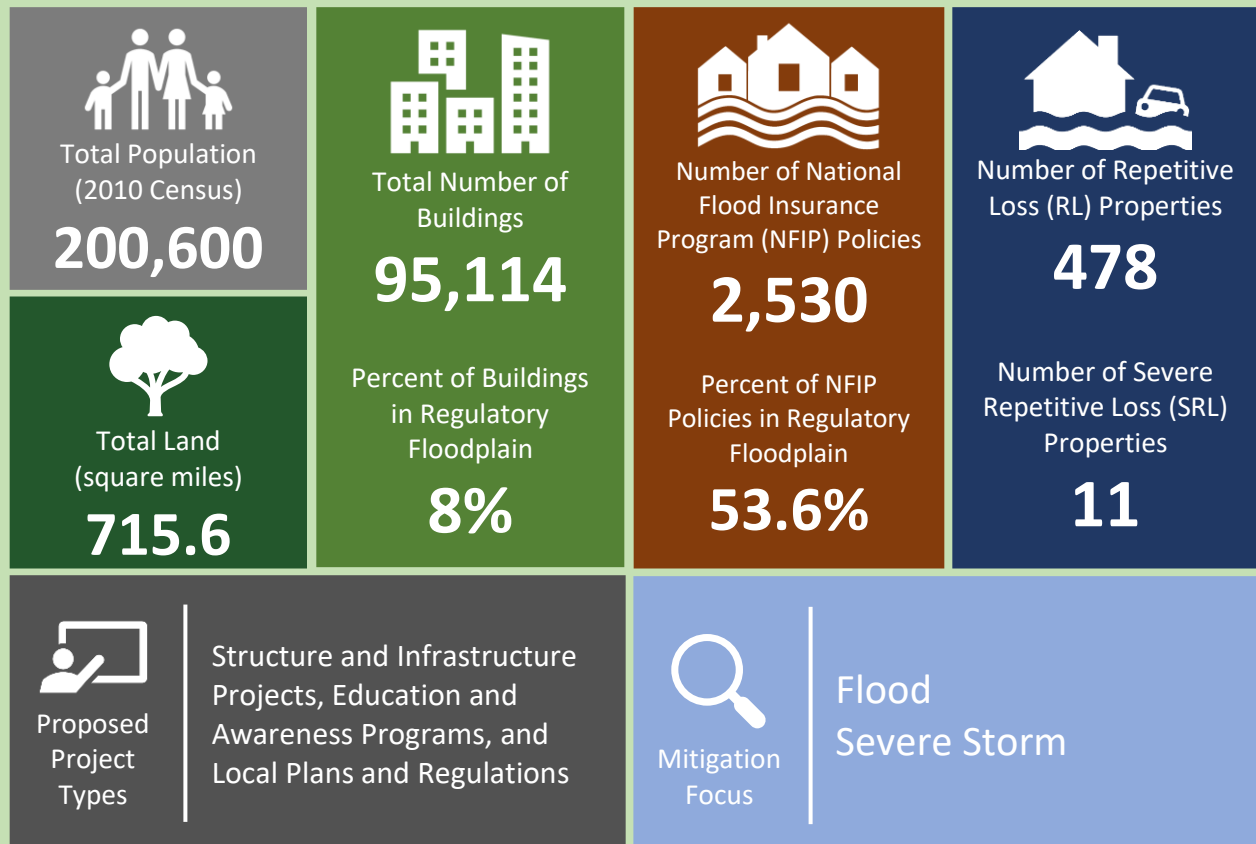
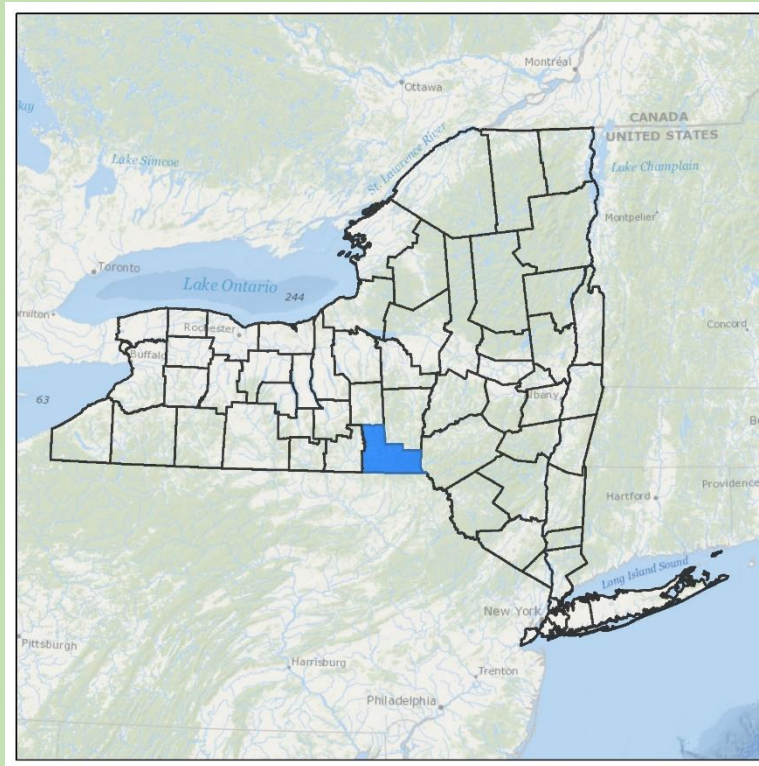




MUNICIPAL ANNEX | Broome County





9.1 BROOME COUNTY

This section presents the jurisdictional annex for Broome County.

9.1.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Nazar Logvis, Engineer Broome County Office Building 60 Hawley Street, P.O. Box 1766, Binghamton, NY 13902 607-778-2490 nlogvis@co.broome.ny.us	Leslie Boulton, Dep Comm of Engineering Broome County Office Building 60 Hawley Street, P.O. Box 1766, Binghamton, NY 13902 607-778-2490 lboulton@co.broome.ny.us

9.1.2 Municipal Profile

Section 4 (County Profile), Volume I of this HMP includes details on Broome County’s population, location, climate, history, growth, and development.

9.1.3 Hazard Event History Specific to the County

Broome County has a history of natural hazard events, as detailed in Volume I, Section 5.0 (Risk Assessment) of this HMP. Since 1954, Broome County has been included in 25 FEMA disaster declarations. Of which, eight were identified as flooding incidents, eight identified as severe storm incidents, four identified as snow incidents, two identified as hurricane incidents, one identified as a fire incident, and two identified as other (power outage and West Nile Virus). According to the NOAA-NCEI storm events database, a majority of the hazard events that have impacted Broome County have been severe storm-related (over 300 events since 1955), flood-related (over 100 events since 1996), and severe winter storm-related (nearly 80 events since 1996). A summary of historical events appears in each hazard profile of the plan and includes a chronology of events that have affected the County and its municipalities.

9.1.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 (Risk Assessment) of this HMP convey detailed information regarding each participating jurisdiction’s vulnerability to the identified hazards. The risk ranking methodology is presented in Section 5.3 (Risk Ranking). The County had the opportunity to adjust the final ranking based on feedback from planning partners. The following summarizes the hazard vulnerabilities and their ranking in Broome County. Section 5.0 (Risk Assessment) includes additional vulnerability information relevant to this jurisdiction.

Hazard Risk Ranking

The table below summarizes the hazard risk/vulnerability rankings of potential natural hazards for Broome County. The County has reviewed the hazard risk/vulnerability risk ranking table and has made adjustments as necessary. The drought ranking was modified from low to medium based on input from the Steering Committee and the impacts drought conditions can have on the county. The wildfire ranking was modified from medium to low as the county has no real history of wildfire occurrences.



Table 9.1-1. Hazard Risk/Vulnerability Risk Ranking

HAZARD	Drought	Earthquake	Extreme Temperature	Invasive Species	Flood	Severe Storm	Severe Winter Storm	Wildfire
RELATIVE RISK FACTOR	Medium*	Low	Medium	Low	High	Medium	Medium	Low*

Notes: The scale is based on the following hazard rankings as established in Section 5.3.
 High = Total hazard priority risk ranking score of 5 and above
 Medium = Total hazard priority risk ranking of 3.9 – 4.9
 Low = Total hazard risk ranking below 3.8
 *The county changed the initial ranking of this hazard based on event history, municipal experience, and feedback from the county

9.1.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- National Flood Insurance Program
- Integration of mitigation planning into existing and future planning mechanisms

Planning and Regulatory Capability

The table below summarizes the regulatory tools that are available to Broome County.

Table 9.1-2. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master / Comprehensive Plan	Yes – adopted 2013	County	Planning	Current plan was adopted in 2013; an update will begin in 2019
Capital Improvements Plan	Yes	Local or County	Legislature with input from Depts: Public Works, Planning, etc.	Adopted annually as part of County budget process
Floodplain Management / Basin Plan	No			County has no land use authority to enact policies/local laws for floodplain management
Stormwater Management Plan	Yes	County	Engineering	Effective March 2013
Open Space Plan	Under Development	Local or County	Environmental Management Council	EMC has been working on it for several years. Uncertain of when it will be complete.
Stream Corridor Management Plan	No	Local or Watershed		
Watershed Management or Protection Plan	Yes	Regional	Local or Watershed: Southern Tier East Regional Planning and	Have a regional plan, Susquehanna Chemung Action Plan. Not at county level but do have an inspection/maintenance plan for County flood control structures.



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
			Development Board	
Economic Development Plan	Yes	County	Planning	Component of Broome County Comprehensive Plan and The Agency (Broome County IDA) has the 2017-2020 Strategic Action Plan
Comprehensive Emergency Management Plan	Yes	Local or County	Office of Emergency Services	County Plan has been developed is under review
Emergency Operation Plan	Yes	Local or County	Office of Emergency Services	Complete and regularly under review and updated as appropriate
Evacuation Plan	No	County	Office of Emergency Services	Evacuation routes are determined at the time of the event.
Post-Disaster Recovery Plan	No	Local	N/A	N/A
Transportation Plan	Yes	Local and County (through board)	Binghamton Metropolitan Transportation Study (BMTS), local MPO	Looking Forward 2040, Long Range Transportation Plan, BMTS is about to begin development of the update.
Strategic Recovery Planning Report	No	N/A	N/A	N/A
Other Plans: Flood Hazard Analysis	Yes	Local and County	Planning	<ul style="list-style-type: none"> Broome County Watershed Flood Mitigation Analysis, Project identified to be implemented by County or local muni as relevant Debris Management Plan
Regulatory Capability				
Building Code	No	Local	N/A	N/A
Zoning Ordinance	No	Local	N/A	N/A
Subdivision Ordinance	No	Local	N/A	N/A
NFIP Flood Damage Prevention Ordinance	No	Local	N/A	N/A
NFIP: Cumulative Substantial Damages	No	Local	N/A	N/A
NFIP: Freeboard	No	Local	N/A	N/A
Growth Management Ordinances	No	Local	N/A	N/A
Site Plan Review Requirements	No	Local or Watershed	N/A	N/A
Stormwater Management Ordinance	No	Local	DPW - Engineering	MS4 Program Implemented – written plan in place, but no authority for ordinance.
Municipal Separate Storm Sewer System (MS4)	Yes	County	DPW – Engineering and Highways	Broome County is a regulated MS4 under state and federal law. A program is in place for compliance.
Natural Hazard Ordinance	No	Local	N/A	No land use authority at the County level
Post-Disaster Recovery Ordinance	No	Local	N/A	N/A
Real Estate Disclosure Requirement	Yes	State	NYS, Real Estate Agent	NYS mandate, Property Condition Disclosure Act, NY Code - Article 14 §460-467



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	No	N/A	N/A	N/A

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to Broome County.

Table 9.1-3. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	No	No county authority
Mitigation Planning Committee	No	
Environmental Board/Commission	Yes	Broome County Environmental Management Council
Open Space Board/Committee	No	
Economic Development Commission/Committee	Yes	The Agency (Broome County Industrial Development Agency)
Maintenance Programs to Reduce Risk	Yes	DPW - Highways
Mutual Aid Agreements	Yes	Emergency Services; DPW - Highways
Technical/Staffing Capability		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	DPW, Engineering and Planning
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	DPW and Engineering
Planners or engineers with an understanding of natural hazards	Yes	DPW, Engineering and Planning
NFIP Floodplain Administrator (FPA)	No	Local municipalities have authority
Surveyor(s)	Yes	Both in-house and contracts with consultants
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	Planning – GIS (not HAZUS)
Scientist familiar with natural hazards	No	
Emergency Manager	Yes	Emergency Services
Grant writer(s)	Yes	Emergency Services, DPW, Engineering, and Planning
Staff with expertise or training in benefit/cost analysis	Yes	Planning and Engineering
Professionals trained in conducting damage assessments	No	Some staff have a general understanding but not expertise, use consultants

Fiscal Capability

The table below summarizes financial resources available to Broome County.





Table 9.1-4. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for specific purposes	Yes
User fees for water, sewer, gas or electric service	Yes
Impact Fees for homebuyers or developers of new development/homes	No
Stormwater Utility Fee	No, theoretically could implement but only have authority over components in our right of way, wouldn't make sense unless done in partnership with municipalities who have connected systems.
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes – But not generally used by County [If Private activity is very minimal as a part of a multipurpose issuance the County could issue private activity bonds for capitalizing a County owned asset. (County Finance, not to be included in text but just as an FYI)]
Incur debt through private activity bonds	Yes – But not generally used by County [Counsel was unsure what special tax bonds were meant but thought what they understood the concept to be as unfeasible in New York State (County Finance, not to be included in text but just as an FYI)]
Withhold public expenditures in hazard-prone areas	Yes
Other Federal or State Funding Programs	Yes
Open Space Acquisition Funding Programs	None in place
Other	No

Community Classifications

The table below summarizes classifications for community program available to Broome County.

Table 9.1-5. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	No	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No	N/A	N/A
Public Protection (ISO Fire Protection Classes 1 to 10)	No	N/A	N/A
NYSDEC Climate Smart Community	No	N/A	N/A
Storm Ready Certification	Yes	N/A	September 2005
Firewise Communities classification	NP	N/A	N/A
Natural disaster/safety programs in/for schools	No	N/A	N/A
Organizations with mitigation focus (advocacy group, non-government)	Yes	N/A	N/A
Public education program/outreach (through website, social media)	Yes	N/A	N/A



Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Public-private partnership initiatives addressing disaster-related issues	Yes?	Community Organizations Active in Disasters (COAD)	N/A

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule (<https://www.isomitigation.com/bcegs/>)
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/ppc/>
- New York State Climate Smart Communities (<http://www.dec.ny.gov/energy/56876.html>)
- The National Weather Service Storm Ready website at <https://www.weather.gov/stormready/communities>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

The table below provides an approximate measure of Broome County’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.1-6. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)	Moderate	High
Planning and regulatory capability	X (Regulatory) No land use authority		X (Planning)
Administrative and technical capability			X
Fiscal capability		X – High capability for fixing issues but low for proactive approaches that may add cost (same for rest below)	
Community political capability		X	
Community resiliency capability		X	
Capability to integrate mitigation into municipal processes and activities		X	

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community’s progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.



