

NY Rising Community Reconstruction Plan

NYRCR Village of Washingtonville

March 2014

NY Rising Community Reconstruction Program



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FOREWORD

INTRODUCTION

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

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

PROGRAM OVERVIEW

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

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

provided through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program.²

Forty-five NYRCR Communities, each comprising one or more of the 102 localities, were created and led by a NYRCR Planning Committee composed of local residents, business owners, and civic leaders. Members of the Planning Committees were identified in consultation with established local leaders, community organizations, and in some cases municipalities. The NYRCR Program sets a new standard for community participation in recovery and resiliency planning, with community members leading the planning process. Across the State, more than 500 New Yorkers represent their communities by serving on Planning Committees.

² Five of the 102 localities in the program—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program.



More than 400 Planning Committee Meetings have been held, during which Planning Committee members worked with the State’s NYRCR Program team to develop community reconstruction plans and identify opportunities to make their communities more resilient. All meetings were open to the public. An additional 125-plus Public Engagement Events attracted thousands of community members, who provided feedback on the NYRCR planning process and proposals. The NYRCR Program’s outreach has included communities that are traditionally underrepresented, such as immigrant populations and students. All planning materials are posted on the NYRCR Program’s website (www.stormrecovery.ny.gov/nyrcr), providing several ways for community members and the public to submit feedback on materials in progress.

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

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

The NYRCR Program does not end with this NYRCR Plan. Governor Cuomo has allocated over \$650

million of funding to the program for implementing projects identified in the NYRCR Plans. NYRCR Communities are also eligible for additional funds through the program’s NY Rising to the Top Competition, which evaluates NYRCR Communities across eight categories, including best use of technology in the planning process, best approach to resilient economic growth, and best use of green infrastructure to bolster resilience. The winning NYRCR Community in each category will be allocated an additional \$3 million of implementation funding. The NYRCR Program is also working with both private and public institutions to identify existing funding sources and create new funding opportunities where none existed before.

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

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

THE NYRCR PLAN

This NYRCR Plan is an important step toward rebuilding a more resilient community. Each NYRCR Planning Committee began the planning process by defining the scope of its planning area, assessing

storm damage, and identifying critical issues. Next, the Planning Committee inventoried critical assets in the community and assessed the assets’ exposure to risk. On the basis of this work, the Planning



Committee described recovery and resiliency needs and identified opportunities. The Planning Committee then developed a series of comprehensive reconstruction and resiliency strategies, and identified projects and implementation actions to help fulfill those strategies.

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

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

While developing projects for inclusion in this NYRCR Plan, Planning Committees took into account cost estimates, cost-benefit analyses, the

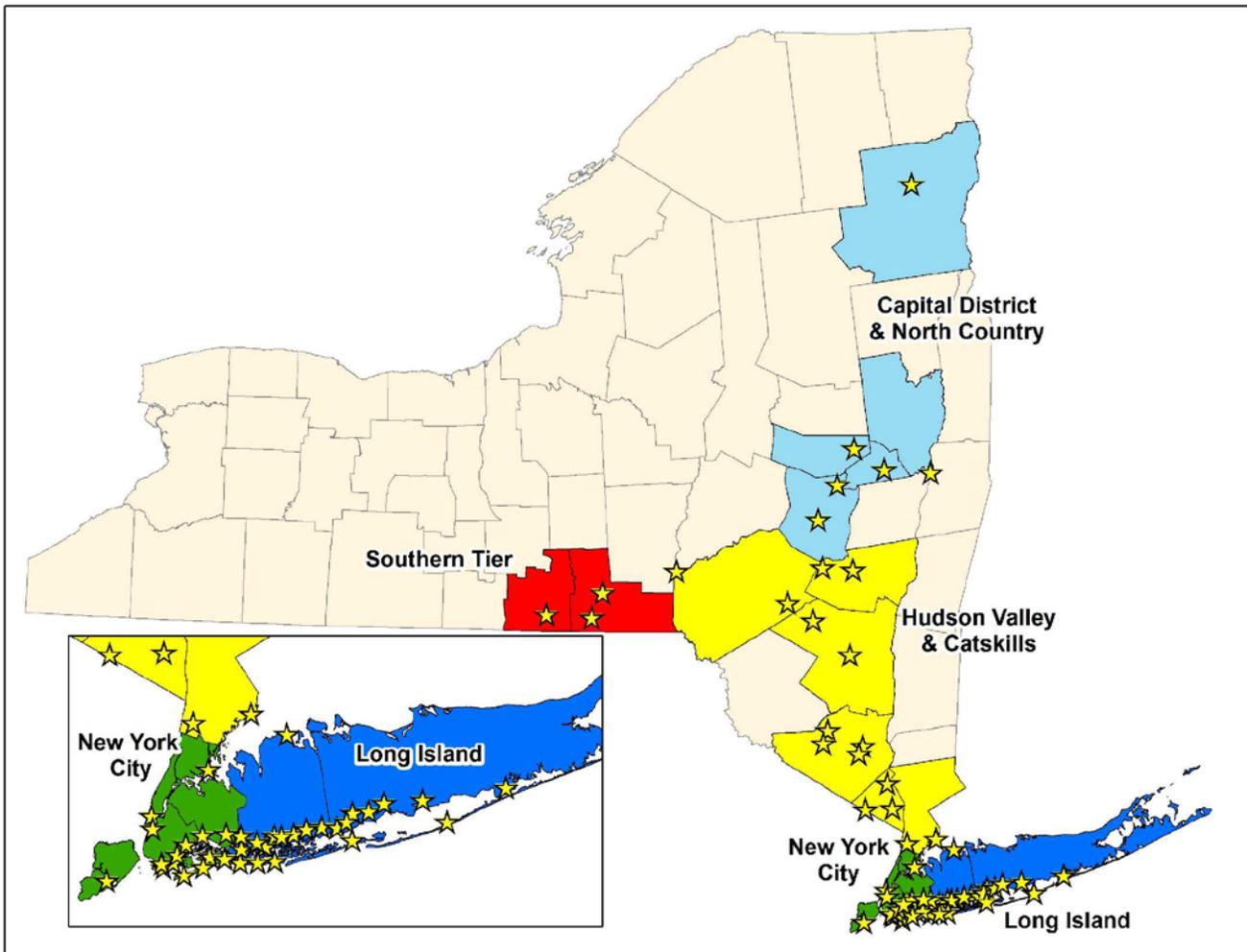
effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. Planning Committees also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding. Projects and actions implemented with this source of Federal funding must fall into a Federally-designated eligible activity category, fulfill a national objective (meeting an urgent need, removing slums and blight, or benefiting low to moderate income individuals), and have a tie to the natural disaster to which the funding is linked. These are among the factors that the Governor’s Office of Storm Recovery will consider, in consultation with local municipalities and nonprofit organizations, when determining which projects and actions are best positioned for implementation.

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

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



NYRCR COMMUNITIES³



Find out more at: StormRecovery.ny.gov/Community-Reconstruction-Program

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



EXECUTIVE SUMMARY

OVERVIEW

The Village of Washingtonville is located in central Orange County, New York, within the northern region of the Town of Blooming Grove. The Village shares the majority of its border with the Town of Blooming Grove, and a small portion with the Town of New Windsor.

In late August-early September 2011, back-to-back storms Hurricane Irene and Tropical Storm Lee became the most recent in a long history of floods in Washingtonville. The Village's downtown, consisting of residential, commercial, and historic properties, is cradled by Moodna Creek, and is immediately in the flood hazard area. The area flooded with up to 8 feet of water during Hurricane Irene, destroying Village Hall, and damaging or destroying approximately 80 homes. Flooding also incapacitated the Village's emergency services, government, and public works; this compromised continuity of services and operations, and hindered response times during the disaster and into the recovery phase.

The impacts and challenges caused by these storms and resultant flooding were significant, and affected the lives of all segments of the local community, and the region at large. Despite extensive collaboration between the community and agency partners to use available response and recovery resources, including inspiring local volunteer efforts, considerable unmet recovery needs remain more than two years after flood waters have receded.

To address the substantial, lasting impacts from both historic and more recent floods, and to establish long-term community health and resiliency, the Village of Washingtonville has developed a NY Rising Community Reconstruction (NYRCR) Washingtonville Plan. The NYRCR Washingtonville planning area includes all land within the Village boundaries, as well as a contiguous ¼ mile buffer around the Village. This planning area was defined to encourage reconstruction and resiliency projects that address the sources of flooding in the Village, and to protect the assets that affect the Village's resiliency to future storm events.

Under the guidance and funding of the NYRCR Program, the completed NYRCR Washingtonville Plan aims to address the most critical needs and impacts from Hurricane Irene and Tropical Storm Lee, while also identifying strategies and priorities for future resiliency, increased quality of life, community vibrancy, and economic growth. The Village's highest priorities are synthesized into proposed projects that may be implemented with an NYRCR award of up to \$3 million.

The following critical issues were identified during the NYRCR Washingtonville Planning process through a combination of existing plan reviews, technical analyses, ongoing public input, inter-agency coordination, and NYRCR Washingtonville Committee (Committee) guidance and discussion.

CRITICAL ISSUES

The Village's proximity to Moodna Creek offers residents and visitors both active and passive recreation along the Creek's banks. However, the Moodna also places its most crucial community

assets at an inherent risk of flooding, and as the waters of the Creek overtop its banks, the Village has repeatedly sustained significant flood damage to infrastructure and critical assets.



Repeated flooding of the Village’s primary transportation access routes and corridors has created significant evacuation and safety issues in the past. Numerous flood events have inundated State Route 208 and State Route 94, the primary transportation corridors providing access into and out of the Village, including to vital services, such as food and medical care. During peak high-water levels following Hurricane Irene, widespread flooding crippled transportation functionality and limited emergency response throughout the Village. The alarming impacts of road closures were widespread across the Village, with sizeable sections of the Village isolated from emergency relief for days.

A thriving economy in the Village is significantly restrained by the real and perceived threats of severe flood damage. Additional challenges to local economic growth that were corroborated by anecdotal and documented evidence throughout the planning process include:

- A lack of economic development incentives;
- Lack of parking near commercial and downtown areas;
- Insufficient recreational opportunities to keep families in town; and
- A need to inventory and assess economic assets damaged by storm events.

Increasing housing costs and reduced housing affordability are growing issues throughout Orange County. The severity of these issues is more pronounced in the Village of Washingtonville, exacerbated by the skyrocketing costs of flood insurance. Of the 110 National Flood Insurance policyholders in the Village, 27 are classified by FEMA as Repetitive Loss (RL) properties, and five as Severe Repetitive Loss (SRL) properties. General housing affordability issues particularly limit options for flood-ravaged homeowners who may otherwise look to relocate their homes to less-flood-prone locations within the Village.

A lack of focused local planning documents currently places the community at a disadvantage when making decisions to guide the future growth of Washingtonville. While the Village is included in the planning area of several regional and Orange County planning documents, much of the information and issues specific to Washingtonville are minimized or marginalized. Identifying emerging issues, trends, and strategies to address them becomes increasingly challenging without up-to-date local data and information, and ongoing stakeholder engagement. In addition, the lack of a formal Washingtonville Comprehensive Plan presents a challenge for verifying the consistency of local ordinances with shifting community goals and preferences.

COMMUNITY-DRIVEN PROCESS

Through collaborative discussions, stakeholder engagement, reviews of existing plans and studies, and a focused intention toward holistic community recovery, the Committee adopted the following vision to guide the recovery and resiliency effort for the Village of Washingtonville:



To create a resilient and vibrant environment in the Village of Washingtonville that embraces the community's history, charm, and character while providing for future economic stability and reducing vulnerability to the effects of natural hazards, flooding, and climate change. Through stakeholder-driven action the Village will focus its efforts to recover from the past and most recent storm and flood events by fostering economic vitality and focusing on the safety and well-being of people, property, and critical assets.

The Village of Washingtonville will recover from the effects of Hurricane Irene and Tropical Storm Lee, and past flooding events to create a community that is stronger and more economically robust as a result of rebuilding and re-visioning. By capitalizing on the social, economic, and environmental assets; protecting vulnerable populations; maintaining community character; and attracting new families and businesses; the

Village of Washingtonville will remain a safe, resilient, and welcoming place.

Public input was solicited and incorporated into the planning process through diverse and continuous methods to ensure maximum engagement. The public engagement process for Washingtonville advanced the NYRCR Program framework for community-driven resiliency initiatives that began with a communications strategy. This strategy — deliberately targeted to reach residents, homeowners, non-resident property owners, business owners, and community and social service organizations across both the public and private sectors — served as the local blueprint for public engagement and education. Specific venues for public involvement and engagement included weekly or bi-weekly Committee meetings, online and hard copy surveys, focused agency interviews and electronic surveys, and community-wide public meetings.

FINAL PLAN AS BLUEPRINT FOR IMPLEMENTATION

The Committee identified the Village's primary needs through the lens of the community vision and critical issues, including lost economic opportunities attributed to damages, and insufficient local capital for rebuilding and economic expansion. The needs identified provide a basis for the strategies, projects, programs, policies, and actions proposed as a result of this community planning process.

The NYRCR Washingtonville Plan addresses the overarching need to ensure the resiliency of existing assets and any proposed post-storm new construction projects to future storm events. To meet this goal, the Committee first identified and analyzed the Village's economic, health/social services, housing, infrastructure, and natural/cultural resources, specifically highlighting those resources whose loss or impairment posed risk to critical facilities and essential social,

economic, or environmental functions of the community.

The Committee then evaluated the overall risk to these assets, primarily relevant to flooding by Moodna Creek. Once delineated, the risk-to-assets relationship provided another tool for the Committee to use in making decisions for NYRCR reconstruction strategies and proposed projects.

Next, the Committee constructed strategies to reflect community values and input, issues, needs, and opportunities. These strategies are the foundation for proposed projects, programs, policies and actions in this Plan.

Projects were vetted with both qualitative input from the community, and quantitative, scientifically based analysis. This included a detailed Cost Benefit Analysis, Risk Reduction Analysis, and Hydraulic Modeling.



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

Strategy 1: Reduce the impact of flooding on the built environment in the Village, including critical facilities, infrastructure, businesses and housing.

Mays Field Relocation Project - Phase I: Little League field removal and creation of passive flood control – Buy out May's Field property, remove excess dirt, structures, and asphalt to restore as passive flood control, and provide additional flood storage through creation of retention area. It is important to the Committee to also identify a location for new Little League fields. **Proposed**

Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements -

Identify appropriate locations throughout Washingtonville to implement stream management measures, and conduct a feasibility study to analyze reductions in the extent and severity of flooding throughout the Village. The feasibility study would produce detailed projects that address the extent of and reduce the impact of flooding in the Village.

Proposed

Strategy 2: Ensure safe and reliable transportation, movement, and shelters during flood and disaster events.

Complete Additional Hydraulic, Stormwater, and Bridge Analysis - Pursue a comprehensive hydraulic analysis of the Moodna Creek, including erosion

issues along Route 208, as well as an analysis of the numerous bridges and structures that reflect present and potential constrictions, due to their design and location. Pursue analysis of Village stormwater systems for possible improvements.

Proposed

Strategy 3: Improve pre-disaster preparation to include emergency communication systems, evacuation routes, shelter access, sheltering-in-place procedures, and transportation access into and out of the Village.

Village Combined Facility Building - Construct a public facility/structure to house multiple community functions. **Featured**

Automatic Level Sensing Devices - Install automatic level sensing devices on streams and lakes to provide for early warning of potential flooding in the Village, coordinated with similar regional and state-wide initiatives, thereby helping to notify residents and business owners of impending floods.

Featured

Strategy 4: Maintain and enhance economic vitality through retention of the tax base and strategic actions to enhance business viability in the Village.

Village Park - Create a waterfront park at the site of the old Village Hall to include the old Village Hall parcel, as well as two adjacent repetitive, flood-damaged parcels being considered for acquisition. The new park may be designed for passive and active recreation, linking the Village downtown with the banks of Moodna Creek. **Proposed**

Review and Update Village Codes and Ordinances -

Review existing codes and ordinances for consistency with community goals and implement changes, as necessary. Potential updates include streamlining approval/ permitting process; creating flood and overlay zoning districts, targeted density areas, and incentives to encourage desirable business growth and development; and developing a Village Comprehensive Plan. **Proposed**



Strategy 5: Protect, preserve, and enhance natural, cultural, and historic resources and assets.

Moffat Library Improvements - Phase I - Construct improvements to the Moffat Library to increase resiliency and address existing flood damage. Improvements would include water -sealing the basement and stone foundation to minimize water infiltration, providing roof repair or replacement, and installing a backup generator. *Proposed*

Moffat Library Improvements - Phase II- Improve emergency response and operations functionality of the library, and add new social and cultural improvements, such as pedestrian-friendly green

space, sidewalks, and landscaping around the facility. *Proposed*

Improved Local Branding and Marketing - Create a coordinated local branding and marketing initiative to reinforce a sense of place, highlight local assets, and encourage economic development. This initiative may include a historic resources inventory and programming, updated and uniform signage, and wayfinding installations. *Featured*

Strategy 6: Increase access to youth programs, activities, and recreation opportunities for local children and teens.

CONCLUSION

The proposed and featured projects and additional resiliency recommendations listed above are the culmination of the Committee’s robust effort over many months to help the Village build back better from a history of devastating storm and flood damage.

The Committee has carefully crafted and refined the content of this Plan, and has done so through a process that sets a foundation upon which the Village may take its first major steps towards future resiliency.



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TABLE OF CONTENTS

FOREWORD i

NYRCR COMMUNITIES..... iv

EXECUTIVE SUMMARY v

Section I. Community Overview 1

 No one should be an island 1

 Overview of Planning Process 2

 Geographic Scope of the NYRCR Washingtonville Plan 3

 Description of Storm Damage..... 5

Hurricane Irene and Tropical Storm Lee 5

Other Recent Hazard Event History..... 7

 Community Character and Critical Issues 10

Washingtonville’s Geographic Assets..... 10

The People of Washingtonville..... 10

Infrastructure, Transportation, and Facilities 13

A Village to Call Home..... 14

The High Cost of Repetitive Flooding..... 15

Economic Character, Concerns, and Potential 15

Land Use Planning and Development..... 17

 Community Vision 19

 Relationship to Regional Plans..... 20

Section II. Assessment of Risk and Needs..... 25

 Description of Community Assets and Assessment of Risk..... 25

Introduction and Overview 25

Inventory Process 25

Description of Community Assets..... 29

Assessment of Risk to Assets and Systems 39

 Assessment of Needs and Opportunities 51

Community Planning and..... 51

Capacity Building 51

Economic Development 52

Health and Social Services 53

Housing 54

Infrastructure..... 54

Natural and Cultural Resources 55



Section III.Reconstruction and Resiliency Strategies.....59

Strategy 1: Reduce the impact of flooding on the built environment in the Village, including critical facilities, infrastructure, businesses and housing... 59

Strategy 2: Ensure safe and reliable transportation, movement, and shelters during flood and disaster events 63

Strategy 3: Improve pre-disaster preparation to include emergency communication systems, evacuation routes, shelter access, sheltering-in-place procedures, and transportation access into and out of the Village..... 66

Strategy 4: Maintain and enhance economic vitality through retention of the tax base and strategic actions to enhance business viability in the Village.... 69

Strategy 5: Protect, preserve, and enhance natural, cultural, and historic resources and assets..... 74

Strategy 6: Increase access to youth programs, activities, and recreation opportunities for local children and teens..... 79

Section IV.Implementation – Project Profiles.....85

Proposed Projects..... 85

May’s Field Relocation - Phase I: Little League Field Removal and Creation of Passive Flood Control..... 85

Moffat Library - Phase I..... 91

Moffat Library - Phase II..... 94

Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements..... 96

Improved Communication Systems..... 100

Village Park (The Site of the Old Village Hall)..... 103

Review and Update Village Codes and Ordinances..... 107

Complete Additional Hydraulic, Stormwater, and Bridge Analysis..... 111

Featured Projects..... 113

Village Combined Facility Building..... 113

Automatic Level Sensing Devices..... 116

Improved Local Branding and Marketing 119

Section V. Additional Materials 123

Additional Resiliency Recommendations 123

Master Table of Projects 124

Communications Strategy: A Blueprint for Public Engagement..... 130

Information Gathering through Grassroots Input..... 130

Agency Interviews, Surveys..... 132

Getting the Word Out..... 132

Engagement through Community-Wide Public Meetings..... 133

Community Asset Inventory..... 135

Risk Assessment Data and Methodology 139

Data Sources Used..... 139



Description of Methodology..... 139

Glossary..... 145

End Notes 147

LIST OF TABLES

Table 1. Natural Hazard Event History..... 9

Table 2. Village and Town Populations: 2000 to 2010 11

Table 3. Population Trends, 1960 to 2010..... 11

Table 4. Service Providers 14

Table 5. Building Stock Replacement Value by Occupancy Class 18

Table 6. New Development/Potential Development in Municipality 18

Table 7. Review of Existing Plans and Studies..... 21

Table 8. Asset Categories..... 27

Table 9. Economic Assets 46

Table 10. Health and Social Service Assets 48

Table 11. Infrastructure Assets 49

Table 12. Natural and Cultural Resource Assets 50

Table 13. Housing Assets..... 51

Table 14. Strategy 1 61

Table 15. Strategy 2 64

Table 16. Strategy 3 67

Table 17. Strategy 4 71

Table 18. Strategy 5 76

Table 19. Strategy 6..... 81

Table 20. Additional Resiliency Recommendations..... 123

Table 21. Master Project Table 125

Table 22. Vulnerability Based on Impact on Service or Function of Community Assets 141

Table 23. Risk Score Ranges..... 144



LIST OF FIGURES

Figure 1. Overview	4
Figure 2. Road Closures	8
Figure 3. Washingtonville Median Age	11
Figure 4. Washingtonville Employment.....	12
Figure 6. Washingtonville Population Distribution by Ethnicity.....	12
Figure 5. Washingtonville Unemployment Comparison	12
Figure 7. Washingtonville Employment Sectors.....	13
Figure 8. Interactive GIS Web-mapping Portal (Washingtonville)	26
Figure 9. Risk Areas.....	28
Figure 10. Economic Assets.....	30
Figure 11. Health and Social Services Assets	32
Figure 12. Infrastructure Assets.....	34
Figure 13. Natural and Cultural Resource Assets.....	36
Figure 14. Housing Assets.....	38
Figure 15. Risk Scores.....	45
Figure 16. Mays Field Project Location	86
Figure 17. Moffat Library Location Overview	92
Figure 18. Potential Storage Areas Along Moodna Creek.....	97
Figure 19. Village Park Site.....	104
Figure 20. Current Village of Washingtonville Zoning Map, 2014	107
Figure 21. Village Combined Facility Overview	114
Figure 22. Survey Results – Recovery Support Functions Ranking.....	132

SECTION I
Community
Overview





The image shows a view of NYRCR Washingtonville's Main Street and one of the major crossroads of the community. Photo courtesy of Tetra Tech, 2014.



Section I. COMMUNITY OVERVIEW

NO ONE SHOULD BE AN ISLAND

Waterfront property.

Great fishing and boating.

Little League baseball is a local favorite.

To the unwitting person scouting for a home or vacation get-away, such a description suggests a tranquil location that offers both respite and recreation. However, that description belies the gut-wrenching loss of homes suffered by Washingtonville families for generations, and others already living on the edge of a personal economic cliff, where their hopes and dreams for security plunged as the waters rose.

While it has been said that “no man is an island,” many homeowners and businesspeople in Washingtonville repeatedly experience that painful reality, as their homes and businesses are inundated by the burgeoning floodwaters of the Moodna Creek, most notably in the aftermath of the one-two punch from Hurricane Irene and Tropical Storm Lee in late summer 2011.

For those who have survived and suffered the misery and loss caused by major storms and the devastation they unleash with raging floodwaters, the NY Rising Reconstruction (NYRCR) Program and the hope it offers to “build back better” their beloved Village, come none too soon.

Collaboration, creative thinking, and concrete scientific analysis woven together by this NYRCR Washingtonville Plan will set the stage to overcome adversity and unpredictability in ways that preserve lives, property, and local presence.

Washingtonville is up to that challenge, as demonstrated by the deliberately inclusive process

set forth by the NYRCR Program, and the projects and strategies it yielded. Together with its partners for progress, Washingtonville can accomplish what no person can do alone.



View of the Village of Washingtonville Main Street, Courtesy of Nova Consulting, 2014

In late August-early September 2011, back-to-back storms Hurricane Irene and Tropical Storm Lee became the most recent in a long history of floods in the Village of Washingtonville, New York. The cataclysmic impacts and challenges caused by these storms and resultant flooding touched the lives of all members of the local community. Even though local volunteers, community groups, and service agencies worked tirelessly in response and recovery efforts after the flood, the lingering damages that are still present almost two years later are constant reminders of the devastation that occurred.

The NYRCR Washingtonville Plan has been developed to address the weighty and enduring impacts from recent floods, and to endow the long-term health and resiliency of the community. Throughout the planning process, the underlying



goals of the Committee have been to address the most critical needs and impacts from Hurricane Irene and Tropical Storm Lee, while identifying strategies and priorities for future resiliency, increased quality of life, community vibrancy, and economic growth.

OVERVIEW OF PLANNING PROCESS

This planning process was guided by a steering Committee consisting of local residents, business owners, and community leaders, including the Blooming Grove/Washingtonville Chamber of Commerce, the Moffat Library, the Orange County Citizens Foundation, Warwick Properties, and the Washingtonville Art Society. The Committee worked with an assigned team of consultants (Consultant Team) to collaboratively manage all components of the final NYRCR Washingtonville Plan. Consultant Team partners provided technical expertise in all areas of planning, recovery, and development, and supported the Committee in developing materials, conducting public outreach, performing detailed analyses, and identifying and prioritizing projects for implementation. Throughout the entire process, the Committee was supported by New York State Department of State (NYS DOS) planning staff and representatives from the NYRCR Program.

As an implementation-focused program, the NYRCR Program planning process uses and builds on existing plans and studies to leverage prior work that could be used in development of the recovery plan. An initial, thorough review of existing planning documents has been conducted to identify areas of completed planning work, as well as those areas that need additional analysis and effort.

Recovery Support Functions

Plan components, supporting analysis, and subsequent recommendations focused on the six

Recovery Support Functions that serve as the structural roadmap for this Plan —

- Community Planning and Capacity Building
- Economic Development
- Health and Social Services
- Housing
- Infrastructure
- Natural and Cultural Resources

The Recovery Support Functions (RSFs) used here are adopted from FEMA’s National Disaster Recovery Framework, where they serve as the coordinating structure for key areas of federal emergency assistance.

The purpose of the RSF’s is to support local governments by facilitating problem solving, improving access to resources, and by fostering coordination among State and Federal agencies, nongovernmental partners and stakeholders.

Throughout the planning process, the Committee conducted regular meetings with the Consultant Team, NYS DOS planning staff, and the regional NYRCR Program lead. These meetings provided the venue for managing the overall process, assigning tasks, determining the direction of the plan, and ultimately, in selecting projects for prioritization.

The NYRCR Washingtonville planning process incorporated the following steps:

Public engagement and outreach

Public input was solicited and incorporated into the planning process through diverse and continuous methods to ensure maximum engagement.



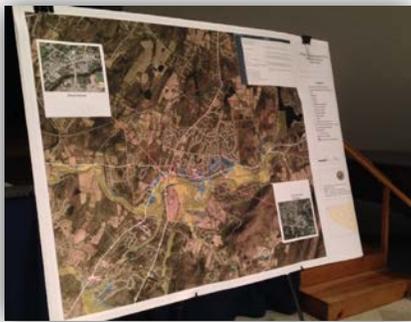
Review of existing plans and studies

The planning process leveraged existing plans and studies to accelerate recovery, allow for informed decision-making, and place a greater focus on implementation.

Inventory of critical community facilities

All community facilities were identified and inventoried to ensure that the Village’s essential community assets were incorporated into the plan’s goals and direction.

Poster shows a geographic overview of the Village, on display at an NYRCR Washingtonville Public Meeting. Photo is courtesy of Tetra Tech.



Risk assessment for critical assets

Critical community assets were evaluated to determine the potential risk for damage or loss as a result of future disaster events.

Development of community vision and goals

The community developed an overarching vision for the Village’s future and generated a set of goals to guide the NYRCR Washingtonville Plan’s development and support realization of the vision.

Identification of key issues, needs, and opportunities

The NYRCR Washingtonville Plan identifies the full range of issues, needs, and project opportunities necessary to be addressed to achieve resiliency and community health and vibrancy. They include flood mitigation, damage and recovery needs, housing needs, economic development and business needs, and infrastructure needs among others.

Identification of potential projects

An initial list of potential projects was developed based on public input, community vision, key needs and opportunities, and preliminary community analysis.

Project analysis and prioritization

All projects identified were fully vetted through a series of detailed assessments, including feasibility, cost-benefit, market, and highest-and-best-use analyses (among others) to verify the merits of each project and assist in prioritizing for implementation.

Detailed implementation strategy

After selecting proposed projects, the Committee developed an implementation strategy that included the appropriate steps, timelines, and potential funding opportunities that may be necessary to complete each project.

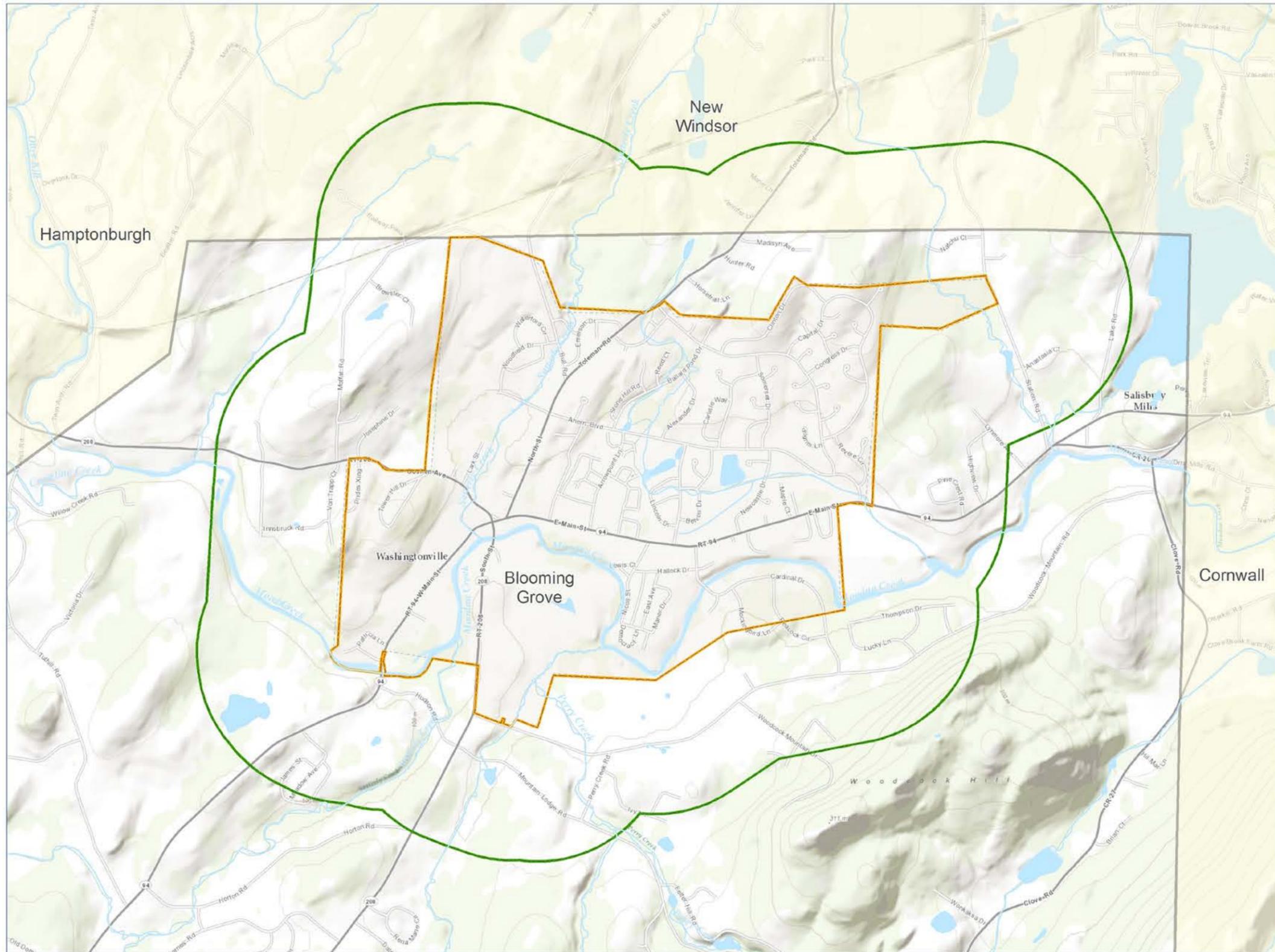
GEOGRAPHIC SCOPE OF THE NYRCR WASHINGTONVILLE PLAN

The Village of Washingtonville is located in central Orange County, New York, within the northern region of the Town of Blooming Grove. The Village shares the majority of its border with the Town of Blooming Grove, and a small portion with the Town of New Windsor.

The initial planning area consisted of the total land area within the Village municipal boundaries. After a review of past storm events, the sources of historical flooding, and the location of critical facilities serving the Village that were affected by flooding, the NYRCR Washingtonville Committee chose to extend the planning area to include a contiguous ¼ mile buffer around the Village, limiting project implementation to the sources of flooding local to the Village and the assets that affect the Village’s resiliency to storm events. A map of the extended planning area is depicted at Figure 1.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY, NY

Figure 1. Overview



Legend

- Village of Washingtonville/ Planning Area
- Additional Planning Area
- Blooming Grove

This map is for reference only.
Data Sources:
NYRCR
NYS DOS



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Feet





DESCRIPTION OF STORM DAMAGE

Hurricane Irene and Tropical Storm Lee

August – September 2011

Tropical Storm Irene moved across Southeast New York on August 28, 2011, bringing extended periods of heavy rainfall and resulting in widespread moderate to major flooding across the area¹. High winds and flooding from the storm created widespread debris and caused major damage to infrastructure throughout the region.



Hurricane Irene. Photo courtesy of NOAA.

Moodna Creek overflowed its banks, resulting in severe damage at Village Hall, incapacitating the Village’s emergency services, government operations, and public works². The surge of water



Repeatedly in the path of danger, a Washingtonville mobile home park is inundated by waters of the nearby Moodna Creek. Many of the lots have since been vacated through a buy-out program or abandonment. Photo is courtesy of NYRCR Washingtonville Committee.



Floodwaters eventually rose to virtually swallow this entryway sign to a heavily trafficked commercial location. Businesses struggle to “stay afloat.” Photo is courtesy of NYRCR Washingtonville Committee.

engulfed the town from its southwestern to its northeastern boundaries.

The speed of floodwater produced rapids on State Route 94, and combined with heavy winds resulted in whitecaps that topped the flood waters and inundated the bus garage of Washingtonville High School.

At its height, the water reached above six feet, filling basements, first floors, and yards. Flood waters overwhelmed the natural creek path near Beverly and Patricia Lanes and formed a new path straight through the foundations of countless homes. The Washingtonville High School and Middle School were under water, as were the village gas stations and sole local food market. Even the Village’s beloved center, its Moffat Library, was not spared. Though it has stood there for more than a hundred years, the library was critically damaged by the same raging waters that engulfed the rest of Washingtonville.

On Cardinal Drive, moving toward the Village’s eastern end, the surge of water engulfed the first floor of a residence. The mobile homes of Washingtonville Manor and Brookside Acres were



devastated, as homes were unable to withstand the rush and height of the water. Both communities were fully inundated and forced to undergo evacuations.



The view from a Washingtonville resident's deck provokes fear and foretells of the extensive damages that would be left in the wake of the flooding. Photo is courtesy of the NYRCR Washingtonville Committee.

Widespread flooding crippled transportation functionality and limited emergency response throughout the Village of Washingtonville during the peak flows. The Western portion of the Village became an island; from the Middle School westward on Route 94 to the Village's boundary, then down Hudson Road to meet Route 208. There was no escape.

Those who remained were cut off from the rest of the Village, including those living in an adult assisted living facility on Route 94.

One family tried to evacuate in a small rowboat, but capsized and was left clinging to a tree until help arrived. Other water rescues were performed for residents at Udderly Fresh Farms on Route 94 near Farmview Lane, where a local farmer was required to evacuate his herd.

The major roads, bridges, and culverts serving the Village, both within the Village limits and in the Town of Blooming Grove, that were damaged by the storm are mapped in Figure 2, and listed below.

Closures within the Village of Washingtonville

- Route 208 (Moodna Creek Bridge)
- Goshen Avenue (culvert over Unnamed Tributary)
- Route 94 (Moodna Creek Bridge)
- Cardinal Drive / Locust Street (Moodna Creek Bridge)
- Peacock Circle
- Beverly Lane and Patricia Lane
- Depot Street
- Hallock Drive
- Democracy Lane, East Ave, Farm Lane, Freedom Drive, Lewis Court, Manor Drive, Nicoll Street, and Park Circle (All Mobile Home Park)
- Bernadette Way
- Bull Road (culvert) and Seacord Lane
- Ahern Boulevard



Damaged culvert downtown. Photo is courtesy of Tetra Tech.



Closures within the Town of Blooming Grove that are directly adjacent to or connect to roads in the Village of Washingtonville

- State Route 94 (Bridge over Unnamed Tributary in Salisbury Mills)
- Woodcock Mountain Drive
- Station Road

The results of the closures shown in Figure 2 were widespread across the Village, but they most seriously affected emergency personnel by limiting their access to residents in need. At the same time, whole sections of the Village were isolated from emergency relief for days. Inundation of State Route 208 and State Route 94, the primary corridors providing access into and out of the Village, caused significant issues with evacuation and safety.

