \$1,500,000. It will prevent future environmental, infrastructure and real property damage in this community and potentially create an attractive water feature in the park. It will contribute to flood management and create a multi-use trail which will benefit the health of the Town residents. The costs to rehabilitate the dam are beyond the scope of the NYRCR Program.



IV. Proposed and featured project profiles

Implementation Strategy

Timeframe

Anticipated completion date: approximately two years

Regulatory Requirements

U.S. Environmental Protection Agency (USEPA), U.S. Corps of Engineers (USACE), NYSDEC, and U.S. Fish and Wildlife Service. The project will require review for applicability of SEQRA under Part 617 of the NYS Environmental Conservation Law. Federal Energy Regulatory Commission (FERC) approval may be required.



Enhance Stormwater Conveyance Systems on Crouse Drive, Maple Street, Midline Road, and Wallins Corners Road to Bunn Creek

Project Type: Proposed

Strategies

- Improve drainage in key areas known to flood

Recovery Functions

- Infrastructure Strategies
- Natural and Cultural Resources Strategies

Location

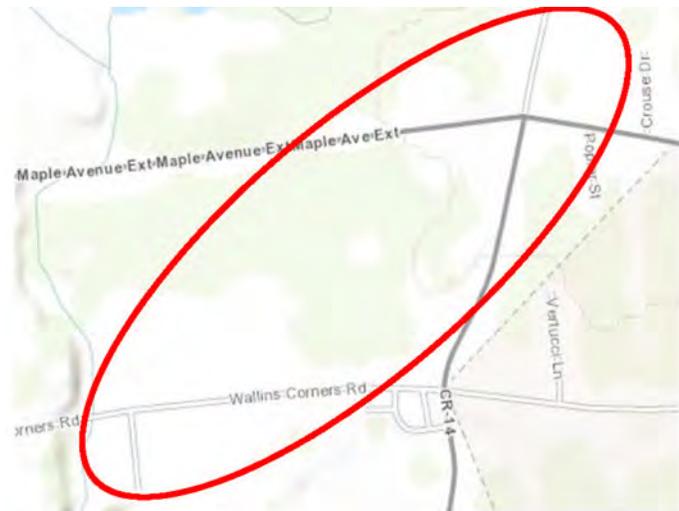
- Town of Amsterdam

Jurisdiction

- Town of Amsterdam

Project Description: Stormwater conveyance problems have been reported along Crouse Drive, Maple Avenue, Midline Road, and Wallins Corners Road. Stormwater runoff follows these roadways, east to west, towards Bunn Creek, which then drains in a southerly direction, joining larger streams, and then to the Mohawk River. This area experienced heavy flooding during Hurricane Irene.

The area of concern for this project is located north of the City of Amsterdam and east of State Route 30 and Bunn Creek, in the Town of Amsterdam.



Project Location Stormwater Conveyance Systems on Crouse Drive, Maple Street, Midline Road, and Wallins Corner Road to Bunn Creek.

Along Maple Avenue, Midline Road, and Wallins Corners Road it appears that roadside swales and ditches drain the roadways, however, in some locations these ditches are too shallow or narrow. There is no proper stormwater conveyance system along Crouse Street, which has very limited space along the roadside edge, taking it difficult to install drainage swales or ditches. It is assumed that the capacity of the culverts underneath the driveways along these streets is insufficient.

Due to the lack of comprehensive stormwater drainage infrastructure within the area of interest, the objective of the proposed project consists of installing a stormwater drain system that would adequately convey runoff to Bunn Creek. To mitigate flooding on Crouse Drive, Maple Avenue, Midline Road, and Wallins Corner Road, the following is recommended:

- Crouse Drive – 1,500 feet of local road drainage swale (includes both sides of road), lined with stone riprap (driveway crossing culverts included in item following); and



IV. Proposed and featured project profiles

- Maple, Midline, and Wallins Corner roads:
 - 13,000 feet of swale and ditch re-grading and/or widening/deepening,
 - 13,000 feet of swale/ditch sodding/seeding,
 - Approximately 2,500-feet of swale rehabilitation with riprap, and
 - Replacement of approximately 50 culverts with larger diameter/cross section at driveways and 4 larger culvert roadway crossings.

After completion of these improvements, the Town should implement an annual maintenance activity schedule, to mow swales and clear swales and culverts to ensure that the conveyance and storage capacity of the stormwater drainage system remains intact and functions properly. Clogged or undersized culverts and drainage swales would likely result in flooding onto adjacent properties and potentially cause overtopping of the roadways they cross or run in parallel.

Risk Reduction: This project is expected to lead to a direct reduction of flood risk to approximately 50 residences, 20 local businesses, and surrounding farmland and other infrastructure that were impacted by Hurricane Irene and Tropical Storm Lee. It would prevent erosion at the crossing of Bunn Creek under Maple Avenue and reduce the potential for damage to local roads from storm flows undercutting the roadway base, and swale overflows. It would stabilize conditions along Maple Avenue during storm events, which is the primary connector between this neighborhood and State Route 30 to the west. It would also improve safety for residents who live in the.

Social and Health Benefits: This project would directly benefit the approximately 50 homes and 20 businesses in the project area, keeping a thriving mixed-use community intact, preventing damage to homes, and maintaining economic and employment opportunities in the Community. Emergency responders will be protected from the risk of driving into unsafe conditions while responding to calls during storm events, as would residents attempting to but unable to evacuate their homes.

Environmental Benefits: Improved conveyance of stormwater would reduce erosion along both local roads and at Bunn Creek outfall locations. The construction of new drainage swales and improvement of existing swales would allow for infiltration and reduce the transport of pollutants from stormwater runoff of parking lots, driveways, and agricultural lands into Bunn Creek. This would protect habitat within the creek and also reduce impacts to the creek channel from erosion and sedimentation.

Economic Benefits: Protecting business assets would maintain employment opportunities within the Community by reducing potential damage to local small businesses, manufacturers, and other facilities. It would reduce the risk of lost work days and income due to closures from flooding, and reduce. A reduction in flood risk to the area also protects agricultural land uses and prevents crop losses. Installing adequate stormwater conveyance would also reduce the potential for damage and repairs necessary to local roads, which may result in unplanned but necessary repairs by the Town, and put undue burden on taxpayers.



Cost Benefit Analysis: This project is estimated to cost **\$900,000**. Investment in this project would benefit the residents and local businesses in this area by reducing loss of business activity and work days from flooding and expensive home repairs. It would also prevent the loss of road infrastructure, and expenses associated with emergency repairs.

Implementation Strategy

Timeframe

Anticipated completion date: one year from start date

Regulatory Requirements

Local, county, and NYSDOT roadway permits, NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity. It may require a NYSDEC Protection of Waters permit and for work along Bunn Creek, or a USACE Section 404 Permit (although the activities are likely covered by a general permit)



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Old Fort Johnson Conditions Assessment

Project Type: Proposed

Strategies

- Protect cultural artifacts, and historic sites and archives from damage and loss.

Recovery Functions

- Natural and Cultural Resource Strategies
- Economic Development Strategies

Locations

- Village of Fort Johnson

Jurisdiction

- Town of Amsterdam

Project Description: Old Fort Johnson currently operates as a museum that highlights the social, cultural, military, and industrial past of the Mohawk Valley. The site is located in the Village of Fort Johnson, at the northwest corner of the intersections of Routes 5 and 67, immediately north of the Mohawk River. Old Fort Johnson is a two-story stone house built in 1749 by Sir William Johnson, Superintendent of Indian Affairs and hero of the Battles of Lake George and Fort Niagara. The house, designated a national historic landmark in 1972, is owned and operated as a museum by the Montgomery County Historical Society. Kayaderosseras Creek runs along the eastern side of Old Fort Johnson, approximately 90-feet away. The creek, which carries water from several tributaries, flows in a southerly direction flowing into the Mohawk River approximately 500 feet downstream. Because of the structure's close proximity to these water bodies, inundations during high storm events have affected the integrity of the structure and damaged the building. The most significant event, occurring with Hurricane Irene and Tropical Storm Lee in 2011, flooded the Fort with 5.5 feet of water, reaching the tops of the mantels on the first floor, tipping its 18th century privy on its side, and flooding the visitor's center with 2 feet of water.



Front entrance at Old Fort Johnson following flooding in August 2011.

Source: The Daily Gazette,
<http://www.dailygazette.com/photos/2011/aug/29/28034/>,

accessed on March 19, 2014.

The preservation of this cultural and historical building not only enriches the local Community, but also acts as a sightseeing location attracting visitors, residents, and businesses. Preservation and maintenance of the Fort can only be successfully implemented after a complete assessment of the building's exterior and interior is performed.



IV. Proposed and featured project profiles

This project consists of a full interior conditions assessment for Old Fort Johnson. A full conditions assessment would provide recommendations to implement rehabilitation that would extend the longevity of the historic Fort. It should be noted that the Preservation League of New York, through their Technical Assistance Grant Program, have awarded a \$2,900 grant to the Montgomery County Historical Society to fund an assessment of the exterior of Old Fort Johnson. However, this amount would not cover the costs of the much needed full conditions assessment.

This project would not require any permits, but, it would require complete access to the building by the Montgomery County Historical Society.

Risk Reduction: The project would recommend methods and strategies to protect the museum displays, furniture and archives from future flood events.

Social and Health Benefits: This project will preserve these cultural and historic resources for future generations. The Museum is an important source of pride for Amsterdam residents and it is significant to be able to preserve the Museum itself as an important cultural resource for both residents and visitors. The Museum is supported by a vibrant group of volunteers which also serves to attract new and retain existing residents to the community.

Environmental Benefits: The project will identify methods for interior protection from future flood events and would therefore prevent mold and other environmental hazards from forming in the interior of the Museum structure.

Economic Benefits: The Old Fort Johnson Museum is a National Historic Landmark that serves as an attractive destination for visitors, residents, and businesses. The Museum is being promoted through New York State's heritage tourism initiative known as *Path Through History*. Preserving this museum would help to invigorate the local economy by maintaining and growing its visitor base.

Cost Benefit Analysis: This project is estimated to cost **\$80,000**. The project will provide recommendations to repair existing interior issues from Irene and Lee flood events and suggest how to reduce the risk of future flood damage to this historic structure and property. The long-term protection of the Museum's assets will far exceed the cost associated with the rehabilitation of items that suffered substantial damage or the replacement of items that were or could be permanently lost.

Implementation Strategy

Timeframe

Anticipated completion date: 3 months after assessment is started

Regulatory Requirements

Access to the building by the Montgomery County Historical Society.



Rebuild Retaining Wall on Kayaderosseras Creek next to Old Fort Johnson

Project Type: Proposed

Strategies

- Protect cultural artifacts, and historic sites and archives from damage and loss.

Recovery Functions

- Natural and Cultural Resource Strategies

Location

- Town of Amsterdam

Jurisdiction

- City of Amsterdam

Project Description: The retaining wall along Kayaderosseras Creek was built to provide erosion control along the stream bank. It has been in disrepair for several years and is no longer providing flood protection. The bank is eroding away and is resulting in bank de-stabilization and downstream sedimentation. The disrepair of this retaining wall had a direct impact on the Old Fort Johnson Museum, which sustained significant interior and exterior damage during Hurricane Irene and Tropical Storm Lee. Inundation during storm events has affected the integrity of the structure and damaged the Museum.



The Old Fort Johnson property was heavily flooded, in part due to the failing retaining wall along Kayaderosseras Creek

The project will evaluate, design and rebuild the retaining wall to stabilize the stream bank and protect Old Fort Johnson from flooding. For the purposes of preliminary cost estimation, it has been assumed that recommendations for the rehabilitation of the retaining wall include the following:

- Replacing 250 linear feet of retaining wall on both sides of the creek, consisting of an approximately 8-foot high reinforced concrete retaining wall, extending from the Route 5 culvert upstream
- Stabilizing creek embankments with riprap, from approximately 200 feet upstream of the end of the new retaining wall to Route 5
- Clearing culverts under Route 5 and the railroad
- Clearing approximately 150 feet of the creek channel from Old Fort Johnson to the Mohawk River



IV. Proposed and featured project profiles

The improvements will stabilize the creek's bank and protect the historical Old Fort Johnson site from flooding.

Risk Reduction: It has been reported that the retaining wall in its current condition is no longer providing bank stabilization and erosion control, thus, the creek's bank is eroding away. Preservation of the Fort can only be successfully implemented after a complete rehabilitation of the creek's retaining wall to ensure the longevity of the historic Fort. The project will protect Old Fort Johnson and five nearby residences from flooding from the Kayaderosseras Creek.

Social and Health Benefits: The project will provide physical protection to Old Fort Johnson building and the museum's displays, furniture and archives from future flood events. This will preserve these cultural and historic resources for future generations. The Museum is an important source of pride for Amsterdam residents and it is significant to be able to preserve the Museum itself as an important cultural resource for both residents and visitors.

Environmental Benefits: The project will re-stabilize the stream bank and therefore reduce sedimentation and provide improved conveyance of stormwater. This will remove a source of sediment from the Kayaderosseras Creek into the Mohawk River. It will protect habitat within the creek and also reduce impacts to the creek channel from erosion and sedimentation.

Economic Benefits: The Old Fort Johnson Museum is a National Historic Landmark that serves as an attractive destination for visitors, residents, and businesses. The Museum is being promoted through New York State's heritage tourism initiative known as *Path Through History*. Preserving this museum will help to invigorate the local economy by maintaining and growing its visitor base.

Cost Benefit Analysis: The project will repair a retaining wall that once served to protect the houses and businesses around it during times of high water. **This project is estimated to cost \$450,000**, which is minimal compared to the cost of repairing and rehabilitating an important historic structure and replacing the artifacts within.

Implementation Strategy

Timeframe

Anticipated completion date: Approximately one year from start of project

Regulatory Requirements

Local building permits, NYSDOT roadway permit, NYSDEC Protection of Waters permit, USACE Section 404 permits (the work may be covered under a general permit).

Additionally, access to the historical property operated by the Montgomery County Historical Society will be necessary.



Town of Amsterdam – Featured Projects



IV. Proposed and featured project profiles

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Sewer Service Extension along Midline Road

Project Type: Featured

Strategies

- Mitigate damage to transportation corridors and infrastructure

Recovery Functions

- Infrastructure Strategies
- Health and Social Strategies

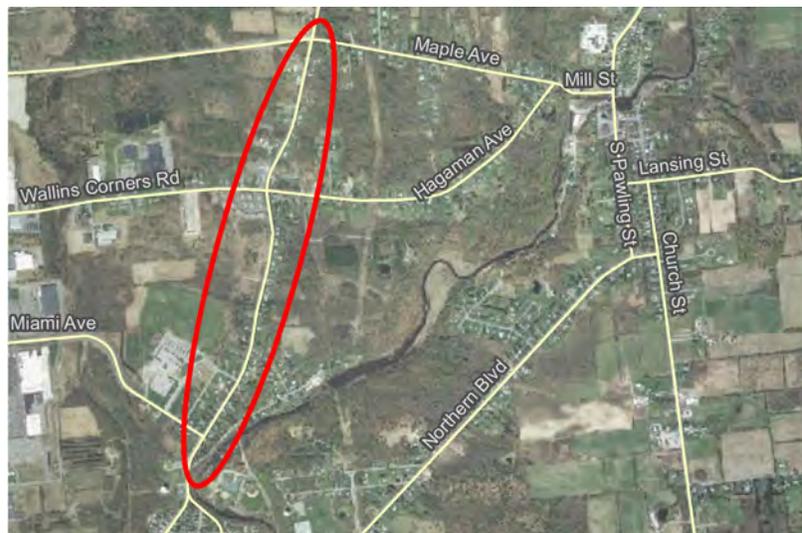
Location

- Town of Amsterdam

Jurisdiction

- Town of Amsterdam
- Montgomery County

Project Description: This project will install sewer along a 1.4 mile segment of Midline Road in the Town of Amsterdam. Installing sewer lines will reduce the vulnerability of groundwater wells in the area. The project is expected to eliminate concerns over groundwater contamination from residential septic leachate during major rainfall events and subsequent high groundwater levels. Expanding the Town’s sewer system will require agreement with the City of Amsterdam who currently accepts and treats the Town’s wastewater.



This project is located on Midline Road, commencing at the intersection with Locust Avenue and Clizbe Avenue, at the Town’s southern boundary with the City of Amsterdam, extending northerly to the intersection with Maple Avenue (State Route 39).

Risk Reduction: The project will protect the quality of potable water for residents and businesses in this area. Flooding will have less potential to cause septic fields to leach and potentially contaminate local wells, creating a public health risk. Since well contamination can ultimately lead to illness and abandonment of property, this risk reduction has a strong cost to benefit ratio.

Social and Health Benefits: The project will reduce the high risk of groundwater and surface contamination to residential human health. It will improve the overall quality of the area and lower the potential for a public health issues. The new bike pedestrian-bicycle path will connect isolated neighborhoods to more dense neighborhoods and commercial business districts.



IV. Proposed and featured project profiles

Environmental Benefits: This project will reduce or eliminate leakage and or overflows from individual septic systems during heavy rainfall and high groundwater. The action will protect groundwater quality and plant and animal habitat in the immediate area.

Economic Benefits: Improving the utility infrastructure will improve the value of the community and reduce recurring maintenance costs for residents and the Town. It will stabilize the neighborhood by retaining residents and businesses and protect the real property tax base. It will encourage infill in areas that were previously thought to be difficult or unbuildable sites. Additional development will increase the tax base.

Cost Benefit Analysis: The area lacks municipal sewer service, with residents and businesses using on-site septic systems. Residents have concerns about potential septic leachate during heavy rainfall and subsequent high groundwater levels. Back-ups and leakages of septic systems into a home or effluent overflow into yards present health concerns, and extensive costs to homeowners and the Town due to testing of systems and repairs. **This project is estimated to cost \$2,500,000.**

Implementation Strategy

Timeframe

Anticipated completion date: 18 months from project start date

Regulatory Requirements

This activity requires permission from the City of Amsterdam who currently received and treats the Town of Amsterdam's wastewater.

Local, county, and NYSDOT roadway permits, NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity. If work takes place in or around streams, it may require a NYSDEC Protection of Waters permit, or a USACE Section 404 Permit (although the activities would likely be covered by a general permit).



Town of Florida – Proposed Projects



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Fort Hunter Stormwater Detention Pond & Schoharie Crossing Drainage Improvements

Project Type: Proposed

Strategies

- Improve drainage in key areas known to flood

Recovery Functions

- Infrastructure Strategies
- Natural and Cultural Resources

Location

- Hamlet of Fort Hunter

Jurisdiction

- Town of Florida

Project Description: The Fort Hunter community was built at the confluence of the Schoharie Creek and Mohawk River, on a peninsula that sits between the east bank of the Schoharie and South bank of the Mohawk. Significant flooding in the hamlet occurred during Hurricane Irene.

Severe flooding that occurred during Hurricane Irene was due to several factors: floodwaters breached the banks of the Schoharie Creek and entered the hamlet, flat local topography left water few places to drain, and the current stormwater drainage channels were blocked with debris and unable to carry water away.

