



**TOWN OF HARRISON
VILLAGE OF HARRISON**
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JOAN B. WALSH
*Supervisor of the Town of Harrison
Mayor of the Village of Harrison*

February 24, 2010

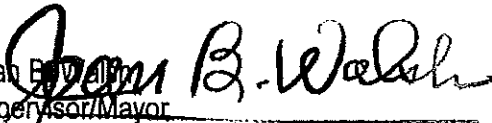
Mr. John Fishbein
New York State Emergency Management Office
1220 Washington Avenue, Building 22
Albany, New York 12226-2251

Re: Town/Village of Harrison
Draft Multi-Hazard Mitigation Plan

Dear Mr. Fishbein:

Attached please find revised copies of the Town/Village of Harrison's Draft Multi-Hazard Mitigation Plan. The draft takes into account the comments contained in Mr. Lucchese's e-mail of January 15, 2010, which contained the initial State review (crosswalk) of the above referenced plan.

Very truly yours,


Joan B. Walsh
Supervisor/Mayor

JBW/fmb

Attachments: Hard Copy (1)
Electronic Copy (2)

cc: Mr. Eugene Lucchese, MEP
Regional Trainer/Planner
NYSEMO Region 2
171 Cheney Drive
Poughkeepsie, N.Y. 12601

Hard Copy (1)
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Town / Village of Harrison, New York

Hazard Mitigation Plan

Final Draft
September 17, 2009

With NYSEMO changes per initial Review January 2010

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Executive Summary

The Town / Village of Harrison, New York developed this Multi-Hazard Hazard Mitigation Plan in an effort to reduce future loss of life and property resulting from natural disasters. It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the Town/Village. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from natural disasters. Natural hazard mitigation may be defined as a method permanently reducing or alleviating the losses of life, property, and injuries resulting from natural hazards through long and short-term strategies. Example strategies include planning, policy changes, programs, projects, and other activities. Natural hazard mitigation is the responsibility of individuals, private businesses and industries, state and local governments, and the federal government.

Need for Mitigation Planning

This natural hazard mitigation plan is intended to assist the Town/Village of Harrison in reducing its risk from natural hazards by identifying resources, information, and strategies for risk reduction. It will also help to guide and coordinate mitigation activities throughout the Town/Village. The Town/Village received funds to develop the plan from the Hazard Mitigation Grant Program (HMGP), a both Federal Emergency Management Agency (FEMA) grant program. The Town/Village provided the additional funds for the plan's development from its General Fund.

Plan Organization

The Mitigation Plan contains background on the purpose of the plan, the methodology used to develop the plan, a profile of the Town/Village of Harrison, Risk Assessment on natural hazards that have the potential to impact the study area, and several appendices. The mitigation plan provides recommendations for activities that will assist the Town/Village in reducing risk and preventing loss from future natural hazard events. The action items address multi-hazard issues, as well as activities for the hazards of flood, severe weather, severe winter weather, extreme heat, earthquakes, drought, and dam failure.

Plan Participants

The Town/Village of Harrison recognized the importance of establishing a collaborative planning process to develop both short-term and long-term risk reduction strategies with strong ties to the existing programs and divisions of governance. Therefore, the Town/Village developed a planning committee comprised of individuals and specialists with natural hazard mitigation understanding and responsibilities from town departments, the schools, outside agencies and individuals from Harrison. The committee included representatives from the following organizations:

Police Department
Fire Departments (3)
Emergency Medical Services
Public Works and Engineering

Building Department
Planning Department
Legal Counsel
School District
Westchester Joint Water Works
Westchester County Office of Emergency Management
New York State Office of Emergency Management
Municipal Neighborhood Groups

What Will Be Accomplished

The Town/Village's vision related to emergency preparedness is to strive to create a "A More Disaster Resistant Community." The planning committee further describes this vision: By creating a legacy of mitigation activities, Town/Village and community leaders' proactive implementation of long term, cost effective mitigation measures will serve to protect its population, its properties, its natural and built environment and its investments. The forethought of Harrison's leaders has preserved the Town/Village through decades of hazard events. The plan fosters coordinated partnerships and the development of strategies for reducing the risks posed by natural hazards.

Town/Village Goals

The plan describes the overall direction that the Harrison's agencies, organizations, and citizens can take to work toward mitigating risk from natural hazards. The Harrison plan was developed with significant input from the Hazard Mitigation Planning Committee. The principal mission is to reduce risk, prevent loss of property and commerce, and promote expedient recovery, while safeguarding people and the environment from natural disaster events through a coordinated and collaborative community partnership. This mission is implemented through the following five goals:

Goal #1	Protect Life and Property
Goal #2	Safeguard Critical Public Facilities and Infrastructure
Goal #3	Maintain and Enhance Emergency Response Capabilities
Goal #4	Protect the Environment
Goal # 5	Increase Awareness and Preparedness

Action Items Developed

The following action items were developed for plan implementation:

- **Coordinating Organization:** The coordinating organization is the public agency with regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. The coordinating organizations for all action items listed in this plan are departments within the Town/Village of Harrison.
- **Internal Partners:** Internal partner organizations are departments within the Town/Village that may be able to assist in the implementation of action items by providing relevant resources to the

coordinating organization.

- **External Partners:** External partner organizations can assist the Town/Village in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations. The internal and external partner organizations listed in the mitigation plan are potential partners recommended by the planning committee, but who were not necessarily contacted during the development of the plan. Partner organizations should be contacted by the coordinating organization to establish commitment of time and or resources to action items.
- **Timeline:** Action items include both short and long-term activities. Each action item includes an estimate of the timeline for implementation. *Short-term action items (ST)* are activities which city agencies are capable of implementing with existing resources and authorities within one to two years. *Long-term action items (LT)* may require new or additional resources or authorities, and may take between one and five years to implement.
- **Levels of Immediate Capability:** The Hazard Mitigation Planning Committee prioritized the plan's five goals determining the most important as "Identifying the risk level and evaluating Harrison's vulnerability." The risk assessment identified various hazards that may threaten Harrison municipal facilities from low to severe. The step of prioritizing the action items and determining the ability for the Town/Village to immediately implement the action item was to review each action against availability of resources and funding. High – can immediately implement, Low – need a great deal of outside funding and resources with Medium landing somewhere in between.
- **Ideas for Implementation:** Each action item includes ideas for implementation and potential resources, which may include grant programs or human resources.
- **Plan Goals Addressed:** The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals following implementation.

Plan Implementation

The plan maintenance section of this document details the formal process that will ensure that the Town/Village of Harrison's Multi-Hazard Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the Town/Village will integrate public participation throughout the plan maintenance process. Additionally, this section includes an explanation of how the Town/Village of Harrison intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the Comprehensive Plan, Capital Improvement Plans, and Building Codes.

Plan Adoption

The Harrison Town/Village Council will be responsible for adopting the Town/Village of Harrison's Multi-Hazards Mitigation Plan and providing the support necessary to ensure plan implementation. After the plan is adopted via resolution by the Town/Village Council, the Commissioner of Public Works will be responsible for submitting it to the State Hazard Mitigation Officer at the New York State Emergency Management Office who will then submit the plan to the Federal Emergency Management Agency (FEMA–Region II) for review. This review will address the federal criteria outlined in FEMA Program Guidance. Upon acceptance by FEMA, the Town/Village of Harrison will

gain eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds.

The effectiveness of the Town/Village of Harrison's Multi- Hazard Mitigation Plan will be contingent on the implementation of the plan and incorporation of the outlined action items into existing municipal plans, policies, and programs. The Multi- Hazard Mitigation Plan includes a range of action items that, if implemented, would reduce loss from hazard events in the Town/Village of Harrison. Together, the action items in Harrison's Multi- Hazard Mitigation Plan provide the framework for activities that Town/Village's departments can choose to implement over the next five years. The Hazard Mitigation Planning Committee has prioritized the plan's goals and identified actions, which will be implemented, as resources permit, through existing plans, policies, and programs.

Coordinating Body

The Town/Village Board, through the Commissioner of Public Works and a Committee will be the coordinating body for the mitigation plan. The responsibility has been established by the Town/Village Board and includes representatives from applicable Town/Village Departments, including, but not limited to, the current Hazard Mitigation Planning Committee members. One of the Committee roles will be to review the mitigation plan annually and to oversee the update process. The Department of Public Works will be responsible for overseeing the plan's implementation. The Commissioner of Public Works will Chair the Committee to facilitate Multi- Hazard Mitigation Plan meetings. Plan implementation and evaluation will be a shared responsibility among all of the assigned Committee members.

Implementation through Existing Programs

The Town/Village of Harrison will address planning goals and legislative requirements through its comprehensive land use plan, capital improvement plans, Town/Village codes and an array of non-regulatory projects and programs. The Multi- Hazard Mitigation Plan provides a series of recommendations – many of which are closely related to the goals and objectives of existing planning programs. To the extent possible the Town/Village will incorporate the recommended mitigation action items into existing programs and procedures.

Economic Analysis of Mitigation Projects

The Federal Emergency Management Agency's (FEMA) methods of identifying the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist Town/Village in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Formal Review Process

The Town/Village of Harrison has developed a method to ensure that a regular review and update of the Multi-Hazard Mitigation Plan occurs. All Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan and the Commissioner of Public Works is responsible for contacting the Committee members and organizing the annual plan review meeting.

Continued Public Involvement

The Town/Village of Harrison is dedicated to involving the public directly in the continual reshaping and updating of the Multi-Hazard Mitigation Plan. The Committee members are responsible for the annual review and update of the plan. Commissioner of Public Works will continue to identify opportunities for the public's engagement in implementation and update of the plan. Public participation will continue to be invited through a series of presentations to community organizations such as fraternal organizations, neighborhood organizations and others. Copies of the plan will be posted on the Town/Village website and will be available there during the annual update periods. The website also contains contact information where people may direct questions and comments.

Contact Information

To request information or provide comments regarding this plan, please contact:

Michael Amodeo, P.E.
Town Engineer
Town/Village of Harrison
1 Heineman Plaza
Harrison, New York 10528

Telephone: 914-670-3070
Fax: 914-835-8064

Purpose

The primary purpose of this multi-hazard mitigation plan is to guide hazard mitigation planning to better protect the people and property of the Town/Village of Harrison from the effects of hazard events. It demonstrates the Town/Village's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. A secondary purpose is to make the Town/Village of Harrison eligible for federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program as well as any other State or local government programs which may require as a pre-requisite the, the existence of such a plan.

Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of \$4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005).

Hazard mitigation planning is the process through which natural hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. This plan documents the Town/Village of Harrison's natural hazards mitigation planning process, identifies relevant natural hazards and risks, and identifies the strategy to be used to decrease its vulnerability and increase its resiliency and sustainability.

The Town/Village of Harrison Multi-Hazard Mitigation Plan is a multi-jurisdiction plan that covers the incorporated co-terminus community of the Town / Village of Harrison. It documents the Town/Village's natural hazards mitigation planning process, identifies natural hazards and associated risks to the city, and develops a hazards mitigation strategy to lessen vulnerability and improve resiliency to natural disasters, thereby enhancing the Town/Village's long-term sustainability. The Town/Village prepared this multi-hazard mitigation plan pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim

Final Rule published in the Federal Register on February 26, 2002 (44 CFR §201.6). (Hereafter, these requirements and regulations will be referred to collectively as the DMA.)

While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because the Town/Village of Harrison is subject to many kinds of natural hazards, access to these programs is vital.

This plan addresses natural hazards only. Although the Harrison Hazard Mitigation Planning Committee HHMPC recognizes that FEMA encourages communities to address manmade and technological as well as natural hazards, the scope of this effort was limited to natural hazards for two reasons: 1) many of the planning activities for manmade and technological hazards are either underway or complete and were developed by a different set of organizations and 2) the DMA requires extensive public information and input, which is in direct conflict with the confidentiality necessary in planning for the fight against chemical, biological, and radiological terrorism. The HHMPC determined it was not in the community's best interest to publicly share specific information about the area's vulnerability to manmade hazards. That being said, the plan references certain potential transportation related hazards which exist in the community and look to first responder organizations to further investigate the potential for such disasters in the community as well as develop response protocols under the Unified Command System.

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to the Town/Village and its property owners by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruption. Harrison has been affected by natural hazards in the past and is thus committed to reducing future disaster impacts and maintaining eligibility for federal funding.

Plan Organization

The Town/Village of Harrison's Multi-Hazard Mitigation Plan is organized as follows, with detailed descriptions provided in Chapter 3.

- Chapter 1: Introduction
- Chapter 2: Plan Adoption
- Chapter 3: Planning Process
- Chapter 4: Town/Village Profile
- Chapter 5: Risk Assessment
- Chapter 6: Mitigation Strategies
- Chapter 7: Plan Implementation Maintenance Procedures

Table 1-1 below shows the key Local Mitigation Plan elements as well as the Section in the Federal Register where detailed information may be found. The Table also shows the respective Chapter in the Town / Villages All Hazard Mitigation Plan where the information may be found.

Table 1.1 FEMA Local Mitigation Plan Review Crosswalk

Plan Criteria	Principal Location In Plan
Prerequisites	
Adoption by the Local Governing Body: 201.6 c (5)	Chapter 2
Planning Process	
Documentation of the Planning Process: 201.6 b and 201.6 c (1)	Chapter 3
Risk Assessment	
Identifying Hazards: 201.6 c (2) (i)	Chapter 5
Profiling Hazards: 201.6 c (2) (i)	Chapter 5
Assessing Vulnerability: Overview 201.6 c (2) (ii)	Chapter 5
Assessing Vulnerability: Addressing Repetitive Loss Properties: 201.6 c (2) (ii)	Chapter 5
Assessing Vulnerability: Identifying Structures 201.6 c (2) (ii) (A)	Chapter 5
Assessing Vulnerability: Estimating Potential Losses 201.6 c (2) (ii) (B)	Chapter 5
Assessing Vulnerability: Analyzing Development Trends 201.6 c (2) (ii) (C)	Chapter 5
Mitigation Strategy	
Local Hazard Mitigation Goals: 201.6 c (3) (i)	Chapter 6
Identification and Analysis of Mitigations Actions: 201.6 c (3) (ii)	Chapter 6
Identification and Analysis of Mitigations Actions (NFIP Compliance) 201.6 c (3) (ii)	Chapter 6
Implementation of Mitigations Actions: 201.6 c (3) (iii)	Chapter 6
Planning Maintenance Process	
Monitoring, Evaluation, and Updating the Plan: 201.6 c (4) (i)	Chapter 7
Incorporation into Existing Planning Mechanisms: 201.6 c (4) (ii)	Chapter 7
Continued Public Involvement: 201.6 c (4) (iii)	Chapter 7

Source: FEMA Multi-Hazard Mitigation Planning Guidance under DMA 2000, Part 3. Local Multi-Hazard Mitigation Planning Guidance July 1, 2008

Benefits of Mitigation Planning

This planning process and the subsequent results will provide guidance for the Town/Village of Harrison, involved agencies both public and private and citizens and visitors to better prepare and respond when disasters occur. Mitigation planning along with subsequent reviews and updates allows the Town/Village to remain eligible for Federal, State and Local Mitigation Grant funding for projects designed to reduce the impact of future disaster events. Strategic benefits to preparing and updating the plan include; a better understanding of hazards and potential hazards to which the Town/Village is exposed, utilizing funding where the most positive impact on the community is likely to occur, potential savings by partnering with entities having a vested interest in the community, reduced strategic impacts and damages to persons and property, as well as creating a more disaster resistant community.

Plan Adoption

This section of the Town / Village of Harrison, New York Multi-Hazard Hazard Mitigation Plan outlines the process by which this plan will be formally adopted by the local governing body.

As plan chapters are completed as drafts DRE will, having already discussed the process with the HMPC representative from the New York State Emergency Management Office (NYSEMO), submit them to NYSEMO to make sure all elements of DMA 2000 and other program requirements have been included.

Once the entire document has received a preliminary review by NYSEMO, and any items have been added / revised, the plan will be placed on the Town / Village of Harrison's monthly Town / Village Board Meeting Agenda for discussion and "Approval for Submission" to FEMA. The plan will then be submitted to FEMA through NYSEMO for "Approval Pending Adoption". FEMA may approve the document or return it to the Town/Village for revision. Final adoption of the Plan will take place following receipt of FEMA's "Approval Pending Adoption".

In addition to being required by DMA 2000, adoption of the plan is necessary because:

- It lends authority to the plan to serve as a guiding document for local and state government officials;
- It gives legal status to the plan in the event it is challenged in court;
- It certifies to program and grant administrators that the plan's recommendations have been properly considered and approved by the governing authority and the jurisdiction's citizens; and
- It helps insure the continuity of mitigation programs and policies over time because elected officials, staff, and other community decision-makers can refer to the official document when making decisions about the community's future.

Source: FEMA . August 2003. "How to Series"-
Bringing the Plan to Life (FEMA 386-4).

Following receipt of FEMA's "Approval Pending Adoption" the Town / Village Board will pass a resolution, approving the final plan document. A certified copy of the Town / Village Board resolution adopting the plan will be submitted FEMA and the New York State Hazard Mitigation Officer (SHMO). FEMA will then provide a letter to the Town / Village indicating final acceptance of the plan.

Introduction

The Town / Village of Harrison recognized the need and importance of a multi-hazard mitigation plan and initiated its development. The Town / Village contracted with Dolph Rotfeld Engineering P.C. (DRE) to facilitate and develop the plan. DRE's role was to:

- Assist in establishing a hazard mitigation planning committee (HMPC) as defined by regulations in the Disaster Mitigation Act of 2000 (DMA),
- Meet the DMA requirements as established by federal regulations and following the Federal Emergency Management Agency's (FEMA) planning guidance,
- Facilitate the entire planning process,
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assist in facilitating the public input process,
- Produce the draft and final plan documents, and Coordinate the New York State Emergency Management Office and FEMA Region II plan reviews.

Local Government Participation

The first order of business was to establish the Hazard Mitigation Planning Committee. The committee was established using the guidance provided in FEMA publication 386-1, Getting Started: Building Support for Mitigation Planning. The DMA planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Detail areas within the planning area where the risk differs from that facing the entire area
- Identify specific projects to be eligible for funding,
- Have the governing board formally adopt the plan
- Fully participate in the process

For the Town / Village of Harrison HMPC members, "participation" meant:

- Attending and participating in the HMPC meetings
- Providing available data requested of the HMPC
- Reviewing and providing comments on the plan drafts
- Advertising, coordinating, and participating in the public input process
- Coordinating the formal adoption of the plan by the governing board(s)

The Planning Process

DRE established the planning process for the Town / Village of Harrison plan using the DMA planning requirements and FEMA's associated guidance. This guidance is structured around a

four-phase process which indicates the order in which individual chapters of the plan were developed

- 1) Organize Resources
- 2) Assess Risks
- 3) Develop the Mitigation Plan
- 4) Implement the Plan and Monitor Progress

Table 3-1 FEMA's Expanded four-phase process.

FEMA's 4-Phase Process	Expanded Process
1) Organize Resources 201.6(c)(1) 201.6(b)(1) 201.6(b)(2) and (3)	1)Organize the Planning Effort 2) Involve the Public 3) Coordinate with Other Departments and Agencies
2) Assess Risks 201.6(c)(2)(i) 201.6(c)(2)(ii)	4)Identify the Hazards 5) Assess the Risks
3) Develop the Mitigation Plan 201.6(c)(3)(i) 201.6(c)(3)(ii) 201.6(c)(3)(iii)	6) Set Goals 7) Review Possible Activities 8) Draft an Action Plan
4) Implement the Plan and Monitor Progress 201.6(c)(5) 201.6(c)(4)	9) Adopt the Plan 10) Implement, Evaluate, and Revise the Plan

Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With the Town / Village of Harrison's commitment to participate in the DMA planning process, DRE worked with the Town / Village HMPC Committee Chairman to establish the framework and organization for development of the plan. The HMPC, which was comprised of key Town / Village staff and other local government and stakeholder representatives, developed the plan with leadership from the Town / Village Planner and facilitation by DRE. The list of participating HMPC participants / municipal agencies included:

- Assessor
- Attorney
- Comptroller
- Facilities and Asset Management
- Fire / Rescue / EMS
- Information Technology/Geographic Information Systems
- Planning
- Police Department

- Public Works
- Supervisor and Town Board
- Board of Education
- Neighborhood Representatives and business community

Other Government and Stakeholder Representatives:

- FEMA Region II
- New York State Emergency Management Office
- Westchester County Office of Emergency Management
- Westchester Joint Water Works

A full list of participants is available in Appendix F: Hazard Mitigation Planning Committee Members

The planning process officially began on May 6, 2008, with a kick-off meeting in at Town / Village Hall. The meeting covered the scope of work and an introduction to the DMA requirements along with the anticipated level of participation of all member agencies. The HMPC met several times during the planning period and 4 public meetings were held. The purpose and outcomes of these meetings is described in Table 3.2

Table 3-2 Hazard Mitigation Planning Committee Schedule and Topics

HMPC/ Public Meeting	Meeting Topic	Meeting Date
1.	Kick-off meeting, introduction to the DMA, the planning process, presentation by NYSEMO, discussion, question and answer	May 6, 2008
2.	Public meeting of Town Board to discuss plan, chairman appointment and establishment of Hazard Mitigation Planning Committee	May 15, 2008*
3.	Compilation of time for matching costs, identification of Hazards using Guidance from FEMA Document 386-1	June 18, 2008
4.	Consultant report on list of Hazards to be assessed, public participation process and individual elements	July 9, 2008
5.	Finalize list of hazards. Begin assessment of identified hazards	October 22, 2008
6.	Risk Assessment and Mitigation Strategies	March 24, 2009
7.	Review preliminary draft by Committee and Public	May 11, 2009*
8.	Presentation of final draft at Town Board meeting	September 17, 2009*
9.	Final draft at Town Board meeting and Council Adoption	October 1, 2009*

* evening public meetings

A series of additional meetings were held between the Consultant and the Town Offices to gather local information pertinent to the preparation of the plan. Dates and subject matter are included in Table H.

Agendas and minutes for each of the meetings are shown in Appendix H and are on file with the Town / Village of Harrison Department of Public Works.

Planning Step 2: Involve the Public

At the third meeting, the HMPC discussed options for public involvement and agreed to an approach using established public information mechanisms and resources within the community. Public involvement activities included an announcement at the September 2008 Town/Village Board meeting that funding had been received for the development of the Town/Village's Hazard Mitigation Plan, that a committee had been established to prepare the plan document and that the public would be invited to participate and have input to the process. A questionnaire, for residences and businesses was prepared based on information provided in FEMA 386-1, "Getting Started, Building Support for Mitigation Planning". The questionnaire was placed on the Town/Villages website on October 27, 2008 and remained on the website until January 31, 2009. One Hundred thirty five (135) individuals completed and submitted the questionnaire. Public comments from the questionnaire were compiled and made available to the HMPC and are shown in Appendix D. Where appropriate, additional stakeholder and public comments from the questionnaire were incorporated into the final plan, Section 6, Mitigation Strategies. A summary of stakeholder and public comments received as part of the questionnaire and if where appropriate included in the plan, are shown in Appendix I. A letter was sent by the Supervisor/Mayor to all residents and businesses on November 21, 2008 announcing the Town / Villages development of the Hazard Mitigation Plan, soliciting comments and inviting participation in the process and requesting the completion of the questionnaire which was available at Town/Village Hall or on line. A public meeting with the HMPC Committee was held on May 11, 2009 for the purpose of presenting a preliminary draft to the public with time for questions and input. Copies of the preliminary draft were available for distribution. No individual members of the public attended with the exception of those representing the hamlets and neighborhood group who served on the HMPC Committee. Other than the additional stakeholder and public comments made in the questionnaire (thirty-two) and those provided by the hamlet and neighborhood representatives on the HMPC at the Committee meetings, no additional stakeholder or public comments were received.

The public agenda of the Town/Village Board meeting held on September 17, 2009, included the notice that the Draft Multi-Hazard Mitigation Plan would be presented and invited the public to comment. A presentation of the overall Hazard Mitigation Planning concept was made by the consultant to the Town / Village Board and those present. Comments were solicited and none were received.

The draft document was posted on the Town/Village website on September 21, 2009 and the public was invited to comment on the draft. A hard copy of the draft plan is available for review at the Town/Village of Harrison Department of Public Works, 1 Heineman Place, Harrison, New York 10528. The plan is available online at <http://www.town.harrison.ny.us/HHMP/whatsnews.aspx>. The draft document remained available to the public for comment until October 22, 2009. No

comments were received and the draft was then forwarded to the New York State Emergency Management Office for their initial review.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the HMPC determined that data collection, mitigation strategy development, and plan approval would be greatly enhanced by inviting state and federal agencies and organizations to participate in the process. Based on their involvement in hazard mitigation planning, their landowner / proximity to the Town / Village, and/or their interest as a neighboring jurisdiction, representatives from the following agencies were sent a letter by the Mayor on November 6, 2008, announcing the start of the Hazard Mitigation Plan Development process and inviting them to participate.