As of April 4, 2013, more than \$102 million in individual assistance and \$459 million in public assistance grants had been awarded by the Federal Emergency Management Agency (FEMA) to affected counties in the State of New York for disaster recovery.

In the Village of Washingtonville, flood damage resulted in the demolition of Village Hall and damage or losses to approximately 80 homes.

National Flood Insurance Policy (NFIP) claims information for flood-insured properties in

Washingtonville showed that 69 properties out of 110 insured properties claimed losses.

In total, 63% of the NFIP-insured properties in the Village claimed building and content losses in excess of \$2.86 million.³

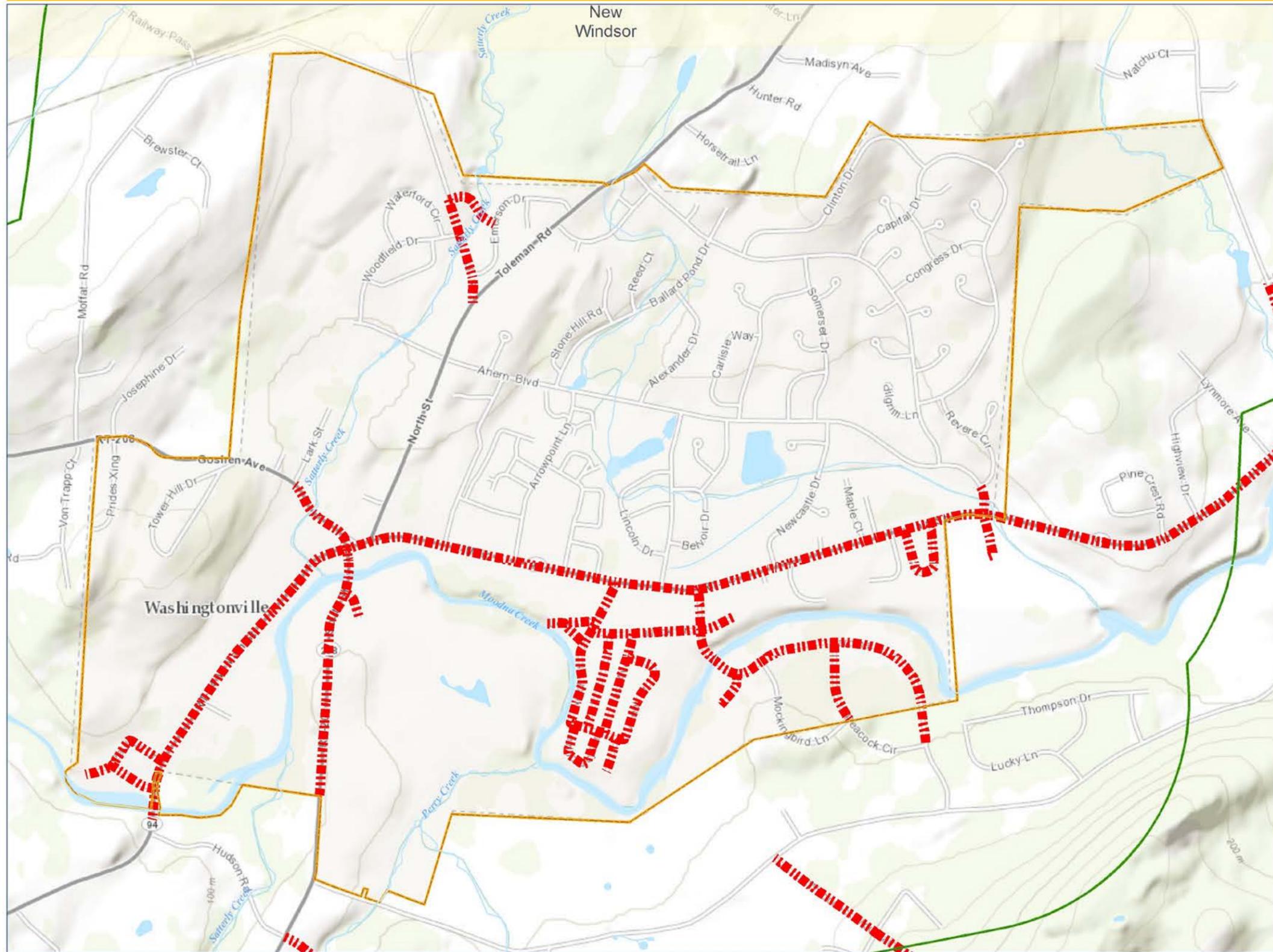
Less than two weeks after Hurricane Irene passed through the Village, Tropical Storm Lee brought heavy rains and additional flooding across parts of central and southeastern New York State.⁴ An already struggling Washingtonville was once again struck by high winds, heavy rains, and debris.

The havoc wreaked in Washingtonville by these two storms is etched in the memories of residents, but was also captured by citizen journalists in photographs and videos, many of which were posted on public media outlets that documented the degree of destruction they had experienced. Homes and businesses that had sat along the banks of the Moodna Creek in Washingtonville since before the Revolutionary War were decimated – the swiftness of the water and devastation left in its wake were something the Village of Washingtonville had never seen, and had never expected.

Other Recent Hazard Event History

Table 1 summarizes information regarding recent hazard events that have occurred in or around the Village of Washingtonville.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY, NY
Figure 2. Road Closures



Legend

-  Village Boundary/ Planning Area
-  Additional Planning Area
-  Irene Road Closures

This map is for reference only.
 Data Sources:
 NYRCR
 Orange County: Post Irene Road Closure Data



0 500 1,000
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TABLE 1. NATURAL HAZARD EVENT HISTORY

Event Type	Date(s) of Event	FEMA Declaration	Orange County Designated?	Approximate Damage Assessment
Severe Storms and Flooding (Nor'easter)	March 13-31, 2010	DR-1899	Yes	<p>A Nor'easter produced an extended period of heavy rainfall on March 13, causing widespread flooding across portions of southeast New York. 1.63 inches of rain fell in the Village of Washingtonville causing Moodna Creek and other small streams to exceed their banks in the Village, and inundating numerous houses with water.</p> <p>Widespread flooding in the Village that damaged private properties, school facilities, the police station, village offices, fire department and recreation facilities.</p>
Thunderstorms /Wind	June 24, 2010	N/A	N/A	Severe thunderstorms brought strong winds and hail. Trees were reported down in the Village of Washingtonville.
Flood	March 7, 2011	N/A	N/A	Heavy rainfall resulted in moderate to major flooding across portions of southeastern New York. In the Village of Washingtonville, Moodna Creek overflowed its banks, flooding first-floor residents and businesses on Route 208 as well as Route 94 near Washingtonville High School. Rainfall totals measures 0.5 inch in the Village of Washingtonville.
Tornado	July 29, 2011	N/A	N/A	In Lower Hudson Valley, there was at least one "supercell," which produced a tornado in Orange County. The National Weather Service (NWS) confirmed an EF-1 tornado that ran from the Towns of Goshen to Blooming Grove, on Friday July 29, 2011. The tornado touched down in the Town of Goshen before it finally lifted near Prospect Road in the Town of Blooming Grove. All along its path, trees converged into a well-defined narrow path. Total property damage from this event was approximately \$50,000.
Hurricane Irene	August 26-September 5, 2011	DR-4020	Yes	Heavy rain caused widespread flooding of Moodna Creek, damaging private property, school facilities, the police station, village offices, and fire department and recreation facilities.
Remnants of Tropical Storm Lee	September 7-11, 2011	DR-4031	Yes	Tropical Storm Lee brought high winds, heavy rains and additional flooding, leading to debris accumulation adding to damages incurred by Hurricane Irene.
Hurricane Sandy	October 27 – November 8, 2012	DR-4085	Yes	High winds and snow downed trees and power lines causing widespread power outages. The water and wastewater plants were inaccessible as a result of road closures.



COMMUNITY CHARACTER AND CRITICAL ISSUES

The following key issues have been identified during the NYRCR Washingtonville planning process through a combination of existing plan reviews, technical analysis, public input, inter-agency coordination, and Committee guidance and discussion. Understanding that additional issues and needs may, and likely will, be uncovered throughout additional analysis and the implementation of this Plan, this section, therefore, is not intended to represent a comprehensive or final inventory of real or potential issues and needs related to resiliency and community development.



Moodna Creek is a natural asset to the community when it is not flooding. Photo is courtesy of Tetra Tech.

Rather, the issues discussed here, as well as the needs and opportunities listed in Section 2, reflect an evaluation of available data, along with significant due diligence, technical analysis, stakeholder input, and Committee discussion.

As the implementation process moves forward, additional information-gathering, public input, and analysis will lead to a greater understanding of these and other local issues, which will uncover the true needs and opportunities of Washingtonville. All

subsequent information relating to this section and relevant projects will be incorporated into the implementation process to ensure maximum potential recovery and future resiliency.

Washingtonville’s Geographic Assets

The 15.5-mile Moodna Creek takes its name from the Dutch “Moordenaars,” or Murderer’s Creek, and is a small tributary of the Hudson River, with a portion flowing through the center of Washingtonville. Proximity to this water source is Washingtonville’s greatest attraction, but it also places its most crucial community assets at an inherent risk of flooding, and as the water of the creek overtops its banks, the Village has repeatedly sustained significant flood damage to infrastructure and assets.

The Village’s downtown, consisting of residential and commercial properties, is cradled by Moodna Creek and is directly within the flood hazard area. The area flooded with up to 8 feet of water during Hurricane Irene, destroyed Village Hall, and damaged or destroyed approximately 80 homes. Flooding also incapacitated the Village’s emergency services, government, and public works.

Flooding has increased in severity and frequency in recent years, which has only worsened the impact of these events on local transportation, homes, and businesses. The Moodna Creek has always been crucial component to the Village character, but the intense flooding of recent years has become a major threat to the safety, economy, and quality of life in Washingtonville.

The People of Washingtonville

As reported by the 2010 Decennial Census, the Village of Washingtonville has a population of 5,899 people residing in 2,253 households, representing an increase of 0.8% since 2000. While this figure reflects only a modest gain over the past decade, the Village has seen a far more significant



population gain, on average, over the past 50 years. The tables below summarize recent population trends in the Village.

TABLE 2. VILLAGE AND TOWN POPULATIONS: 2000 TO 2010

Municipality	Census 2010 Pop.	Census 2000 Pop.	2000 HAZUS-MH Pop. Over 65	2000 HAZUS-MH Low-Income Pop.
Town of Blooming Grove	18,028. ¹	11,797	935	347
Village of Washingtonville	5,899	5,851	206	543

Source: U.S. Census 2010 (U.S. Census Bureau); HAZUS-MH v2.1
 Town of Blooming Grove population includes population of the Village of Washingtonville

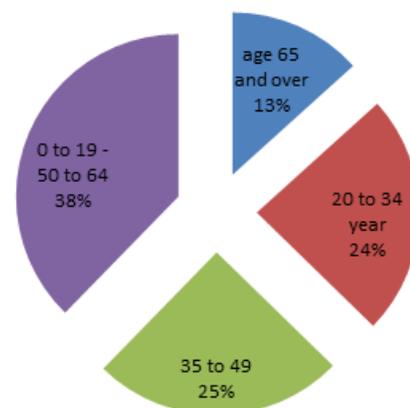
TABLE 3. POPULATION TRENDS, 1960 TO 2010

Year	Population	Change in Population	Percent (%) Population Change
Village of Washingtonville			
1960	1,178	*	*
1970	1,827	649	55.1%
1980	2,380	553	30.3%
1990	4,906	2,526	106.1%
2000	5,851	945	19.3%
2010	5,899	48	0.8%

Source: U.S. Census Bureau

The population of the Village is slightly older than the surrounding County and State, but is relatively balanced, with a median age of 41.1 (County median - 36.6; State median - 38.0). The population of residents age 65 and over is 13.3%, which is also only slightly higher than the County average of 11%. A healthy population of 20 to 34 year olds (24% of the population) and 35 to 49 year olds (24% of the population) provides an essential workforce for the community and region.⁵

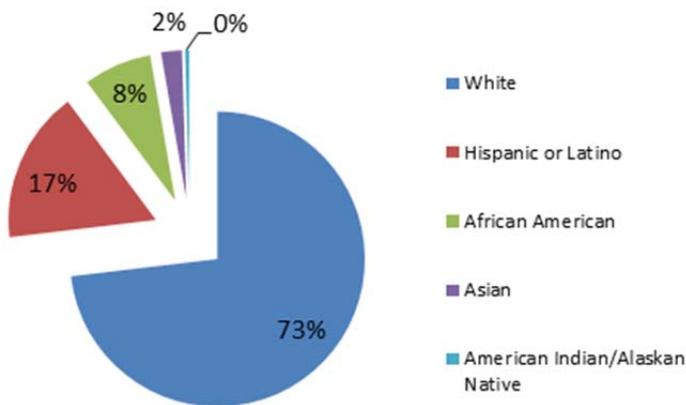
FIGURE 3. WASHINGTONVILLE MEDIAN AGE





As of the 2010 Census, 80.3% of Village residents are White, 18.3% are Hispanic or Latino, 8.2% are African American, 2.5% are Asian, and 0.5% are American Indian and Alaskan Native.
 (Note: According to the Census, Hispanics may be of any race, so that population group is also included in applicable race categories.)

FIGURE 5. WASHINGTONVILLE POPULATION DISTRIBUTION BY ETHNICITY



The 2010 Census also shows that 89.4% of Village residents graduated from high school or higher, compared to a national average of 85.7%, and 18.7% have earned a bachelor’s degree or higher, compared to a national average of 28.5%

FIGURE 6. WASHINGTONVILLE UNEMPLOYMENT COMPARISON

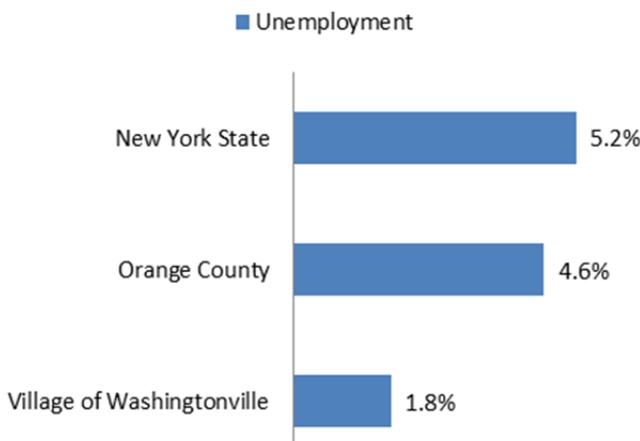
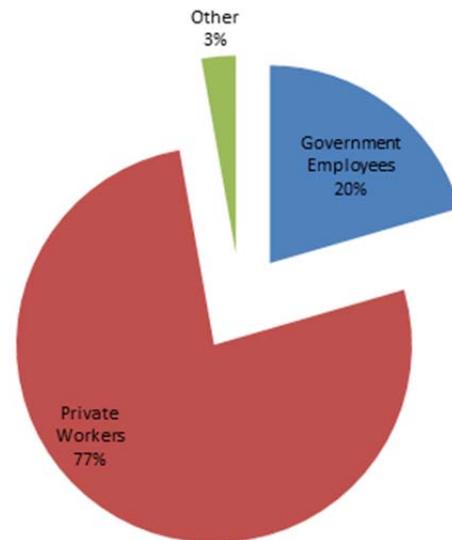


FIGURE 4. WASHINGTONVILLE EMPLOYMENT



respectively.

Unemployment in Washingtonville is at a very low rate at 1.8%, compared to 4.6% in Orange County and 5.2% in New York State. Arguably, there is a direct correlation between the level of education and an individual’s ability to gain employment and earn higher wages. In addition, only 6.2% of people were considered under the poverty level, as opposed to 11.4% in the County and 14.5% in the State. These figures, combined with a higher median income than the State average, are generally indicative of a healthy economy.

Of all workers in the Village, 20.5% are employed by the government and 76.7% are private workers.

Given its one-hour commute time to New York City, Washingtonville is home to an increasingly diverse population that reflects the out-migration of “urbanites” to this more suburban-rural community.



The following break-down of employment by sector indicates some of the key drivers for the local economy:

- 24.8% - Educational Services, Health Care, and Social Assistance
- 19.6% - Retail Trade
- 8.9% - Professional, Scientific, Management, Administrative, and Waste Management Services
- 8.8% - Finance, Insurance, and Real Estate Rental and Leasing
- 5.8% - Public Administration

Infrastructure, Transportation, and Facilities

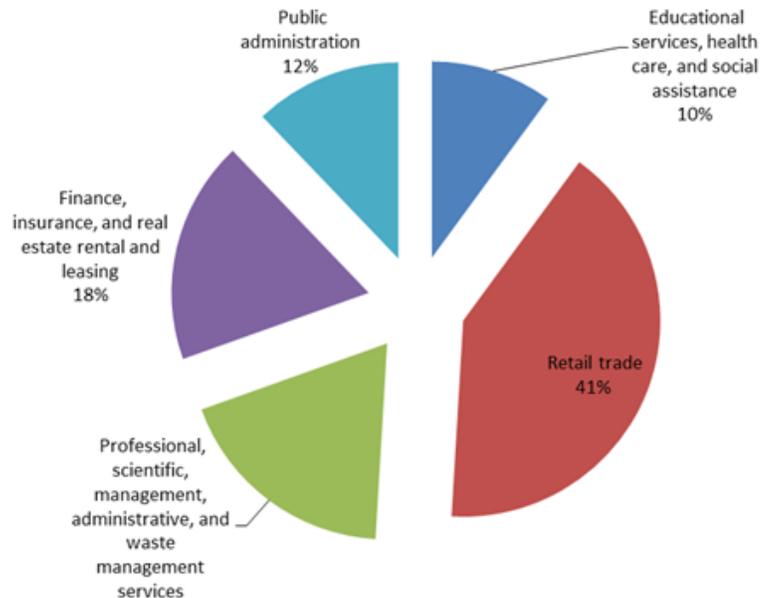
Transportation

Major roads in the Village of Washingtonville include State Route 208 and State Route 94. These corridors provide primary access into and out of the Village, and their repeated flooding has created significant evacuation and safety issues in the past. The Village also contains a number of local collector streets providing access to individual homes, businesses, and other local assets.

Inter-municipal bus service, provided by the Town of Warwick, provides service from Washingtonville to shopping centers in Monroe, Harriman, and Woodbury, but relies on the local roads that were so badly damaged and routes that were shut down during recent floods. County Routes 20 (Orrs Mills Road) and 27 (Clove Road), located outside of the Village boundary, also contribute to local transportation networks; however, Clove Road was also closed by the floods from Hurricane Irene.

While regional transportation systems may be less vulnerable to the impacts of local flooding, many local residents rely on accessing them to maintain their livelihood. The Metropolitan Transit Authority provides commuter rail service linking Orange

FIGURE 7. WASHINGTONVILLE EMPLOYMENT SECTORS



County to New York City via the Port Jervis Line of Metro-North Commuter Railroad. The Metro-North station in Salisbury Mills along Route 94, just north of the Village of Washingtonville, and another station in Campbell Hall in Hamptonburgh, serves the Village population (Town of Blooming Grove Comprehensive Plan, 2005); however, both were rendered useless for days after Irene, as the entire Metro North line was suspended as a result of widespread flooding and debris. Additional commuter service to New York City is offered by Coach USA, a commuter bus line with numerous stops around the planning area. However, this service was equally incapacitated, as were other forms of public transit by the local and feeder route outages.⁶

Local Facilities

The Village of Washingtonville is served by essential local services, including a local police department and fire department. In addition, local facilities and service providers available in the Village are summarized in Table 4.



TABLE 4. SERVICE PROVIDERS		
NAME	ADDRESS	MUNICIPALITY
Education		
Washingtonville Middle School	38 W Main Street	Washingtonville (V)
Washingtonville High School	54 W Main Street	Washingtonville (V)
Taft Elementary School	10 Toleman Road	Washingtonville (V)
AHRC ⁷	11 Canterbury Circle	Washingtonville (V)
Water Service		
Washingtonville Water Plant		Washingtonville (V)
Washingtonville Sewer Treatment Plant		Washingtonville (V)
Energy Service		
Orange and Rockland		Blooming Grove (T)
Communication		
Frontier Communications		Washingtonville (V)

A Village to Call Home

According to the 2010 Decennial Census, there are 2,253 housing units in the Village. Approximately half of the housing units (51.6%) are single-family detached residential structures according to the American Community Survey, with the remainder consisting of 24.6% multi-family units, 12.1% single-family attached units, and a relatively high percentage of mobile homes (11.8%). The vast majority of housing units are also owner occupied (75.3%), which represents a higher percentage than

both the County (68.9%) and the State (53.3%). The Village has a very low vacancy rate of only 3.5% compared with 8.1% in Orange County and 9.7% in New York State.

The housing stock in the Village is generally newer than in many other areas of the State, with 34% built between 1990 and 2004 and another 46.8% built between 1970 and 1989⁸, and the median home value in the Village is \$297,000, which aligns closely with values in the County (\$299,500) and State (\$301,000).

High owner-occupied housing rates combined with a low vacancy rate and a relatively new housing stock paint a seemingly pleasant strong image of the state of housing in the Village.

However, increasing costs and reduced affordability are growing issues throughout the State of New York and Orange County. The severity of these issues is more pronounced in the Village of Washingtonville, exacerbated by the skyrocketing costs of flood insurance.



House near downtown. Photo is courtesy of Tetra Tech.



Median costs for owners and renters in the Village are reflected below:

- **Owner (with a mortgage)** - Median monthly costs: \$2,528 (County - \$2,320; State - \$2,017)
- **Renter** - Median gross rent: \$923 (County - \$1,090; State - \$1,025)

Based on the various issues causing challenges to housing affordability, 46% of owners with a mortgage and a staggering 58.6% of renters pay more than 35% of their household income for rent. According to the U.S. Department of Housing and Urban Development, paying more than 30% of household income for housing costs qualifies a resident as “cost burdened,” and indicates residents are likely to have difficulty affording essential costs of life, including savings or expendable cash to cover relocation or repair costs in the face of a disaster.

Nearly half of homeowners and more than half of renters pay so much of their income for housing that they are officially considered “burdened,” meaning that the essential costs of life may be difficult to afford.

The effects of decreasing affordability touch most areas of community development by limiting the attraction of a younger workforce, young families, and first-time home buyers, and restricting local spending and future economic growth.

The High Cost of Repetitive Flooding

An estimated 204 residents in the Village of Washingtonville live within the 1% annual chance flood area (NFIP Special Flood Hazard Area). The methodology used to determine this number widely underestimates the population at risk to flooding. For example, this estimate does not account for multiple residences on the same parcel (such as

multiple mobile homes on a singularly owned property).⁹

Of the total parcels within the municipality, an estimated 131 (8.2%) are located within the 1% annual chance flood area. An estimated \$49,511,000 (6.6%) of the municipality's replacement cost for the general building stock (structure and contents) is located within the 1% annual chance flood area.¹⁰

There are 110 NFIP policies in the community, and 62 policies located within the 1% annual chance flood area. FEMA has identified 27 Repetitive Loss (RL) properties, including five Severe Repetitive Loss (SRL) properties in the municipality¹¹.

The Blooming Grove Hazard Mitigation Plan estimates that for a 1% annual chance flood, \$44,361,000 (5.9%) of the municipality's replacement cost for the general building stock (structure and contents) will be damaged, 530 households may be displaced, 370 people may seek short-term sheltering, and an estimated 6,040 tons of debris could be generated.

Economic Character, Concerns, and Potential

First settled in 1731, the Village of Washingtonville was named in honor of President George Washington and contains America's oldest winery. The Village has numerous other commercial enterprises, including several smaller malls with local and chain retailers, and provides cultural and commercial offerings for the surrounding area.



"Welcome to Washingtonville." Photo is courtesy of the Washingtonville Photo Library.

The Village contains a healthy set of additional assets that support local businesses and can be leveraged for future economic growth, including:

- High quality of life, local character, and charm
- Waterfront access
- Access to open space and outdoor recreation
- Proximity to large market and labor force of New York City
- Highly skilled labor force
- Active community members and organizations

While many indicators, such as unemployment status and median income suggest a healthy economy in the Village of Washingtonville, several issues are currently deterring the local business environment from reaching its full potential.

A thriving economy in the Village is significantly restrained by the real and perceived threat of severe flood damage.

During the initial NYRCR Washingtonville planning meetings, the Committee identified several additional challenges to local economic growth that were explored during the planning process, including:

- A lack of economic development incentives;
- Lack of parking near commercial and downtown areas;
- Insufficient recreational opportunities to keep families in town; and
- Need to inventory and assess economic assets damaged during storm events.

While most residents are employed (1.8% unemployment) and earning a decent wage (median household income: \$67,577), supplemental data suggests that many residents are spending substantial work and free time outside of the Village. An average travel time to work of 42.4 minutes¹² indicates that many residents currently work outside the Village boundary and likely support businesses such as gas stations, restaurants, and others in neighboring communities throughout the work week.

During initial NYRCR Washingtonville Planning Committee meetings, it was indicated that recreational opportunities for children and young people are currently lacking in the Village, so that families spend free time and expendable income in neighboring communities.

While Little League baseball plays a prominent role in the lives of the youth in the area, repeated flooding of the field limits regular use. Moreover, the repeated expense associated with repair and restoration makes field retention increasingly difficult.



The baseball field is repeatedly transformed into a basin with heavy rainfalls and snow melts. The cost of repair and field replacement threatens its financial viability. Photo is courtesy of NYRCR Washingtonville Planning Committee.

Residents spending work and leisure time outside of the Village represents a missed opportunity to capture additional spending for the local economy. This is an important component of an economic development and land use strategy for the Village, because population projections do not indicate major increases in resident population over the next five years.

Several factors are also increasing the difficulty of doing business in the Village. There is currently a lack of incentives to encourage desirable development and job growth in Washingtonville. Utilization of diverse incentive programs, including tax abatements, density bonuses, fast-track permitting, as well as technical training and assistance with public funding applications, can encourage the types of businesses and development deemed appropriate by the community. In addition, the Committee indicated that there is a growing impression among the community and business owners that current ordinances and regulatory controls may be discouraging business attraction and retention.

A review of existing ordinances for consistency with community goals assisted the Committee in identifying areas of disconnect and opportunities for improvement.

The Committee also identified rising local costs, including school taxes and flood insurance rates, as well as a limited-capacity wastewater treatment plant, as issues affecting local growth and development.

Finally, there is limited utilization and marketing of local historic, cultural, and recreational opportunities. In particular, there is great potential to turn the Moodna Creek from a risk to a more significant asset, by increasing the recreational access to the waterway.

A thorough inventory of local historic and cultural sites, combined with increased visibility and marketing, may help to drive additional tourism and local spending.



The Moffat Library, located at the square of Washingtonville, is a local historic treasure that offers educational, civic, and meeting opportunities for villagers. The building has suffered significant flood damage over the years, was evacuated after Hurricane Irene, and is not operational at this time. Photo is courtesy of the Washingtonville Photo Library.

Land Use Planning and Development

Like many communities, the Village of Washingtonville encompasses a range of land uses including residential, commercial, industrial, public space, agriculture, and community services. The Village utilizes a variety of regulatory tools to guide land use and development including, but not limited



to, a Building Code, Zoning Ordinance, Subdivision Ordinance, NFIP Flood Damage Prevention Ordinance, and Floodplain Management Plan, among others, but lacks a focused effort in the implementation and coordination of these planning tools. Favorable aspects of the Village's zoning regulations with respect to community reconstruction goals include a wide range of

permitted business uses within the Village's downtown, despite the challenge that the vast majority of the downtown is located in the flood hazard area.

Table 5 summarizes the replacement value of the current building stock in the Village by land use or occupancy class.

TABLE 5. BUILDING STOCK REPLACEMENT VALUE BY OCCUPANCY CLASS				
Municipality	Total	Residential	Commercial	Industrial
Village of Washingtonville	\$748,988,000	\$523,112,000	\$133,702,000	\$32,557,000

Source: Town of Blooming Grove Hazard Mitigation Plan

Table 6 summarizes major residential/commercial development and major infrastructure development that are identified for the next 5 years in the Village.

TABLE 6. NEW DEVELOPMENT/POTENTIAL DEVELOPMENT IN MUNICIPALITY						
Property Name	Type (Residential or Commercial)	No. of Structures	Address	Parcel ID	Known Hazard Zone	Description /Status
Highview/Moffat Ridge	Residential	69	Moffat/Bull Rd Intersection	101-1-2.12 and 107-2-12	None	Conditionally Approved
Brotherhood Plaza	Commercial	Unknown	Brotherhood Drive	108-1-5.2	None	Concept
Brotherhood Winery	Commercial	Unknown	Brotherhood Drive	107-3-28.2	None	Concept
Spear Brothers Lumber Yard	Commercial	Unknown	Route 208	118-1-7	None	Concept
Casazza	Residential	Unknown	Route 208/Woodcock Mt. Road	121-1-1.1	Flood Plain	Concept



While zoning ordinances and building codes allow for a range of development, they do not go far enough to encourage it.

The lack of focused local planning documents currently places the community at a disadvantage when making decisions to guide the future growth of Washingtonville.

While the Village is included within the planning area of several regional and county plans, much of the information and issues specific to Washingtonville become lost.

Identifying emerging issues, trends, and strategies to address them becomes increasingly challenging without up-to-date local data and information and ongoing stakeholder engagement. In addition, the lack of a formal Village Comprehensive Plan presents a challenge for verifying the consistency of local ordinances with shifting community goals and preferences.

Key challenges, such as land use planning, affordable housing, and opportunities for new development outside of the floodplain need to be addressed, in large part, at the local level.

As a result, the absence of a local economic development and land use strategy is an important gap that should be addressed to manage growth and build a sustainable economy.

COMMUNITY VISION

Through collaborative discussions, stakeholder engagement, reviews of existing plans and studies, and a focused intention toward holistic community recovery, the Committee adopted the following vision to guide the recovery and resiliency effort for NYRCR Washingtonville.



Historic Village High School. Photo courtesy of the Washingtonville Photo Gallery

NYRCR Washingtonville Community Vision

To create a resilient and vibrant environment in the Village of Washingtonville that embraces the community's history, charm, and character while providing for future economic stability and reducing vulnerability to the effects of natural hazards, flooding, and climate change. Through stakeholder-driven action the Village will focus its efforts to recover from the past and most recent storm and flood events by fostering economic vitality and focusing on the safety and well-being of people, property, and critical assets.

The Village of Washingtonville will recover from the effects of Hurricane Irene and Tropical Storm Lee and past flooding events to create a community that is stronger and more economically robust as a result of rebuilding and re-visioning. By capitalizing on the social, economic, and environmental assets; protecting vulnerable populations; maintaining community character; and attracting new families and businesses; the Village of Washingtonville will remain a safe, resilient, and welcoming place.



RELATIONSHIP TO REGIONAL PLANS

The Committee recognizes the importance of identifying issues and challenges that transcend municipal boundaries and of working collaboratively with neighboring communities to gain greater regional resiliency and prosperity. To that end, the Village has utilized opportunities for regional collaboration throughout this process, including leveraging existing regional plans and studies; encouraging stakeholder input from neighboring communities; identifying projects with regional benefits; exploring opportunities to leverage multiple funding sources; protecting assets with regional significance; and fostering inter-agency cooperation to address any potential hurdles to implementation of priority projects.

The Village of Washingtonville has participated in development of several plans and studies in recent years that guide the growth and development of select aspects of the Village, including management of the Moodna Creek and watershed. The majority of these plans, however, have been prepared by outside agencies and generally approach conditions, issues, and recommendations at the regional level, with Village data that are aggregated with neighboring communities. While several plans do provide key local information (including the Town of Blooming Grove Hazard Mitigation Plan [2013]), the lack of a recent local Comprehensive Plan, Economic Development Strategy, or other locally driven plans result in a gap in current information, with minimal guidance on a future development vision specific to the Village.

The Committee has reviewed and incorporated existing documents into the preliminary planning

process to build on relevant data, methodologies, stakeholder engagement, and consensus to inform the development of this NYRCR Washingtonville Plan.

As the planning process proceeded, key gaps in analysis and information were identified and potential solutions were formulated as part of prioritizing projects and initiatives for implementation through the NYRCR Program.

The content and recommendations of this document are intended to help to serve as the basis for additional local planning efforts in the future.

Review of Existing Plans: The Village of Washingtonville contributed to several regional studies and plans in recent years that aim to foster collaborative initiatives to enhance quality of life and all aspects of economic, community, and environmental health. This Plan’s development included a review of these and other prior regional planning efforts to identify common goals, emerging issues, and opportunities for collaboration. This review also helped to identify regional key economic drivers, housing stock characteristics, and demographic trends that would influence regional community development. The Committee drew on these prior planning efforts to identify potential projects that would be of regional significance, benefitting Washingtonville, as well the region at large. Below is a review of the existing plans and studies reviewed and incorporated into this planning process along with an indication of the key components that will help drive implementation of the NYRCR Washingtonville Plan:



TABLE 7. REVIEW OF EXISTING PLANS AND STUDIES

Resource	Relevance	Key Components for NYRCR Washingtonville Planning Process
Orange County Comprehensive Plan (2010)	Establishes a vision for the long-term maintenance, growth, and development of the County. Provides overarching goals and recommended implementation actions for all areas of the community including but not limited to infrastructure, community facilities, housing, economic development, and natural and cultural resources among others.	County vision, detailed community/demographic/economic data, goals, and recommendations for all areas of community and economic development
Town of Blooming Grove Hazard Mitigation Plan (2013)	Provides County and local strategies for mitigating all potential hazards to the Village. Provides detailed information on past and current flood issues, existing flood initiatives, and recommendations for additional mitigation actions to address future disaster events.	Detailed past flood information, hazard vulnerabilities, assessed values and potential losses, past and ongoing mitigation projects, and proposed mitigation initiatives
Mid-Hudson Regional Economic Development Council Strategic Plan (2011)	A regional economic development strategy and vision for the Mid-Hudson region of New York. Illustrates the economic climate, trends in job creation and business growth for the region, as well as strategies for leveraging assets, revitalizing traditional urban centers and attracting desirable growth.	Key economic drivers, regional economic advantages and challenges, recommendations for economic development initiatives, priority regional projects
A Three County Regional Housing Assessment: Ulster, Orange, and Delaware Counties from 2006-2020	Provides a comprehensive look at current housing trends and issues in the three-County plan area. Provides detailed information relating to affordability, economic climate, as well as existing and projected housing gaps at the local and regional level.	Existing housing gap analysis by income level, target affordable home values and rents by local income, projected future gaps, and recommendations for providing adequate housing to accommodate future populations
U.S. Army Corp of Engineers Comprehensive Response Document: Moodna Creek (2010)	Provides a review of flood risk, damage, and causes of historical flood issues for the Moodna Creek including the portion contained within the boundaries of Washingtonville. Identifies potential causes and strategies for addressing flood issues associated with the Moodna Creek.	Past flood information, issues contributing to flood risk, key areas of flood concern for the Village of Washingtonville
Moodna Creek Watershed Conservation and Management Plan (2010)	Provides an inter-municipal plan for managing the area’s water resources including an overview of the Moodna Creek Watershed and documentation of local watershed conditions, issues, potential causes of flooding, and water quality problems, among others. Identifies opportunities for improvements related to environmental and ecosystem protection, flood reduction, enhanced access to waterways among others.	Review of existing flood issues in Washingtonville, identification of past damage from flooding, recommended actions for implementation
Village of Washingtonville Zoning Ordinance (First enacted 1-7-1963, amended 5-8-1995)	Sets forth local land use regulations for permitted uses and development standards in the Village's zoning districts.	Village of Washingtonville Zoning Ordinance



Projects with Regional Significance: As part of the identification of their priority initiatives and actions presented in this Plan, the Committee made a focused effort to advance projects that will also benefit neighboring municipalities. Throughout the identification and development of these projects, the Committee sought opportunities to effect change on a regional level while simultaneously benefitting from cost reductions available through collaboration. Infrastructure projects that would benefit the Village and the region were considered, as well as emergency services, social services, waterway projects, and other ventures that naturally transcend municipal boundary lines.

In addition, it was recognized early in the development of this plan that it is common for one community to contain critical economic, cultural, or social assets that have significance for neighboring communities and the region at large. To that end, the Committee ensured that projects aiming to protect these assets or to enhance their positive impact were identified, highlighted, and considered for implementation.

Interagency Cooperation: As the Committee identified and developed its priority list of projects, it reached out to regional organizations, such as the County Planning Office, watershed councils, and regional economic development agencies to discuss project ideas and opportunities for collaboration, and to identify any required regulatory approval processes. Critically important was the assessment of available resources that regional entities could provide to the Committee to aid in the planning process. These resources included current data sets, services to provide feasibility assessments, and financial and regulatory resources available to support project implementation. This collective process was supported and furthered through coordination with the Mid-Hudson Regional Economic Development Council’s State Agency Review Team (SART), and helped to create a support network for the Committee to help ensure successful project implementation and the realization of the vision and goals identified during the NYRCR Washingtonville Plan process.

SECTION II
Assessment of
Risk and Needs





**GLENN
PERRY**
**SENIOR
FIELD**

RESERVED
PARKING




Section II. ASSESSMENT OF RISK AND NEEDS

DESCRIPTION OF COMMUNITY ASSETS AND ASSESSMENT OF RISK

Introduction and Overview

A primary goal of the NY Rising Community Reconstruction (NYRCR) Washingtonville Plan is to ensure that both reconstructed assets and any proposed post-storm new construction projects are more resilient during future storm events. In order to gain a comprehensive understanding of the community, the NYRCR Washingtonville Committee (Committee) began the process to accurately identify and analyze economic, health/social services, housing, infrastructure, and natural/cultural resources in the Village of Washingtonville.