This project proposes to optimize Fort Hunter’s existing stormwater conveyance infrastructure, increase stormwater storage capacity, and divert upland drainage runoff away from the hamlet during flood events.



Two or more stormwater detention ponds are proposed in the northeast section of Fort Hunter. A site evaluation will determine final locations of the ponds.



IV. Proposed and featured project profiles



The Schoharie Crossing Historic Site was heavily damaged by Hurricane Irene.

Six culverts have been identified along the existing canal system which will require replacement due to being undersized. During replacement, material that has filled in and within the drainage ditches will be removed to reestablish drainage capabilities. Additionally, this project proposes to install at least two new storm drainage storage ponds along the northeast side of the hamlet to help alleviate flooding and reroute stormwater runoff around the hamlet. This scope assumes that two sites will

be necessary due to available land area. However one pond could be constructed if the siting process determines a suitable location for one pond. Based on the preliminary hydrologic evaluation, the ponds will provide additional storage for small and medium storm events, up to the 25 year storm, and have the capacity to store approximately 1 foot of water across the hamlet.

In addition to the drainage improvements, several footbridges and interpretative signs will be restored at culvert repair locations within the Schoharie Crossing State Historic Site. This will help restore damage to the Site's facilities and the multi-use trails that were damaged during Hurricane Irene.

Risk Reduction: This project is expected to lead to a direct reduction of flood risk to approximately 50 residences, several hundred acres of farmland, the Fort Hunter Fire Station (a moderate risk Community Asset), and the Schoharie Crossing State Historic Site (high risk Community Asset). It will reduce the potential for damage to local roads from storm flows undercutting the roadway base, and swale overflows particularly along Main Street which is the primary connector between this hamlet and Interstate 90 to the south. It will also improve safety for residents who live in the hamlet, and reduce risk to emergency responders during storm events. .

Social and Health Benefits: The project will provide much needed drainage improvements, while continuing to enhance the cultural and historic heritage of the community. The restoration of multi-use trails also allows visitors traveling along the Erie Canalway Trail or Heritage Corridor to stop and spend some time exploring the unique Erie Canal history that Fort Hunter has to offer. Emergency responders and residents will have a reduced risk of driving into unsafe conditions on local roads.

Environmental Benefits: This project will improve on the existing drainage ditches in the community, enabling improved flow for the existing natural drainage corridors, and directing stormwater away from residential homes. The construction of new drainage ponds will allow for detention of stormwater and reduce the transport of pollutants that results from runoff of parking lots, driveways, and agricultural



lands the Mohawk River. This will protect habitat within the creek and also reduce impacts to the creek channel from erosion and sedimentation.

Economic Benefits: The project is expected to provide protection to residences, saving private property owners and insurers from paying for costly repairs due to damages from future flooding. The project will also protect farmland from inundation, maintaining the local agricultural economic base by preventing crop losses and damage to farm machinery and buildings. In addition, it may reduce damage to local roads, which may result in unplanned but necessary repairs, and put undue burden on taxpayers.

Cost Benefit Analysis: Investment in this project will benefit the residents in the hamlet by reducing losses from substantial destruction of residences or heavily damaged homes. It will benefit farmers by reducing loss of farm land and work days from flooding or crop losses. It will protect the Schoharie Crossing State Historic Site, an important cultural asset to the area, whose facilities were significantly damaged during Irene. It will also prevent the loss of road infrastructure, and expenses associated with emergency repairs by directing runoff into the existing canals and drainage pathways around the hamlet of Fort Hunter. **This project is estimated to cost \$1,850,000.** The additional detention capacity may be able to reduce up to one foot of stormwater that would otherwise flood the hamlet.

Detailed hydrologic information, such as tributary drainage areas and flow rates into each culvert, was not available at the time of this feasibility evaluation. Clarification of exact culvert crossings and existing sizes will need to be determined at the start of the project. For planning purposes, it has been assumed that the existing culverts are approximately 18 inches and will need to be increased to a minimum of 8 foot x 8 foot box culverts. New concrete headwalls and wingwalls, stone riprap aprons, and channel rehabilitation extending 50-feet from the headwalls at both the upstream and downstream ends will also be constructed at each of these crossings. This increase in system conveyance will aide in reducing backups in the drainages and will help mitigate localized flooding. Several areas along the existing canal infrastructure were observed to be filled in with debris (i.e., sediment and dense vegetation), particularly behind the existing culverts. This project also proposes to clean out the canals in these locations as part of the culvert and canal rehabilitation to restore the canals ability to convey stormwater. Annual maintenance of the stormwater infrastructure is recommended to remove debris that results from normal rainfall and flood events which may result in culvert clogging and contribute to the canal fill to ensure proper structure performance.

In addition to evaluating the effects of restoring the existing canal system, a simple hydraulic calculation was conducted to develop a conceptual feasibility evaluation and determine the preliminary sizing of the proposed ponds and associated drainage improvements. The calculation indicated that the proposed storm ponds will increase the stormwater storage capacity within the community and aid in the reduction of flooding within Fort Hunter resulting from runoff flow.

Several locations have been identified as potential storage pond areas, but final siting for each of these ponds will depend on the community's ability to acquire the land and will be based on the results of the design and drainage study that will evaluate local soil types, topography, groundwater table levels, etc.



IV. Proposed and featured project profiles

The proposed system includes construction of one or more stormwater detention ponds, modifications of the site grading, and additional drainage facilities, such as ditches or culverts, that will be utilized to connect the existing drainage ditches and canals with areas that currently are isolated during floods due to localized topography. The storage ponds will require outfall control structures that will discharge runoff to a location along the Mohawk River downstream of the confluence with Schoharie Creek. The combined volume required for the ponds within this drainage area has been estimated as approximately 15 acre-feet in order to provide detention for roughly +/- 1 foot of stormwater generated from the entire community. It is proposed that the new stormwater ponds will be constructed downstream of the existing ditches and canals. It is assumed that the drainage pond will be able to discharge to the Mohawk River using gravity drainage; if this is not the case, a pump station will have to be considered.

Land ownership has been identified as a potential limitation for the construction of the proposed detention areas in the community. Much of the land identified within the proposed pond siting locations would be subject to SHPO requirements and are currently subject to agricultural leases and easements. These siting limitations will need to be considered during the detailed drainage study and design phase of the project.

A detailed hydraulic study, topographic survey of the proposed pond sites, and geotechnical analysis will be required in order to finalize the design of the storage ponds and the pond outlet structures. At a minimum, the 25-year storm should be used for sizing the drainage system (ditches, ponds, and the outfall structures). This study will also identify if additional improvements will be required for the existing drainage ditches beyond replacing culverts and removing debris that has filled in portions of the canals. If land availability becomes an issue, the drainage study will evaluate alternative means to increasing the stormwater storage capacity for Fort Hunter, such as modifying the sinuosity of the existing, non-canal drainage system in order to delay stormwater detention. The drainage study can also be used to evaluate the effects of reconnecting the existing canal system with Schoharie Creek by restoring the connection that is located at the old East Guard Lock just upstream of the town's visitor's center to assess if use of historic canal channels as a diversion channel for Schoharie Creek will help alleviate flooding issues that result from stream overflow during large storm events.

A major portion of the community sits within the floodplain and located at the confluence of two major water bodies, flooding from stream flow will likely continue to contribute to flooding within Fort Hunter even after implementation of the proposed stormwater mitigation project. The best flood protection for this area would be to isolate the community through the use of large berms or floodwalls in order to prevent water flowing to into it. This will not only avoid overflows from Mohawk River and Schoharie Creek but will also prevent backwater affects that result from the downstream area. This type of design will require a drainage retrofit study with good topographic information and historical river flow/stage data, and detailed drainage hydrologic and hydraulic modeling. It is highly recommended that an evaluation of this type be considered in the future; however, scheduling and costs do not reflect extensive study.



Implementation Strategy

Timeframe

Anticipated completion date: Approximately two and a half years from start of the project

Regulatory Requirements

Local, county, and NYSDOT roadway permits, NYSDEC Protection of Waters permit, NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, a United States Army Corps of Engineers section 10 or 404 permit may be required for work in the historic canal or Schoharie Creek. SHPO (State Historic and Preservation Office) permits will also be required. Coordination with Canal Corp will be required. The project will require review for applicability of SEQRA under Part 617 of the NYS Environmental Conservation Law.



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Fort Hunter Berm Stabilization

Project Type: Proposed

Strategies

- Stabilize and revitalize neighborhoods and protect them from flooding.

Recovery Functions

- Infrastructure Strategies

Location

- Town of Florida

Jurisdiction

- Town of Florida

Project Description: The hamlet of Fort Hunter in the Town of Florida was built at the confluence of the Schoharie Creek and Mohawk River. Land in the hamlet is flat, and the area serves as floodplains for the adjacent waterways. An existing protective berm constructed of stone and rip rap lines the Schoharie Creek along the hamlet’s western boundary. It runs approximately from the historic connection point of the old Schoharie aqueduct crossing, south east to State Route 5S.



View of retaining wall facing northwest on Schoharie Street at Railroad Avenue.

When the Schoharie Creek overtopped its banks during Hurricane Irene, the protective berm was breached at the Schoharie Crossing State Historic Site, allowing floodwaters to rush into the hamlet. Flooding from the storm destroyed a number of residences and heavily damaged the Schoharie Crossing facilities. Floodwaters from Schoharie Creek during Irene also entered the hamlet at the western end of the protective berm, flowing down Main Street to the north and west.

This project will repair and reinforce the hamlet of Fort Hunter’s protective berm, improving resiliency against flooding from Schoharie Creek. Since the community sits the floodplain, with little elevation change throughout, the most effective flood protection is to prevent water flowing into the area. Repairs to the existing berm and flood wall and the extension of the berm will help to serve this purpose. The breach in the berm from Hurricane Irene is located just downstream of Route 5S, adjacent to the Schoharie Crossing Historic Site.



IV. Proposed and featured project profiles

The project will include repairs of the existing berm in its most damaged section. Damages in this section have already been assessed, and will include reinforcement of approximately 250 feet of the 1,800-foot existing berm with a clay core, and raising the height of the berm by 5 feet across the 250 foot segment. Berm height additions are based on the results of hydraulic modeling discussed below.

The project will also include a full conditions assessment and elevation survey of the entire 1,800 foot berm, and repairs and reinforcement where needed. For project planning purposes, the cost estimate assumes repairs and reinforcement will be needed for thirty percent of the remaining berm length (465 feet). The results of the elevation survey will indicate where additional berm height may be necessary.



Location of existing berm and proposed extension on north bank of the Schoharie Creek at Fort Hunter, NY.

A detailed drainage study, topographic survey of the Schoharie Berm, floodwall structural inspection, and geotechnical investigation will be necessary to finalize the flood wall design. Coordination with the Canal Corp, United States Army Corps of Engineers (USACE) and NYSDEC will be required prior to finalizing the design and initiating construction of floodwall repairs.

Surveys, studies and design for the project could be started immediately, with the conditions assessment and reinforcement of the existing berm to follow. A drainage study should be performed prior to design. The design will include a structural, geotechnical and topographic survey conducted by a licensed engineer. Construction of the new berm extension for project Alternative 4 will take approximately six months upon completion of design and permitting.



This existing retaining wall is owned by the Canal Corp. Some repairs were made to the wall immediately after Hurricane Irene to address portions of the breach, including restoring washed out portions of the berm and replacing the stream bank rip rap that was dislodged from the flood waters. The breached 250-foot long, 20-foot wide, span of the flood wall follows the northeastern stream bank of Schoharie Creek just downstream of the Erie Canal Trail Bridge.

Hydraulic modeling software (HEC-RAS) was utilized to develop a conceptual feasibility evaluation of the current and post-mitigation flood scenarios in the hamlet of Fort Hunter which is anticipated to be subject to continued flooding due to the berm breach. In order to estimate the extent of flooding under existing and post-mitigation conditions, multiple storm events were simulated to represent the peak storm events (10-year, 50-year, 100-year and 500-year). The model utilized LIDAR topographic information provided from the Schoharie County Soil and Water Conservation District to develop the Schoharie Creek and Mohawk River geometry which was refined using data provided in the most current Montgomery County FEMA FIS, as available. The existing Schoharie Creek floodwall geometry was determined by assumptions and notes collected during a 2011 site visit conducted by McDonald Engineering and through discussions with Canal Corp personnel. Based on these visual assessments it was determined that the current height of the floodwall was approximately 5 feet.

For the purposes of the conceptual feasibility analysis, the proposed floodwall elevation in the model was set at the 100-year Based Flood Elevation identified in the Montgomery County FEMA FIS for the Mohawk River which was observed to be approximately 3.5 feet higher than existing berm elevation. Both existing conditions and post-mitigation scenarios were simulated and compared. The conceptual model results indicated that increasing the berm elevations will provide protection of the Fort Hunter hamlet area for the approximate 100-year storm and any smaller storm events. Hydraulic modeling demonstrated that a height increase of 3.5 feet was sufficient to protect against a 100-year storm event. To account for data limitations and uncertainties in the model results, the proposed height increase is 5 feet, which should allow 1.5 feet of freeboard at the top of the berm. In addition, reinforcement of the existing berm includes reinforcing the wall with a clay core and providing additional stream bank protection.

Risk Reduction: This project is expected to lead to a direct reduction of flood risk to approximately 50 residences, several hundred acres of farmland, the Fort Hunter Fire Station (a moderate risk Community Asset), and the Schoharie Crossing State Historic Site (high risk Community Asset). It will also improve safety for residents who live in the hamlet, and reduce risk to emergency responders during storm events.

Social and Health Benefits: This project will directly benefit the approximately 50 homes in the project area, keeping a thriving residential community intact, preventing damage to homes, and protecting the hamlet's fire house. It will protect the Schoharie Crossing State Historic Site, an important cultural Community Asset. Emergency responders will also have safer conditions to drive through as they attend to calls during a storm, and residents will have less risk of driving into unsafe conditions on local roads or of being unable to evacuate their homes.



IV. Proposed and featured project profiles

Environmental Benefits: This project will protect against erosion along the north bank of the Schoharie Creek in the hamlet.

Economic Benefits: This project has multiple economic benefits, including the protection of residences, farmland, and road infrastructure in the hamlet. Protecting farmland in the hamlet from flooding will maintain the local agricultural economic base by preventing crop losses and damage to farm machinery and buildings. The protection of residences will save private property owners and insurers from paying for costly damage repairs. Additionally, the Town will have a reduction in unplanned, emergency repair expenses for hamlet roads.

Cost Benefit Analysis: The project will provide repairs, reinforcement, and additional height as needed across the length of the existing berm in order to reduce the risk of future breaches, and protect the hamlet from flooding. The project will protect approximately residences in the hamlet from costly repairs due to flooding. It will also protect key assets in the hamlet, the Fort Hunter Fire Department, and the Schoharie Crossing State Historic Site. **The cost of this project is estimated at \$760,000.**

Implementation Strategy

Timeframe

Anticipated completion date: two years from start of project

Regulatory Requirements

Coordination with the Canal Corp (owner of the berm), NYSDEC Protection of Waters Permit and a US Army Corps of Engineers permit for work on the berm and in Schoharie Creek.



Enlarge Undersized Culverts

Project Type: Proposed

Strategies

- Improve drainage in key areas known to flood.

Recovery Functions

- Infrastructure Strategies

Location

- Town of Florida

Jurisdiction

- Town of Florida
- Montgomery County

Project Description: This project proposes enlargements of culverts at up to fourteen road crossings in the Town of Florida that were flooded out during Hurricane Irene and Tropical Storm Lee in 2011. The extent of the flooding during the storms indicated that the culverts were undersized and unable to handle a major rainfall event. Localized roadway flooding and flooding of nearby homes was experienced in these problem areas during Hurricane Irene and Tropical Storm Lee.



Undersized culverts can lead to flooding of road crossings and nearby properties.

The fourteen project locations, identified in the table below, are spread throughout the town. The culverts listed run under town, county and state roads. To mitigate property and roadway flooding, the undersized conduits will be upgraded to larger concrete culverts or multiple culvert sets. As an example, at the Terwillager Creek crossing along Pattersonville Road, near Hutchinson Road, it was reported that a 48-inch concrete culvert had been replaced with a much smaller metal culvert, causing flooding onto the nearby properties. Other roadways where flooding has been identified due to reported undersized culverts include Sulphur Springs Road, Hartman Road, McKinney Road, and Bulls Head Road.

Detailed hydrologic information, such as tributary drainage areas and flow rates into each culvert, is currently unavailable. Additionally, several of the previously mentioned streets include various water-body crossings, and clarification of exact culvert locations needs to be undertaken. Exact needs for each location should be evaluated during design. For planning purposes, it has been assumed that all the crossings along the roadways, with exception of major streams flowing under bridges, will require a typical upgrade to dual 24-inch reinforced concrete pipe culverts. It has also been presumed that each culvert will require new concrete headwalls with wingwalls, stone riprap aprons and channel rehabilitation ex-



IV. Proposed and featured project profiles

tending 50-feet from the headwalls at both the upstream and downstream ends. Field evaluation should be performed at each site before selecting a final culvert design. Roadway restoration extending 15-feet to either side of the culvert centerline has also been considered at each location. Annual maintenance of the stormwater infrastructure is recommended to remove debris resulting from normal rainfall and flood events, which may cause pipe clogging, to ensure proper structure performance. The table below summarizes the potential locations in consideration for proposed upgrades to the stormwater conveyance infrastructure.

Culvert ID*	Approximate Location	Approximate Dual Culvert Pipe Length (ft)
1	Pattersonville Rd. (100-ft south of Hutchinson Rd.)	50
2A	Sulfur Springs Rd. (300-ft south of Cooper Rd.)	40
2B	Sulphur Springs Rd. (Hartman Rd. Intersection)	100
2C	Sulphur Springs Rd. (550-ft east of Taylor Rd.)	45
3	Scotch Bush Rd. (100-ft south of Hartman Rd.)	30
4A	McKinney Rd. (1,600-ft north of Lost Valley Rd.)	40
4B	McKinney Rd. (3,200-ft north of Peck Rd.)	60
4C	McKinney Rd. (1,200-ft north of Peck Rd.)	65
4D	McKinney Rd. (400-ft north of Peck Rd.)	40
5A	Bull Heads Rd. (100-ft east of Dorn Rd.)	90
5B	Bull Heads Rd. (450-ft north of Thayer Rd.)	55
5C	Bull Heads Rd. (300-ft west of Mohr Rd.)	80
6A	Pattersonville Rd. (100-ft south of Bull Heads Rd.)	60
6B	Bull Heads Rd. (50-ft north of Pattersonville Rd.)	90
Total		845

*List is not presented in order of priority



Risk Reduction: This project is expected to reduce flooding, protecting road infrastructure and neighboring residences in the affected areas. Additional benefits include the mitigation of roadway and stream bank erosion at project locations.