- New York State Department of Environmental Conservation
- New York State Department of Transportation
- New York State Thruway Authority
- City of Rye
- Village of Rye Brook
- Village of Mamaroneck
- Village of Scarsdale
- City of White Plains

In addition to those listed above, the HMPC used technical data, maps, reports, and studies from the following agencies and groups. The HMPC obtained this information either through the respective agency websites or directly from the organization.

- FEMA HAZUS MH
- National Oceanic and Atmospheric Administration
- U.S. Geological Survey
- Westchester County Department of Planning

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this plan. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability from natural hazards. The Town / Village of Harrison uses a variety of comprehensive planning mechanisms, such as a master plan, an emergency response plan, and municipal policies, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this multi-hazard mitigation plan establishes a credible and comprehensive plan that ties into and supports other community programs. The development of this plan incorporated where appropriate, information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

- Town / Village of Harrison Master Plan
- Town / Village of Harrison Stormwater Management Plan
- US Army Corps of Engineers Section 905(B) Reconnaissance Study, Westchester County Streams, Westchester County, New York and Fairfield County, New York, July 2008 Final
- Town / Village of Harrison Zoning Regulations
- Town / Village of Harrison Planning Regulations
- Town / Village of Harrison Municipal Code
- Town / Village of Harrison Emergency Response Plan
- City of Rye, New York Hazard Mitigation Plan

A complete listing of documents utilized in the preparation of this plan, agency which produced the documentation, as well as the format of the documentation (hard copy or website) is shown in Appendix G.

Phase 2: Assess Risks

Planning Steps 4 and 5: Identify the Hazards and Assess the Risks

DRE led the HMPC in an exhaustive research effort to identify and document all the natural hazards that have, or could, impact the municipality. Data collection worksheets taken from FEMA Guidance document 386-1 were used in this effort to aid in determining hazards and vulnerabilities and where risk varies across the planning area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities. The HMPC also conducted a capability assessment to review and document the municipalities current capabilities to mitigate risk and vulnerability from natural hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC can assess those activities and

measures already in place that contribute to mitigating some of the risks and vulnerabilities previously identified. DRE produced two drafts during these planning steps for the HMPC to review in advance of the mitigation planning goals and strategy meetings. The first draft contained the hazard identification. The second draft included the entire risk assessment, containing the hazard identification, the vulnerability assessment, and capability assessment. A more detailed description of the risk assessment process and the results are included in Section 5: Risk Assessment.

Phase 3: Develop the Mitigation Plan

Planning Steps 6 and 7: Set Goals and Review Possible Activities

DRE facilitated brainstorming and discussion sessions with the HMPC that described the purpose and the process of developing planning goals and objectives, a comprehensive range of mitigation

alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Section 6: Mitigation Strategy.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, DRE produced a complete first draft of the plan. This complete draft was posted for HMPC review and comment on the web site. Other agencies were invited to comment on this draft as well. HMPC and agency comments were integrated into the second draft, which was advertised and distributed to collect public input and comments. DRE integrated comments and issues from the public, as appropriate, along with any additional internal review comments and produced a final draft for the New York State Emergency Management Office and FEMA to review and approve, contingent on final adoption by the Town / Village Board.

Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the plan, it was approved by the Town / Village Board of Trustees in a draft format on September 17, 2009. A copy of the adoption resolution is included in Appendix A: Plan Adoption. Once the adoption is complete, formal approval by NYSEMO and FEMA can proceed. A copy of the Hazard Mitigation Plan is on file at Town Hall in the Department of Public Works, 1 Heineman Place, Harrison, New York and is posted on the Town website at <http://www.town.harrison.ny.us/HHMP/whatsnews.aspx>

Planning Step 10: Implement, Evaluate, and Revise the Plan

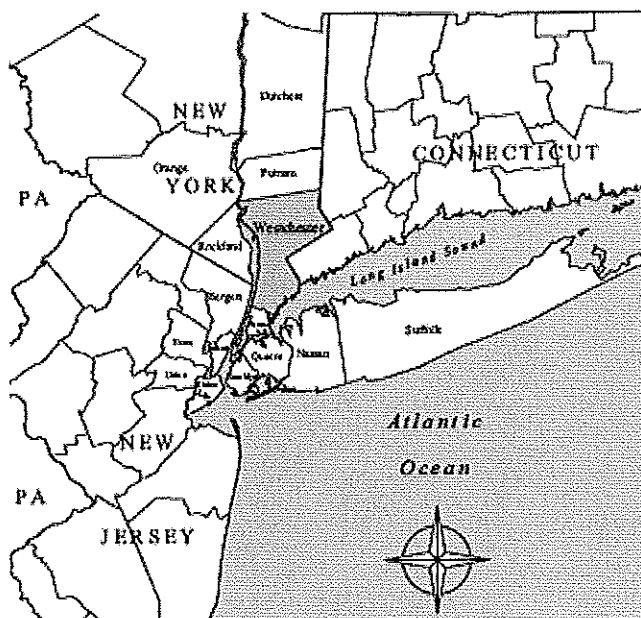
The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Section 7: Plan Maintenance Procedures.

Finally, there are numerous organizations within the Town / Village whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is paramount to the ongoing success of this plan and mitigation in the Town / Village of Harrison and is addressed further in Section 6. A plan update and maintenance schedule and a strategy for continued public involvement are also included in Section 7.

Overview

The Town/Village of Harrison is located in the east-central portion of Westchester County in New York State, approximately 23 miles north of New York City. Figure 4-1 shows Westchester County's location in the region. The Town is bordered to the west by the City of White Plains (the county seat and regional business center), to the north by the Town of North Castle, to the east by the Village of Rye Brook, and to the south by the City of Rye. The Town and Village of Mamaroneck are located to the south west of the Town. Figure 4-2 shows the Town's location and its geographic relationship to other municipalities in the County. The Town's latitude and longitude are: 40°58'8"N, 73°42'47"W (40.9688889, -73.7130556).

Figure 4-1 Regional Location



Source: Westchester County Data Book 2008

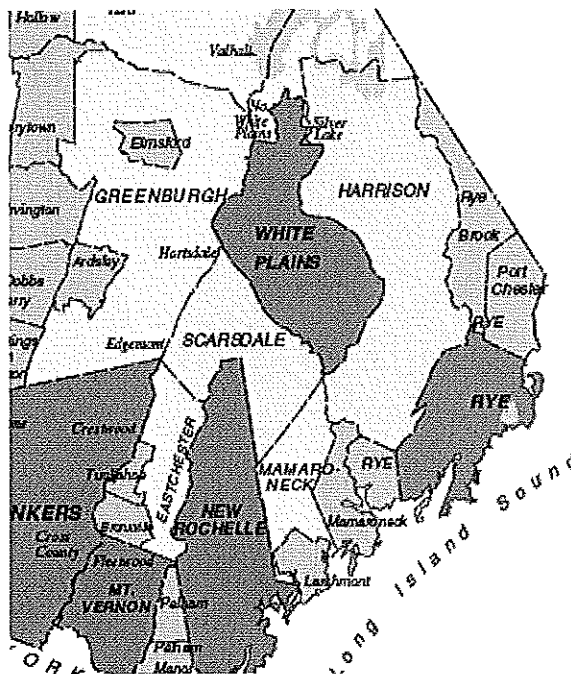
The Town is 17 square miles or approximately 11,000 acres in size. It is one of the largest in terms of land area in the central and south portions of the County and has one of the lowest population densities – 1340 people per square mile as compared to an average of 3,134 people/square mile in nearby communities. At the time of the last U. S. Census in 2000, the Town had a population of 24,154 which represented a 4% growth in the 10 years since the Census was conducted in 1990. Recently released Census Bureau figures, estimates the Town's 2007 population at 26,504, a 9.9% increase from 2000.

The Town has a suburban character and is known both for its high quality residential neighborhoods as well as major national companies and corporate office complexes. Located on opposite ends of the Town are two long time, established hamlet centers, downtown Harrison in the south and Silver Lake in the north. Areas of small lot single and two-family homes and a few low scale garden apartments adjoin these areas. In between these hamlet centers are expansive neighborhoods of primarily large lot and expensive single family homes. The estate area of Purchase has been the location of new subdivisions and luxury residences in recent years. This area is also the location of the corporate

headquarters of PepsiCo and Mastercard, the campuses of two major colleges, Manhattanville College and the State University of New York at Purchase, the Performing Arts Center and the Newburger Museum. Several country clubs and golf courses are located in this area as well as in other sections of the Town.

The Town's central location made it easily accessible to one of the northeast corridor's major regional transportation networks including state and federal highways and parkways (the New England Thruway/I-95, I-684, the Cross Westchester Expressway/I-287, and the Hutchinson River Parkway), the New Haven line of the Metro-North Railroad, and the Westchester County Airport. The combination of this transportation system and the demand, starting in the late 1960's-early 1970's, for more office space to house businesses that originally sought room to expand out of New York City, resulted in the development of large areas of corporate office complexes along the I-287/Cross Westchester Expressway along the Town's border with White Plains which became known as the Platinum Mile. These office complexes and accompanying service industries resulted in the development of new and expensive single family homes in the Purchase and southern Harrison neighborhoods.

Figure 4-2 Harrison and Surrounding Communities



Source: Westchester County Data Book, 2008

Water is a dominant topographic feature in the Town. Located in the upper reach of the Lower Long Island Sound drainage basin, there are approximately 36 miles of watercourses throughout the Town as well as lakes, ponds, and wetland systems. Areas adjacent to the Blind Brook, branches of the Mamaroneck River, Beaver Swamp Brook, and Brentwood Brook/Beaver Swamp Brook West are located within the 100 and 500 year floodplain. There are also many areas of steep slopes (15% or more) and rocky terrain located throughout the Town.

Historically in Westchester County, the location of the early rail lines, parkways, downtowns, neighborhoods and business areas were built on the flat, low lying floodplains and wetlands which adjoin local rivers, streams and watercourses. This is also true for the Town of Harrison where neighborhoods and businesses in these floodplains, particularly in downtown Harrison, have been subject to repeated, severe flooding as the result of storms during the past 50 years.

Environmental Setting

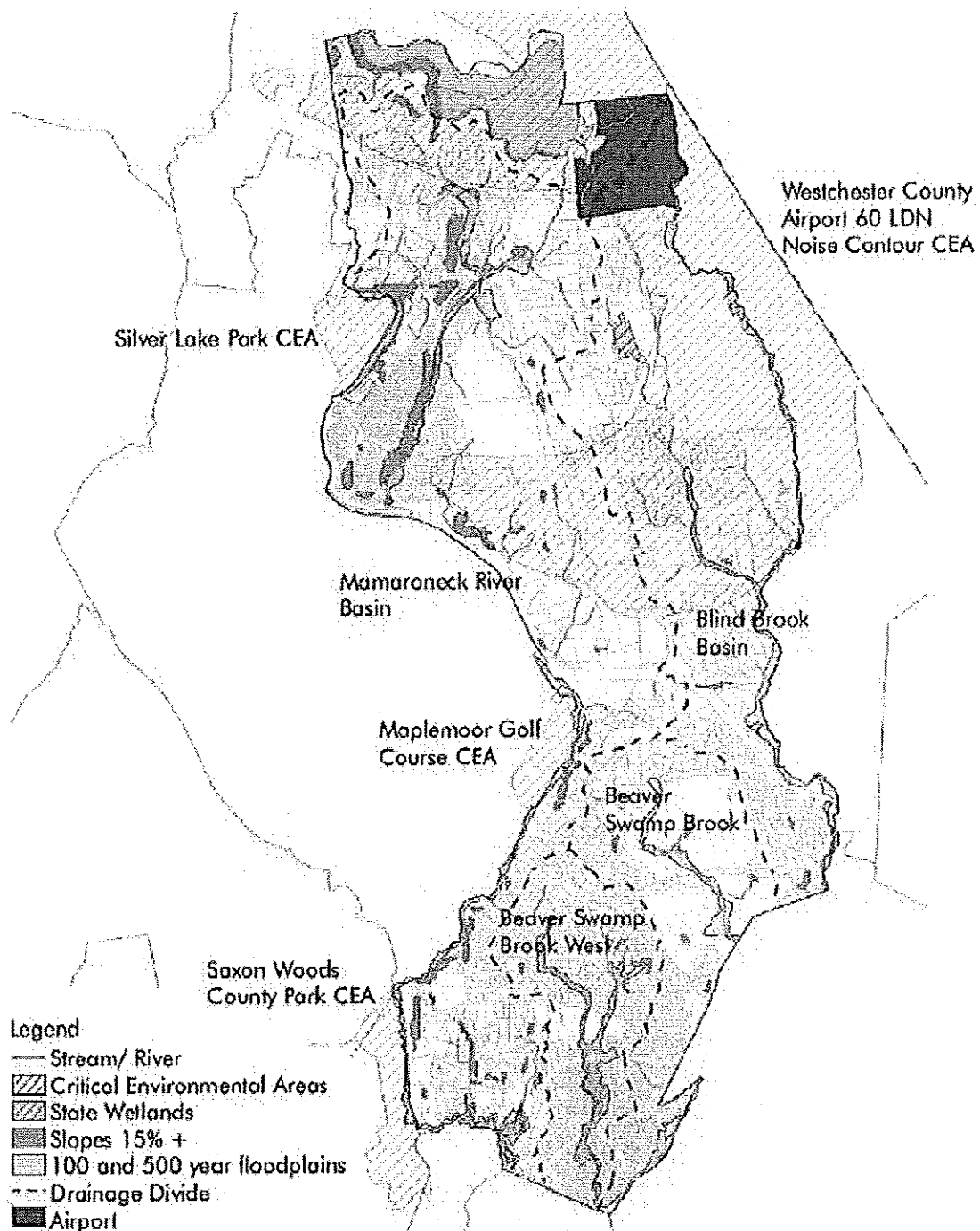
The Town is located in the Hudson Valley climate division of New York State. The seasonal temperature is typical of the northeastern United States with cold winters, mild springs, hot summers, and mild falls. The average temperature in January is about 31 degrees F. and 77 degrees F. in July. Average rainfall in Westchester County is 45-50 inches per year. Average county snow fall is 28-30 inches per year.

A major ridge line runs from Rye Lake in the north through downtown Harrison to the south that separates the Mamaroneck River drainage basin from the Blind Brook, Beaver Swamp, and Brentwood Brook watershed drainage basins. According to the Town's 2006 Comprehensive Plan Update Draft there are many areas of steep slopes (15% or more) located throughout the Town which have become subject to development. Many of these areas are located in the Purchase and Park Lane areas. Watercourses and waterbodies flow through and drain Harrison eventually making their way south through the City of Rye and Village of Mamaroneck to the Long Island Sound, a federally designated estuary of national significance. Within the Town/Village there are four major subwatersheds: the Mamaroneck River, Blind Brook, Beaver Swamp Brook, and Brentwood Brook/Beaver Swamp Brook West. A small portion of the northerly section of Town drains to the Kensico Reservoir, a New York City drinking water supply reservoir which serves Westchester County as well as New York City.

Areas within the FEMA designated 100 and 500 year flood plain for these four major drainage basins has been the location of severe and recurring flooding during storm events. Areas around the Beaver Swamp Brook and Brentwood Brook/Beaver Swamp Brook West have been especially hard hit in recent years. A number of studies have been initiated by the Town as well as other agencies in order to identify impediments and recommend structural and non-structural solutions. The Town has also undertaken several flood control projects in order to help alleviate problems along the Beaver Swamp Brook. Recent reports include an October, 2007 Reconnaissance Study Site Visit and Report by the US Army Corps of Engineers that focused on areas along Beaver Swamp Brook, Brentwood Brook and the Mamaroneck River impacted by the storms in the spring of 2007. In March 2008, a Beaver Swamp Brook Impact Analysis was prepared for the Town by Leonard Jackson Associates. That report is still under review and recommends several stream channel projects in Harrison as well as downstream in the Village of Mamaroneck.

Although the primary purpose was not flooding, the Town has participated in and endorsed two intermunicipal watershed plans for the Long Island Sound known as WAC #3 and WAC #4. These plans were coordinated by Westchester County in 1997-1998 with the objective of controlling non-point source water quality pollution through structural and non-structural means. This provided a good basis for the Town's preparation of a multi-faceted stormwater pollution prevention plan to comply with the federally mandated MS4 stormwater management regulations.

Figure 4-3 Environmental Features



Source: Town/Village of Harrison Comprehensive Plan 2006 Draft, BFJ Planning

All or a portion of five NYS designated wetlands (12.4 acre minimum) are located in the Town. Many smaller sized wetlands areas are also located throughout the Town and are regulated by a local wetlands ordinance. Many ponds and lakes of varying sizes are located throughout the town. The largest include Forrest Lake, Silver Lake, Spring Lake, and Croker Lake.

Figure 4-3 identifies major environmental features.

Demographics

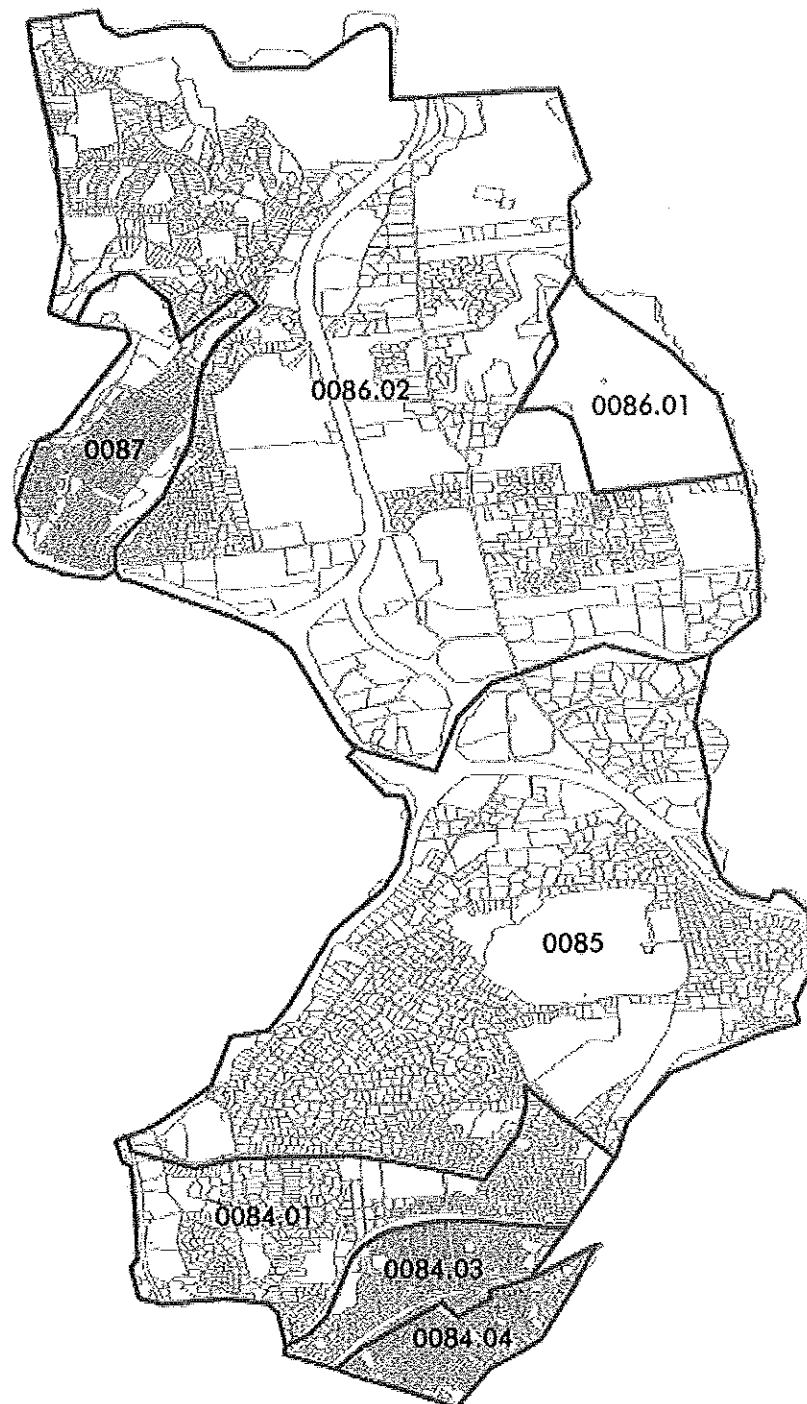
According to the 2000 U.S. Census, the Town had a total population of 24,154. This represented a 4% increase in population (846 people) from the 1990 census (23,308). In July, 2007, the Town's population was estimated to be 26,504 by the U.S. Census Bureau's American Community Survey (ACS). This would mean that in the 7 years since the last Census was conducted, the Town's population continued to increase, this time by 9.7% (+566 persons). By comparison Westchester County as a whole grew 6% between 1990 and 2000, and an additional 3% between 2000 and 2007.

It should be noted that Harrison along with several other municipalities in Westchester have questioned the 2000 census population figures as well as the current estimate as being too high. This could be due, in part, to the fact that the sample data used by the Census Bureau's ACS uses a variety of factors on a national scale that may not be relevant at the county or local level. As a result there is a 10% chance that the true statistic lays outside the Bureau's margin of error. For the purposes of the Hazard Mitigation Plan (HMP), the Town is using FEMA's HAZUS-MH risk assessment software program which relies on 2000 Census data. During the course of the preparation of the risk assessment and its evaluation of the findings, the HMP planning committee determined that the use of 2000 Census figures did not result in any material differences in the magnitude and impact of the identified potential losses.

The Town's population is more affluent and better educated than the average for Westchester County. In 2000, the Town's median family income was \$98,167 as compared to \$79,881 for the County. Approximately 87% of Harrison residents graduated from high school or higher with 50.2% of those residents having a college degree. For all town residents 16 years of age and older, 61% were employed in 2000 with 78.4% working in private industry, 14.3% in government, and 6.2% self employed. The occupation of the town's labor force was as follows: 48.3% in management, professional and related; 12.8% in services; 27.5 in sales and office; 7% in construction, extraction, and maintenance; and 4.3% in production, transportation, and material moving.

Table 4-1 profiles selected demographic characteristics which provide useful information for the HMP. Because there are significant differences between areas of the Town due to historical settlement patterns and development trends, the profile provides a comparison of neighborhood planning areas and the Town as a whole. The neighborhood planning areas are those identified in the Town's 2006 Comprehensive Plan Update Draft: Downtown Harrison and Harrison Central Business District (CDB), Southern Harrison (the area south of the Hutchinson River Parkway and north of Downtown Harrison/CDB, Silver Lake-West Harrison and Park Lane, and Purchase. These areas generally correspond with six of the seven census tracts which cover the Town (note: Tract 86.01 is the State University at Purchase and no data is available from the 2000 Census). The location of these census tracts is shown in Figure 4-4.

Figure 4 – 4 Census Tracts and Neighborhood Planning Areas



Source: Town/Village of Harrison Comprehensive Plan 2006 Draft, BFJ Planning

**Table 4-1 Selected Demographic Characteristics by Census Tract
Town of Harrison and Neighborhood Planning Areas
Year 2000**

Data	Harrison Total	84.03 84.04 Downtown Harrison	84.01 85.00 Southern Harrison	86.02 Purchase	87.00 Silver Lake/W. Harrison & Park Lane
Population	24,154	8456	5658	4660	5380
% Population Change 1990-2000	4	6.4	6	39.5	5.6
Density (persons/sq.mile)	1388	9092	867	564	5868
% White alone	89.8	86.7	94.2	86.3	92.9
% Black or African American	1.4	0.6	0.9	4.7	0.5
% Asian Alone	5.4	9.5	3.3	4.6	2.0
% Hispanic (any race)	6.7	7.1	2.7	6.1	10.9
Median Age	37.2	37.8	41.1	23.8	37.6
% 1 Person Households	21.7	11.4	3.7	2.3	10.6
Median Family Income	\$98,167	\$78,615	\$179,752	\$166,492	\$69,375
% Making \$25,000 or less	14.4	18.3	7.6	6	18.7

Source: US Census Bureau

The Disaster Mitigation Act of 2000 (DMA 2000) requires that HMPs consider what are termed "socially vulnerable" populations. These populations can be more susceptible to hazard events, based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. This HMP considers three socially vulnerable population groups:

- seniors (persons over the age of 65);
- low-income (household annual income below \$25,000 a year); and
- language difficulties (limited or no ability to speak English).