To meet this goal, the Committee developed a comprehensive inventory of assets within and beyond the planning area with support of the Consultant Team. By gathering this information, the Committee compiled sufficient and accurate information to assess risk to the assets under current and future conditions within the planning horizon. The Committee was actively engaged throughout the inventory and risk assessment process, and collaboratively reviewed all aspects of the assessment, and collectively approved the results.

Inventory Process

Data Collection

To kick off this process, the Committee — with support from the Consultant Team — prepared a preliminary inventory of assets through stakeholder outreach, Committee deliberations, and review of datasets. The New York State Department of State (NYS DOS) Risk Assessment Work Group facilitated development of a comprehensive list of datasets that were provided to the NYRCR Washingtonville

Committee. NYS DOS provided databases that included datasets from numerous public and private sources. In addition to the data provided by NYS DOS, the Committee compiled local-level data from Orange County Geographic Information System (GIS) and the Town of Blooming Grove Hazard Mitigation Plan. Data was also gathered from Committee members during scheduled meetings and via a community map portal, as discussed in the Public Engagement and a Collaborative Approach discussion that follows.

A Collaborative Approach to Engaging the Public

Geographic Information Systems (GIS) are often a vital tool for communities undergoing an inventory of structures, natural features, or other assets associated with a physical location. However, GIS services are less available to most suburban and rural areas of New York State than for their urban counterparts. While it may not be recorded in any discernible geographic format, suburban and rural residents have a wealth of local knowledge which could contribute to such an inventory.

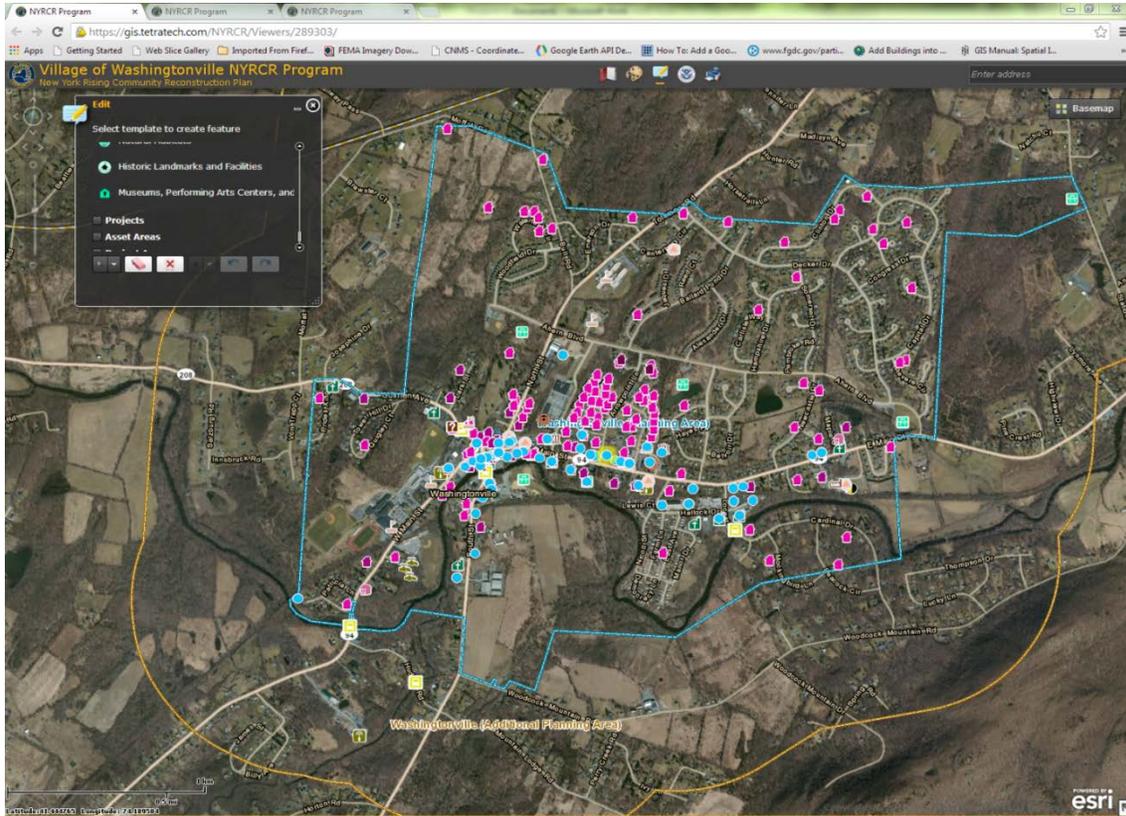
Community Map Portal

To capitalize on this knowledge, Committee meetings were held to engage the public in collaborative dialogue to identify and compile assets using an interactive GIS web-mapping portal created from the very information that the community provided. **This unique on-line tool allowed the committee to identify and detail community assets and critical facilities.**

This portal allowed Committee members to visualize, interact with, edit, and add assets. It also allowed for the capture and use of local knowledge to populate and refine the asset inventory information (Figure 8).



FIGURE 8. INTERACTIVE GIS WEB-MAPPING PORTAL (WASHINGTONVILLE)



Source: NYRCR Committee

Asset Classification

The Committee reviewed and classified the compiled data into six categories in accordance with the National Disaster Recovery Framework asset categories as identified in Table 8.

Assets were also classified as either “critical” or “non-critical” facilities. Critical assets, as defined by

the Federal Emergency Management Agency (FEMA), include, but are not limited to, features that create or extend the useful life of structures, or facilities that provide important community services, such as healthcare facilities, emergency operation centers, and power generation facilities, among others.



TABLE 8. ASSET CATEGORIES

Asset Class	Examples
Economic	Office buildings, business and industrial parks, manufacturing, warehouses, storage facilities, groceries, restaurants, banks, lodging, storefronts, downtown center, and seasonal/tourism destinations
Health and Social Services	Schools, health care, day care, elder care, emergency operations, government and administrative services, media and communications, police, fire, and rescue
Housing	Single-family and multi-family dwellings, supportive housing/group homes, senior housing, and affordable housing
Infrastructure Systems	Pedestrian, bicycle and vehicular ways, transit, bridges, airports, rail, ports, ferries, gas stations, water supply, stormwater, wastewater, solid waste, recycling, and power generation facilities
Natural and Cultural Resources	Natural habitats, wetlands and marshes, recreation facilities, parks, public access, open spaces, agricultural areas, religious establishments, libraries, museums, historic landmarks, and performing arts venues
Socially Vulnerable Populations	Assets predominantly providing services for people with disabilities, low and very-low income populations, the elderly, young children, homeless, and people at risk of becoming homeless

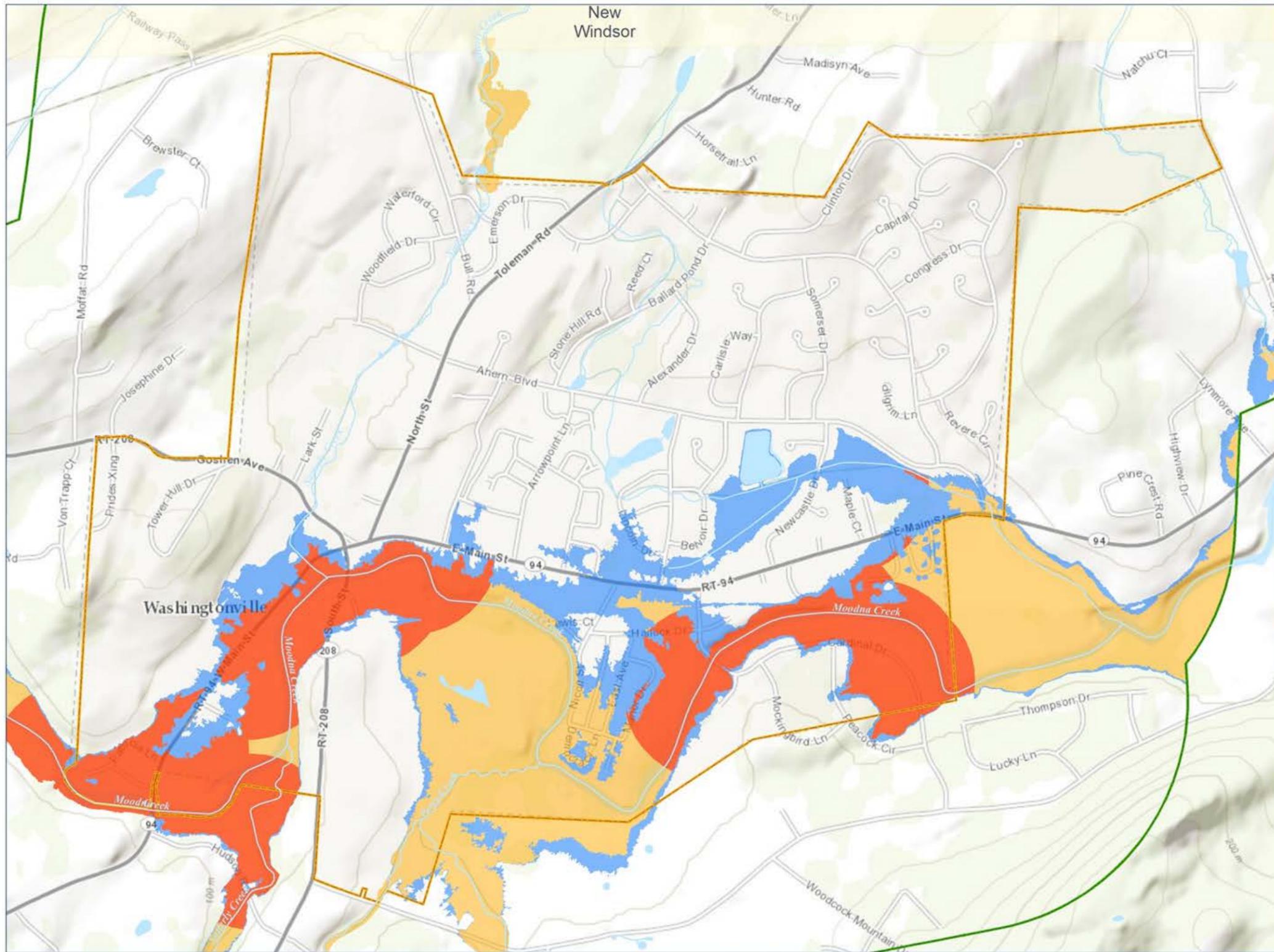
Source: NYS DOS, 2013

Description of Risk Areas

Once assets were identified and classified, it was essential to understand which geographic areas have been and will be affected by flooding to determine which assets are at risk and to what degree. The three risk areas for riverine communities are based on the current Flood Hazard

Area (FHA) and the FEMA National Flood Insurance Policy severe repetitive loss data. These areas reflect the frequency and likelihood of flood inundation and are classified as either “extreme,” “high,” or “moderate” in descending order of risk magnitude. Figure 9 shows the risk areas in the NYRCR Washingtonville planning area.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY, NY
Figure 9. Risk Areas



Legend

- Village of Washingtonville/ Planning Area
- Additional Planning Area

Risk Area

- Moderate Risk
- High Risk
- Extreme Risk

This map is for reference only.
 Data Sources:
 NYRCR- Asset Locations, Risk Areas,
 Risk Scores
 Moodna Creek Watershed Atlas,
 Orange County Water Authority (2008)


0 500 1,000
Feet





"Welcome to Washingtonville" sign, courtesy of the Washingtonville Photo Library.

Description of Community Assets

The following section provides an overview of the Village of Washingtonville's assets, with each asset or group of assets' subcategory, and risk area. A complete list of assets indicating name, location, and community value is included in Section V for information. Figures 10 through 14 illustrate the locations of assets within the NYRCR Washingtonville planning area and relative to the defined risk areas.



View of Main Street, courtesy of Nova Consulting.

Economic Assets

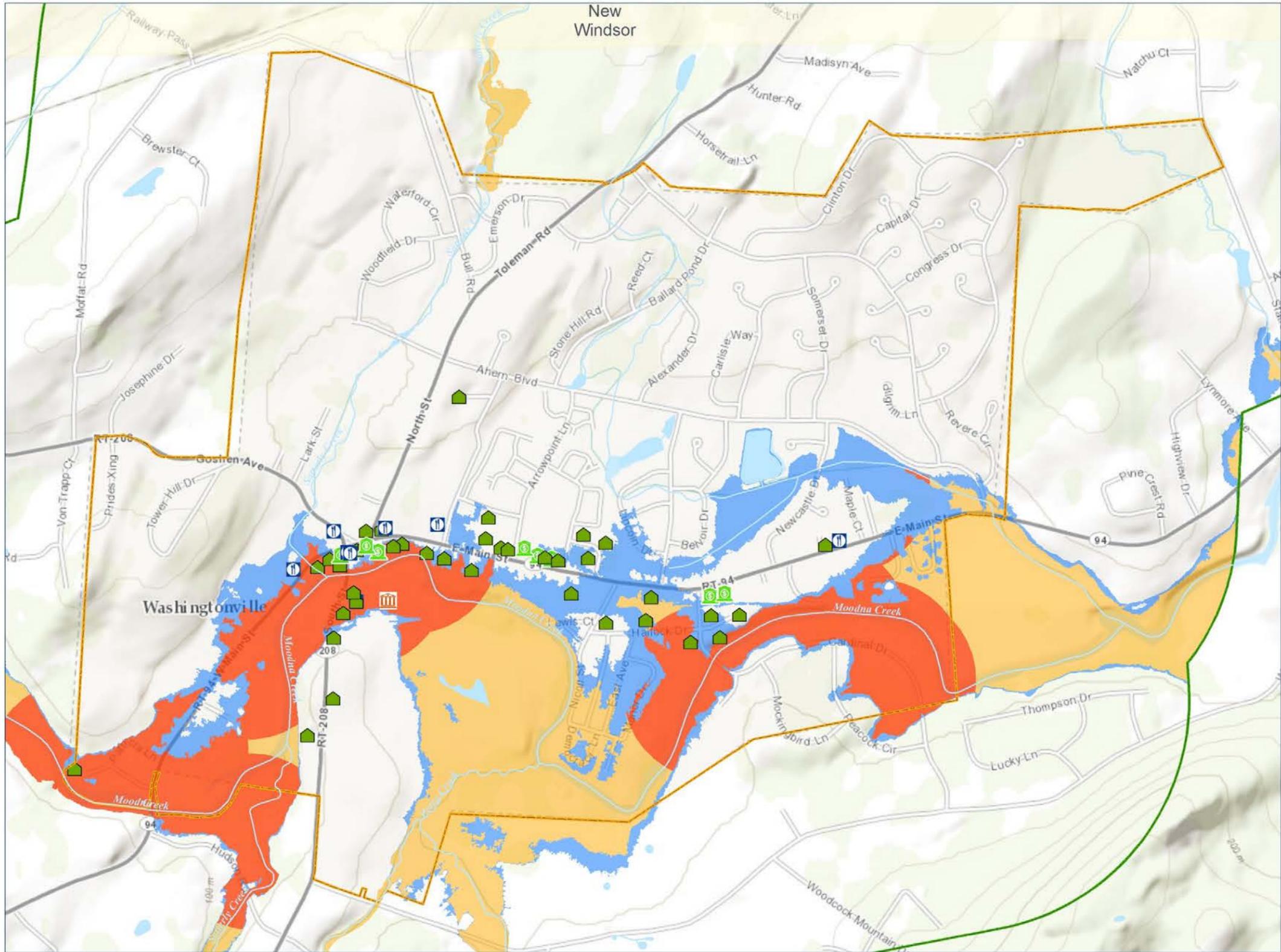
The Village of Washingtonville is located in central Orange County, New York, within the northern region of the Town of Blooming Grove. Recently, the Village has been successful in increasing commercial business and providing cultural and commercial activities to visitors from surrounding areas.



View of local retail center, courtesy of Nova Consulting.

The Village recognizes the importance of keeping a focus on economic development, while simultaneously incorporating resilience measures that strengthen the local community's ability to achieve success and thrive by it in future years. The Committee identified 89 facilities within this category, including the Washingtonville Pharmacy, the Brotherhood Winery, Faith Realty, and the Country Store.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY
Figure 10. Economic Assets



Legend

- Village of Washingtonville/ Planning Area
- Additional Planning Area

Assets

- Downtown Center
- Banks and Financial Services
- Downtown Center
- Grocery/Food Suppliers
- Large Business
- Restaurants
- Small Business

Risk Area

- Moderate Risk
- High Risk
- Extreme Risk

This map is for reference only.
 Data Sources:
 NYRCR- Asset Locations, Risk Areas,
 Risk Scores
 Moodna Creek Watershed Atlas,
 Orange County Water Authority (2008)



0 500 1,000
 Feet





Health and Social Service Assets

This asset category includes items that serve a variety of public functions, from health treatment facilities to general-purpose shelters in public schools, and from post offices to town halls. During a flood event, these facilities could serve as critical disaster response and recovery centers, and their identification is essential to future disaster management and preparedness. This category also includes many critical assets, including fire protection, police services, hospitals, and emergency operations facilities. The Village was severely impacted from the storm damage and hindered residents' ability to access health and social services. In many cases, residents were cut off from services by road and bridge damage.

Twenty facilities were identified, including Washingtonville Middle School, Washingtonville Village Courthouse, and CVS. Many structures are close to the Moodna Creek and at risk from flood damage.

Critical Facilities

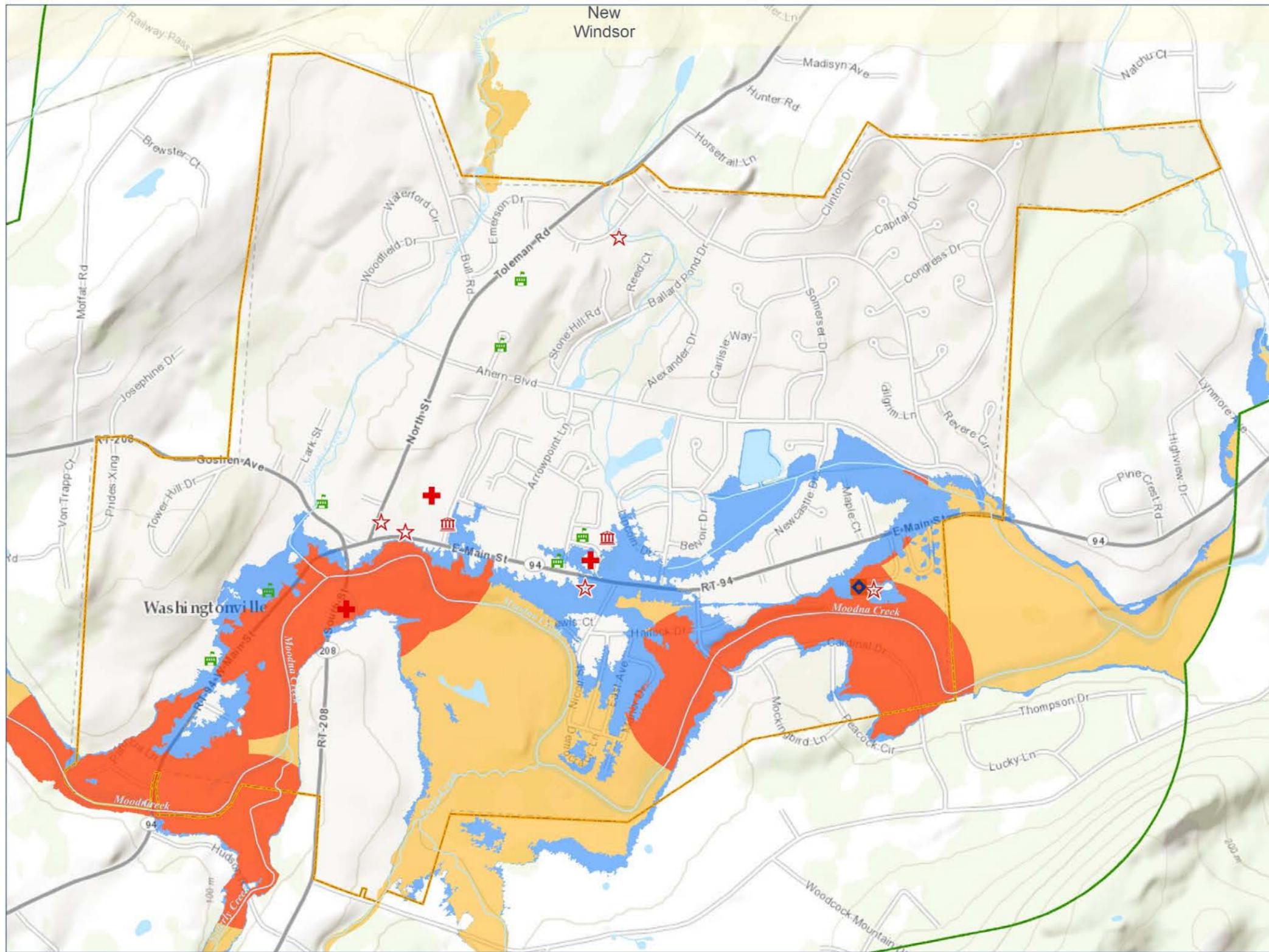
Critical facilities are assets on which the community relies for essential services. They may include:

- Facilities that produce, use, or store highly volatile, flammable, explosive, toxic, or water-reactive materials;
- Hospitals and nursing homes, and housing for the elderly, which are likely to contain occupants who may not be mobile enough to avoid injury or escape death during a flood or a severe storm event;
- Emergency operation centers, or data storage centers that contain records or services that may become lost or inoperative during flood and storm events;
- Power-generating plants and other principal points of utility lines.



View of the Old Village Hall, which had been used as an emergency communications and resource center before being damaged and ultimately demolished after Hurricane Irene. Photo is courtesy of the Village of Washingtonville.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY
Figure 11. Health and Social Services Assets



Legend

- Village of Washingtonville/ Planning Area
- Additional Planning Area

Assets

- Daycare and Eldercare
- ★ Emergency Operations/Response
- 🏛️ Government and Administrative
- + Healthcare Facilities
- H Primary/Regional Hospitals
- ⊠ Public Works Facilities
- 🏠 Schools

Risk Area

- Moderate Risk
- High Risk
- Extreme Risk

This map is for reference only.
 Data Sources:
 NYRCR- Asset Locations, Risk Areas,
 Risk Scores
 Moodna Creek Watershed Atlas,
 Orange County Water Authority (2008)

0 500 1,000
Feet





Infrastructure Assets



Route 208 (South Street) Bridge. Photo courtesy of NOVA Consulting.

The Village of Washingtonville sustained significant flood damage to infrastructure assets when waters of Moodna Creek overtopped its banks after Hurricane Irene in 2011. Flooding has always occurred in the Village, but has increased in severity and frequency in recent years, resulting in closure

of key access corridors Route 94 and Route 208, and taxing emergency response and communication networks. Maintaining safe access to and from the Village, as well as functional communication between residents and emergency personnel during storm events, were clear priorities based on public comment and Committee feedback.

Assets within this category are not restricted to transportation infrastructure, but also include water supply systems and telecommunications facilities. During a storm event, these facilities provide access to critical disaster response and recovery personnel, and identification of these facilities is essential to future disaster management and preparedness. The facilities also allow for maintenance of sanitary conditions during a disaster event.

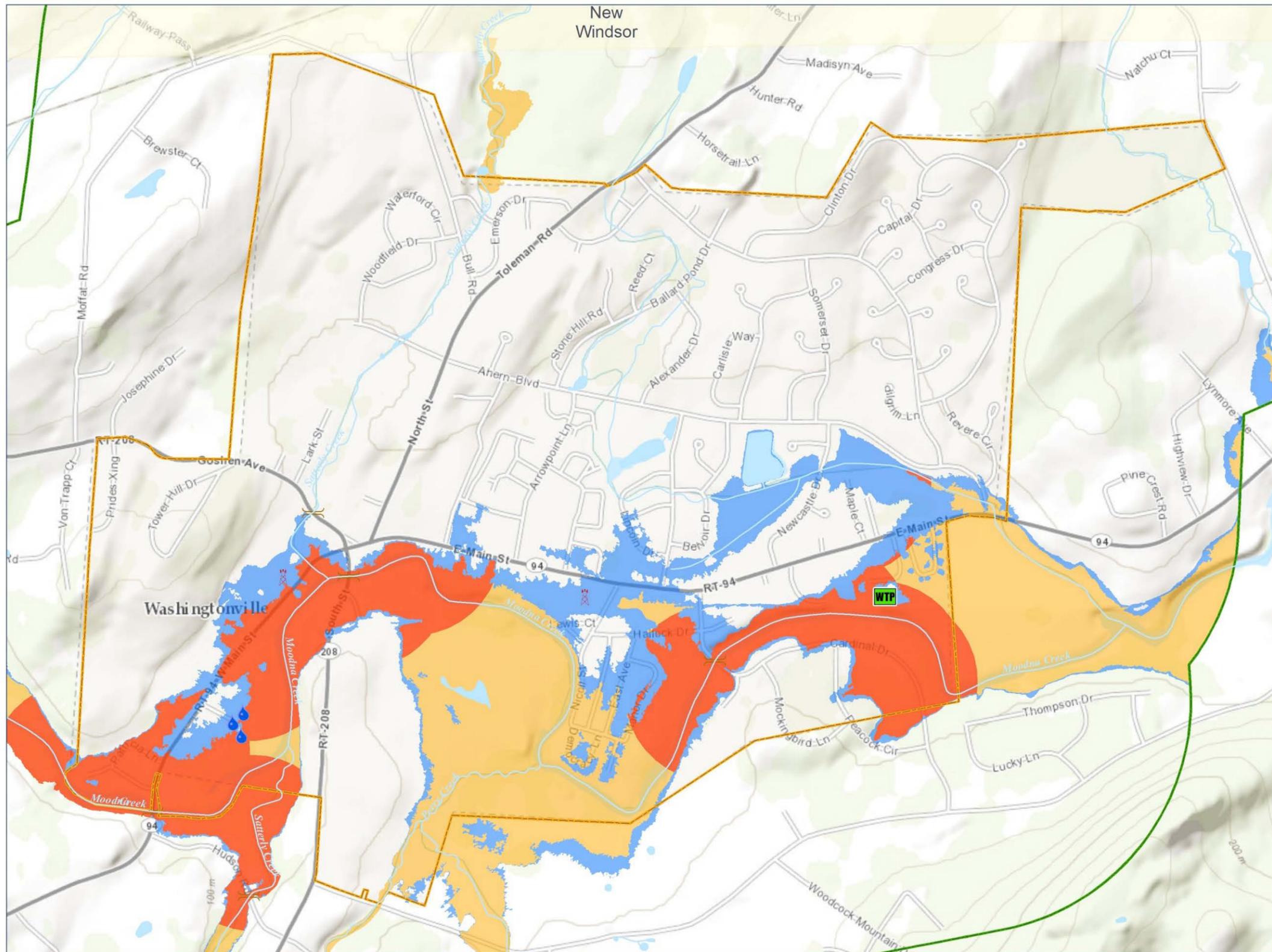
Thirteen facilities were identified within this category, including Hudson Road Bridge, SJM Landing Heliport, and Washingtonville Water Plant, and others. Most of the facilities are in close proximity to Moodna Creek.



Downstream view of a tributary culvert at the Beaverdam Lake Spillway. Photo courtesy of NOVA Consulting.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY

Figure 12. Infrastructure Assets



Legend

- Village of Washingtonville/ Planning Area
- Additional Planning Area

Assets

- Power Supply
- Stormwater
- Telecommunications
- Transportation
- Water Supply
- Wastewater

Risk Area

- Moderate Risk
- High Risk
- Extreme Risk

This map is for reference only.
 Data Sources:
 NYRCR- Asset Locations, Risk Areas,
 Risk Scores
 Moodna Creek Watershed Atlas,
 Orange County Water Authority (2008)

0 500 1,000 Feet





Natural and Cultural Resource Assets

Natural and cultural resources are important to the quality of life within the Village, and some serve to protect other assets within the community from potential impacts of flooding. Identifying these assets is important to (1) understand ways to protect historic and cultural resources, and (2) determine where natural resources, such as wetlands or floodplains, could be enhanced to help protect the Village’s infrastructure and other assets during storm events.



Snapping Turtle in the Moodna Creek. Photo courtesy of NOVA Consulting.

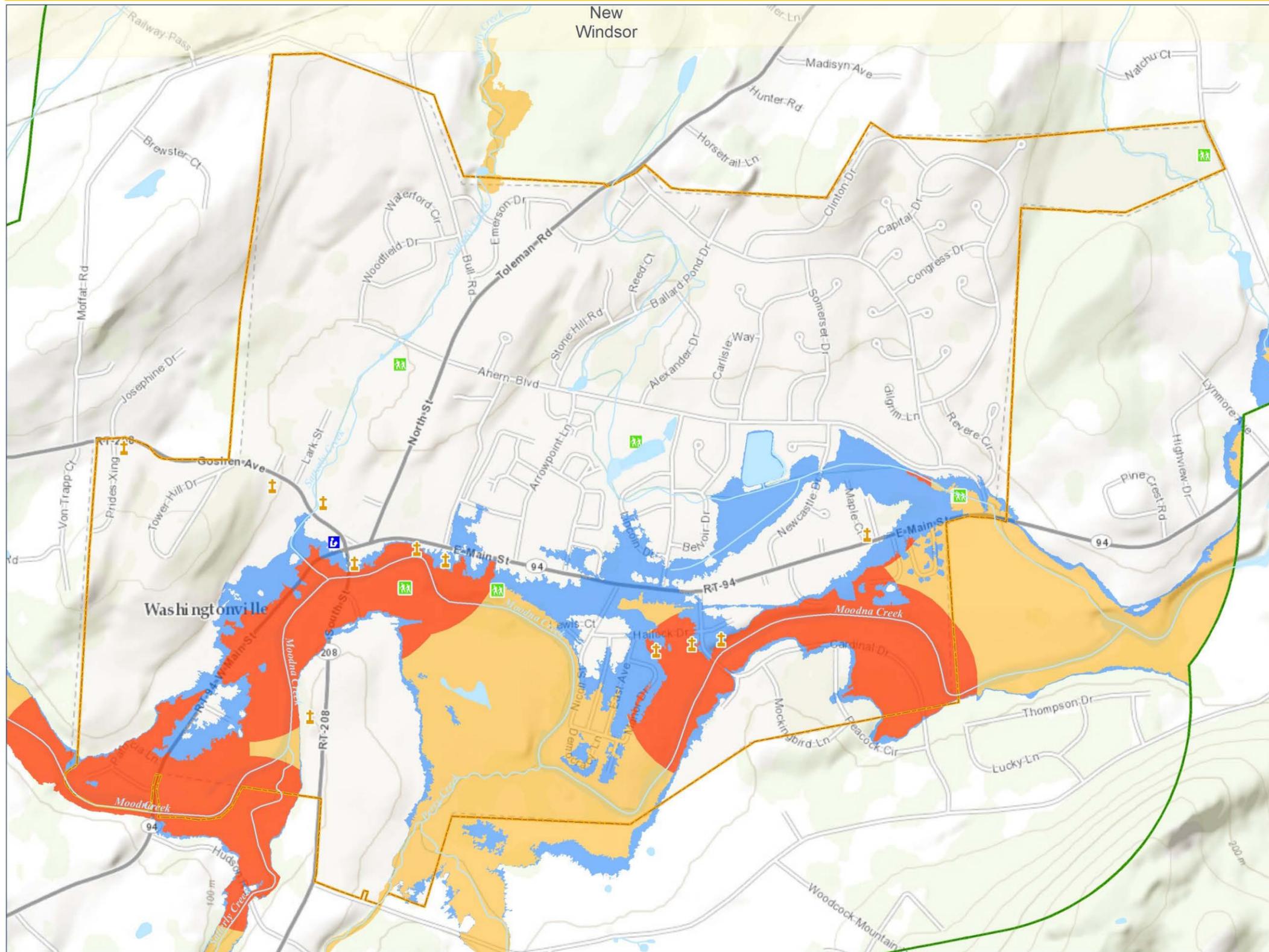


Driveway bridge off Route 208 in Washingtonville. Photo courtesy of NOVA Consulting.

The Committee identified 24 facilities in this category, including Moffat Library, Mays Field, St. Anne’s Episcopal Church, Washingtonville Lions Club, and Main Street Hockey Rink, and others.

A number of these assets have been identified in Committee meetings, public forums, and survey results as staples of utmost importance in the community, yet many are located in an area of risk, as shown in Table 12.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY
Figure 13. Natural and Cultural Resource Assets



Legend

- Village of Washingtonville/ Planning Area
- Additional Planning Area

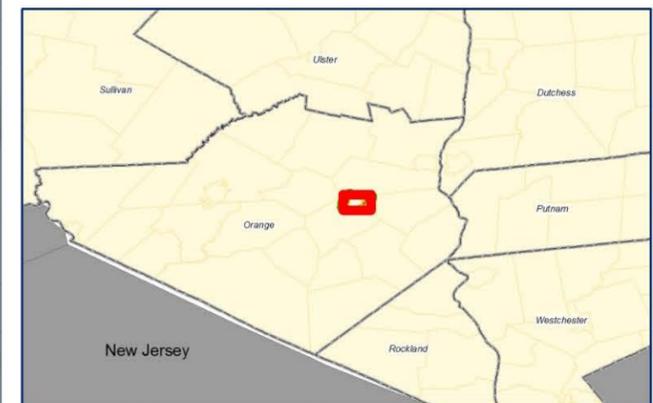
Assets

- Cultural or Religious
- Libraries
- Parks and Recreation
- Hunting and Fishing Lands
- Historic Landmarks and Facilities
- Museums and Arts Centers
- Community Centers
- Natural Habitats
- Natural Protective Features
- Water Bodies

Risk

- Moderate Risk
- High Risk
- Extreme Risk

This map is for reference only.
 Data Sources:
 NYRCR- Asset Locations, Risk Areas, Risk Scores
 Moodna Creek Watershed Atlas, Orange County Water Authority (2008)





Housing

The Village suffers from several challenges hindering the provision of safe and adequate housing for current and future residents, many of which were significantly exacerbated during and after the floods from Hurricane Irene and Tropical Storm Lee.

This asset category includes, but is not limited to, multi-family dwellings, supportive housing/group homes, and senior housing. Assets include historic homes, as well as recently redeveloped housing units in the Village.

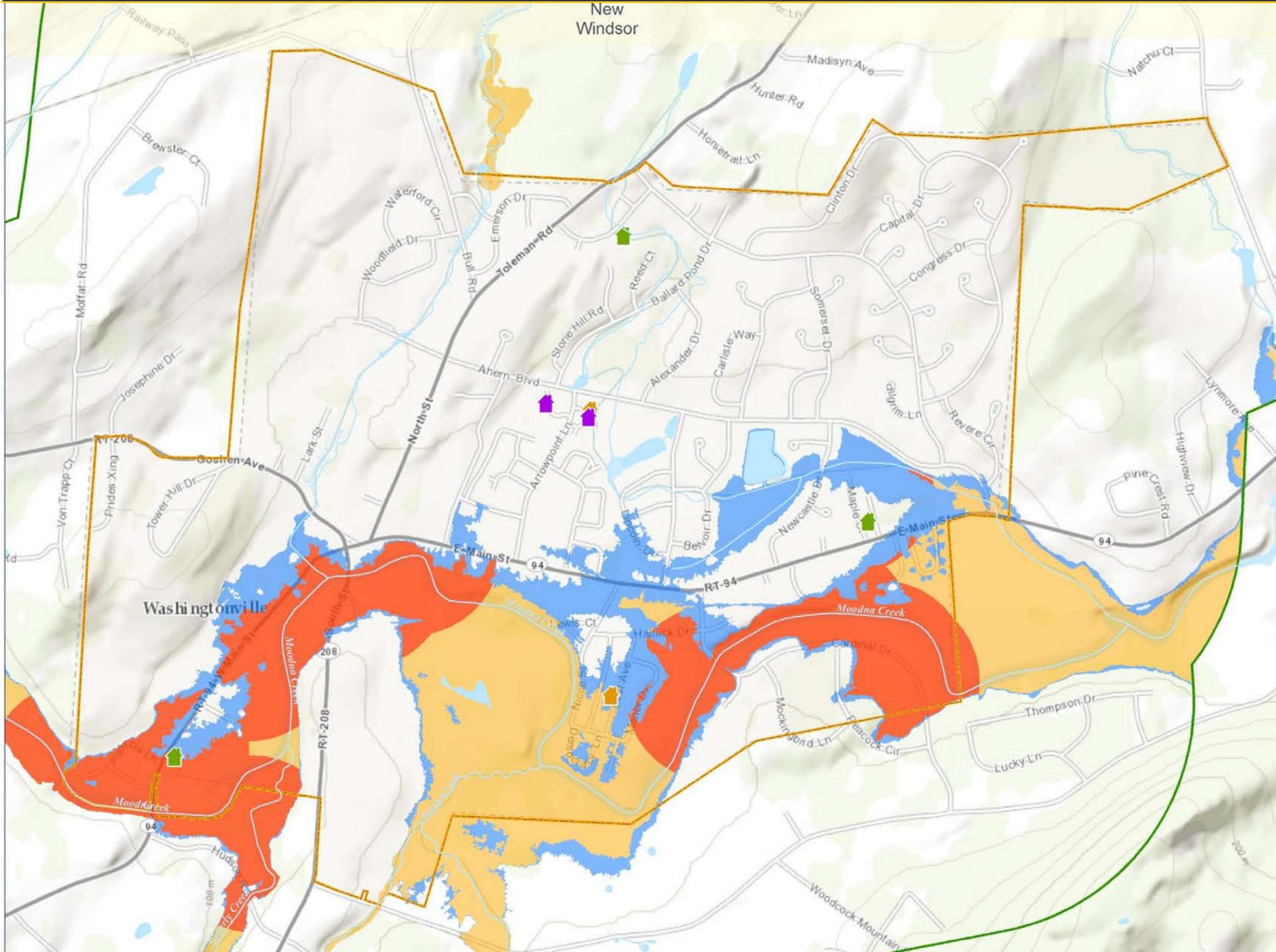


Housing along Moodna Creek near Clove Road Bridge. Photo courtesy of NOVA Consulting.