Social and Health Benefits: At the repaired sites, emergency responders will be protected from the possibility of entering unsafe, flooded roads during storm events, as will residents no longer at risk of driving into unsafe conditions on local roads or unable to evacuate their homes.

Environmental Benefits: Stabilizing the stream banks and roadways in the vicinity of each repair will prevent against future erosion and reduce the risk of slope instability. The enlargement of the culverts will enable more flow to pass through, thereby improving drainage and reducing the buildup of debris in creek channels.

Economic Benefits: This project will mitigate future damages to homes, businesses and road infrastructure in the vicinity of the project sites. This project will also save private property owners, insurers, and taxpayers from paying for costly repairs due to future flooding.

Cost Benefit Analysis: This project is expected to reduce localized flooding at a number of road crossings, which will reduce the risk of flooding for residential structures and infrastructure, and provide safer conditions for vehicular traffic and emergency responders. It will additionally provide stream bank protection in the vicinity of the repairs. **This project is estimated to cost \$840,000, and includes the replacement of culverts at up to fourteen road crossings in the Town.**

Implementation Strategy

Timeframe

Anticipated completion date: approximately 16 months after start date

Regulatory Requirements

Local, county and NYSDOT roadway permits. The projects would likely be considered minor work for NYSDEC Protection of Waters Permits (only needed for protected stream locations). USACE Section 404 Permit requirements should be reviewed (although the activities would likely be covered by a general permit).



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Acquisition and Demolition of Abandoned Flooded Properties and the Design and Construction of a Public Park

Project Type: Proposed

Strategies

- Stabilize and revitalize neighborhoods and protect them from flooding

Recovery Functions

- Housing
- Natural and Cultural Resources

Location

- Town of Florida

Jurisdiction

- Town of Florida

Project Description: Several residential properties on Brown Place and Quackenbush Street in the hamlet of Fort Hunter were substantially damaged by flooding during Hurricane Irene and some have been abandoned. The acquisition and demolition of the residences will reduce the number of homes in the floodplain and provide an opportunity to provide parkland and off-street parking for the community.

The proposed project includes acquisition and demolition of substantially damaged homes on Brown Place and Quackenbush Street. The Brown Place properties will be converted to a park which will serve as a public access point for fishing, and will also add other recreational amenities, including a basketball court and picnic tables. The Quackenbush Street properties will become a gravel parking lot, which will provide off-street parking for the surrounding residents.

For the purposes of preliminary cost estimation, it has been assumed that recommendations for the proposed public park and parking lot will include the following:

- Parking lot with gravel surface for approximately 30 parking spaces.
- Park benches, picnic tables, walking paths, basketball court, heritage information signs, fishing locations, and canoe/kayak launch ramps.

The project cost also includes acquisition and demolition of up to three residential parcels in addition to those for which FEMA buy-outs are already underway.





IV. Proposed and featured project profiles

Risk Reduction and Cost Benefit Analysis: This project reduces risk by reducing the number of residences within the floodplain. It also creates useful public space, which will remain primarily impermeable and free of enclosed structures, increasing floodplain buffer.

Social and Health Benefits: The use of the properties as recreational land and permeable parking fulfills a need expressed from hamlet residents, and creates opportunities for waterfront access, fishing, and outdoor recreation.

Environmental Benefits: The removal of residences and driveways and replacement with parkland and permeable surfaces increases the available floodplain buffer in the hamlet. Town ownership will prevent the properties from being re-developed for a use not compatible with their location.

Economic Benefits: By removing several at-risk residences, the project mitigates future risk of damages to these homes, saving the property owners, and insurers from paying for costly repairs. It also prevents the hamlet from being subject to blight from abandoned properties, helping maintain community integrity.

Cost Benefit Analysis: Even though Fort Hunter is located alongside two major water bodies (Schoharie Creek and Mohawk River), the small community lacks official public areas where the residents can enjoy the community's natural resources. The re-purposing of the abandoned properties as an activity park will provide the community with a useful, environmentally focused, and family-friendly recreational facility as well as create a natural public space that the community can enjoy. Additionally, the construction of the proposed park will reduce the number of homes within the floodplain, and the risk of future damages to these properties. **This project is estimated to cost \$760,000.**

Implementation Strategy

Timeframe

Anticipated completion date: approximately 16 months after start date

Regulatory Requirements

This activity is likely covered by building permits. Coordination with FEMA may be required if the properties are acquired by the Town through the FEMA buyout process.



Waterfront projects such as Riverlink Park in the City of Amsterdam are reconnecting the City with the Mohawk River.

Source: Ecology and Environment, Inc.



The Dove Creek retaining wall was further eroded and undercut from storms Irene and Lee, putting critical St. Mary's Hospital facilities at risk in the City of Amsterdam.

Source: The LA Group

V. Additional materials

Section V includes additional materials that include:

- Additional Resiliency Recommendations
- A master table of projects
- Description of the public engagement process
- Community asset inventory table
- End notes
- A glossary



V. Additional materials

A. Additional Resiliency Recommendations

Table 15 Additional Resiliency Recommendations

Strategy	Project Name	Short Description	Project Category	Regional (Y/N)
Improve emergency response through community-wide coordination and positioning of critical resources and services.	The Montgomery County Community Services Building Flood Resiliency Upgrades	This building has been known to flood during high rainfall events. Since it houses the Office of Emergency Management and the County Department of Public Works, when it is flooded neither organization can fully meet its responsibilities for community-wide coordination during an emergency. Although this asset is located outside of the geographic project study area, it provides necessary services to the communities within it and is considered critical to the continued operations of the municipalities it serves. It is recommended that at least the regional emergency response functions should be housed outside the floodplain.	Additional Resiliency Recommendation	Yes
Stabilize and revitalize neighborhoods and protect homes from flooding.	Vulnerable Population Housing and Community Center	A building will be repurposed to include housing on the second and third floor for vulnerable populations including homeless persons and veterans while the first floor will serve primarily as a community center for youth and seniors, also designed for use as a shelter during emergencies.	Additional Resiliency Recommendation	No
Stabilize and revitalize neighborhoods and protect homes from flooding.	Abandoned and Damaged Homes Program	Flood waters have damaged homes such that they continue in disrepair or have been abandoned. The project will establish a program to address buildings that are too costly to renovate or have been abandoned.	Additional Resiliency Recommendation	No
Mitigate damage to transportation corridors and infrastructure	Water Main Installation – Maple Avenue	There are no water main connections on Maple Avenue between route 30 and Midline Road (about 1 mile). This project will install public water connections to reduce the risk of contamination of water supply and encourage development in this part of the Town.	Additional Resiliency Recommendation	No



Table 15 (continued) Additional Resiliency Recommendations

Strategy	Project Name	Short Description	Project Category	Regional (Y/N)
Improve drainage for key areas known to flood.	Restore Storm Infrastructure – Chapman Drive – Town of Amsterdam	The catch basins, drains and outfalls along Chapman Road from the City border (Holly Street) to Truax Road have caused problems; they have been clogged with debris which causes additional damage during floods. This project is to restore catch basins and outfalls. NYS DOT and potentially CSX share maintenance responsibilities. Town cannot afford to do the work. A program is needed to fund this work for the Town. Additionally, the outfalls on the River side have been compromised by beaver dams.	Additional Resiliency Recommendation	No
Augment natural and cultural resources for flood resiliency.	Amsterdam City Park	This project is to create a community park on a property which is co-owned by a local not-for-profit organization and the City of Amsterdam. The project would remove the current hardscape surface and install permeable features.	Additional Resiliency Recommendation	No



V. Additional materials

B. Master Table of Projects

Table 16 Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Facilitate communication from emergency response organizations to residents before, during, and after emergency events.	Emergency Communications System – Area-wide	The project aims to be more inclusive of the diverse community population including those who do not speak English, or represent vulnerable populations. An emergency communications protocol will be established which includes elements such as a formal multi-lingual communications system to inform municipalities and residents. This will require inter-municipal instruments such as Memoranda of Understanding and standardized regional coordination to effectively transmit information among jurisdictions.	Proposed	\$315,000	Yes
Improve emergency response through community-wide coordination and positioning of critical resources and services.	Maintain Power to Critical City Buildings – City of Amsterdam	Critical government operations came to a halt with the loss of power during Hurricane Irene. This project will be to purchase generators for City Hall and the Department of Public Works buildings to support continuity of government operations during storms with power outages.	Proposed	\$300,000	No



Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Improve emergency response through community-wide coordination and positioning of critical resources and services.	Establish emergency shelter locations – City of Amsterdam	The City requires additional sheltering operations to support residents during storms. Two school facilities have been identified and each requires the permanent installation of an emergency generator.	Proposed	\$300,000	No
Improve emergency response through community-wide coordination and positioning of critical resources and services.	Establish an Emergency Shelter at Town Hall and the High School – Town of Amsterdam	Both Amsterdam Town Hall and Amsterdam High School have been identified as suitable for use as emergency shelters. They will each require a permanent installation of an emergency generator.	Proposed	\$300,000	No
Maintain essential medical services to all populations during an emergency event	Dove Creek Restoration and Medical Facility Wall Reinforcement – City of Amsterdam	St. Mary’s Hospital computer systems and paper records are at risk because the retaining wall adjacent to the hospital is severely undercut and at risk of collapse. The project will be to restore Dove Creek, which requires stabilization, restoration, and debris removal/management; and to reinforce the retaining wall.	Proposed	\$1,400,000 (Funding expected under alternate source)	No



V. Additional materials

Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Create and sustain a 'Business Friendly Climate' to encourage businesses to remain, locate, grow and develop	Gateway Park – City of Amsterdam	This project is to demolish the Carpetland building that was severely damaged during Hurricane Irene. The property will be repurposed for public recreational use.	Proposed	\$370,000	No
Create and sustain a 'Business Friendly Climate' to encourage businesses to remain, locate, grow and develop	Gateway Park – City of Amsterdam	This project is to demolish the Carpetland building that was severely damaged during Hurricane Irene. The property will be repurposed for public recreational use.	Proposed	\$370,000	No
Stabilize and revitalize neighborhoods and protect them from flooding	Acquisition and Demolition of Abandoned Flooded Properties and the Design and Construction of a Public Park – Town of Florida	This project will acquire and demolish 3 houses in the hamlet of Fort Hunter and build a park, and a gravel parking lot in their place.	Proposed	\$760,000	No



Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Stabilize and revitalize neighborhoods and protect them from flooding	Fort Hunter Berm Stabilization – Town of Florida	The existing berm on the east shore of the Schoharie Creek at Fort Hunter was damaged and breached by water during Hurricane Irene, and was identified by the Canal Corp as the main breached area that contributes to the flooding issues observed in Fort Hunter. This project will repair and extend the berm currently owned by the Canal Corp. In partnership with the Canal Corp, the current berm will be evaluated for structural integrity.	Proposed	\$760,000	No
Stabilize and revitalize neighborhoods and protect them from flooding	South Chuctanunda Creek Bank Stabilization – City of Amsterdam	Erosion of stream banks and damage to the retaining walls along the South Chuctanunda Creek occurred as a result of major storms in 2011 and subsequent years. This is causing a collapse of the stream bank and failure of a section of retaining wall between the Route 5S and Florida Avenue crossings. This project aims to stabilize the steam banks to protect nearby homes, and sewer and water lines which cross the creek near the Florida Avenue crossing.	Proposed	\$560,000	No
Stabilize and revitalize neighborhoods and protect them from flooding	Streambed and Retaining Wall Inspection and Repair North Chuctanunda Creek – City of Amsterdam	This project will address a portion of the creek, which needs the bedrock streambed cleared of displaced rock debris and stabilization of the natural stream banks, and a quarter of the retaining wall length will need low-level repairs on both sides of the creek.	Proposed	\$815,000	No



V. Additional materials

Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Stabilize and revitalize neighborhoods and protect them from flooding	Streambed and Retaining Wall Inspection and Repair Bunn Creek – City of Amsterdam	This project will address a portion of the creek, which will need the bedrock streambed cleared of displaced rock, the stabilization of approximately a quarter of the stream bank length, and the repairs of various sections of the length of retaining walls on both sides of the creek.	Proposed	\$705,000	No
Mitigate damage to transportation corridors and infrastructure	Amtrak Station Relocation Site Plan – City of Amsterdam	The Amtrak Station, located in the floodplain, was inundated by flood waters during Hurricane Irene. Loss of rail service not only prevents the evacuation of locals and visitors but also disrupts intra- and inter-state passenger travel across a critical transportation corridor. The project is to relocate the station out of this high risk flood area.	Proposed	\$250,000	No
Mitigate damage to transportation corridors and infrastructure.	Stormwater System Installation Guy Park Avenue between State Route 5 and Steadwell Avenue – City of Amsterdam	This project will install an underground stormwater conveyance system along Gut Park Avenue from State Route 5 all the way east to Steadwell Avenue in order to attenuate current flooding during major storm events. The stormwater system will outlet into Dove Creek, which crosses Guy Park Avenue between Merrit Street and Steadwell Avenue.	Proposed	\$925,000	No



Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Improve drainage in key areas known to flood	Green infrastructure and flood mitigation master plan – City of Amsterdam	Plan for the traditional urban core of the City of Amsterdam to identify appropriate green infrastructure measures and flood mitigation techniques, develop enhanced stormwater and other regulations that will require and/or incentivize green infrastructure throughout the urban core, and flood mitigation measures in areas prone to flooding.	Proposed	\$240,000	No
Improve drainage in key areas known to flood	Route 5 Stormwater Reconstruction – City of Amsterdam	During Hurricane Irene, flood waters rose onto Route 5 at the west end of the City and overwhelmed the stormwater infrastructure causing damage to the system. This project will make the necessary repairs to make the system functional again.	Proposed	\$1,040,000	No



V. Additional materials

Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Improve drainage in key areas known to flood	Fort Hunter Stormwater Retention Pond and Schoharie Crossing Drainage Improvements – Town of Florida	The project will construct two or more stormwater detention ponds in the northeast area of the hamlet of Fort Hunter. Repairs and enlargements to culverts, and other drainage conveyance improvements will be performed at various locations in the hamlet. In addition to the drainage improvements, several footbridges and interpretative signage will be restored at culvert repair locations within the Schoharie Crossing State Historic Site, to help restore damage to the Site’s facilities and multi-use trails that were damaged during Irene.	Proposed	\$1,850,000	No
Improve drainage in key areas known to flood	Enlarge Undersized Culverts – Town of Florida	This project proposes enlargements of culverts at up to fourteen road crossings in the Town of Florida that were flooded out during Hurricane Irene and Tropical Storm Lee in 2011. Exact needs for each location should be evaluated during design. For planning purposes, it has been assumed that all the crossings along the roadways, with exception of major streams flowing under bridges, will require a typical upgrade to dual 24-inch reinforced concrete pipe culverts.	Proposed	\$840,000	No



Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Improve drainage in key areas known to flood	Enhance Stormwater Conveyance Systems – Town of Amsterdam	This project will install appropriate stormwater conveyance system improvements and expansion along Midline Road, extending out on Wallins Corners Road, and Crouse Drive, which were heavily flooded during Hurricane Irene.	Proposed	\$900,000	No
Augment natural and cultural resources for flood resiliency.	Floodplain Buffers, Bikeway, and Dam Rehabilitation along Chuctanunda Creek – Town of Amsterdam	This project has 3 components: 1) assessment of Harrower Pond Dam, to establish whether it will be feasible to rehabilitate the dam, 2) evaluation of areas upstream of the dam and create floodplain buffers in suitable locations, and 3) design and construction of a bikeway along Chuctanunda Creek, from Hagaman to Shuttleworth Park.	Proposed	\$1,500,000	No
Protect cultural artifacts, historic sites and archives from damage and loss	Old Fort Johnson - full conditions assessment	Montgomery County Historical Society has received a grant to do an exterior assessment of Old Fort Johnson, but there is still a need to do a full assessment of the building – including the interior. This project will include an assessment of the interior of the building, and potential implementation of some of the findings.	Proposed	80,000	No



V. Additional materials

Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Protect cultural artifacts, historic sites and archives from damage and loss	Rebuild Retaining Wall on Kayaderosseras Creek next to Old Fort Johnson	The project will be to evaluate, design and rebuild the retaining wall along Kayaderosseras Creek that was built to provide erosion control. This project will stabilize the stream bank and protect Old Fort Johnson from flooding.	Proposed	\$450,000	No
Maintain essential medical services to all populations during an emergency event	South Side Medical Support – City of Amsterdam	St. Mary’s is the only local hospital and is located on the north side of the river. When bridges become impassable due to flooding, there is limited access to medical services for those on the south side. The project will establish pre-positioned emergency medical resources on the south side of the river to support medical needs.	Featured	\$120,000	No
Create and sustain a “Business Friendly Climate” to encourage businesses to remain, locate, grow and develop	Waterfront Heritage Area	This waterfront heritage area is undergoing Phase II of the BOA Program. This project will provide the planning and design of the area so that it can be constructed to attract visitors, support commerce, and provide green infrastructure as a buffer for flooding. The Waterfront Heritage Area will connect to the Mohawk Valley Gateway Overlook and Amsterdam Riverwalk.	Featured	\$400,000	No



Table 16 (continued) Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Mitigate damage to transportation corridors and infrastructure	Sewer Installation – Midline Road – Town of Amsterdam	The project will install sewer along a 1 mile corridor on Midline Road. It is expected to reduce concerns regarding the potential for septic leachate to contaminate groundwater wells in the area during times of heavy rainfall.	Featured	\$2,500,000	No
Augment natural and cultural resources for flood resiliency	Amsterdam Riverwalk	This project is for a portion of the overall Riverwalk project. It will construct shoreline resiliency improvements that will be required for 1,200 linear feet of the trail where flood damage from Hurricane Irene has compromised the shoreline.	Featured	\$700,000	No



V. Additional materials

C. Public Engagement Process

To gain insight on community needs, opportunities, perceived risks, and priorities, public engagement was sought throughout the planning process. Participation at these outreach events helped shape and provide valuable feedback on the plan components. Residents, public and private agencies, and community organizations all contributed to the NYRCR Plan through the public engagement process. Input helped identify areas of flood concern. It provided consensus on strategies and projects, and suggestions on how projects could be made more effective. Meetings were generally held open house style, with a brief introductory presentation by the state planners, Planning Committee co-chairs and the consultant team. At each of these open house style events, the Planning Committee and consultant team provided information on the NYRCR Program, presented key milestones of the planning process and draft components of the NYRCR Plan to give the public an opportunity to provide comments and ask questions.

These meetings allowed members of the public to ask questions as a group, or to engage one on one with state planners, the Planning Committee and the consultant team. Comments were given verbally, in writing, and by using “sticker votes”- green and red stickers where meeting attendees could indicate their approval of an item or show it was less of a priority. Attendees were also encouraged to email comments through the Governor’s Office of Storm Recovery’s NY Rising Community Reconstruction program website, and visit their website.

To reach as many members of the Community as possible, public meetings were held in a variety of locations and facilities including a school, community arts center, local fire house, and a town hall. Due to the large multi-lingual population, meeting flyers were distributed in both English and Spanish. Meetings were held both on weeknights and weekends to accommodate as many members of the public as possible. To encourage turnout, a Saturday morning pancake breakfast was held at the Town of Florida Town Hall. This meeting format not only attracted 40 attendees, it encouraged an easy-going atmosphere to provide information and have conversations about the NYRCR Plan.