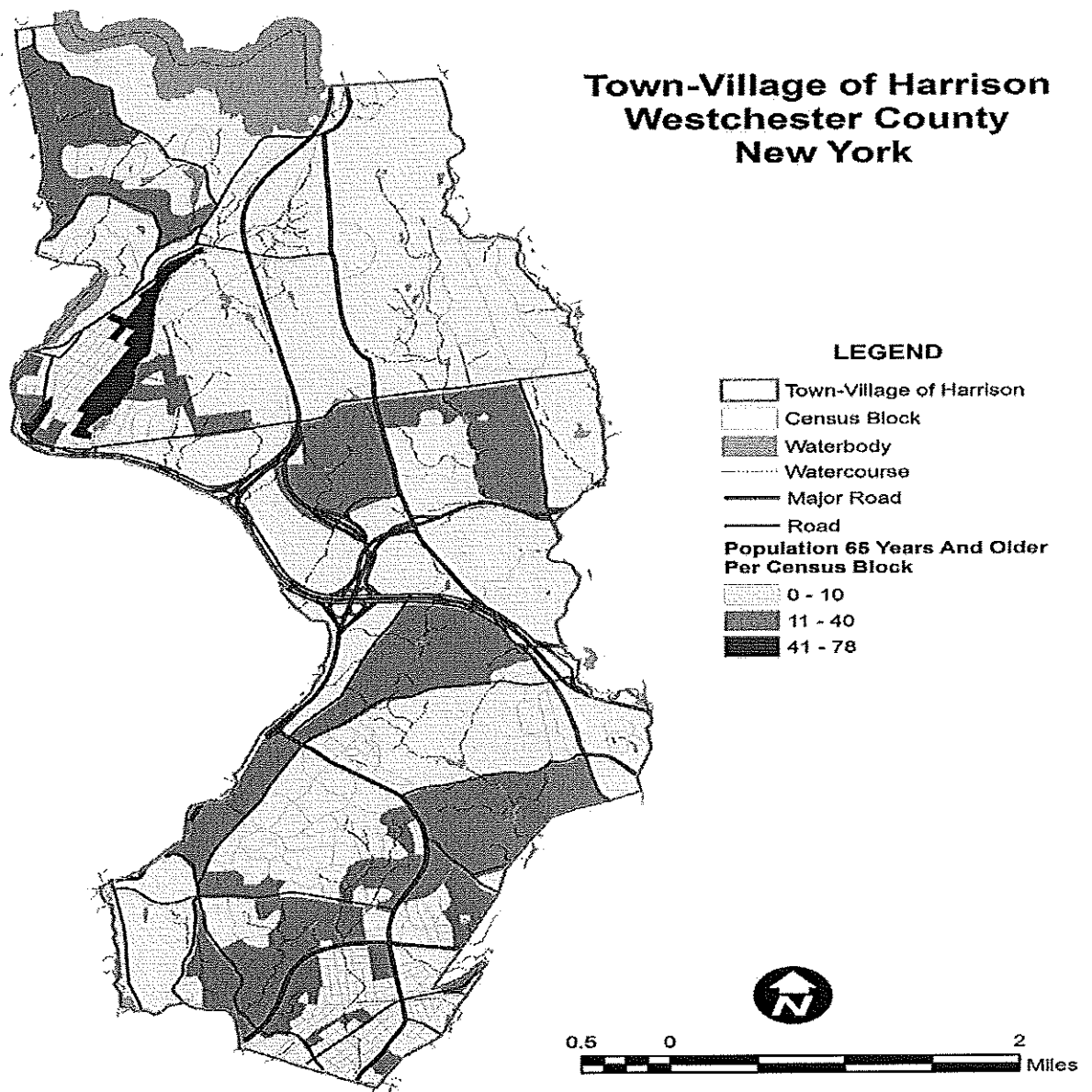
According to 2000 census, there were 3,537 Harrison residents age 65 years or older (14.6% of the total population). Of this number approximately 825 (9.8%) lived alone. The census estimated that 7.8% of these seniors had incomes below the poverty level in 1999.

The 2000 Census identified 1212 of the total 8389 households in Harrison or 14.4% as having an annual income of \$25,000 or less. The Census also found that 4.2% of family households had incomes below the 1999 Poverty Level.

The 2000 Census found that 11.3% (2545) of Harrison residents aged 5 years and over (22544) identified their ability to speak English as less than very well. Approximately 4.6% (1055) indicated that they spoke English "not well" or "not at all". There were 1414 individuals or 6.7% of total population in households that defined as "linguistically isolated". A linguistically isolated household is one in which no member 14 years old and over (1) speaks only English or (2) speaks a non-English language and speaks English "very well." In other words, all members 14 years old and over have at least some difficulty with English.

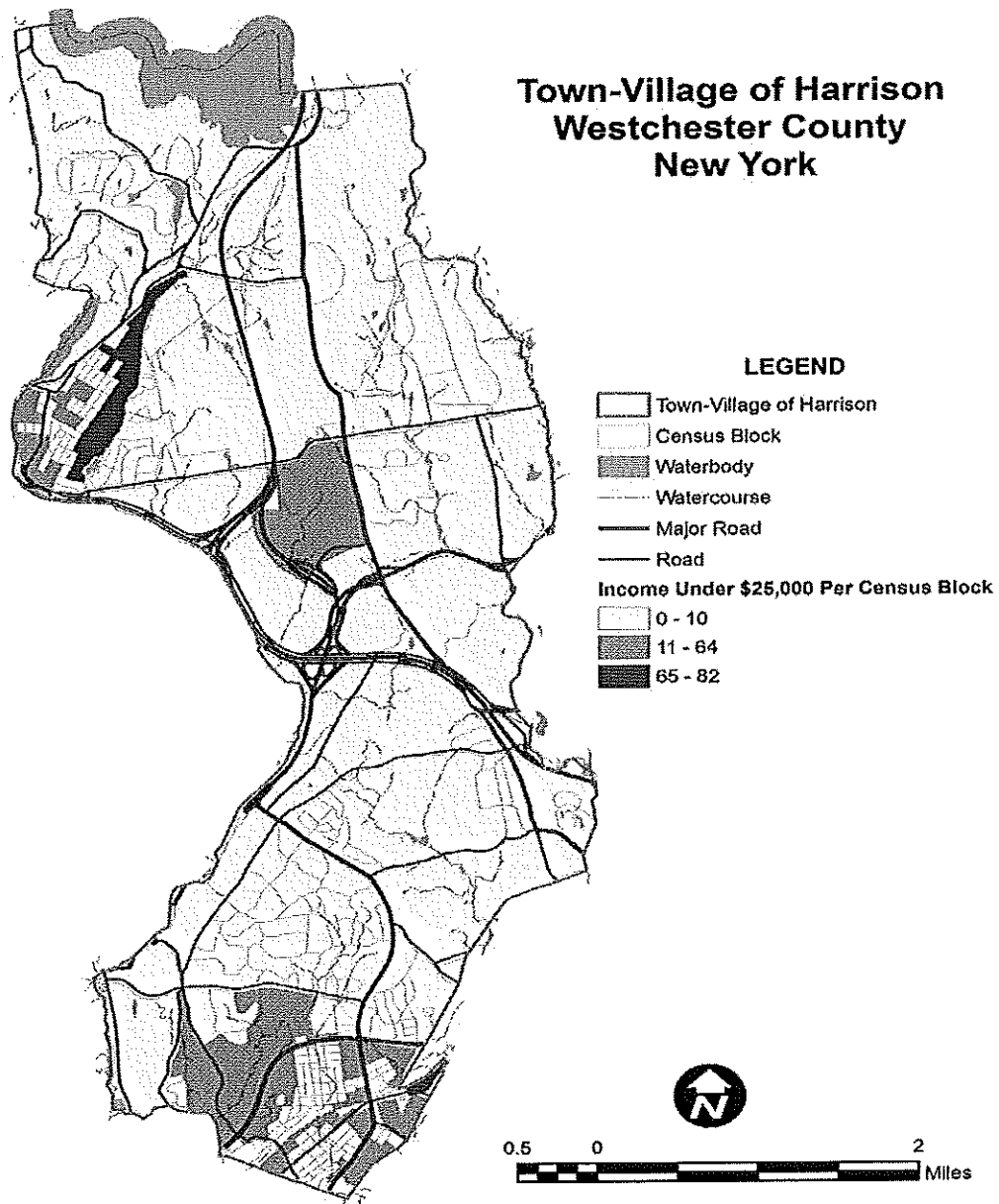
Figure 4-5 shows the distribution of Harrison residents age 65 or older while Figure 4-5 shows the distribution of low income persons. Figure 4-6 shows the distribution of Harrison residents identified as speaking English less than very well.

Figure 4-5 Distribution of Residents Age 65 or Older



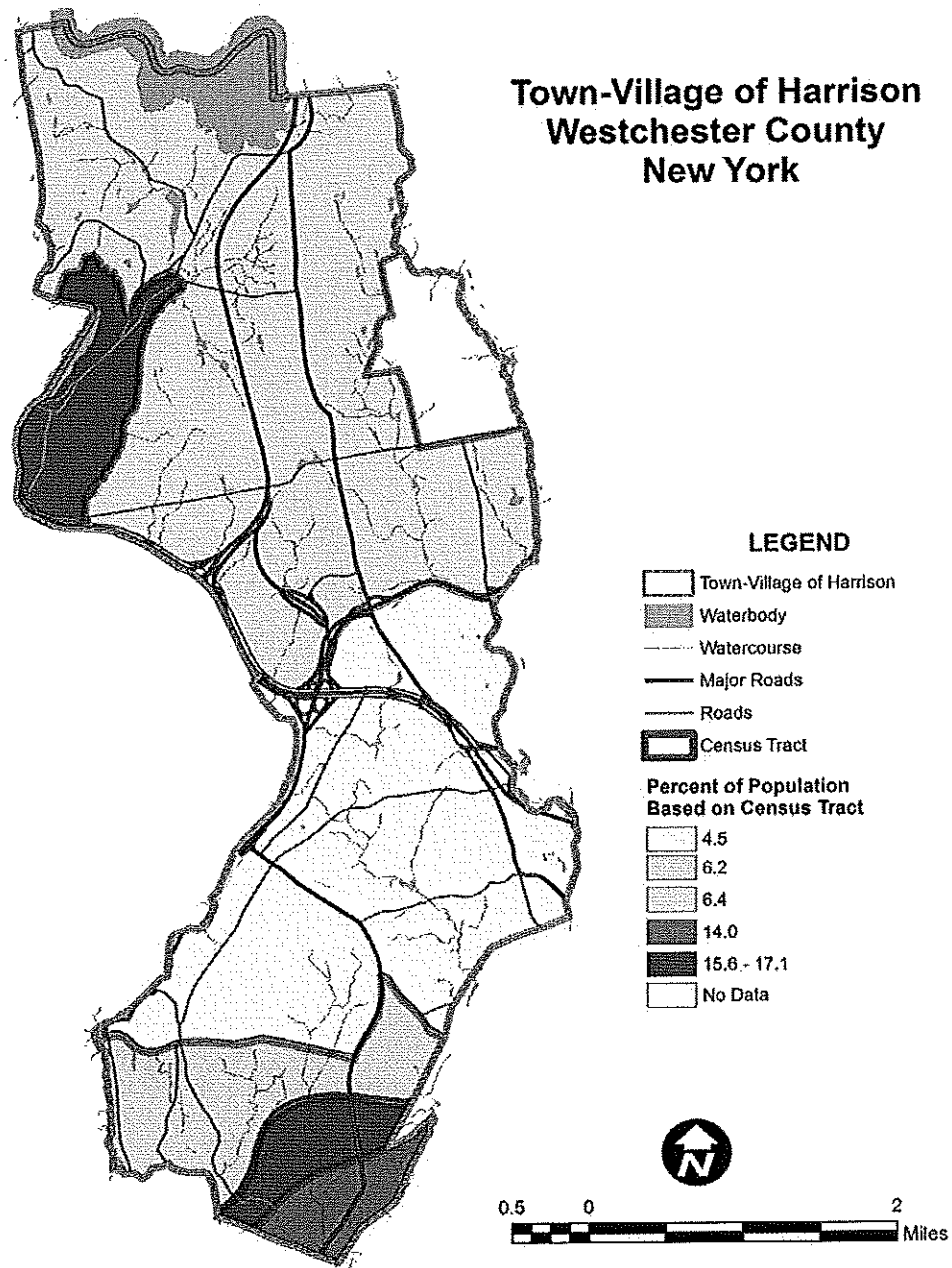
Source: US Census 2000; HAZUS-MH

Figure 4.6 Distribution of Residents with Annual Incomes of \$25,000 or Less



Source: US Census 2000; HAZUS MH

Figure 4-7 Distribution of Residents Who Speak English Less Than Very Well



Source: US Census 2000 Summary File 3 (SF-3) Sample Data

Housing

There were 8657 total housing units in the Town/Village in 2000 which represented an 8% increase (673 units) from 1990. Of these units 5,389 were owner occupied (64%) and 3,005 (36%) were occupied by renters. Approximately 56% of all housing units were single family (detached or attached).

Data provided by the US Census Bureau, New Residential Construction Statistics prepared by the Westchester County Department of Planning reveals that between 2000 and 2007, 564 residential building permits were issued in Harrison. A high of 117 permits were issued in 2002 followed by a steep drop off in succeeding years with 50 permits issued in 2007. This number may stay steady or decline further due to current local, regional and national economic conditions.

The age, type, value, and density of housing units can have important implications for hazard management planning. Table 4-2 highlights these characteristics.

**Table 4-2 Selected Housing Characteristics by Census Tracts
Town of Harrison and Neighborhood Planning Areas**

Housing	Harrison Total	84.03 84.04 Downtown Harrison	84.01 85.00 Southern Harrison	86.02 Purchase	87.00 Silver Lake/W. Harrison & Park Lane
Total Units	8657	3483	1909	1135	2130
Single Family (Detached or Attached) (% of Total Units)	4859 (56.1)	1358 (39)	1724 (90.3)	1062 (93.6)	715
2 Family (% of Total Units)	2064 (23.8)	977 (28.1)	84 (4.4)	23 (2)	980 (46)
20 or more units (% of Total Units)	539 (6.2)	426 (12.2)	67 (3.5)	29 (2.6)	17 (0.8)
Year Built : 1939 or Earlier (% of Total Units)	2518 (29.1)	1128 (32.4)	630 (33)	193 (17)	567 (26.6)
Year Built: 1990-2000 (% of Total Units)	639 (7.4)	138 (4)	108 (5.7)	269 (23.7)	124 (5.8)
Median Value (Owner Occupied)	\$578,000	\$369,000	\$900,000	\$711,500	\$360,600

Source: US Census Bureau 2000

Business and Commercial Uses

In 2006, Harrison was the location of over 1500 business establishments employing approximately 34,000. While approximately 57% of these businesses were small in size employing 4 or fewer employees, Harrison is also the home of the largest number of private employers in Westchester County with 500 or more employees. Major corporate office complexes were drawn to the Town because of its central location in the county with ready access to major highways, rail lines and the Westchester County Airport. Office parks are mainly found along the region's "Platinum Mile" (Cross

Westchester Expressway/I-287). The Purchase area is the long-time home of PepsiCo's national headquarters off of Anderson Hill Road. A major office complex is also located south of Manhattanville College off of Purchase Street where Mastercard, Inc. has its headquarters. A cluster of office buildings are also located in the southwest corner of the Town along Mamaroneck Avenue just south of the City of White Plains between the Hutchinson River Parkway and the New England Thruway. Table 4-3 is an inventory of major businesses and employment sites with 500 or more employees.

Table 4-3 Businesses & Employment Sites with 500 or More Employees, 2008

Company Name	Number of Employees	Specific Industry
Morgan Stanley	1,800	Security Brokers
Pepsi Co, Inc.	1,500	Bottled & Canned Soft Drinks
Journal News	800	Newspapers
Mastercard, Inc.	800	Short-term business credit institutions
Harrison Central School District	678	Elementary & Secondary Schools
Dansk International Designs	600	Other Miscellaneous nondurable goods
Diversified Investment Advisor	555	Pension, health & welfare funds
Citigroup	500	Short-term business credit institutions
Purchase College SUNY	500	Colleges, Universities & Professional Schools

Source: Westchester County Data Book 2006 & 2008

Office development is not only a major economic asset to the Town but is also important to the regional, State, and in some instances national economy as a whole. Office development is also a major land use in the Town with twenty five sites have buildings 100,000 square feet or more in size

Land Use

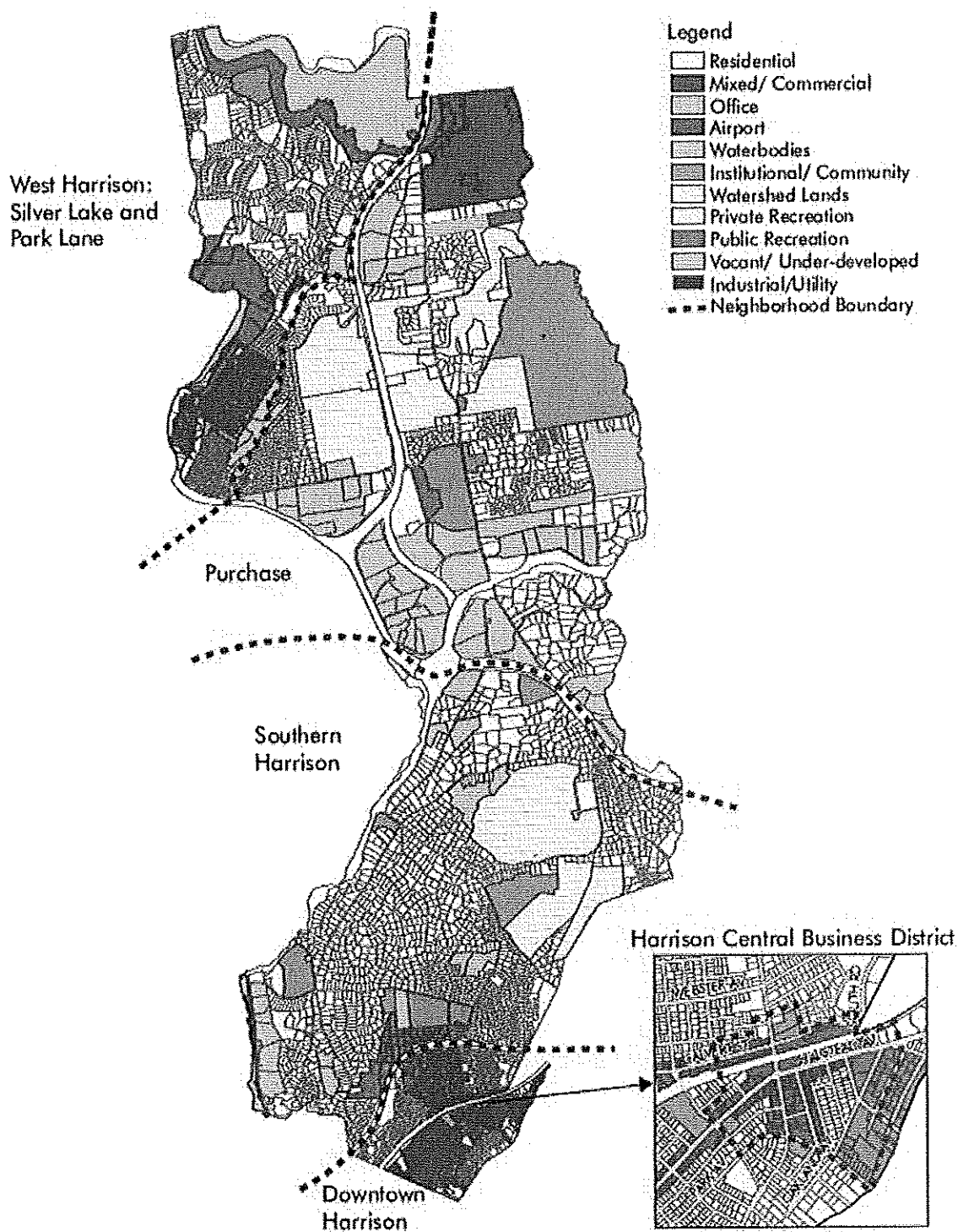
The Town/Village of Harrison prepared a Comprehensive Plan Draft that was released in 2006. The 2006 Plan Draft is still in process but it provides an overview of generalized land use patterns that is still germane to the hazard mitigation planning process. Much of the data and analysis included in that section of the Plan has been summarized below.

The Town contains approximately 11,136 acres. Generalized land uses fall into one of 9 categories as shown on Figure 4-8.

Residential

Residential land uses account for approximately 45% of all land in the Town. Of this amount, approximately 56% are single family dwellings although there is a range of housing types within that category. Most residential uses are predominately low density, with two or less dwelling units per acre comprising about 70% of the residential area. In recent years luxury large lot houses have been constructed in Purchase. What the Comprehensive Plan Update Draft 2006 terms "large lot suburban" is found throughout the town but predominates in southern Harrison. These homes were built generally in the 1950s. Smaller lot single family homes from the 1960s and 1970s are found throughout the

Figure 4-8 Land Use and Neighborhoods



Source: Town/Village of Harrison Comprehensive Plan 2006 Draft, BFJ Planning

Town but concentrated in the downtown Harrison and West Harrison-Silver Lake areas. Two family homes are also found mainly in downtown Harrison and West Harrison-Silver Lake. Residences over retail shops can be found in downtown Harrison and to a less extent in West Harrison-Silver Lake. Low scale garden apartments built in the 1960's can be found in West Harrison and downtown Harrison. Higher density (4-6 stories) multi-family family apartments are located in downtown Harrison. The small lot residential and higher density housing found in downtown Harrison and the central business district have been impacted by frequent natural hazard storm events and the severe flooding that often accompanies it.

Retail

Small scale retail centers primarily serving local residents are situated in downtown Harrison in the central business district and along Halstead Avenue, and in West Harrison-Silver Lake. A few isolated retail establishments can also be found on Anderson Hill Road. Some of the retail establishments in downtown Harrison have been subject to repeated flooding from storm events.

Office

In addition to the belt of commercial offices and office parks along Westchester's "Platinum Mile" north of the Cross Westchester Expressway/I-287, areas of office development are located on Mamaroneck Avenue just south of White Plains. Pepsico has its headquarters off Anderson Hill Road in Purchase. Some smaller office buildings are located in the downtown Harrison central business district as well as professional offices converted from residences around the CBD's perimeter.

Open Space and Recreation

Approximately 1604 acres are devoted to public or private open space and recreational uses. There are almost 82 acres of Town owned parks with Passidomo Park and pool in West Harrison-Silver Lake (48 acres), Veterans Memorial Park in southern Harrison (23 acres) and Bernie Guagnini Brentwood Park (3 acres) in downtown Harrison being the largest. There are six other smaller public parks and playgrounds scattered throughout the Town. The Sollazzo Recreation Center and Veterans Memorial Building in downtown Harrison, and Leo Mintzer Community Center in West Harrison-Silver Lake provide a variety of recreational activities for residents. Seven private country clubs comprising approximately 1200 acres are located in whole or part in the Town.

Institutional

Institutional uses include six public and three private elementary and secondary schools; St. Vincent's, a 43 acre private psychiatric hospital; two colleges, Manhattanville and the State University of New York at Purchase; and the Newburger Museum and Performing Arts Center, both on the SUNY campus.

Vacant

Vacant land accounts for almost 6% of all land uses. Vacant land is primarily situated in northern Harrison and includes the remains of large estates in the Purchase area, and areas with severe natural constraints in West Harrison.

A breakdown of the approximate 11,136 acres of the major land use categories is shown in Table 4-4.