Planning

Existing Integration

Broome County Continuity of Operations/Continuity of Government (COOP/COG) Plan: The county has operations that must be performed, or rapidly and efficiently resumed, following an emergency. While the impact of an emergency cannot be predicted, planning for operations under such conditions can mitigate the impact of the emergency on County staff, facilities, and mission. To that end, the county has prepared a COOP/COG Plan. This plan describes the ways in which Broome County will sustain the capability to perform its critical functions during and after a disruption in internal operations caused by a hazard impact. The COOP/COG plan references the county's HMP (2013) and discusses the critical facility exposure to the hazards of concern for the county.

Broome County Comprehensive Emergency Management Plan (CEMP): The Broome County Department of Emergency Services provides planning, training, resources, responses, warning, coordination, and information through communications to the public, elected officials, and public safety agencies to assist in preparing for, responding to, and mitigating emergencies and disasters that affect the residents of Broome County. The department maintains the Broome County CEMP, an all-hazard plan that describes how Broome County will organize and respond to emergencies and disasters throughout the county. It is based on, and is consistent with, federal, state, and county laws, as well as all other applicable plans and policies, including the National Response Framework and the State of New York CEMP.

Opportunities for Future Integration

Broome County Comprehensive Emergency Management Plan (CEMP): The county's CEMP currently does not contain a detailed evacuation plan for the county, municipalities, and their residents. During the next CEMP update, the county will include evacuation procedures used during hazard events. The county should follow the NYS DHSES CEMP Plan Outline and Guide to develop evacuation planning portion of the CEMP.

Broome County Continuity of Operations/Continuity of Government (COOP/COG) Plan: During the next update of the COOP/COG Plan, the county will incorporate the county's HMP 2019 update to ensure the most up-to-date information is used.

Regulatory and Enforcement (Ordinances)

Existing Integration

Broome County Engineering Division is a principal unit of the Department of Public Works and provides engineering design and project management for repair, renovation, rehabilitation, and replacement projects related to county buildings, bridges, roadways, watersheds, culverts, facilities, and other county infrastructure. The division's fundamental responsibility is the implementation of projects identified by the County Legislature through the Capital Improvement Program (CIP) in conjunction with projects initiated through individual departmental operating budgets. In addition to the CIP projects, the division is responsible for ongoing monitoring and maintenance projects related to the County's 108 bridges and 126 large diameter culverts (those with spans from 5- to 20-feet). The 21 flood control watersheds owned by Broome County are inspected annually by division staff, who also coordinate with other departments to keep these structures in compliance with state and federal regulations. The Engineering Division is tasked with maintaining environmental compliance related to countywide environmental permitting including: (1) the county's MS4 stormwater permit program and implementation, and (2) Bulk Petroleum Storage permitting and requirements (Broome County Engineering Division 2019).



Operational and Administration

Existing Integration

DPW Engineering Division: The Engineering Division continuously reviews and addresses scour and/ or erosion conditions at county-owned bridges and culverts to make improvements to these structures, mitigating future flood damage.

The Engineering Division has performed a series of engineering analyses on spillways to evaluate their stability and susceptibility to erosion; those spillways in need of repair were submitted as part of the County's Capital Improvement Program. In addition, TV/ video inspection of outfall piping at the County's high hazard dams were completed to examine the structural integrity and to identify needs for repairs/ upgrades.

Emergency Services: Emergency Services regularly meets with the NYSDEC to support floodwall closures.

U.S. Army Corps of Engineers (USACE): The USACE Baltimore District is responsible for inspecting floodwalls and levees throughout Broome County. Since 2013, they repaired three Binghamton levee systems, the Vestal and the Endicott-Johnson City levee systems to their pre-storm condition.

Broome County Flood Task Force: The Broome County Planning Department coordinates the Flood Task Force. This group has representatives from local, state, and federal governments, including engineers, Soil and Water Conservation District staff, code officers and elected officials. The group serves to educate its members on topics related to flooding such as flood map amendments, flood insurance, and mitigation funding programs, as well as advocating for changes in federal and state regulations related to flood policy and hazard mitigation.

Broome County Community Organizations Active in Disaster (COAD): The Broome County COAD is an organization whose mission is to provide a collaborative structure to coordinate the work of community organizations and resources to mitigate, prepare for, respond to, and recover from disasters in Broome County, NY. Officially created in 2009, COAD is a membership program, comprised of independent agencies and organizations that may be active in all or any phases of disaster in Broome County. Since 2011, Broome County COAD has recruited over 1,000 volunteers, working over 50,000 hours to help the local community recover from disaster. They helped the 2011 flood recovery process by assisting individuals with their FEMA registration, and repaired/ rebuilt over 100 homes. In 2015, they hosted a FEMA Local Volunteer and Donations Management training to strengthen the capacity of local organizations to handle volunteers and donations during a disaster. Broome County COAD publishes a monthly newsletter that provides readers with safety and preparedness information.

Broome County Soil and Water Conservation District (SWCD): The Broome County SWCD provides technical assistance to municipalities and private property owners that are dealing with flooding issues on their property, works with relevant stakeholders on water quality issues, and coordinates and collaborates on watershed planning and management initiatives. The SWCD also represents the County as part of the Upper Susquehanna Coalition, a regional organization that works together on watershed issues in the New York portion of the Susquehanna Watershed.

Opportunities for Future Integration

Countywide Culverts: There are numerous culverts located throughout Broome County; however, there is no formal inventory of the location of the small culverts (under 48" diameter) or the condition of the culverts. The county needs to complete its inventory of the smaller culverts in order to assess conditions and identify improvement /upgrade needs. Similar to what is currently being done with the County's larger culverts, this inventory will assist with short-term and long-term planning efforts. In order to conduct complete the inventory, the county will need to collect data in the field and collect detailed information about each culvert. Once



remaining data is collected, the county can prioritize the culverts based on their conditions and the type of repairs needed. With this information, the county can continue to seek grant funding or set aside in their county budget (or individual municipal budgets) to repair or replace the culverts.

In addition to completing the inventory of culverts under County jurisdiction, the County will coordinate with the local municipalities to integrate their existing data and information into a comprehensive database, and assist with development of data that hasn't been collected yet using the methodology developed for assessing our own infrastructure. Once completed the data will be shared with municipality.

Funding

Existing Integration

Broome County municipalities fund mitigation projects through existing local budgets, local appropriations (including referendums and bonding), and a variety of federal and state loan and grant programs. Many municipalities noted throughout the planning process that they are faced with increasing fiscal constraints, including decreasing revenues, budget constraints, and tax caps. In an effort to overcome these fiscal challenges, municipalities continue to leverage the sharing of resources and combining available funding with grants and other sources and note that plans and inter-municipal cooperation are beneficial in obtaining grants. County DPW has received Federal Highway Administration federal aid and BridgeNY funding for bridge replacements and upgrades. Section 6 (Mitigation Strategy) provides details on recent grant-funded projects in Broome County.

Opportunities for Future Integration

Broome County will continue to seek grants to fund mitigation projects in the county.

Education and Outreach

Existing Integration

Emergency Services: The Department developed agreements with the United Way and Broome County Organizations Active (BCOAD) to utilize 211, a program that updates residents with important information, more effectively. The Department has made significant improvements into its backup communications infrastructure for 911 and public safety radio dispatching. Emergency Services also regularly publicizes the NY-Alert system, which is run by New York State and is used by municipalities to broadcast alert messages to citizens.

Cornell Cooperative Extension – Broome County: The Cornell Cooperative Extension provides information on the different types of invasive species that are affecting Broome County. The information is provided on their website - <http://cecbroomecounty.com/environment/invasive-species>

National Flood Insurance Program: Participation in the Community Rating System (CRS) can increase a community's resilience, reduce flood insurance premiums, and help save lives and property in the event of a flood. Community participation requires undertaking some or all of the 18 public information and floodplain management activities described in the CRS Coordinator's Manual. In the Broome Community, three municipalities, the Town of Union, Village of Johnson City, and Town of Chenango already participate in the CRS. The county provides technical assistance to municipalities that includes getting the municipalities in contact with the appropriate CRS personnel at the state and/or federal level.



Opportunities for Future Integration

Invasive Species: Broome County currently does not have an education and outreach program related to invasive species found in the county. Invasive species pose a threat to the native vegetation in the county and can lead to increased severity of hazard events (i.e. dying trees from Emerald Ash Borer are more susceptible to strong winds and taking down power lines). The county should work with federal and state agencies to disseminate information to municipalities regarding invasive species and how residents can prevent the spread of invasive species.

Agency liaison: Broome County DPW and Planning will continue to assist federal agencies aiming to assess and mitigate flood risk in the county including the FEMA LAMP process and the USACE Upper Susquehanna Flood Study. By doing so, this increases interagency communication and improves flood knowledge on the county and federal level.

9.1.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

The following table indicates progress on the community's mitigation strategy identified in the 2013 Plan. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and may also be found under 'Capability Assessment' presented previously in this annex.



Table 9.1-7. Status of Previous Mitigation Actions

Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps	
						Cost	Level of Protection	1. Project to be included in 2019 HMP or Discontinue	2. If including action in the 2019 HMP, revise/reword to be more specific (as appropriate).
1	Continue to improve communication and cooperation between county and local public works and highway departments for more efficient and coordinated emergency response.	All		Flood Task Force, Local Emergency Planning Committee, Broome-Tioga Stormwater Coalition	Ongoing Capability	Cost		1.	Ongoing Capability - Removed from Project List
						Level of Protection		2.	
						Damages Avoided; Evidence of Success		3.	
2	Develop or assess a plan for the continuation of county services in the event of a disaster. This includes a plan for accommodating displaced departments due to impacted facilities, planning for information technology needs, and any other measures to minimize disruption to public services during a disaster.	All	Broome County provides essential services to the community and needs to remain in operation during a disasters or other disruptions.	DPW (Buildings and Grounds and Solid Waste); IT; County Executive; OES	Complete	Cost		1.	Discontinue The COOP COG (Continuity of Operations Continuity of Governance) plan was completed and is now in place.
						Level of Protection		2.	
						Damages Avoided; Evidence of Success		3.	
3	Continue to utilize early warning and evacuation systems, including NY Alert and reverse 911, for reducing loss to life and property by giving people time to move personnel property and possessions to safety or to evacuate to safe areas.	All	Effective and efficient communications inform residents and allow them to take actions to reduce the risk of life and property.	OES	Ongoing Capability	Cost		1.	Ongoing Capability - Removed from Project List
						Level of Protection		2.	
						Damages Avoided; Evidence of Success		3.	
4	Maintain database of ARC shelters and provide to public via GIS.	All	Inform community of where to find assistance during a disaster.	ARC, OES, County Planning (GIS); County Health	Ongoing Capability	Cost		1.	Include in 2019 HMP ARC maintains this database but right now it isn't publicly available via GIS.
						Level of Protection		2.	
						Damages Avoided; Evidence		3.	



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps		
						Cost	Level of Protection	1. Project to be included in 2019 HMP or Discontinue	2. If including action in the 2019 HMP, revise/reword to be more specific (as appropriate).	3. If discontinue, explain why.
5	Maintain and encourage working relationships with ARC. Participate in table top exercises dealing with human needs such as sheltering and evacuations.	All	ARC is a primary partner during times of disaster. Coordination is essential.	ARC; OES; County Health	Ongoing Capability	Cost		1. Discontinue	2. -	3. This is an ongoing action for the County
6	Continue training in the National Incident Command System (ICS), under the National Incident Management System (NIMS).			OES	Ongoing Capability	Cost		1. Discontinue	2. -	3. This is an ongoing action for the County
7	Update GIS data, including flood plains (including revisions), planimetrics (buildings and roads), and inundation mapping after actual events.		Provide easily accessible data on which to base action during disasters, make planning decisions for flood mitigation, and other activities to reduce risk.	County Planning – GIS Division	Complete	Cost		1. Ongoing Capability - Removed from Project List	2. -	3. This information is all in the county's online GIS, but it is also updated when new info becomes available, making it ongoing.
8	Continue support of the Local Emergency Planning Committee (LEPC) and coordinate the hazard mitigation plan update with efforts of the LEPC.	All		OES; Planning; Health	Choose an item.	Cost		1. Ongoing Capability - Removed from Project List	2. -	3. -
9	Review existing local plans and efforts to ensure consistency with	All		County Planning	Ongoing Capability	Cost		1. Ongoing Capability - Removed from Project List	2. We do this regularly as we update plans, not as a special project.	



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps
	this plan's goals and objectives, and integrate the goals, objectives, and activities from this plan into existing regulatory documents and programs, where appropriate (including zoning ordinances, building codes, and land use policies).					Damages Avoided; Evidence of Success		3.
10	Continue to Maintain the OES website on the county webpage to provide information for public officials, emergency responders, and residents. Also continue utilizing social media for better dissemination of information.	All		OES	Ongoing Capability	Cost		1.
						Level of Protection		2.
						Damages Avoided; Evidence of Success		3.
11	Continue to assist in the update of floodplain (FIRM) maps – Jurisdictional Level. Specific assistance can be provided in the area of organization of municipal and public meetings and identification of flood-prone areas outside of currently designated areas	Flood		County Planning	No Progress	Cost		1.
						Level of Protection		2.
						Damages Avoided; Evidence of Success		3.
12	Include flood mitigation as a component of the open-space plan in development.	Flood		Environmental Management Council	Ongoing Capability	Cost		1.
						Level of Protection		2.
						Damages Avoided; Evidence		3.



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps
						of Success	Cost	
13	Continue to review water level data during critical periods (spring, major storm events).	Flood		County Planning (Division of GIS) & OES	Ongoing Capability	Level of Protection		1. Ongoing Capability - Removed from Project List 2. 3.
						Damages Avoided; Evidence of Success		
						Cost		
14	Continue to discourage development in hazard prone areas through the 239 review process.	Flood		County Planning	Ongoing Capability	Level of Protection		1. Ongoing Capability - Removed from Project List 2. 3.
						Damages Avoided; Evidence of Success		
						Cost		
15	Through providing technical assistance in the comprehensive plan process, encourage hazard mitigation practices including the reduction of impervious surfaces and use of green infrastructure practices.	All		County Planning	Ongoing Capability	Level of Protection		1. Ongoing Capability - Removed from Project List 2. 3.
						Damages Avoided; Evidence of Success		
						Cost		
16	Continue annual River Bank clean up.	Flood		Environmental Management Council & Broome-Tioga Stormwater Coalition	Ongoing Capability	Level of Protection		1. Include in 2019 HMP 2. Transform program to an “adopt-a-stream” or “adopt a riverbank” format that would expand volunteer activities, and encourage more regular, long-term monitoring. 3.
						Damages Avoided; Evidence of Success		
						Cost		
17	Encourage local zoning ordinances to ensure adequate well recharge	Drought		County Planning	No Progress	Level of Protection		1. Discontinue 2.
						Cost		



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps
						Damages Avoided; Evidence of Success	Cost	
	area for developments served by private wells					Damages Avoided; Evidence of Success		3. No new opportunities arose in the county; therefore, this action will not be included in the plan update
18	Review development plans through the 239 review process to ensure adequate water resources	Drought		County Planning & County Health	Ongoing Capability	Cost		1. Ongoing Capability - Removed from Project List
						Level of Protection		2. Part of the SEQR process to assess water usage.
						Damages Avoided; Evidence of Success		3.
19	Consider flood hazard mitigation alternatives for at risk County properties within the floodplain, including those that have been identified as repetitive loss properties. These include the following: <ul style="list-style-type: none"> • Broome County Office Building • Veterans Memorial Arena • Broome Community College • In addition, the following County-owned or managed parks are flood vulnerable: Grippen, Otsiningo, Dorchester and En-Joie. 							
	See above	Flood	These County-owned properties are vulnerable and have been impacted by flooding. Upgrades to mitigate flood impacts may help reduce damages in the event of a flood.	DPW and Planning	In Progress	Cost	\$1.9M	1. Include in 2019 HMP
						Level of Protection	NA	2. Received funding for green infrastructure improvements at Government Plaza (BCOB) from NYS through the Environmental Facilities Corporation's Green Innovation Grant Program.
						Damages Avoided; Evidence of Success	Address leaking and reduce stormwater flow to pump.	3.
20	Develop a program to continue erosion and scour protection / mitigation of structures (bridges and culverts) using native stone material and drilling & pinning prior to flooding events. .	Flood	Scour and undermining of bridge/culvert structures due to flooding	County DPW, Engineering	In Progress	Cost		1. Include in 2019 HMP
						Level of Protection	High	2. These scour mitigation repairs done with heavy rock cost anywhere between \$15,000 to \$50,000 depending on the size of the structure and the scour issues present. When we complete these heavy stone scour repairs it pretty much mitigates all future storm damage due to erosion and scour beneath the structure along the footings.
						Damages Avoided;		3.