To reach the hard hit community of Fort Hunter in the Town of Florida, an evening meeting was held at the hamlet’s Fire House to better understand the needs of the resi-

¡Queremos sus ideas!

Acompáñenos para un Desayuno de Pancakes GRATIS para hablar del Plan de Reconstrucción Comunitaria, durante la etapa de desarrollo por amigos y vecinos para el Programa de Reconstrucción Comunitaria del Estado de Nueva York (NY Rising). Las comunidades de la Ciudad y Pueblo de Amsterdam, y el Pueblo de Florida están trabajando juntos para producir un plan que aborde el tema de las necesidades de cada comunidad y para toda la región del Valle de Schoharie.

Hasta \$9 millones de dólares estarán a nuestra disposición para los proyectos de reconstrucción que identifiquemos a través de este proceso del plan.

El Plan ayudará a promover nuestra visión para reconstruir nuestras comunidades, revitalizar nuestra economía local, y ayudar a protegerlas de futuras tormentas. Le invitamos a poner sus ideas sobre la “mesa de desayuno” para que revisemos y discutamos el esquema del plan.

Actualmente, un grupo representativo que incluye residentes, empresarios locales, y miembros de organizaciones de la comunidad están trabajando para desarrollar los proyectos y las estrategias para el plan. ¡Venga y comparta su opinión con el grupo sobre su visión para el futuro!

Cuándo:	Dónde:
Sábado, 16 de Noviembre de 2013	Florida Town Hall
8:00 a.m. to 11:00 a.m.	167 Fort Hunter Rd
	Amsterdam, NY 12010

Para más información, favor de contactar:
info@stormrecovery.ny.gov
<http://stormrecovery.ny.gov/community-reconstruction-program>

Public meeting flyer in Spanish



dents. A large turnout from the hamlet's residents helped the Planning Committee and consultant team better understand the issues in the hamlet and their specific needs.

Additional outreach was targeted to smaller community groups, and presentations were given by the Planning Committee at an Amsterdam Rotary meeting, a monthly meeting of a local group of social service organizations, and with a display table and attendance at a resiliency training event held for Montgomery County staff.

Public participation throughout the planning period significantly helped shape and enrich the NYRCR Amsterdam and Florida Plan. The public meetings were also used to educate residents and other stakeholders on severe weather events and flooding risks, critical community issues, and potential reconstruction and resiliency mitigation projects.

A final public engagement event will be held in May 2014 to present the Final Plan.



Public meeting presentation at Creative Arts Center, Amsterdam, NY. Source: Ecology and Environment, Inc.

In October of 2013, the Amsterdam and Florida Conceptual Plan was posted to the NY Rising Community Reconstruction Program website for public review and comments. This document represented a snapshot of the direction the communities and the Planning Committee were expecting to take to enhance community resiliency towards flooding. With guidance from the public, the planning process evolved from the Conceptual Plan as communities analyzed the risk to their assets, their needs and opportunities, and the potential costs and benefits of projects and actions.

This Plan is expected to strengthen community understanding and ownership of efforts to improve community resilience. It is expected that after the conclusion of the NYRCR planning process, continuing input and participation from engaged stakeholders will be solicited within each community, especially as projects are undertaken.



V. Additional materials

D. Community Asset Inventory

Table 17 Community Asset Inventory

Asset Name	Risk Area	Asset Subcategory	Socially Vulnerable Populations	FEMA Critical Facility
Stratton Apartments	N/A	Affordable Housing	Yes	No, Locally Significant
Roosevelt Apartments	N/A	Affordable Housing	Yes	No
Amsterdam Hi-Rise	N/A	Affordable Housing	Yes	No
Amsterdam Creative Arts Center	N/A	Cultural or Religious Establishments	No	No
Montgomery County Adult Recreation Center (ARC)	N/A	Disabled	Yes	No, Locally Significant
Riverfront Center	N/A	Downtown Center	Yes	No, Locally Significant
Amsterdam Police Department	High	Emergency Operations/Response	No	Yes, FEMA
Hagaman Fire Station	N/A	Emergency Operations/Response	No	Yes, FEMA
Fort Hunter Fire Station	Moderate	Emergency Operations/Response	No	Yes, FEMA
Amsterdam Fire Station	N/A	Emergency Operations/Response	No	Yes, FEMA
Cranesville Fire Station	High	Emergency Operations/Response	No	Yes, FEMA
Florida Volunteer Fire Station	Moderate	Emergency Operations/Response	No	Yes, FEMA
Montgomery County Office of the Aging	Extreme	Government and Administrative Services		
United Cerebral Palsy Assoc. of Fulton & Montgomery Co.	N/A	Government and Administrative Services	Yes	No
Resource Center for Independent Living	Extreme	Government and Administrative Services	Yes	No, Locally Significant
Post Office - Hagaman	N/A	Government and Administrative Services	Yes	No, Locally Significant
Fort Johnson Fire Station	Extreme	Government and Administrative Services	No	Yes, FEMA
Fort Johnson Municipal Hall	Extreme	Government and Administrative Services	No	No, Locally Significant
Post Office - Fort Johnson	Extreme	Government and Administrative Services	No	No, Locally Significant



Table 17 (continued) Community Asset Inventory

Asset Name	Risk Area	Asset Subcategory	Socially Vulnerable Populations	FEMA Critical Facility
Guy Park Manor	Extreme	Government and Administrative Services	No	No, Locally Significant
Post Office - Fort Hunter	N/A	Government and Administrative Services	Yes	No, Locally Significant
Ambulance - Greater Amsterdam Volunteer Ambulance Corps, Inc.	Moderate	Government and Administrative Services	No	Yes, FEMA
City of Amsterdam Municipal Hall	N/A	Government and Administrative Services	No	No, Locally Significant
Post Office - Amsterdam	N/A	Government and Administrative Services	Yes	No, Locally Significant
Florida Town Hall/Shelter	N/A	Government and Administrative Services	No	Yes, FEMA
Amsterdam Town Hall	N/A	Government and Administrative Services	No	Yes, FEMA
Waste Transfer Station	N/A	Hazardous Materials, Solid Waste, and Recycling	No	No
Buhrmaster Bulk Oil/Propane Storage	Moderate	Hazardous Materials, Solid Waste, and Recycling	No	No
Sunnyview Hospital & Rehabilitation Center-Sunnyview Audiology	N/A	Healthcare Facilities	No	Yes, FEMA
St. Mary's Healthcare	Extreme	Healthcare Facilities	Yes	Yes, FEMA
Montgomery County Community Services	Extreme	Healthcare Facilities	No	No, Locally Significant
St. Mary's Hospital Amsterdam- Alcoholism Rehabilitation	N/A	Healthcare Facilities	No	Yes, FEMA
Fort Johnson Park	High	Historic Landmarks and Facilities	No	No
Guy Park	Extreme	Historic Landmarks and Facilities	No	No
Greene Mansion	High	Historic Landmarks and Facilities	No	No
Green Hill Cemetery	N/A	Historic Landmarks and Facilities	No	No
Schoharie Crossing State Historic Site	High	Historic Landmarks and Facilities	No	No, Locally Significant



V. Additional materials

Table 17 (continued) Community Asset Inventory

Asset Name	Risk Area	Asset Subcategory	Socially Vulnerable Populations	FEMA Critical Facility
Old Fort Johnson	Extreme	Historic Landmarks and Facilities	No	No, Locally Significant
Cushing Stone Co Inc.	Moderate	Industrial, Warehousing and Manufacturing	No	No
Callanan Industries Inc.	Moderate	Industrial, Warehousing and Manufacturing	No	No
Quandt's Food Service	Moderate	Large Business	No	No
Kapstone Container Corp	High	Large Business	No	No
Amsterdam Free Library	N/A	Libraries	No	No, Locally Significant
Pipeline – CNG Transmission Corporation	High	Liquid Fuels	No	No, Locally Significant
Walter Elwood Museum of the Mohawk Valley	N/A	Museums, Performing Arts Centers, and Stadiums	No	No, Locally Significant
Noteworthy Indian Museum	N/A	Museums, Performing Arts Centers, and Stadiums	No	No, Locally Significant
Lock E-12 Dam at Tribes Hill	High	Navigable Waterway Facilities	No	No, Locally Significant
Jackson Mill Pond Dam	Moderate	Navigable Waterway Facilities	No	No
Kellogg Reservoir Dam	High	Navigable Waterway Facilities	No	No
Harrower Lower Dam	High	Navigable Waterway Facilities	No	No
Harrower Pond Dam	High	Navigable Waterway Facilities	No	No, Locally Significant
Amsterdam Ice Pond Dam	N/A	Navigable Waterway Facilities	No	No
Harrower Mill Dam	High	Navigable Waterway Facilities	No	No, Locally Significant
Amsterdam Diversionary Dam	N/A	Navigable Waterway Facilities	No	No
Mohasco Dam	High	Navigable Waterway Facilities	No	No
Brookside Reservoir Dam	High	Navigable Waterway Facilities	No	No
Lock E-11 Dam at Amsterdam	High	Navigable Waterway Facilities	No	No, Locally Significant



Table 17 (continued) Community Asset Inventory

Asset Name	Risk Area	Asset Subcategory	Socially Vulnerable Populations	FEMA Critical Facility
Smeallie Dam	High	Navigable Waterway Facilities	No	No
Dam - (189-0270f)	High	Navigable Waterway Facilities	No	No
Dam - (189-0270g)	High	Navigable Waterway Facilities	No	No
Rostowski Pond Dam	N/A	Navigable Waterway Facilities	Yes	No
Lock E-10 Dam at Cranesville	High	Navigable Waterway Facilities	No	No, Locally Significant
Dam - (173-0298)	Moderate	Navigable Waterway Facilities	No	No
Centro Civico	N/A	Non-English Speaking Populations	Yes	No, Locally Significant
Veteran's Park	N/A	Parks and Recreation	Yes	No, Locally Significant
Shuttleworth Park/ South Side Flood Wall	Moderate	Parks and Recreation	No	No
Riverfront Park	High	Parks and Recreation	No	No
Riverlink Park	High	Parks and Recreation	No	No
Transmission Line - Niagara Mohawk	High	Power Supply	No	Yes, FEMA
Electrical Substation - Church Street	Moderate	Power Supply	No	Yes, FEMA
Wilkinson Residential Health Care Facility	N/A	Primary/Regional Hospitals	Yes	No, Locally Significant
St. Mary's Healthcare - Amsterdam Memorial Campus	N/A	Primary/Regional Hospitals	Yes	Yes, FEMA
Amsterdam High School	N/A	Primary/Regional Hospitals	No	Yes, FEMA
Pawling Hall	N/A	Public Works Facilities	Yes	No, Locally Significant
Amsterdam Maintenance Facility	N/A	Public Works Facilities	No	No
Cranes Hollow School	Moderate	Schools	No	Yes, FEMA
Amsterdam City School District	N/A	Schools	No	Yes, FEMA
R.J. McNulty Academy	N/A	Schools	No	Yes, FEMA
William H. Barkley Magnet School	N/A	Schools	No	Yes, FEMA



V. Additional materials

Table 17 (continued) Community Asset Inventory

Asset Name	Risk Area	Asset Subcategory	Socially Vulnerable Populations	FEMA Critical Facility
Amsterdam Garden Apartments	N/A	Senior Housing	Yes	No
Sarah Sanford Home for Women	N/A	Supportive Housing	Yes	No, Locally Significant
St. Jude Retreat Hagaman House	N/A	Supportive Housing	Yes	No, Locally Significant
Amtrak Station - AMS	Extreme	Transportation	No	No, Locally Significant
Amsterdam Travel Service - Bus Station	Extreme	Transportation	No	No, Locally Significant
NYDOT Bridges (55 Bridges)	Moderate	Transportation	No	No, Locally Significant
Thruway Bridges (4 Bridges)	Moderate	Transportation	No	No, Locally Significant
Wastewater Pump Station Cleveland Ave	Moderate	Wastewater	No	Yes, FEMA
Wastewater Pump Station South Side	N/A	Wastewater	Yes	Yes, FEMA
Wastewater Pump Station West Side	N/A	Wastewater	Yes	Yes, FEMA
Wastewater Pump Station West Side	Moderate	Wastewater	No	Yes, FEMA
Amsterdam - City Wastewater Treatment Plant	Moderate	Wastewater	No	Yes, FEMA
Drinking Water Treatment Plant - Amsterdam (T)	N/A	Water Supply	No	Yes, FEMA
Drinking Water Treatment Plant - Amsterdam (C)	N/A	Water Supply	No	Yes, FEMA



E. End notes

- ¹ Town of Amsterdam Historical and Regional Overview, <http://www.townofamsterdam.org/> accessed on March 13, 2014
- ² Please reference list on inside cover of document.
- ³ Montgomery County Multi-Jurisdictional All-Hazard Mitigation Plan, October 2008
- ⁴ City of Amsterdam Local Waterfront Revitalization Plan. Approved February 1993.
- ⁵ Erie Canalway National Heritage Corridor, “Things to do: Erie Canalway Trail”, <http://www.eriecanalway.org/> accessed on April 5, 2014.
- ⁶ U.S. Census Bureau Reports, 2000 and 2010.
- ⁷ Cornell Program on Applied Demographics <http://pad.human.cornell.edu/counties/trends1.cfm> accessed on April 8, 2014
- ⁸ Bureau Labor Statistics
- ⁹ 2007-2011 American Community Survey
- ¹⁰ United States Census, 2010
- ¹¹ Town of Florida, History, http://www.co.montgomery.ny.us/florida/tfl_history.asp accessed on April 7, 2014
- ¹² “Clinton’s Big Ditch”, <http://www.eriecanal.org/> accessed on April 5, 2014
- ¹³ Montgomery County Multi-Jurisdictional All-Hazard Mitigation Plan, October 2008
- ¹⁴ NOAA 2011. Extreme Weather 2011: Hurricane Irene August 20-29, 2011. Accessed on March 14, 2014 from <http://www.noaa.gov/extreme2011/irene.html>
- ¹⁵ New York State 2012. New York State Responds – Hurricane Irene and Tropical Storm Lee: One Year Later. August 2012. Accessed on March 14, 2014 from <http://www.governor.ny.gov/assets/documents/Irene-Lee-One-Year-Report.pdf>
- ¹⁶ NOAA 2011. Extreme Weather 2011: Tropical Storm Lee Early September 2011. Accessed on March 14, 2014 from <http://www.noaa.gov/extreme2011/lee.html>
- ¹⁷ Mason, J. 2011. Schoharie Valley deluge cause domino effect. The Daily Gazette. August 30, 2011.
- ¹⁸ Carola, C. 2012. Hurricane Irene: New York historic sites still recovering one year later. Huffington Post. August 26, 2012. Access on March 14, 2014 from http://www.huffingtonpost.com/2012/08/27/hurricane-irene-new-york-historic-sites-recovering-one-year_n_1832733.html
- ¹⁹ The New York Times, Manor That Has Stood for Centuries Teeters in Storms Wake, September 1, 2011 http://www.nytimes.com/2011/09/02/nyregion/guy-park-manor-in-amsterdam-destroyed-by-irenes-floods.html?_r=0 accessed on March 15, 2014
- ²⁰ accessed on March 21, 2014 at <http://newyorkhistoryblog.org/2011/11/23/old-fort-johnson-flood-recovery-events-planned/>
- ²¹ Bump, Bethany, 2011. Irene: Lost Valley totally lost to flooding. The Daily Gazette. September 2, 2011. http://www.dailygazette.com/news/2011/sep/02/0902_lost-valley/ accessed on April 8, 2014
- ²² Cleveland, Arthur, 2012. A year later, Irene’s damage still felt. The Leader Herald. August 26, 2012. Accessed on March 21, 2014: <http://www.leaderherald.com/page/content.detail/id/549551/A-year-later--Irene-s-damage-still-felt.html?nav=5011>
- ²³ Cook, Barbara. 2011. Schoharie Crossing remains closed during flood cleanup. The Leader Herald. September 22, 2100. Access on March 14, 2014 from <http://www.leaderherald.com/page/content.detail/id/540667.html>
- ²⁴ Carola, C. 2012. Hurricane Irene: New York historic sites still recovering one year later. Huffington Post. August 26, 2012. Access on March 14, 2014 from http://www.huffingtonpost.com/2012/08/27/hurricane-irene-new-york-historic-sites-recovering-one-year_n_1832733.html
- ²⁵ Nellis, H. 2013. Writing contest highlights crossing artifacts. Recorder News. Accessed on March 14, 2014 from http://www.recordernews.com/iPad/localnews/01122013_artifact
- ²⁶ Schoharie Creek Debris Assessment. AECOM Technology Corporation, March 2013
- ²⁷ Federal Emergency Management Agency. 2014. Recovery Support Functions: Mission and Expected Outcomes. Access from <http://www.fema.gov/recovery-support-functions-on-March-27>, 2014.



V. Additional materials

F. Glossary

AARP	American Association of Retired Persons
ADA	Americans with Disabilities Act
BFE	Base Flood Elevation
BOA	Brownfield Opportunity Area
Canal Corp	New York State Canal Corporation
CBA	Cost-Benefit Analysis
CDBG-DR	Community Development Block Grant-Disaster Recovery
DEC	Department of Environmental Conservation
DHS	Department of Homeland Security
DOH	Department of Health
DOS	Department of State
DOT	Department of Transportation
DPW	Department of Public Works
EMS	Emergency Medical Services
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
FIRM	Flood Insurance Rate Map
FNSS	Functional Needs Support Services
FMCC	Fulton Montgomery Community College
LWRP	Local Waterfront Revitalization Plan
MCBDC	Montgomery County Business Development Center
MOU	Memorandum of Understanding
MVGO	Mohawk Valley Gateway Overlook
MVREDC	Mohawk Valley Regional Economic Development Council



N/A	Not applicable
NOAA	National Oceanic and Atmospheric Administration
NYRCR	NY Rising Community Reconstruction (Plan / Program)
NYS	New York State
OEM	Office of Emergency Management
OPRHP	(New York State) Office of Parks, Recreation and Historic Preservation
REDC	Regional Economic Development Council
RSF	Recovery support function
SART	State Agency Review Team
SWCD	Soil and Water Conservation District
TDD	Telecommunications for the Deaf Devices
TIGER	Transportation Investment Generating Economic Recovery
TTY	Text Telephone
U.S.	United States
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency

G. Photo credits

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Extensive damage was sustained by the Erie Canal Locks in Tribes Hill and Amsterdam from Hurricane Irene.