Housing along Moodna Creek near May's Field pedestrian bridge. Photo courtesy of NOVA Consulting.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY
Figure 14. Housing Assets



- Legend**
- Village of Washingtonville/ Planning Area
 - Additional Planning Area
- Assets**
- ▲ Affordable Housing
 - Multi-Family Residence
 - ▲ Supportive Housing
- Risk Levels**
- Moderate Risk
 - High Risk
 - Extreme Risk

This map is for reference only.
 Data Sources:
 NYRCR- Asset Locations, Risk Areas,
 Risk Scores
 Moodna Creek Watershed Atlas,
 Orange County Water Authority (2008)





Assessment of Risk to Assets and Systems

The Village of Washingtonville has suffered recent damage by the repetitive flooding of the Moodna Creek. The non-flood stage water velocities along Moodna Creek are fairly slow, increasing the potential for sediment to accumulate behind bridges and spillways and therefore, increasing the chance for flooding. As the Creek's main channel is rather shallow for most of its course through the Village, flood conditions develop rapidly during periods of heavy rain. Confluences of tributaries and culverts may also have impacts on flood condition of Moodna Creek.

This substantial flood risk is primarily caused by proximity of the Village to the Moodna Creek and the waterway's ongoing stream bank erosion. According to U.S. Army Corps of Engineers, the primary causes of flooding include:

- **Reduced Stream Capacity** – Continuous bank erosion has led to the accumulation of sediment in the Moodna Creek. Bank erosion and sediment buildup contribute to changing stream conditions, the loss of vegetation, and a reduced channel capacity, leading to flooding and community damage.
- **Debris and other obstructions** – Obstructions in the stream impede the flow of water and contribute to increased flood risk for the Village.

In order to understand the underlying causes of flooding and sediment transfer in the area, a hydraulic analysis was completed for the portion of the Moodna Creek in the planning area using an existing Hydrologic Engineering Centers River Analysis System (HEC-RAS) model that was modified to include current physical characteristics. The existing flood conditions were evaluated to identify the effect of specific obstructions located within a section of Moodna Creek, starting near a private

road crossing upstream of the Village to the Salisbury Mills Dam, located downstream of the downtown area. Several bridges, including the Route 94 and Locust Street bridges, and multiple railroad crossings, cause increases in water surface elevations under flood conditions.



The stream shown above shows has become a potential flood hazard due to continuous bank erosion causing uprooted trees to collapse over the banks, creating new flow obstructions as accumulated debris. Photo is courtesy of Tetra Tech.

The close proximity of the Village to Moodna Creek, combined with the number of obstructions within the floodplain and their effect on sediment aggradation that results in reduced stream capacity within this reach, are primary causes of substantial flood risk.

In an effort to lower these water surface elevations, several potential floodplain storage areas were identified along Moodna Creek within the Village. These areas were evaluated in the model by adjusting the floodplain elevation, removing potential obstructions, and restoring a natural channel condition.

Model results indicate these reconnected floodplains and restored stream channels can improve flood conditions, but the impacts are generally limited to local improvements. The model results indicate that these types of projects would need to be completed throughout the reach to achieve large-scale results. Although the hydraulic analysis was limited to assessment of the Moodna



Creek floodplain, stormwater management techniques on upland areas both upstream and within the Village are anticipated to have an effect on flood conditions locally. Capturing and detaining stormwater within the watershed could have an impact on flood conditions along Moodna Creek and its tributaries within the Village. More detailed watershed modeling would be needed to assess the impacts of distributed stormwater management techniques, which was not completed as part of this study.

Based on the extension of the FEMA 100- and 500-year floodplain for Moodna Creek and the HEC-RAS analysis conducted, the main areas of the Washingtonville community that are most prone to flooding are the Main Street section between the Route 94 Bridge and the Route 208 Bridge; the south Moodna Creek overbank between Mays Field and Clove Road Bridge; the Mobile Home Park; the properties along Cardinal Drive; the privately owned farm land north of Moodna Creek overbank (Route 94 and Farmview Lane); and the Salisbury Mills area north of Moodna Creek, between Station Road and Lake Road just outside of the Village of

Washingtonville’s eastern boundary in the Town of Blooming Grove.

Several properties along Patricia Lane and Beverly Lane have also been prone to flooding, and many properties within the same area have participated in or have been targeted for an Orange County buyout program. Areas that are least prone to



View of creek upstream of Salisbury Mills Dam. Photo courtesy of NOVA Consulting.

flooding are properties along Goshen Avenue (Route 208); properties along South Street (south of the Companion Animal Hospital); properties north of E Main Street; properties along Moodna Creeks’ overbanks between Clover Road Bridge and the Salisbury Mills Dam.

A total of 13 bridges and two spillways located along Moodna Creek obstruct water flow and may cause water to back up during flooding. The Route 94 bridge and the Route 208 bridge exacerbate flooding issues in the center of Washingtonville. However, outputs from the HEC-RAS hydraulic modeling suggest that removal of these structures may not have substantial benefits in reducing the Water Surface Elevation (WSE) during major flooding events, such as during Hurricane Irene. Another obstruction that has been a concern to the community is the Salisbury Mills Dam. Outputs from



Goshen Avenue Culvert, shown here at normal water stage. Photo courtesy of Tetra Tech.



the HEC-RAS hydraulic modeling suggest that the presence of this dam might have caused a localized influence in terms of WSE increase upstream during major flooding events but did not result in significant flood WSEs farther upstream along the Creek.

Two main tributaries (Satterly Creek and Perry Creek) and several culverts flow into Moodna Creek on either side of South Street, south of downtown Washingtonville. Their contribution to Moodna Creek flow is included in the HEC-RAS modeling. However, their influence in terms of increased flooding cannot be accurately assessed, since it is not possible to isolate the effect of flooding caused by stream confluences. Flooding conditions within Washingtonville are a result of a combination of several factors, including stream confluences, streambed conditions, sedimentation, and obstructions. The hydraulic modeling performed was not able to separate all of these factors to determine cause and effect for each one.

Critical buildings and facilities have been identified within the floodplain extending from the Route 94 bridge to the Locust Street bridge. These structures include the Village Hall, Mays Field, the fire station, the mobile homes park, and the wastewater treatment plant, as well as other residences and commercial buildings. These assets may require flood protection measures or relocation to expand the floodplain, and provide additional water storage during flooding events. As not all critical facilities, structures, and/or roadways that have been impacted by past floods are located within the regulatory floodplain, the impact of flooding and the amount of protection required is assessed on a case-by-case basis, using the hydraulic modeling analysis and historical flood damage reports.

Bank erosion along Moodna Creek and the confluences of its tributaries might have increased

the amount of sediment deposits, or deposition, behind bridges and spillways.

Deposition is the accumulation of natural materials by a gradual process.¹³ Management of sediment deposition in the waterways in is an ongoing challenge for the Towns as they struggle to find a solution for this issue.

Flooding issues might have increased throughout the years as a result of undersized culverts or stormwater drainage outfalls that are located within the Village throughout watersheds that drain to Moodna Creek. In addition, the development of residential properties along the Creek might have encroached on the floodplain and increased bank erosion issues, consequently aggravating the localized flooding occurrence.

The hydraulic analysis performed focused on Moodna Creek and did not include analyses of past conditions to determine whether changes in the watershed, such as increased impervious surfaces, would have increased flooding problems. A desktop and field reconnaissance of the Village did not identify any large new development areas that might affect the nature of the local hydrology. However, climate change could result in larger storms, stressing the capacity of the existing stormwater system.

Potential flood mitigation projects were identified by the NYRCR Washingtonville Planning Committee and analyzed as part of this modeling effort, and are anticipated to decrease flooding problems in those areas.

HEC-RAS analysis indicates lowering the floodplain in certain areas of the Village could increase the amount of floodplain storage and help reduce the flood WSEs in localized areas within the Village.



View of May's Field, one of the areas identified as having the potential to provide additional flood storage. Photo courtesy of NOVA Consulting.

Based on community and Committee feedback and information captured by the asset inventory, the assessment of risks posed to the community's assets proceeded by use of the NYS DOS-provided Risk Assessment Tool. An overview of the highest risk assets and locations is provided with the goal of assessing risk to assets and community resources to suggest issues for further consideration in the development of strategies and projects. The tables that follow list the assets and their associated risk scores, and the figures depict the geographic distribution of risk within the community.

Description of Methodology

Based on community and Committee feedback, in conjunction with information captured by the asset inventory, risks for Washingtonville's assets were assessed using the NYS DOS-provided Risk Assessment Tool. The Risk Assessment Tool is designed to assess and quantify the risk to individual community assets through built-in formulas that calculate an overall risk score category based on three factors: hazard, exposure, and vulnerability. The tool calculates a score for each of these factors and combines them to

represent the relative risk of each asset in the community to one another.

The Risk Assessment Tool calculation combines scores for the three factors using the formula Risk = Hazard x Exposure x Vulnerability.

Each factor in this equation is calculated automatically, based on appropriate inputs and are assigned as follows:

$$\begin{array}{l} \text{Hazard} \\ \times \text{Exposure} \\ \times \text{Vulnerability} \\ \hline = \text{Risk} \end{array}$$

- **HAZARD SCORE:** assigned for each asset based on a 100-year storm event occurring within the next 100 years.
- **EXPOSURE SCORE:** determined by the risk area where the asset is located, and local landscape attributes that influence the potential for storm impacts. This score reflects how landscape features can moderate damage to individual assets.
- **VULNERABILITY SCORE:** reflects the level of impairment or consequences that assets may experience from a hazard event, and reflects the ability of the asset to resist damage from the hazard.

Interpretation of Risk

Risk scores help to identify assets with an elevated potential for storm damage. Some factors that should be considered for each asset in developing a community risk management strategy include:

- Contribution to life safety;
- Whether the asset is a critical facility;
- Value of asset to the community;
- Environmental services provided;



- Economic contribution of the asset;
- Whether alternatives are available; and
- Capacity of the asset to adapt.

The Consultant Team evaluated risk for both a 100-year storm (1% annual chance) and a 500-year event (0.2% annual chance), which represent a higher-intensity storm event. Risk was calculated for each asset, resulting in categorization in one of several categories.

100-year Floodplain

A one hundred-year floodplains (or 1% annual chance floodplain) can be described as a bag of 100 marbles, with 99 clear marbles and one black marble. Every time a marble is pulled out from the bag, and it is the black marble, it represents a 100-year flood event. The marble is then placed back into the bag and shaken up again before another marble is drawn. It is possible that the black marble can be picked one out of two or three times in a row, demonstrating that a 100-year flood event could occur several times in a row (Interagency Floodplain Management Review Committee, 1994).

Severe Category

Both exposure and vulnerability should be reduced for assets in this category, if possible. Relocation of these assets should be considered as a priority option.

High Category

Risk scores in the high category indicate conditions that could lead to significant negative outcomes from a storm.

Actions should be taken to reduce vulnerability, such as elevating or flood-proofing the asset to help avoid a long-term loss of function.

Moderate Category

Risk scores in this category pose moderate-to-serious consequences, but adaptation may be a lower priority based on exposure, or because

Floodway vs. Floodplain

*A **floodplain** is defined as the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that becomes inundated with water during a flood. Most often floodplains are referred to as 100-year floodplains. A 100-year floodplain is not the flood that will occur once every 100 years, rather it is the flood that has a one-percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. – Delaware County Hazard Mitigation Plan Update 2013*

A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations. – FEMA 2014

vulnerability remains relatively low. It is recommended that a combination of measures should be considered to reduce exposure or vulnerability.

Residual Category

Risk scores in the residual category occur when both exposure and vulnerability are relatively low. This situation suggests floods would pose minor or infrequent consequences. Note that risk is never completely eliminated. Some residual risk still remains, even after management measures have been implemented. It is recommended to monitor conditions and adapt, as necessary.

The Consultant Team evaluated risk from both a 100-year storm (1% annual chance of occurrence) and the 500-year event (0.2% annual chance of occurrence), which represents a higher intensity storm event. For further information regarding risk scores, refer to Section V-Additional Materials.



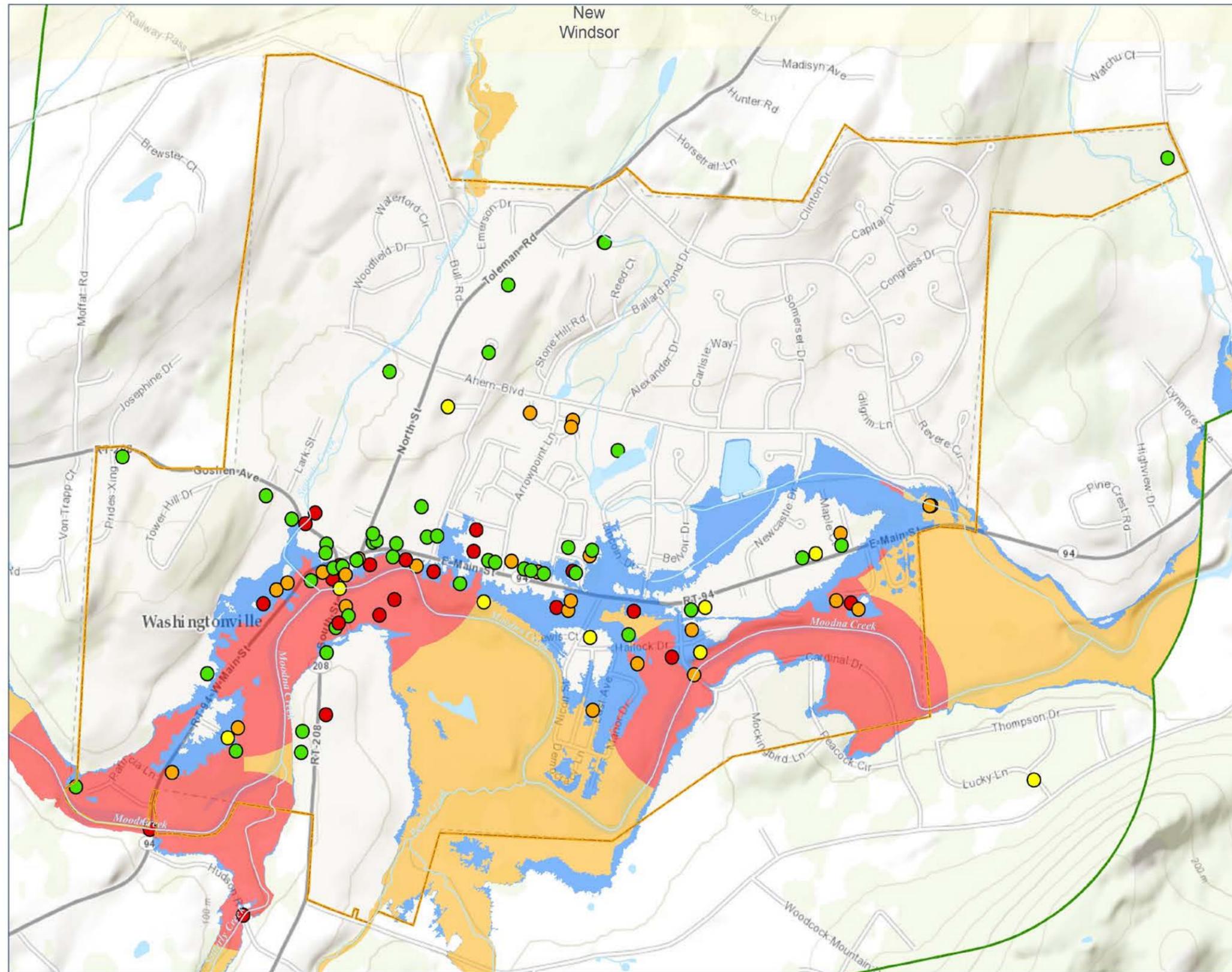
Assessment Results

Many assets identified within the Village are within or proximate to the center of the Village. Most development within the center of the Village is either on or near the floodplain, and sections of the Village are within the floodway. Flooding of Moodna Creek poses the greatest risk to the Village and many of its key assets. Stronger and more frequent large storms have rendered Washingtonville more susceptible to devastating effects of flooding. Clearly, many assets within Washingtonville are exposed and extremely vulnerable to storm events, and the risk score results below indicate this vulnerability.

Not all assets vulnerable to severe and repetitive flooding are located in the regulatory 100 yr. floodplain or identified “Risk Area.” For instance, the Moffat Library experienced significant damages during Hurricane Irene, a storm that caused flooding exceeding most projected expectations.

As previously discussed in the methodology, no risk scores were generated for all assets outside of an identified risk area, and these assets have been omitted from the following section. Figure 15 shows the geographic distribution of risk scores for a 100-year storm event.

NYRCR: VILLAGE OF WASHINGTONVILLE, ORANGE COUNTY
Figure 15. Risk Scores



Legend

- Village of Washingtonville/ Planning Area
- Additional Planning Area

Risk Scores 100 Year Storm

- Severe
- High
- Moderate
- Residual

Risk Area

- Moderate Risk
- High Risk
- Extreme Risk

This map is for reference only.
 Data Sources:
 NYRCR- Asset Locations, Risk Areas,
 Risk Scores
 Moodna Creek Watershed Atlas,
 Orange County Water Authority (2008)


0 500 1,000
Feet





As shown Figure 15. Risk Scores, a number of assets with severe and high risk scores during a 100-year event are along or near Main Street in close proximity to Moodna Creek. The assets with the highest risk scores include Napoli’s Italian Restaurant (Severe), Corner Candle Store (Severe), Washingtonville Pharmacy (Severe), Village Deli (Severe), and Bottini Fuels Storage Site (Severe).

Economic

The risk scores shown below indicate that a number of the Village’s economic assets are at severe or high risk from flooding. Nineteen assets were identified at severe risk, while 22 assets were identified at high risk from flooding during a 100-year event. This risk reflects information provided by the community and Committee. A number of the businesses and facilities in the Village have been routinely affected by flood events, especially the flood events associated with Hurricane Irene and the remnants of Tropical Storm Lee. Table 9 lists the risk scores for economic assets in the Village of Washingtonville.



Courtesy of the Blooming Grove/ Washingtonville Chamber of Commerce.

The buildings shown in Table 9. Economic Assets as the most vulnerable and exposed to flooding within the Village should be considered for flood mitigation actions including possible relocation. Other buildings should be prioritized for floodproofing or other mitigation measures. Most development within the center of the Village is either on or near the floodplain, and many key assets in the Village are at risk from flooding.

TABLE 9. ECONOMIC ASSETS

Asset/ Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Napoli's Italian Restaurant	Restaurants	Severe	Severe
Corner Candle Store	Small Business	Severe	Severe
Washingtonville Pharmacy	Small Business	Severe	Severe
Newport Beverages	Small Business	Severe	Severe
Village Deli	Small Business	Severe	Severe
Bottini Fuels storage site	Small Business	Severe	Severe
Lassaw Dentist office	Small Business	Severe	Severe
Tuthill Agency	Small Business	Severe	Severe
A Plus Mini Mart	Small Business	Severe	Severe
Downtown	Downtown	Severe	Severe
Bradley's Auto Body	Small Business	Severe	Severe
Spindler Bulk Transport	Small Business	Severe	Severe
Flowers by JoAnn	Small Business	Severe	Severe



TABLE 9. ECONOMIC ASSETS

Asset/ Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Auto Zone	Small Business	Severe	Severe
Brookside Express	Small Business	Severe	Severe
Ralph's Motor Repair	Small Business	Severe	Severe
South Street Collision	Small Business	Severe	Severe
Washingtonville Express Lube	Small Business	High	High
The Country Store	Small Business	High	High
Hayes Lawn Care	Small Business	High	High
Lawn Doctor	Small Business	High	High
Orange County Transmission	Small Business	High	High
Santer Fitness	Small Business	High	High
Faith Realty	Small Business	High	High
Charles Quick Insurance	Small Business	High	High
Village Paint & Hardware	Small Business	High	High
Simply Computers	Small Business	High	High
Frontier Communications	Small Business	High	High
Companion Animal Hospital	Small Business	High	High
Utility Survey Corp	Small Business	High	High
State Farm Insurance	Small Business	High	High
Dr. Knipp offices	Small Business	High	High
Beyond Rubies	Small Business	High	High
Hudson Heritage Realty	Small Business	High	High
Triton Contracting Services	Small Business	High	High

Source: NYRCR, NYS DOS

Health and Social Service Assets

Many of the Village’s health and social services assets that have incurred flood damages in the past are also shown to be at high risk from flooding through the risk assessment.

One asset was identified at severe risk from flooding, while three assets were identified at high risk from flooding during a 100-year flooding event.



Old Village Hall, Courtesy of the Village of Washingtonville Photo Library.



This reflects information provided by the community and Committee. A number of businesses and facilities in the Village have been routinely affected by flood events, especially the

flood events associated with Hurricane Irene and Tropical Storm Lee. Table 10 lists the risk scores for health and social service assets in the Village of Washingtonville.

TABLE 10. HEALTH AND SOCIAL SERVICE ASSETS

Asset/ Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Washingtonville Pharmacy	Healthcare Facilities	Severe	Severe
Washingtonville STP	Emergency Operations/Response	High	High
Washingtonville Middle School	Schools	High	High
Washingtonville Fire Station	Emergency Operations/Response	High	High
Washingtonville DPW Garage	Public Works Facilities	Moderate	High

Source: NYS DOS, NYRCR

To reduce future flood damages and losses to these assets, substantial mitigation actions should be taken to reduce both vulnerability and exposure. Some buildings and facilities most vulnerable and exposed to flooding within the Village should be considered for possible relocation. Most development within the center of the Village is either on or near the floodplain, and many key assets in the Village, including the Washingtonville Fire Station, are at risk from flooding. Facilities that cannot be relocated should be prioritized for floodproofing or other mitigation measures.

Infrastructure Assets

Based on information provided by the community and Committee, two infrastructure assets were identified at high risk from flooding during a 100-year flooding event, while many others were identified through the risk assessment to have moderate risk. Even greater numbers of infrastructure assets have been routinely impacted by flood events, especially the flood events

associated with Hurricane Irene and Tropical Storm Lee.

Table 11 lists the risk scores for infrastructure assets in the Village of Washingtonville.



Tributary stream culvert off of Route 208 in Washingtonville. Photo is courtesy of NOVA Consulting.



TABLE 11. INFRASTRUCTURE ASSETS

Asset/ Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Frontier Communications	Telecommunications	High	High
Hudson Road Bridge	Transportation	High	High
Washingtonville Water Plant	Water Supply	Moderate	Moderate
2 Moodna Creek Infrastructure	Transportation	Moderate	Moderate
Cell Tower	Telecommunications	Moderate	Moderate
Route 94 Bridge (over Moodna Creek)	Transportation	Moderate	Moderate
DPW Washingtonville Sewer	Wastewater	Moderate	Moderate

Source: NYRCR, NYS DOS

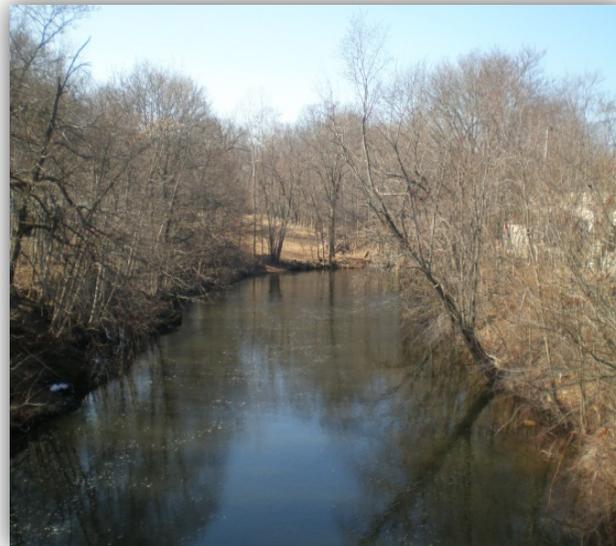
According to the guidance and methodology described, it is clear that substantial mitigation actions should be taken to reduce both vulnerability and exposure to these infrastructure assets. Bridges and facilities most vulnerable and exposed to flooding within the Village should be considered for substantial upgrades. Route 208 and Route 94 bridges should be examined for possible upgrades, as these serve as the main access to and from the center of the Village business district.

Most development within the center of the Village is either on or near the floodplain, and many key assets in the Village are at risk from flooding. Therefore, mitigation actions, such as

floodproofing and upgrades, should be explored.

Natural and Cultural Resource Assets

Based on information provided by the community and Committee, three natural and cultural resource assets were identified at severe risk, and four assets were identified at high risk from flooding during a 100-year flooding event. Many natural and cultural resource assets have been routinely affected by flood events, especially the flood events associated with Hurricane Irene and the remnants of Tropical Storm Lee. Table 12 lists the risk scores for natural and cultural resource assets in the Village of Washingtonville.



Moodna Creek in Washingtonville. Photo is courtesy of NOVA Consulting.



TABLE 12. NATURAL AND CULTURAL RESOURCE ASSETS

Asset/ Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
Knights of Columbus	Cultural or Religious Establishments	Severe	Severe
Washingtonville Lions Club	Cultural or Religious Establishments	Severe	Severe
VFW Post 8691	Cultural or Religious Establishments	Severe	Severe
Grace Community Church	Emergency Operations/Response	High	High
El Shaddai Christian Church	Cultural or Religious Establishments	High	High
Blooming Grove/Washingtonville Chamber	Cultural or Religious Establishments	High	High
Mays Field	Cultural or Religious Establishments	High	High
Washingtonville Athletic Fields	Multi-Family Residence	High	High
Vern Allen Park Roller Hockey	Parks and Recreation	High	High
Main St Hockey Rink	Supportive Housing	Moderate	Moderate
Stone Ridge Pond	Parks and Recreation	Moderate	Moderate
Endangered Species Area	Parks and Recreation	Moderate	Moderate
Riparian Areas	Parks and Recreation	Moderate	Moderate
Hydric Soils	Parks and Recreation	Moderate	Moderate

Those buildings and facilities listed in the table above as the most vulnerable and exposed to flooding within the Village should be considered for flood proofing mitigation measures and possible relocation. However, these considerations should include facilities not located within the regulatory floodplain, and therefore, not associated with a risk score, where historical flood damages suggest future vulnerability.

Providing additional flood storage in the floodplain would likely alter surface water elevations during flood events. Mays Field is within the floodway, and if redeveloped, would provide significant additional flood storage.

Housing Assets

Two housing assets were identified as high risk from flooding during a 100-year flooding event, consistent with information provided by the community and Committee. Table 13 lists the risk scores for housing assets in the Village of Washingtonville. Most housing assets in the Village are outside the areas at risk from flooding; however, the facilities listed in Table 13 should be prioritized for floodproofing or other mitigation measures to reduce both vulnerability and exposure.



Homes in Washingtonville near a small spillway in Moodna Creek. Photo courtesy of NOVA Consulting.



TABLE 13. HOUSING ASSETS

Asset/ Asset Type	Asset Subcategory	100-Year Risk Score	500-Year Risk Score
M H Communities Ltd I	Multi-Family Residence	High	High
Rehabilitation Support & Services	Supportive Housing	High	High

ASSESSMENT OF NEEDS AND OPPORTUNITIES

The needs and opportunities presented in this Plan provide a basis for the strategies, projects, programs, and policies to be proposed as a result of this community planning process. These needs and opportunities arose as a result of many different catalyzing forces and factors, including damages caused by Hurricane Irene or Tropical Storm Lee, ongoing risk faced by assets, lost economic opportunities attributed to damages, insufficient local capital for rebuilding and economic expansion, or needs already existing when the storms hit.¹⁴

Inherent to the process, some strategies and preliminary project ideas are also identified during the needs and opportunities compilation.

The Committee identified preliminary needs and opportunities for the Village of Washingtonville categorized by each of the six Recovery Support Functions (RSF’s) that serve as the structural roadmap for this Plan.

Community Planning and Capacity Building

Many of the community planning systems in the Village of Washingtonville were stressed during the floods from Hurricane Irene and Tropical Storm Lee and in the subsequent disaster recovery efforts. The lack of focused local planning efforts and regulation enforcement currently places the community at a disadvantage when making decisions to guide the future growth of Washingtonville and increase resiliency to storm events.

**RECOVERY SUPPORT FUNCTION:
 Community Planning and Capacity Building**

This recovery function addresses the community’s ability to implement storm recovery activities and to plan how to mitigate the effects of future storms. The experience highlighted an overall limited capacity regarding the Village’s capability to support and permit appropriate reconstruction and redevelopment to build back better with flood-resilient infrastructure based on up-to-date risk information, flood-proofing best practices, and long-term goals and visions.

Identifying emerging issues, trends, and strategies to address them becomes increasingly challenging without up-to-date local data and information and ongoing stakeholder engagement, all of which are in short supply in the Village.

The lack of formal planning documents provides a challenge for verifying the consistency of local ordinances with shifting community goals and preferences, and limits the community’s ability to manage growth effectively to prevent impacts from flooding.

The needs and opportunities identified regarding these concerns are:

- **Need** to work with affected homeowners regarding flood elevation requirements and other needs related to agency coordination and documentation during and after a disaster (FEMA)
- **Need** to evaluate local zoning codes, floodplain requirements, and ordinances for



consistency with community and NYRCR Washingtonville Plan goals and expectations. Review should include an evaluation of identified issues including whether the existing code supports community and economic development goals

- **Need** for a sufficient number of operating shelters during storms (Most shelters were flooded or inaccessible during the last flood)
- **Opportunity** to identify new sites for shelters or potential improvements to existing shelters
- **Opportunity** to consider coordinating with American Red Cross on training for operating a shelter
- **Need** for additional local planning to guide the future growth of the community including a Comprehensive Plan, Economic Development Strategy, and Housing Assessment
- **Need** for additional hydraulic modeling of the Moodna Creek and its numerous bridges and structures to determine additional potential creek constrictions and flood risks due to the design and location of

existing structures.

Economic Development

There are many issues in the Village of Washingtonville that currently deter the local business environment from reaching its full potential; many of which existed before the major flooding in 2011 but that became more pronounced in the aftermath of those events. **Recreation opportunities for children and young people are currently lacking in the Village, so that families spend free time and expendable income in neighboring communities.** This lack persists, even while the Village fails to fully use and market its own wealth of local historic, cultural, and recreational opportunities.

Several factors were noted as contributing to the difficulty of doing business in the Village, including a lack of incentives to encourage desirable development and job growth, and a local perception among the community leaders and business owners that current ordinances and regulatory controls may be discouraging business attraction and retention. Stemming from these issues, the Committee enumerated these needs and recommendations:

- **Need** to evaluate the potential for economic development incentives including opportunities for:
 - Expedited permitting
 - Fee waivers
 - Tax incentives
 - Density bonuses
 - Technical assistance
- **Need** to determine the potential for additional parking near commercial and downtown areas
- **Need** to increase recreational opportunities to keep children and families in town. Providing local recreation activities for

RECOVERY SUPPORT FUNCTION: Economic Development

The primary economic concern after a disaster is returning economic and business activities to a state of health. Recovery periods present unique opportunities for developing new economic strengths that result in a more sustainable and economically robust community. Communities that strategically design an economic development strategy, and support these elements in their planning process, are more likely to capitalize on opportunities for economic improvement, such as those presented through recovery programs like NYRCR.



families will also increase the likelihood that families will shop and lodge locally, rather than travel outside the Village for recreational and spinoff shopping

- **Opportunity** to create additional access to waterways and expand passive outdoor recreation
- **Need** to inventory and assess economic assets with remaining damage from the storm
- **Need** an improved local branding and marketing strategy to reinforce sense of place, highlight local assets and encourage economic development.
- **Opportunity** to conduct a historic resources inventory and design new programming, updated and uniform signs, mapping/materials, and wayfinding guides

Health and Social Services

Past floods in Washingtonville, including those associated with Hurricane Irene and Tropical Storm Lee, led to widespread structural damage to private properties and repeatedly to critical local service facilities, including the Washingtonville High School and Middle School facilities, police station, Village offices, fire house, and recreation facilities.

**RECOVERY SUPPORT FUNCTION:
 Health and Social Services**

After a disaster, one of the more immediate considerations is whether public health, health care facilities, and essential social service needs have been restored. To help develop appropriate strategies and management measures, the Committee reviewed the existing Village assets that support vulnerable populations and identified key needs critical to protecting the health and well-being of all residents in a post-disaster environment. Transportation infrastructure failures and access interruption are the main hindrances to providing basic care at a level equal to that outside of floods.

Other storms involving high winds or heavy snow downed trees and power lines caused widespread power outages throughout the Village. **The water and wastewater plants were inaccessible as a result of road closures from storm damage after Hurricane Irene.** The significant vulnerability posed by these interruptions to critical public health and safety services underlies a number of the needs and opportunities the Committee identified.

- **Need** to ensure hospital and healthcare access during storms. During previous storms, access was very limited by the restricted roadway into (one way) and out of (one way) the Village
- **Opportunity** to expand existing “Neighbors for Neighbors” program. Currently operated by Jewish Family Services, there is an opportunity to access records on existing vulnerable or at-risk populations served during past floods and create a strategy for ensuring they don’t fall through the cracks
- **Need** to evaluate remaining damage to the Police facility from the storm through pursuit of FEMA funding or alternative resources. Through an oversight, repairs to the facility were not submitted for FEMA funding. The Village is currently working with FEMA to try to secure funding, but it is not guaranteed
- **Need** to provide additional outreach and education on key issues related to disaster preparedness, evacuations, sheltering in place, and stream maintenance



Housing

Increasing costs and reduced affordability are significant issues in the Village of Washingtonville and are exacerbated by rising home values and high local costs, including flood insurance.

RECOVERY SUPPORT FUNCTION: Housing

Local housing goals emphasize increasing affordable options outside the flood zone. Resiliency alternatives are directed toward the types and locations of housing assets with the greatest needs, the provision of sufficient housing alternatives for owners and renters, and the implementation of incentive programs for homeowners to undertake home elevations or other mitigation retrofits.

The effects of decreasing affordability hinder community development and resiliency by limiting the attraction of new families and first-time home buyers, stifling local spending and future economic growth. **In addition to affordability challenges, an estimated 204 Village residents live in the 1 %annual chance flood area (NFIP Special Flood Hazard Area).** This number greatly underestimates those residents affected by flooding from access and other service interruptions and neglects to account for instances where multiple structures are on a single parcel. The Village downtown is a known and identified flood hazard area, having flooded with up to 8 feet of water in some areas and resulting in damages or losses to approximately 80 homes.

Working from an intimate knowledge of these factors, the Committee identified housing-related needs and opportunities to further evaluate In the NYRCR Washingtonville Planning process:

- **Need** to protect existing housing stock from repetitive flooding
- **Opportunity** to explore the potential for flood proofing or elevation of flood-prone

properties to protect structures from future damage, with repetitive loss and severe repetitive loss property as a priority

- **Opportunity** to explore the potential for the acquisition of flood-prone properties and repurpose as public open space and additional recreational and water access
- **Opportunity** to do a storm damage housing assessment to identify homes with remaining damage and need
- **Need** to address affordability issues
- **Opportunity** to evaluate the potential damage and buyout homeowners paying property taxes for the last few years at pre-damage tax assessment

Infrastructure

Washingtonville has a history of incurring transportation and other infrastructure damages from severe storms, especially those leading to floods. Major corridors in the Village include State Route 208 and State Route 94 that provide primary access into and out of the Village and have experienced repetitive flooding.

RECOVERY SUPPORT FUNCTION: Infrastructure

Much of the critical infrastructure in the Village of Washingtonville was incapacitated during the flooding caused by Hurricane Irene and Tropical Storm Lee. Transportation interruptions, breakdowns in communication networks, storm water system overflows, and damages to emergency response equipment incurred during these storms highlight the need for investment in this area. Re-building infrastructure with increased resilience is critical for improving the Village’s capacity to respond to future disasters.

During Hurricane Irene, Moodna Creek and other small streams exceeded their banks and surged through the Village, cutting off main ingress and egress points to residential areas, completely



shutting down Route 94 near Goshen Avenue, and forcing emergency responders to make water rescues of residents, for whom all transportation access routes were inundated.

Residents and Committee members noted deficiencies in disaster-time communications systems, and insufficient capacity at the Village wastewater facility. A major source of community concern was the suspected uncoordinated release of dams upstream from the Village that caught unsuspecting homeowners off-guard, as already flooded areas suddenly were inundated with more water long after the rains ended. Other infrastructure-related needs and opportunities were identified.