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps	
						Evidence of Success	Cost	1.	2.
21a	County-owned flood control Watershed Program: Bathymetric surveys of all county-owned flood control watershed reservoirs for prioritization of dredging and cleaning.	Flood	Determine which flood basins need removal of sediment build-up and how much.	County DPW-Engineering	Complete	Evidence of Success	\$10,000-\$15,000 per site – 21 sites have been completed	1.	Ongoing Capability - Removed from Project List
						Level of Protection	Medium	2.	Work has been completed
						Damages Avoided; Evidence of Success		3.	
21b	County-owned flood control Watershed Program: Schedule & obtain funding for dredging and cleaning of the watershed reservoirs.	Flood	As a result of 21a – need to drain and dredge ponds near dams.	County DPW-Engineering	Ongoing Capability	Cost		1.	Include in 2019 HMP
						Level of Protection		2.	Work is ongoing – complete 1-2 each year. Depending on extent of sediment to be removed cost is generally \$20,000 - \$35,000 per site.
						Damages Avoided; Evidence of Success		3.	
22	Work with local school districts and higher educational facilities to understand and mitigate flood vulnerabilities.	Flood, Severe Storm		County Planning Dept/school district superintendents	No Progress	Cost		1.	Discontinue
						Level of Protection		2.	Unless we can determine specific projects, should remove.
						Damages Avoided; Evidence of Success		3.	
23	See Above	Flood	Original problem as stated.	County DPW – Engineering & Highways	No Progress	Review the County infrastructure maintenance program – including roads and roadside ditch cleaning and repair, culvert inspections and repair, bridge inspections and maintenance – to determine if there is anything else that we could be doing that would make this effort more effective in protecting against damage after storm and flood events.			
						Cost		1.	Discontinue
						Level of Protection		2.	
						Damages Avoided; Evidence		3.	This needs to be something that the County does on an ongoing basis – not defined as a specific project.



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps	
						Cost	Level of Protection	1. Project to be included in 2019 HMP or Discontinue	2. If including action in the 2019 HMP, revise/reword to be more specific (as appropriate).
24a	County-owned flood control Watershed Program: SITES analysis for outlet and overflow structures to determine scour and erosion vulnerability and where additional protective measures are warranted.	Flood	Evaluate scour and erosion potential	County DPW - Engineering	Complete	of Success		1. Discontinue 2. 3. Work has been completed	
						Cost	\$72,000		
						Level of Protection	Low		
24b	County-owned flood control watershed program: Results of SITES analysis will likely result in identification of further projects required to increase protective measures at overflow structures.	Flood	Repair of scour at vulnerable dams	County DPW - Engineering	In Progress	Cost		1. Include in 2019 HMP 24b, 25b, 26b & 27b need to be combined into a dam upgrade and repair program. Refer to number 27b in this table. 2. 3.	
						Level of Protection			
						Damages Avoided; Evidence of Success			
25a	County-owned flood control Watershed Program: Outlet pipe inspections using a video camera mounted on a small track-driven remote-controlled vehicle to be performed under low or no-flow conditions.	Flood	Evaluate outlet structures	County DPW - Engineering	Complete	Cost	\$69,000	1. Discontinue 2. 3. Work has been completed.	
						Level of Protection	High		
						Damages Avoided; Evidence of Success	No risk of loss or failure		
25b	County-owned flood control Watershed Program- Results of analysis could result in identification of upgrades and/or repairs that are needed in the outflow pipes to keep the dam outflow functioning correctly.	Flood	Repair of deficient outlets	County DPW - Engineering	In Progress	Cost		1. Discontinue 2. - 3. At the time of the plan update, there are no areas of needed repair identified by evaluation.	
						Level of Protection			
						Damages Avoided; Evidence of Success			



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps	
						Cost	Level of Protection	1.	2.
26a	County-owned flood control Watershed Program- Evaluation of NRCS requirements should be completed, and then each watershed that does not meet full PMF requirements needs to be examined for potential upgrades to meet the requirement. Needs are prioritized for repairs.	Flood	Evaluate dam capacity	County DPW – Engineering	Complete	Cost		1.	Discontinue
						Level of Protection		2.	
						Damages Avoided; Evidence of Success		3.	Work has been completed.
26b	County-owned flood control Watershed Program - Project identification and cost estimates for repairs identified in 26a	Flood	Upgrade of dams as needed	County DPW – Engineering	In Progress	Cost		1.	Discontinue
						Level of Protection		2.	
						Damages Avoided; Evidence of Success		3.	Identified repairs have been included in overall upgrade program identified in 27b below.
27a	See Above	Flood	Evaluate ways to increase capacity	County DPW – Engineering	In Progress	County-owned flood control Watershed Program - Evaluate storage capacity within each existing watershed (behind dam) to determine if additional storm storage can be provided by simple means (such as an adjustment to the permanent pool level, regarding land controlled by the County behind the dams, etc.). Identify and prioritize specific projects.			
						Cost		1.	Discontinue
						Level of Protection		2.	
27b	County-owned flood control Watershed Program Implement specific projects identified in 24, 25, 26 & 27 above.	Flood	Upgrades to watersheds to include all identified issues	County DPW – Engineering	In Progress	Cost		1.	Include in 2019 HMP
						Level of Protection		2.	Program and fund major upgrades to sites 9A (\$1,200,000 estimate), 9C (\$1,500,000 estimate) and 13 (\$1,200,000 estimate) based on results of previous studies.
						Damages Avoided; Evidence of Success		3.	
28		Flood		County Planning		Cost		1.	Ongoing Capability





Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps
						Level of Protection	Damages Avoided; Evidence of Success	
	Provide technical assistance and support to local municipalities applying to the CRS program.		Tasks that can be completed at the County level can help communities with limited capabilities achieve CRS certification.		Ongoing Capability	Level of Protection		2.
						Damages Avoided; Evidence of Success		3.
29	Conduct workshops for residents regarding hazard mitigation, flood insurance, disaster preparedness and related topics.	All	Conflicting information about flood risk, mitigation, and preparedness can cause confusion.	County Planning, Emergency Services, COAD	In Progress	Cost		1.
						Level of Protection		2.
						Damages Avoided; Evidence of Success		3.
30	Provide technical assistance to municipalities on hazard mitigation planning, hazard mitigation funding, flood insurance, flood mapping, and related issues through the Flood Task Force	Flood	Community leaders need assistance in communicating flood issues to their residents.	County Planning	Ongoing Capability	Cost		1.
						Level of Protection		2.
						Damages Avoided; Evidence of Success		3.
31	Contribute to the ACE Upper Susquehanna River Basin Comprehensive Flood Damage Reduction Feasibility Study	Flood	At a regional level, identify the current risk for flooding, propose ways to minimize the impact from flood events, determine impacts from various levels of flooding, and suggest structural and non-structural alternatives that could help	County Planning	In Progress	Cost		1.
						Level of Protection		2.
						Damages Avoided; Evidence of Success		3.



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps	
			minimize damage to life and property.					<ol style="list-style-type: none"> 1. Project to be included in 2019 HMP or Discontinue 2. If including action in the 2019 HMP, revise/reword to be more specific (as appropriate). 3. If discontinue, explain why. 	
32	Pursue green infrastructure initiatives as solutions to localized flooding and drainage issues for County-owned facilities and infrastructure.	Flood / Drought		County Planning and DPW	In Progress	Cost	\$1.9M	1.	In progress, Include in 2019 HMP
						Level of Protection	NA	2.	Grant for Government Plaza noted in item 19, above.
						Damages Avoided; Evidence of Success	Address leaking and reduce stormwater flow to pump.	3.	
33	Continue public education efforts and municipal training for stormwater management, green infrastructure, and other related issues.	Flood/ Severe Storms/ Drought		Broome-Tioga Stormwater Coalition	Ongoing Capability	Cost		1.	Ongoing Capability - Removed from Project List
						Level of Protection		2.	
						Damages Avoided; Evidence of Success		3.	
34a	Watershed-based Mitigation Strategy: 1.) Identify and map areas of concern for localized flooding and drainage and prioritize target areas. 2.) Develop plans for mitigating issues in three target areas.	Flood/ Severe Storms	Identify hazard areas throughout the County, prioritize areas for further analysis and identify watershed based mitigation solutions.	County Planning	Complete	Cost		1.	Include in 2019 HMP
						Level of Protection		2.	The study was completed that included mitigation strategies for 3 high priority watersheds. This update should include the next steps: 1) Implement mitigation strategies created in the plan 2) Develop mitigation strategies for additional priority watersheds – Fuller Hollow Creek, Chamberlain Creek, and Brixius Creek
						Damages Avoided; Evidence of Success		3.	
34b	Watershed-based Mitigation Strategy: Assist municipalities in obtaining funding for the implementation of plans developed in the strategy for the three target areas.	Flood/ Severe Storms		County Planning	No Progress	Cost		1.	Discontinue
						Level of Protection		2.	
						Damages Avoided; Evidence of Success		3.	Integrate into items above, 34a





Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps	
						Cost	Level of Protection	1.	2.
34c	Watershed-based Mitigation Strategy: Utilize strategy to identify additional opportunities for planning and implementation of mitigation actions for areas identified in the study.	Flood/ Severe Storms		County Planning	In Progress	Cost		1.	Discontinue
						Level of Protection		2.	
						Damages Avoided; Evidence of Success		3.	Integrate into items above, 34a
35	Evaluate available mapping data associated with stormwater and water resource infrastructure. Collect existing data and fill in gaps where information is missing.	Flood	Stormwater and water resources data exists independently within each municipal entity. This makes it difficult to do planning involving integrated systems.	Flood Task Force; Broome-Tioga Stormwater Coalition; Southern Tier 8 Regional Planning	No Progress	Cost		1.	Include in the 2019 HMP
						Level of Protection		2.	Keep this in. Add the following: Work with the Broome-Tioga Stormwater Coalition and Flood Task Force to achieve this.
						Damages Avoided; Evidence of Success		3.	
36	Continued support of consistent funding for river gauges through inclusion as a Federal budget line item.	All	Continuity of river gauges is periodically threatened due to budget cuts. River gauges help us to monitor flood threats.	Flood Task Force	Ongoing Capability	Cost		1.	Ongoing Capability - Removed from Project List
						Level of Protection		2.	Haven't heard any threats to river gauges lately but does come up from time to time.
						Damages Avoided; Evidence of Success		3.	
37	Implement outreach and education efforts for realtors, municipalities and homebuyers regarding real estate disclosure in hazard areas.	Flood	The value of flood impacted homes is a concern for municipalities, homeowners and other stakeholders.	County Planning & Flood Task Force	No Progress	Cost		1.	Discontinue
						Level of Protection		2.	This is still needed, but perhaps can be under the educational items above?
						Damages Avoided; Evidence of Success		3.	
38	Explore further opportunities to leverage flood inundation	Flood		County Planning (GIS)	Ongoing Capability	Cost		1.	Discontinue
						Level of Protection		2.	



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)	Next Steps
	mapping to support emergency management and public awareness during flood events.					Damages Avoided; Evidence of Success	3. Emergency Services have been using the flood inundation mapping to predict where there might be issues and where they need to focus their efforts.
39	Improve integration and coordination for protection of vulnerable populations.	All		County Mental Health and Office for the Aging	No Progress	Cost	1. Include in 2019 HMP
						Level of Protection	2. Document the existing procedures the County Mental Health and Office for the Aging departments and what provide for the vulnerable populations in Broome County.
						Damages Avoided; Evidence of Success	3.
40	Use modeling to anticipate transportation routes expected to be impacted during flood events and identify / establish alternate routes. Identify alternate routes that are of a high priority due to presence of essential facilities (i.e. hospitals, shelters)	Flood	An analysis of how transportation is likely to be impacted during a flood event will allow us to identify a plan for action, and make it easier to notify the public during an event.	County Planning / BMTS / Transit	No Progress	Cost	1. Include in 2019 HMP
						Level of Protection	2. Put 40 and 41 together into one action
						Damages Avoided; Evidence of Success	3.
41	Develop plan for transition to alternate routes during a hazard event and dissemination of transportation information to the public and municipal agencies.	Flood		County Planning/ BMTS/ NYSDOT/ OES/Transit	No Progress	Cost	1. Include in 2019 HMP
						Level of Protection	2. Put 40 and 41 together into one action.
						Damages Avoided; Evidence of Success	3.
42	Support NYS Department of Transportation and Federal Highway Administration vulnerability assessment for transportation	Flood		NYSDOT	No Progress	Cost	1. Discontinue
						Level of Protection	2.
						Damages Avoided; Evidence	3. Project did not move forward.



Project #	Project	Hazard(s) Addressed	Brief Summary of the Original Problem	Responsible Party	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if project status is complete)		Next Steps
	infrastructure pilot project.					of Success		1. Project to be included in 2019 HMP or Discontinue 2. If including action in the 2019 HMP, revise/reword to be more specific (as appropriate). 3. If discontinue, explain why.