Source: Rick Sager, Montgomery County Emergency Management

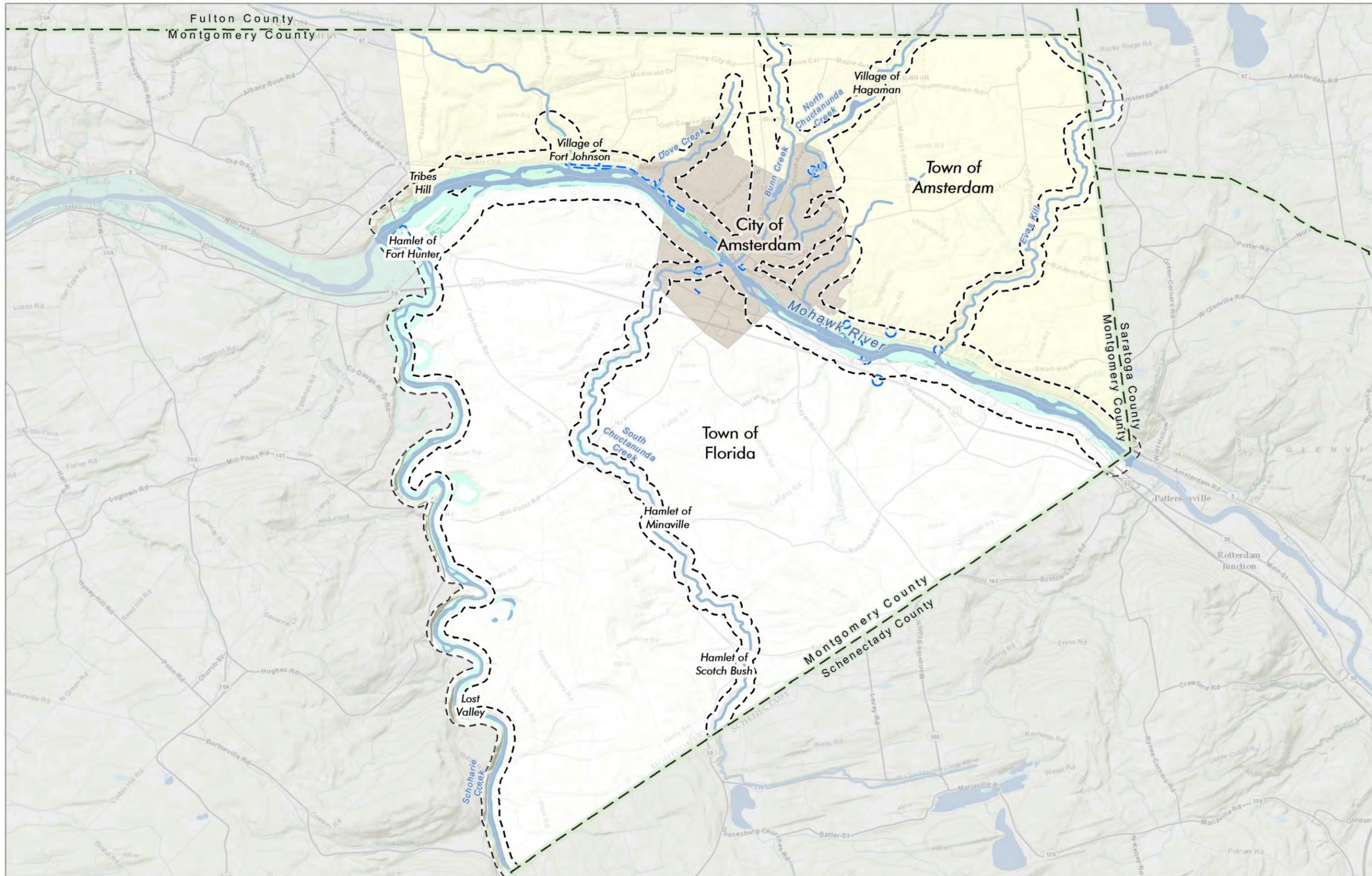
Appendix A. Geographic Study Area



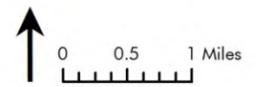
The Harrower Mill Dam along the Chuctanunda Creek (Town of Amsterdam) employed turbines for power at its adjacent namesake factory (now demolished) for the production of dyes for the carpet industry in the early 1900s.

Source: E & E

Appendix A: Geographic study area
 City and Town of Amsterdam
 Town of Florida



- Legend**
- County Boundary
 - Extreme Risk Area
 - Moderate Risk Area (500-year flood plain)
 - High Risk Area (100-year flood plain)
 - Project Study Area Buffer
 - City of Amsterdam
 - Town of Amsterdam
 - Town of Florida
 - Water



ESRI - World Topo Imagery





Historic site suffers damage from Hurricane Irene
Source: Canal Corp

Appendix B. Map Series: Community Asset Inventory

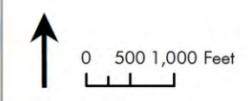


Drainage ditches and the historic Erie Canal channels are used in the hamlet of Fort Hunter for stormwater conveyance.

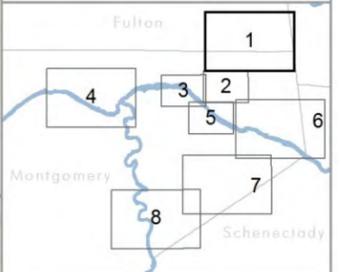
Source: The LA Group

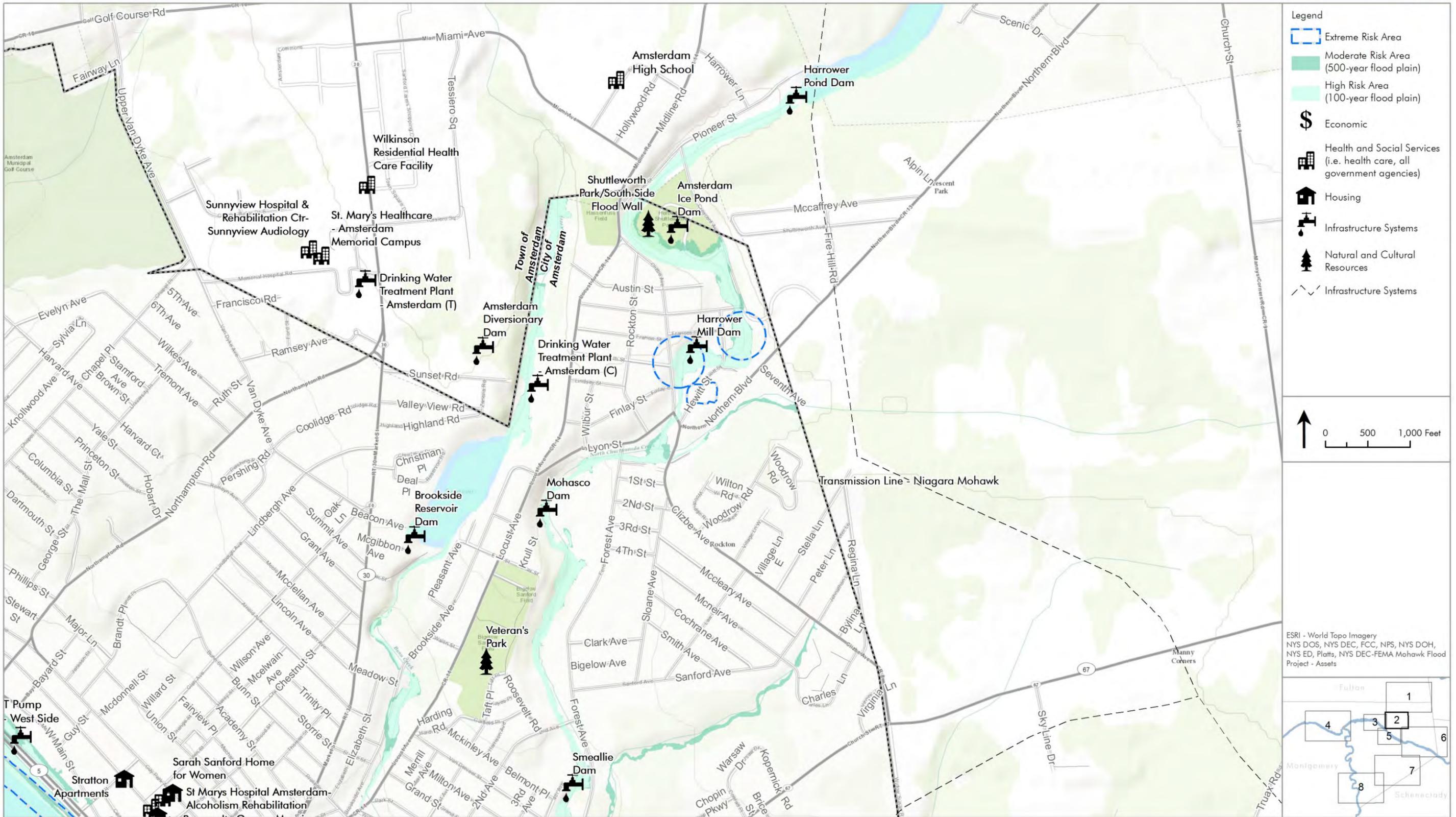


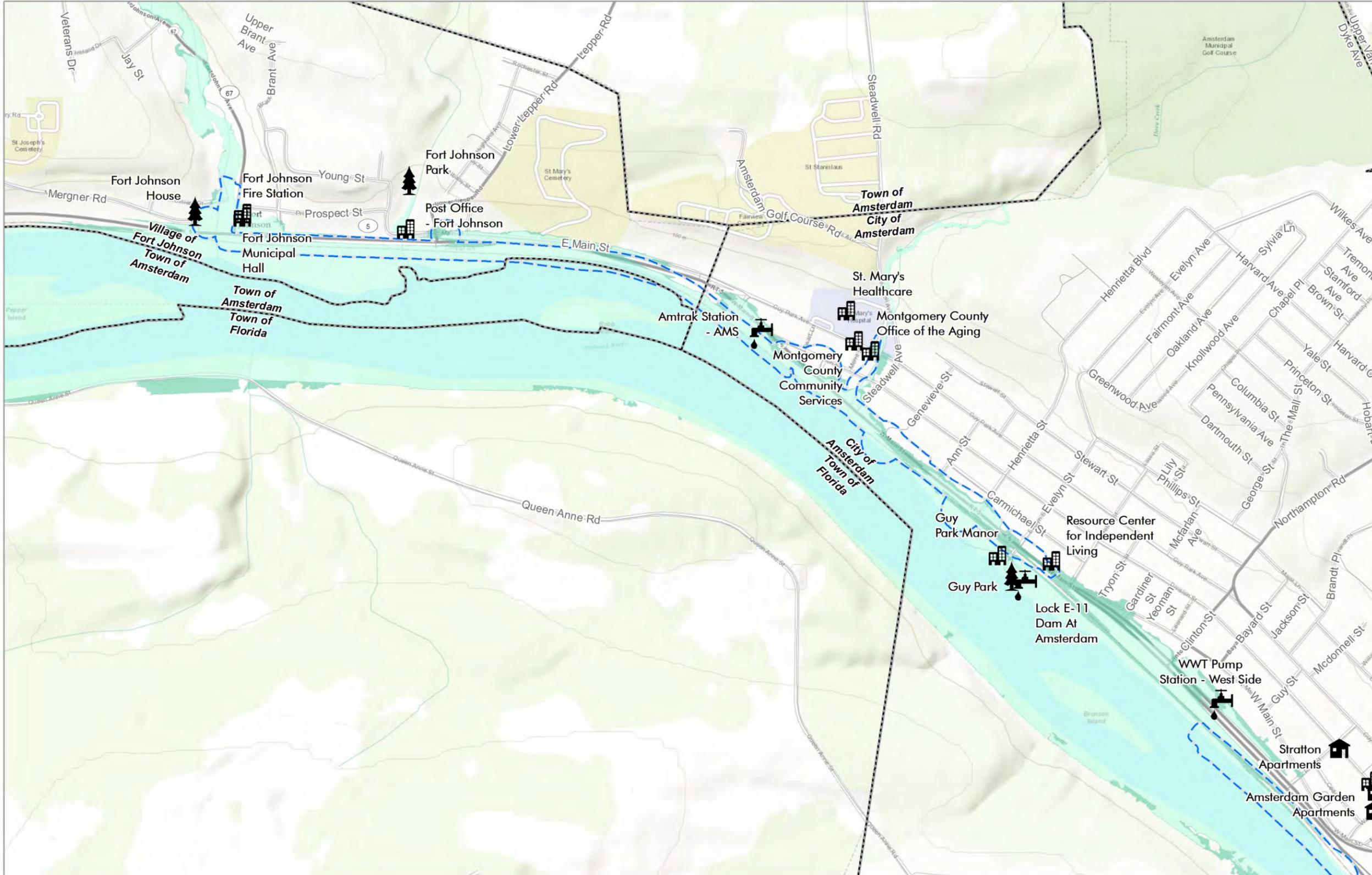
- Legend**
- Extreme Risk Area
 - Moderate Risk Area (500-year flood plain)
 - High Risk Area (100-year flood plain)
 - Economic
 - Health and Social Services (i.e. health care, all government agencies)
 - Housing
 - Infrastructure Systems
 - Natural and Cultural Resources
 - Infrastructure Systems



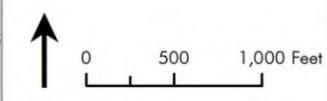
ESRI - World Topo Imagery
 NYS DOS, NYS DEC, FCC, NPS, NYS DOH,
 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets



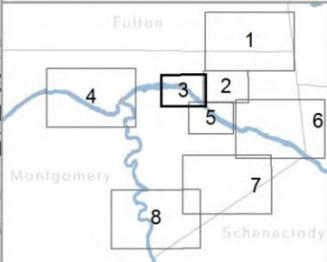


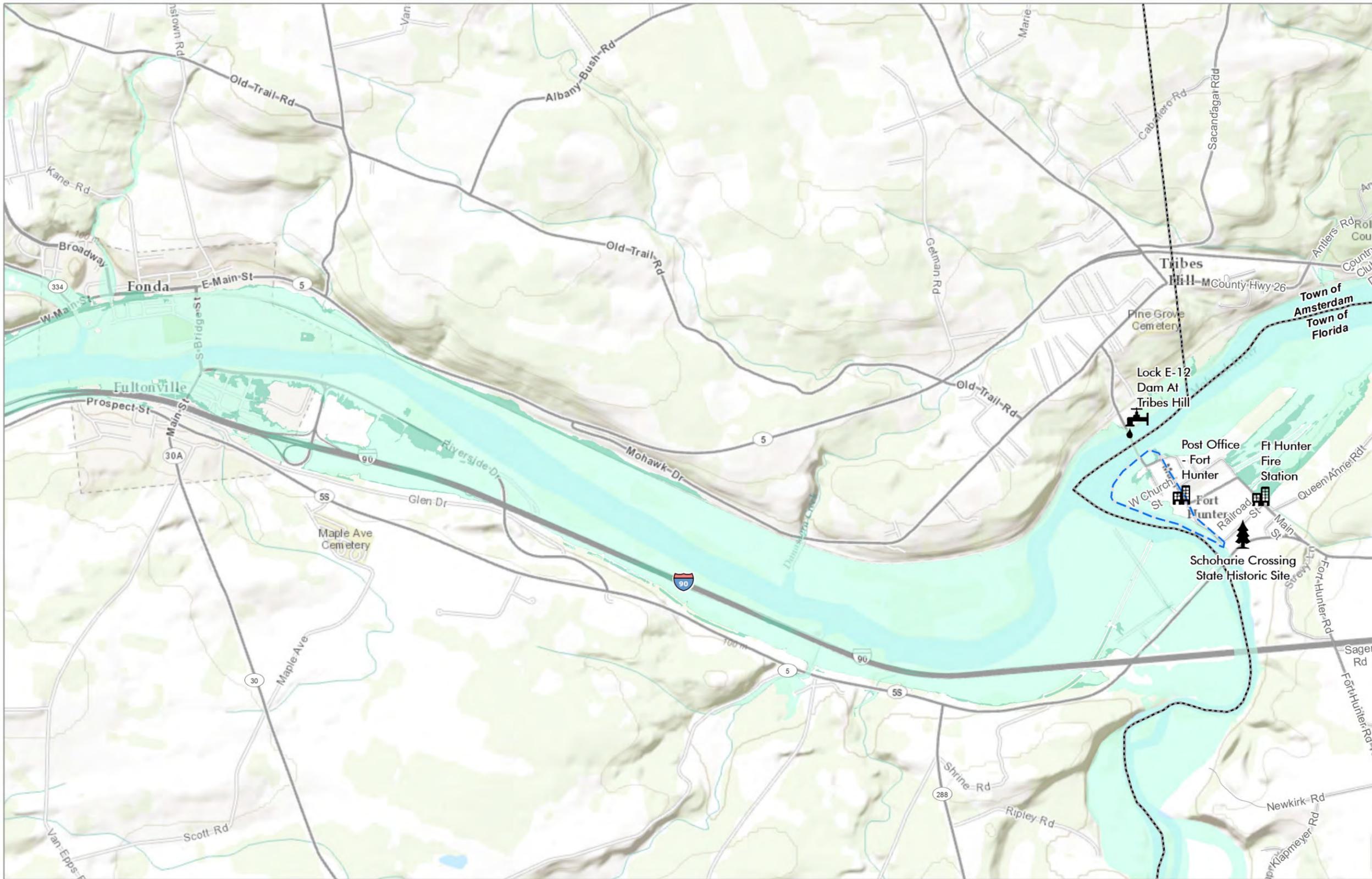


- Legend**
- Extreme Risk Area
 - Moderate Risk Area (500-year flood plain)
 - High Risk Area (100-year flood plain)
 - \$ Economic
 - 🏥 Health and Social Services (i.e. health care, all government agencies)
 - 🏠 Housing
 - 🚰 Infrastructure Systems
 - 🌲 Natural and Cultural Resources
 - 🚧 Infrastructure Systems