- **Need** to address infrastructure deficiencies contributing to increased and repetitive flooding and damage including existing dams, bridges
- **Need** to explore the potential for a coordinated dam release along Moodna Creek
- **Opportunity** to explore transition to underground power lines in the Village downtown
- **Opportunity** to explore the installation of permeable pavers where feasible in the downtown area
- **Need** to relocate emergency and government facilities out of the floodplain
- **Need** to explore the potential for floodproofing of key government facilities including the wastewater treatment facility
- **Need** for backup power sources at key Village facilities including the Police station and Village Hall
- **Opportunity** to explore the potential for emergency notification improvements
- **Need** to ensure sufficient access into and out of the Village during storms

- **Need** to evaluate remaining flood damage to the municipal parking lot located at the former site of Village Hall. Due to an oversight, repairs to the facility were not submitted for FEMA funding. The Village is currently working with FEMA trying to secure funding, but it is not guaranteed.
- **Need** to address damages through pursuit of FEMA funding or alternative resources.
- **Need** to explore possibility of reducing stormwater inundation from runoff of adjacent hills and unregulated discharge into creeks.
- **Opportunity** to explore the potential for increasing capacity at the wastewater treatment plant to facilitate new development economic growth in the Village

Natural and Cultural Resources

The substantial flood risk in Washingtonville is primarily caused by the proximity of the Village to Moodna Creek and the waterway’s ongoing stream bank erosion. This proximity combined with the number of obstructions in the floodplain and their effect on sediment aggradation that results in

**RECOVERY SUPPORT FUNCTION:
Natural and Cultural Resources**

Natural infrastructure has been increasingly recognized and promoted among hazard and climate planners and managers as low impact and sustainable means to mitigate losses from natural hazards. In Washingtonville, Moodna Creek and its tributaries are at once the Village’s greatest asset and, at the same time one of the greatest threats to Village systems. While looking to protect the Village’s man-made assets, the Committee identified needs and opportunities to restore the Village’s natural systems to best withstand inundation from future storms.



reduced stream capacity in this reach, are primary causes of substantial flood risk.

The Moodna Creek is one of the Village’s greatest assets, providing recreational opportunities and opportunities to capitalize on the tourist draw of waterfront access, among other benefits.

The Committee identified a number of needs and opportunities relating to capitalizing on these opportunities and others to enhance the marketing of local historic resources and to make environmental and ecosystem protection improvements through flood reduction. These needs and opportunities are:

- **Need** to address stream conditions that cause repeat floods including gravel deposits, stream bank erosion, and remaining debris. Where appropriate, implement select debris removal, gravel harvesting, or alternative effort to address problematic areas
- **Need** to explore opportunities to improve local facilities including the Moffat Library
- **Need** to increase the natural strength of the stream banks to be more resilient against future floods
- **Need** to inventory and assess parks and cultural resources damaged by the flood
- **Need** to develop an inventory of historic and cultural sites
- **Need** to develop greater access to the water for recreation
- **Opportunity** to use buyout properties to create new access points
- **Opportunity** to investigate potential rail/trail project on abandoned line through the Village
- **Need** to study feasibility and regulatory issues concerning modification of the three

bridges to provide reduced obstruction to the waterway

- **Need** for additional walking, biking, and hiking trails
- **Need** to explore opportunities for the creation of stormwater storage and passive flood control along Moodna Creek
- **Need** to identify any illicit stormwater discharges and point source pollution into Moodna Creek

SECTION III
Reconstruction
and Resiliency
Strategies





Image shows a view of Washingtonville's Mays Field Pedestrian Bridge , and represents a "bridging" of the community vision, identified needs, and opportunities to build back better that are presented in this NYRCR plan. Photo courtesy of Tetra Tech.



Section III. RECONSTRUCTION AND RESILIENCY STRATEGIES

Through a combination of additional analysis, ongoing discussions, NY Rising Community Reconstruction (NYRCR) Washingtonville Committee (Committee) meetings, and public feedback, NYRCR Washingtonville identified a series of preliminary strategies to address the most critical needs related to community health, safety, resiliency, and quality of life.

The strategies reflect community values, issues, needs, and opportunities, and are the foundation for identifying and prioritizing projects and implementation strategies in Section IV of this Plan.

Many of the needs identified by the Committee and presented in Section II are included in the discussion that follows to help draw the connection between those needs and the related strategies. Some of those needs and opportunities appear explicitly in one or more strategies, either by being referenced in a strategy title, or called out in the description of that strategy. Others are presented as actions in the associated tables beneath each strategy description.

While most of the initially identified needs and opportunities are directly translated here into short- or long-term strategies and actions, others are not. The Committee decided to promote the

most immediate needs to serve the greatest community benefit.

The Committee developed these strategies with input from the public. A full description of Proposed Projects and Featured Projects is in Section IV: Implementation - Project Profiles. A full list of Proposed Projects, Featured Projects, and Additional Resiliency Recommendations is in Section V (Additional Materials).

Strategy 1: Reduce the impact of flooding on the built environment in the Village, including critical facilities, infrastructure, businesses and housing

Infrastructure challenges in the community as they relate to flooding and storm resiliency were

identified repeatedly in Committee meetings, public forums, and stakeholder surveys as the greatest threat to Washingtonville.

Needs addressed by this strategy may include transportation infrastructure upgrades, protection of assets incurring repetitive flood damage, and ensuring the continuity of critical government and emergency response capabilities.



Many roadways and bridges were damaged in Washingtonville in the wake of Hurricane Irene. Pictured above is a steel bridge west of Nicoll Street near the Mobile Home Park, which is currently fenced off. Photo is courtesy of Nova Consulting.



This strategy directs efforts and investment toward fulfilling several of the needs identified by the Committee:

- Address infrastructure deficiencies contributing to increased and repetitive flooding and damage including existing dams, bridges
- Relocate emergency and government facilities out of the floodplain
- Protect existing housing stock from repetitive flooding
- Address stream conditions that cause repeat floods including silt deposits, stream bank erosion, and remaining debris
- Increase the natural strength of the stream banks to be more resilient against future floods
- Explore opportunities for the creation of stormwater storage and passive flood control along Moodna Creek

In light of these needs, this strategy to reduce the impacts of flooding allows for investment in a range of resiliency projects.

Opportunities that arise from this strategy include pursuing additional hydraulic, stormwater, and bridge analysis, exploring the potential for a coordinated dam releases along Moodna Creek, and implementing select debris removal, gravel harvesting, or alternative efforts to address known problematic areas.



The photograph above shows Moodna Creek as it bends around May's Field, a site which was identified through hydraulic modeling as an effective site for capturing and storing flood waters to mitigate downstream impact. Photo is courtesy of Nova Consulting.

These and other projects would reduce flood impacts by reducing the Village's overall vulnerability to floods. The projects proposed in Table 14 were defined by the Committee to accomplish Strategy 1.



TABLE 14. STRATEGY 1

Strategy 1: Reduce the impact of flooding on the built environment in the Village, including critical facilities, infrastructure, businesses and housing					
Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/ Featured Project	Regional Project (Y/N)
May’s Field Relocation - Phase I: Little League Field Removal and Creation of Passive Flood Control (See description of Phase 2 at end of Strategy 6 narrative)	Remove existing fields, excess dirt, facilities, structures, and asphalt to restore the field as passive open space to provide flood control along Moodna Creek and additional flood storage. (Phase II of the project would relocate and reconstruct the Little League field to a new location out of the floodplain, securing a more resilient recreation facility for all users. Phase II is listed in Table 21. Master Project Table.)	Natural and Cultural Resources; Community Planning and Capacity Building	\$1,322,300	Proposed	N
Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements	Identify and analyze locations throughout the Village to implement stream management measures, reducing the extent and severity of flooding throughout the Village.	Natural and Cultural Resources; Community Planning and Capacity Building	\$500,000	Proposed	N
Improved Communications Systems	Implement a warning and emergency information system, for real-time information to be widely distributed to the general public in a variety of formats.	Infrastructure; Health and Social Services	\$10,000	Proposed	Y
Review and Update Village Codes and Ordinances	Review existing Village codes and ordinances to identify opportunities for updates that ensure future development in the Village does not exacerbate the flooding issues. Identify where changes are needed, and consider implementation strategies.	Natural and Cultural Resources; Community Planning and Capacity Building; Economic Development	\$50,000	Proposed	N



TABLE 14. STRATEGY 1

Strategy 1: Reduce the impact of flooding on the built environment in the Village, including critical facilities, infrastructure, businesses and housing					
Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Complete Additional Hydraulic, Stormwater, and Bridge Analysis	Build on the base investigations with comprehensive technical analysis to provide detailed recommendations to Village officials for further actions to effectively reduce the impact of flooding on the community.	Natural and Cultural Resources; Community Planning and Capacity Building	\$75,000	Proposed	Y
Village Combined Facility Building	Construct a combined facility in the Village to house multiple community functions including EMS, fire and police services. Relocates critical services out of the flood hazard area.	Infrastructure; Community Planning and Capacity Building; Health and Social Services	\$7,950,000	Featured	N
Automatic Level Sensing Devices	Install automatic level sensing devices on streams and lakes to provide for early warning of potential flooding in the Village.	Natural and Cultural Resources; Community Planning and Capacity Building	\$55,000	Featured	Y

Notes: Y/N Yes or no
 EMS Emergency medical services



Strategy 2: Ensure safe and reliable transportation, movement, and shelters during flood and disaster events

During Hurricane Irene and Tropical Storm Lee, access to health and social services was limited by the restricted roadway into (one way) and out of (one way) the Village. Sheltering capacity was significantly reduced, as most shelters were flooded or inaccessible during the flood.

This strategy is focused on providing health and social services, including emergency response and recovery, for residents of Washingtonville.

Providing reliable transportation and mobility during storms and floods relies on building a resilient transportation network and addressing individual route segments with a history of flood vulnerability. Ensuring sufficient sheltering capacity relies on operational capacity of a shelter in terms of the structure size and available supply of provisions. In addition, the shelter location should be out of the flood risk area and accessible from other parts of the Village.

To achieve this strategy, some projects will focus on reducing flooding to reduce transportation access interruption.

Others will look to adapt to anticipated flood levels by moving services out of the flood area, such as relocating the village

emergency shelters and Emergency Medical Service(s) (EMS).

In some cases, proposed actions will attempt to reduce flooding and improve existing infrastructure to accommodate anticipated flows.

For example, elevating and upgrading an aging bridge will ensure safe transportation access, provide increased floodplain capacity to reduce roadway overtopping, and potentially reduce surface water elevations of design floods.

Other opportunities which could be pursued under this strategy include coordinating with American Red Cross on training for shelter operations and addressing a range of infrastructure deficiencies which contribute to increased and repetitive flooding and damage.



Connectivity is key to emergency response and recovery, and was a major struggle for residents and emergency responders in Washingtonville during Hurricane Irene. Shown above is Clove Road Bridge, part of a severed transportation network during flood recovery in 2011. Photo is courtesy of Nova Consulting.

In total, this strategy addresses needs and opportunities across three recovery support functions, proposing investments in community planning and capacity building, health and social services, and infrastructure improvements. It capitalizes on opportunities to improve sheltering capabilities, health care access, and emergency response capabilities.

The preliminary project ideas proposed in Table 15 have been defined by the Committee to accomplish Strategy 2.



TABLE 15. STRATEGY 2

Strategy 2: Ensure safe and reliable transportation, movement, and shelters during flood and disaster events.

Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/ Featured Project	Regional Project (Y/N)
May’s Field Relocation - Phase I: Little League Field Removal and Creation of Passive Flood Control (See description of Phase 2 at end of Strategy 6 narrative)	Remove existing elements and restore the field as passive flood control along Moodna Creek. The project is anticipated to reduce flooding in the Village by creating additional flood storage and reducing surface water levels locally. HEC-RAS modelling shows risk reduction benefits for numerous assets, including the Village downtown and associated roadways, and the joint Town of Blooming Grove/Village of Washingtonville Chamber.	Natural and Cultural Resources; Community Planning and Capacity Building	\$1,322,300	Proposed	N
Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements	Identify and analyze locations throughout the Village to implement stream management measures, reducing the extent and severity of flooding throughout the Village. Future projects would look to reduce flooding on critical roadway segments, and further identify transportation system elements in need of improvement to reduce flood vulnerability.	Natural and Cultural Resources; Community Planning and Capacity Building	\$500,000	Proposed	N
Review and Update Village Codes and Ordinances	Review existing Village codes and ordinances to identify opportunities for updates that ensure future development in the Village does not exacerbate the flooding issues. Identify where changes are needed, and consider implementation strategies.	Natural and Cultural Resources; Community Planning and Capacity Building; Economic Development	\$50,000	Proposed	N



TABLE 15. STRATEGY 2

Strategy 2: Ensure safe and reliable transportation, movement, and shelters during flood and disaster events.

Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/ Featured Project	Regional Project (Y/N)
Complete Additional Hydraulic, Stormwater, and Bridge Analysis	Build on the base investigations with comprehensive technical analysis and provide detailed recommendations to Village officials for further actions that will effectively reduce the impact of flooding on the community. The analysis should include erosion issues along Route 208 in the Village, and an analysis of the numerous bridges and structures that represent present and potential future constrictions of flood water flow.	Natural and Cultural Resources; Community Planning and Capacity Building	\$75,000	Proposed	Y
Village Combined Facility Building	Construct a combined facility in the Village to house multiple community functions including EMS, fire and police services, and be an emergency shelter and communications center for the Village of Washingtonville and the Town of Blooming Grove. This project relocates sheltering functions out of the flood hazard area.	Infrastructure; Community Planning and Capacity Building; Health and Social Services	\$7,950,000	Featured	N

Notes: Y/N Yes or no
 EMS Emergency medical services



Strategy 3: Improve pre-disaster preparation to include emergency communication systems, evacuation routes, shelter access, sheltering-in-place procedures, and transportation access into and out of the Village.

Much as with Strategy 2, this strategy focuses on taking proactive measures to mitigate damages and losses from future storms. In this case, the Committee proposed specific actions that better prepare citizens and emergency response agencies to “weather the storm,” including providing adequate flood warning systems and conducting a wide-reaching education campaign to teach residents how to best prepare to shelter in place.

During previous storms, access for evacuation was limited by the flood-restricted roadways, and many residents reported being stranded or isolated during the Hurricane Irene and Tropical Storm Lee floods. Many residents also reported being caught off-guard by rushing flood waters on Moodna Creek and felt that less damage may have resulted if the impending hazard was announced by an advanced warning system.

While existing disaster communications are in place, they are vulnerable to power outages and other damages on the Village facilities where they are headquartered, including the Police Station and Village Hall.

Addressing the resilience of these facilities where critical disaster-time functions are housed will ensure reliable communications systems during future storms.

The provision of reliable mobility during storms and floods relies on building a resilient transportation network, and addressing individual route segments that have a history of flood vulnerability. Ensuring sufficient emergency communications relies on operational and structural capacity of the

operations center of command, and the location of that control center, which should be out of the flood risk area and accessible from other parts of the Village.



The old Village Hall, shown above, was the center for many critical Village functions, including emergency operations. The structure was destroyed during the floods from Hurricane Irene, and has since been demolished. Photo courtesy of Washingtonville Photo Gallery.

Improving residents’ capabilities to shelter in place and taking adequate measures for disaster preparedness in their homes, and their capability to respond immediately to the threat of imminent flood dangers, will be achieved through extensive education and outreach campaigns and an improved disaster warning system. These warnings and other forms of emergency information should be widely distributed in a variety of formats, to ensure that the greatest number of people receive and act on the messages.

The preliminary project ideas proposed in Table 16 have been defined by the Committee to accomplish Strategy 3.



TABLE 16. STRATEGY 3

Strategy 3: Improve pre-disaster preparation to include emergency communication systems, evacuation routes, shelter access, sheltering-in-place procedures, and transportation access into and out of the Village.

Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
May's Field Relocation - Phase I: Little League Field Removal and Creation of Passive Flood Control (See description of Phase II at end of Strategy 6 narrative)	Remove existing elements and restore the field as passive flood control along Moodna Creek. The project is anticipated to reduce flooding in the Village by creating additional flood storage and reducing surface water levels locally. HEC-RAS modeling shows that the project reduces the inundation extent and reduces the water surface elevation on Main Street and Route 208.	Natural and Cultural Resources; Community Planning and Capacity Building	\$1,322,300	Proposed	N
Moffat Library Improvements	Phase II of the Library improvement project focuses on resiliency to future storms, including improving emergency response and operations through the creation of an emergency information and communication center within the Moffat Library building.	Natural and Cultural Resources; Community Planning and Capacity Building	\$1,010,000 (Phase II)	Proposed	N
Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements	Identify and analyze locations throughout the Village to implement stream management measures, reducing the extent and severity of flooding on critical roadway segments, and further identify transportation system elements in need of improvement to reduce flood vulnerability.	Natural and Cultural Resources; Community Planning and Capacity Building	\$500,000	Proposed	N
Improved Communications Systems	The Village proposes to implement an emergency alert system to efficiently alert residents of disaster situations, provide critical safety and evacuation information, and increase the capacity of the Village to recover from an emergency event. Use of this system will follow and be in accordance with the Town of Blooming Grove's EAS Plan that is currently under development.	Community Planning and Capacity Building; Health and Social Services	\$10,000	Proposed	N



TABLE 16. STRATEGY 3

Strategy 3: Improve pre-disaster preparation to include emergency communication systems, evacuation routes, shelter access, sheltering-in-place procedures, and transportation access into and out of the Village.

Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Review and Update Village Codes and Ordinances	Review existing Village codes and ordinances to identify opportunities for updates that ensure future development in the Village does not exacerbate the flooding issues. Identify where changes are needed, and consider implementation strategies. Potential updates would include creating targeted density areas that would amend zoning restrictions to control future development in hazard vulnerable and access restricted areas.	Natural and Cultural Resources; Community Planning and Capacity Building; Economic Development	\$50,000	Proposed	N
Complete Additional Hydraulic, Stormwater, and Bridge Analysis	Complete comprehensive technical analysis with recommendations to Village officials to reduce the impact of flooding on the community. The analysis should include erosion issues along Route 208 in the Village and the numerous bridges and structures that constrict flood water flow.	Natural and Cultural Resources; Community Planning and Capacity Building	\$75,000	Proposed	Y
Village Combined Facility Building	Construct a combined facility in the Village to house multiple community functions including EMS, fire and police services, and to act as a communications center for the Village of Washingtonville and the Town of Blooming Grove.	Infrastructure; Community Planning and Capacity Building; Health and Social Services	\$7,950,000	Featured	N
Automatic Level Sensing Devices	Install automatic level sensing devices on streams and lakes to provide for early warning of potential flooding in the Village.	Natural and Cultural Resources; Community Planning and Capacity Building	\$55,000	Featured	Y

Notes: Y/N Yes or no
 HEC-RAS Hydrologic Engineering Centers River Analysis System
 EAS Emergency Alert System
 EMS Emergency medical services



Strategy 4: Maintain and enhance economic vitality through retention of the tax base and strategic actions to enhance business viability in the Village.

The floods associated with Hurricane Irene and Tropical Storm Lee in 2011 crippled the Village’s economy. Damages led to costly repairs for businesses and homeowners, and the losses incurred and the deficiencies in critical transportation networks function and emergency response capability painted a grim picture of the Village as a place to live, work, and play. By directing ideas and resources toward reversing this negative perception, this strategy encourages existing landowners to stay and encourages new investment and growth in the Village.

While this strategy is most central in responding to the economic development and recovery challenges identified in the community, it addresses both the need for additional local planning efforts to guide future growth and development, and the need to protect existing housing stock from repetitive flooding.

These needs are components of a greater need for an improved economic climate in the Village that may be accomplished by attracting and retaining more business in the downtown, more residents to add to the tax base, and by a combination of other actions focusing on making Washingtonville a better place to do business and to call home.

Efforts to incentivize business growth would have a discernible impact on the economic vitality of the Village and the viability of local businesses.

These projects may include evaluating and updating existing local zoning codes and ordinances; evaluating the potential use of expedited permitting, fee waivers, tax incentives, density



This view of Main Street at one of the primary crossroads of the Village’s downtown shows both Washingtonville’s colorful character and its potential for economic growth. Photo courtesy of Tetra Tech.

bonuses, and technical assistance; and the need for an improved local branding and marketing strategy.

The Village could expand the range of permitted arts-related uses in non-residential districts, including provisions for artist work-life spaces in conjunction with retail or other non-residential uses. Increasing capacity at the wastewater treatment plant would facilitate new economic growth in the Village through increasing the capacity for business and residential development.

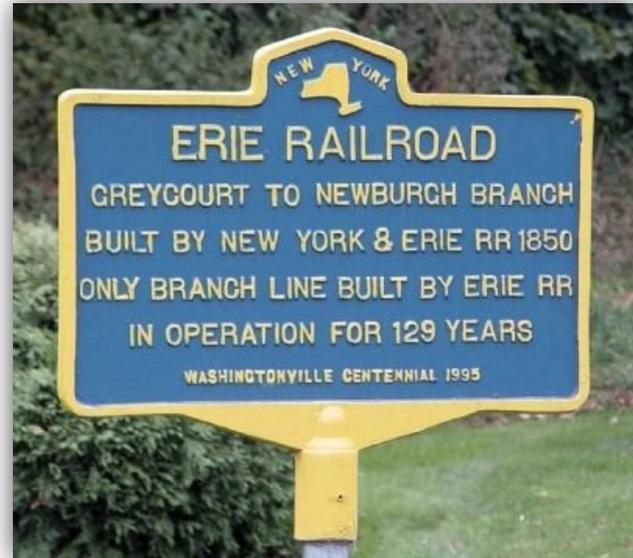
Focusing on the residential tax base, actions such as exploring opportunities to improve the Moffat Library; protecting existing housing stock from repetitive flooding; and addressing housing affordability issues would reap large benefits for the current and future residential population of the Village.



In another example, the provision of new recreational opportunities for families, such as developing more waterfront access sites for water-based recreation, would increase the likelihood that those families will shop and lodge locally rather than travel outside the Village for recreational and spinoff shopping.

Thoroughly reviewing and evaluating existing zoning codes, floodplain requirements, and ordinances will highlight issues where an existing code effectively prohibits the types of community and economic development goals identified in the NYRCR Washingtonville planning process. In conjunction with floodproofing investments, the Village could allow increased heights and densities in the downtown area (N-B District) and other commercial districts, as appropriate, to encourage commercial, multi-family, and mixed-use redevelopment. These codes could then be revised and updated to support the economic progress and growth needed in the Village.

The actions and preliminary project ideas proposed in Table 17 have been defined by the Committee to accomplish Strategy 4.



The Erie Railroad is one of many historic and cultural assets that the Village could use in creating an improved local branding and marketing strategy to reinforce sense of place, highlight local assets, and encourage economic development. Photo courtesy of Washingtonville Photo Gallery.



TABLE 17. STRATEGY 4

Strategy 4: Maintain and enhance economic vitality through retention of the tax base and strategic actions to enhance business viability in the Village.					
Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/ Featured Project	Regional Project (Y/N)
May’s Field Relocation - Phase I: Little League Field Removal and Creation of Passive Flood Control (See description of Phase II at end of Strategy 6 narrative)	Remove existing elements and restore the field as passive flood control along Moodna Creek. The project is anticipated to reduce flooding in the Village by creating additional flood storage and reducing surface water levels locally. HEC-RAS modeling shows that the project reduces the inundation extent and reduces the water surface elevation on Main St. and Rte. 208. (Phase II of the project would relocate and reconstruct the Little League field to a new location out of the floodplain, securing a more resilient recreation facility for all users. Phase II is listed in Table 21. Master Project Table.)	Natural and Cultural Resources; Community Planning and Capacity Building	\$1,322,300	Proposed	N
Moffat Library Improvements	Phase II of the Library improvement project focuses on resiliency to future storms, including improving emergency response and operations through the creation of an emergency information and communication center within the Moffat Library building.	Natural and Cultural Resources; Community Planning and Capacity Building	\$1,010,000 (Phase II)	Proposed	N
Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements	Identify and analyze locations throughout the Village to implement stream management measures, reducing the extent and severity of flooding on critical roadway segments, and further identify transportation system elements in need of improvement to reduce flood vulnerability.	Natural and Cultural Resources; Community Planning and Capacity Building	\$500,000	Proposed	N



TABLE 17. STRATEGY 4

Strategy 4: Maintain and enhance economic vitality through retention of the tax base and strategic actions to enhance business viability in the Village.					
Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/ Featured Project	Regional Project (Y/N)
Improved Communications Systems	The Village proposes to implement an emergency alert system to efficiently alert residents of disaster situations, provide critical safety and evacuation information, and increase the capacity of the Village to recover from an emergency event. Use of this system will follow and be in accordance with the Town of Blooming Grove’s EAS Plan that is currently under development.	Community Planning and Capacity Building; Health and Social Services	\$10,000	Proposed	N
Review and Update Village Codes and Ordinances	Review existing Village codes and ordinances to identify opportunities for updates that ensure future development in the Village does not exacerbate the flooding issues. Identify where changes are needed, and consider implementation strategies. Potential updates would include creating targeted density areas that would amend zoning restrictions to control future development in hazard vulnerable and access restricted areas.	Natural and Cultural Resources; Community Planning and Capacity Building; Economic Development	\$50,000	Proposed	N
Complete Additional Hydraulic, Stormwater, and Bridge Analysis	Build on the base investigations with comprehensive technical analysis and provide detailed recommendations to Village officials for further actions that will effectively reduce the impact of flooding on the community. The analysis should include erosion issues along Route 208 within the Village, and an analysis of the numerous bridges and structures that represent present and potential future constrictions of flood water flow.	Natural and Cultural Resources; Community Planning and Capacity Building	\$75,000	Proposed	Y



TABLE 17. STRATEGY 4

Strategy 4: Maintain and enhance economic vitality through retention of the tax base and strategic actions to enhance business viability in the Village.					
Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/ Featured Project	Regional Project (Y/N)
Village Combined Facility Building	Construct a combined facility in the Village to house multiple community functions including EMS, fire and police services, and to act as a communications center for the Village of Washingtonville and the Town of Blooming Grove.	Infrastructure; Community Planning and Capacity Building; Health and Social Services	\$7,950,000	Featured	N
Automatic Level Sensing Devices	Install automatic level sensing devices on streams and lakes to provide for early warning of potential flooding in the Village.	Natural and Cultural Resources; Community Planning and Capacity Building	\$55,000	Featured	Y
Improved Local Branding and Marketing	Create a coordinated local branding and marketing initiative to encourage economic development throughout the Village.	Economic Development; Community Planning and Capacity Building; Natural and Cultural Resources	\$50,000	Featured	N

Notes: Y/N Yes or no
 EMS Emergency medical services
 EAS Emergency Alert System



Strategy 5: Protect, preserve, and enhance natural, cultural, and historic resources and assets

The Village of Washingtonville’s sense of place and identity is defined by its natural, cultural, and historic resources.

Along with the critical infrastructure and transportation assets that are often the focus of disaster mitigation or preparedness efforts, these elements of the community fabric bind together all elements of truly resilient communities, as they often represent the very reasons why Washingtonville residents choose to call this Village home.

The Village’s natural, cultural, and historic assets are critical components of the Village’s recovery and future economic development goals, so their protection and enhancement are a priority in the NYRCR Washingtonville Planning effort.

The strategy addresses a range of needs and opportunities across two recovery functions, pointing equally to actions that address needs in the Natural and Cultural Resources and the Economic Development categories. Specifically, the community identified these needs in response to past floods that may be met by this strategy to fuel future resiliency:

- Improve flood-damaged local public facilities such as the Moffat Library
- Inventory and assess the condition of Village parks and other cultural and historic resources
- Develop greater access to the water for recreation
- Build additional walking, biking, and hiking trails

- Opportunity to investigate potential rail/trail project on abandoned line through the Village
- Identify any illicit stormwater discharges and point source pollution into Moodna Creek
- Opportunity to pursue additional hydraulic and stormwater analysis to inform and guide the implementation of future actions



This downstream view of Moodna Creek taken from the deck of the Locus Street Bridge highlights the natural beauty which characterizes the Village of Washingtonville. Photo courtesy of Nova Consulting.

The preservation of natural, cultural, and historic resources relies on accurately identifying and highlighting existing resources and, through doing so, recognizing where these assets should be enhanced to provide the greatest community benefit. One of the most valuable environmental resources in the Village is Moodna Creek, which is also the source of the hazard threat posed to many of the built cultural resources, such as historic buildings and important community gathering spaces.



To further illustrate this point, increasing public access to the waterfront was identified as a need by the Committee. Simultaneously, proposals were made to relocate the little league recreation fields and make repairs needed to reopen the Moffat Library, as both facilities were significantly damaged from flooding during Hurricane Irene and Tropical Storm Lee in 2011.

Accordingly, investments should be made in projects that respect a multitude of cultural and natural resources and that are mindful not to enhance one at the expense of another. To accomplish these ends, the Committee proposed the actions and preliminary project ideas in Table 18 all of which work toward satisfying Strategy 5.



The Moffat Library, shown here from the back of the building, is a mainstay of the Village’s cultural and historical identity, and remains closed due to damages incurred from Hurricane Irene. Photo courtesy of Tetra Tech.



TABLE 18. STRATEGY 5

Strategy 5: Protect, preserve, and enhance natural, cultural, and historic resources and assets.

Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
May's Field Relocation - Phase I: Little League Field Removal and Creation of Passive Flood Control (See description of Phase 2 at end of Strategy 6 narrative)	Remove existing fields, excess dirt, facilities, structures, and asphalt to restore the field as passive open space to provide flood control along Moodna Creek and additional flood storage. (Phase II of the project would relocate and reconstruct the Little League field to a new location out of the floodplain, securing a more resilient recreation facility for all users. Phase II is listed in Table 21. Master Project Table.)	Natural and Cultural Resources; Community Planning and Capacity Building	\$1,322,300	Proposed	N
Moffat Library Improvements	Phase I of the project includes improvements that markedly increase the facility's resiliency, address existing damage that the library incurred from Hurricane Irene and Tropical Storm Lee, and improve the facility's overall functionality.	Natural and Cultural Resources; Community Planning and Capacity Building	\$620,000 (Phase I)	Proposed	N
Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements	Identify and analyze locations throughout the Village to implement stream management measures, reducing the extent and severity of flooding throughout the Village. Potential to create new stormwater storage areas and to implement long-term gravel harvesting or bank stabilization programs would be analyzed, both of which would have an overall positive impact on the health of riverine ecosystems in Moodna Creek by reducing runoff and sloughing during storms.	Natural and Cultural Resources; Community Planning and Capacity Building	\$500,000	Proposed	N



TABLE 18. STRATEGY 5

Strategy 5: Protect, preserve, and enhance natural, cultural, and historic resources and assets.

Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Village Park (the site of the old Village Hall)	Create a waterfront park to include the old Village Hall parcel and two adjacent repetitive flood damaged parcels that the Village proposes to buy-out as part of the NYRCR program. The new park would create a public amenity out of reclaimed repetitively flood-damaged properties, including the historic site for the Village Hall and neighboring properties that were flooded and damaged during both Irene/Lee events. The park may be designed for passive and active recreation, linking the Village downtown with the banks of Moodna Creek.	Natural and Cultural Resources; Community Planning and Capacity Building; Economic Development	\$670,000	Proposed	N
Review and Update Village Codes and Ordinances	Review existing Village codes and ordinances to identify opportunities for updates that ensure future development in the Village does not exacerbate the flooding issues. Identify where changes are needed, and consider implementation strategies. Potential updates would include creating surface water management measures, modernizing wastewater regulations, and implementing enforcement programs for water resources regulations.	Natural and Cultural Resources; Community Planning and Capacity Building; Economic Development	\$50,000	Proposed	N
Complete Additional Hydraulic, Stormwater, and Bridge Analysis	Build on the base investigations with comprehensive technical analysis and provide detailed recommendations to Village officials for further actions that will effectively reduce the impact of flooding on the community. The analysis should include erosion issues and should also be a venue for the Village to pursue more detailed stormwater systems analysis to identify possible improvements.	Natural and Cultural Resources; Community Planning and Capacity Building	\$75,000	Proposed	Y



TABLE 18. STRATEGY 5

Strategy 5: Protect, preserve, and enhance natural, cultural, and historic resources and assets.

Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Improved Local Branding and Marketing	Create a coordinated local branding and marketing initiative to reinforce sense of place, and highlight local assets throughout the Village. This initiative should include a historic resources inventory, new public space programming, updated and uniform signs, mapping and wayfinding materials, and arts and culture installations.	Economic Development; Community Planning and Capacity Building; Natural and Cultural Resources	\$50,000	Featured	N

Notes: Y/N Yes or no
 N/A Not available



Strategy 6: Increase access to youth programs, activities, and recreation opportunities for local children and teens

The Village of Washingtonville recognizes that local youth are critical players in the effort to building back better, and therefore is putting the stability of those organizations, institutions, and programs that support them at the forefront. This strategy aims to capitalize on the resilience of local youth as the key to the Village’s strong economic future, and in doing so supports strengthening existing and creating new recreation opportunities and offering other youth-focused programs and activities.

This future also relies on protecting critical assets, infrastructure and environmental, for the enjoyment and use of future generations. The Village understands that creating opportunities for local youth will also draw in and retain other members of the family units for recreation, shopping, dining, investing, and engaging in the community.



This view of the Route 208 (South Street) Bridge as it crosses Moodna Creek in front of the Washingtonville Middle School (as seen in the background of the photograph) emphasizes the intimate relationship between flooding in the Village and opportunities for local youth. Photo is courtesy of NOVA Consulting.

Directing efforts and investment toward these opportunities could have a tremendous impact on the success of the Village of Washingtonville in increasing access to youth programs and



The May’s Field ball fields, shown here, have been flooded repetitively and incurred costly annual damages due to floods. Relocating the fields outside of the floodplain and restoring the site as passive flood storage would reduce costly damages and ensure the sustainability of Little League operations for future generations. Photo is courtesy of NOVA Consulting.

recreational opportunities and would aid in retaining the existing tax base and enhancing economic viability.

For instance, the need to develop and improve waterfront access could be addressed by the creation of new public space along Moodna Creek, which could be a boon to local economic development, a major asset for existing residents and a draw for visitors. The investigation of the potential for rail/trail projects through the Village may lead to a regional recreational draw.

The focus of this strategy is on improvements for the public good, and the resiliency of all Washingtonville residents, whether young or old, across all segments of the community.

Public parks, library improvements, and flood-resilient recreational facilities will undoubtedly serve low-income and otherwise marginalized members of the population. The relocation of May’s



Field, a heavily used recreational asset, out of the high-risk flood zone would benefit local and regional athletic teams including public programs; as would offering low-cost access to team play for local children whose families could not otherwise afford to pay participation fees.

Investment in these types of assets would serve the younger residents of Washingtonville and increase

the likelihood that families will shop and lodge locally rather than travel outside the Village for recreational and spinoff shopping. To accomplish these ends, the Committee proposed the actions and preliminary project ideas in Table 19, all of which work toward satisfying Strategy 6.



TABLE 19. STRATEGY 6

Strategy 6: Increase access to youth programs, activities, and recreation opportunities for local children and teens.

Project Name	Short Project Description	Recovery Support Function	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
May's Field Relocation - Phase I: Little League Field Removal and Creation of Passive Flood Control	Remove existing fields, excess dirt, facilities, structures, and asphalt to restore the field as passive open space to provide flood control along Moodna Creek and additional flood storage. (Phase II of the project would relocate and reconstruct the Little League field to a new location out of the floodplain, securing a more resilient recreation facility for all users. Phase II is listed in Table 21. Master Project Table.)	Natural and Cultural Resources; Community Planning and Capacity Building	\$1,322,300	Proposed	N
Moffat Library Improvements	Phase I of the project includes improvements that markedly increase the facility's resiliency, address existing damage that the library incurred from Hurricane Irene and Tropical Storm Lee, and improve the facility's overall functionality.	Natural and Cultural Resources; Community Planning and Capacity Building	\$620,000 (Phase I)	Proposed	N
Village Park (the site of the old Village Hall)	Create a waterfront park to include the old Village Hall parcel and two adjacent repetitive flood damaged parcels. The park may be designed for passive and active recreation, linking the Village downtown with the banks of Moodna Creek.	Natural and Cultural Resources; Community Planning and Capacity Building; Economic Development	\$670,000	Proposed	N

Notes: Y/N Yes or no
 N/A Not available



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SECTION IV
Implementation
-Project Profiles





Photo courtesy of Tetra Tech



Section IV. IMPLEMENTATION – PROJECT PROFILES

PROPOSED PROJECTS

Through the NYRCR Washingtonville Planning process and as a result of a thorough review of the impacts of Hurricane Irene, the effects of Tropical Storm Lee and the ensuing needs and opportunities, the Village has developed the following projects in support of its recovery strategies. These proposed and featured projects address the needs of the community and are consistent with the strategies indicated in the plan.