Completed Mitigation Initiatives Not Identified in the Previous Mitigation Strategy

Broome County has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2013 Plan:

- Broome County assisted with the property acquisitions in the Towns of Conklin and Kirkwood. Two homes were acquired in the Town of Conklin and one home in the Town of Kirkwood. The properties were turned over to the towns. This project was completed in 2010.
- Broome County Planning Department
 - Completed the Broome County Watershed Flood Hazard Mitigation Plan identifies and evaluates flood risk and acts as a tool for municipalities to make more informed decisions regarding mitigation funds.
 - Completed a Debris Management Plan that provides municipalities with information about debris removal protocol during and emergency.
- Broome County Department of Public Works
 - The Engineering Division was responsible for the repair and mitigation of 20 bridges and two large culverts following the 2011 flood. To minimize future flood damage, additional mitigation measures included: placement of heavy table-top rock along bridge bases, placement of heavy dump stone to protect inlets and outlets, bank / slope stabilization and armoring to repair structures' existing damage. This project was completed between 2011 and 2013.
 - The County DPW performed a series of spillway engineering analyses to determine which structures were in most need of repair.
 - The Department conducted TV/video inspections of outfall piping to identify needs for repair of the County's high-hazard dams.
 - Replacement of Juneberry Road Bridge (BIN 3349940) – to address capacity and local flooding issues.
 - Bridge was identified in “Broome County Hazard Mitigation Plan – May 2016” as one of top priority locations to address localized flooding issues. DPW obtained BRIDGE-NY funding to replace and raise the structure to mitigate localized flooding. Currently in design – scheduled for construction in 2019.
- Broome County GIS updated its Parcel Mapper with a floodplain layer; users can view inundation levels from both floods and FIRM maps.
- Broome County Emergency Services
 - The Broome County's Emergency Response Plan's actions were updated by Emergency Services to correlate BCGIS flood inundation levels from both floods and FIRM maps.
 - Completed a countywide comprehensive Continuity of Operations/ Continuity of Government Plan
 - Developed agreements with the United Way, COAD, and 211 to better assist residents and organize resources during an emergency
 - Made improvements to its backup communications systems for 911 and public safety radio dispatching
- Provide assistance to local municipalities in levee accreditation efforts or efforts to conduct freeboard deficient procedure for levees without adequate freeboard for accreditation. Coordinate intermunicipal efforts and act as a liaison with federal and state agencies as necessary.
 - Lisle, Whitney Point, and one levee in the City of Binghamton have freeboard, but others do not. By moving forward the accreditation process, or through the freeboard deficient procedure of the LAMP process, we can have a better picture of the risk to those living behind levees and save residents money on flood insurance.



- Government Plaza Green Infrastructure Project
 - Government Plaza is a flood impacted property. Green Infrastructure upgrades will help to address water flow issues at the site currently causing leaks and other water damage issues.

Proposed Hazard Mitigation Initiatives for the Plan Update

Broome County participated in a mitigation action workshop on October 17, 2018 and was provided the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.1-8 summarizes the comprehensive-range of specific mitigation initiatives Broome County would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.1-9 provides a summary of the prioritization of all proposed mitigation initiatives for the Plan update.

Broome County created action worksheets for those they identified as high priority mitigation actions. Those actions are identified in Table 9.1-8 and completed action worksheets are included at the end of this annex.



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) Mitigated	Description of the Problem and Solution	Critical Facility (Yes / No)	EHP Issues	Timeline	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Potential Funding Sources	Priority	Mitigation Category	CRS Category
Broome County-1	Trim Street Culvert Enlargement	1, 5	Flood, Severe Storm	<p>Problem: The ditches along Trim Street, starting at its intersection with Route 11 and extending 2 miles eastward, in the Town of Kirkwood, are not functioning properly. This leads to drainage issues, overflow onto roadways, cause culvert and road erosion, and impacts access to homes. This area floods with almost every severe storm and poses a risk to the health and safety of residents in this area. The Kirkwood Fire Department is located just east of the intersection and this critical facility is vulnerable during extreme flooding. The building was valued at \$173,287 in 2018 by the local tax assessor. Closer to the intersection is the home of the Binghamton Elks Club. While this building is not technically a critical facility, it is used by a major civic organization and valued at \$300,000. Thus, the value of two major structures near the proposed project is roughly half a million dollars. Also, Trim Street carries traffic between a major surface street, Highway 11, and Interstate 86. All the driveways along this 2-mile stretch are susceptible to failure and may cause residents to be unable to access or leave their homes.</p> <p>Solution: Widen the ditches to improve stormwater management. Increase the culvert size from 12 inches to 24 inches. Line widened ditches with light or medium stone. This project will pay for itself in the long run by minimizing ditch degradation and culvert washout.</p>	Yes	No	2 years	Broome County Engineer	\$400,000 saved by eliminating annual repairs. Protect critical facility and ensure fire department will be have egress and regress to respond to fire events.	\$250,000	TIP, PDM, HMGP	High	SIP	PP
Broome County-2	Reinforce the Acre Creek Banks under Loughlin Road Bridge	1, 5	Flood, Severe Storm	<p>Problem: Loughlin Road Bridge, in the Town of Kirkwood, is a county-owned and -operated structure that spans Acre Creek. The creek slope beneath the bridge regularly fails after a severe storm, leading to bank failure and reduced creek water quality. Creek overflow leads to flooded roadways and has caused flooding in adjacent homes and businesses. Several bridges connect private property (business and residential) over the creek, which are often clogged with debris and have failed in the most recent flooding.</p> <p>Solution: Reinforce 1,500 linear feet of each bank and the stream bottom with stone and rip-rap. One side was reinforced in a hit-or-miss fashion in order to save money because there was not enough in the budget to do the complete job. The road has failed on occasion, requiring frequent emergency repairs. Doing the repairs on both sides and the bottom at one time will protect the entire structure because the job will involve using interlocking materials.</p>	No	No	2 years	Broome County Engineer	Reduce estimated annual repairs that cost \$70,000 per event	\$1 million	TIP, PDM, HMGP	High	SIP	PP
Broome County-3	Glenwood Road Bridge Replacement	1, 5	Severe Storm, Flood	<p>Problem: Glenwood Road at Glenwood Road Bridge in the Town of Vestal is regularly subject to flash flooding because of its proximity to Choconut Creek and hydraulic restriction at the bridge. Nearby home and business owners are often restricted when the roadway becomes flooded. Glenwood and other roads are often closed for several days, which affects the ability of emergency personnel to reach nearby residents. County-owned and -operated Glenwood Road bridge over Choconut Creek is situated between Underwood Road and Highway 26. The bridge, a major route serving those who live and work west of Highway 26, is and has been subject to repeated erosion and flood damage. The community considers bridge replacement to be a priority mitigation action.</p> <p>Solution: Increase the hydraulic capacity of the bridge by raising the roadway and extending the span. Page four of this worksheet illustrates how traffic would be rerouted while the project is underway.</p>	Yes	No	2 years	Broome County Engineer	Lessen road washouts; reduce the cost of interim road, bridge and creek repairs; and eliminate the need for road closures and resident evacuations.	\$1.5 million	PDM, HMGP, Bridge NY. TIP	High	SIP	PP
Broome County-4	Identify priority locations for property buyouts: Richards Avenue and Tharp Road area has been identified as one priority	1, 3, 5	Flood, Severe Storm	<p>Problem: The relocation of Choconut Creek now causes frequent flooding and damage to nearby homes located on Tharp Road and the Richards Ave. Park area. The Vestal community is a thriving part of the county and attractive to current and potential residents. Homeowners are frustrated from dealing with repeat flood events but want to remain in the immediate area.</p> <p>Solution: Acquire and demolish 12 of the most affected properties, providing property owners relief from flood impacts while giving them the financial resources to relocate to a safer part of the town.</p>	No	No	2 years	Broome County Engineer	Eliminate destruction of homes on Tharp Road and Richards Avenue, the total value of which is \$1.8 million	\$3.6 million	PDM, HMGP	High	SIP	PP
Broome County-5 (previous action)	Flood hazard mitigation alternatives for at risk County properties	1, 5	Flood	<p>Problem: Best mitigation strategy must be identified for County at-risk properties.</p> <p>Solution: Broome County will consider hazard mitigation alternative for at-risk county properties within the floodplain. This includes the Broome County office building, Veterans Memorial Arena, Broome Community College, and the county-owned/managing parks - Grippen, Otsiningo, Dorchester and En-Joie. The county will perform property specific site assessments to identify best mitigation solution.</p>	Yes	No	Within 5 years	County DPW and Planning	Address leaking and reduce stormwater flow to pump.	\$1.9 million	FEMA FMA and HMGP	Medium	LPR	PR
		1, 5		<p>Problem: Scour and undermining of bridge/culvert structures due to flooding</p>	No	No							SIP	PP



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) Mitigated	Description of the Problem and Solution	Critical Facility (Yes / No)	EHP Issues	Timeline	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Potential Funding Sources	Priority	Mitigation Category	CRS Category
Broome County-6 (previous action)	Undermining of Bridges and Culverts		Flood, Severe Storm, Severe Winter Storms	Solution: Develop a program to continue erosion and scour protection / mitigation of structures (bridges and culverts) using native stone material and drilling & pinning prior to flooding events			Within 2 years	County DPW and Engineering	Increase integrity of bridges and culverts, reduce flood occurrences in the county	\$350,000	BridgeNY, FEMA HMGP	High		
Broome County-7 (previous action)	Countywide CRS Assistance to Communities	1, 2, 3, 5	Flood	Problem: Not all of the municipalities have capacity to complete requirements for the CRS program. The county currently does not have the capacity to assist municipalities with completing the necessary requirements to join CRS. Solution: Identify CRS actions that can be completed at the county-wide scale to inform municipal efforts or complete individual CRS actions.	No	No	Within 2 years	Planning	Prevent duplication of efforts between municipalities and reduce the burden for CRS program requirements for local communities	County Staff Time	County Budget	Medium	LPR, EAP	PR, PI
Broome County-8 (previous action)	Contribute to the ACE Upper Susquehanna River Basin Comprehensive Flood Damage Reduction Feasibility Study	All	Flood	Problem: Need to determine the cause of and solutions for regional flood issues are properly addressed. Solution: At a regional level, identify the current risk for flooding, propose ways to minimize the impact from flood events, determine impacts from various levels of flooding, and suggest structural and non-structural alternatives that could help minimize damage to life and property.	No	No	Within 2 years	County Planning	Ensure that local concerns are adequately represented and that local communities are integrated into the process appropriately.	County Staff Time	County Budget	High	LPR	PR
Broome County-9 (previous action)	Watershed-based Mitigation Strategy	All	Flood, Severe Storm	Problem: Identify hazard areas throughout the County, prioritize areas for further analysis and identify watershed based mitigation solutions. Solution: A watershed study was completed and identified the following next steps: 1) Implement mitigation strategies created in the plan 2) Develop mitigation strategies for additional priority watersheds – Fuller Hollow Creek, Chamberlain Creek, and Brixius Creek	No	No	Within 5 years	County Planning, Soil and Water conservation District, Upper Susquehanna Coalition	Mitigate flooding in priority watersheds.	\$75,000-\$1.3M	FEMA HMGP	High	LPR	PR
Broome County-10 (previous action)	Stormwater Resources and Sewer shed Mapping	1, 2, 3, 5	Flood, Severe Storm	Problem: Stormwater and water resources data exists independently within each municipal entity. This makes it difficult to do planning involving integrated systems. NYS stormwater regulations also require MS4s to complete sewer shed mapping. Solution: Working with the Broome-Tioga Stormwater Coalition and Flood Task Force, evaluate available mapping data associated with stormwater and water resource infrastructure. Collect existing data and fill in gaps where information is missing.	No	No	Within 1 year	Flood Task Force; Broome-Tioga Stormwater Coalition; Southern Tier 8 Regional Planning	Creation of one integrated database for use in comprehensive intermunicipal stormwater management.	\$200,000	WQIP, Municipal Budgets	High	LPR	PR
Broome County-11 (previous action)	Use modeling to anticipate transportation routes expected to be impacted during flood events	All	Flood	Problem: Road closure information is not distributed in an intuitive manner. Evacuation/alternate routes determined at time of disaster, not predetermined. An analysis of how transportation is likely to be impacted during a flood event, including anticipated climate change projections, will allow the county to identify a plan for action, and make it easier to notify the public during an event. Solution: Convene an interagency group to determine the best procedures for road closures and communicating information and develop a web-based mechanism for information dissemination. In addition, the county will use modeling to anticipate transportation routes expected to be impacted during flood events and identify / establish alternate routes. This modeling will look at both the 1% annual flood and the 0.2% annual flood. Including assessment of the 0.2% annual flood event will allow us to account for the anticipated impacts of climate change (rise in base flood elevation) on road infrastructure. This approach is useful as a first order screening of potential vulnerabilities to future flood risk to be taken into consideration during planned maintenance and upgrade projects. The county will look at various sources to assist with climate change projections (Northeast Regional Climate Center, NYSEDA, and NYSEDC Climate Smart Communities). Identify alternate routes that are of a high priority due to presence of essential facilities (i.e. hospitals, shelters). In addition, develop a plan for transition to alternate routes during a hazard event and dissemination of transportation information to the public and municipal agencies.	No	No	Within 2 years	County Planning/ BMTS/ NYSDOT/ OES/Transit	Document anticipated road closures and alternative routes for use during a disaster and identifying necessary road improvements; streamline effective communication during disasters	\$75,000	FEMA PDM Climate Smart Communities	High	LPR	PR



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) Mitigated	Description of the Problem and Solution	Critical Facility (Yes / No)	EHP Issues	Timeline	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Potential Funding Sources	Priority	Mitigation Category	CRS Category
Broome County-12	Countywide Culvert Inventory	1, 2, 3, 5	Flood, Severe Storm	<p>Problem: There are numerous culverts located throughout Broome County; however, there is no formal inventory of the location of the culverts or the condition of the culverts. The county is in need of a culvert inventory to provide a snapshot of local drainage within Broome County and identify the needs of each culvert and the types of improvements they could need.</p> <p>Solution: This inventory will assist with short-term and long-term planning efforts. In order to conduct the inventory, the county will need to collect data in the field and collect detailed information about each culvert. Once data is collected, the county can prioritize the culverts based on their conditions and the type of repairs needed. With this information, the county can seek grant funding or set aside in their county budget (or individual municipal budgets) to repair or replace the culverts.</p>	No	No	Within 3 years	County Highway and Engineering	Creation of one database for use in comprehensive water resource management.	Staff Time	WQIP, CSC	Medium	SIP	PP
Broome County-13	Invasive Species Public Outreach	2, 3	Invasive Species	<p>Problem: There are numerous invasive species impacting Broome County. The county currently does not have an education and outreach program related to invasive species found in the county. Invasive species pose a threat to the native vegetation in the county and can lead to increased severity of hazard events (i.e. dying trees from Emerald Ash Borer are more susceptible to strong winds and taking down power lines).</p> <p>Solution: The county will work with federal and state agencies to disseminate information to municipalities regarding invasive species and how residents can prevent the spread of invasive species.</p>	No	No	Within 2 years	Broome County Environmental Management Council/Cornell Cooperative Extension	Increase awareness of impacts, preventing the spread of and eradication of invasive species.	\$15,000	NYSDEC Invasive Species Grants	Medium	EAP	PI
Broome County-14	Susquehanna River Regional River Initiative	1, 2, 3, 5	Flood	<p>Problem: There is currently no regional river system between Broome and Tioga County and the Village of Sidney.</p> <p>Solution: This proposed project establishes a regional river system initiative to build resilience. This project is intended to link the Broome County, Tioga County, and the Village of Sidney together to comprehensively understand and address flooding issues in the Upper Susquehanna River basin. The intent is to partner and build on the USACE/NYSDEC Upper Susquehanna River Study that is currently under way and create regional resiliency through specific projects as well as outreach and education.</p>	No	No	Within 1 year	Upper Susquehanna Coalition, Soil and Water Conservation District, County Planning	Determine priority locations for flood mitigation projects to reduce overall flood risk on a regional scale, implement priority actions	\$3M	NY Rising	Medium	LPR	PR
Broome County-15	United Way of Broome County Infrastructure Resiliency Broome County	All	All	<p>Problem: During Tropical Storm Lee, the 911 system serving Broome County received so many calls that its operators could not handle the volume. United Way contributed staff on a 24-hour basis to assist with call volumes. The United Way's 211 system responded to more than 12,000 flood-related calls. Since the United Way does not have an emergency power generator to rely on in case of power outages, this project would purchase and install an emergency generator at the United Way's facility to keep the 211 system operational.</p> <p>Solution: This proposed project would enhance the United Way's 211 call service by installing a backup generator for emergency use across a five-county area: Broome County, Tioga County, Chenango County, Delaware County, and Otsego County. During storm events, the 211 system provides critical relief to the 911 system that is needed for emergencies.</p>	No	No	Within 2 years	County Emergency Services, United Way	Enhance reliability of the public assistance hotline during disasters.	\$20,000	FEMA HMGP and PDM	High	LPR	PR
Broome County-16	Targeted Disaster Preparedness Education	All	All	<p>Problem: Broome County lacks a formal disaster preparedness education campaign which makes it difficult to communicate the importance of preparedness to low-income residents, renters, non-English speaking residents, persons with disabilities, and other identified vulnerable populations.</p> <p>Solution: This project provides a disaster preparedness education campaign for vulnerable populations in the Southern Tier. These groups could include low-income residents, renters, persons for whom English is a second language, persons with disabilities, or other identified vulnerable populations. The project would raise individual preparedness levels for these groups through three training programs: "Preparedness for Individuals and Households", "Preparing Your Pet", and "Preparedness for Businesses". The business training would include planning for continuity of operations after a disaster. Project funds would be used for volunteer recruitment, training, orientation, and program implementation and cover a service area that includes Broome, Chenango, Delaware, and Tioga Counties.</p>	No	No	Within 2 years	County Emergency Services and Planning	Provide focused, effective and measurable educational programming to high priority demographics	\$25,000	Climate Smart Communities	Medium	EAP	PI
Broome County-17	Village of Deposit Drainage Study	1, 3, 5	Flood, Severe Storm	<p>Problem: Flooding issues in the Village of Deposit - Not enough data/info to design solutions</p> <p>Solution: Conduct a study to determine causes and solutions of the flooding issues.</p>	Yes	No	Within 2 years	Broome County with support from the Village of Deposit and Delaware County	Identify flood mitigation projects to reduce flooding	\$150,000	FEMA HMGP or PDM	High	LPR	PR
		1, 4, 5	All	Problem: Additional equipment would enhance recovery capabilities.	No	No				\$375,000		Medium	SIP	PP