Table 4-4 – Generalized Land Use 2006

Use	Approximate Acres	Percent
Residential	4,989	44.8
Commercial, Retail & Office	809	7.3
Institutional/Recreation & Open Space	2,338	21.0
Airport	327	2.9
Vacant	637	5.7
Circulation	1,479	13.3
Water Supply	164	1.5
Cemetery	20	0.2
Waterbodies	373	3.3
Total	11,136	100.0

Source: Town/Village of Harrison Comprehensive Plan 2006 Draft, BFJ Planning

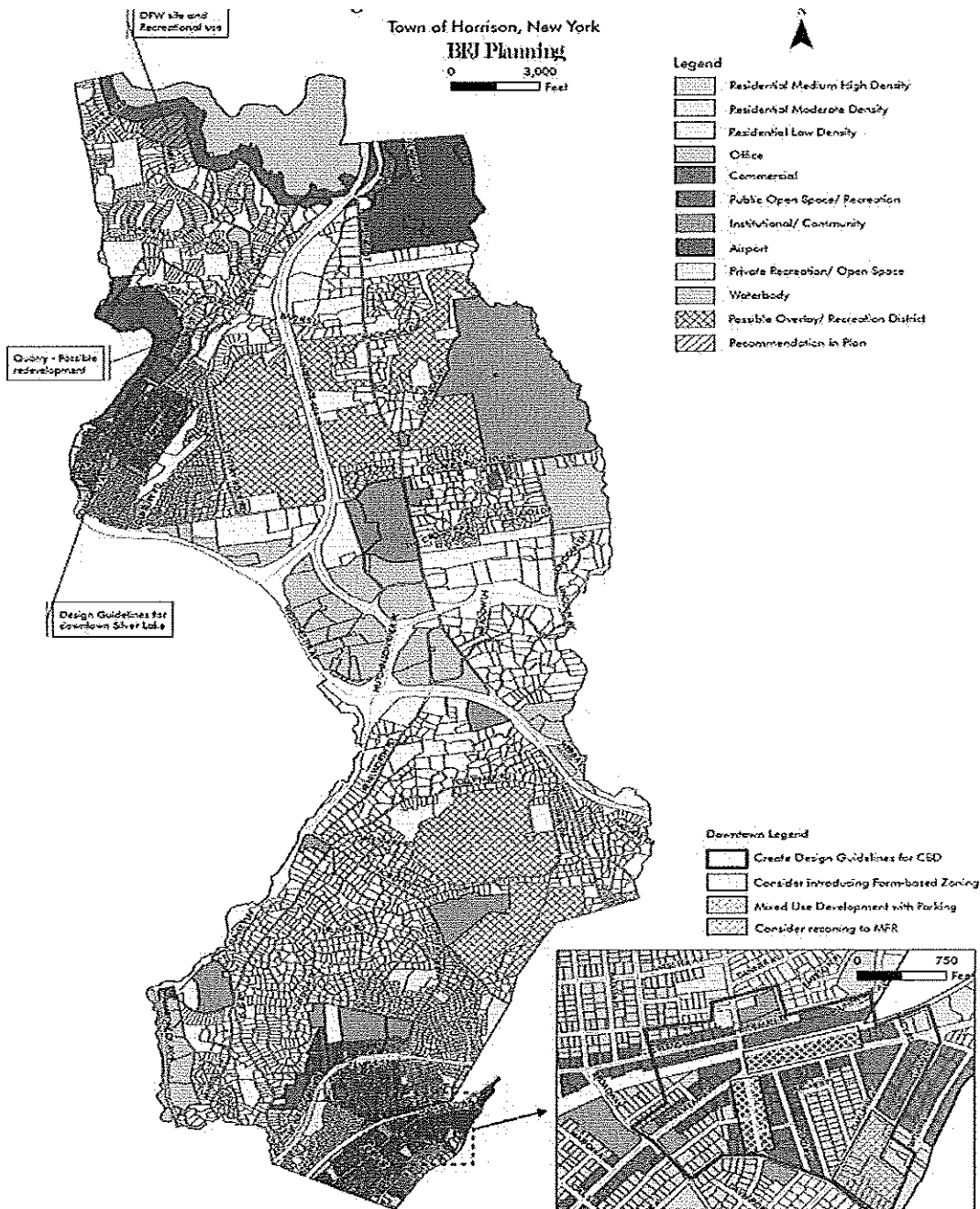
Zoning

There are 19 zoning districts in the Town. These include seven single family residence districts ranging from in size from 5000 square foot minimum lot size to large lot estates with a minimum 2.5 acre lot size; one two family residence district; one garden apartment zone; and two multi-family districts. There are eight commercial districts including four SB zones for commercial and corporate offices (5-100 acre minimum lot size), and four zones with no minimum lot size for neighborhood, central business district and professional business uses.

Future Development

The Town/Village's 2006 Comprehensive Plan 2006 Draft examined land use trends and identified properties and areas with future development potential. A copy of the future land use plan prepared as part of the plan is shown in Figure 4-9.

Figure 4-9 Future Land Use



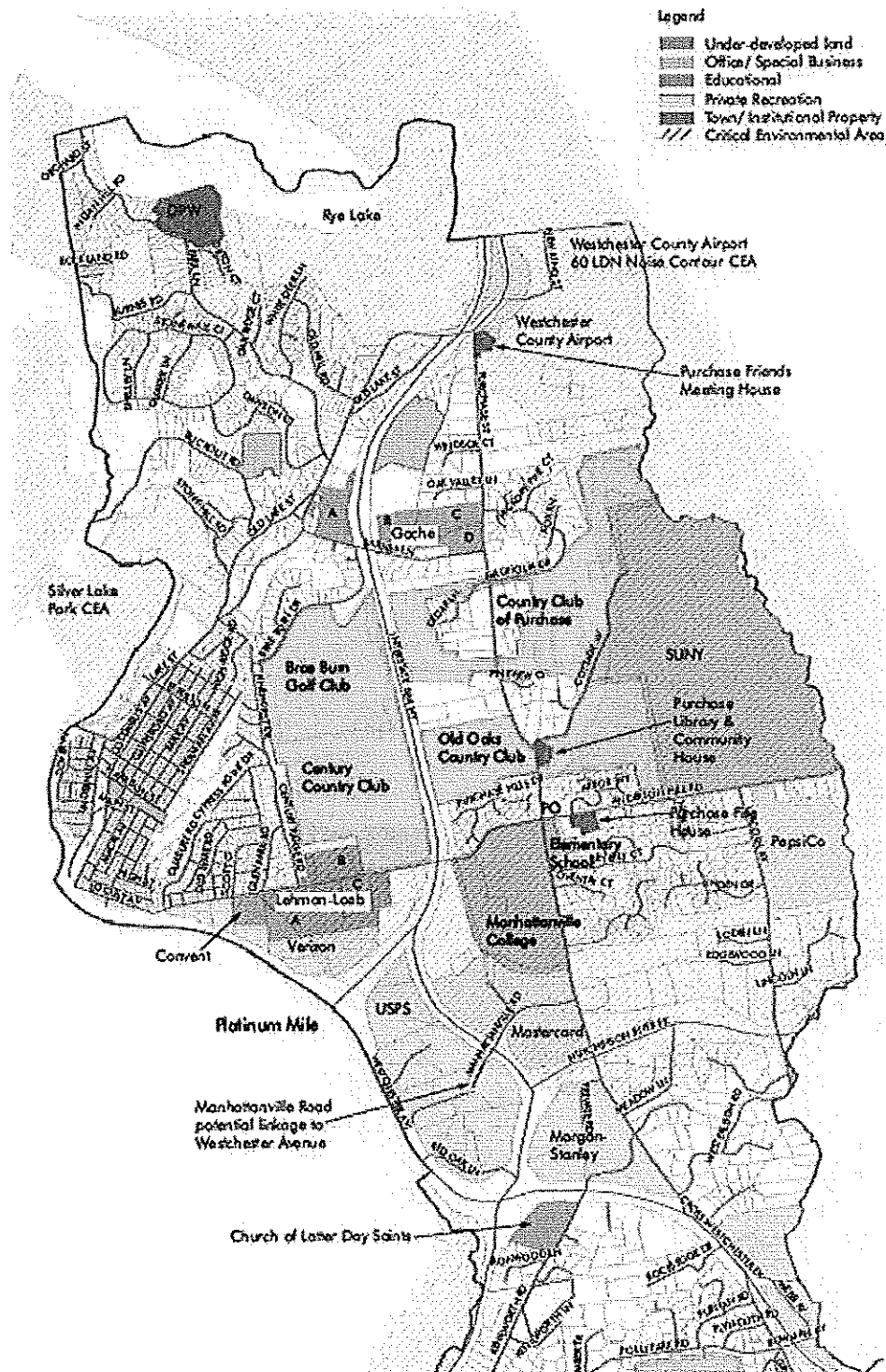
Source: Town/Village of Harrison Comprehensive Plan 2006 Draft, BRJ Planning

This information was reviewed with the Town Planner and the Planning Committee. The following are some of the future areas that could be the subject of new or redevelopment proposals.

1. Lake Street Quarry and stoneyard is located on Lake Street south of Barnes Lane just north of the Silver Lake business area. It has been in operation since the 1920's but is a non-conforming use in a one-acre single family residential zone. In recent years there has been talk of the owner selling the property or proposing a new use. The Comprehensive Plan Update Draft recommends that any new use be in keeping with the low density residential character of the surrounding area although the barren and exposed condition of the site might not make it attractive for a residential use.
2. The 33 acre former Nike Base is located in the northwest corner of the Town off of Park Lane. It is Town owned. Future plans call for 11 acres of the site to continue to be used for Town DPW facilities including the water supply facilities now operated by the Westchester Joint Water Works, and a fire training center. The remaining 22 acres will be reserved for Town recreational uses which are yet to be determined.
3. There are seven private golf clubs located throughout the town which if ever developed under existing single family zoning could have a major impact on surrounding neighborhoods and infrastructure. The Comprehensive Plan Update Draft recommends the possibility of a recreation overlay zone in order to protect the low density and open space uses of these properties.
4. Some estates and large tracts of land remain in the Purchase area. These properties have significant development potential, covering almost 189 acres which could result in the construction of approximately 161 homes under the current single family residential zoning (see Figure 4-10).
5. Manhattanville College has plans to construct its first new major academic building in 40 years, the 30,586 square foot Student Center for Creative Arts. A Campus Master Plan is almost complete and will soon be submitted to the Town for review. In recent years, SUNY Purchase has been making improvements to its campus. A Space Utilization Study Draft for Review was released in March 2008. The Plan calls for a major reorientation, renovation, and expansion of several existing buildings throughout the campus. As a state facility, SUNY has not submitted its plans to the Town for review as it is exempt from Town zoning and does not need building permits. In July, 2008, the Governor vetoed a bill that would have permitted SUNY Purchase to lease 64 acres of unused property to an operator of retirement communities for the construction of a "senior learning center." The College's President has urged the Governor to reconsider. In addition to housing for retirees, the proposal included housing for staff and faculty as well as a hotel and conference center.
6. Several areas of the CBD/downtown could be redeveloped. A joint MTA-Town concept plan has been released which proposes the construction of a new retail-residential complex adjacent to the railroad station on Halstead Avenue on the current 3.3 acre on-grade commuter parking lots. The proposal calls for the construction of a commuter parking garage, retail facilities and 39 apartments. It is anticipated that an RFP will be released in 2009.

Property on the easterly side of Oakland Avenue is industrial-commercial in nature and is the location of several nonconforming uses. The Comprehensive Plan Update Draft recommends that the area be instead redeveloped with higher density, multi-family residential uses.

Figure 4-10 Significant Properties in the Purchase Area



Source: Town/Village of Harrison Comprehensive Plan 2006 Draft, BFJ Planning

The former train station adjacent to Town Hall on Heineman Place was acquired by the Town in 2004. The Town proposes to convert it to a Town Justice Center – a new court and meeting facilities as well as a parking deck expansion for 85 cars. Until the general economic climate improves, the project is on hold.

The construction of a new DPW facility at Gleason Place is also planned and has been submitted for federal economic stimulus funding.

Critical Facilities

HAZUS separates critical buildings and facilities into five categories based on their loss potential as follows:

Essential Facilities are crucial to the health and welfare of the whole population and are especially important following hazard events. Essential facilities commonly include police, fire and EMS stations, hospitals & other medical facilities, emergency operation centers, evacuation shelters, and schools which serve as shelters or feeding stations in an emergency.

Transportation Systems include airports, major roadways, bridges and tunnels, railways and waterways.

Lifeline Utility Systems such as potable supply systems, sewerage treatment facilities, oil, natural gas, electric power and communication systems.

High Potential Loss Facilities would have a high loss associated with them and include nuclear power plants, dams, and military installations.

Hazardous Waste Facilities house industrial or hazardous materials such as corrosives, explosives, flammable materials, radioactive materials, & toxins.

Emergency Facilities

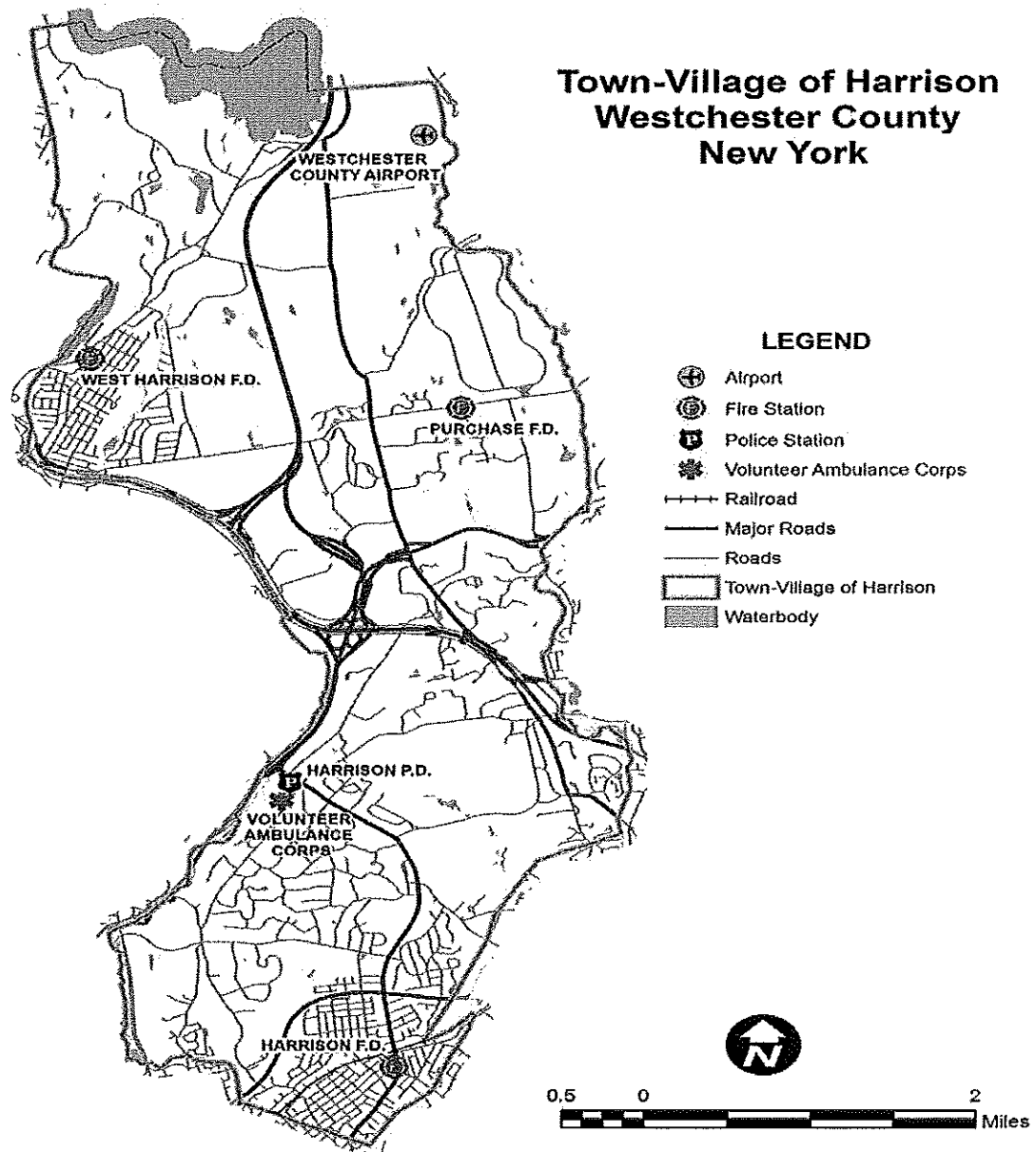
The Harrison Police Department serves the entire Town. The police station is located at the corner of North Street and Pleasant Ridge near an entrance/exit to the Hutchinson River Parkway. A K-9 facility and garages are also on site. The Department is staffed by 80 career professionals.

The Town is covered by one of five fire districts, manned mostly by volunteers and supplemented by career firefighters in the Downtown district only. Three fire houses are located in the Town:

West Harrison (Fire District #1)
Downtown (Fire District #2)
Purchase (Fire District #4)

A small section of the Town close to the City of Rye is serviced by the Rye City Fire District (Fire District #3). The West Harrison Fire Department provides fire protection to Fire District #5 which covers the North Castle border.

Figure 4-11 Emergency Facilities in the Town/Village of
Harrison



Source: HAZUS-MH; WC GIS

The Harrison Volunteer Ambulance Corps (HVAC) facility is on the same site as the Harrison Police Department. Its volunteers serve the entire Town. HVAC is a basic and advanced life support provider.

Table 4-5 is an inventory of the Town's emergency facilities and Figure 4-10 shows their location.

Table 4-5 Emergency Facilities Inventory

Facility Name	Address	Structural Value	Contents	Building Type	Occupancy/ Capacity	Backup Power (Y/N)
Police Station	650 North Street	\$1,698,842	\$312,120	TBD	70	Y
Fire District #1- West Harrison	95 Lake Street	\$1,193,577	186,177	TBD	TBD	Y
Fire District #2 - Downtown	202 & 206 Harrison Avenue	\$1,415,718	310,293	TBD	70	Y
Fire District #4 - Purchase	Anderson Hill Road	TBD	TBD	TBD	50	TBD
Volunteer Ambulance Corps	2 Pleasant Ridge Road	\$406,719	\$58,495	TBD	TBD	Y

Source: Town of Harrison, Westchester County GIS, HAZUS-MH

The Westchester County Department of Emergency Services, located in Valhalla, New York provides comprehensive training for Town personnel in the operation of the Hazardous Material Response Team (HAZMAT).

The Town's Police, Fire, and HVAC share communication channels during emergencies.

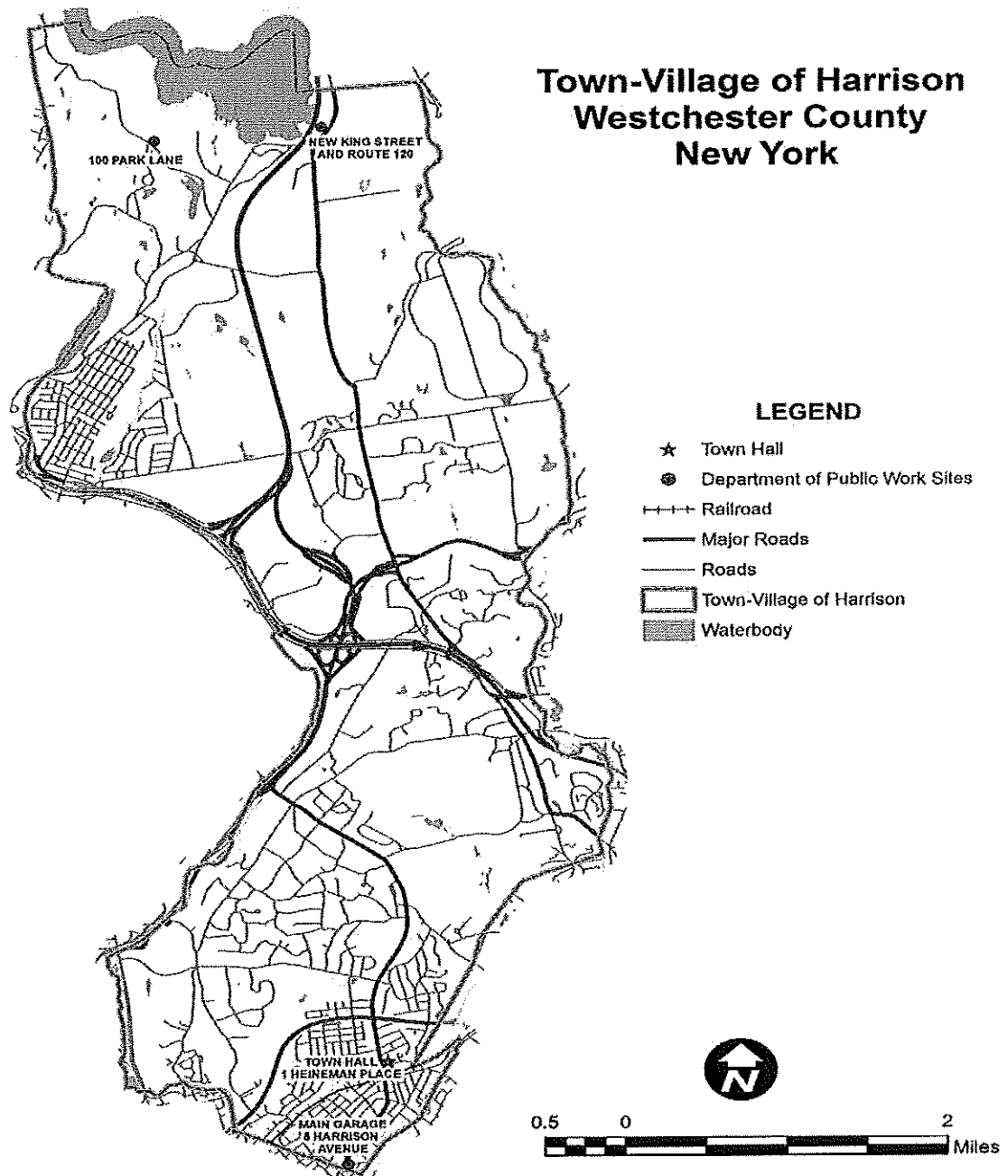
During the course of many natural hazard events, the Town's Department of Public Works is called upon to play an important role in assisting emergency responders. As a result, the Planning Committee determined that Public Works facilities should also be included in this category as "Other Emergency Response Related Facilities." An emergency command center is located in the basement of Town Hall. Table 4-6 is an inventory of those facilities and Figure 4-12 shows their location.

Table 4-6-Other Important Emergency Response Related Facilities

Facility Name	Address	Structural Value	Contents	Building Type	Occupancy /Capacity	Backup Power (Y/N)
DPW Garage	New King Street & Route 120	\$1,716,535	\$496,470	TBD	TBD	TBD
Gleason Place Garage	5 Harrison Avenue	TBD	TBD	TBD	TBD	TBD
DPW Garage	100 Park Lane	TBD	TBD	TBD	TBD	TBD
Town Hall	1 Heineman Place	\$3,087,098	\$467,971	TBD	TBD	Y

Source: Town/Village of Harrison DPW & Comptroller's Office

Figure 4-12 Other Important Emergency Response Related Facilities



Source: Local Data; WC GIS

Hospitals and Medical Centers

There is no general care hospital located within the Town of Harrison. The closest hospitals are White Plains Hospital Center (292 beds-community general), Greenwich (174 beds – community general), Sound Shore Medical Center (471 beds – comprehensive care), and Westchester Medical Center (635 beds – acute care and level 1 trauma center).

Shelters

There are no American Red Cross shelters in the Town. The Neuberger Museum at the SUNY Purchase campus is a designated Stay Cool Center.

Schools

The Town is served by the Harrison Central School District. There are six schools in the district: Harrison High School, Louis M. Klein Middle School, and the four elementary schools Harrison Avenue, Parsons Memorial, Purchase and Samuel J. Preston. The Keio Academy is a private regional high school for Japanese speaking student and is located off of Purchase Street. There are two parochial schools in Harrison; St Anthony's in Silver Lake and the School of the Holy Child on Westchester Avenue. The campuses of two major colleges are located in the Town, Manhattanville College and the State University of New York (SUNY) at Purchase. In addition Fordham University and Long Island University have area branches in the Town.

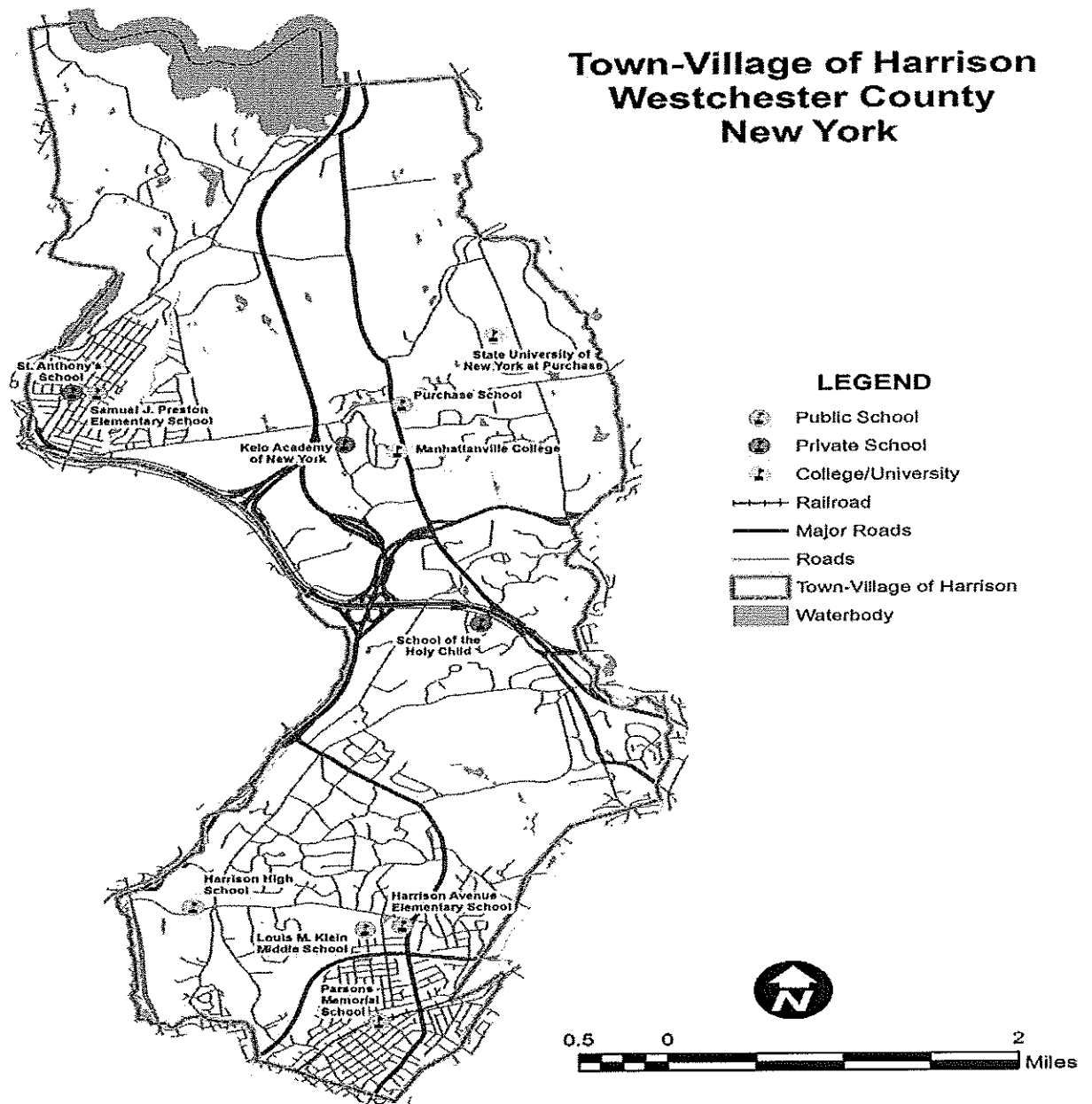
Table 4-7 is an inventory of educational facilities in the Town and Figure 4-13 shows their location.