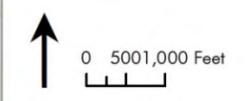


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 Project - Assets

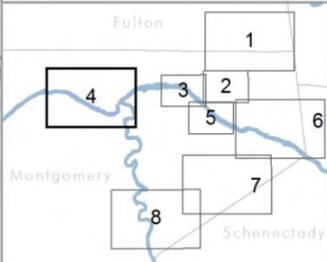


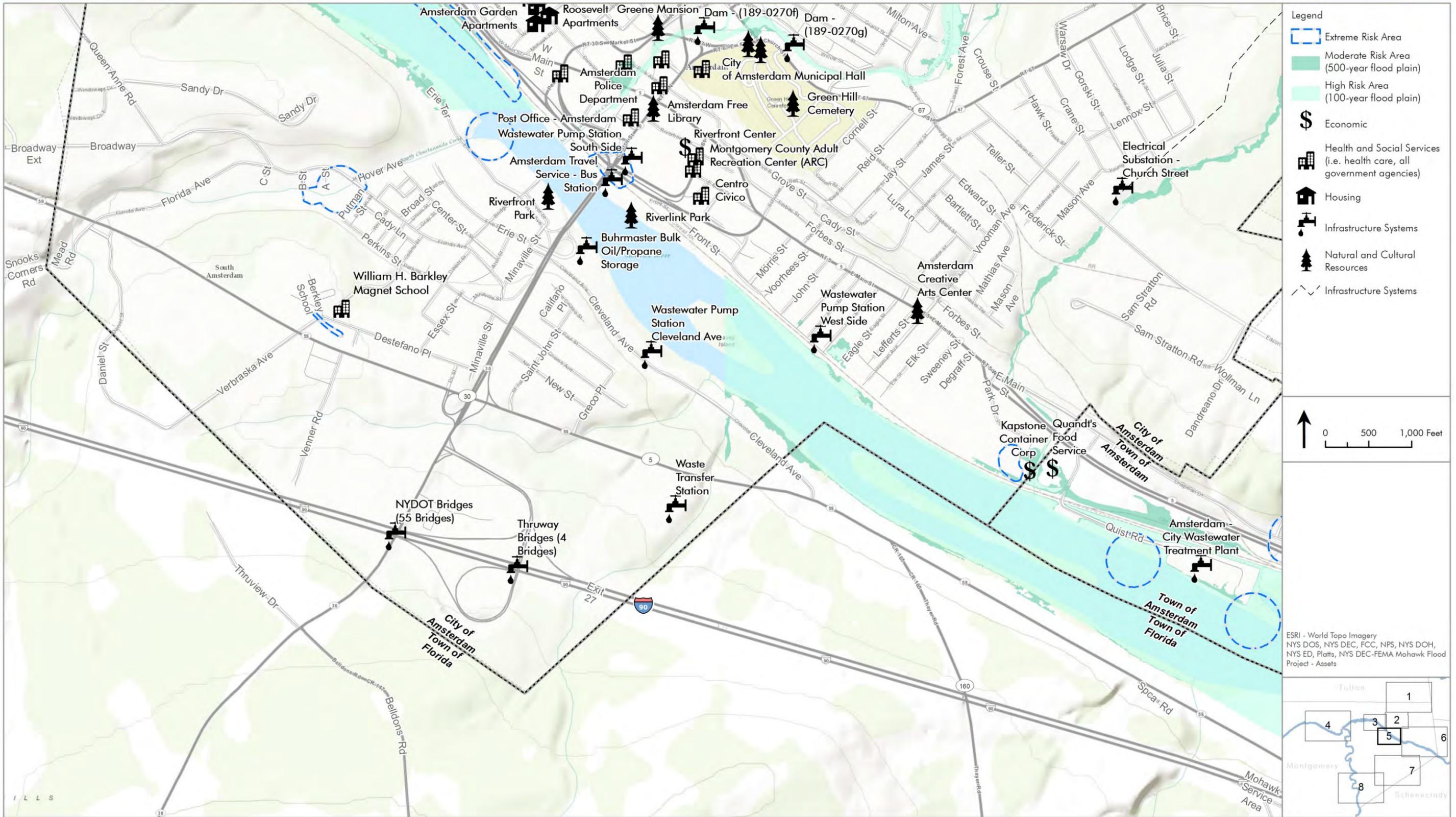


- Legend
- Extreme Risk Area
 - Moderate Risk Area (500-year flood plain)
 - High Risk Area (100-year flood plain)
 - Economic
 - Health and Social Services (i.e. health care, all government agencies)
 - Housing
 - Infrastructure Systems
 - Natural and Cultural Resources
 - Infrastructure Systems

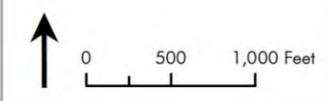


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 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets

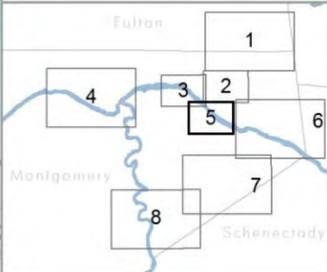


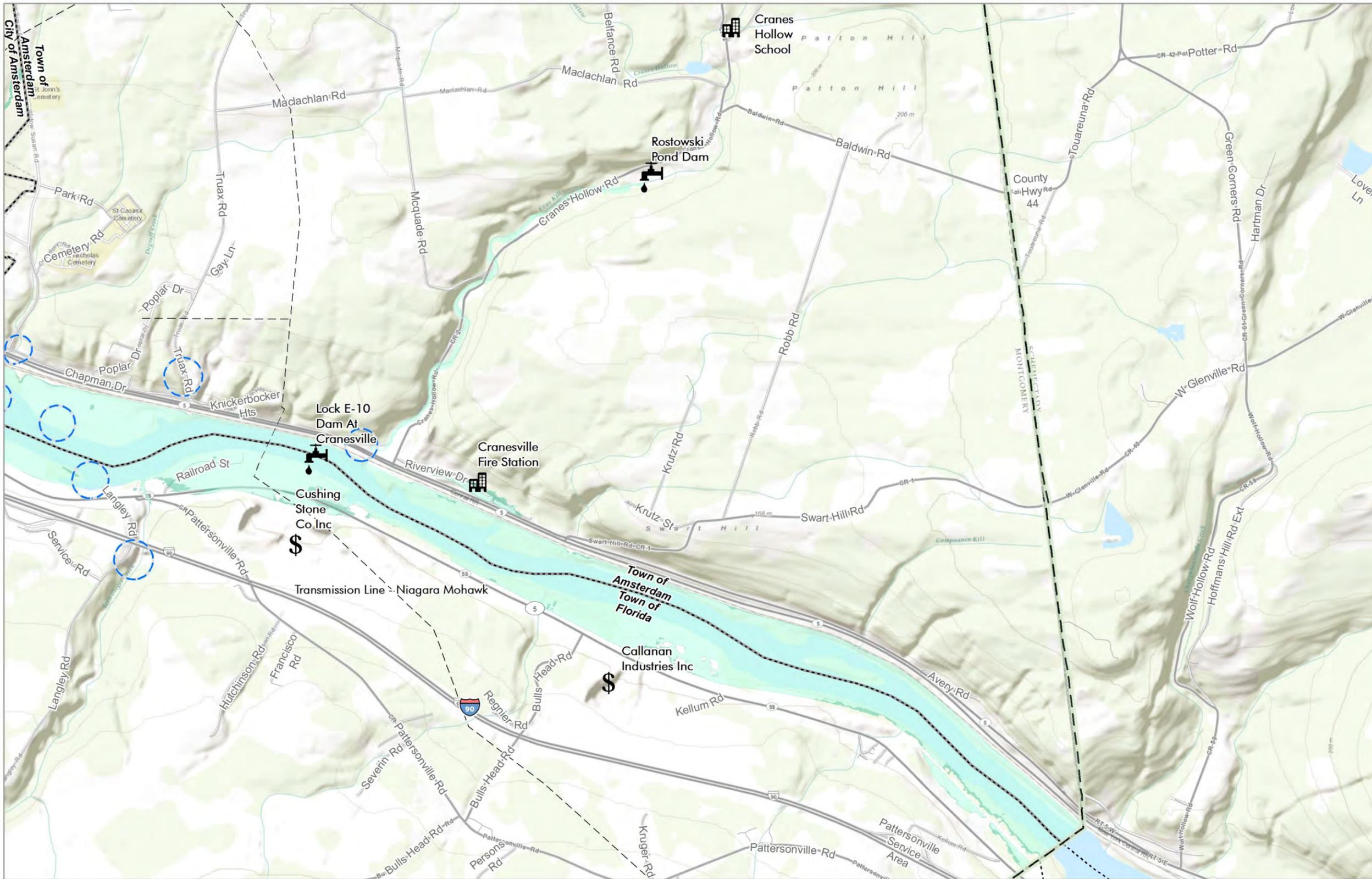


- Legend
- Extreme Risk Area
 - Moderate Risk Area (500-year flood plain)
 - High Risk Area (100-year flood plain)
 - \$ Economic
 - 🏠 Health and Social Services (i.e. health care, all government agencies)
 - 🏠 Housing
 - 🚧 Infrastructure Systems
 - 🌲 Natural and Cultural Resources
 - 🚧 Infrastructure Systems

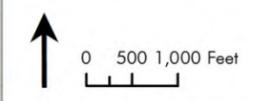


ESRI - World Topo Imagery
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 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets

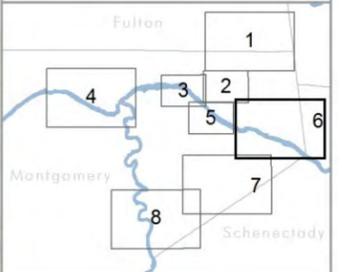


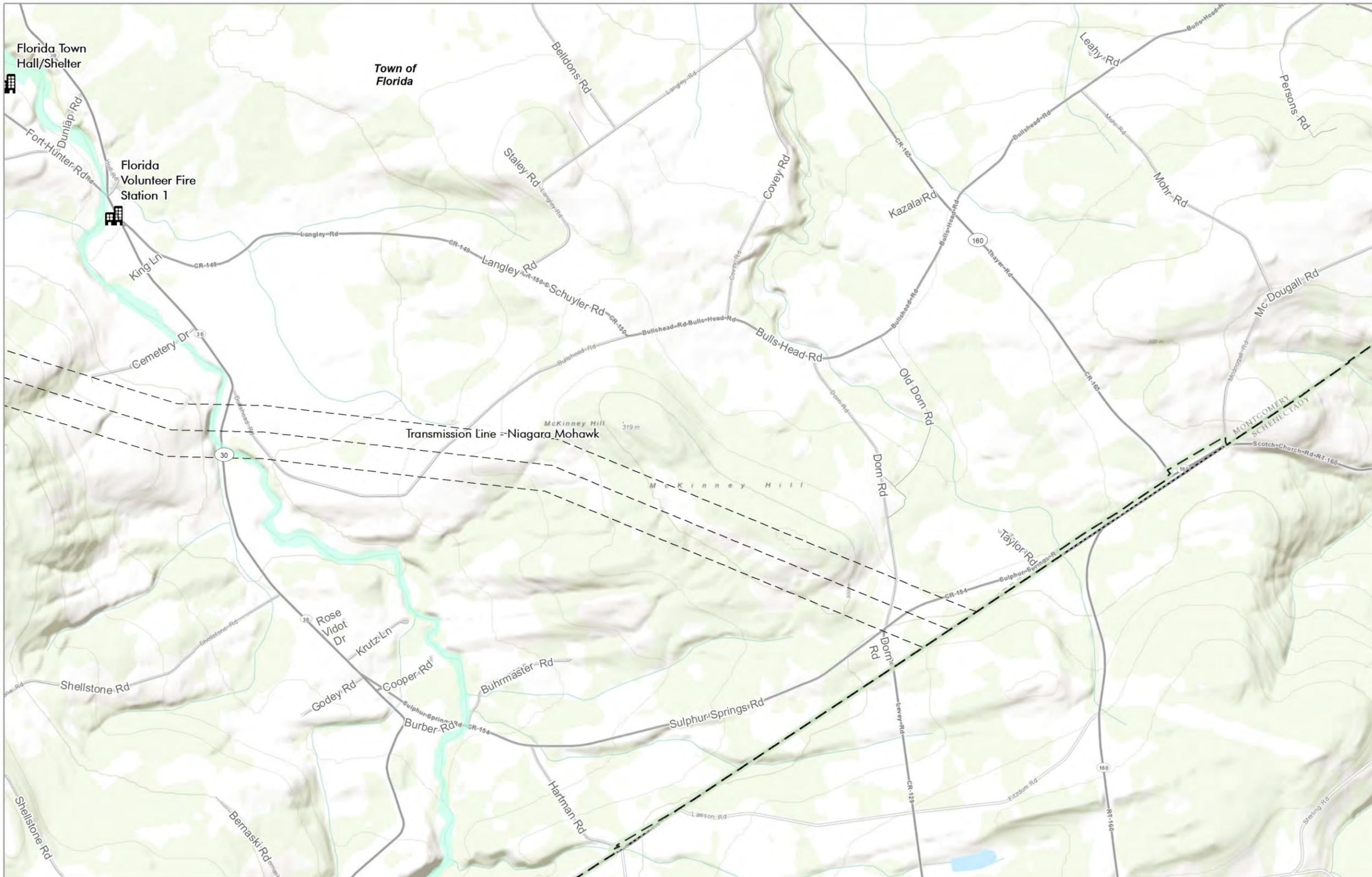


- Legend
- Extreme Risk Area
 - Moderate Risk Area (500-year flood plain)
 - High Risk Area (100-year flood plain)
 - \$ Economic
 - 🏠 Health and Social Services (i.e. health care, all government agencies)
 - 🏠 Housing
 - 🏗️ Infrastructure Systems
 - 🌲 Natural and Cultural Resources
 - 🏗️ Infrastructure Systems

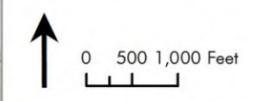


ESRI - World Topo Imagery
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 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets

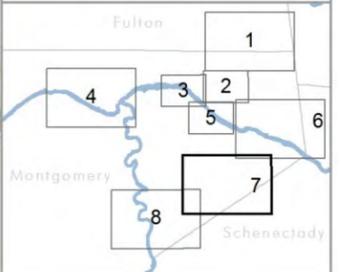


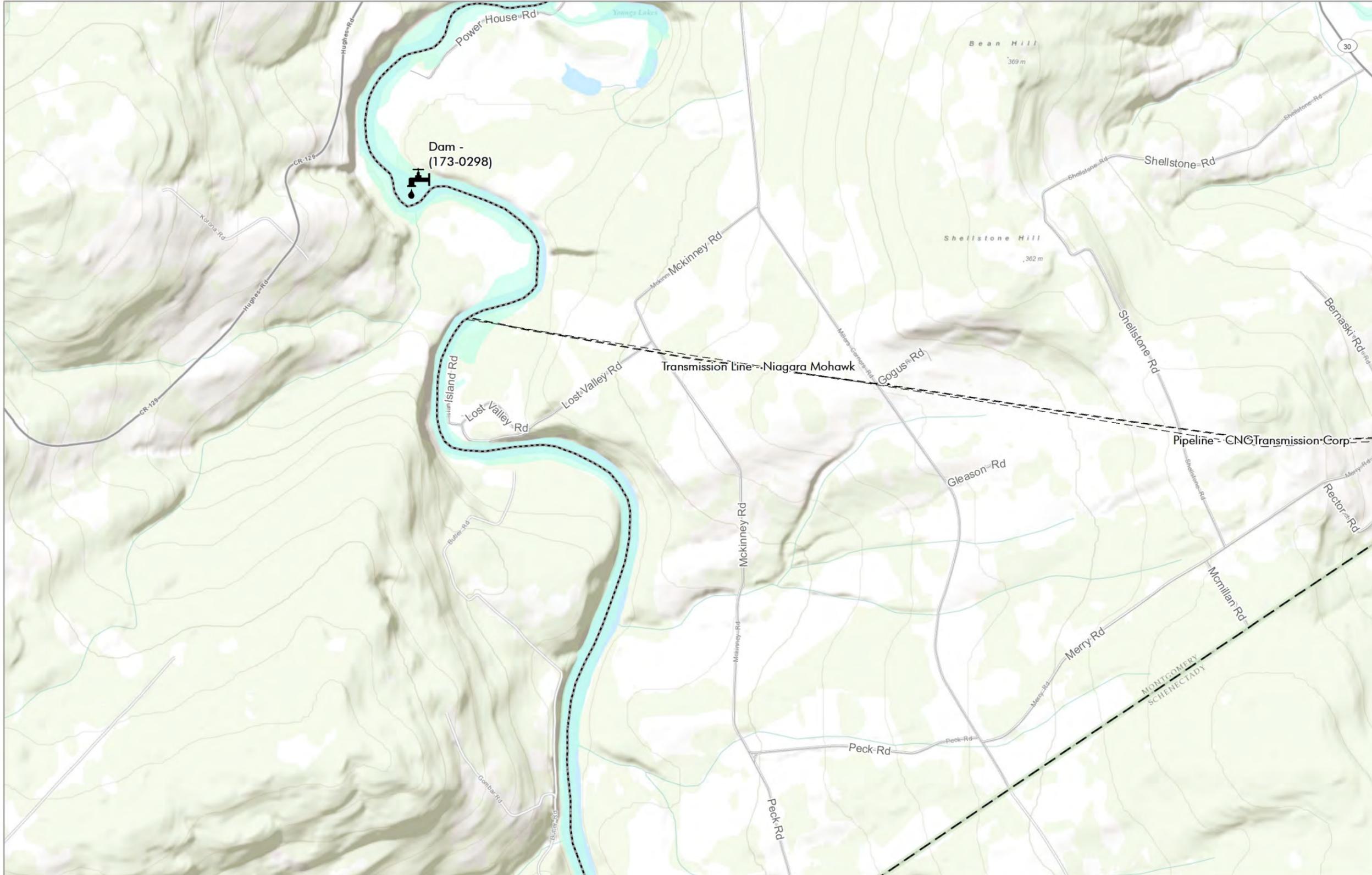


- Legend
- Extreme Risk Area
 - Moderate Risk Area (500-year flood plain)
 - High Risk Area (100-year flood plain)
 - Economic
 - Health and Social Services (i.e. health care, all government agencies)
 - Housing
 - Infrastructure Systems
 - Natural and Cultural Resources
 - Infrastructure Systems

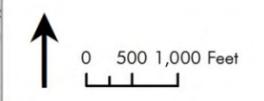


ESRI - World Topo Imagery
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 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets

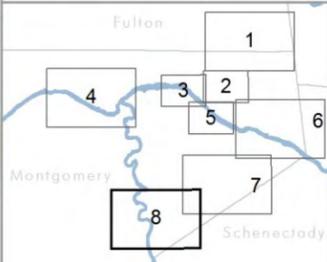




- Legend
- Extreme Risk Area
 - Moderate Risk Area (500-year flood plain)
 - High Risk Area (100-year flood plain)
 - \$ Economic
 - 🏠 Health and Social Services (i.e. health care, all government agencies)
 - 🏠 Housing
 - 🏗️ Infrastructure Systems
 - 🌲 Natural and Cultural Resources
 - ⚡ Infrastructure Systems



ESRI - World Topo Imagery
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 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets





**The Schoharie crossing aqueduct—remnants
of the community's Erie Canal heritage**

Source: Canal Corp

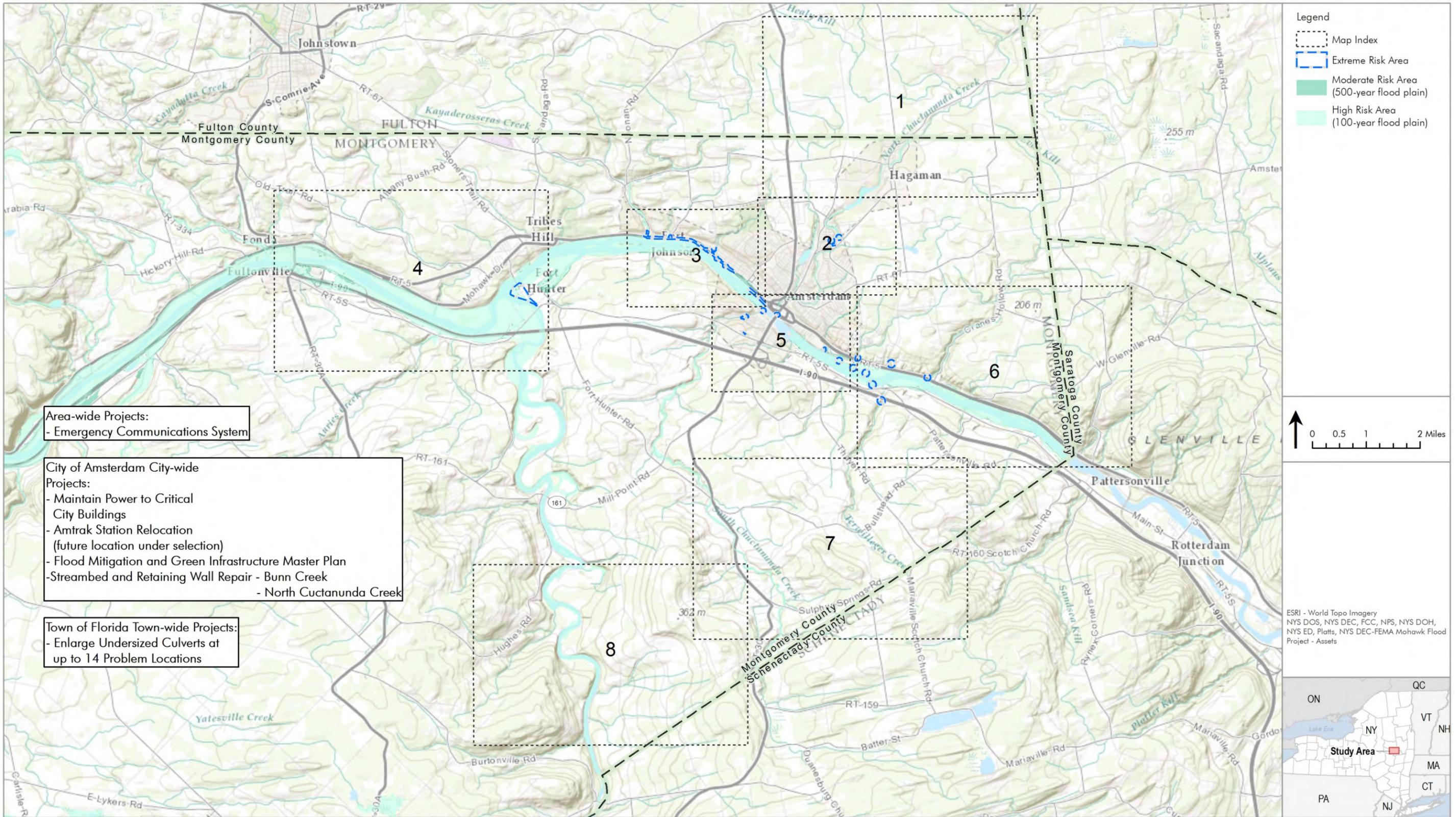


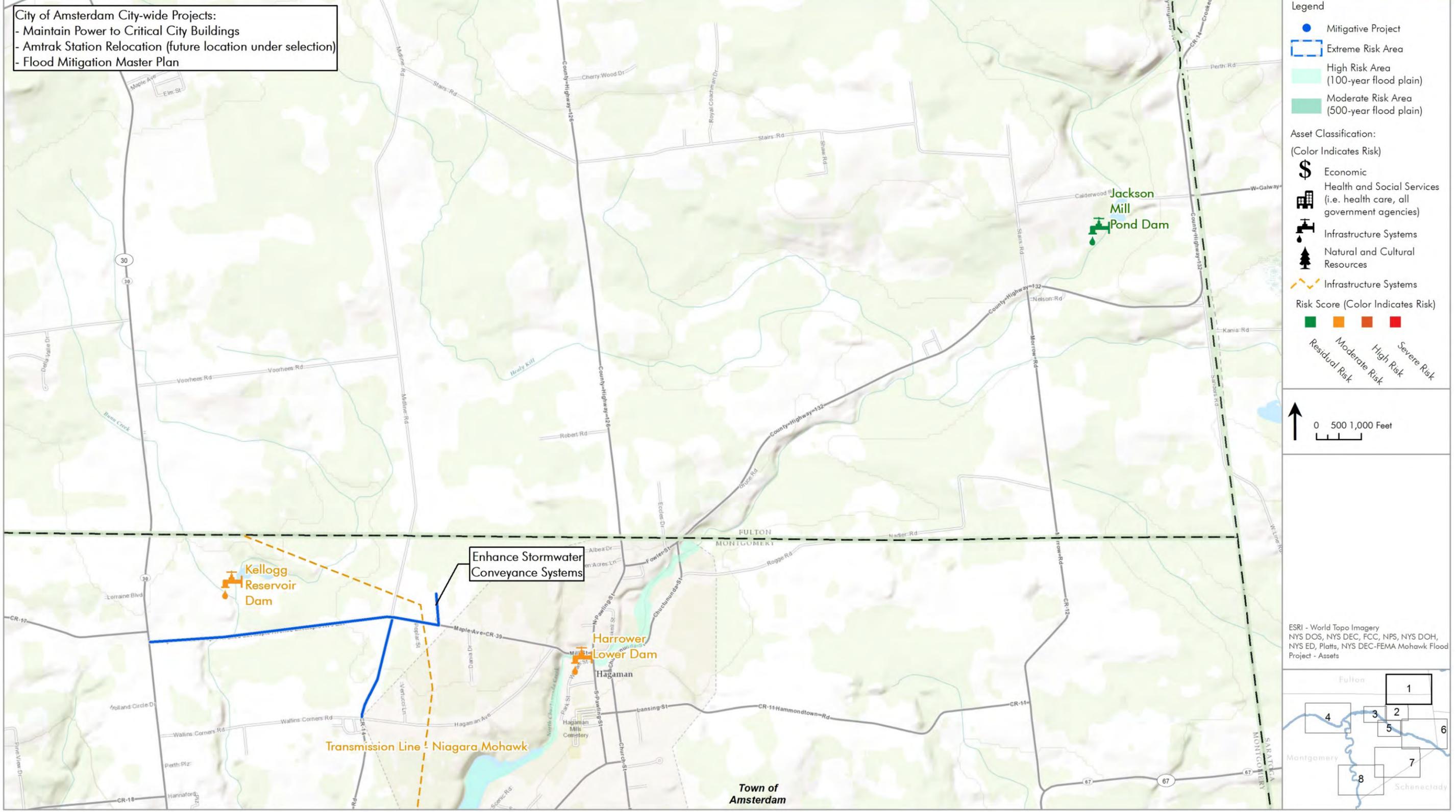
Appendix C. Map Series: At Risk Community Assets and Projects

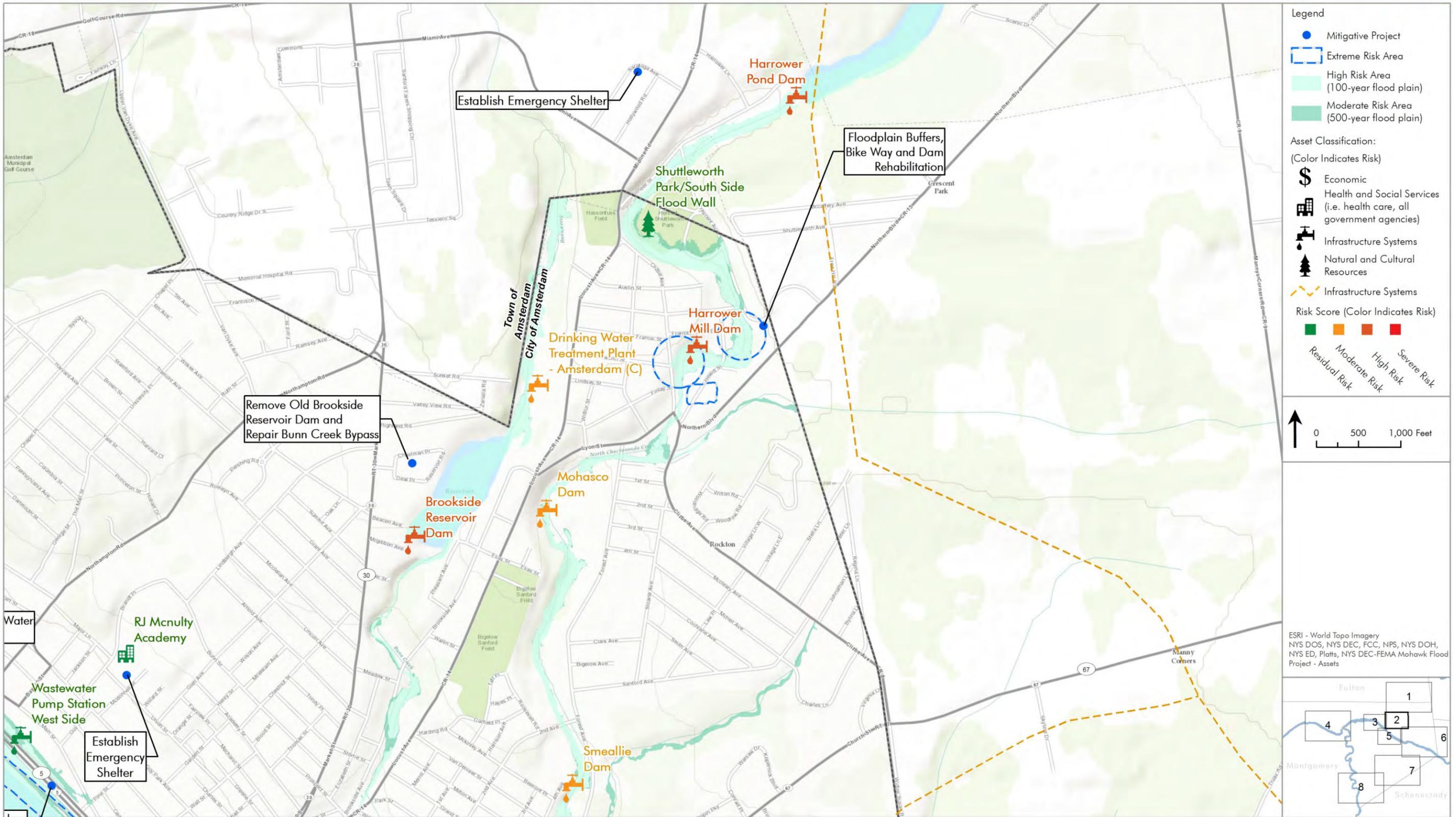


Erie Canal Lock E-11 was pummeled by floodwaters on the Mohawk River during Irene.
Source: Walter Elwood Museum

Appendix C: Map series: at-risk assets and mitigative projects
 City and Town of Amsterdam
 Town of Florida
 Overview







Legend

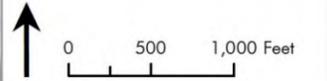
- Mitigative Project (Blue dot)
- Extreme Risk Area (Blue dashed outline)
- High Risk Area (100-year flood plain) (Light green)
- Moderate Risk Area (500-year flood plain) (Medium green)

Asset Classification:
 (Color Indicates Risk)

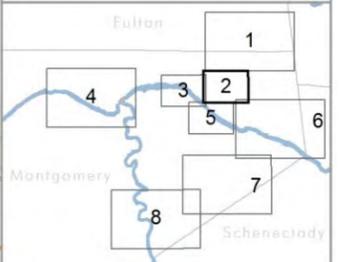
- Economic (Dollar sign icon)
- Health and Social Services (i.e. health care, all government agencies) (Building icon)
- Infrastructure Systems (Tower icon)
- Natural and Cultural Resources (Tree icon)
- Infrastructure Systems (Dashed orange line icon)

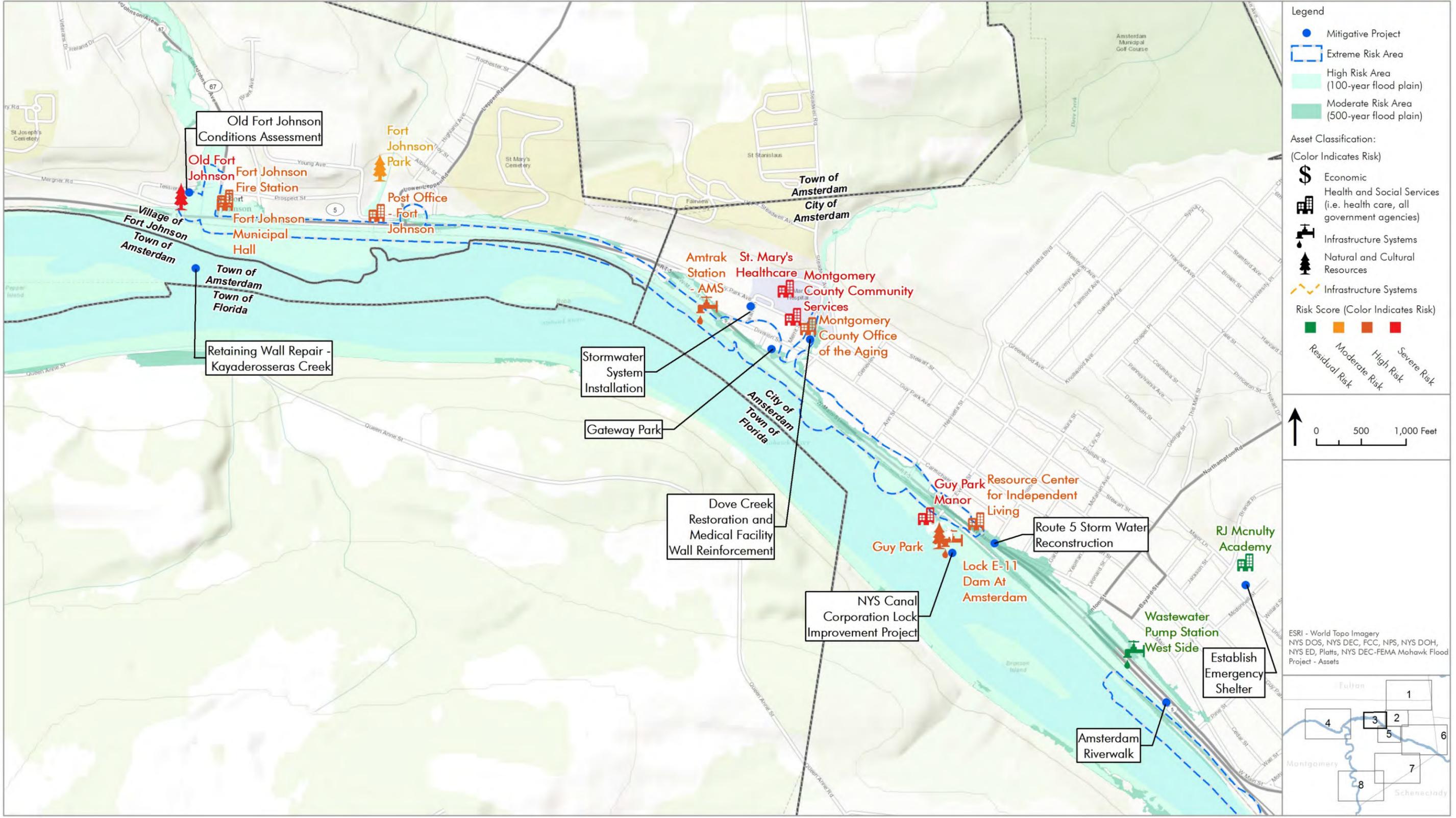
Risk Score (Color Indicates Risk)

- Residual Risk (Green)
- Moderate Risk (Orange)
- High Risk (Red)
- Severe Risk (Dark Red)

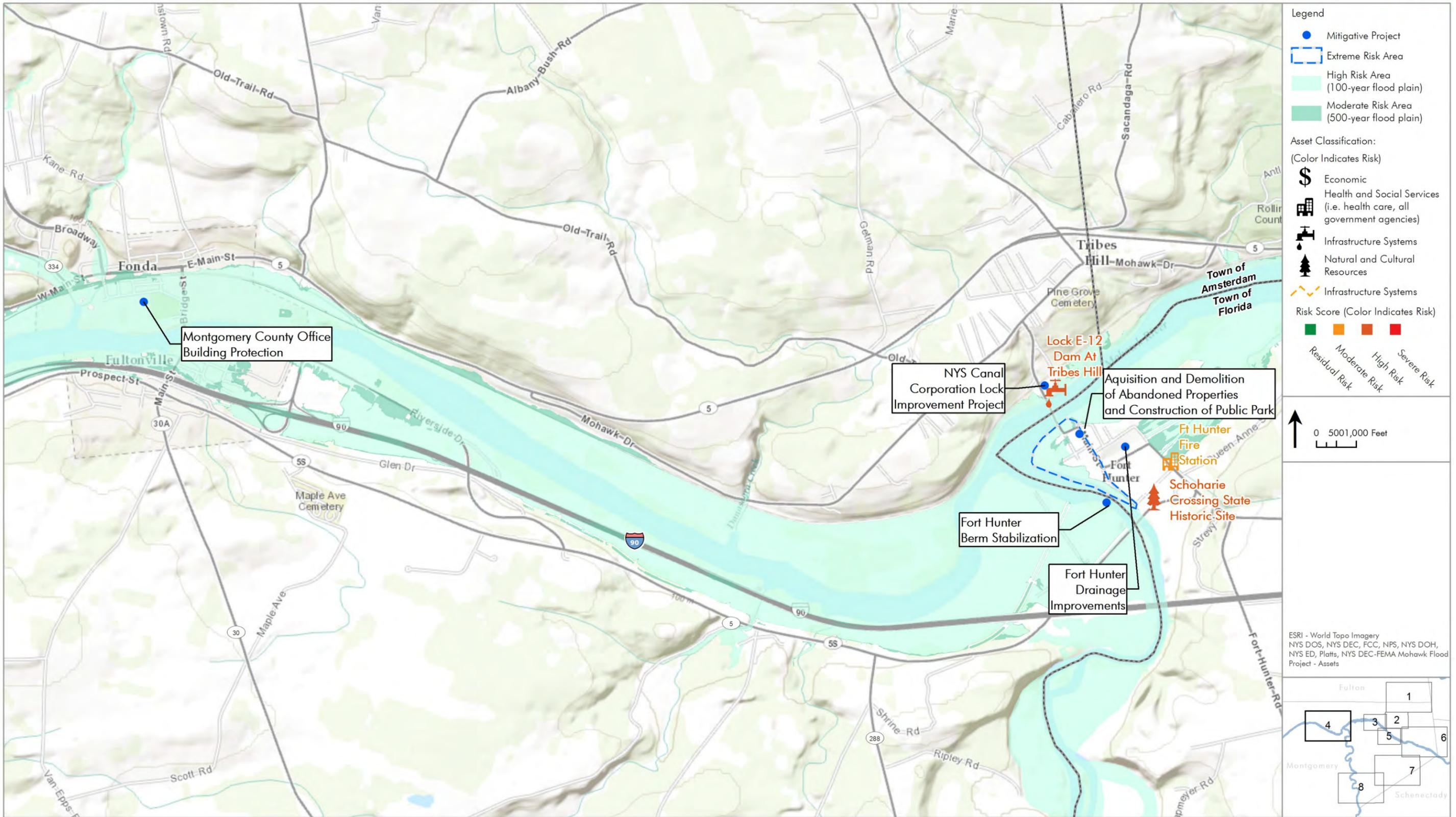


ESRI - World Topo Imagery
 NYS DOS, NYS DEC, FCC, NPS, NYS DOH,
 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets





ESRI - World Topo Imagery
 NYS DOS, NYS DEC, FCC, NPS, NYS DOH,
 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets



Legend

- Mitigative Project
- Extreme Risk Area
- High Risk Area (100-year flood plain)
- Moderate Risk Area (500-year flood plain)

Asset Classification:
 (Color Indicates Risk)

- Economic
- Health and Social Services (i.e. health care, all government agencies)
- Infrastructure Systems
- Natural and Cultural Resources

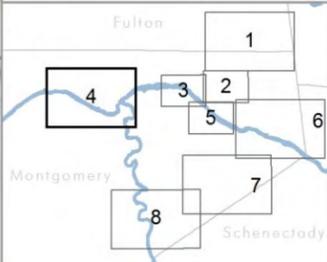
Infrastructure Systems

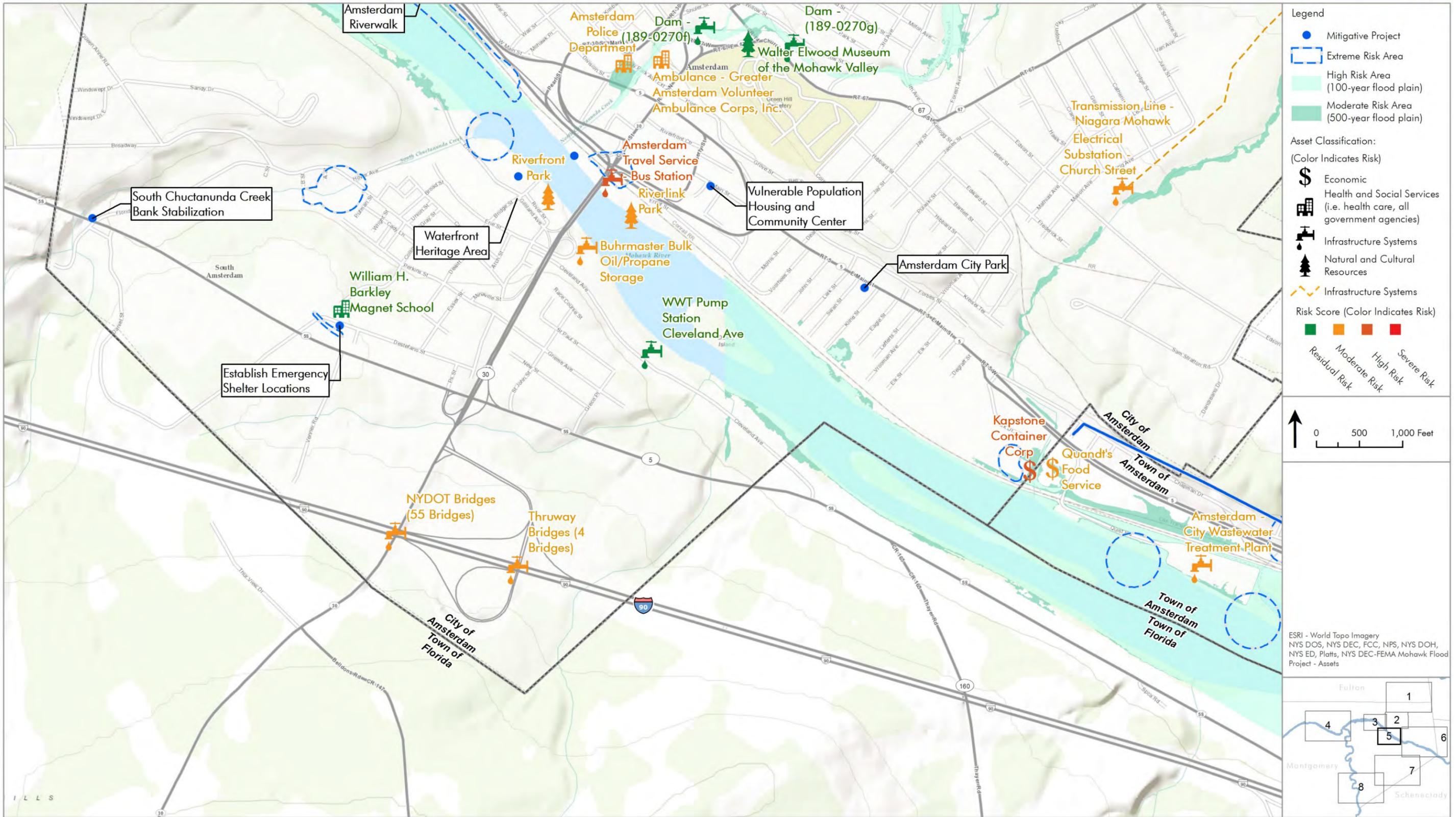
Risk Score (Color Indicates Risk)

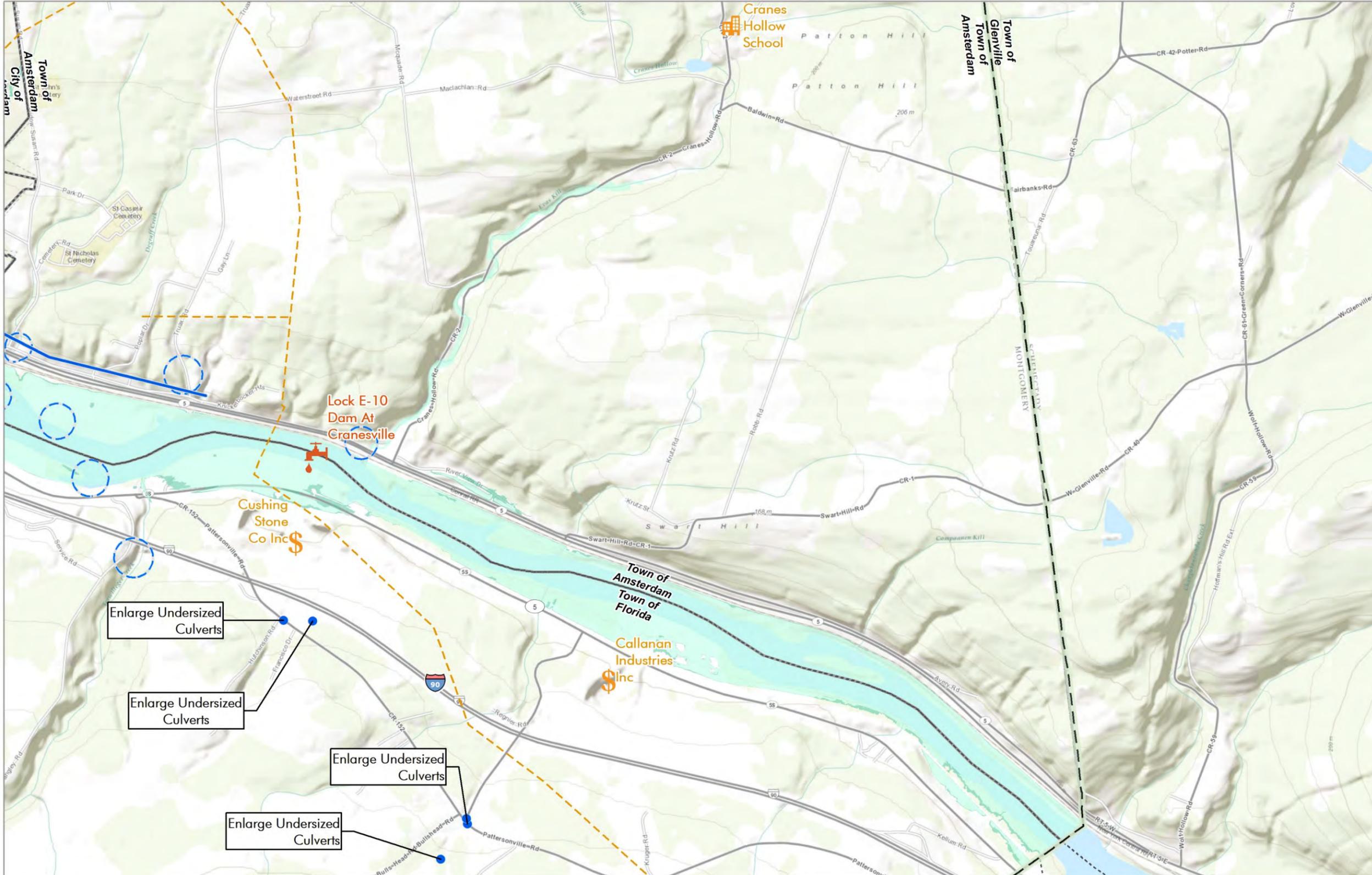
- Residual Risk
- Moderate Risk
- High Risk
- Severe Risk

0 5001,000 Feet

ESRI - World Topo Imagery
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 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets







Legend

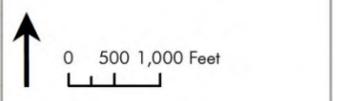
- Mitigative Project
- Extreme Risk Area
- High Risk Area (100-year flood plain)
- Moderate Risk Area (500-year flood plain)

Asset Classification:
 (Color Indicates Risk)

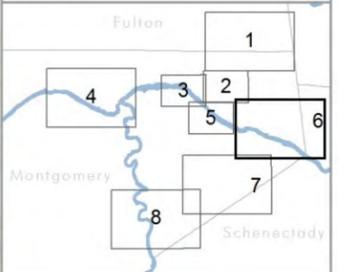
- \$ Economic
- 🏠 Health and Social Services (i.e. health care, all government agencies)
- 🚧 Infrastructure Systems
- 🌳 Natural and Cultural Resources
- 🚧 Infrastructure Systems

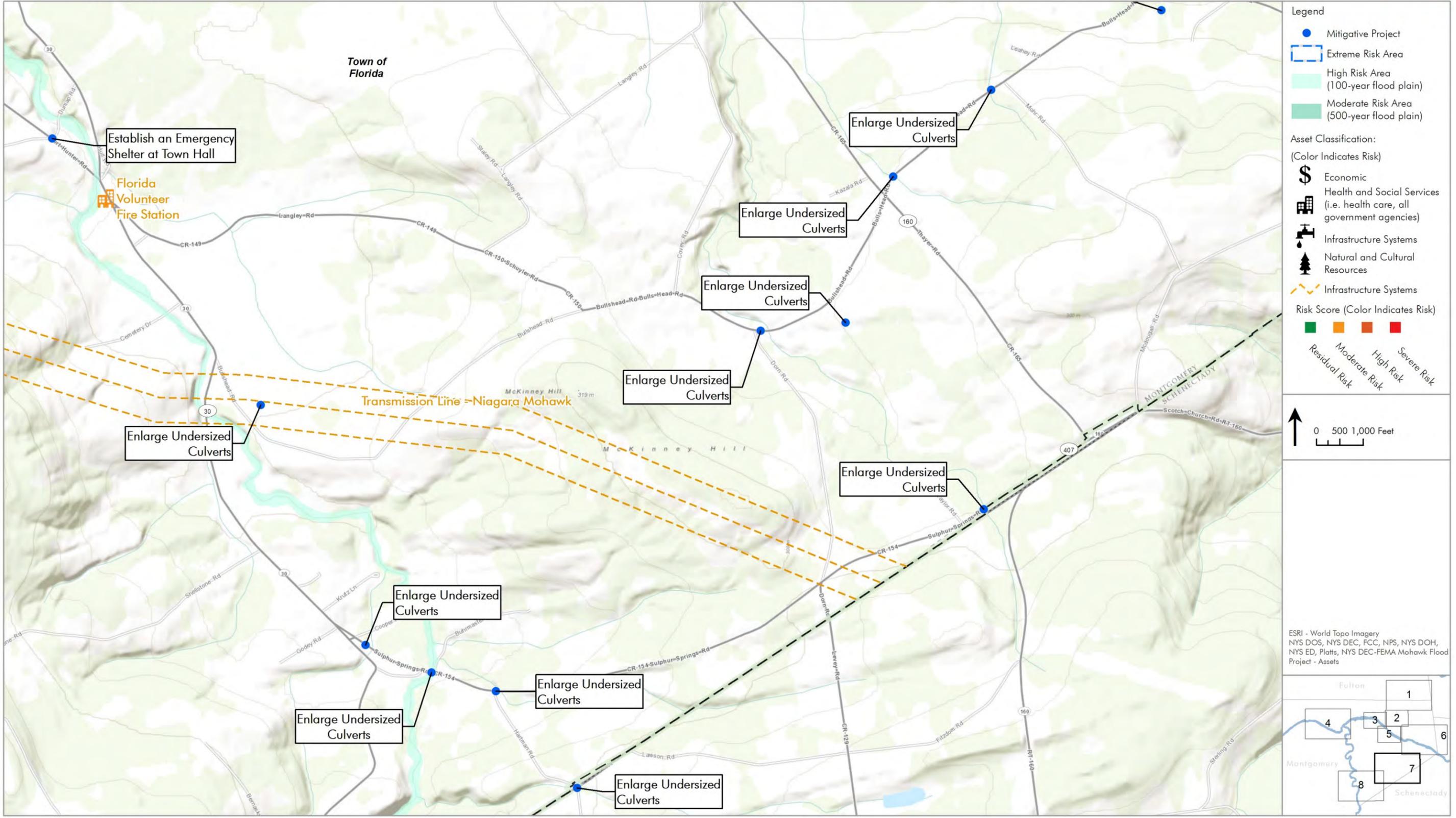
Risk Score (Color Indicates Risk)

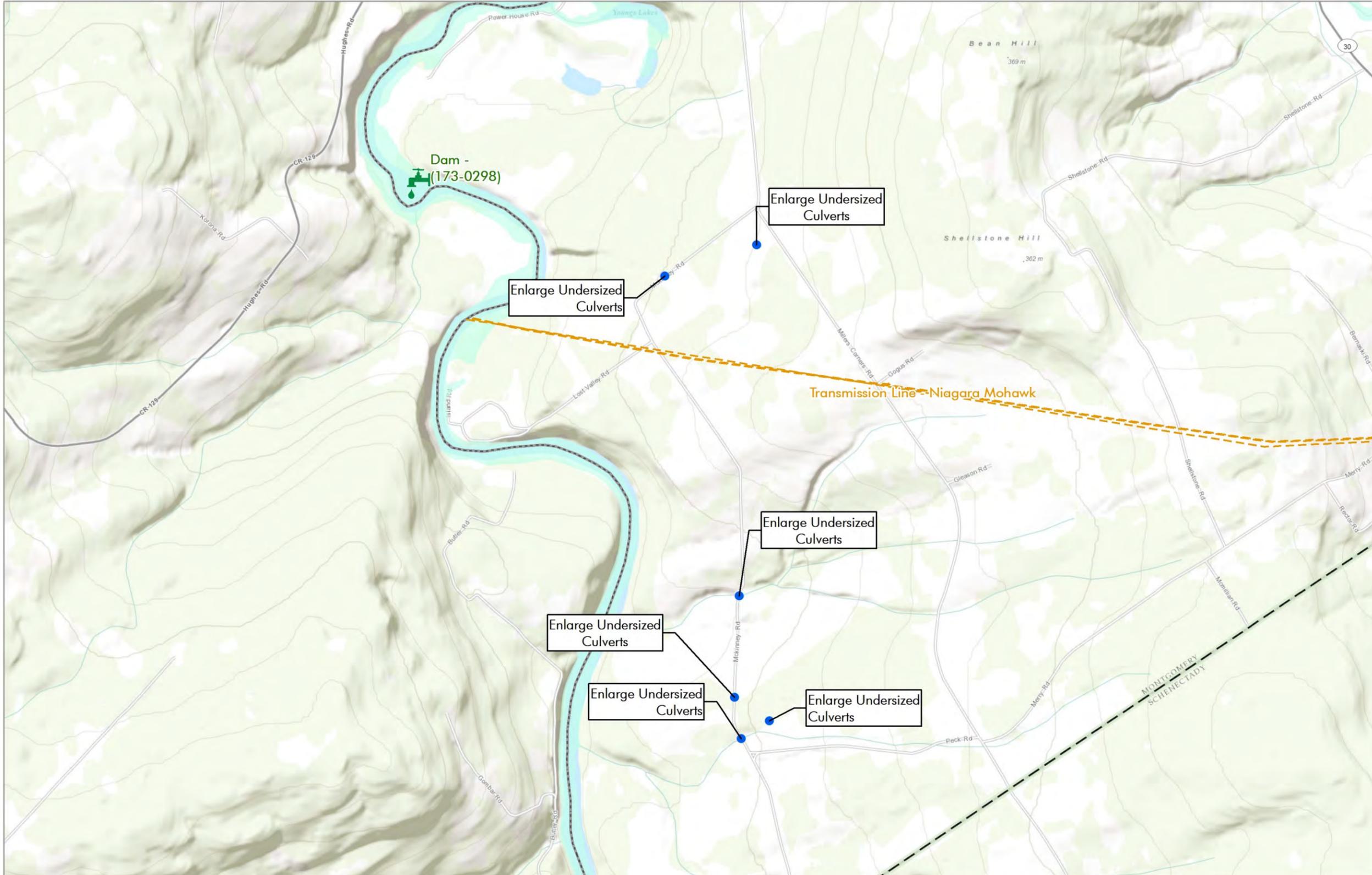
- Residual Risk
- Moderate Risk
- High Risk
- Severe Risk



ESRI - World Topo Imagery
 NYS DOS, NYS DEC, FCC, NPS, NYS DOH,
 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets







Legend

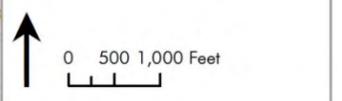
- Mitigative Project
- ▭ Extreme Risk Area
- ▭ High Risk Area (100-year flood plain)
- ▭ Moderate Risk Area (500-year flood plain)

Asset Classification:
 (Color Indicates Risk)

- 💰 Economic
- 🏠 Health and Social Services (i.e. health care, all government agencies)
- 🏗️ Infrastructure Systems
- 🌳 Natural and Cultural Resources
- 🔧 Infrastructure Systems

Risk Score (Color Indicates Risk)

- 🟢 Residual Risk
- 🟡 Moderate Risk
- 🟠 High Risk
- 🔴 Severe Risk



ESRI - World Topo Imagery
 NYS DOS, NYS DEC, FCC, NPS, NYS DOH,
 NYS ED, Platts, NYS DEC-FEMA Mohawk Flood
 Project - Assets