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) Mitigated	Description of the Problem and Solution	Critical Facility (Yes / No)	EHP Issues	Timeline	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Potential Funding Sources	Priority	Mitigation Category	CRS Category
Broome County-18	Equipment for Highway Department			Solution: Purchase of additional Gradall Excavator and Mini Excavator			Within 2 years	Broome County Highway	Reduce recovery time for infrastructure repairs following disaster		FEMA HMGP or PDM			
Broome County-19	Flood Control Structures on Nanticoke Creek	1, 5	Flood	Problem: Upgrades have been identified for three County Flood Control Structures on Nanticoke Creek in the Towns of Lisle and Maine. Solution: Nanticoke Site 9A in the Town of Lisle is under design and scheduled for construction in 2019 Nanticoke Creek Site 13 (Town of Maine) – watershed upgrades: Design in 2020 (estimated cost = \$300,000) Construction in 2021 (estimated cost = \$1.5-million) Nanticoke Creek Site 9C (Town of Lisle) – watershed upgrades: Design in 2022 (estimated cost = \$300,000) Construction in 2023 (estimated cost = \$1.3-million)	No	No	Within 4 years	Broome County Engineering	Enhance and maintain flood control capacity.	\$5.5M	Broome County CIP	High	SIP	PP
Broome County-20	Brady Hill Road (Binghamton) Culvert	1, 5	Flood, Severe Storm	Problem: Brady Hill Road Culvert undersized and floods adjacent church regularly. Solution: Identify the best solution to alleviate the flooding problems on Brady Hill Road in Binghamton. Potential solutions would be upsizing the existing culverts, adding additional culverts, and routine maintenance of the culverts to keep clear of debris.	No	No	Within 3 years	Broome County Engineering and Highway Department	Reduce flooding at culvert and inundation of structures	\$350,000	BridgeNY, FEMA HMGP	Medium	SIP	PP
Broome County-21	Evacuation Plans	All	All	Problem: Evacuation Plans are not predetermined for Broome County Communities Solution: Develop an evacuation plan for Broome County. The plan should outline procedures intended to help manage and coordinate evacuations in the county. This will include different evacuation routes based on different situations, procedures on how to notify people of the evacuation, and the chain of command in issuing an evacuation.	No	No	Within 2 years	Broome County Emergency Services	Improve efficiency and predictability for evacuations during disasters	\$50,000	Department Budget	High	LPR	PR
Broome County-22	Backup Power for County Facilities	1, 3, 5	All	Problem: County facilities without backup or old backup – COB old generator; arena no generator Solution: Purchase and install generators at COB (60 Hawley St. Binghamton) and the arena (1 Stuart St, Binghamton). This will allow the facilities to operate during power outages and provide essential services to the county and its residents. These facilities could also serve as an emergency shelter and having backup power will allow those facilities to provide shelter services.	No	No	Within 3 years	Broome County Arena/ Engineering/ Health/ Planning	Prevent outages as County facilities	\$1.9 million	FEMA HMGP and PDM	Medium	SIP	PP
Broome County-23	Stream Gauge Installation and Outreach and Watershed Monitoring	All	Flood, Severe Storm	Problem: The county is in need of additional stream gauges, and water level monitoring at our watersheds. In addition to stream gauges, there is a need to communicate the technical information in a simpler way. Solution: Assess which locations would be best for additional stream gauges to monitor flash flooding. Nanticoke and Chamberlain are two that have been identified. Also place flood elevation monitoring at watersheds (high hazard dam flood control) in order to activate emergency action plans if necessary. Establishing live dashboard for disaster events on County website. Integrate live monitoring of features deemed helpful.	No	No	Within 5 years	Broome County Information Technology, Broome County Emergency Services, Engineering, Planning, Broome County Soil and Water Conservation District, Cornell Cooperative Extension	Early detection for flooding conditions	\$15,000/site plus ongoing O&M	USGS and NWS	High	SIP	PP
Broome County-24	Hydrological Data for Nanticoke Creek	1, 4	Flood, Severe Storm	Problem: Hydrological Data for Nanticoke Creek needs to be updated so that mitigation projects can be most accurate and effective. Solution: Conduct hydrological study on the Nanticoke watershed.	No	No	Within 2 years	Broome County Planning/ Engineering (Contractors)	Identify flood mitigation projects to reduce flooding	\$75,000	USGS Water Resources Research Act Program, FEMA PDM	Medium	LPR	PR
Broome County-25	Rain Gauges	1, 2	Severe Storm	Problem: Broome County has rain gauges on all of the hilltops but it currently isn't used for disaster mitigation efforts. Solution: Assess ways that this data can be useful and implement.	No	No	Within 1 year	Broome County Emergency Services/ Planning/ Engineering	Have additional data for use in preparedness and response efforts.	Staff Time	County Budget	Medium	LPR	PR
Broome County-26	Education and Awareness for the Flood Control Structures	1, 2	Flood	Problem: The general public isn't aware of the County owned flood control structures and the significant flood mitigation services they provide. Solution: Develop educational materials and signage (for those that also have recreational uses) about County flood control structures.	No	No	Within 1 year	Broome County Engineering/ Planning	Raise awareness of County flood control efforts.	Staff Time	County Budget	High	EAP	PI



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) Mitigated	Description of the Problem and Solution	Critical Facility (Yes / No)	EHP Issues	Timeline	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Potential Funding Sources	Priority	Mitigation Category	CRS Category
Broome County-27	Flood Insurance Education Program	1, 2	Flood	Problem: Flood insurance education is needed. There is a lot of confusion about what is required among insurance agents, residents, municipal reps, realtors, banks Solution: Establish training/education opportunities, develop educational fact sheets, brochures, etc.	No	No	Within 2 years	Broome County Planning	Ensure residents are appropriately covered and paying appropriate rates.	\$10,000	County Budget	Medium	EAP	PI
Broome County-28	Old Vestal Road Drainage Study	1, 3	Flood, Severe Storm	Problem: Stormwater issues on Old Vestal Road. Insufficient drainage due to development in Vestal. Solution: Study drainage leading to the Old Vestal Road system in order to assess solutions.	No	No	Within 3 years	Broome County Public Works, Town of Vestal	Projects and costs identified for implementation to improve drainage.	\$50,000	FEMA PDM or HMGP	Medium	SIP	PP
Broome County-29	Vulnerable Population Assessment	1, 5	All	Problem: Disaster impacts on vulnerable populations are not specifically identified. Solution: Conduct assessment of vulnerable populations impacted by disasters (especially flooding) utilizing existing GIS data. Provide to the local municipalities for policy and planning actions.	No	No	Within 2 years	Broome County Planning	Prioritize actions that protect vulnerable populations.	Staff time	County budget	Medium	LPR	PR
Broome County-30	Second Street Drainage System Upgrades	1, 3, 5	Flood, Severe Storm	Problem: The closed drainage system in Second Street (Village of Deposit) is undersized with larger diameter pipes draining side streets into a smaller diameter line in Second Street. The furthest downstream portion of this system was replaced and upsized in 2010, however A +/-700-ft section of pipe between Dean Street and Church Street was not replaced due funding availability. Over the past several years the flooding issues in Second Street along this section of roadway have increased, causing sidewalk and roadway icing and closure in the winter, and severe flooding the rest of the year. This section of road is directly in front of the Town of Sanford offices (building value of \$976,800), which is a critical facility vulnerable during flooding events. Also, located on this block are two churches (buildings valued at (\$862,900 and \$533,300 respectively), one commercial bank property (building valued at \$550,000), and several single and multifamily residential properties (total buildings valued at \$916,800). Although only the Town offices would be considered critical infrastructure, there is an additional \$2.863-million worth of other building infrastructure located within the flood prone area. Solution: Replace the closed drainage system and structures, and increase the size (capacity) of this system. Design of this mitigation has been completed, pipe size increase from an 18" diameter pipe to a 36" diameter pipe.	Yes	No	1 year	Broome County Engineer	\$300,000 saved by eliminating annual repairs. Protect critical facility and other properties.	\$320,000	TIP, PDM, HMGP	High	SIP	PP
Broome County-31	Use modeling to anticipate transportation routes expected to be impacted during flood events to include areas vulnerable to the 500-year flood			Problem: Solution:										
Broome County-32	Climate Smart Community program	All	All hazards	Problem: Broome County and local municipalities need to take action to reduce greenhouse gas emissions and adapt to a changing climate. Solution: Broome County will work towards becoming a Climate Smart Community. In addition, the county will encourage each municipality to participate. The first steps to becoming a Climate Smart Community is outline online (https://climatesmart.ny.gov/actions-certification/getting-started/). Once registered, the county will be able to review and select actions to implement. As they are implemented or completed, the county will upload the required information to the CSC portal and apply for certification. The benefits of becoming a Climate Smart Community includes: better scores on grant applications for some state funding; state-level recognition for community leadership; robust framework to organize local climate action and highlight priorities; streamlined access to resources, training, tools and expert guidance; and networking and sharing best practices with peers. Additionally, by implementing identified actions, the county experience additional benefits include, but not limited to: cost savings through greater efficiency; improved air quality from switching to cleaner	No	No	Within 6 months	Broome County Planning and municipalities	Greater climate resilience in the county.	Staff Time	County Budget	High	LPR	PR



Table 9.1-8. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) Mitigated	Description of the Problem and Solution	Critical Facility (Yes / No)	EHP Issues	Timeline	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Potential Funding Sources	Priority	Mitigation Category	CRS Category
				energy; conservation of green spaces; and reduction of future flood risk through climate change adaptation strategies.										

Notes:

Not all acronyms and abbreviations defined below are included in the table.

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CRS Community Rating System
- DPW Department of Public Works
- FEMA Federal Emergency Management Agency
- FPA Floodplain Administrator
- HMA Hazard Mitigation Assistance
- N/A Not applicable
- NFIP National Flood Insurance Program
- OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

- FMA Flood Mitigation Assistance Grant Program
- HMGP Hazard Mitigation Grant Program
- PDM Pre-Disaster Mitigation Grant Program

Timeline:

The time required for completion of the project upon implementation

Cost:

The estimated cost for implementation.

Benefits:

A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection (NSP) – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.
- Natural Resource Protection (NR) - Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities

Critical Facility:

- Yes ☑ - Critical Facility located in 1% floodplain



Table 9.1-9. Summary of Prioritization of Actions

Project Number	Project Name	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
Broome County-1	Trim Street Culvert Enlargement	1	1	1	1	1	0	0	1	0	1	1	1	1	0	10	High
Broome County-2	Reinforce the Acre Creek Banks under Loughlin Road Bridge	1	1	1	1	1	0	0	1	0	1	1	1	1	0	10	High
Broome County-3	Glenwood Road Bridge Replacement	1	1	1	1	1	0	0	1	0	1	1	1	1	0	10	High
Broome County-4	Identify priority locations for property buyouts: Richards Avenue and Tharp Road area has been identified as one priority	1	1	1	1	1	0	0	0	0	1	1	1	1	1	10	High
Broome County-5	Flood hazard mitigation alternatives for at risk County properties	1	1	1	1	1	1	0	0	0	1	0	1	0	0	8	Medium
Broome County-6	Undermining of Bridges and Culverts	1	1	1	1	1	1	0	1	0	1	1	1	0	0	10	High
Broome County-7	Countywide CRS Assistance to Communities	1	1	1	1	1	1	0	0	0	1	0	1	0	0	8	Medium
Broome County-8	Contribute to the ACE Upper Susquehanna River Basin Comprehensive Flood Damage Reduction Feasibility Study	1	1	1	1	1	0	1	1	0	1	0	1	1	0	10	High
Broome County-9	Watershed-based Mitigation Strategy	1	1	1	1	1	1	0	1	0	1	1	1	0	0	10	High
Broome County-10	Stormwater Resources and Sewer shed Mapping	1	1	1	1	1	1	0	1	0	1	1	1	0	0	10	High
Broome County-11	Use modeling to anticipate transportation routes expected to be impacted during flood events	1	1	1	1	1	1	0	0	0	1	0	1	1	1	10	High
Broome County-12	Countywide Culvert Inventory	1	1	1	1	1	0	1	0	0	1	1	1	0	0	9	Medium
Broome County-13	Invasive Species Public Outreach	1	1	1	1	1	1	0	1	0	1	0	1	0	0	9	Medium
Broome County-14	Susquehanna River Regional River Initiative	1	1	1	1	1	0	0	1	0	1	0	1	0	0	8	Medium
Broome County-15	United Way of Broome County Infrastructure Resiliency Broome County	1	1	1	1	1	0	0	0	0	1	1	1	1	1	10	High





Table 9.1-9. Summary of Prioritization of Actions

Project Number	Project Name	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
Broome County-16	Targeted Disaster Preparedness Education	1	1	1	1	1	1	0	0	0	1	1	1	0	0	9	Medium
Broome County-17	Village of Deposit Drainage Study	1	1	1	1	1	0	0	1	0	1	1	1	1	0	10	High
Broome County-18	Equipment for Highway Department	1	1	1	1	1	1	0	0	0	1	1	1	0	0	9	Medium
Broome County-19	Flood Control Structures on Nanticoke Creek	1	1	1	1	1	1	0	1	0	1	0	1	1	0	10	High
Broome County-20	Brady Hill Road (Binghamton) Culvert	1	1	1	1	1	0	0	0	0	1	1	1	0	0	8	Medium
Broome County-21	Evacuation Plans	1	1	1	1	1	1	0	0	0	1	1	1	1	0	10	High
Broome County-22	Backup Power for County Facilities	1	1	1	1	1	1	0	0	0	1	1	1	0	0	9	Medium
Broome County-23	Stream Gauge Installation and Outreach and Watershed Monitoring	1	1	1	1	1	0	0	0	0	1	1	1	1	1	10	High
Broome County-24	Hydrological Data for Nanticoke Creek	1	1	1	1	1	0	0	0	0	1	1	1	0	0	8	Medium
Broome County-25	Rain Gauges	1	1	1	1	1	1	1	0	0	1	0	1	0	0	9	Medium
Broome County-26	Education and Awareness for the Flood Control Structures	1	1	1	1	1	1	1	0	0	1	0	1	1	0	10	High
Broome County-27	Flood Insurance Education Program	1	1	1	1	1	1	0	0	0	1	0	1	0	0	8	Medium
Broome County-28	Old Vestal Road Drainage Study	1	1	1	1	1	0	0	1	0	1	1	1	0	0	9	Medium
Broome County-29	Vulnerable Population Assessment	1	1	1	1	1	1	1	0	0	0	1	1	0	0	9	Medium
Broome County-30	Second Street Drainage System Upgrades	1	1	1	1	1	0	0	1	0	1	1	1	1	0	10	High
Broome County-31																	
Broome County-32																	

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.