Table 4-7 Educational Facilities in the Town of Harrison

Facility Name	Address	Type of Facility/Grade Range	Enrollment	Designated Shelter (Y/N)	Shelter Capacity	Structural Value	Content Value	Bldg. Type	Backup Power (Y/N)
Harrison High School	255 Union Avenue	Public 9-12	957	Y	2000	95,000,000	20,000,000	M	Y
Louis M. Klein Middle School	50 Union Avenue	Public 6-8	808	Y	1500	75,000,000	15,000,000	M	N
Parsons Memorial School	200 Halstead Avenue	Public K-5	439	Y	500	45,000,000	10,000,000	M	N
Harrison Avenue	480 Harrison Avenue	Public K-5	522	Y	500	45,000,000	10,000,000	M	N
Samuel J. Preston	50 Taylor Avenue	Public K-5	312	Y	500	45,000,000	10,000,000	M	N
Purchase School	2995 Purchase Street	Public K-5	456	Y	500	45,000,000	10,000,000	M	N
Keio Academy	3 College Road	Private 9-12	TBD	TBD	TBD	TBD	TBD	TBD	TBD
St. Anthony's School	45 E. Gainsborg Avenue	Private K-8	TBD	TBD	TBD	TBD	TBD	TBD	TBD
School of the Holy Child	2225 Westchester Avenue	Private 5-12	TBD	TBD	TBD	TBD	TBD	TBD	TBD
SUNY at Purchase	2900 Purchase Street	Public 4 Year	4251 Total 4092 Undergraduate	TBD	TBD	TBD	TBD	TBD	TBD
Manhattanville	Purchase Street	Private 4 Year	3023 Total 1842 Undergraduate	TBD	TBD	TBD	TBD	TBD	TBD

Source: School Districts, Westchester County Data Book and GIS, HAZUS-MH

Figure 4-13 Educational Facilities in the Town/Village of Harrison

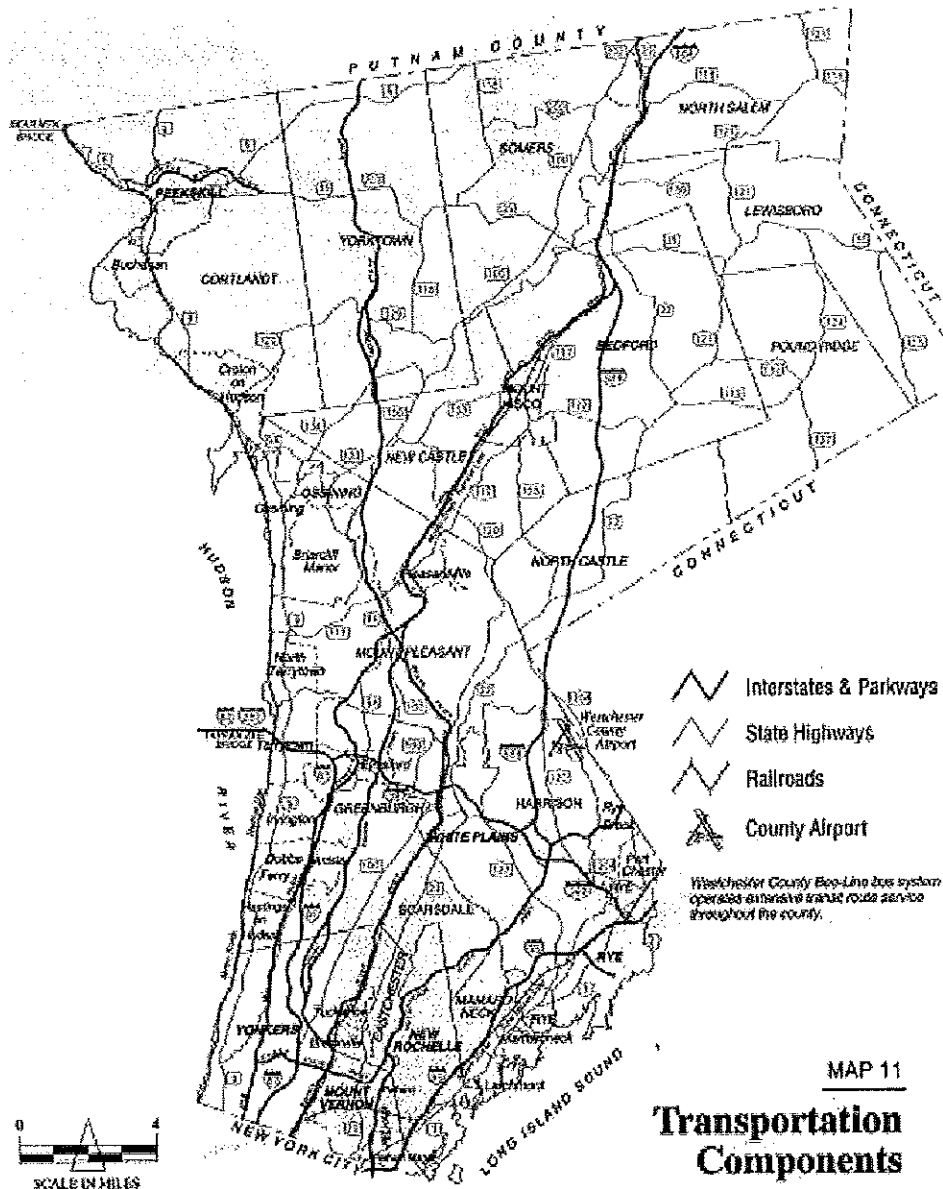


Source: Westchester County GIS; HAZUS-MH

Transportation Systems

The transportation network located within the Town's boundaries is composed of limited access, arterial and local roads, a rail line and station, and the Westchester County Airport. Figure 4-14 shows the regional transportation network in Westchester County.

Figure 4-14 Westchester County Transportation Network



Source: Westchester County Department of Planning (<http://co.westchester.ny.us/patterns/MAP/maps.htm>)

There are approximately 130 miles of roads in the Town. According to 2005 New York State Department of Transportation (NYSDOT) centerline highway mileage jurisdiction for Westchester County approximately 81.5 miles fall under the jurisdiction of the Town, 23.5 miles are owned by NYSDOT, 18.4 miles are Westchester County's and 6.2 miles are described as "other." The Town Department of Public Works maintains the town's roads, including street light maintenance, and cleaning of gutters, catch basins, and the storm sewer system. The annual road-paving program includes paving approximately x to x miles of roads and the winter snow removal program addresses x miles of roadways.

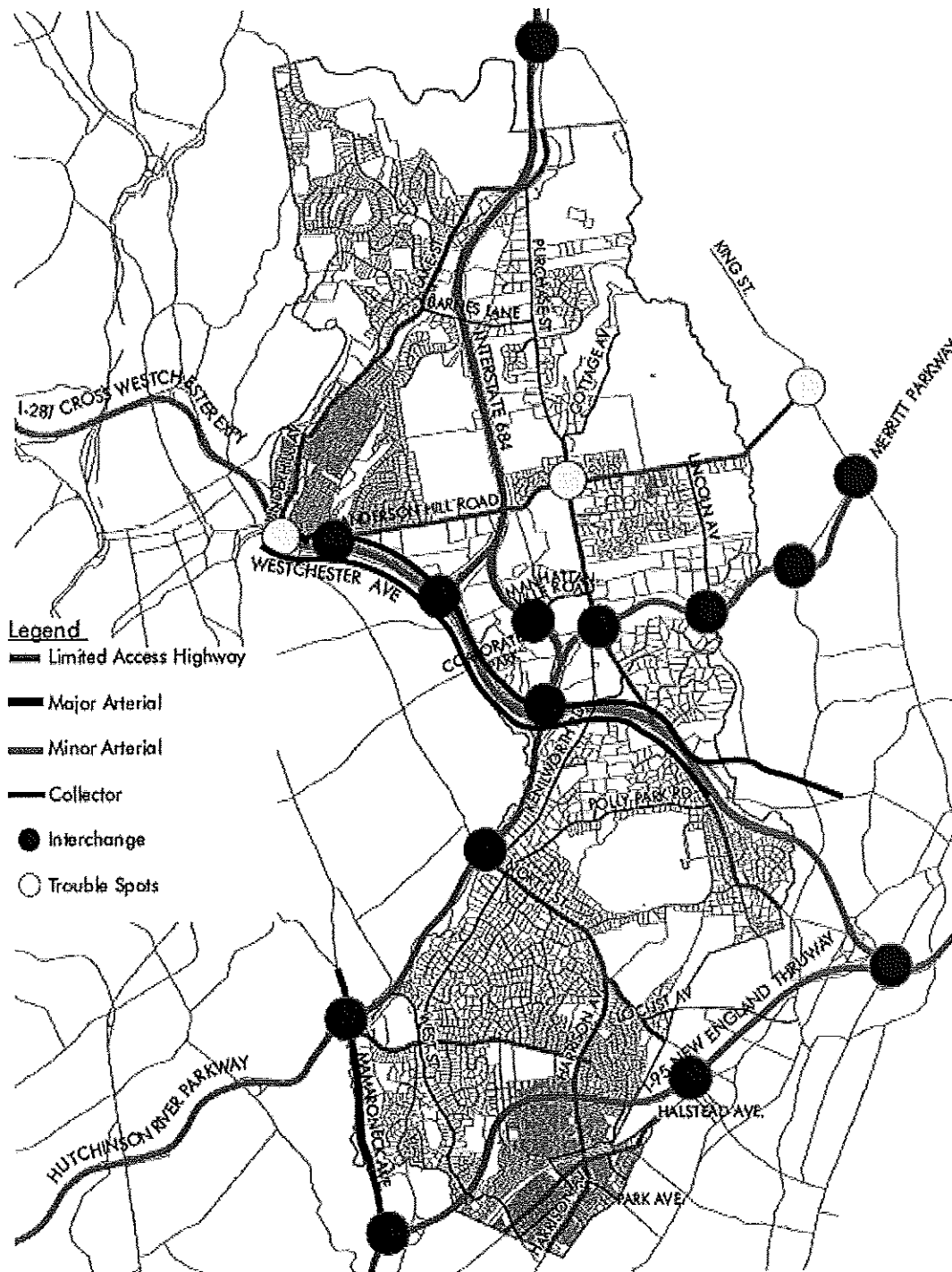
Portions of four major limited access highways travel through the Town and surrounding communities: The New England Thruway (I-95), the Cross Westchester Expressway (I-287), I-684, and the Hutchinson River Parkway. These highways serve not only the New York metropolitan area but also the northeast U.S. According to data NYS DOT data, volume on three of these highways exceeds 95,000 vehicles a day.

Arterials are designed to carry traffic between Harrison and surrounding communities. Mamaroneck Avenue (County Road #8A& #8B), a 4 lane road just south of the City of White Plains in Harrison generally situated between the Hutchinson River Parkway interchange and New England Thruway entrance in Mamaroneck, and Westchester Avenue (County Road #62, the I-287 east-west service road) are the two major arterials in the Town. There are a number of minor arterials and collector streets including Anderson Hill Road (County Road #18), Purchase Street (NYS Route 120), Barnes Lane and Lincoln Avenue in the Purchase area, North Street (County Road #73), Union Avenue (County Road #94), and Polly Park Road (County Road #104) in the South Harrison section, and Harrison Avenue (NYS Route 127), Halstead Avenue (County Road #80A) and Park Avenue (County Road #38) in downtown Harrison. Figure 4-15 identifies the road hierarchy in the Town.

Downtown Harrison is served by the Metro-North commuter railroad, New Haven Line, with frequent service to Grand Central Station in New York City. According to the 2000 Census, almost 17% of the Town's workforce commutes by train. The average shortest peak morning commute time to New York Grand Central Station is 36 minutes. Commuter parking is available adjacent to the station. According to Metro North data, the average daily weekday peak period ridership from Harrison was 2,338 with 4,988 boarding during the AM and PM peak in both directions. Harrison is served by the Westchester County Beeline bus line. Most routes through Harrison come from or travel to the City of White Plains and service within the community is limited.

The Westchester County Airport is a county-owned light general aviation airport which serves commercial, corporate, and private aircraft. The airport handled over 176,550 flight operations in 2007, of which 49% were corporate, 24% were commercial, and 27% were general aviation. There are 9 commercial airlines which fly out of the airport. A number of commercial flights have been cut back recently due in large part to fuel costs. Since 1985 commercial traffic at the airport has been restrained by operation of a Terminal Capacity Agreement. These restrictions were further extended and signed into Westchester County law in 2004 into what is known as the Terminal Use Regulation. This limits the number of passengers and the number of flights to four flights per half hour (either arriving or departing). A Voluntary Restraint from Flight (VRFF) agreement is also in place, which applied to the hours between 12 midnight and 6:30 pm. The total number of passenger that passed through the terminal in 2007 was 1,650,000, an increase of over 500,000 from 2006. The airport operates light

Figure 4-15 Road Hierarchy in the Town/Village of Harrison



Source: Town/Village of Harrison Comprehensive Plan 2006 Draft, BFJ Planning

general aviation and corporate aviation with over 400 corporate jets based there. According to the Westchester County Data Book 2008, the airport serves more corporate fleets than any airport in the world with 550 corporate flights a day. The Airport covers approximately 373 acres in the Town. The airport is an important economic asset to the county and the region.

Lifeline Utility Systems

The Westchester Joint Water Works provided data for potable water tanks and pumping stations and the Harrison Department of Public Works provided information on sanitary sewer systems.

Potable Water Supply

The Town is served by one water district which is operated by the Westchester Joint Water Works (WJWW) in conjunction with the Town and Village of Mamaroneck and parts of the City of New Rochelle and City of Rye. WJWW serves approximately 6000 domestic customers in Harrison primarily in downtown Harrison, Purchase and Silver Lake. WJWW also provides service to the fire fighting facilities (e.g. fire hydrants) of the Town's four fire districts. The water is purchased from the New York City water supply system and pumped from the Kensico Reservoir. WJWW operates four storage tanks, and two pump stations in the Town. There is also one source, the Silver Lake Well which is rated at 0.4 MGD, which is not operational. WJWW is also responsible for maintaining the water distribution system. Table 4-8 is an inventory of the water tanks and pump stations owned and operated by WJWW in the Town and Figure 4-16 shows their location.

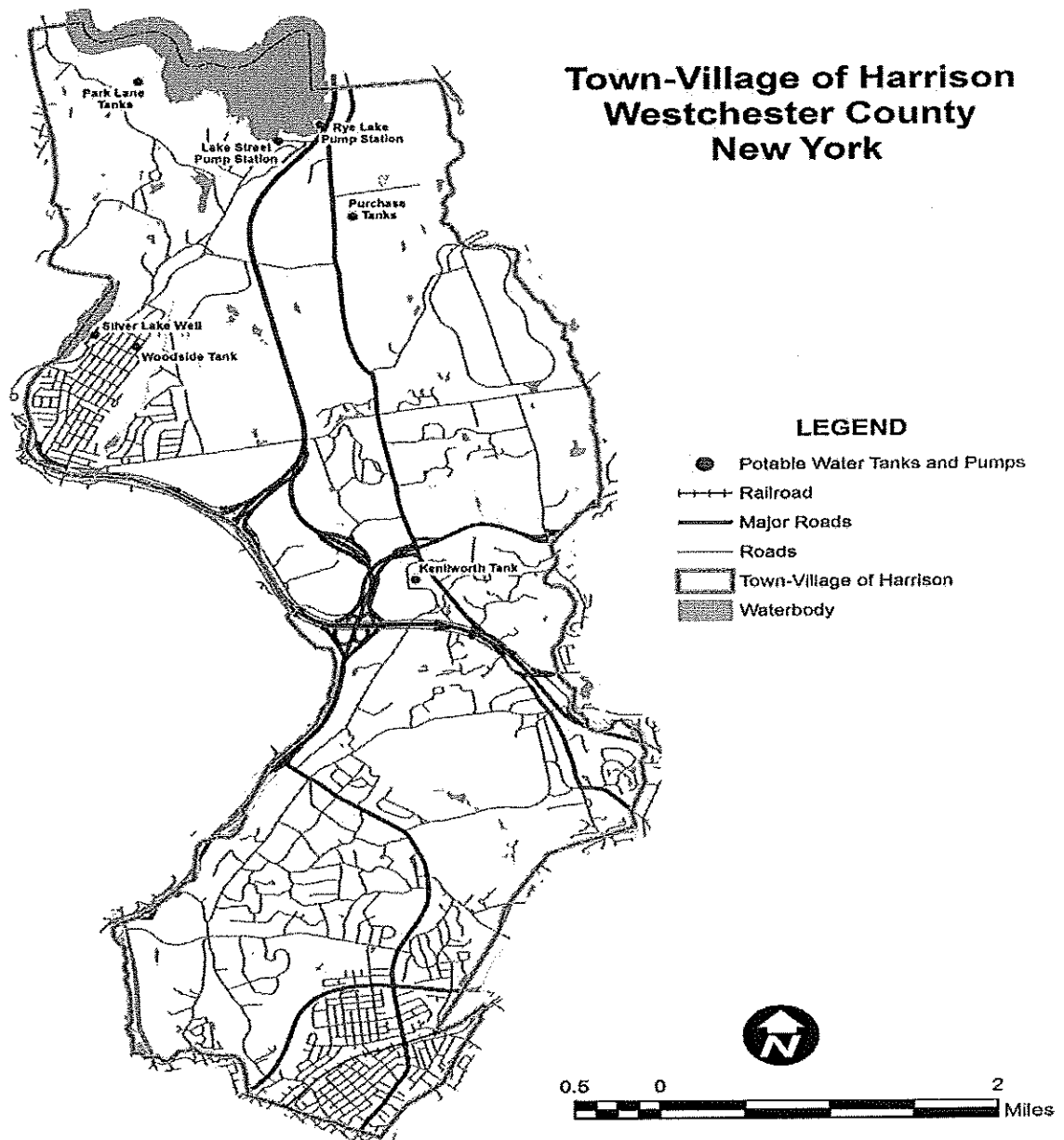
Table 4-8 WJWW Potable Water Tanks & Pumps - Town of Harrison

Facility	Capacity	Supply Capacity (gallons)	Structural Value	Backup Power (Y/N)
Woodside Tank	NA	815,000	\$1,000,000+	NA
Park Lane Tanks(2)	NA	815,000 each	\$1,000,000+ each	Y
Kenilworth Tank	NA	450,000	\$1,000,000+	NA
Purchase Tanks (2)	NA	1,000,000 each	\$1,000,000+	Y
Rye Lake Pump Station	20 mgd	NA	\$10,000,000+	Y
Lake Street Pump Station (emergency supply source)	3.3 mgd	NA	TBD	TBD
Silver Lake Well (not operational)	0.40 mgd	NA	TBD	TBD

MGD = Million Gallons per day

Source: Westchester Joint Water Works

Figure 4-16 Potable Water Tanks & Pumps Town/Village of Harrison



Source: Westchester Joint Water Works

Wastewater Facilities

Harrison is served by four county sewer districts: Mamaroneck, Blind Brook, Bronx Valley, and Upper Bronx. Most of the Town is located in either the Mamaroneck or Blind Brook sewer districts. Portions of the northern portion of Town including the West Harrison neighborhood are served by the Upper Bronx and Bronx Valley sewer districts. A large portion of the Purchase area north of Anderson Hill Road is not sewered. The Harrison Department of Public Works maintains the sanitary sewer system including the repair and cleaning of the collection system and seven pump stations. Table 4-10 provides an inventory of the Town's pump stations and Figure 4-17 shows their location.

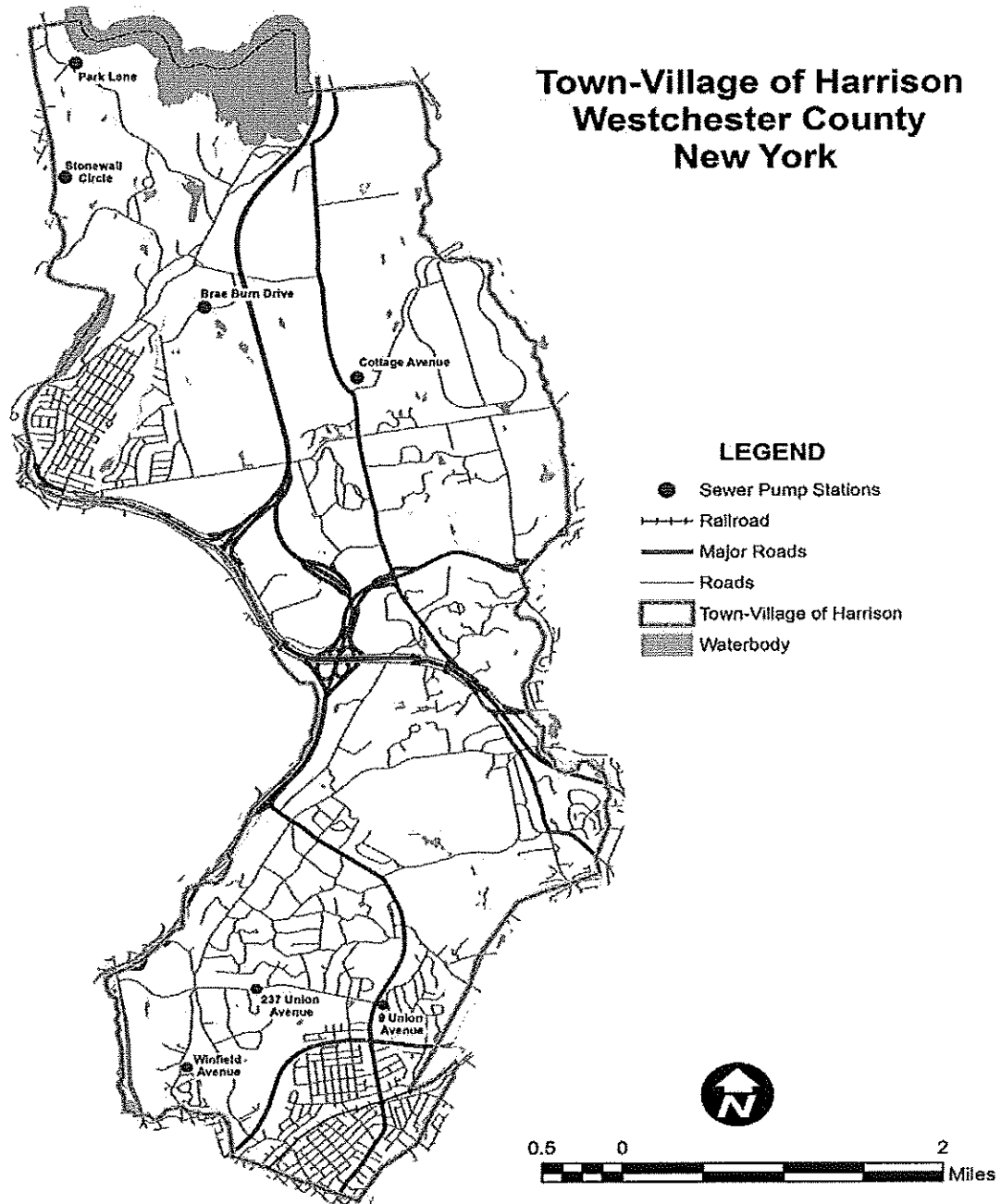
Table 4-9 Town of Harrison Sewer Pump Stations

Name	Service Area	Structural Value	Rate (GPM)	Average Daily Flow (GPD)	Backup Power (Y/N)
237 Union Avenue	F.A. Area #5 (?)	TBD	TBD	2880	N
Park Lane	Park Lane	TBD	400	90,000	Y
9 Union Avenue	Individual House (?)	TBD	TBD	3,000	N
Brae Burn Drive	Brae Burn Drive from Pinehurst Dr. to Barnes Lane	7,500	TBD	38,400	Y
Cottage Avenue	Cottage Avenue	TBD	63	26,000	Y
Winfield Avenue	FA #1a & 2 (?)	TBD	100	34,560	Y
Stonewall Circle	North end of Stonewall Circle, Shelley Lane & Jamison Court	TBD	100	24,500	Y

GPM = Gallons per minute; GPD = gallons per day

Source: Town of Harrison Annual Pump Station Report, 2007; Harrison Public Works Department

Figure 4-17 Sewer Pump Stations in the Town/Village of Harrison



Source: Town/Village of Harrison Engineering & DPW Departments

Electrical Power Facilities

Electrical power is transmitted and distributed by Consolidated Edison (Con Ed) throughout most of Westchester County and the entire Town. The HAZUS-MH provided data identifies no electric substations in the Town and there are no electrical power generating facilities in the Town/Village.