May's Field Relocation - Phase I: Little League Field Removal and Creation of Passive Flood Control

Project Description

Background: May's Field is located on the southeast bank of Moodna Creek, just east of the Route 208 crossing. The site is regularly flooded and has experienced damages during extreme weather events in recent years, most notably during Hurricane Irene and Tropical Storm Lee in 2011. May's Field is owned by the Town of Blooming Grove and is used by the Washingtonville Little League. The 10.2-acre field is located at 3 Depot Street in Washingtonville. Because of its location on the floodplain and floodway of Moodna Creek, the field is repetitively flooded, necessitating frequent field restoration resulting from material loss during flooding. This field is an important asset to the

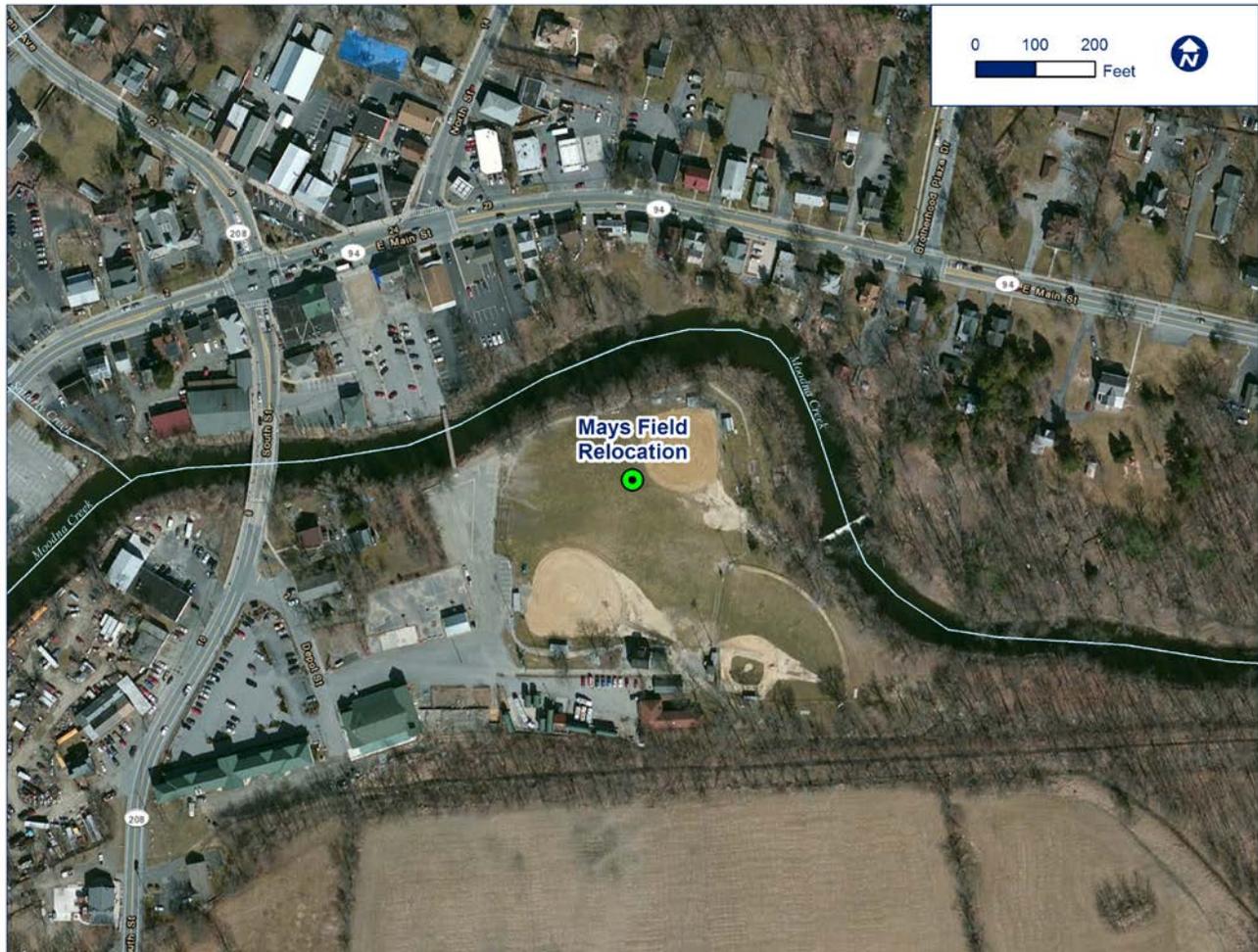
youth of the Village of Washingtonville as well as that of the surrounding areas, including the Town of Blooming Grove and the Village of South Blooming Grove. While it serves all youths, a particular focus has been placed the low-income youth population: the Little League is pro-active in seeking out members of that group to participate in the league at no cost. The location of the field, adjacent to the creek, provides a clear opportunity to provide increased flood storage and passive flood control to alleviate flooding in the vicinity and is shown in Figure 16.



May's field in March 2014. Photo is courtesy of Tetra Tech.



FIGURE 16. MAYS FIELD PROJECT LOCATION



Source: HEC-RAS 2014

Connection to the disaster: Flood water during Hurricane Irene and Tropical Storm Lee contributed to the damage and loss of functionality of the existing field. Specifically, the disaster caused erosion and loss of field materials, and the field was rendered useless for youth recreational activity. The site, in its current condition, does not provide any significant passive flood control to protect the adjacent structures or infrastructure.

Solution: This two phase project focuses on reducing flood impacts on recreational programming and facilities within the Village by

relocating May’s Field ballpark to a suitable location in the Village or Town of Blooming Grove, and restoring the land at the site of the existing fields as a natural floodway, which will have the added benefit of reducing flood impacts to neighboring properties.

Phase I of the project includes Village acquisition of May’s Field from the Town of Blooming Grove, removal of the impervious surfaces onsite, restoring the field as passive open space, providing flood control and additional flood storage, and reconnecting the creek to its natural floodplain. It is



the hope of the Committee that the Town will consider this project an opportunity to relocate the ball fields and recreational features to a new site outside the floodplain. Phase II would relocate the May’s Field recreational features to a new site outside the floodplain.

“Floodproofing measures are either passive or active depending on whether they require human intervention. Passive measures do not require human intervention and are recommended whenever possible. Active, or emergency, measures require human intervention and are effective only if there is enough warning time to mobilize the labor and equipment necessary to implement them and safely evacuate.¹⁵”

In order for the Village to implement the flood-mitigation improvements offered by this proposed project, it must purchase the May’s Field property from the Town of Blooming Grove, and then proceed with construction activities. Preferably, the Town will have located a suitable site for relocation of the ball fields, and would be able to act quickly on constructing the new ball fields to avoid a lengthy impact on Little League operations and program scheduling. As Phase II would fall under the jurisdiction of the Town of Blooming Grove, it is included in this plan as an Additional Resiliency Recommendation rather than a Proposed or Featured project.

Both phases of this project have numerous safety and resiliency benefits for the Village of Washingtonville, the Town of Blooming Grove, and the Washingtonville Little League. As such, one recommended solution would be for the three parties (the Village, the Town, and the Washingtonville Little League Board of Directors) to enter into a formal written agreement by which the relocation and reconstruction of the ball fields is

guaranteed to occur in close coordination with demolition at the existing site. It would be understood that the NYRCR funds used to purchase



The May’s Field property, including the ball fields and parking lot shown above, was identified through hydraulic modeling as an effective site for capturing and storing flood waters to mitigate downstream impact. Photo is courtesy Tetra Tech, 2014.

the existing property would be held in good faith by the Town for the purchase and/or construction of new ball fields.

Phase I of the project consists of several key elements including the acquisition and deed restriction of May's Field property, and the removal of existing fields, the removal of excess dirt, facilities, structures, and asphalt. Deed restriction will comply with FEMA buyout property deed restriction standards and limit the use of the property to passive recreation uses. The installation of additional specific flood mitigation measures will be determined by the results of future hydraulic analysis.

Project Cost Estimate

The first phase of the project includes the acquisition of the property. According to the 2013 Orange County Tax Office’s market value estimates,



the 10.20-acre property has an assessed 2013 value of \$78,400 (\$53,400-land) a market value of \$408,300. The estimated total project cost, including property acquisition, civil engineering, demolition and removal of impervious surfaces, and construction of natural flood storage for Phase I is \$1,322,300.

Project Benefits or Co-Benefits

This flood mitigation project provides multiple benefits to the community including risk and damage reduction, economic, and social benefits. The development of additional storage and passive open space will enhance recreational opportunities for citizens while also helping to mitigate flooding. The benefits include less frequent roadway flooding and washouts during storm events and increased mobility for residents, emergency response staff, and other essential personnel during storm events and other emergencies. The project will benefit all residents of Washingtonville, especially those who live in the immediate area of the project. The results will include safer access to homes, businesses, and other essential facilities (hospitals, doctor offices, etc.). In addition, reconstructing the fields at a new location outside of the floodplain during Phase II of the project will serve children from the Village and the neighboring Town of Blooming Grove participating in Little League.

Flood Protection and Safety: A hydraulic analysis conducted for the section of Moodna Creek running through the Village concluded that the removal of the field in addition to further excavation at the site would positively result in flood reduction of neighboring structures and facilities, as well as those further upstream. Providing new area for flood storage and increasing flood capacity will help alleviate damages to roadways and infrastructure in the Village. The project will allow residents to have more reliable access to Middletown, Newburgh, and Cornwall where a majority of health care and

social services are located, including the regional hospitals and the Orange Regional Medical Center. The project allows residents and emergency services to more easily access these facilities during storm events.

Environmental: There are several environmental benefits associated with this project. Namely, this project will increase the capacity of the creek to move potential flood waters, mimicking natural conditions that may have been present before the site was filled for use as an upland recreation site. In addition, the additional flood water storage capacity provided by this project will help to improve water quality by minimizing the impact of potentially hazardous floodwaters on the environment. The project will also improve the in-stream habitat of the Moodna Creek by removing man-made fill and restoring natural vegetation.

Economic Benefits: The project area is located on the banks of the Moodna Creek and is the subject of frequent flooding, which results in damage to the playing fields, rendering them useless for their intended function and necessitating costly post-storm repairs. Little League Board Members reported that monies are expended annually, sometimes many times per season, to repair the fields, creating an additional fiscal burden on the community during periods of flood and storm recovery. Removing the fields from the floodplain will control this cycle of costly flood damage repair and maintenance. Furthermore, by providing flood storage this project will reduce flood impacts to homes and businesses in downtown Washingtonville, benefitting the community as a whole. Finally, this project will create jobs and encourage economic growth spurred by construction through the purchase and use of associated supplies and services. Finally, improvements building a more resilient village will create greater confidence for attracting new



businesses and relocating existing businesses to Washingtonville. As the Village prioritizes and implements infrastructure projects addressing flood safety and accessibility issues, these investments will encourage individuals and private businesses to continue to invest in Washingtonville. By creating safer more reliable access to the downtown, this project will benefit Main Street business growth and will bolster the Village’s continued role as regional commercial and cultural hub.

Public Support: Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding within the Village. The public has been supportive of the project’s streambank management/repair, stream maintenance/cleaning, and stormwater/surface water control.

The Committee anticipates some public concern over the timing of the two phased project, insofar as the opening of a new ball fields occurs after the existing May’s Field is closed for recreational use. The Committee recommends that the stakeholders (the Village, the Town, and the Washingtonville Little League Board of Directors) work outside of this project to acquire and build new fields prior to Phase I so that there is no disruption in activities. Further, there may be potential for the Town to later seek reimbursement for the actions taken to acquire and rebuild new fields before the old fields are demolished and transformed to flood storage.

Additional Benefits

In addition to the benefits described above, this project also stands to positively impact land use in the Village. The creation of passive open space and storage retention will benefit neighboring properties and uses by providing reduced risk to

transportation which helps protect assets and potentially increases property values.

Project Cost-Benefit Analysis

Improvements to core environmental infrastructure benefit overall community resilience towards future storms, ensuring the protection of the Village’s assets and the safety of its residents.

Based on available information and preliminary designs, the proposed project would have a net benefit on community safety and health, as well as mobility, safety, and other community needs. The reduction in flood water on a critical thorough fare, repair of damaged infrastructure, and increased protection for adjacent properties collectively position the Village to benefit considerably from this project.

Summary:

- Total Investment: **\$1,322,300**
- Flood level reduction: **Up to 0.52 feet**
- Jobs created: **2¹⁶**
- Assets protected: **3**

Anticipated Reduction of Risk Associated with the Project

Overall, the project addresses short-, medium-, and long-term risks of all homes and businesses in the Village, including but not limited to adjacent property owners and the local Little League.



The improvements will provide additional storage, reduce the vulnerability of the Village upstream by lowering the surface water elevation, and reduce overall exposure to flood waters. The project reduces the extent of inundation and reduces the water surface elevation on Main Street and Route 208.

The project will reduce flood risk to the Village-identified assets listed below:

- Downtown
- Washingtonville Pharmacy
- Moodna Creek
- VFW Post 8691
- May's Field
- Blooming Grove/Washingtonville Chamber
- Blooming Grove Ambulance
- Police Station
- Historic houses

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses and completing construction is expected to happen over the course of 12 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

There is a potential need for Construction SPDES GP authorization if upland disturbance is greater than 1 acre. The improvements will need to meet the local zoning standards and building code standards.

Jurisdiction

The Town of Blooming Grove and the Village of Washingtonville.



Moffat Library - Phase I

Project Description

Background: Moffat Library has been a cultural center in the Washingtonville community since 1887. It is located northwest of the Moodna Creek at the intersection of Route 94 and Route 208. This two-phase project focuses on implementing upgrades and improvements to the Village public library, located at 6 West Main Street, in downtown Washingtonville.

Connection to the disaster: The historic building was severely damaged by flood waters from Hurricane Irene. All library activities were shut down as the contents of the building were evacuated and relocated to a temporary off-site location. The doors of the historic Moffat Library remain closed to the public at the time of this Plan’s publication.

Solution: Phase I of the project includes improvements that markedly increase the facility’s resiliency, address existing damage that the library incurred from Hurricane Irene and Tropical Storm Lee, and improve the facility’s overall functionality. Improvements captured in Phase I include water sealing the basement and stone foundation to minimize water infiltration, repair or replacement of the roof, and installing a backup generator. These improvements increase resiliency, address existing damage, and improve the Library’s overall functionality in the face of future storms.

Project Cost Estimate

The estimated cost for Phase I of this project is \$620,000.

Project Benefits or Co-Benefits

This project will provide multiple benefits to the community including risk and damage reduction, economic, and social benefits. The project will benefit all residents of Washingtonville, especially



Moffat Library. Photo is courtesy of Tetra Tech.

those who live near or in the immediate area of the project. The results will include serving the socially vulnerable populations, including children of the Village and those in the neighboring town of Blooming Grove.

Population Protection: The improvements to the library will allow the library to act as an Emergency Operations Center (EOC) and a shelter for the residents of the Village during severe events. The project enhances an emergency facility while allowing for healthy and safe environment for those in need of shelter.

Flood and Cultural Asset Protection: This project will help ensure that a culturally important historic structure is more resilient against future storm and flooding events. This project will help to reduce any future maintenance or repair costs associated with flood or storm damages. The project will also protect the existing historic Moffat Library while also enhancing the cultural value of library programming within the Village.

Economic Benefits: This project will create jobs and encourage economic growth spurred by construction through the purchase and use of associated supplies and services. Additionally, improvements building a more resilient village will



create greater confidence for attracting new and relocating existing businesses to Washingtonville. Building a more resilient village through improvements to the library and other community facilities will create greater confidence for private investors in Washingtonville. As the Village prioritizes and implements projects addressing the resiliency of public assets, these investments will encourage individuals and private businesses to continue to invest in Washingtonville. By creating a more flood-resilient downtown, this project will benefit main street business growth and will bolster the Village’s continued role as regional commercial and cultural hub.

Public Support: Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding in the Village. The public has been supportive of access to the post-disaster resources project type, which is associated with this project.

Additional Benefits

The renovation to the library will add cultural value and protect an important cultural and historic resource. This will add to and invigorate the cultural opportunities for citizens while also helping to mitigate flooding.

FIGURE 17. MOFFAT LIBRARY LOCATION OVERVIEW





Project Cost-Benefit Analysis

Based on available information and preliminary designs, the proposed project would have a net benefit on community safety, health, economy and environment.

- Investment: **\$620,000**
- Flood level reduction: **N/A**
- Jobs created: **0.8**
- Assets protected: **1**

Anticipated Reduction of Risk Associated with the Project

Overall, the improvements proposed to Moffat Library would increase the resiliency of this key social and cultural asset, contributing to cultural resource, social services, and economic strategies outlined in this plan. While improvements would benefit all residents, they could be particularly helpful for vulnerable populations who otherwise lack adequate access to internet services, emergency response and recovery resources, and other public resources made available by the public library. Accordingly, these library improvements would increase the capacity of the Village to recover from future storm events.

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses, and completing construction of the first phase of the project is expected to happen over the course of 12 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

The improvements will need to meet the local zoning standards and building code standards. There is a potential need for Construction SPDES GP

authorization if upland disturbance is greater than one (1) acre.

Jurisdiction

The Moffat Library Board has jurisdiction over the building and facility operations, while the Village has jurisdiction over abutting sidewalks, streets and other infrastructure.



Moffat Library - Phase II

Project Description

Background: Moffat Library has been a cultural center in the Washingtonville community since 1887. It is located northwest of the Moodna Creek at the intersection of Route 94 and Route 208. This two-phased project focuses on implementing upgrades and improvements to the Village public library, located at 6 West Main Street, in downtown Washingtonville.

Connection to the disaster: The historic building was severely damaged by flood waters from Hurricane Irene. All library activities were shut down as the contents of the building were evacuated and relocated to a temporary off-site location. The doors of the historic Moffat Library remain closed to the public at the time of this Plan’s publication.

Solution: Phase II focuses on resiliency to future storm events, including improving emergency response and operations, as well as adding new social and cultural improvements in and around the library facility. Specific improvements would include:

- Creation of an emergency information and communication center
- Demolition of adjacent structure owned by the library for future use as a parking lot and addition to the facility
- Installation of geothermal heating/cooling system
- Creation of greenspace, sidewalks and landscaping around the facility.

The repaired Moffat Library will provide a central, dedicated location to house a repository of governmental, scientific and academic data on the flooding of the Washingtonville and the Moodna creek, including municipal plans for public reference. Ideally, this material will be housed



Moffat Library. Photo is courtesy of Tetra Tech.

within the larger Washingtonville/Blooming Grove Historical collection. Also, with the expanded capacity provided by the new parking lot and later an expanded collection and program space, the library will seek to expand their supplemental programs to include lectures and other public events that address past and present flood issues and solutions, both within the Village and in surrounding areas.

Project Cost Estimate

The estimated cost for Phase II of this project is \$1,010,000.

Project Benefits or Co-Benefits

This project will provide multiple benefits to the community including risk and damage reduction, economic, and social benefits. The project will benefit all residents of Washingtonville, including socially vulnerable populations and children living in the Village and in the neighboring town of Blooming Grove.

Population Protection: The improvements to the library will improve the library’s functionality as an Emergency Operations Center (EOC) and a shelter for the residents of the Village during severe events.



Flood and Cultural Asset Protection: This project will enhance the cultural value of library programming within the Village.

Environmental: The project will result in an increase in pedestrian-friendly greenspace, sidewalks, and landscaping around the facility. Environmental quality within the building will be increased as health and safety improvements made to the building are completed.

Economic Benefits: This project will create jobs and encourage economic growth spurred by construction through the purchase and use of associated supplies and services. As the Village prioritizes and implements projects addressing the resiliency and sustainability of public assets, these investments will encourage individuals and private businesses to continue to invest in Washingtonville.

Public Support: Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding in the Village. The public has been supportive of access to the post-disaster resources project type, which is associated with this project.

Additional Benefits

The renovation to the library will add cultural value and protect an important cultural and historic resource. This will add and invigorate the cultural opportunities for citizens while also helping to mitigate flooding.

Project Cost-Benefit Analysis

Based on available information and preliminary designs, the proposed project would have a net benefit on community safety, health, economy and environment.

- Investment: **\$1,010,000**
- Flood level reduction: **N/A**

- Jobs created: **1**
- Assets protected: **1**

Anticipated Reduction of Risk Associated with the Project

Overall, the improvements proposed to Moffat Library would increase the resiliency of this key social and cultural asset, contributing to cultural resource, social services, and economic strategies outlined in this plan. While improvements would benefit all residents, they could be particularly helpful for vulnerable populations who otherwise lack adequate access to internet services, emergency response and recovery resources, and other public resources made available by the public library. Accordingly, these library improvements would increase the capacity of the Village to recover from future storm events.

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses and completing construction of this phase of the project is expected to happen over the course of 12 to 16 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

The improvements will need to meet the local zoning standards and building code standards. There is a potential need for Construction SPDES GP authorization if upland disturbance is greater than one (1) acre.

Jurisdiction

The Moffat Library Board has jurisdiction over the building and facility operations, while the Village has jurisdiction over abutting sidewalks, streets and other infrastructure.



Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements

Project Description

Background: Washingtonville is highly prone to flooding events throughout the Village. Unidentified stormwater outflows present environmental concerns and surface water runoff adds to already burdened floodways during heavy rain events.



Culvert on south bank of the Route 208 (South Street) Bridge Moodna Creek. Photo is courtesy of Tetra Tech.

Connection to the disaster: During Hurricane Irene and Tropical Storm Lee, the torrential rains caused extreme flooding throughout the Village.

Solution: This project proposes to identify and analyze appropriate locations throughout the Village of Washingtonville to implement stream management measures, recognizing that the project depends on participation by local landowners. Management measures such as creating new stormwater storage areas and long-term gravel harvesting and bank stabilization

programs to reduce the extent and severity of flooding throughout the Village would be analyzed in a feasibility study. The feasibility study would provide a list of projects that synergistically address the extent of and reduce the impact of flooding in the Village.

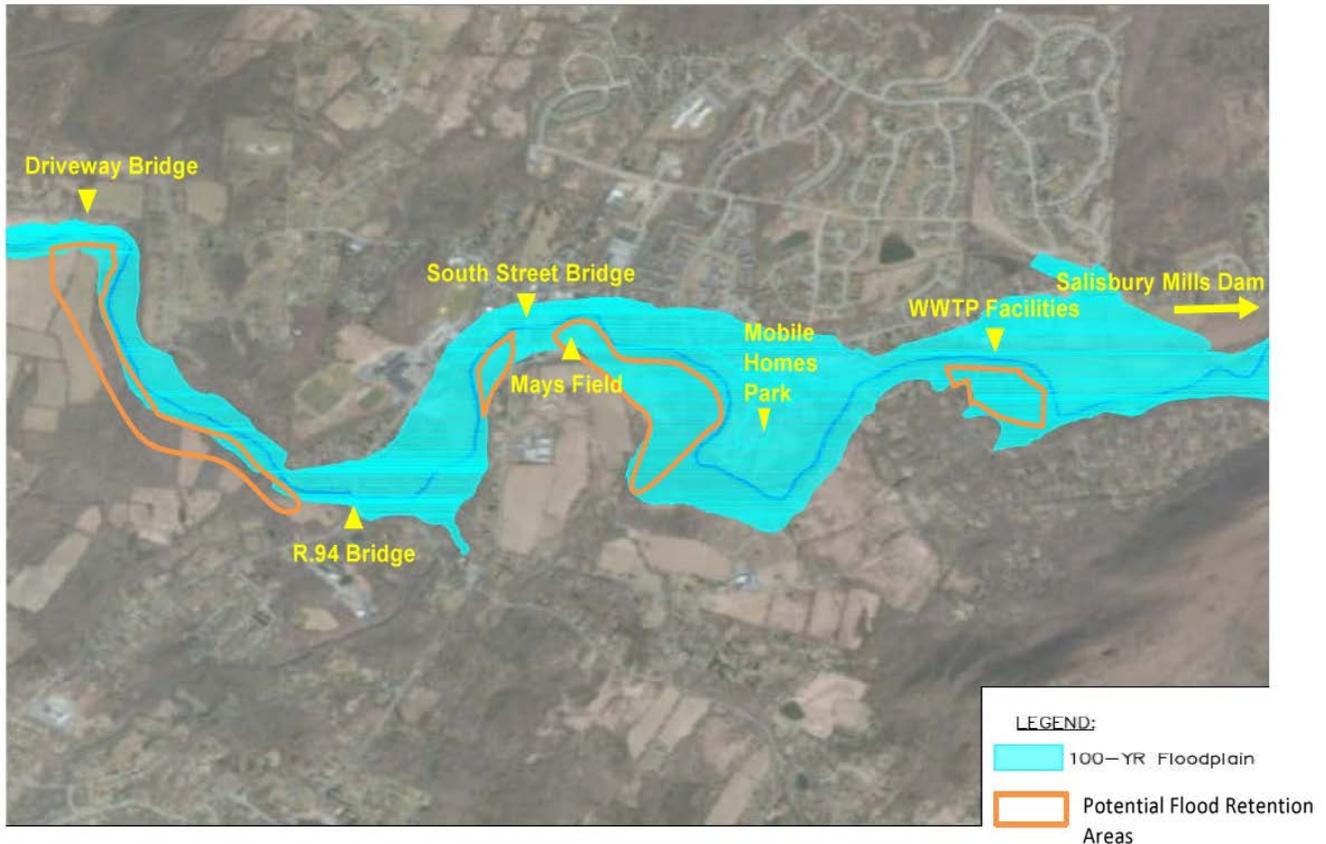
Options for consideration may include reconnecting the floodplain with the creek, stream management measures such as scheduled coordinated gravel harvesting, and stream bank stabilization. Other projects may propose the reuse or reclamation of land within the floodplain to create new flood water storage basins.



Moodna Creek. Photo is courtesy of Tetra Tech.

These projects should consider aligning with other property acquisition-based projects on this list, including the May’s Field Relocation project and redevelopment of a Village Park. Some of the conceptual locations for storage based on the HEC-RAS analysis are shown in Figure 18.

FIGURE 18. POTENTIAL STORAGE AREAS ALONG MOODNA CREEK



Source: HEC-RAS 2014

Project Cost Estimate

The project involves a feasibility study and in-depth hydraulic modeling and analysis for both upstream and downstream storage areas along the Moodna Creek including of both reservoirs and dams. The estimated project cost for the study is \$500,000.

Project Benefits or Co-Benefits

This flood mitigation project provides multiple benefits to the community including risk and damage reduction, economic, and social benefits. The project will benefit all residents of Washingtonville, especially those who live near or in the immediate area of the project. The results will include safer access to homes, businesses, and other essential facilities (hospitals and doctor offices), but in addition will serve the socially

vulnerable populations including children of the Village and those in the neighboring town of Blooming Grove.

Flood Protection and Safety: Flood storage and capacity increasing projects in the Village will work to help alleviate damages to roadways and infrastructure in the Village. This project will allow residents to have more reliable access to Middletown, Newburgh, and Cornwall. A majority of health care and social services are located within these municipalities, including the Orange Regional Medical Center. The benefits include less frequent roadway flooding and washouts during storm events, and increased mobility for residents, emergency response staff, and other essential



personnel during storm events and other emergencies.

Environmental: Several environmental benefits are associated with this project. Namely, the results of this study could recommend actions that would increase the capacity of the Creek to move potential flood waters. In addition, the increased flood water storage capacity provided by the potential findings and subsequent projects may help to improve water quality and maintain the natural characteristics in Moodna Creek by minimizing the impact of potentially hazardous floodwaters on the environment.

Economic Benefits: This project is a study, so the number of new jobs generated would be low. However, implementation of the study and plan has the potential to create both construction and new jobs. Additionally, improvements building a more resilient village will create greater confidence for attracting new and relocating existing businesses to Washingtonville. As the Village prioritizes actions, improvements will create greater confidence for private investors in Washingtonville. As the Village prioritizes and implements projects addressing the resiliency of public assets, these investments will encourage individuals and private businesses to continue to invest in Washingtonville. By creating a more flood-resilient downtown, this project will benefit main street business growth and will bolster the Village’s continued role as regional commercial and cultural hub.

Development of the passive open space and flood storage improvements will have a positive economic effect on future recovery and repair spending. As a result of this project, the area will become more resilient against future storms and will reduce inundation for surrounding properties and transportation infrastructure, which in turn will help to reduce any future maintenance or repair

costs associated with flood damage. The project will also enhance the recreational value within the Village while protecting the existing commercial infrastructure. While this project will lay an important foundation for future economic opportunity in the Village, there are limited direct economic benefits anticipated (permanent jobs, direct additional spending, and direct additional taxes).

Public Support: Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding within the Village. The public has been supportive of the project’s streambank management/repair, stream maintenance/cleaning, and stormwater/surface water control).

Additional Benefits

In addition to the benefits described above, this project also stands to potentially positively affect land use in the Village. The creation of passive open space and storage retention will positively affect neighboring properties and uses by providing reduced risk to transportation, which helps protect assets and potentially increases property values.

Project Cost-Benefit Analysis

Improvements to core environmental infrastructure benefit overall community resilience towards future storms, ensuring the protection of the Village’s assets and the safety of its residents.

Based on available information and preliminary designs, the proposed project would have a net benefit on community safety and health, as well as mobility, safety and other community needs.



The reduction in flood water on a critical thoroughfare, repair of damaged infrastructure, and increased protection for adjacent properties collectively position the Village to benefit considerably from this project.

- Total Investment: **\$500,000**
- Flood level reduction: **TBD**
- Jobs created: **.5**
- Assets protected: **3**

Anticipated Reduction of Risk Associated with the Project

Based on the findings, this project has the potential to reduce the extent and severity of flooding throughout the Village. The reduction of stormwater runoff also reduces the risk of releasing upland contaminants into the creek. The development of additional storage and passive open space will enhance recreational opportunities for citizens while also helping to mitigate flooding. The reduction in risk was analyzed using the assumptions and factors described in the Risk Reduction Analysis.

The following risk reduction benefits and other benefit types are expected:

- Reduce extent and severity of flooding throughout the Village
- Reduce stormwater runoff, which also reduces the risk of letting upland contaminants into riverine environments
- Reduce risk of transportation failure along creek-side roadway segments
- Improve accessibility for emergency services and personnel during hazardous flooding events

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses and completing construction is expected to happen over the course of 12 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

An Article 15 Permit is required where protected. The stream class of the Moodna Creek varies from protected to non-protected. Potential Construction SPDES GP authorization required if more than 1 acre of upland disturbance.

Jurisdiction

Jurisdiction is not applicable for the nature of this study-focused project.



Improved Communication Systems

Project Description

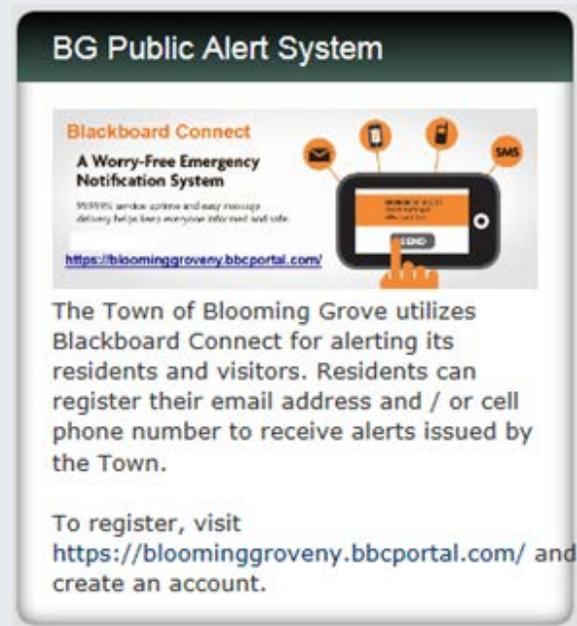
Background: Providing warning and other information to the public is vital to ensure a community’s resilience to disasters. Studies have shown the need for messages to be received several times in a wide array of formats (e.g., telephone, text message, and Emergency Alert System [EAS] broadcast) before individuals will consider the messages reliable and take action. Likewise, upon hearing a warning message, individuals will check with their family, neighbors, and friends to confirm that they also received the message and determine if the message is reliable. It is therefore vital for warnings and other emergency information to be widely distributed in a variety of formats, to ensure that the greatest number of people receives and acts on the message.

Connection to the disasters: This project responds to a widespread concern over a lack of reliable communication identified in the aftermath of Hurricane Irene and Tropical Storm Lee. Many residents reported having received little or no warning of rapidly rising flood waters and also expressed concern over a lack of defined information centers where affected residents could direct questions and concerns related to weathering the storm and reconvening from the disaster.

Solution: This project is to utilize the Town of Blooming Grove’s Blackboard Connect emergency notification system in the Village of Washingtonville. Using Blackboard Connect will allow the village to reach its goals of:

- Efficiently alerting residents to disasters
- Providing critical safety and evacuation information, and
- Increasing the capacity of the Village to recover from an emergency event.

Use of this system will follow and be in accordance with the Town of Blooming Grove’s EAS Plan, which is currently under development. The improved communication system will efficiently alert residents of disaster situations, provide critical safety and evacuation information, and increase the capacity of the Village to recover from an emergency event. The Village would work in coordination with Orange County Emergency Management Agency and Town of Blooming Grove to capitalize on improvements made by the Town and County, and leverage those improvements by installing necessary technology in Village facilities to connect with the Town and regional Emergency Alert Systems, improving communications before, during, and after an emergency event.



Project Cost Estimate

There is no cost to the Village for use of the Blackboard Connect system. However, a public outreach campaign may be necessary to build public confidence in the system and convince individuals to sign up to receive the alerts.



This campaign is estimated as a one-time cost of \$10,000. Village anticipates annual outreach on a smaller scale to maintain public awareness of the system. This is estimated at \$1,200 per year.

Project Benefits or Co-Benefits

Flood Protection and Safety: This project will help ensure that citizens are efficiently alerted of a disaster, while also providing critical safety and evacuation information, and increasing the capacity of the Village to recover from an emergency event.

Environmental: Although no environmental assets were identified as being completely secured, several environmental benefits are associated with this project. The project will result in the creation of more secure community emergency response and information network could lead to better response time to emergencies affecting environmental assets or infrastructure that may alter environmentally sensitive areas.

Economic Benefits: As this project takes advantage of working within an existing system, no construction or installation will be needed. Instituting an effective emergency communications system will create greater confidence for private investors in Washingtonville. As the Village prioritizes and implements projects that address emergency response and safety issues, these investments illustrate a commitment to the future and will encourage individuals and private businesses to continue to invest in Washingtonville. By creating safer more disaster-ready downtown, this project will benefit main street business growth and will bolster the Village’s continued role as regional commercial and cultural hub.

While this project will reduce risk to economic assets in the community, there are limited direct economic benefits anticipated (permanent jobs, direct additional spending, direct additional taxes).

Public Support: Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated risk reduction and resource coordination within the Village.

Additional Benefits: This project will provide system that is critical for future of emergency communications in the Village. This project will enhance communication between emergency and essential personnel will be improved for day-to-day events and emergencies.

The project will benefit all residents of Washingtonville, especially those who live or in the immediate area of the project. The results will include safer and more reliable emergency response to homes, businesses, and other essential facilities (hospitals and doctor offices) during severe storm events. The results will include serving the socially vulnerable populations including children of the Village and those in the neighboring town of Blooming Grove.

Project Cost-Benefit Analysis

Based on available information and preliminary designs, the proposed project would have a net benefit on community safety, health, economy and environment.

- Investment: **\$10,000**
- Flood level reduction: **N/A**
- Jobs created: **0**
- Assets protected: **TBD**

Anticipated Reduction of Risk Associated with the Project

The reduction in risk was analyzed using the assumptions and factors described above. The following risk reduction benefits and other benefit types are expected:



- Increased efficiency and safety during hazard events
- Increased preparedness of residents and businesses in multiple jurisdictions
- Improved functionality of warnings, alerts, and communications during flood events
- Improved coordination with regional initiatives

Implementation Timeframe

A projected timeframe for the project is that setup of the system for the Village’s use will take

approximately 1 month. Focused public outreach will be conducted for the first year, with ongoing follow up being conducted for 50 years.

Local, State, and Federal Government Regulatory Requirements Related to the Project

N/A

Jurisdiction

The Village of Washingtonville



Village Park (The Site of the Old Village Hall)

Project Description

Background: There is a history of flooding events affecting properties along the western bank of Moodna Creek adjacent to West Main Street. One of those properties is where the Village Hall used to reside at 29 West Main Street. The site is currently being used as auxiliary parking for the schools across the street. Adjacent to that site are three residential properties that have also experienced repetitive flood damage, and that are currently participating in a FEMA buyout program to transfer ownership to the Village of Washingtonville. These three sites – two directly adjacent to the old Village Hall site and one in very close proximity – collectively represent a significant area of waterfront property that, once returned to natural conditions, will be less vulnerable to future floods.

Solution: Create a waterfront park at the site of the old Village Hall to include the old Village Hall parcel as well as two adjacent parcels subject to repetitive flood damage that are currently participating in the FEMA buyout program. The new park would create a public amenity out of reclaimed repetitively flood-damaged properties, including the historic site for the Village Hall and neighboring properties that were flooded and damaged during both Irene and Lee events. The park may be designed for passive and active recreation, linking the Village downtown with the banks of Moodna Creek. The park design will highlight natural features, waterfront, and Main Street connections, and be showcased as an effective use of reclaimed property within the floodplain.



Old Village Hall. Photo is courtesy of Washingtonville Photo Gallery



Condition of existing site at the location of the old Village Hall. Photo is courtesy of Tetra Tech.

Connection to the disaster: The Village Hall site was severely damaged by Hurricane Irene and the remnants of Tropical Storm Lee between August 26 and September 5, 2011, resulting in the demolition of the Village Hall.

The Committee intends to engage university or graduate students studying landscape architecture and urban design to help the community explore the park’s potential layout and program. The Committee will continue to explore the potential of hosting a design contest with local universities and colleges for the new public space. The project location is shown in Figure 19 below.



FIGURE 19. VILLAGE PARK SITE



Source: OCGIS

Project Cost Estimate

The estimated project cost, which includes civil engineering/landscape design, demolition of the FEMA buyout, repetitively damaged structures, and construction of new park amenities, is \$670,000. The maintenance of the waterfront park will be the responsibility of the Village. It is estimated the annual maintenance cost will be \$13,000.

Project Benefits or Co-Benefits

This flood mitigation project provides multiple benefits to the community, including risk and damage reduction, economic, and social benefits. The project will benefit all residents of

Washingtonville, especially those who live or in the immediate area of the project. The results will include safer access to homes, businesses, and other essential facilities (hospitals and doctor offices), but in addition will serve the socially vulnerable populations including children of the Village and those in the neighboring town of Blooming Grove. The development of additional storage and passive open space will enhance recreational opportunities for citizens while also helping to mitigate flooding.

Flood Protection and Safety: Flood storage and capacity increasing projects in the Village will work to help alleviate damages to roadways and



infrastructure in the Village. This project will allow residents to have more reliable access to Middletown, Newburgh, and Cornwall. A majority of health care and social services are located within these municipalities, including the regional hospitals and the Orange Regional Medical Center. The benefits include less frequent roadway flooding and washouts during storm events, and increased mobility for residents, emergency response staff, and other essential personnel during storm events and other emergencies. It will also facilitate removal of two additional structures out of the floodway and flood plain.