Projects with totals of less than 5 were identified as low; projects with totals of 5 to 9 were identified as medium; and projects with totals of greater than 9 were identified as high.





9.1.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.1.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for Broome County that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which Broome County has significant exposure. County-wide hazard maps are included in Section 5 of this plan. Municipal hazard profiles are included within Section 5.4, Volume I of this Plan.



Action Worksheet			
Project Name:	Trim Street Culvert Enlargement		
Project Number:	Broome County-1		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The ditches along Trim Street, starting at its intersection with Route 11 and extending 2 miles eastward, in the Town of Kirkwood, are not functioning properly. This leads to drainage issues, overflow onto roadways, cause culvert and road erosion, and impacts access to homes. This area floods with almost every severe storm and poses a risk to the health and safety of residents in this area. The Kirkwood Fire Department is located just east of the intersection and this critical facility is vulnerable during extreme flooding. The building was valued at \$173,287 in 2018 by the local tax assessor. Closer to the intersection is the home of the Binghamton Elks Club. While this building is not technically a critical facility, it is used by a major civic organization and valued at \$300,000. Thus, the value of two major structures near the proposed project is roughly half a million dollars. Also, Trim Street carries traffic between a major surface street, Highway 11, and Interstate 86. All the driveways along this 2-mile stretch are susceptible to failure and may cause residents to be unable to access or leave their homes.		
Action or Project Intended for Implementation			
Description of the Solution:	Widen the ditches to improve stormwater management. Increase the culvert size from 12 inches to 24 inches. Line widened ditches with light or medium stone. This project will pay for itself in the long run by minimizing ditch degradation and culvert washout.		
Is this project related to a Critical Facility?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Is this project related to a Critical Facility located within the 100-year floodplain?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	50-year event	Estimated Benefits (losses avoided):	\$400,000 saved by eliminating annual repairs. Protect critical facility and ensure fire department will be able to egress and regress to respond to fire events.
Useful Life:	25 years	Goals Met:	Protect infrastructure and critical facility.
Estimated Cost:	\$250,000	Mitigation Action Type:	Structural
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Immediately
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	TIP, PDM, HMGP
Responsible Organization:	Broome County Engineer	Local Planning Mechanisms to be Used in Implementation if any:	Stormwater Management Plan
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Problem continues or worsens
	Ongoing annual road repairs	\$15,000/year	Costly short-term solution
	Install a retention ponds	\$800,000	Uncertain about feasibility, high-maintenance, need to secure property owner agreements
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			





Action Worksheet		
Project Name:	Trim Street Culvert Enlargement	
Project Number:	Broome County-1	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protect residents who utilize Trim Street – reduces the amount of flooding they experience due to this issue
Property Protection	1	Protect homes and businesses in the area of Trim Street – reduces the amount of flooding they experience due to this issue
Cost-Effectiveness	1	Benefits of project outweigh the costs – protecting residents and infrastructure; roads not closing due to washouts and flooded streets
Technical	1	
Political	1	
Legal	0	Need to work with the Town of Kirkwood as the project is in their jurisdiction
Fiscal	0	Need to seek grant funding
Environmental	1	
Social	0	
Administrative	1	
Multi-Hazard	1	Flood, Severe Storm
Timeline	1	Completed within 5 years after funds received
Agency Champion	1	County and Town would like to see this project completed
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

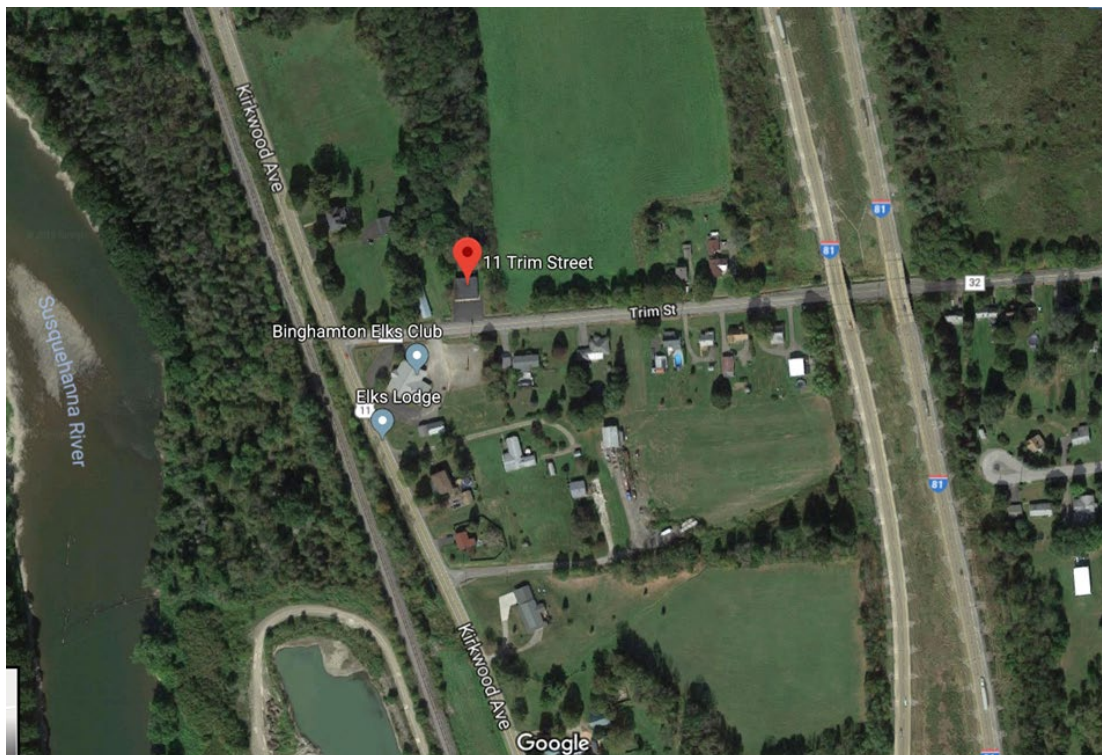
The Google maps below present street and satellite views of the intersection of Trim Street and Highway 11 (Kirkwood Highway), the location of the proposed project. Kirkwood Fire Co., Inc. is located just east of the intersection, and the Elks Lodge is located across the street in a southwesterly direction from the station.



Figure 9.1-1. Proposed Project Location Map



Figure 9.1-2. Aerial Overview of Proposed Project Location



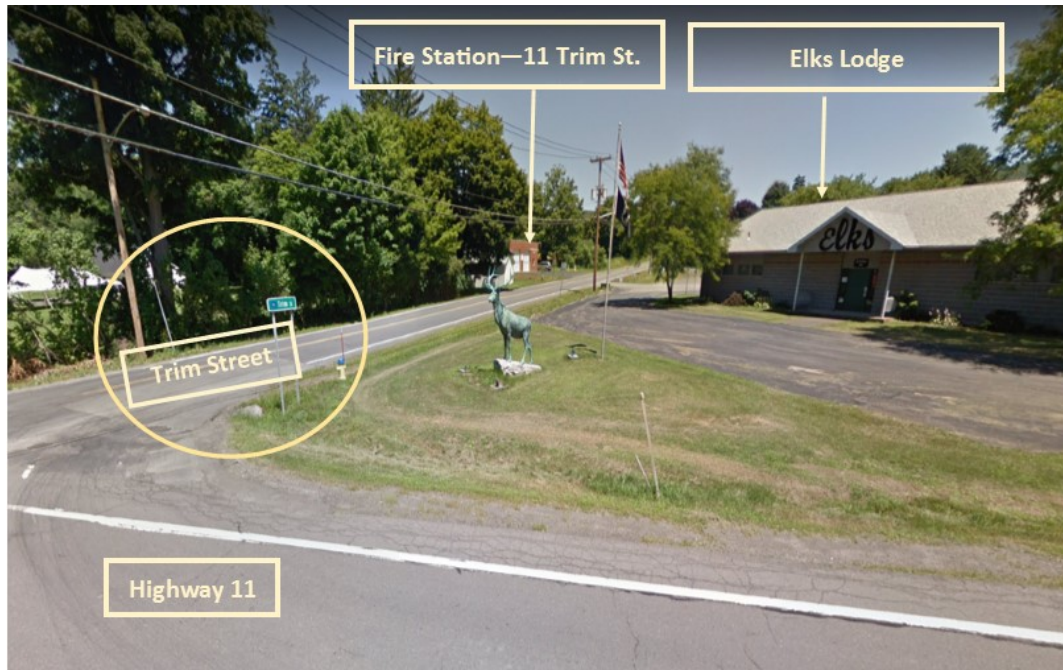
The intersection at which the project would take place is shown inside a yellow circle in both photos. The top photo shows the Kirkwood Fire Department in the square at upper left, and the Elks Lodge is shown in the heptagon at right. The eye-level bottom photo also shows the location of both structures relative to the project site.



Figure 9.1-3. Aerial Description of Proposed Project Location



Figure 9.1-4. Street View of Proposed Project Location





Action Worksheet			
Project Name:	Reinforce the Acre Creek Banks under Loughlin Road Bridge		
Project Number:	Broome County-2		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Loughlin Road Bridge, in the Town of Kirkwood, is a county-owned and -operated structure that spans Acre Creek. The creek slope beneath the bridge regularly fails after a severe storm, leading to bank failure and reduced creek water quality. Creek overflow leads to flooded roadways and has caused flooding in adjacent homes and businesses. Several bridges connect private property (business and residential) over the creek, which are often clogged with debris and have failed in the most recent flooding.		
Action or Project Intended for Implementation			
Description of the Solution:	Reinforce 1,500 linear feet of each bank and the stream bottom with stone and rip-rap. One side was reinforced in a hit-or-miss fashion in order to save money because there was not enough in the budget to do the complete job. The road has failed on occasion, requiring frequent emergency repairs. Doing the repairs on both sides and the bottom at one time will protect the entire structure because the job will involve using interlocking materials.		
Is this project related to a Critical Facility?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Is this project related to a Critical Facility located within the 100-year floodplain?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	100-year event	Estimated Benefits (losses avoided):	Reduce estimated annual repairs that cost \$70,000 per event
Useful Life:	100 years	Goals Met:	Protect infrastructure, personal property, maintain open roadways, minimize possibility of hazardous material affecting water quality.
Estimated Cost:	\$1.0 million	Mitigation Action Type:	Structural
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Immediately
Estimated Time Required for Project Implementation:	Two years	Potential Funding Sources:	TIP, PDM, HMGP
Responsible Organization:	Broome County Engineer	Local Planning Mechanisms to be Used in Implementation if any:	Public Works Operations Plan, Floodplain Management Plan
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Continued bank failure
	Repeated bank repair	\$70,000 per event over the past few years	Short-term solution
	Buyout affected properties	\$1.0 million	Loss of tax base and reduction in numbers of businesses
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Reinforce the Acre Creek Banks under Loughlin Road Bridge	
Project Number:	Broome County-2	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protect residents from future flood events – reduces or eliminates the flood risk to homes
Property Protection	1	Protect structures from future flood events – reduces or eliminates flood damage to the structures
Cost-Effectiveness	1	Benefits outweigh the costs – reduce or eliminate damages to homes and infrastructure
Technical	1	
Political	1	
Legal	0	Need to work with the Town of Kirkwood as the bridge is located in the town
Fiscal	0	Need to seek grant funding
Environmental	1	
Social	0	
Administrative	1	The County has the administrative capabilities to complete this project
Multi-Hazard	1	Flood and Severe Storm
Timeline	1	Completed within five years of receiving funds
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

The Google street maps below show the project location where Loughlin Road crosses Acre Creek. The Loughlin Road bridge is marked by a blue circle on both maps. The second map provides a close-up view of the location