Fuel and Natural Gas Pipeline

Natural gas is supplied to the Town by Con Ed. The HAZUS-MH provided data identified no fuel or natural gas pipeline infrastructure in the Town.

High Potential Loss Facilities are defined by FEMA as having a high loss associated with them such as nuclear power plants, dams, and military installations. None of these types of facilities are located in Harrison.

Hazardous Waste Facilities house industrial/hazardous materials such as corrosives, explosives, flammable materials, radioactive materials, & toxins. There are none of these type of facilities located in the Town.

Risk Assessment

Requirement §201.6(c)(2):

The risk assessment shall provide the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Methodology

As defined by the Federal Emergency Management Agency (FEMA), risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a jurisdiction's potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (2002), which breaks the assessment down to a four-step process:

- 1) Identify Hazards
- 2) Profile Hazard Events
- 3) Inventory Assets
- 4) Estimate Losses

Data collected through this process has been incorporated into the following sections of this chapter:

- **Section 5.1: Identifying Hazards** identifies the hazards that threaten the planning area.
- **Section 5.2: Profiling Hazards** discusses the threat to the planning area and describes previous occurrences of hazard events and the likelihood of future occurrences.
- **Section 5.3: Assessing Vulnerability** assesses the Town / Village's total exposure to natural hazards, considering assets at risk, critical facilities, and future development trends.

5.1 Identifying Hazards

Requirement §201.6(c)(2)(i):

The risk assessment shall include a description of the type of all natural hazards that can affect the jurisdiction.

The HMPC, through its consultant, conducted a hazard identification study to determine the hazards that threaten the planning area.

Tools

To address the requirements of DMA 2000 and understand potential vulnerability and losses associated with the hazards of concern, the Town / Village used standardized tools, combined with local, state and federal data and expertise to conduct the risk assessment. Using existing natural hazards data and input gained through planning meetings, the HMPC agreed upon a list of natural hazards that could affect the Town/Village of Harrison.

Multi-Hazard (HAZUS)

FEMA has developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or HAZUS. HAZUS was developed in response to the need for more effective national, state, and community level planning and the need to identify areas that face the highest risk and potential for loss. HAZUS was expanded into a multi-hazard methodology, HAZUS-MH with new models for estimating potential losses from wind (hurricanes) and flood (riverine and coastal) hazards. HAZUS-MH is a Geographic Information System (GIS)-based software tool that applies engineering and scientific risk calculations that have been developed by hazard and information technology experts to provide defensible damage and loss estimates. These methodologies are accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

HAZUS-MH uses GIS technology to produce detailed maps and analytical reports that estimate a community's direct physical damage to building stock, critical facilities, transportation systems and utility systems. To generate this information, HAZUS-MH uses default HAZUS-MH provided data for inventory, vulnerability, and hazards; this default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, and economic impact) depending on the hazard and available local data. HAZUS-MH's open data structure can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage. The guidance *Using HAZUS-MH for Risk Assessment: How-to Guide* (FEMA 433) was used to support the application of HAZUS-MH

for this risk assessment and plan. More information on HAZUS-MH is available at <http://www.fema.gov/hazus>.

HAZUS – MH was used to assess potential exposure and losses associated with hazards of concern for the Town / Village.

HAZUS-MH was applied using HAZUS-MH software and associated tools to estimate losses associated with the flood and hurricane hazards. HAZUS-MH support was used to evaluate other hazards, where possible. For most of the hazards evaluated in this risk assessment, historic data is not sufficient to model future losses at this time. However, HAZUS-MH can map hazard areas and calculate exposures if geographic information on the locations of the hazards and inventory data is available. For some of the other hazards of concern, areas and inventory susceptible to specific hazards were mapped and exposure was evaluated to help guide mitigation efforts discussed in Chapter 6. For other hazards, a qualitative analysis was conducted using the best available data, professional judgment and knowledge of the community over time. This approach was applied to all hazards of concern to the Town / Village.

In addition, this approach was applied to the non-hurricane components of the severe storm hazard. For this risk assessment, the loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their affects on the built environment.

Where HAZUS-MH data conflicts with locally obtained information, the local information shall be verified and utilized in the plan where appropriate. Where such data discrepancies exist, a notation shall be made referencing such discrepancy.

Identification of Hazards of Concern

In order to initially identify what hazards may exist in the study area, the Westchester County CEMP (version November 2005) and the 2008 New York State Hazard Mitigation Plan were consulted. The Westchester County CEMP utilized the Hazards New York (HAZNY) software provided by NYSEMO to score and classify the potential hazards to which Westchester County as a whole is exposed (450 square mile area and a population of approximately 900,000). The hazards ultimately identified by the Town Village of Harrison correspond to some extent with those identified by the Westchester County CEMP although in some cases with differing classifications. These differing classifications exist due to the differing levels of response and recovery between these two levels of government. The 2008 New York State Hazard Mitigation Plan, while viewing hazards from a statewide perspective, provided information on specific hazards which were determined to be of concern in the study area.

The Town / Village of Harrison HMPC considered the full range of hazards that could impact the area and then identified and ranked those hazards presenting the greatest concern. The basis for the

determination involved the utilization of Worksheet #1 in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (2002). This Worksheet, coupled with additional research of local, state and federal databases on frequency, magnitude and potential for occurrence by the consultant resulted in identifying the hazards most likely to impact the community and thus requiring further analysis. In some cases, the FEMA Region II Hazard Mitigation Toolkit, available on the internet was consulted for direction and formatting.

Because of similar characteristics and reporting criteria, certain hazards were combined following consultation with the NYSEMO representative.

The Hazard Identification was completed over the course of three (3) meetings with the HMPC. The first step was to provide the HMPC with a listing of the potential hazards (Worksheet 1) along with instructions on how to proceed. The first meeting Hazard Identification meeting was held on June 18, 2008 and included discussion on each of the Hazards indicated on Worksheet # 1. The discussion include personal knowledge of the HMPC including the consultant staff. A preliminary list of potential hazards was developed, and the consultant was to provide a database search on the potential hazards identified and make a report to the HMPC at the July 9, 2008 meeting. Table 5.1 below lists all the Hazards of Concern and whether or not a significant threat exists to the Town/Village of Harrison.

Table 5.1 Hazards of Concern

Hazard of Concern	Potential for Hazard to occur in Study Area?	If Yes, does Hazard pose a Significant Threat	Reason for Determination	Source of Information
Avalanche	No	No	Study area does not have topography for such an event	Input from HMPC and Study area DPW
Coastal Erosion	No	No	Study area has no coast line	Municipal Map
Coastal Storm	Yes	Yes	Study area lines within 1 mile of Long Island Sound	FEMA Disaster Records, NYSEMO HMP
Dam Failure	Yes	Yes	5 dams located in study area	NYSDEC, DPW data base
Drought	Yes	Yes	Identified in NYSEMO HMP, Identified by HMPC	NOAA, NCDC, NYCDEP data base NYSEMO HMP
Earthquakes	Yes	Yes	Identified in NYSEMO HMP, identified by HMPC	USGS Earthquakes Hazard Program, Lamont Cooperative Seismographic Network, NYSEMO HMP
Expansive Soils	No	No	No history of such an event, soil in area not conducive to such an event, not identified in NYSEMO HMP	USGA Landslide Hazards Program

Hazard of Concern	Potential for Hazard to occur in Study Area?	If Yes, does Hazard pose a Significant Threat	Reason for Determination	Source of Information
Extreme Heat	Yes	Yes	Identified by HMPC	Input from HMPC
Flood	Yes	Yes	Presidential Disaster Declarations, identified in NYSEMO HMP, identified by HMPC	NOAA, NCDC, FEMA Disaster Records, NYSEMO HMP,
Hailstorm	Yes	Yes	See Severe Storm	See Severe Storm
Hurricane	Yes	Yes	See Severe Storm	See Severe Storm
Land Subsidence	No	No	No local history	No local records of such an event
Landslide	No	No	No local history	No such records of such an event
Severe Storms (windstorm, hurricane, hailstorm, tornado)	Yes	Yes	Presidential Declarations, identified in NYSEMO HMP, identified by HMPC	Local records, NOAA, NCDC, FEMA Disaster Records, NYSEMO HMP,
Severe Winter Storms (blizzard, ice storm)	Yes	Yes	Presidential Declarations, identified in NYSEMO HMP	NOAA, NCDC, Local records, input from HMPC
Tornado	Yes	Yes	See Severe Storm	See Severe Storm
Tsunami	No	No	No local records, not identified in NYSEMO HMP	No records of such an event in study area
Volcano	No	No	No volcanos located in study area	NYSEMO HMP
Wildfires	No	No	Identified as minor hazard by HMPC	Input from HMPC
Windstorm	Yes	Yes	See Severe Storm	See Severe Storm

The consultant reported the results of their review of all potential hazards at the July 9, 2008 HMPC meeting and a draft final list of potential hazards was developed. The HMPC was to review the draft final list of potential hazard, provide any comments or questions to the consultant with a final determination of potential hazards to be made at the next HMPC meeting. At the October 22, 2008, a review was made of the draft potential hazards and was determined as final with no adjustments.

Hazard Ranking

Each hazard was ranked to indicate the probability of occurrence and their impacts on both population and property. This section outlines factors that influenced the ranking including probability of occurrence and impacts

Probability of Occurrence

Probability of occurrence is an estimate of how often a hazard event occurs. The consultant reviewed historical records from Federal agencies such as FEMA, NOAA and USGS, the New

York State (NYSEMO Hazard Mitigation Plan), New York City Department of Environmental Protection and local records on file in the Town / Village's Department of Public Works developed as a result of significant disaster related events. Designations utilized in this plan are consistent with those used in the New York State Hazard Mitigation Plan. Hazards were then ranked based on definition criteria, historical database information and the institutional memory of the HMPC.

Table 5-2. Probability of Occurrence Ranking Factors

Rating	Probability	Definition
1	Rare	Hazard event is likely to occur less than once every 30 years
2	Occasional	Hazard event is likely to occur less than once every 5 years, but more than once every 30 years
3	Frequent	Hazard event is likely to occur more than once every 5 years

Utilizing these criteria, the HMPC developed the following listing of hazards, in the order of potential frequency for occurrence and grouped based on similar damage characteristics:

- Flood
- Severe Storm (Windstorm, Hurricane, Coastal Storm, Hailstorm, Tornado)
- Severe Winter Storm (Ice Storm, Blizzard)
- Extreme Heat
- Drought
- Earthquake
- Dam Failure

5.2 Profiling Hazards

Requirement §201.6(c)(2)(i):

The risk assessment shall include a description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

For each hazard, a generic description of the hazard and associated problems is provided along with details specific to the Town / Village of Harrison. Information on past occurrences and the extent or location of the hazard within or near the Town / Village and impacts, where known, are also discussed. To assess the history of natural hazard events in Harrison, the HMPC evaluated the hazards history for the Town / Village. Existing data and statistics are maintained in the Department of Public Works as well as FEMA and other Federal Agency databases.

The HMPC and other local resources, such as newspaper articles, were used to refine the data to more accurately indicate how hazards affected the Town / Village in the past. In general, information provided by planning team members is integrated into this section with information from other data sources.

FEMA Profiling Requirements

The FEMA requirements call for a full profiling of all natural hazards that impact the jurisdiction. Specifically, the Risk Assessment regulation (201.6. (c)(2)(i)) requires that “the plan include a description of all natural hazards that affect the jurisdiction.”

There are FEMA requirements for plans to specifically address the following in their risk assessment: Location, Extent, Previous Occurrences, and Probability of Future Events. The FEMA “How to Guide: Understanding Your Risks” (FEMA 386-2) was consulted throughout the development of the risk assessment phase of the plan. In addition, the FEMA Region II “Tool Kit”, which provided numerous tables and formats to assist in meeting requirements for plan approval was consulted. The FEMA requirements relating to the hazard profile/ description section of a plan are provided in the following paragraphs as an indication of the actions taken.

The description of each hazard **shall** include the following information:

- The **location** or geographical areas in the community that would be affected.
- The hazard **extent** (i.e., magnitude or severity) of potential hazard events. For those hazards not geographically determined, plans **shall** indicate their applicable intensity. For example, in areas where tornadoes occur, plans *should* indicate the recorded intensities of previous events.
- The **probability**, likelihood, or frequency that the hazard event would occur in an area.

The plan **shall** also provide a discussion of **past occurrences** of hazard events in or near the community. This discussion *should* include:

- Information on the damages that occurred (e.g., costs of recovery, property damage, and lives lost) to the extent practicable.
- Level of severity (i.e., flood depth or extent, wind speeds, earthquake intensity, etc.).
- Duration of event.
- Date of occurrence.
- Sources of information used or consulted for assembling a history of past occurrences.

When appropriate, the hazard analysis *should* also identify on a map the areas affected by each identified hazard. Additionally, a composite map (i.e., a map showing combined information from different thematic map layers) *should* be provided for hazards with a recognizable geographic boundary (i.e., hazards that are known to occur in particular areas of the jurisdiction, such as floods, coastal storms, wildfires, and landslides).

The characterization of hazards *should* describe the conditions, such as topography, soil characteristics, meteorological conditions, etc., in the area that may exacerbate or mitigate the

potential effects of hazards. The hazard analysis *should* be detailed enough to allow identification of the areas of the jurisdiction that are most severely affected by each hazard.

The plan *should* describe the analysis or sources used to determine the probability, likelihood, or frequency of occurrence as well as the severity or magnitude of future hazard events. The plan *should* note any data limitations and create mitigation strategy actions for obtaining the limited data to improve future risk analysis efforts.

As mentioned above, planning jurisdictions are strongly encouraged to utilize the “How to Guides” and the Region II “Tool Kit” as they prepare their mitigation plan. In addition, the plan will have a greater likelihood of receiving FEMA approval if a specific effort is made to review the plan approval criteria in detail using the Local Hazard Mitigation Plan Review Crosswalk Form, and assuring that each element of the requirement is fully addressed in the plan.

5.3: Assessing Vulnerability

To understand risk, a community must evaluate what assets are exposed to hazard events. The inventory of assets considers the population, structures, and lifelines that could be impacted by hazard events. This section of the risk assessment will be broken down into the following subsections for each hazard:

- Overview of vulnerability
- Data and methodology used in the evaluation
- Impact on life, safety and health
- Identifying structures including general building stock, critical facilities and critical infrastructure
- Economic impact
- Addressing Repetitive Loss Properties (NFIP data for floods, other hazards as available)
- Estimating Potential Losses
- Analyzing Development Trends (new buildings, critical facilities and Infrastructure)
- Additional Data and Next Steps
- Overall vulnerability conclusion
- Multi-jurisdictional Risk Assessment

Information available locally as well as that available from the County of Westchester Planning Department and in the HAZUS MH database will be utilized to quantify the people, places, and things that could be injured, damaged, or destroyed during the occurrence of a hazard. Once the overall asset inventory was established, the portion of the inventory that is at risk of being impacted by the various hazards will be identified. This “at-risk” segment can be identified by overlaying the hazard area (for example, flood zone) with the asset data to estimate the assets at risk. For example, areas of residential development may be compared with flood zones to determine the locations and number of structures at risk of damage or destruction from flooding. Because HAZUS-MH was used to support this mitigation plan, HAZUS-MH provided data was used as a starting point for inventory data. HAZUS-MH includes a range of asset data based on national and regional data sets, such as the U.S. Census for population data. Potential sources of information including their own institutional memory was discussed with the HMPC at the

October 22, 2008 meeting. At this point the consultant began the process of gathering the needed information. The consultant then reviewed this data with the planning committee and selected data for inclusion, focusing on critical and essential facilities first. These facilities include police and fire stations, schools, hospitals, and other buildings that are critical to community functions and recovery after a hazard event. A range of other data also were reviewed; for example, local parcel data was reviewed for building value data but this data set did not provide all of the attributes needed for HAZUS-MH. Local building and facility data were used to supplement the HAZUS-MH-provided data for individual, site-specific critical facility categories.

Hazard Profile - Flood

Description

A flood is a general and temporary condition of partial or complete inundation on normally dry land. The Town / Village of Harrison is susceptible to the following types of flooding:

- Riverine flooding, including overflow from a river channel, flash floods, and ice-jam floods.
- Riverine flooding including dam-break floods;
- Urbanized or street flood events
- Floodplain

According to USGS, floods are the most frequent and costly natural disaster in terms of human hardship and economic loss. As much as 90% of damage related to natural disasters (excluding drought) are caused by floods and associated mud and debris flows.

Floods do not follow a specific pattern from onset to termination of an event. They may develop over a period of days as a result of slow and steady rainfall, or can occur relatively quickly as a result of several inches of rainfall an hour. Levels of soil saturation including water and frost, spring snow melt, intensity of rainfall, impediments and side friction in floodways can all impact the intensity and duration of a flood event.

Depending on where they occur, floods can pose significant risks to health and safety or interruption to transportation and other services. Loss of life, injury and the possibility of disease as a result of standing water are both critical and immediate concerns. Economic losses due to flooding may be significant. Collateral losses such as disruption of commerce, unemployment due to flooded workplaces, inundated transportation systems, disruption of utility systems and temporary loss of ones residence, expenses for disaster relief and cleanup, and other related costs, can add up to millions of dollars. Floods can increase the workload burden of municipal services several fold beyond typical daily operations especially for police, fire and public works operations. Health care services and professionals may become quickly overburdened during a local flood event with the potential for impacting health care and other resources outside the area. Annual economic losses due to flooding are estimated to be as high as \$100 million in New York State

During the Risk Assessment for flooding in the Town / Village of Harrison, the following agency websites were visited for pertinent information:

- The New York State Department of Environmental Conservation, Bureau of Flood Protection and Dam Safety, Division of Water, web site, <http://www.dec.state.ny.gov/pubs/42978.html>
- The Federal Emergency Management Agency (FEMA) National Flood Insurance Program staff and web site, <http://www.fema.gov/business/nfip>

- National Oceanic and Atmospheric Administration (NOAA), National Climate Data Center at www.ncdc.noaa.gov.
- The United States Geological Survey (USGS) web site <http://www.usgs.gov/themes/flood.html>,
- New York State Climate Office, Department of Earth and Atmospheric Sciences at Cornell University web site, <http://nysc.eas.cornell.edu>, http://nysc.eas.cornell.edu/climate_of_ny.html

Riverine or Overbank Flooding

This type of flooding is defined as when a watercourse exceeds its “bank-full” capacity and is usually the most common type of flood event. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that is combined with soils or drainage systems that are already saturated or overloaded from previous rain events. The duration of riverine floods may vary from hours to several days

Factors that directly affect the amount of flood runoff include precipitation amount, intensity, and spatial and temporal distribution; the amount of soil moisture; seasonal variation in vegetation; snow depth; and the water resistance of the surface due to urbanization. Other factors, such as debris blocking a waterway or channel, can further aggravate a flood event. Development has altered the natural environment, changing and interrupting some of the natural drainageways. As a result, drainage systems can become overloaded more frequently. The most serious overbank flooding occurs during flash floods that result from intense rainstorms or following a dam failure. The term “flash flood” describes localized floods of great peak flow and magnitude and short duration. In contrast to riverine flooding, this type of flood usually results from a heavy rainfall on a relatively small drainage area. Flash floods by definition occur very quickly and may occur with little or no warning.

Urban or Street Flood Events

These events occur due to the conversion of open space to buildings, roads and parking lots, which cause the land to lose its ability to absorb rainfall. Urbanization increases runoff two to six times over what would occur on natural terrain. Except at underpasses, street flooding and yard ponding usually do not exceed more than a foot or two and are often viewed more as a nuisance than a major hazard. However, during periods of urban flooding, high velocity flows can occur in streets, even in areas with only shallow flooding.

Floodplains

The area adjacent to a channel is the floodplain. Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 100-year flood, the flood that has a 1-percent chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program.

The potential for flooding can change and increase as a result of land use changes and changes to land surface that change the floodplain. A change in environment can create localized flooding problems in and out of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Geographic Location and Extent

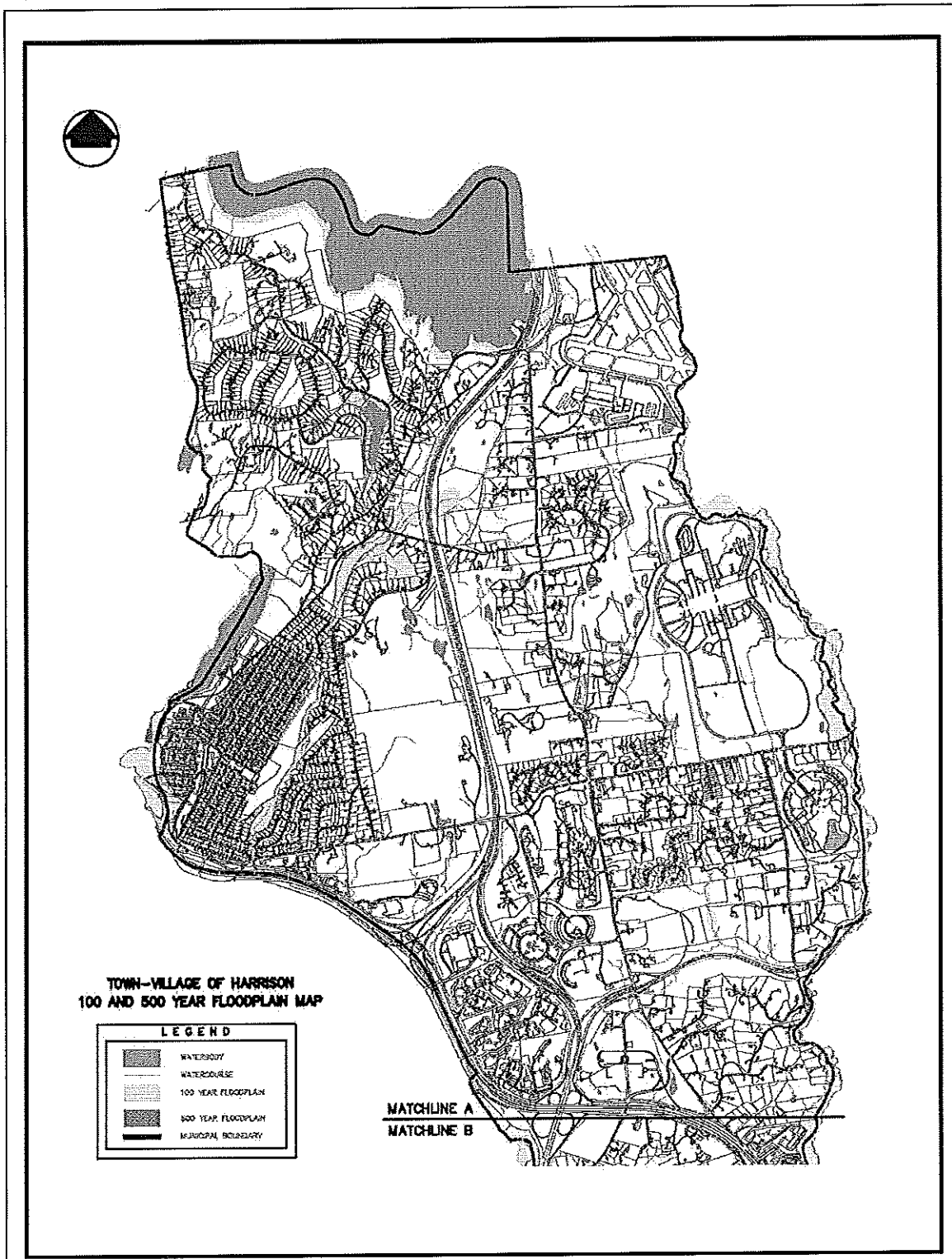
Several areas of the Town / Village of Harrison lie within 100 and 500 year floodplains. Additionally, areas outside these designated floodplains experience what is known as “urban flooding” resulting from undersized or poorly maintained drainage systems combined with intense rainfalls of short or long duration.