Environmental: Although no environmental assets were identified as being completely secured, several environmental benefits are associated with this project. The project will result in the following environmental benefits: increase in conveyance capacity and reduction of upstream water surface elevations, creation of additional storage capacity along the creek and lower water surface elevations, lower water flows that will remain in the Moodna Creek and help maintain natural characteristics, and improved water quality.

Economic Benefits: Development of the passive open space and flood storage improvements will have a positive economic effect on future recovery and repair spending. As a result of this project, the area will become more resilient against future storms and will reduce inundation for surrounding properties and transportation infrastructure, which in turn will help to reduce any future maintenance or repair costs associated with flood damage. The project will also protect the existing commercial infrastructure while also enhancing the recreational value within the Village. While this project will certainly create economic opportunity, limited direct economic benefits are anticipated (permanent jobs, direct additional spending, and direct additional taxes).

Public Support: Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding within the Village. The public has been supportive of the project’s streambank management/repair (stream maintenance and cleaning), and stormwater and surface water control.

Additional Benefits: In addition to the benefits described above, this project also stands to benefit land use in the Village. The creation of passive open space and storage retention will benefit neighboring properties and uses by providing reduced risk to transportation which helps protect assets and potentially increases property values.

Project Cost-Benefit Analysis

Based on available information and preliminary designs, the proposed project would have a net benefit on community safety, health, economy and environment.

- Investment: **\$670,000**
- Flood level reduction: **TBD**
- Jobs created: **0.9**
- Assets protected: **TBD**

Anticipated Reduction of Risk Associated with the Project

The reduction in risk was analyzed using the assumptions and factors described above. The following risk reduction benefits and other benefit types are expected:

- Removal of critical assets from floodway
- Clearance and remediation activities on repetitive flood damaged properties
- Improvement to public facilities benefitting all residents and visitors
- Investment in public spaces encouraging local business growth



- Potential to create new public amenities to retain and attract residents
- Encouragement of pedestrian activity on and through Main Street

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses and completing construction is expected to happen over the course of 12 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

There is a potential need for Construction SPDES GP authorization if upland disturbance is greater than 1 acre. The improvements will need to meet the local zoning standards and building code standards.

Jurisdiction

The Village of Washingtonville owns the former Village Hall site, and will have jurisdiction over the FEMA buyout properties once the acquisition process is complete. The Village also has jurisdiction over any infrastructure abutting the new park location.



Review and Update Village Codes and Ordinances

Project Description

Background: The Washingtonville Committee has identified a need to review existing Village codes and ordinances to respond to the flooding issues that have become evidently clear based on the impacts of Hurricane Irene and the remnants of Tropical Storm Lee. It is clear that any future development in the Village should not exacerbate the flooding issues and should work toward facilitating resiliency within the Village.

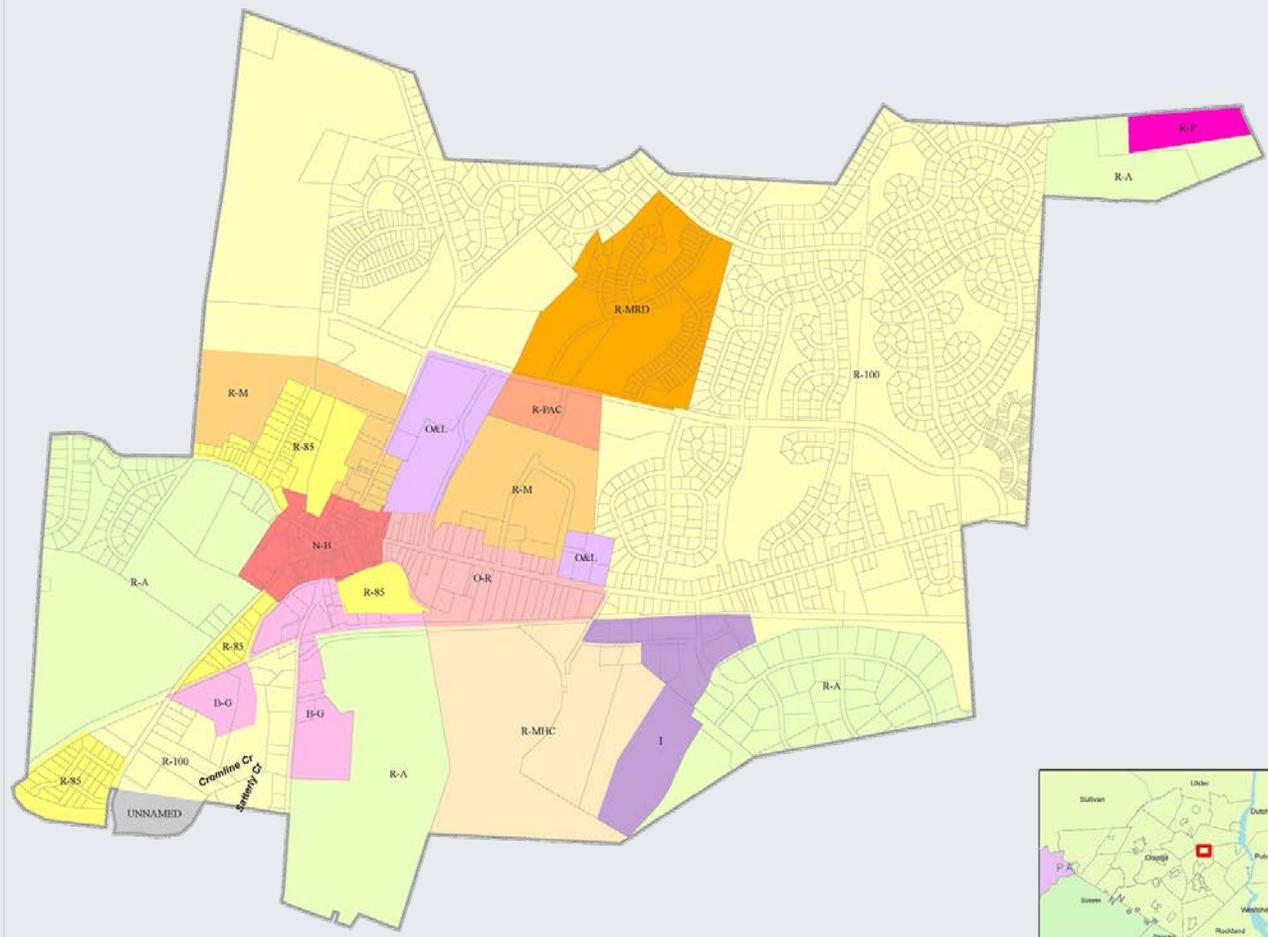
Connection to the disaster: The Village was severely damaged by Hurricane Irene and the

remnants of Hurricane Lee between August 26 and September 5, 2011. It is clear that the future development of the Village must account for areas prone to flooding and work toward planning for mitigation and other flood reducing uses and projects.

Solution: This project would include a planning component to identify where changes are needed and a feasibility study to consider implementation strategies. Potential updates include:

- Review site plan review procedures to streamline the process for desired forms of business investment
- Create targeted density areas

FIGURE 20. CURRENT VILLAGE OF WASHINGTONVILLE ZONING MAP, 2014





- Provide incentives for affordable/workforce/senior housing outside of flood hazard areas, including increasing allowable heights and densities in key locations
- Encourage and allow river-dependent commercial recreational uses in the Village's commercial districts
- Modify development standards and procedures to encourage the use of low-impact development and sustainable design techniques that enhance stormwater management on individual sites
- Provide incentives (including density bonuses) for using residential cluster provisions, particularly in cases where high-value resources are protected or other desirable design provisions are incorporated to manage stormwater runoff and groundwater recharge, such as low-impact development techniques
- Review and strengthen wastewater regulations
- Develop design standards for the Neighborhood Business (N-B) and Business General (B-G) Districts to maintain small-town character, walkability, and architectural integrity of the Village, and review current sign ordinance
- Zoning restrictions to control and mitigate future development in hazard areas, and/or create flood and overlay zoning districts
- Create a Village Comprehensive Plan



Photo is courtesy of Tetra Tech.

Project Cost Estimate

The estimated project cost, which includes a review of the Village's codes and ordinances by legal counsel, certified planners and engineers, is \$50,000. Although a project useful life does not apply, it is assumed there will be a 5-year implementation period and may require various levels of training for municipal employees and consultants.

Project Benefits or Co-Benefits

The development of a comprehensive plan and ordinances can result in numerous positive benefits to the community from a safety, environment, and economic stand point. The project will benefit all residents of Washingtonville.

Flood Protection and Safety: The plan could result increased safety by facilitating removal of flood prone structures from the flood plain and floodway and discouraging new

development in hazard prone areas. Other benefits include less frequent roadway flooding and washouts during storm events and increased mobility to residents, emergency response staff, and other essential personnel during storm events and other emergencies.

Environmental Benefits: The plan and implementation of ordinances could result in the creation of environmental benefits such as creating flood and overlay zoning districts to protect the floodplain and other environmentally sensitive areas, including surface water protection for the enhancement of water quality; increasing wastewater regulations that affect water quality; and zoning restrictions to control and mitigate



future development in hazard areas to protect and restrict flood-prone areas.

Economic Benefits: As the focus of the project is to review and update existing codes and ordinances, the economic benefits will likely be realized in the future. Updated zoning codes may incentivize commercial and retail development, create new high-density residential districts, or attract new investment and development in other ways. In many cases, revised codes will lead directly to job creation, increased tax base, and new spending in the community. To whatever end, the Village will explore the realm of opportunities for enhancing municipal codes to best suit the economic, social, and environmental goals of the community.

In addition to the potential to provide development incentives, revised codes and ordinances should also focus on building a more resilient village in the face of natural disasters. Active hazard mitigation and emergency management will also create greater confidence for private investors in Washingtonville. The Village may create a master plan which prioritizes infrastructure projects that address flood safety and accessibility issues, in which case it will be illustrating a commitment to the future of Washingtonville’s most critical assets and systems. By planning for reliable access to the downtown, completion of a comprehensive plan can benefit business growth and bolster the Village’s role as regional commercial and cultural hub.

Finally, the plan could enact ordinances that result in the protection of environmental assets, flood prone areas, and historic and cultural resources. Ensuring these assets are more resilient against future storms, when coupled with an overall reduction in inundation by prioritizing flood mitigation projects and smart land use practices,

will help to reduce any future maintenance or repair costs associated with flood damage.

Public Support: Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding within the Village. The public has been supportive of code enforcement and creation (17% of respondents support) project types.

Additional Benefits

The plan can facilitate development that benefits all residents of Washingtonville, especially those who live or in the immediate area of the project. The results will include safe access to their homes, businesses, and other essential facilities (hospitals and doctor offices) during severe storm events.

Project Cost-Benefit Analysis

Based on available information the proposed project would have a net benefit on community safety, health, economy, and environment.

- Investment: **\$50,000**
- Flood level reduction: **N/A**
- Jobs created: **0**
- Assets protected: **TBD**

Anticipated Reduction of Risk Associated with the Project

The reduction in risk was analyzed using the assumptions and factors described above. As this project is a planning exercise, the exact results and ultimate recommended actions are unknown at this time.



However, given the information and data analyzed to date, the following risk reduction benefits and other benefit types could be realized:

- Removes critical assets from floodway
- Reduces vulnerability by burying future overhead power lines
- Decreases stormwater runoff, protecting riverine ecosystems, and limiting contributing flood waters
- Encourages new development in non-hazard areas, reducing Village-wide vulnerability
- Streamlines investment into disaster-resilient infrastructure
- Addresses short-, medium-, and long-term risks
- Encourages local business growth
- Retains or grows current tax base

- Potential to create new amenities to retain and attract residents
- Potential to create new jobs to retain and attract residents

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses and completing construction is expected to happen over the course of 19 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

N/A

Jurisdiction

The Village of Washingtonville



Complete Additional Hydraulic, Stormwater, and Bridge Analysis

Project Description

Background: The Committee proposes continued and additional analysis to build on the base investigations completed as part of the NYRCR Washingtonville Planning Process. The current level of investigation has been effective in painting a broad picture of the needs, vulnerabilities, and opportunities for improvement in the Village. Still, a significantly more comprehensive technical analysis is required to provide detailed recommendations to Village officials for further actions, both in terms of short-term implementable projects, and long-term measures that will effectively reduce the impact of flooding on the community.

Connection to the disaster: During Hurricanes Irene and Tropical Storm Lee, the torrential rains led to stream bank overflows, debris buildup, and caused extreme flooding throughout the Village.

Solution: The Committee recommends a comprehensive hydraulic analysis of Moodna Creek that extends to relevant tributaries outside of the Village and Town boundaries, where necessary. The analysis should include erosion issues along Route 208 within the Village, as well as an analysis of the numerous bridges and structures that represent present and potential future constrictions of flood water flow. This analysis would also be a venue for the Village to pursue more detailed analysis of Village stormwater systems for possible improvements.

Project Cost Estimate

The project involves a hydraulic modeling and analysis of Moodna Creek. The estimated project cost for the study is \$75,000.

Project Benefits or Co-Benefits

This project provides multiple benefits to the community including risk and damage reduction, economic, and social benefits. The project will benefit all residents of Washingtonville.

Flood Protection and Safety: Anticipated results and recommended actions from this project are expected to address both short and long-term risks faced by Washingtonville regarding Moodna Creek flooding. Increasing resident safety and removing critical assets from the floodway are outcomes being sought out from the study.



An example of structural flood protection on the north bank of Moodna Creek at the foot of Clove Road Bridge. Photo courtesy of Nova Consulting.

The development of infrastructure improvements will work towards mitigating flooding. The benefits include less frequent roadway flooding and washouts during storm events, and increase the mobility to residents, emergency response staff, and other essential personnel during storm events and other emergencies.

Economic Driver: Development of the passive open space and flood storage improvements will have a positive economic effect on future recovery and repair spending. The area will become more resilient against future storms and will reduce



inundation for surrounding properties and transportation infrastructure which in turn will help to reduce any future maintenance or repair costs associated with flood damage. The project will also protect the existing commercial infrastructure while also enhancing the recreational value within the Village.

Environmental: The project could result in the creation of the following environmental benefits: increase in conveyance capacity and reduction of upstream water surface elevations, remove critical assets from floodway, decrease stormwater runoff, protecting riverine ecosystems and limiting contributing flood waters, lower water flows will remain in the Moodna Creek and help maintain natural characteristics, and improved water quality.

Public Support: Implementation of the plan will result in construction projects that will benefit all residents of Washingtonville, especially those who live or in the immediate area of the project. The results will include safer access to homes, businesses, and other essential facilities (hospitals and doctor offices) during severe storm events. Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding within the Village.

Project Cost-Benefit Analysis

Based on available information the proposed project would have a net benefit on community safety, health, economy and environment.

- Investment: **\$75,000**
- Flood level reduction: **TBD**
- Jobs created: **TBD**
- Assets protected: **TBD**

Anticipated Reduction of Risk Associated with the Project

The reduction in risk was analyzed using the assumptions and factors described above. As this project calls for a technical analysis of a defined problem, the exact results and ultimate recommended actions are unknown at this time. However, given the information and data analyzed to date, the following risk reduction benefits and other benefit types could be realized:

- Removes critical assets from floodway
- Decreases stormwater runoff, protecting riverine ecosystems, and limiting contributing flood waters
- Streamlines investment into disaster-resilient infrastructure
- Addresses short-, medium-, and long-term risks
- Increases resident safety and reduces risk to village assets and properties through analysis of additional opportunities for improved mitigation and resiliency.

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses and completing construction is expected to happen over the course of 7 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

N/A

Jurisdiction

Jurisdiction is not applicable for the nature of this study-focused project.



FEATURED PROJECTS

Village Combined Facility Building

Project Description

Background: The project would construct a combined facility in the Village of Washingtonville building to house justice courts, municipal offices, Department of Public Works (DPW), EMS, fire services, and police services and to act as an emergency shelter and communications center for the Village of Washingtonville and the Town of Blooming Grove.

Connection to the disaster: Village Hall, DPW, Fire Headquarters, the sewage treatment plant, and several other facilities were all severely impacted by flooding during Hurricane Irene and the remnants of Tropical Storm Lee between August 26 and September 5, 2011, resulting in the demolition of the Village Hall and damage to the other facilities. This project would have a goal of alleviating the impacts of flooding events to Village services and facilities.

Solution: The project intends to co-locate multiple community functions within a new public facility, capitalizing on the efficiencies realized by having cooperating Village departments and crews operating from the same location and out of the flood hazard area. While a location in the Village Center would be preferable, the Committee will identify the best potential location for development.

Project Cost Estimate

The estimated project cost, which involves land acquisition, architecture and engineering, and construction of buildings and infrastructure, is \$7,950,000. Please note the project cost estimate does not include administrative costs.

Project Benefits or Co-Benefits

Flood Protection and Safety: The construction of a consolidated Village Hall will allow the building to act as the main EOC and shelter for the residents of the village during severe events. The project allows for the enhancement of an emergency facility while allowing for healthy and safe environment for those in need of shelter. Results seen will include safer access to and protection of homes, businesses, and other essential facilities (hospitals and doctor offices) during severe storm events.



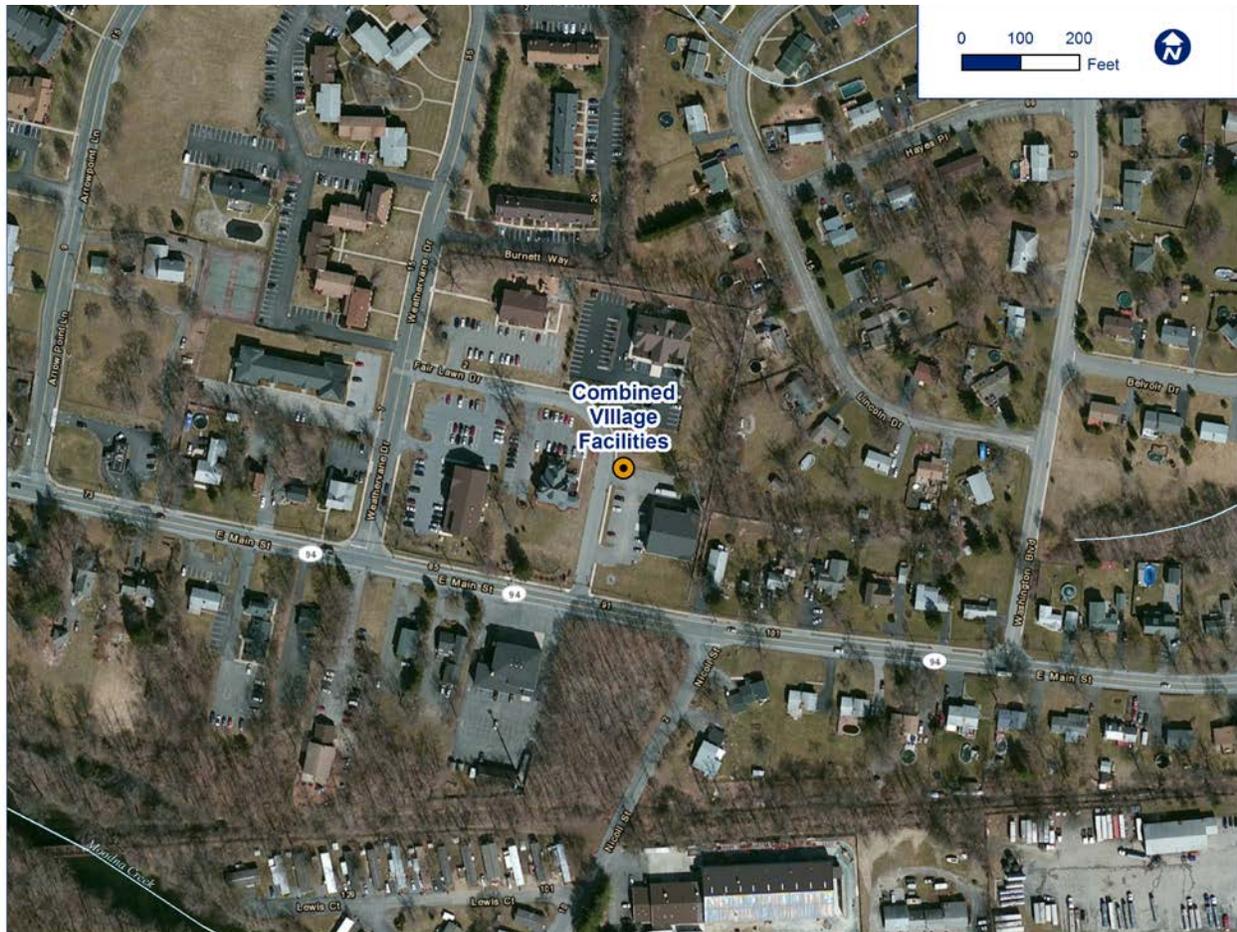
Flooded Sign at Local Retail Center. Photo is courtesy of NYRCR Washingtonville Committee.

Economic Driver: In addition to economic growth spurred by construction, improvements aimed at building a more resilient village will also create greater confidence for private investors in Washingtonville.

By creating a safer, more inviting downtown, this project will benefit main street business growth and will bolster the Village’s continued role as regional commercial and cultural hub. The area will become more resilient against future storms and will reduce inundation for surrounding properties and transportation infrastructure which in turn will help to reduce any future maintenance or repair costs associated with flood damage.



FIGURE 21. VILLAGE COMBINED FACILITY OVERVIEW



The project will also protect the existing historic buildings while also enhancing the cultural value within the Village.

Environmental: The project will result in the following environmental benefits: better environmental quality within the buildings that result from health and safety improvements associated with the project, and increased conveyance capacity and reduction of upstream water surface elevations because existing facilities would be removed from the floodplain.

Public Support: Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown

support for all projects that will positively affect the issues associated with flooding within the Village. The public has been supportive of access to post-disaster resources and relocation and elevation, project types, which are associated with the project.

Project Cost-Benefit Analysis

Based on available information, the proposed project would have a net benefit on community safety, health, economy, and environment.

- Investment: **\$7,950,000**
- Flood level reduction: **N/A**
- Jobs created: **9.9**
- Assets protected: **TBD**



Anticipated Reduction of Risk Associated with the Project

The reduction in risk was analyzed using the assumptions and factors described above. The following risk reduction benefits and other benefit types are expected:

- Removes critical assets from floodway
- Increases resiliency of key assets and critical emergency resources
- Increases emergency service capability
- Increases capacity for essential equipment and vehicles
- Increases efficiency and safety during hazard events
- Enhances regional functionality among neighboring municipalities

Implementation Timeframe

The multiple phases of this project, including design, permitting, contracting, and construction, are expected to take approximately 1 year.

Local, State, and Federal Government Regulatory Requirements Related to the Project

The improvements will need to meet the local zoning standards and building code standards. There is a potential need for Construction SPDES GP authorization if upland disturbance is greater than one (1) acre.

Jurisdiction

The Village will have jurisdiction over the any acquired property and the building and facility operations, as well as abutting sidewalks, streets and other infrastructure.



Automatic Level Sensing Devices

Project Description

Background: Automatic level sensing devices would be installed on streams and lakes to provide for early warning of potential flooding in the Village in coordination with the Orange County Emergency Management Agency. The project includes identifying and analyzing appropriate locations for installation of water level sensor devices within the Village and the feasibility of constructing and maintaining the devices over time.

Connection to the disaster: During Hurricane Irene and Tropical Storm Lee, the torrential rains caused extreme flooding throughout the Village. Many residents were caught off guard when, long after rains had stopped, and unexpected surge of



Example Automatic Level Sensing Device. Photo courtesy of the University of Iowa Water Sustainability Initiative, watersustainability.uiowa.edu

and maintenance of the devices be closely coordinated with similar regional and state-wide initiatives helping to notify residents and business owners of impending floods.¹⁷

Project Cost Estimate

The estimated project cost, which includes permitting, installation, and implementation of equipment, is \$55,000. It is anticipated that the Village will need to conduct regular inspections, replace equipment and parts and calibrate the system proposed. Please note the project cost estimate does not include administrative costs.

Project Benefits or Co-Benefits

Flood Protection and Safety: The enhancement of the flood emergency information and data within the Village will benefit both health care and social services. It will assist with access and quality of health care in the Village and surrounding communities.



Sensing devices may be placed closely downstream of known high flow locations, such as the Beaverdam Lake Spillway, shown above. Photo courtesy of NOVA Consulting.

floodwaters from the Moodna Creek left parts of the Village under up to 8 feet of water.

Solution: Once appropriate locations have been identified, the Committee proposes to construct the devices, including housings and casings for sensors, at appropriate locations. The Committee recommends that the ongoing use, data collection,



The U.S. Geological Survey water-stage recorder and crest-stage gage shown above sends real-time water level information to an online database, and is an example of the type which may be used in the Village. Courtesy of National Water Information System: Web Interface.

This project will provide system that is critical for future of emergency hazard notification and communication of information in the Village. This project will enhance communication between emergency and essential personnel will be improved for day-to-day events and emergencies.

Economic Driver: In addition to economic growth spurred by construction, improvements aimed at building a more resilient village will also create greater confidence for private investors in Washingtonville. As the Village prioritizes and implements projects that address lingering flood safety issues, these investments illustrate a commitment to the future and will encourage individuals and private businesses to continue to

invest in Washingtonville. By creating a safer, more inviting downtown, this project will benefit main street business growth and will bolster the Village’s continued role as regional commercial and cultural hub. Finally, by providing safer, more reliable transportation and accessibility, individual property values are likely to grow over the long term.

Environmental: Since this project is for the development of a system of sensors, no assets were identified as being completely secured. However, environmental benefits are associated with this project. The project will result in the enhancement of the quality of environmental data and facilitate planning for the various stages of the Moodna Creek.

Public Support: The project will benefit all residents of Washingtonville, especially those who live or in the immediate area of the project. The results will include safer and more reliable emergency response to homes, businesses, and other essential facilities (hospitals and doctors’ offices) during severe storm events. Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding within the Village. The public has been supportive of emergency preparedness and interagency coordination project types, which are associated with the project.

Project Cost-Benefit Analysis

Based on available information, the proposed project would have a net benefit on community safety, health, economy and environment.

- Investment: **\$55,000**
- Flood level reduction: **N/A**
- Jobs created: **0.5**
- Assets protected: **TBD**



Anticipated Reduction of Risk Associated with the Project

The reduction in risk was analyzed using the assumptions and factors described above. The following risk reduction benefits and other benefit types are expected:

- Helps protect against future flood hazards
- Positively impacts functionality of emergency response providers during flooding events
- Provides earlier notification and warning of flooding
- Increases safety for residents
- Increases efficiency and safety during hazard events

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses and completing construction is expected to happen over the course of 12 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

There is the potential to require an Article 15 permit if any disturbance to bed or banks of protected sections of the stream. The stream class of the Moodna Creek varies from protected to non-protected.

Jurisdiction

The Village of Washingtonville.



Improved Local Branding and Marketing

Project Description

Background: The project would create a coordinated local branding and marketing initiative to reinforce sense of place, highlight local assets, and encourage economic development throughout the Village of Washingtonville. This initiative should include a historic resources inventory, new public space programming, updated and uniform signage, mapping and wayfinding materials, and arts and culture installations, among others.



Marketing materials would highlight local natural and historic attractions, as shown above, and the Village’s commercial character. Photo is courtesy of NOVA Consulting.

Connection to the disaster: A thriving economy in the Village is significantly restrained by the real and perceived threat of severe flood damage. During Hurricane Irene and Tropical Storm Lee, the torrential rains caused extreme flooding throughout the Village, cutting off access to the commercial center of the Village downtown. During the initial NYRCR Washingtonville Planning meetings, the Committee identified several challenges to local economic recovery from downturns due to flood damage and to economic growth, including a lack of coordinated branding and outreach strategy



Sample of Local Attractions Photo courtesy of Washingtonville Photo Library.

marketing the Villages economic, recreation, and cultural assets to outside would-be visitors.

Solution: The Village of Washingtonville and Town of Blooming Grove Chamber of Commerce has dedicated business members with the ability to collectively manage the program once implemented.

Project Cost Estimate

The estimated project cost is \$50,000. Although a project useful life does not apply to the branding activities, it is assumed there will be a 5-year implementation period and will require on-going updates and training to municipal employees. This is an estimated cost of \$1,000 per year over 5 years. Please note the project cost estimate does not include administrative costs.

Project Benefits or Co-Benefits

The project will benefit all residents of Washingtonville.

Flood Protection and Safety: Enhancement of local marketing and branding will add cultural value and protect important cultural and historic resources. This project will add and invigorate the cultural opportunities for citizens while also spurring investment that helps to mitigate flooding.

Economic Driver: In addition to economic growth spurred by construction, improvements aimed at building a more resilient Village will also create greater confidence for private investors in Washingtonville. As the Village prioritizes and



implements projects that address lingering flood safety issues, private investors illustrate a commitment to the future and will encourage individuals and private businesses to continue to invest in Washingtonville. By creating safer more inviting downtown, this project will benefit main street business growth and will bolster the Village’s continued role as regional commercial and cultural hub.

Environmental: Since this project is for the development of program for marketing and branding, no assets were identified as being completely secured. However, environmental benefits are associated with this project. The project will enhance existing open space and recreation and increase awareness and connectivity with the environmentally sensitive areas of the Village.

Public Support: The results will include creating vitality and viability that benefit homes, businesses, and other essential facilities (hospitals and doctor offices). Several surveys and public outreach initiatives have been completed as a part of this planning process. In general, the public has shown support for all projects that will positively affect the issues associated with flooding within the Village. The public has been supportive of the promotion of tourism and growth, which is associated with the project.

Project Cost-Benefit Analysis

Based on available information, the proposed project would have a net benefit on community safety, health, economy and environment.

- Investment: **\$75,000**
- Flood level reduction: **N/A**

- Jobs created: **0.5 or more**
- Assets protected: **N/A**

Anticipated Reduction of Risk Associated with the Project

The reduction in risk was analyzed using the assumptions and factors described above. The following risk reduction benefits and other benefit types are expected:

- Improves coordination with regional initiatives
- Potential to positively impact business owners and residences affected by the storms
- Encourages local business growth
- Potential to create new amenities to retain and attract residents
- Potential to create new jobs to retain and attract residents
- Retains historic or local character
- Encourages activity on Main Street

Implementation Timeframe

General project implementation, including preparation of engineering design documents, submittal to regulatory agencies for review and permit approval, preparation of bid documents and review of responses and completing construction is expected to happen over the course of 12 months.

Local, State, and Federal Government Regulatory Requirements Related to the Project

N/A

Jurisdiction

The Village of Washingtonville

SECTION V
Additional
Materials





Photo courtesy of Tetra Tech



Section V. ADDITIONAL MATERIALS

ADDITIONAL RESILIENCY RECOMMENDATIONS

TABLE 20. ADDITIONAL RESILIENCY RECOMMENDATIONS

Project Name	Short Project Description	Regional Project (Y/N)	Strategy
Moodna Creek Dam Improvements	Elimination or modification of existing dams to control water levels and reduce flooding impacts. Potential dams for further analysis include: Dam at Tomahawk Lake, Salisbury Mills Dam, and Dam behind the Hook & Ladder. Also explore the possibility of a process for coordinated dam releases.	N	1, 5
Mays Field Relocation - Phase II: Relocate and Construct new Little League field	Relocate and reconstruct the Little League field to a new location out of the floodplain. New Mays Field will benefit both Washingtonville and Blooming Grove children participating in Little League.	Y	1, 5, 6
Power Line and Sidewalk Improvements	Harden and bury utility lines in the Village and install permeable paving as sidewalks in the Village Center. Permeable paving installation and installation of buried power lines	N	1, 4
Wastewater Facility Flood Proofing	Construct/Install flood proofing and flood mitigation improvements for the Wastewater Facility. The village wastewater facility is currently in construction with H2M, but not designed to be flood proof.	N	1, 5
Route 208 Bridge Replacement	Redesign and replace/construct Route 208 Bridge to be "Full Flow". The new bridge will be designed based on Hydraulic Analysis to accommodate the volume and height of flood waters during future flood events.	N	1, 2
Route 94/Hudson Bridge Replacement	Redesign and replace/construct Route 94/Hudson Bridge to be "Full Flow". The new bridge will be designed based on Hydraulic Analysis to accommodate the volume and height of flood waters during future flood events.	N	1, 2
Buyout Program and Open Space Development	Acquisition and conversion of buy-out properties to public spaces that provide recreational and ecological benefits (e.g. vegetated riparian buffers, flood control and/or mitigation practices). Boat launches and public contact with water should be encouraged. Could include interpretive signage about past floods and the values of the Moodna Creek watershed. Create additional access points to the water for recreation	N	1, 4, 5, 6
Mobile Home Park Buyout	Explore the possibility of a targeted Buyout program for the mobile park home which is currently located adjacent to the stream and is a significant flood risk.	N	1, 4



MASTER TABLE OF PROJECTS

The Village of Washingtonville’s NYRCR Committee has undertaken an iterative and methodical process to arrive at the Priority Projects, Featured Projects, and Additional Resiliency Recommendations presented in this plan. The three-part methodology presented below was designed to identify and consider the full range of potential actions and outcomes through a variety of analytical and quantitative assessment combined with stakeholder outreach, public engagement, and Committee discussions.

- 1. Initial project Identification:** The project evaluation process was initiated through a combination of existing plan review, preliminary stakeholder surveys, and Committee discussions, which collectively returned more than 50 possible projects and initiatives spanning the full breadth of community needs and opportunities.
- 2. Preliminary Project Analysis:** Selecting top priority projects from a large group of worthy potential projects required a series of increasingly detailed qualitative and quantitative analyses. The full list of identified projects was initially evaluated and refined by four primary criteria to create a manageable universe of feasible projects for further assessment. Project evaluation criteria included Categorization, Feasibility, Funding, and Alignment with NYRCR Washingtonville Plan Goals.
- 3. Detailed Analysis and Final Project Selection:** Final project selection and delineation into the three-tiered hierarchy of Priority Projects, Featured Projects, and Additional Resiliency Recommendations occurred through a series of in-depth analyses applied to those projects identified during the previous phase of assessment. This process included detailed Cost

Benefit Analysis, Risk Reduction Analysis, and Hydraulic Modeling combined with ongoing public feedback and Committee discussions. Projects selected as Priority represent those initiatives that would return the greatest community benefit. Projects of great community benefit that were infeasible for cost, timing, or other considerations have been included as Featured Projects or Additional Resiliency Recommendations in this plan for future implementation through alternative means.

Table 21 reflects all projects developed by the Community – Proposed Projects, Featured Projects, and Additional Resiliency Recommendations. Projects in this table are not ranked or prioritized.