Figure 9.1-5. Proposed Project Location Map

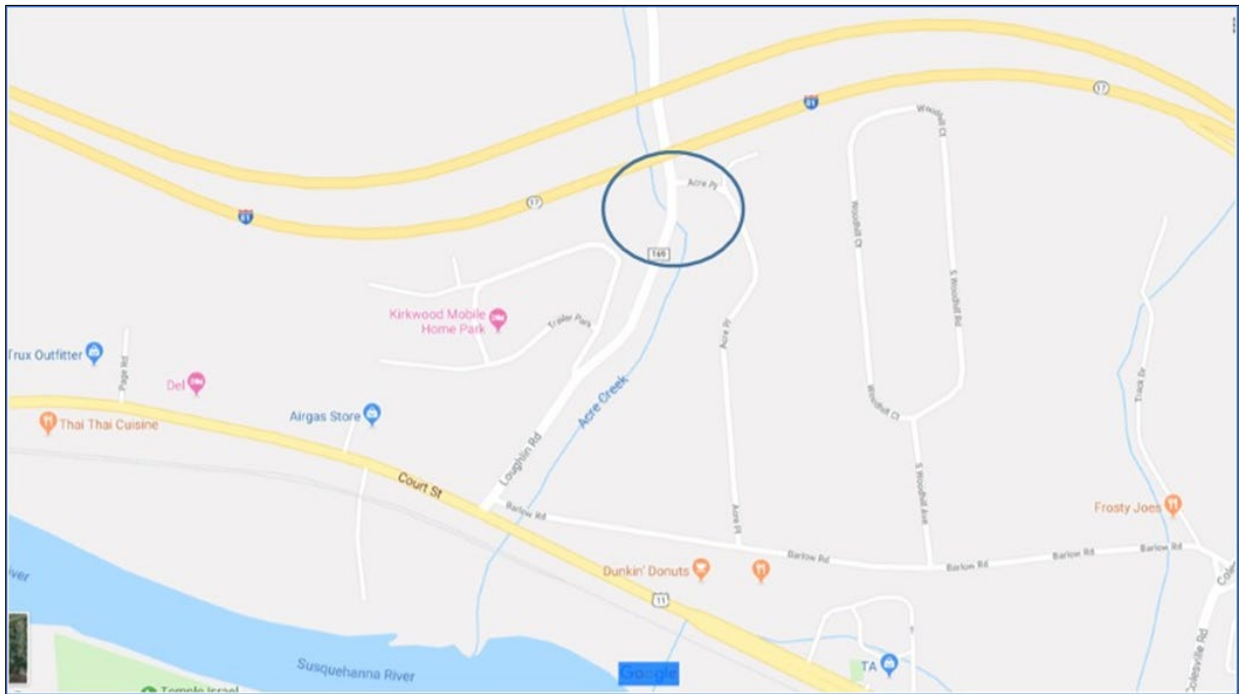
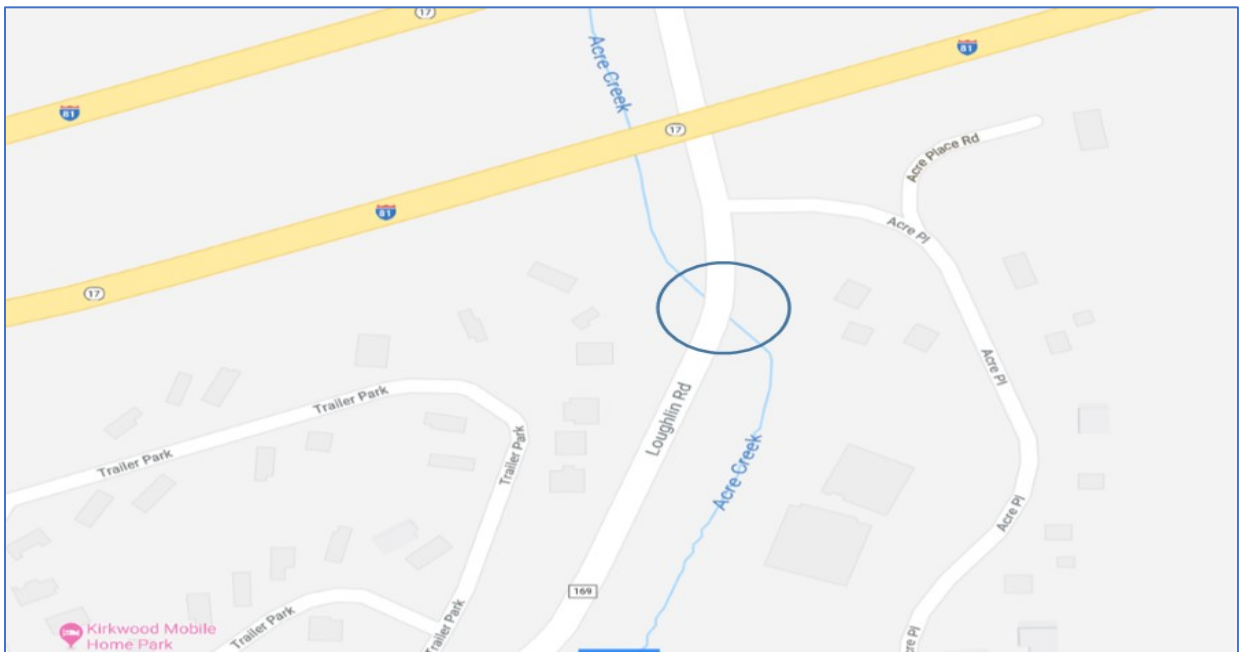


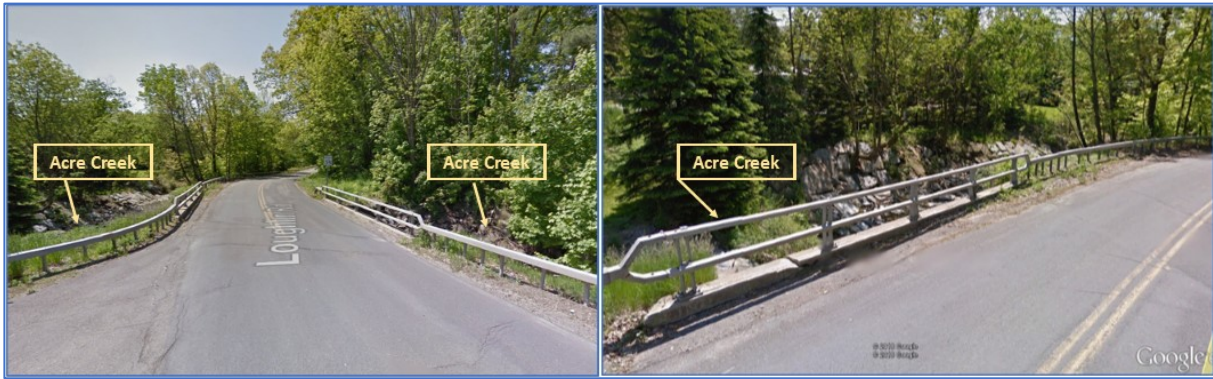
Figure 9.1-6. Proposed Project Location Map



These Google images show the creek on either side of the Loughlin Road Bridge overpass. The bottom photos show the creek from the perspective of someone standing on the overpass.



Figure 9.1-7. Aerial and Street Views Proposed Project Location Map



This Google photo depicts the neighborhood near the Loughlin Road bridge. Many homes and businesses in the vicinity would be affected by the Acre Creek bank failure that could result in flooding of nearby roadways and structures.



Figure 9.1-8. Aerial Map of Neighborhood Near Proposed Project Site





Action Worksheet			
Project Name:	Glenwood Road Bridge Replacement		
Project Number:	Broome County-3		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Glenwood Road at Glenwood Road Bridge in the Town of Vestal is regularly subject to flash flooding because of its proximity to Choconut Creek and hydraulic restriction at the bridge. Nearby home and business owners are often restricted when the roadway becomes flooded. Glenwood and other roads are often closed for several days, which affects the ability of emergency personnel to reach nearby residents. County-owned and -operated Glenwood Road bridge over Choconut Creek is situated between Underwood Road and Highway 26. The bridge, a major route serving those who live and work west of Highway 26, is and has been subject to repeated erosion and flood damage. The community considers bridge replacement to be a priority mitigation action.		
Action or Project Intended for Implementation			
Description of the Solution:	Increase the hydraulic capacity of the bridge by raising the roadway and extending the span. Below information illustrates how traffic would be rerouted while the project is underway.		
Is this project related to a Critical Facility?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Is this project related to a Critical Facility located within the 100-year floodplain?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	100-year storm, the project would include 2' of freeboard	Estimated Benefits (losses avoided):	Lessen road washouts; reduce the cost of interim road, bridge and creek repairs; and eliminate the need for road closures and resident evacuations.
Useful Life:	75 years	Goals Met:	Safety of property and residents
Estimated Cost:	\$1.5 million	Mitigation Action Type:	Structural
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Immediately
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	PDM, HMGP, Bridge NY. TIP
Responsible Organization:	Broome County Engineer	Local Planning Mechanisms to be Used in Implementation if any:	Public Works Plan
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Continued flooding and road washout
	Buy out 4 nearby properties	\$1 million	Doesn't address the bridge problem
	Close Glenwood Road between Underwood Road and Co. Highway 26	\$500,000	Greatly inconveniences residential, business and commuter traffic.
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

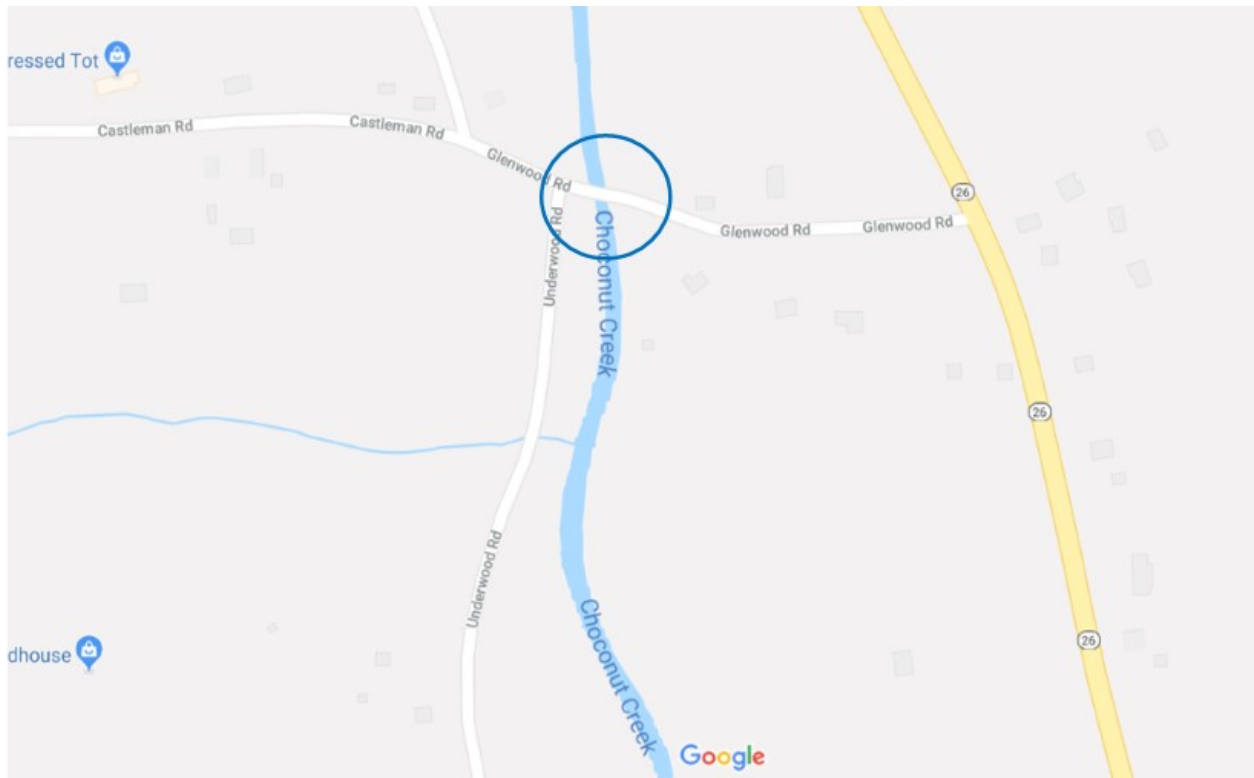
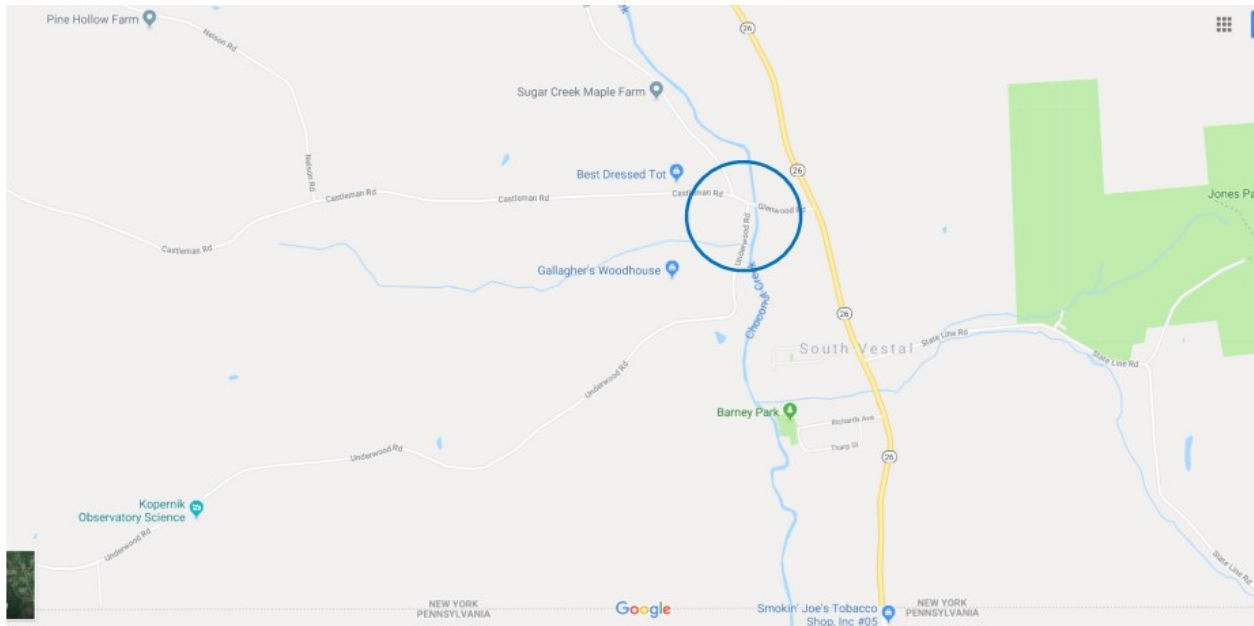


Action Worksheet		
Project Name:	Glenwood Road Bridge Replacement	
Project Number:	Broome County-3	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protect residents from future flood events – allows roadways to remain open and provide access to residents and emergency personnel
Property Protection	1	Protect structures from future flood events – reduces or eliminates flood damage to the structures; allows roadways to remain open during periods of heavy rain and/or flooding
Cost-Effectiveness	1	Benefits outweigh the costs – reduce or eliminate damages to homes and infrastructure
Technical	1	
Political	1	
Legal	0	Need to work with the Town of Vestal as the bridge is located in the town
Fiscal	0	Need to seek grant funding
Environmental	1	
Social	0	
Administrative	1	The County has the administrative capabilities to complete this project
Multi-Hazard	1	Flood and Severe Storm
Timeline	1	Completed within five years of receiving funds
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

The Google maps below show the location (marked with a blue circle) of the project in the Town of Vestal. The bottom map provides a closeup view of the intersection where the proposed work will take place.



Figure 9.1-9. Proposed Project Area Map





The top Google image shows where Glenwood Road crosses Choconut Creek, and how it extends from Underwood Road (at left) to Highway 26 (at right). The two images at bottom show views of the roadway from the Glenwood Road Bridge. The short distance between the water and the bridge indicates that road failure and water overtopping could easily overwhelm the roadway and those who travel it. The project location is marked by a yellow circle in all three images.