This study utilized FEMA Flood Insurance Rate Maps (FIRMS) dated September 2007 in order to determine sections of the study area located in the 100 and 500 year floodplains. An interview was conducted by the consultant with the Commissioner of Public Works to determine those areas most susceptible to flooding including areas where flood damage had occurred in the past. The following FEMA FIRMS contain areas in the 100 and 500 year floodplains:

- 36119C0267F 36119C0259F
- 36119C0353F 36119C0269F
- 36119C0278F
- 36119C0279F
- 36119C0286F
- 36119C0287F
- 36119C0288F
- 36119C0289F
- 36119C0293F
- 36119C0351F
- 36119C0352F
- 36119C0354F
- 36119C0356F

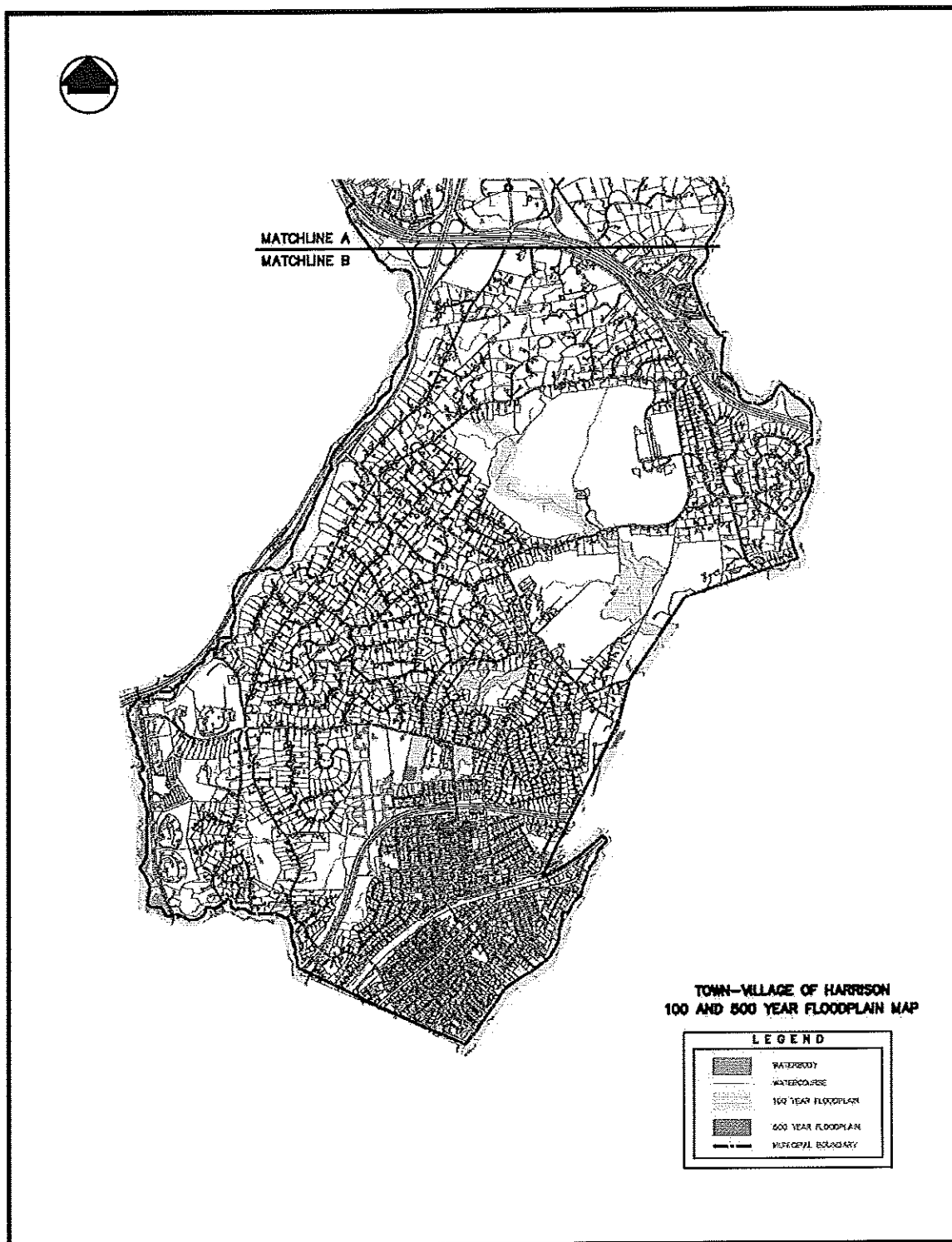
A complete set of Floodplain Maps is available in the office of the Commissioner of Public Works of the Town/Village of Harrison.

Figure 5-1 September 2007 FEMA FIRM of Flood Prone areas of the Town / Village of Harrison 100 (1%) and 500 Year (2%) (Upper)



Source: FEMA FIRM for Town / Village of Harrison, September 2007

Figure 5-2 September 2007 FEMA FIRM of Flood Prone areas of the Town / Village of Harrison 100 (1%) and 500 Year (.2%) (Lower)



Source: FEMA FIRM for Town / Village of Harrison, September 2007

Major Sources of Flooding

The Town / Village of Harrison has multiple creeks, tributaries, and associated watersheds. The Town / Village is highly urbanized as a result of the “built-out” condition of the study area. As such, the natural hazards related to stormwater and flood management are particularly complicated by the fact that space is at a premium and thus many structures are within the floodplain. All drainage ways are subject to periodic flooding. The figure below shows the major waterbodies and drainage ways in the study area. Waterways which have the ability to cause flooding include:

- Mamaroneck River
- Blind Brook
- Beaver Swamp Brook
- Brentwood Brook
- Nelson Creek

Previous Occurrences and Losses

According to the NOAA Satellite and Information Service, National Climatic Data Center, 69 Flood Events of varying degrees have occurred in Westchester County from January 1950 through May of 2008. These events have included Urban, Flash and Coastal Flooding. Table 5-3 provides a listing of Presidential Disaster Declarations for flood events impacting the Town / Village of Harrison from 1996 through 2007.

Table 5-3 Presidential Disaster Declarations for Flooding Events 1996 – 2007

Type of Event	Date	Declaration Number	Aid to Municipality (In Dollars)
Severe Storm Flooding	October 1996	1146-DR-NY	\$41,923
Hurricane Floyd	September 1999	1296-DR-NY	\$58,704
Severe Storm Flooding	April 2005	1589-DR-NY	None
Severe Storm, Inland and Coastal Flooding	April 2007	1692-DR-NY	\$519,645

Source: FEMA website. Some overlap with Severe Storm Hazard

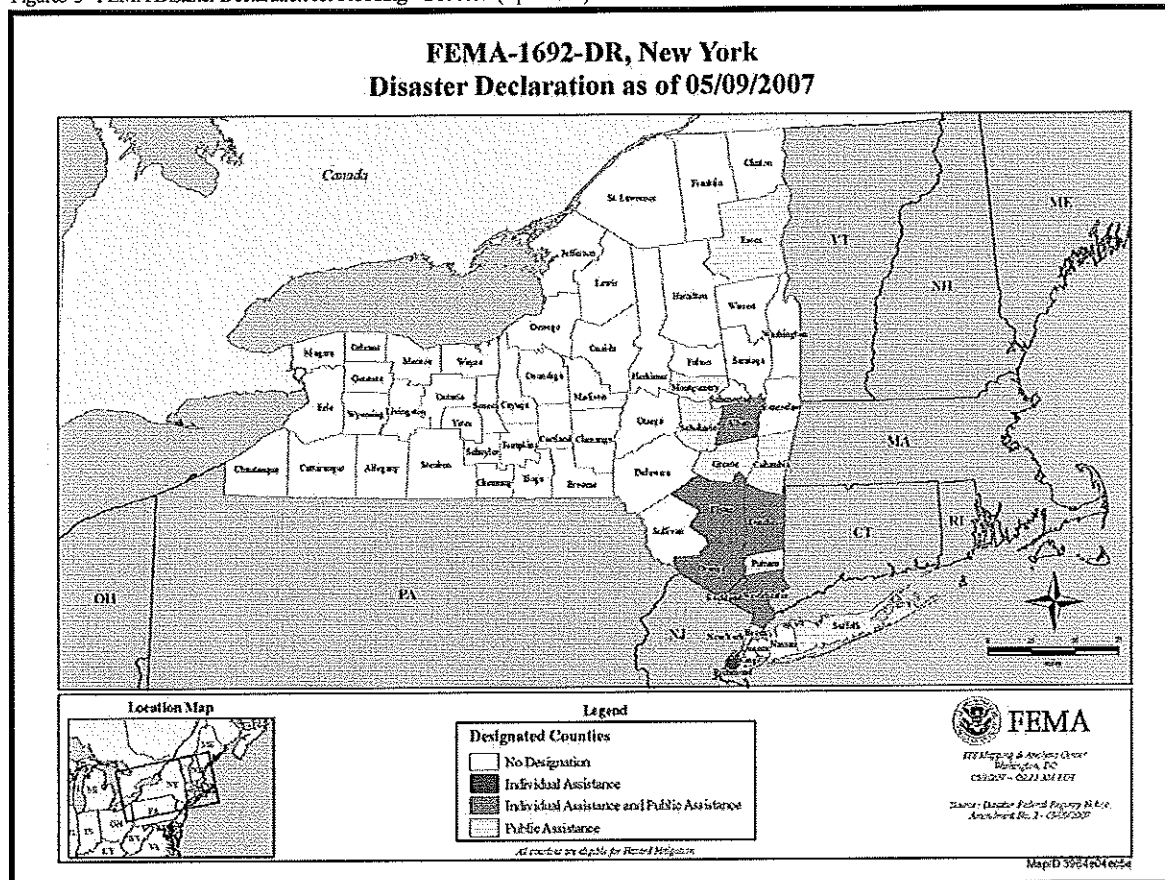
As part of the Town / Village of Harrison Flood Mitigation program, the Department of Public Works has identified eight (8) individual locations where localized flooding has previously occurred. Table 5-2 lists the area of the study area where the localized flooding has occurred, the street location as well as the reason the flooding is occurring.

Table 5-4 Localized Flooding Locations identified by Department of Public Works

Area	Location	Description
Downtown Harrison	Avondale Road and Argyle Road	Localized flooding exceeds drainage capacity, low lying area
Downtown Harrison	Genessee Trail and Woodlands Road	Over land flow due to insufficient drainage capacity
Downtown Harrison	Meadow Street and Park Avenue	Localized flooding, exceeds drainage capacity, low lying area
Downtown Harrison	Pilgrim Road	Low lying wetland area, no drainage outlet subject to overflow during storms
Downtown Harrison	Ramapo Trail	Overland flow due to insufficient drainage capacity
Purchase	Meadow Lane	Low lying wetland area, no drainage outlet
Purchase	Westerleigh Road and Sylvanleigh Road	Overland flow across highway due to insufficient drainage capacity
West Harrison	Main Street	Overland flow across highway due to insufficient drainage capacity, sewer system backups and inundation of local basements

Source: Town/Village of Harrison Department of Public Works

Figure5-3 FEMA Disaster Declaration for Flooding—DR 1692 (April 2007)



Source: http://www.gismaps.fema.gov/2007graphics/dr1692/dec_1692.pdf

Probability of Future Events

The FEMA FIRM maps when overlaid on municipal tax maps provided by the Westchester County Information Technology Department indicates a number of built out areas in the Town / Village of Harrison which are susceptible to flooding and for which historical records have verified numerous flooding events. Much of the Stormwater and Floodplain infrastructure in these areas is in excess of 75 years old and was designed when areas of open space still existed in the municipality. Many of those open space areas have been built up with roads, homes, businesses and corporate parks, depleting pervious areas where water had previously been absorbed into aquifers.

Changing storm patterns over the last few years have created rain events of greater intensity and duration which can lead to surcharging of stormwater drainage conveyance systems allowing water to spread out over flat low lying areas flooding streets and basements. Based on historical records the probability of occurrence of flood events would be considered frequent (likely to occur more than once every five years).

Vulnerability Assessment

A vulnerability assessment is defined as assessing the vulnerability of people and the built environment to a given level of hazard. After identifying types of risk, a vulnerability analysis can help to determine the weak points in the community. This assessment examines the vulnerability of the existing and future built environment, such as structures, utilities, roads and bridges, as well as environmental vulnerability, such as open space that can suffer from erosion. Once the geographic areas of risk are identified in the Town / Village, vulnerability can be assessed for the population, property and resources at risk in those areas. Vulnerability indicates what is likely to be damaged by the identified hazards and how severe the damage may be. If an area is determined to be at risk of flooding, vulnerability estimates for that area could include residential property losses, impacts to the tax base and damages to public infrastructure. Flooding events can impact several areas of Town/Village of Harrison. All assets associated with those areas including population, structures, critical facilities and utilities are vulnerable. The following sections evaluate and estimate the potential impact of flooding:

- Overview of vulnerability
- Data and methodology used in the evaluation
- Impact on life, safety and health
- Identifying structures including general building stock, critical facilities and critical infrastructure
- Economic impact
- Addressing Repetitive Loss Properties (NFIP data for floods, other hazards as available)
- Estimating Potential Losses
- Analyzing Development Trends (new buildings, critical facilities and Infrastructure)
- Additional Data and Next Steps
- Overall vulnerability conclusion
- Multi-jurisdictional Risk Assessment

Overview of Vulnerability

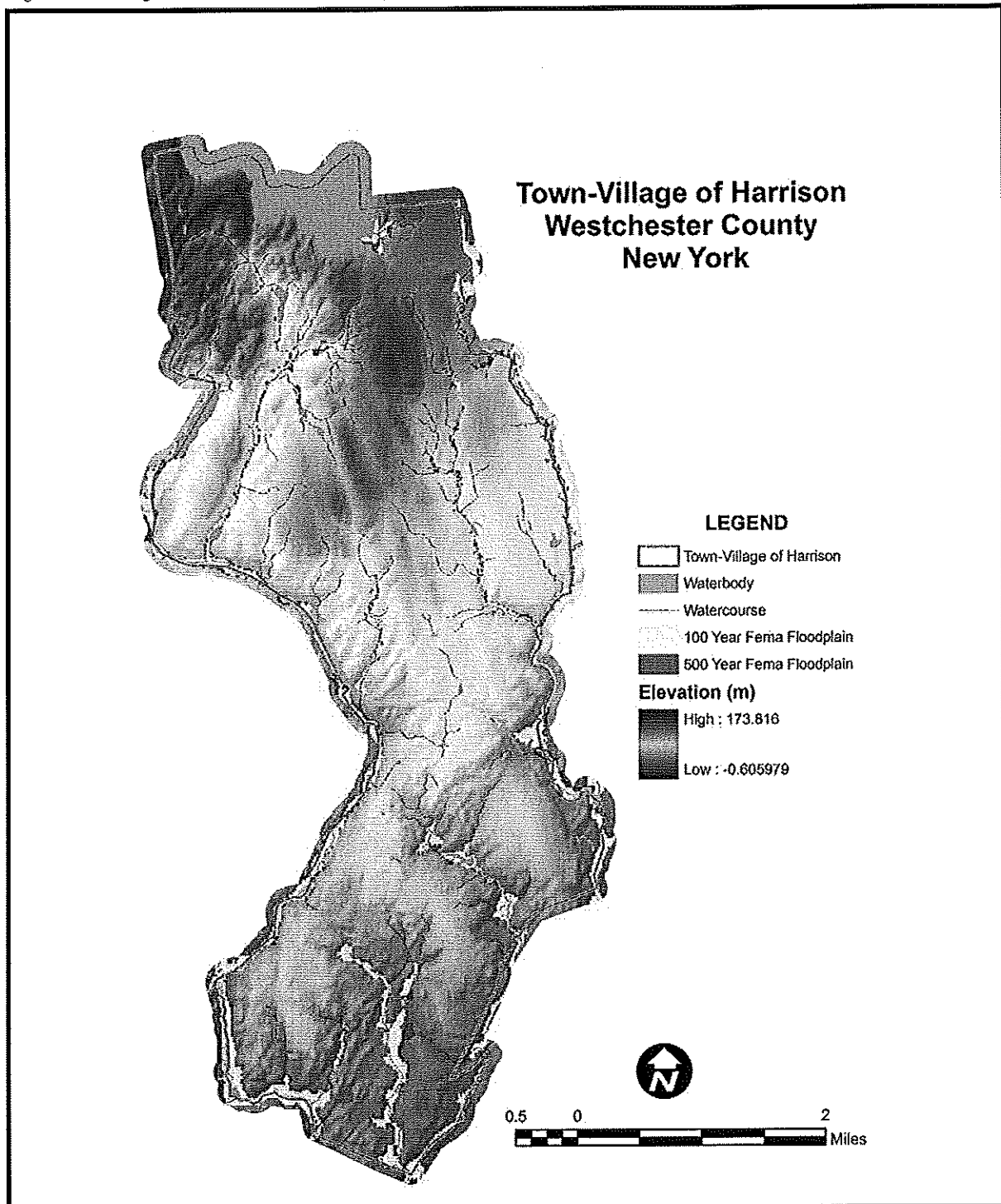
Municipal staff, the HMPC, input gathered from the Natural Disaster Survey and information gathered by the consultant identifies flooding as the most significant concern to the Town / Village of Harrison. A number of built out, densely populated areas of the municipality lie within or in close proximity to floodplains and have experienced a number of flooding events in the past. To assess vulnerability, potential losses were calculated for 100 year and 500 year flood events.

Data and Methodology

Data utilized to assess the flood hazard was gathered from historical records located in municipal offices, the September 2007 Floodplain maps for the municipality (Hard Copy and HAZUS-MH), Westchester County, New York Geographic Information Systems Maps and Overlays, input from the HMPC, the Natural Hazards Survey and information on file with the consultant. Population data, Residential and Commercial Building Stock and associated Values (Structure and Content) and FEMA Floodplain data was taken from HAZUS-MH. Critical facilities, infrastructure and lifeline information was gathered locally and by utilizing HAZUS-MH. **In analyzing the Flood Hazard, HAZUS-MH**

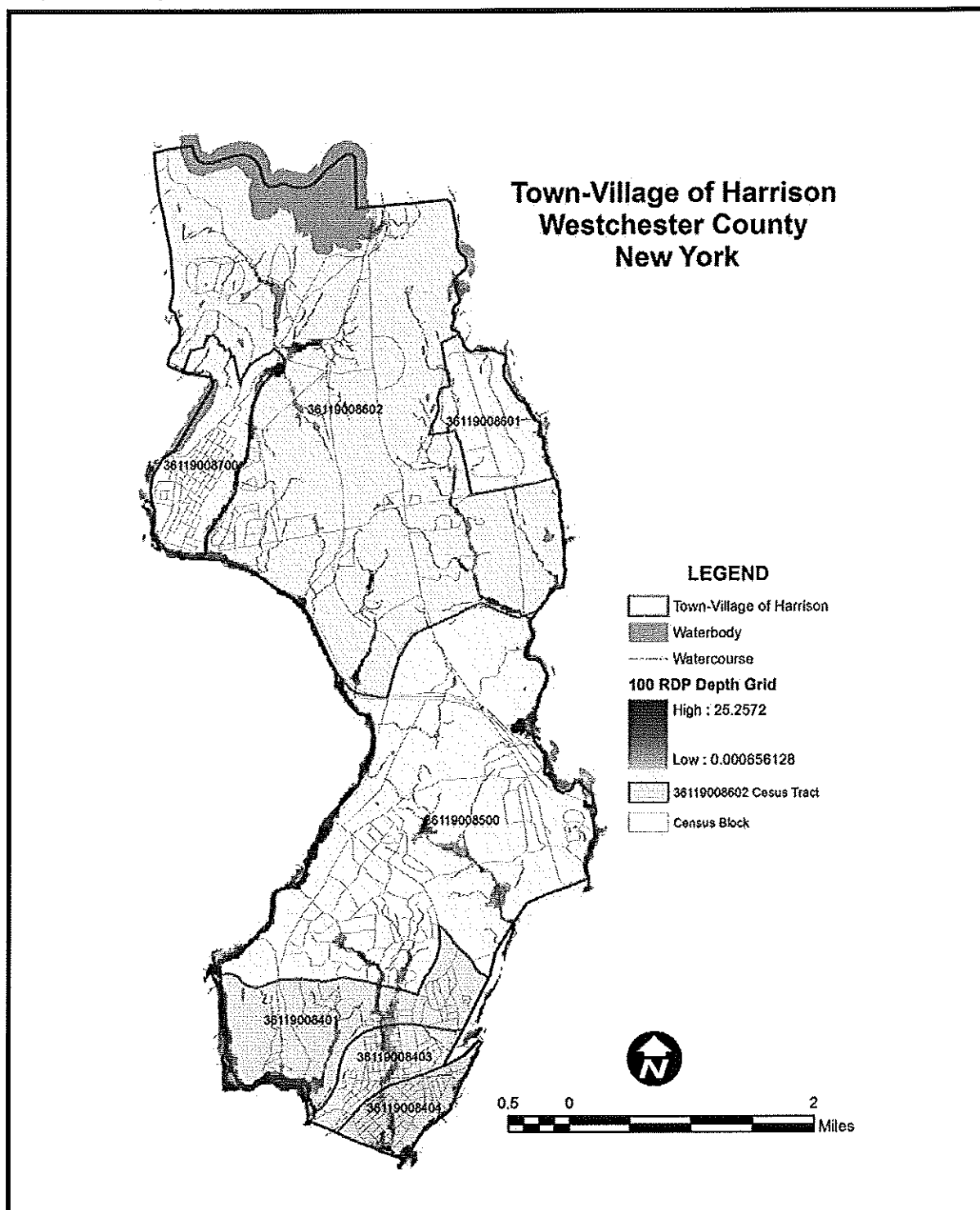
calculated loss information for 100 year and 500 year events (consistent with FEMA Floodplain Mapping).

Figure5-4: USGS Digital Elevation Model and FEMA 100 year and 500 year floodplains for the Town/Village of Harrison



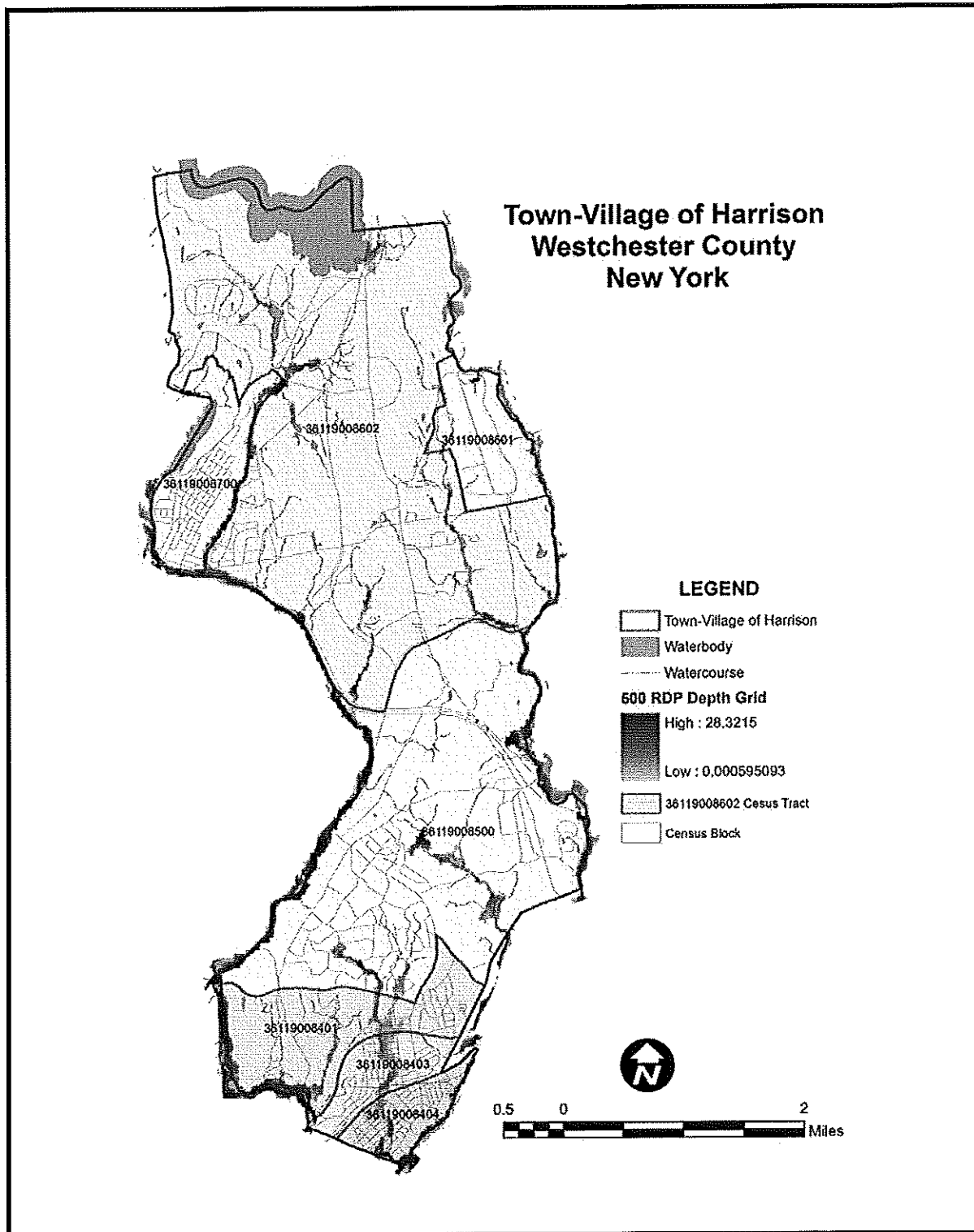
Source: HAZUS-MH

Figure 5-5: Flood Depth Grid for a 100 Year Mean Return Period Flood Event



Source: HAZUS-MH Note: Depth is measured in feet. High and Low figures indicate that at some point in the grid area, the water will rise to that particular Depth. (Source: HAZUS-MH Flood Support Team)

Figure 5-6 Flood Depth Grid for a 500 year Mean Return Period Flood Event



Source: HAZUS-MH Note: Depth is measured in feet. High and Low figures indicate that at some point in the grid area, the water will rise to that particular Depth. (Source: HAZUS-MH Flood Support Team)

Impact on Life, Safety and Health

HAZUS-MH was utilized to determine the population at risk in the 100 and 500 year flood events. Table 5.3 below shows the population placed in jeopardy as a result flood hazard events.