TABLE 21. MASTER PROJECT TABLE

Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)	Strategy
Mays Field Relocation - Phase I: Little League field removal and creation of passive flood control	Buyout May's Field property, remove existing baseball fields, excess dirt, facilities, structures and asphalt to restore as passive flood control, and provide additional flood storage through creation of retention area.	Proposed	\$1,322,300	N	1, 4, 5
Mays Field Relocation - Phase II: Relocate and Construct new Little League field	Relocate and reconstruct the Little League field to a new location out of the floodplain. New Mays Field will benefit both Washingtonville and Blooming Grove children participating in Little League.	Additional Resiliency Recommendation	\$500,000+	Y	1, 5, 6
Moffat Library Improvements - Phase I	Construct improvements to the Moffat Library to increase resiliency, address existing flood damage, and improve the facility's overall functionality. Improvements would include water sealing the basement and stone foundation to minimize water infiltration, roof repair or replacement, and installing a backup generator.	Proposed	\$620,000	N	1, 2, 5, 6
Moffat Library Improvements - Phase II	Improve emergency response and operations functionality of the library, and add new social and cultural improvements in and around facility. Improvements would include creating an emergency information and communication center within the Moffat Library, demolishing the adjacent structure (owned by the library) for parking in the short-term with the potential for future library expansions, installing a geothermal heating/cooling system, and creating pedestrian friendly green space, sidewalks, and landscaping around the facility.	Proposed	\$1,010,000	N	1, 2, 5, 6



TABLE 21. MASTER PROJECT TABLE

Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)	Strategy
Moodna Creek Stormwater Storage Areas/Moodna Creek Stream Management Improvements	Identify and analyze appropriate locations throughout the Village of Washingtonville to implement stream management measures, reducing the extent and severity of flooding throughout the Village. Management measures such as creating new stormwater storage areas and long-term gravel harvesting or bank stabilization programs would be analyzed in a feasibility study. The feasibility study would provide a list of projects that synergistically address the extent of and reduce the impact of flooding in the Village.	Proposed	\$500,000	N	1, 2, 4, 5
Improved Communications Systems	Development and installation of a town wide emergency notification system to efficiently alert residents of disaster situations, provide critical safety and evacuation information, and increase the capacity of the Village to recover from an emergency event.	Proposed	\$10,000	N	3
Village Park	Create a waterfront park at the site of the old Village Hall to include the old Village Hall parcel as well as two adjacent repetitive flood damaged parcels that the Village proposes to acquire. The new park would create a public amenity out of reclaimed repetitively flood-damaged properties, and may be designed for passive and active recreation, linking the Village downtown with the banks of Moodna Creek.	Proposed	\$670,000	N	1, 4, 5, 6



TABLE 21. MASTER PROJECT TABLE

Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)	Strategy
Review and update Village codes and ordinances	<p>Review existing codes and ordinance for consistency with community goals and implement changes as necessary.</p> <p>Potential updates include:</p> <ul style="list-style-type: none"> ▪ Streamline approval/ permitting process ▪ Create flood and overlay zoning districts ▪ Create targeted density areas ▪ Include surface water protection ▪ Increase wastewater regulations ▪ Review current sign ordinance ▪ Zoning restrictions to control and mitigate future development in hazard areas ▪ Create a Village Comprehensive Plan ▪ Create incentives to encourage desirable business growth and development 	Proposed	\$50,000	N	1, 4, 5
Complete Additional Hydraulic, Stormwater, and Bridge Analysis	<p>Build on the base analysis from the CR Planning Process to provide additional information and recommendations to be used as a resource in the planning and development of further actions to reduce flood impacts. Pursue a comprehensive hydraulic analysis of the Moodna Creek including erosion issues along Route 208 as well as an analysis of the numerous bridges and structures that represent present and potential constrictions due to their design and location. Pursue analysis of village stormwater systems for possible improvements.</p>	Proposed	\$75,000	N	1, 2, 4, 5
Village Combined Facility Building	<p>Construct a public facility/structure to house multiple community functions</p>	Featured	\$7,950,000	N	1, 2



TABLE 21. MASTER PROJECT TABLE

Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)	Strategy
Automatic Level Sensing Devices	Install automatic level sensing devices on streams and lakes to provide for early warning of potential flooding in the Village. The project includes identifying and analyzing appropriate locations for device installation, and the feasibility of constructing and maintaining the devices over time. Once appropriate locations have been identified, the devices (including housings and casings for sensors) will be installed. The ongoing use, data collection, and maintenance of the devices will be closely coordinated with similar regional and state-wide initiatives helping to notify residents and business owners of impending floods.	Featured	\$55,000	Y	3, 5
Improved Local Branding and Marketing	Create a coordinated local branding and marketing initiative to reinforce sense of place, highlight local assets and encourage economic development. Initiative may include a historic resources inventory and programming, updated and uniform signage, mapping/materials, wayfinding installations among others.	Featured	\$50,000	N	4, 5
Moodna Creek Dam Improvements	Elimination or modification of existing dams to control water levels and reduce flooding impacts. Potential dams for further analysis include: Dam at Tomahawk Lake, Salisbury Mills Dam, and the dam behind the Hook & Ladder. Also explore the possibility of a process for coordinated dam releases.	Additional Resiliency Recommendation	\$10,000,000+	N	1, 5
Power Line and Sidewalk Improvements	Harden and bury utility lines in the Village and install permeable paving as sidewalks in the Village Center. Permeable paving installation and installation of buried power lines	Additional Resiliency Recommendation	\$5,000,000+	N	1, 4
Wastewater Facility Flood Proofing	Construct/install flood proofing and flood mitigation improvements for the Wastewater Facility. The village wastewater facility is currently in construction with H2M, but not designed to be flood proof.	Additional Resiliency Recommendation	\$500,000+	N	1, 5



TABLE 21. MASTER PROJECT TABLE

Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)	Strategy
Route 208 Bridge Replacement	Redesign and replace/construct Route 208 Bridge to be "Full Flow". The new bridge will be designed based on Hydraulic Analysis to accommodate the volume and height of flood waters during future flood events.	Additional Resiliency Recommendation	\$3,000,000+	N	1, 2
Route 94/Hudson Bridge Replacement	Redesign and replace/construct Route 94/Hudson Bridge to be "Full Flow". The new bridge will be designed based on Hydraulic Analysis to accommodate the volume and height of flood waters during future flood events.	Additional Resiliency Recommendation	\$3,000,000+	N	1, 2
Buyout Program and Open Space Development	Acquisition and conversion of buy-out properties to public spaces that provide recreational and ecological benefits (e.g. vegetated riparian buffers, and flood control and mitigation practices). Boat launches and public contact with water should be encouraged. Could include interpretive signage about past floods and the values of the Moodna Creek watershed. Create additional access points to the water for recreation	Additional Resiliency Recommendation	\$500,000+ depending on the number of properties	N	1, 4, 5, 6
Mobile Home Park Buyout	Explore the possibility of a targeted Buyout program for the mobile park home, which is currently located adjacent to the stream and is a significant flood risk.	Additional Resiliency Recommendation	\$500,000+ depending on the number of properties/homes	N	1, 4



COMMUNICATIONS STRATEGY: A BLUEPRINT FOR PUBLIC ENGAGEMENT

Community collaboration and engagement are integral to recovery and resiliency efforts, from immediate post-disaster activities to identifying and implementing projects that guard against future devastation from storms. The public engagement process for Washingtonville was essential in developing community-driven resiliency initiatives. The communications strategy formed at the beginning of the NYRCR process targeted outreach to residents, homeowners, non-resident property owners, business owners, and community and social service organizations across both the public and private sectors and served as the local blueprint for public engagement and education.

Information gathering through grassroots input and information sharing through multi-media messaging were at the heart of public engagement.



Image of the newspaper advertisement for Public Meeting #3. Courtesy of Tetra Tech.

The means and methods by which people send and receive messages are a direct reflection of their geographic locations and demographic characteristics. Where and how people live provides a predictable gauge to understanding how they acquire and share information about community happenings. As a result, a launched, multi-faceted outreach campaign in Washingtonville was predicated on a communications strategy that considered

community demographics (age, education, and socio-economic factors), the availability (or lack of availability) of Internet connectivity, as well as the visibility of venues that attract regular foot traffic (web-based and brick-and-mortar facilities such as storefronts, places of worship, and health care outlets).

Information Gathering through Grassroots Input

The NYRCR Village of Washingtonville’s Planning Committee solicited information and public opinions about community needs and opportunities relative to storm recovery and building resiliency. Public input about these needs and opportunities, in light of existing and non-existing community resources, critical assets, and essential redundancies, was instrumental to the

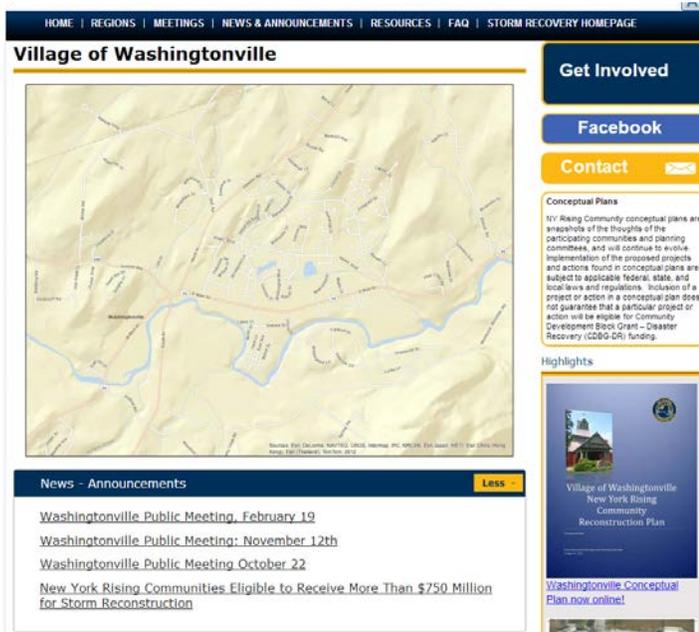


Members of the Committee and local public gather for a public meeting. Courtesy of Tetra Tech.

development of proposed and featured projects, and additional resilience recommendations.

Regular Planning Committee Meetings

Since NYRCR Program consummation in Washingtonville in early fall 2013, the NYRCR Washingtonville Planning Committee, composed of local residents, businesspeople, and community



Screenshot of the NYRCR Washingtonville webpage with public meeting announcements. Photo courtesy of Tetra Tech.

organizational stakeholders, met virtually weekly to discuss issues, prospective projects, and to advance the vetting and outreach processes. Guided by formal meeting agendas and Roberts Rules of Order, each meeting included time for public comment in an open, inviting environment and where meeting minutes were recorded and reviewed and accepted at the next meeting. Regular, weekly meetings were typically held at the Washingtonville Firehouse at 89 Main Street in the Village

All planning meetings were advertised on the NYRCR Program website, along with many business, community, and civic organizations – particularly those where NYRCR Washingtonville Planning Committee members had immediate influence. is shown in the image above.

Online, Hard-Copy Surveys

Surveys prepared for the public and for community stakeholder organizations were developed, distributed, and publicized by the Committee via email and were distributed in hard-copy form around the Village in high-visibility, heavily-trafficked locations. An example of one such survey

The purpose of the surveys was to gather input regarding the impacts of storm events, and where community needs and opportunities exist to close the gap vis-à-vis potential projects for funding through the NYRCR Program and other funding channels. While electronic surveys were tabulated using the online survey tool Survey Monkey, hard-copy submittals were manually entered by the



IMPORTANT, TIME-SENSITIVE SURVEY Business Owners/Leaders



New York Rising Community Reconstruction Program Village of Washingtonville, NY

THIS SURVEY CAN ALSO BE COMPLETED ONLINE BY DECEMBER 15, 2013 AT:
<https://www.surveymonkey.com/s/Washingtonville-Business-Survey>

WHAT IS THIS ABOUT?

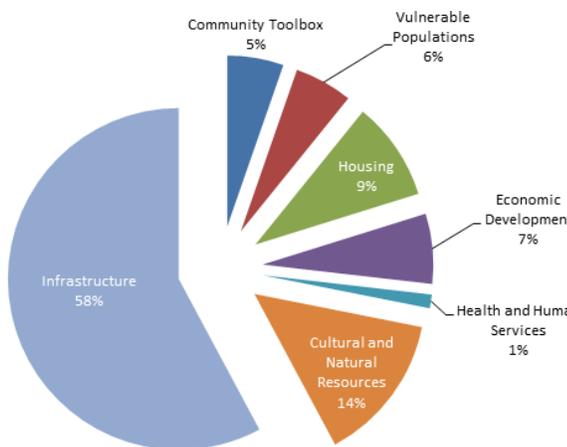
Washingtonville is eligible for **up to \$3 million** through the NY Rising Community Reconstruction Program. Your help is needed to advance the vision for Washingtonville’s disaster recovery and resilience. This is a real opportunity for local residents and businesses to define and decide how to rebuild and make Washingtonville stronger than ever! **WE NEED YOUR HELP!**



Consultant Team. The surveys documented both quantitative and qualitative information, and enabled participants to rank the importance of the six recovery support functions defined by the NYRCR Program.

The graphs below indicate survey participants' ranking of these six recovery support functions, showing that improving infrastructure resiliency was the top priority. These results were gathered between September 2013 and January 2014.

FIGURE 22. SURVEY RESULTS – RECOVERY SUPPORT FUNCTIONS RANKING



Agency Interviews, Surveys

The NYRCR Washingtonville Planning Committee worked with community leaders of various service organizations to obtain input on their needs. An electronic survey was developed and issued to the leaders of specific groups in the community including members of fire departments and law enforcement organizations; and employees from utility companies, hospitals, and schools. The surveys gathered information related to the impact from the flooding events and identified specific projects from each organization. Particular inquiry was made to agencies providing services to vulnerable populations who would have difficulty

with self-evacuation and post-event recovery activities.

From healthcare and social services to first responders and business leaders, the agencies surveyed were asked how demand for their services among vulnerable populations was met during the flood disasters.

The Consultant Team also conducted telephone interviews with key community stakeholders who did not participate in the online survey. These interviews enabled more in-depth discussions that yielded valuable input relative to prospective needs and project opportunities.

While this largely qualitative information was also manually recorded in Survey Monkey, results were consistent with other data collected, indicating infrastructure as the primary focus area for NYRCR Program funding.

Getting the Word Out

The Consultant Team's demographic profile of Washingtonville showed that residential target audiences for messaging include sizeable aging populations that either do not have or do not use the Internet. Public outreach efforts incorporated the following variety of multi-media messages:

- Media alerts
- Newspaper advertisements (print and online)
- Informational flyers and posters
- Web site notifications (including NYRCR Program)
- Community/school web sites
- Social media (Facebook, Twitter, Constant Contact)
- Public access channel scrollers
- Public radio broadcasts
- In-mailbox postcards and letters



Engagement through Community-Wide Public Meetings

Three community-wide meetings were conducted between October 2013 and February 2014 to: provide education about the NYRCR Program; obtain input from the Village’s residents, property owners, and business owners; review the draft Conceptual Plan; and to review projects based on public input, intelligence gathering, and scientific analysis.

The first public meeting was held at the Washingtonville Central Middle School. State officials and the Consultant Team provided attendees with an overview of the NYRCR Program and the CDBG-DR program, while one of the Committee Co-chairs introduced the remaining Committee members. The Vision Statement and goals developed by the Committee were also presented.

The Committee invited Washingtonville citizens and other members of the attending public the opportunity to communicate their ideas on how to spend financial resources on projects that would focus on recovery, build resiliency in the

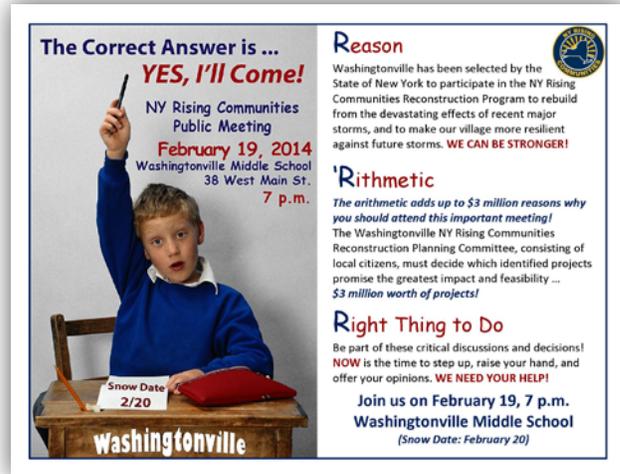


Image of the poster distributed around the Village and among organizations willing to post on their web pages. Courtesy of Tetra Tech.

community, and meet one of the six recovery functions. These ideas were communicated through the “voting” exercise indicated above. In addition, attendees provided the Committee with their ideas for unmet needs and opportunities for resolution.

The second public meeting was held at the Washingtonville Central Middle School and included another “voting” exercise to involve additional community members and to gauge any significant difference from those responses offered in Public Meeting #1. Additionally, it provided an opportunity to gather input on resiliency strategies and projects.

The third public meeting, well-advertised throughout the community by multiple print and electronic means, showcased suggested projects and other recommendations for resiliency. Nearly 100 people were in attendance, who listened intently to the Consultant Team’s presentation of hydraulic modeling and to what degree each proposed project would affect areas prone to flooding. Input provided at this meeting, in particular, was valuable to forming the definitive list of proposed and featured projects.



Image of the NYRCR Washingtonville geographic overview map at a public meeting. Photo courtesy of Tetra Tech.



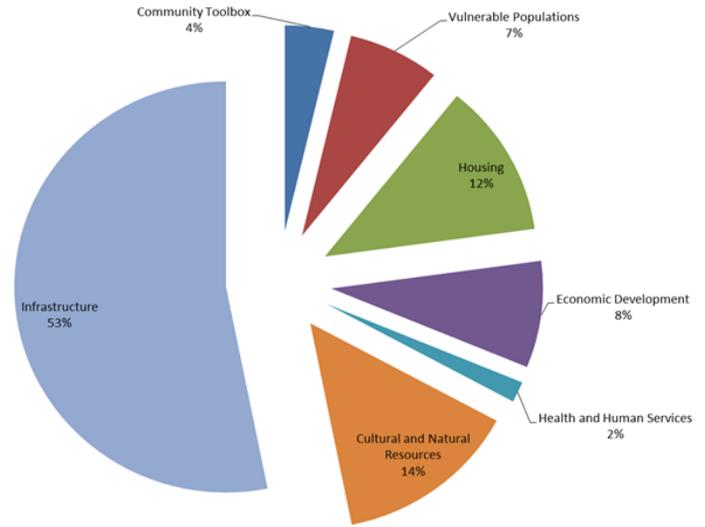
An in-mailbox postcard, posters, newspaper advertisements, website postings, and Constant Contact email campaign complemented Face Book and Twitter posts to advertise the meetings.

Constant Contact campaign results alone show that more than 60% of those who received an “e-vite” opened the message. Of those who opened it, 10% clicked through to the link for the NYRCR Program website.

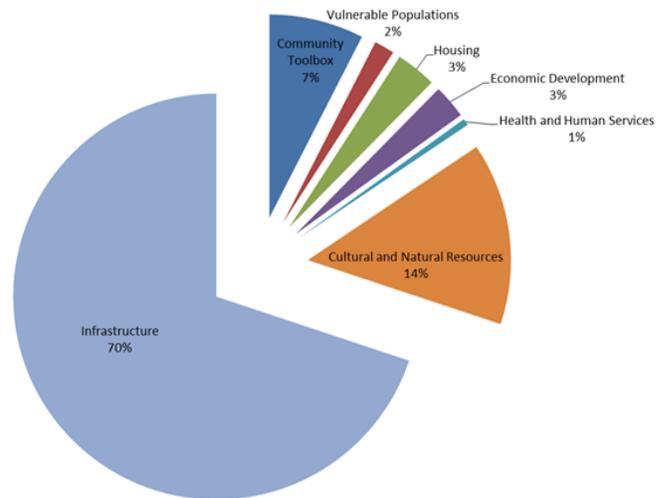
Interactive Exercise

Attendees at the first two public meetings indicated their prioritization of the recovery support functions through a mock spending exercise. Given play money, each community member in attendance indicated how they would spend NYRCR Program funding by placing their “dollars” in ballot boxes labeled by support function. Results from these exercises are indicated in the graph below, and are largely consistent with all other forms of opinion gathering. Data compiled consistently suggests that infrastructure was the top priority about which the public felt the Committee should focus. Ultimately, the Committee used the results of these exercises as a basis for project identification.

Washingtonville Public Meeting #1 Voting Results



Washingtonville Public Meeting #2 Voting Results





COMMUNITY ASSET INVENTORY

Risk Assessment Tool																					
Asset Information							Landscape Attributes							Risk Assessment				Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Storm Water Discharge	Vegetated Stream Bank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Downtown	Extreme	Economic	Downtown	Yes	No, Locally Significant	High	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Napoli's Italian Restaurant	Extreme	Economic	Restaurants	No	No	Low	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	5	75	4	5.00	5	100
Bradley's Auto Body	Extreme	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Former Brookside Auto building	Extreme	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Spindler Bulk Transport	Extreme	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Flowers by JoAnn	Extreme	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Auto Zone	Extreme	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Brookside Express	Extreme	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Joanne's Dance Studio	Extreme	Economic	Small Business	No	No	Low	Yes	Yes	Yes	No	No	No	1.5	3	3.50	5	53	4	3.50	5	70
Corner Candle Store	Extreme	Economic	Small Business	No	No	Low	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	5	75	4	5.00	5	100
Washingtonville Pharmacy	Extreme	Economic	Small Business	No	No	High	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	5	75	4	5.00	5	100
Ralph's Motor Repair	Extreme	Economic	Small Business	No	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
South Street Collision	Extreme	Economic	Small Business	No	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Newport Beverages	Extreme	Economic	Small Business	No	No	Low	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	5	75	4	5.00	5	100
Village Deli	Extreme	Economic	Small Business	No	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	5	75	4	5.00	5	100
Former Janalee's School of Dance building	Extreme	Economic	Small Business	No	No	Low	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	5	75	4	5.00	5	100
Bottini Fuels storage site	Extreme	Economic	Small Business	No	No	Low	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	5	75	4	5.00	5	100
Lassaw Dentist office	Extreme	Economic	Small Business	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Tuthill Agency	Extreme	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
A Plus Mini Mart	Extreme	Economic	Small Business	Yes	No, Locally Significant	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Washingtonville STP	Extreme	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	No	No	1.5	3	3.50	5	53	4	3.50	5	70
Washingtonville Pharmacy	Extreme	Health and Social Services	Healthcare Facilities	Yes	No, Locally Significant	High	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90



Risk Assessment Tool

Asset Information							Landscape Attributes							Risk Assessment				Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Storm Water Discharge	Vegetated Stream Bank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Moodna Creek	Extreme	Infrastructure Systems	Transportation	Yes	No	Medium	Yes	Yes	No	Yes	Yes	Yes	2.5	3	4.50	1	14	4	4.50	1	18
Moodna Creek	Extreme	Infrastructure Systems	Transportation	Yes	No, Locally Significant	High	Yes	Yes	No	Yes	Yes	Yes	2.5	3	4.50	1	14	4	4.50	1	18
Route 94 Bridge (over Moodna Creek)	Extreme	Infrastructure Systems	Transportation	Yes	No, Locally Significant	High	Yes	Yes	No	No	No	Yes	1.5	3	3.50	1	11	4	3.50	1	14
Hudson Rd Bridge (over Satterly Creek)	Extreme	Infrastructure Systems	Transportation	Yes	No	Low	Yes	Yes	No	No	No	Yes	1.5	3	3.50	3	32	4	3.50	3	42
Knights of Columbus	Extreme	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Washingtonville Lions Club	Extreme	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
VFW Post 8691	Extreme	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	4.50	5	68	4	4.50	5	90
Mays Field	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	Yes	Yes	No	Yes	Yes	Yes	2.5	3	4.50	2	27	4	4.50	2	36
Grace Community Church	High	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	Medium	Yes	Yes	Yes	No	No	No	1.5	3	2.50	5	38	4	2.50	5	50
Vern Allen Park Roller Hockey	High	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	Yes	No	No	No	1.5	3	2.50	2	15	4	2.50	2	20
Main St Hockey Rink	High	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	2.00	2	12	4	2.00	2	16
Washingtonville Athletic Fields	High	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.50	2	21	4	3.50	2	28
Stone Ridge Pond	High	Natural and Cultural Resources	Parks and Recreation	Yes	No	Low	Yes	Yes	No	Yes	Yes	No	2	3	3.00	1	9	4	3.00	1	12



Risk Assessment Tool

Asset Information							Landscape Attributes							Risk Assessment				Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Storm Water Discharge	Vegetated Stream Bank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Endangered Species Area	High	Natural and Cultural Resources	Natural Habitats	Yes	No	Low	Yes	Yes	No	Yes	Yes	No	2	3	3.00	1	9	4	3.00	1	12
Riparian Areas	High	Natural and Cultural Resources	Wetlands and marshes	Yes	No	Low	Yes	Yes	No	Yes	Yes	No	2	3	3.00	1	9	4	3.00	1	12
Hydric Soils	High	Natural and Cultural Resources	Wetlands and marshes	Yes	No	Low	Yes	Yes	No	Yes	Yes	No	2	3	3.00	1	9	4	3.00	1	12
Chase Bank - main location	Moderate	Economic	Banks and Financial Services	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Bank of America	Moderate	Economic	Banks and Financial Services	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Utility Survey Corp	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	No	No	No	1.5	3	2.00	4	24	4	2.00	4	32
Washingtonville Express Lube	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
The Country Store	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Hayes Lawn Care	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Lawn Doctor	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Orange County Transmission	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Santer Fitness	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Faith Realty	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
State Farm Insurance	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	No	No	No	1.5	3	2.00	4	24	4	2.00	4	32
Charles Quick Insurance	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Village Paint & Hardware	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Simply Computers	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Dr. Knipp offices	Moderate	Economic	Small Business	Yes	No	Medium	Yes	Yes	Yes	No	No	No	1.5	3	2.00	4	24	4	2.00	4	32
Frontier Communications	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Beyond Rubies	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	No	No	No	1.5	3	2.00	4	24	4	2.00	4	32
Hudson Heritage Realty	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	No	No	No	1.5	3	2.00	4	24	4	2.00	4	32
Triton Contracting Services	Moderate	Economic	Small Business	Yes	No	Low	Yes	Yes	Yes	No	No	No	1.5	3	2.00	4	24	4	2.00	4	32
Companion Animal Hospital	Moderate	Economic	Small Business	No	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48



Risk Assessment Tool

Asset Information							Landscape Attributes							Risk Assessment				Optional: Risk Assessment (500-year event)			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Defensive Flood Protection Measures	Elevation	Freeboard	Point of Confluence	Storm Water Discharge	Vegetated Stream Bank Buffers	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Washingtonville Fire Station	Moderate	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	No	No	1.5	3	2.00	4	24	4	2.00	4	32
DPW Washingtonville Garage	Moderate	Health and Social Services	Public Works Facilities	Yes	No, Locally Significant	High	Yes	Yes	Yes	No	No	No	1.5	3	2.00	3	18	4	2.00	3	24
Washingtonville Middle School	Moderate	Health and Social Services	Schools	Yes	Yes, FEMA	High	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
M H Communities Ltd I, Rehabilitation Support & Services,	Moderate	Housing	Multi-Family Residence	Yes	No, Locally Significant	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
Frontier Communications	Moderate	Housing	Supportive Housing	Yes	No, Locally Significant	Medium	Yes	Yes	Yes	No	No	No	1.5	3	2.00	4	24	4	2.00	4	32
Cell Tower	Moderate	Infrastructure Systems	Telecommunications	Yes	No, Locally Significant	0	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
DPW Washingtonville Sewer	Moderate	Infrastructure Systems	Telecommunications	Yes	No, Locally Significant	High	Yes	Yes	Yes	No	No	No	1.5	3	2.00	2	12	4	2.00	2	16
Washingtonville Water Plant	Moderate	Infrastructure Systems	Wastewater	Yes	No	Medium	Yes	Yes	No	No	No	No	1	3	1.50	2	9	4	1.50	2	12
El Shaddai Christian Church	Moderate	Infrastructure Systems	Water Supply	Yes	No, Locally Significant	High	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	2	18	4	3.00	2	24
Blooming Grove/Washingtonville Chamber	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48
		Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	No	2.5	3	3.00	4	36	4	3.00	4	48



RISK ASSESSMENT DATA AND METHODOLOGY

The following section outlines the initial risk assessment for assets within the Village. The analysis incorporated the baseline methodology, enhanced by specific assumptions at the request of the Committee. The baseline methodology included four major components of the analysis: Risk Area, the Hazard Factor, the Exposure Score, and the Vulnerability Score.

Data Sources Used

NYDOS Provided Data:

- Federal Communications Commission
- Insurance Services Office, Inc.
- National Oceanic and Atmospheric Administration (NOAA)
- Federal Communications Commission (2012)
- National Park Service (2011)
- National Pipeline Mapping System (2003)
- NYS Department of Health, NYS Department of Transportation
- NYS Division of Homeland Security and Emergency Services
- NYS Office for People With Developmental Disabilities
- NYS Office of General Services
- NYS Office of Mental Health
- NYS Department of Environmental Conservation (2009)
- NYS Education Department (2000)
- Environmental Systems Research Institute (ESRI) (2010).

Local Data, Orange County:

- Parcels
- Tax Data
- Critical facilities
- Natural Resources
- Infrastructure
- Soils

- Depth Grids
- Flood Hazard Areas (FHA)
- Buyout Properties
- Damaged Roadways
- Building Data
- Land Use
- Zoning

Description of Methodology

The risk assessment for assets within the Village incorporated NYRCR baseline methodology, enhanced by specific assumptions at the request of the committee. The baseline methodology included four major components of the analysis: the Risk Area, Hazard Factor, Exposure Score, and Vulnerability Score.

Risk area classifications (extreme, high, or moderate) are determined by the asset's location relative to mapped coastal risk zones.

The hazard score of 3 was assigned for the hazard factor in the tool (100-year flood water level occurring within a 100-year planning time frame).

The exposure score is determined by the sum of a base score (derived from the risk area in which the asset is located) plus 0.5 point for each of the six landscape feature conditions below, if present. A base score was assigned for Exposure to each asset depending on highest-class risk area (Extreme = 2, High = 1, and Moderate = 0.5) in which a significant portion of the asset is located. The total exposure score was calculated for each asset by adding 0.5 point to the base score for each of the following conditions:

- **Defensive flood protection measures** – are absent, below base flood elevation (BFE), in poor condition, or lack maintenance commitment
- **Elevation** – the asset site is below BFE



- **Freeboard** – elevation of the habitable or occupied portion of the asset is less than 2 feet above BFE
- **Point of Confluence** – asset is within an area subject to increased flood risk (based on consultant’s judgment or NYRCR Washingtonville Planning Committee guidance) because of a confluence of merging streams
- **Stormwater Discharge** – asset is within an area subject to increased flood risk

(consultants judgment or planning team guidance) because of stormwater system discharge

- **Vegetated Stream Bank Buffers** – asset is within Floodway Fringe (FEMA definition).

Vulnerability score:

Table 22 outlines the methodology, which accounts for an asset with a known length of time of service disruption or complete loss of service.



TABLE 22. VULNERABILITY BASED ON IMPACT ON SERVICE OR FUNCTION OF COMMUNITY ASSETS

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



The Village worked toward developing a methodology for assessing risk, which also considered the unique situation and individual dynamics of areas at risk. To assess true vulnerability, the planning committee determined which asset locations required consideration and concluded that because asset-specific information on facility recovery times (after impact by a flooding event) was not available, standard assumptions based on similar facilities should be used. **The committee worked together to develop a tiered-factor approach to assess risk, generating risk scores that accurately reflected vulnerabilities and overall risk within the community.** The factor is adjusted based on similar facility types in a descending 5 point scale that is reduced by one point determined by its risk area location. For example, as noted in the vulnerability section below, all buildings were assumed to be 5 and all garages and storage buildings were assumed to be 4. Assumptions were reviewed and approved by the committee. When specific vulnerability information was available, the standard methodology was applied; however, if information was not available, the following assumptions were applied:

Risk Area Assumptions

1. Risk Areas:
 - a. Extreme risk areas: areas within the 100-year FHA that are within 1,000 feet of a Repetitive Loss Property.
 - b. High risk areas: areas within the 100-year FHA
 - c. Moderate risk areas: areas within the 500-year FHA
 - d. “N/A” risk areas: areas outside of an identified FHA (all assets not located in an Extreme, High or Moderate Risk Area were identified as N/A, and do not produce a risk

score. Assets in this category are given a risk score of “False” in the risk assessment tool)

2. Socially Vulnerable Populations:
 - a. Areas with a maximum 25 people/sq. mile density of population earning less than \$20,000.00 per year
 - b. Areas with a maximum 25 people/sq. mile density of population over the age of 65.

Assumptions for the Landscape Attributes and Vulnerability

Landscape attributes:

1. Defensive Flood Protection Measures: all assets were assumed “Yes” if absent, below BFE, in poor condition, or lacking maintenance commitment.
2. Elevation: all assets outside the extreme, high, or moderate risk area were assumed “No,” and all assets in the High and Moderate Hazard Zone were assumed “Yes” if the asset site is below BFE.
3. Freeboard: all assets outside the extreme, high, or moderate risk area were assumed “No,” and all building, structure, and bridge assets in the extreme, high, and moderate risk areas were assumed “Yes” if elevation of the habitable or occupied portion of the asset is less than 2 feet above BFE.
4. Point of Confluence (POC): all assets within 1,500 feet downstream of major POC (this is a Hazard Mitigation Plan (HMP) dataset with all streams with 4,300 cubic feet per second [CFS] or more during a 100-year storm event) and within the extreme, high, or moderate risk areas are “Yes”; all others are “No.”



5. Storm Water Discharge: all assets within 1,000 feet of a major culvert (HMP dataset) and within the extreme, high, or moderate risk areas are “Yes.”
6. Vegetated Stream Buffers: all assets within the floodway are assumed “Yes”; all others “No.”

Assets in “Extreme” and “High” Risk Areas

Vulnerability:

1. All buildings were assumed to be 5.
2. All garages storage buildings were assumed to be 4.
3. All transportation infrastructure and water treatment facilities were assumed to be 3.
4. All wells and springs were assumed to be 2.
5. All natural and cultural resources other than buildings were assumed to be 2.
6. All natural resources were assumed to be 1.

Assets in the “Moderate” Risk Area

Vulnerability:

1. All buildings were assumed to be 4.
2. All garages storage buildings were assumed to be 3.

3. All transportation infrastructure and water treatment facilities were assumed to be 2.
4. All wells and springs were assumed to be 1.
5. All natural and cultural resources other than buildings were assumed to be 2.
6. All natural resources were assumed to be 1.

Landscape Attributes:

1. Point of Confluence: “Yes” if the asset is subject to increased flooding due to an upstream point of confluence, and “No” if the asset is not affected. Comments justifying impact were provided where available.
2. Stormwater Discharge: “Yes” if the asset is affected by stormwater discharge and “No” if the asset is not affected. Comments justifying impact were provided where available.

While the risk scores differ between the two events as a result of using different hazard scores, the basis for how assets are categorized into the severe, high, moderate, or residual risk levels is the same for the two events, as shown by the similarly colored regions in Figure 20. For example, a risk score of 60 in the 100-year event evaluation is shown as 80 in the 500-year event evaluation; however, both scores are classified as severe risk



TABLE 23. RISK SCORE RANGES	
100 YEAR EVENT	500 YEAR EVENT
Severe (Risk Score >53)	Severe (Risk Score >70)
<p>Risk scores in the “Severe” category occur only if one of the two factors, exposure or vulnerability, is rated 5, and the other is 4 or higher, which could indicate that the asset is in a dangerous situation. Both exposure and vulnerability should be reduced, if possible. Consider relocation a priority option for these assets.</p>	
High (Risk Score 24 - 53)	High (Risk Score 32 - 70)
<p>Risk scores in the “High” category are indicative of conditions that could lead to significant negative outcomes from a storm. Using the risk scoring system, a total of 24 (or 32 for the 500-year event) can be achieved only if the vulnerability is 4 and exposure is 2, or vice versa. A vulnerability of 4 indicates likely loss of service of an asset for an extended period of time. For many assets, this loss may be unacceptable. Actions should be taken to reduce vulnerability, such as elevating or floodproofing the asset to help avoid a long-term loss of function. A score of 4 for exposure indicates most of the local landscape attributes that help reduce storm damages are absent. Actions to restore landscape attributes may be appropriate. All other risk scores higher than 24 (or 32 for the 500-year event) indicate either the exposure or the vulnerability (or both) are higher than the conditions discussed above, lending more weight to need to take actions that reduce risk. Relocation may be necessary in the future if other means of adaptation or management actions are not effective.</p>	
Moderate (Risk Score 6 - 23)	Moderate (Risk Score 8 - 31)
<p>Risk scores in the “Moderate” category pose moderate to serious consequences, but adaptation may be of lower priority based on one factor, exposure, or because vulnerability remains relatively low. Use a combination of measures to reduce exposure and vulnerability.</p>	
Residual (Risk Score <6)	Residual (Risk Score <8)
<p>Risk scores in the “Residual” category occur when both exposure and vulnerability are relatively low. This situation suggests floods would pose minor or infrequent consequences. However, a vulnerability score of 3 may not be acceptable for critical facilities or assets of high community value, because the community cannot afford to be without these services, even infrequently. Note that risk is never completely eliminated. Some residual risk still remains even after management measures have been implemented. It is recommended that the community monitors conditions and adapts as necessary.</p>	

Source: NYS DOS, 2013



GLOSSARY

ALS	Advanced life support
BFE	Base Flood Elevation
CDBG	Community Development Block Grant
CDBG-DR	Community Development Block Grant Disaster Recovery
cfs	Cubic feet per second
CRS	Community Ratings System
DPW	Department of Public Works
EMS	Emergency Medical Service
EOC	Emergency Operations Center
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FHA	Flood Hazard Area
FTE	Full time equivalent
GIS	Geographic Information Systems
gpd	Gallons of water per day
HAZUS-MH	Hazards US-Multi-Hazard risk assessment model
HEC-RAS	Hydrologic Engineering Center - River Analysis System
IA	Individual Assistance
MTC	Margaretville Telephone Company
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NYC DEP	New York State Department of Environmental Protection
NYRCR	New York Rising Community Reconstruction
NYS DEC	New York State Department of Environmental Conservation
NYS DOS	New York Department of State
PA	Public Assistance
POC	Point of Confluence



RL	Repetitive Loss
SART	State Agency Review Team
SRL	Severe Repetitive Loss
SWOT	Strength, weaknesses, opportunities and threats



END NOTES

¹ The accuracy of monetary figures discussed is based only on the available information identified during research for this plan.

² Photo from National Weather Service shows Hurricane Irene striking New York City.

³ FEMA, 2013

⁴ NCDC, 2013

⁵ U.S. Census, 2010

⁶ U.S. Department of the Interior. U.S. Geological Survey. USGS Current Conditions for the Nation: USGS 01394620 Rahway River at Kenilworth NJ. Accessed 2014 at: URL: <http://waterdata.usgs.gov/nwis/uv>

⁷ (Town of Blooming Grove Comprehensive Plan, 2005)(Town of Blooming Grove Comprehensive Plan, 2005) Town of Blooming Grove Comprehensive Plan, 2005

⁸ AHRC is a functional needs housing facility.

⁹ American Community Survey, 2011

¹⁰ Town of Blooming Grove Hazard Mitigation Plan, 2013

¹⁰ Town of Blooming Grove Hazard Mitigation Plan, 2013

¹¹ Town of Blooming Grove Hazard Mitigation Plan, 2013

¹² American Community Survey, 2010

¹³ “Deposition” definition from Encarta Dictionary

¹⁴ NYRCR program Handbook

¹⁵ *Floodproofing Non-Residential Buildings* (FEMA P-936). Sec 1.2 Definitions and Key Concepts.

¹⁶ The construction jobs were estimated based on a methodology developed by the United States Department of Commerce Economics and Statistics Administration as presented in the September 2013 Economic Impact of Hurricane Sandy: Potential Economic Activity Lost and Gained in New Jersey and New York. This study estimated job creation from recovery spending on infrastructure projects in New York and reported 7.15 construction jobs and 8.4 total jobs per \$1,000,000 in construction spending.

¹⁷ U.S. Department of the Interior. U.S. Geological Survey. USGS Current Conditions for the Nation: USGS 01394620 Rahway River at Kenilworth NJ. Accessed 2014 at: URL: <http://waterdata.usgs.gov/nwis/uv>