Figure 9.1-10. Aerial View of Proposed Project Area



Figure 9.1-11. Street View of Proposed Project Area

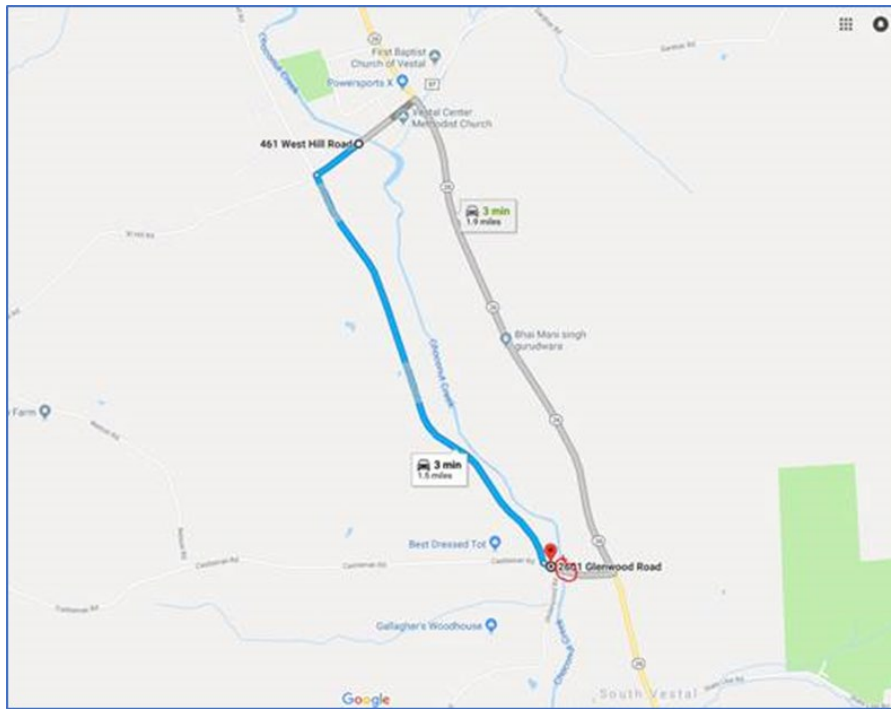


During the time in which the Glenwood Road bridge is being replaced, traffic will use the offsite detour shown in the map at right below. NY Route 26 is a high-speed road that could easily accommodate the detour for the season in which work is being completed. Most of the traffic using the bridge is travelling in a north-south direction. Signage would direct travelers to access Glenwood Road at West Hill Road, which would inconvenience them little and not extend travel time. The project would take approximately five months to complete, with an approximate work window of May to October.

The geometry of the bridge is such that it can be easily raised with little impact on adjacent properties. The image at right shows the restriction that is causing the problem to be resolved. It would not be difficult to lengthen the bridge eastward because the project would not affect nearby properties. The project benefit is that road gains grade as one travels eastward, which lends itself to naturally lengthening the bridge in this direction.



Figure 9.1-12. Proposed Traffic Detour for Proposed Project





Action Worksheet			
Project Name:	Home buyouts on Richards Avenue and Tharp Road		
Project Number:	Broome County-4		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The relocation of Choconut Creek now causes frequent flooding and damage to nearby homes located on Tharp Road and the Richards Ave. Park area. The Vestal community is a thriving part of the county and attractive to current and potential residents. Homeowners are frustrated from dealing with repeat flood events but want to remain in the immediate area.		
Action or Project Intended for Implementation			
Description of the Solution:	Acquire and demolish 12 of the most affected properties, providing property owners relief from flood impacts while giving them the financial resources to relocate to a safer part of the town.		
Is this project related to a Critical Facility?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Is this project related to a Critical Facility?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	100-year storm	Estimated Benefits (losses avoided):	Eliminate destruction of homes on Tharp Road and Richards Avenue, the total value of which is \$1.8 million
Useful Life:	75 years	Goals Met:	Reduce the risk of flood to 10-20 homes
Estimated Cost:	\$3.6 million	Mitigation Action Type:	Structural
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Immediate
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	PDM, HMGP
Responsible Organization:	Broome County Engineer	Local Planning Mechanisms to be Used in Implementation if any:	Stormwater Management Plan, Comprehensive Plan
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Residential properties continue to be affected
	Rebuild elevating with minimum of 2' freeboard	\$2.4 million	Doesn't fully address the problem, the land still floods
	Build a 1,300-linear foot floodwall	\$1.6 million	Aesthetically not pleasing
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Home buyouts on Richards Avenue and Tharp Road	
Project Number:	Broome County-4	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Eliminates flood risk to residents living in these homes
Property Protection	1	Eliminate flood damage to the homes in this area
Cost-Effectiveness	1	
Technical	1	
Political	1	There is political support for this project; the county will work with the Town of Vestal to acquire homes
Legal	0	
Fiscal	0	Need to seek grant funding to complete this project
Environmental	0	No negative environmental impacts
Social	0	No negative social impacts
Administrative	1	
Multi-Hazard	1	Flood and Severe Storm
Timeline	1	To be completed within five years of receiving funds
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

The project will be carried out in South Vestal, located in southern Broome County, approximately ½ mile north of the New York boundary with the state of Pennsylvania. The image at bottom shows the Barney Park neighborhood reached via Richards Avenue and Tharp Road from Highway 26.



Figure 9.1-13. Overview Map of Proposed Project Area



Figure 9.1-14. Overview Map of Proposed Project Area





This August 14, 2018 news story from the Binghamton Fox-TV affiliate discusses the need for Richards Avenue residents to be ready to evacuate should nearby Choconut Creek overflow into Barney Park and reach nearby homes.

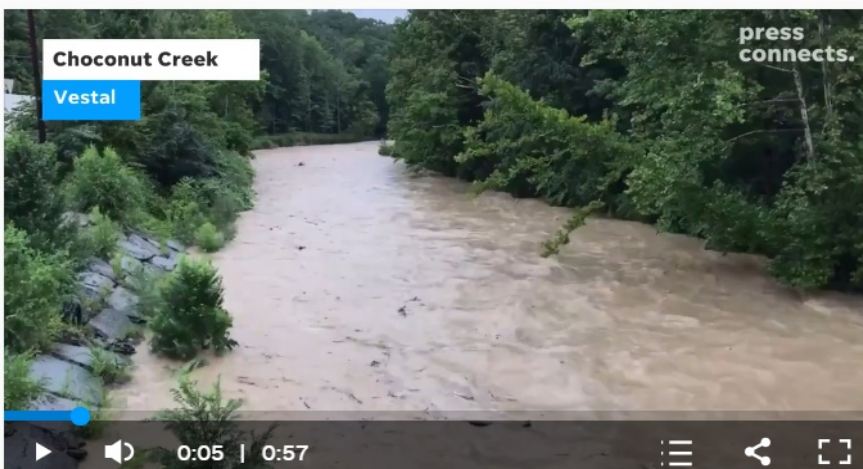
Figure 9.1-15. News Article

The screenshot shows a news article on the FOX 40 website. The article title is "Flooding Forces Evacuations In Vestal Ctr. Near Choconut Creek". It was posted on August 14, 2018, at 9:13 AM EDT and updated at 11:44 AM EDT. The author is FOX 40 Staff. The article text states: "Flash Flood Warning is back in place for Southern Broome County, Southeast Tioga County, Northeastern Susquehanna County and Northwestern Wayne County in Northeastern PA. Broome County emergency management says homes in on Richards Avenue in Vestal Center near Choconut Creek may be forced to evacuate. Emergency crews closed off Route 11 and Main Street in Kirkwood on Thursday due to flooding. The National Weather Service is urging people living in flood-prone areas to be ready to take quick action to protect life and property." There is a small photo of a flooded street. Below the article is a tweet from Jason Garnar (@jasongarnar) stating: "Due to flooding in #BroomeCounty - The Broome County Emergency Operations Center (EOC) has been activated. 9:16 AM - Aug 14, 2018". The tweet has 16 replies. To the right of the article is an advertisement for pumpkin carving.

USAToday local online publication pressconnects.com regularly covers stories about local flooding. The images below were taken from a July 24, 2017 story about flash flooding from Choconut Creek overflow in the town of Vestal



Figure 9.1-16. Flash Flooding from Event



These neighborhood snapshots show the Barney Park area to be a quiet, well-maintained, settled neighborhood of working families.



Figure 9.1-17. Street View of Proposed Project Area





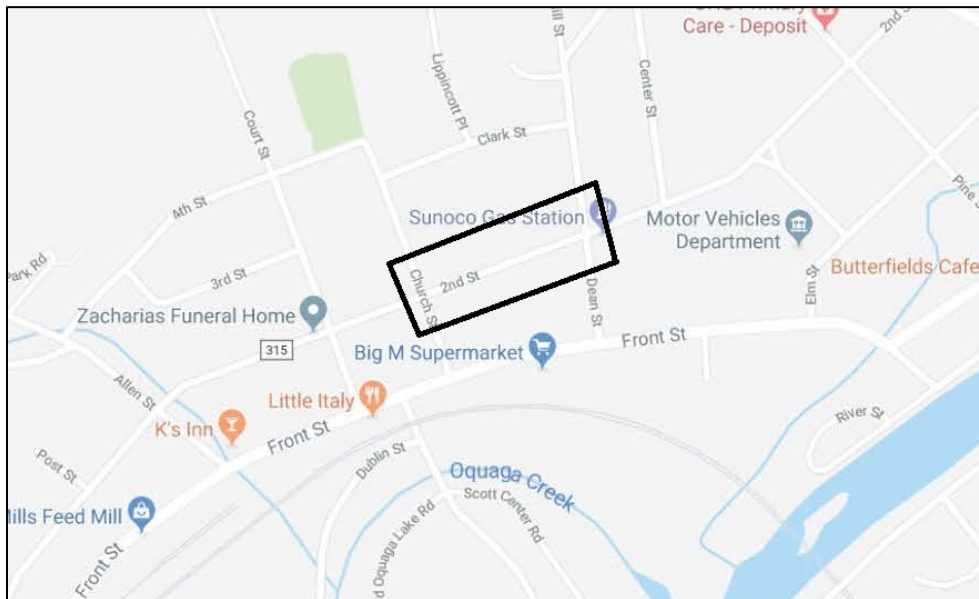
Action Worksheet			
Project Name:	Second Street Drainage System Upgrades		
Project Number:	Broome County-30		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	<p>The closed drainage system in Second Street (Village of Deposit) is undersized with larger diameter pipes draining side streets into a smaller diameter line in Second Street. The furthest downstream portion of this system was replaced and upsized in 2010, however, a +/-700-ft section of pipe between Dean Street and Church Street was not replaced due funding availability. Over the past several years the flooding issues in Second Street along this section of roadway have increased, causing sidewalk and roadway icing and closure in the winter, and severe flooding the rest of the year. This section of road is directly in front of the Town of Sanford offices (building value of \$976,800), which is a critical facility vulnerable during flooding events. Also, located on this block are two churches (buildings valued at (\$862,900 and \$533,300 respectively), one commercial bank property (building valued at \$550,000), and several single and multifamily residential properties (total buildings valued at \$916,800). Although only the Town offices would be considered critical infrastructure, there is an additional \$2.863-million worth of other building infrastructure located within the flood prone area.</p>		
Action or Project Intended for Implementation			
Description of the Solution:	Replace the closed drainage system and structures, and increase the size (capacity) of this system. Design of this mitigation has been completed, pipe size increase from an 18" diameter pipe to a 36" diameter pipe.		
Is this project related to a Critical Facility?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Is this project related to a Critical Facility?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	50-year event	Estimated Benefits (losses avoided):	\$300,000 saved by eliminating annual repairs. Protect critical facility and other properties.
Useful Life:	25 years	Goals Met:	Protect infrastructure and critical facility.
Estimated Cost:	\$320,000	Mitigation Action Type:	Structural
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Immediately
Estimated Time Required for Project Implementation:	1 year	Potential Funding Sources:	TIP, PDM, HMGP
Responsible Organization:	Broome County Engineer	Local Planning Mechanisms to be Used in Implementation if any:	Hazard Mitigation, Stormwater Management
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Problem continues and worsens
	Ongoing annual road repairs and maintenance materials (salt)	\$15,000/year	Short-term solution and does not protect buildings and properties
	Elevate municipal offices and other buildings impacted by this issue	\$1 million	While it's a long-term solution, project is costly and not all buildings are able to be elevated; still does not solve the flooded roadways
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

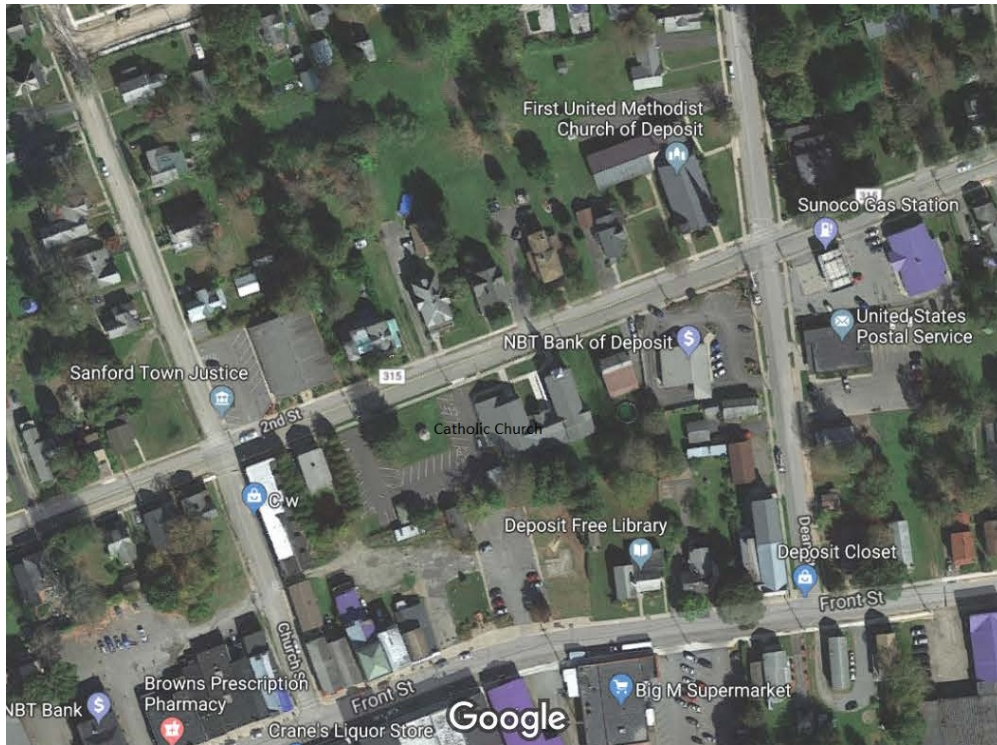


Action Worksheet		
Project Name:	Second Street Drainage System Upgrades	
Project Number:	Broome County-30	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Protect structures in the immediate area from future flood damages; allows town offices to remain open during emergencies
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	0	The county has jurisdiction over the drainage system; however, the county will need to work with the town and village to complete the project
Fiscal	0	Need to seek grant funding to complete the project
Environmental	1	
Social	0	No negative social impacts
Administrative	1	
Multi-Hazard	1	Flood, Severe Storm, Severe Winter Storm
Timeline	1	To be completed within five years after receiving funds
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

The Google maps below present street and satellite views Second Street between Dean Street and Church Street - the location of the proposed project. The satellite view shows the location of the Town building, the churches and the bank building, as well as the residential structures along this block.

Figure 9.1-18. Street and Satellite View of Proposed Project Location





Looking west down Second Street at the intersection of Church Street. Project will reconstruct drainage system through this intersection continuing west. Town Offices are in the building to the left, and building on the right is a multi-family residential structure.

Figure 9.1-19. Looking West Down Second Street at the Intersection Of Church Street



Further west on Second Street – heading west. One of the churches is shown on the right side of the street.



Figure 9.1-20. Looking Further West on Second Street



Second Street near the intersection with Dean Street. Second church is on the left, and bank facility is on the right. Project will tie into new and upgraded drainage system in this intersection.

Figure 9.1-21. Second Street near the intersection with Dean Street