Table 5-5 Sheltering Requirements

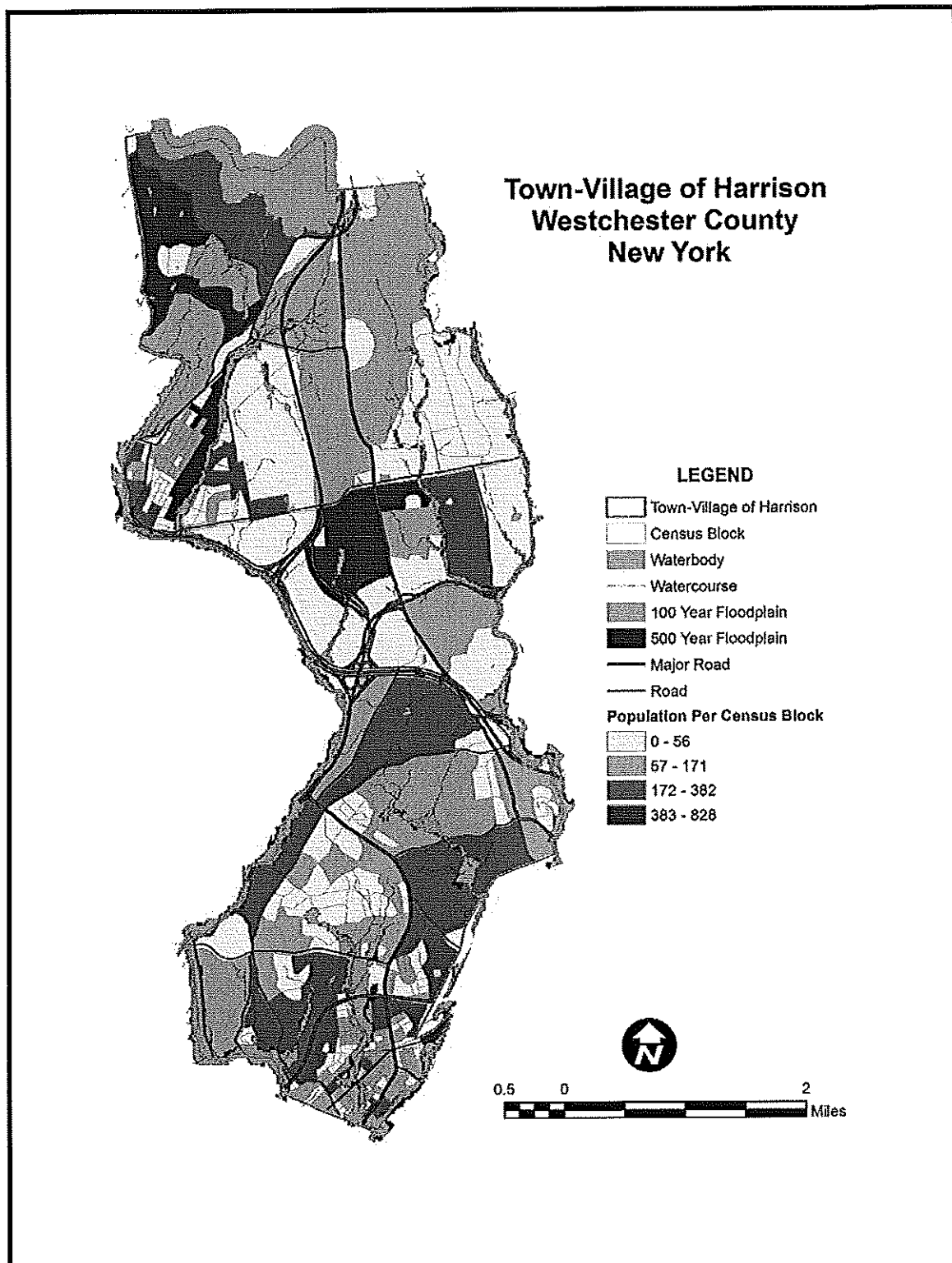
Category	100 Year Event	500 Year Event
Number of People Displaced	1,960	2,291
Households Displaced	653	764
Persons Seeking Temporary Shelter	1,458	1,774

Source: HAZUS-MH

The table above is utilized as part of the municipalities emergency response plan when considering relocation and sheltering needs. Because of numerous past flooding events, those living and working in the floodplain areas are generally aware under what conditions they may experience flooding thus keeping to a minimum injuries and deaths. The emergency response plan for such areas includes closing off of flooded streets which limits the exposure to injury or death to pedestrians and motorists. Increasing public awareness as to the dangers associated with flooding, which is part of this plans mitigation strategy, will aid in reducing future injuries or deaths.

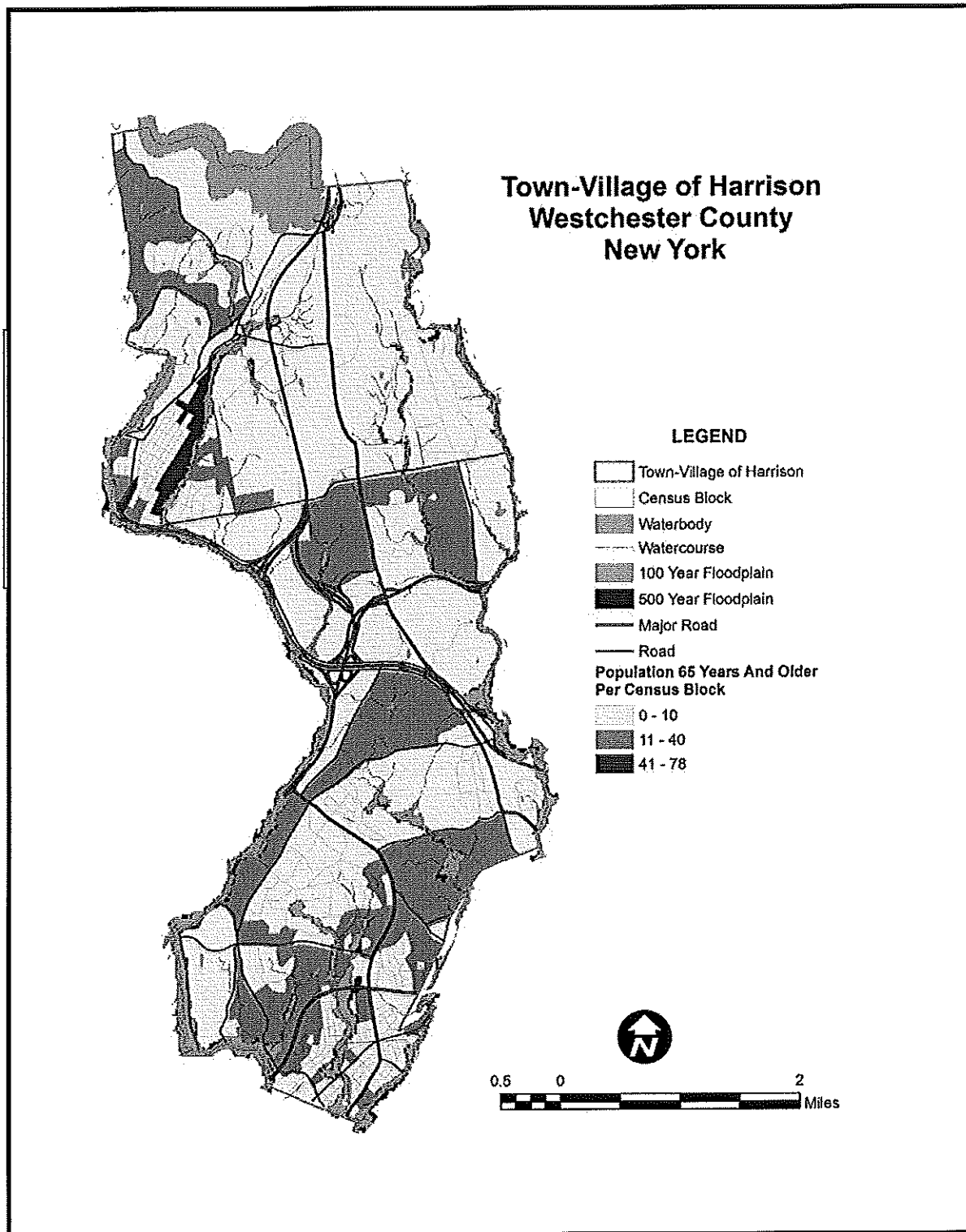
The following Figures and Tables show comparisons between the 100 year and 500 year floodplain areas in relation to population densities for the elderly and low income families.

Figure 5-7 Distribution of Population Density Relative to 100 and 500 Year Floodplains



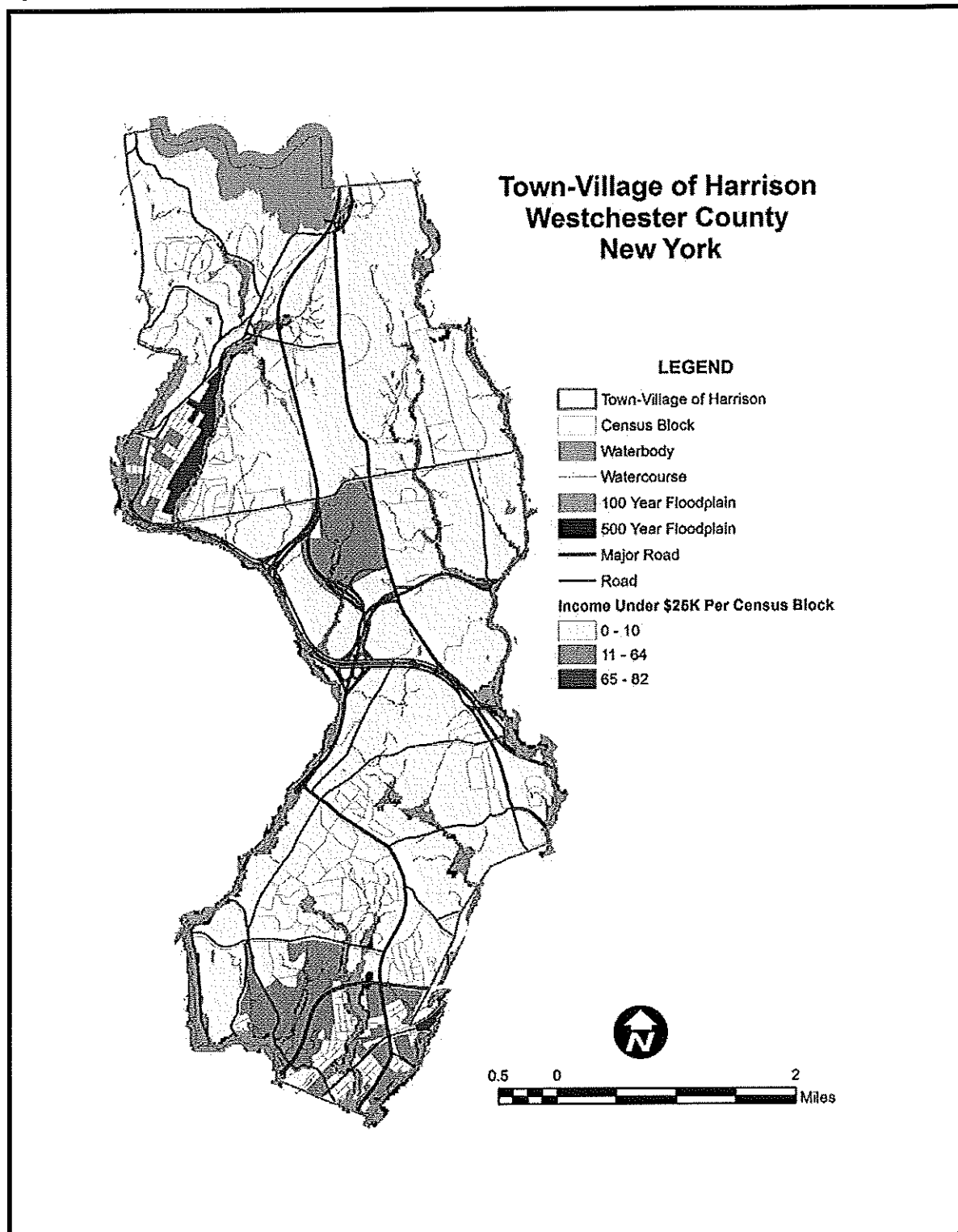
Source: HAZUS-MH

Figure 5-8 Distribution of Elderly Population (65 and older) Relative to 100 and 500 Year Floodplains



Source: HAZUS--MH

Figure 5-9 Distribution of Low Income Population Density Relative to the 100 and 500 Year Floodplains



Source: HAZUS--MH

Identifying structures including general building stock, critical facilities and critical infrastructure

General Building Stock, Critical Facilities and Critical Infrastructure were evaluated relative to their locations within 100 and 500 year floodplains. The potential loss value was determined using HAZUS – MH. The following Table were created using HAZUS-MH.

Table 5-6: Buildings Exposed to the 100 year and 500 year Flood Hazard Event by Occupancy Class and Total Replacement Value (\$1,000)

Building Occupancy Class	Number of Buildings In Study Area	Exposure Value in Study Area (in 2006 dollars)	Percent of Total For Study Area	Exposure Value For 100 Year Event	Percent Total For 100 Year Event	Exposure Value For 500 Year Event	Percent Total For 500 Year Event
Agriculture	57	9,704	.3%	4,946	.3%	4,998	.3%
Commercial	673	669,177	23.6%	481,562	29.4%	484,809	29.1%
Education	27	52,876	1.9%	40,694	2.5%	40,694	2.4%
Government	16	18,789	.7%	15,945	1.0%	15,945	1%
Industrial	190	180,212	6.3%	156,239	9.5%	159,420	9.6%
Residential	6,618	1,865,990	65.8%	919,330	56.1%	936,600	56.3%
Religion	43	41,243	1.5%	20,291	1.2%	21,467	1.3%
Total	7,624	2,837,991	100%	1,639,007	100%	1,663,933	100%

Source: HAZUS-MH

Table 5-7 Building Stock by Construction Type as a Percentage of Study Area Total

Building Construction	Count	Percent of Total
Wood	5,409	70.95
Steel	498	6.54
Concrete	183	2.40
Precast	32	.42
Reinforced Masonry	234	3.07
Un-reinforced Masonry	1268	16.63
Manufactured Homes	0	0
Total	7,624	

Source: HAZUS-MH

Table 5-8 Essential Facilities

Category	Number of Facilities in Study Area
Hospitals	0
Medical Clinics	0
Schools	10
Fire Stations	3
Police Stations	1
Emergency Operations	0
Public Works Operations and Maintenance	2

Source: HAZUS-MH / Local Information

Transportation and Utility Lifeline Facilities are those infrastructure both public and privately owned that provide services which allow communities to function and be economically viable. The HAZUS-MH program maintains a local inventory of these facilities including transportation system which include highways, railways, light rail, bus, ports, ferry and airports. Also included in the inventory are utility systems such as potable water, wastewater, natural gas, crude and refined oil, electric power and communications. The total value of the lifeline inventory exceeds \$1,209,000,000 and includes 96 kilometers of highways, 43 bridges and 481 kilometers of pipes.

Table:5-9 Transportation System Lifeline Inventory

System	Component	No. of locations / segments	Replacement Value (millions of dollars)
Highway	Bridges	43	655.70
	Segments	19	462.50
	Tunnels	0	0
	Subtotal		1,118.20
Railways	Bridges	1	0
	Facilities	0	0
	Segments	2	11.20
	Tunnels	0	0
	Subtotal		11.20
Light Rail	Bridges	0	0
	Facilities	0	0
	Segments	0	0
	Tunnels	0	0
	Subtotal		0
Bus	Facilities	0	0
	Subtotal		0
Ferry	Facilities		0
	Subtotal		0
Port	Facilities	0	0
	Subtotal		0
Airport	Facilities	1	6.40
	Runways	2	73.30
	Subtotal		79.80
	Total		1,209.20

Source: HAZUS-MH

While the facilities shown in Table 5-7 exist in the study area, only a portion of the highway network is the operating and maintenance responsibility of the Town/ Village of Harrison. Highway mileage in the study area is broken down as shown in the Table 5-8

Table 5-10 Municipal Entity Responsible for Highway Transportation System

Municipal Entity Responsible	Mileage
Town/Village of Harrison	81.5
New York State Department of Transportation	23.5
New York State Thruway Authority	6.2
County of Westchester	18.4

Source: New York State Department of transportation Highway Inventory

The railway system is operated and maintained by the Metro-North Commuter Railroad and the Airport is operated and maintained by the County of Westchester.

Table 5-11 Utility System Lifeline Inventory

System	Component	No. of locations / segments	Replacement Value (millions of dollars)
Potable Water	Distribution Lines	NA	4.80
	Facilities	0	0
	Pipelines	0	0
	Subtotal		4.80
Waste Water	Distribution Lines	NA	2.90
	Facilities	0	0
	Pipelines	0	0
	Subtotal		2.90
Natural Gas	Distribution Lines	NA	1.90
	Facilities	0	0
	Pipelines	0	0
	Subtotal		1.90
Oil Systems	Distribution Lines	0	0
	Facilities	0	0
	Pipelines	0	0
Electric Power	Distribution Lines	0	0
	Facilities	0	0
	Subtotal		0
Communication	Distribution Lines	0	0
	Facilities	0	0
	Subtotal		0
	Total		9.60

Source: HAZUS-MH

In order to fully evaluate the potential for damage and loss based on occupancy class, severity of damage to each type of occupancy must also be considered. Table 5-10 provides definitions for damage categories to a light wood framed building.

Table 5-12 Example of Structural Damage by Category and Description for Light Wood Framed Buildings

Damage Category	Description
None	
Slight	Small plaster or gypsum board cracks at corners of door and window openings and wall /ceiling intersections; Small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum board cracks at corners of doors and window openings; small diagonal cracks across Shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: HAZUS-MH, 2005

Economic Impact

HAZUS-MH was utilized to estimate economic losses for buildings, critical facilities and transportation and lifeline systems. Building related losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during a flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood. The total loss estimated for the 100 year floods is 80.86 million dollars and 109.13 million dollars for the 500 year flood which represents 4.93% and 6.57% respectively of the total replacement value of the scenario buildings.

Table 5-13 Building-Related Economic Loss Estimates 100 Year Event (Millions of Dollars)

Category	Area	Residential	Commercial	Industrial	Other	Total
Building Loss	Building	22.22	7.71	3.00	1.19	34.12
	Content	12.70	19.20	7.58	5.45	44.92
	Inventory	0	.20	1.12	.03	1.35
	Subtotal	34.92	27.11	11.69	6.67	80.40
Business Interruption	Income	0	.12	0	.02	.14
	Relocation	.05	.02	0	0	.07
	Rental Income	.02	.01	0	0	.03
	Wage	0	.10	0	.12	.23
	Subtotal	.06	.26	.01	.14	.46
All	Total	34.98	27.37	11.70	6.81	80.86

Source: HAZUS-MH

Table 5-14 Building-Related Economic Loss Estimates 500 Year Event (Millions of Dollars)

Category	Area	Residential	Commercial	Industrial	Other	Total
Building Loss	Building	32.68	10.22	3.65	1.62	48.17
	Content	18.39	25.02	9.03	6.33	56.76
	Inventory	0	.26	1.31	.05	1.62
	Subtotal	51.08	35.50	13.99	8.00	108.56
Business Interruption	Income	0	.15	0	.02	.19
	Relocation	.06	.03	0	0	.09
	Rental Income	.02	.02	0	0	.04
	Wage	0	.14	0	.13	.27
	Subtotal	.08	.33	.01	.15	.57
All	Total	51.16	35.83	13.99	8.14	109.13

Source: HAZUS-MH

For Transportation and Utility Lifeline System Losses, HAZUS-MH computes the direct repair cost for each component only. There are no losses computed by HAZUS-MH for business interruption due to lifeline outages. Long term economic impacts are estimated for 15 years after the earthquake. This information is quantified in terms of income and employment changes within the study area. For the 100 year and 500 year Flood Events, there was no direct economic loss for transportation or lifeline systems.

The direct Economic Losses for Vehicles by type and time of day was calculated by HAZUS-MH. Table 5-15 reflects the values calculated.

Table 5-15 Direct Economic Losses for Vehicles (in dollars)

Category	Cars	Light Trucks	Heavy Trucks	Total
Study Area Day	\$43,656,746	\$18,358,965	\$33,984,571	\$96,000,232
Study Area Night	\$66,568,078	\$27,993,864	\$51,819,886	\$146,381,827
100 Year Event Day	\$3,440,254	\$1,247,078	\$1,154,519	\$5,841,851
100 Year Event Night	\$2,986,099	\$918,334	\$744,474	\$4,648,907
500 Year Event Day	\$3,796,645	\$1,417,639	\$1,628,726	\$6,843,010
500 Year Event Night	\$3,696,750	\$1,196,021	\$1,054,457	\$5,947,228

Source: HAZUS-MH

HAZUS-MH, for the 100 year and 500 year flood event scenarios, did not indicate any Economic Income and Employment Impact with or without outside aid.

Addressing Repetitive Loss Properties (NFIP data for floods)

The Federal Emergency Management Agency National Flood Insurance Program provides flood loss data as a result of insurance claims filed by home/business owners who have purchased a separate insurance policy with respect to flood damage. Loss information based on claims files is shown in the following table:

Table 5-16 FEMA NFIP Loss Cases and Payments to the Town/Village of Harrison 1978 to November 30, 2008 (Repetitive and Non-Repetitive)

Total Losses	Closed Losses	Open Losses	Closed without Payment	Total Payments
668	558	0	110	\$3,476,352

Source: FEMA NFIP BureauNet (<http://bsa.nfipstat.com/reports/1040.htm#36>)

The Town / Village of Harrison requested and received from the New York State Department of Environmental Conservation Floodplain Management Section, repetitive flood loss information for buildings for the period 1978 through December 2008. Buildings defined as repetitive loss are those sustaining four or more paid losses of more than \$1,000 each, or two losses within a 10-year period that, in the aggregate, equal or exceed the current value of the insured property, or three or more losses that, in the aggregate, equal or exceed the current value of the insured property. For the study area, a total of 66 properties were identified as having incurred repetitive losses. Property types incurring repetitive losses include 34 single family units, 27 multi-family (2-4) units, 2 condominium units and 3 non-residential properties. Tables 5-17 and 5-18 list the number of repeat losses and losses in defined flood zones.

Table 5-17 Properties sustaining multiple repetitive losses

Number of repetitive losses	Number of Properties sustaining losses
2	25
3	21
4	13
5	3
6	1
7	0
8	0
9	1
10	0
11	2

Source: NYSDEC Floodplain Management Section

Table 5-18 Properties sustaining losses by flood zone type

Flood Zone Designation	Number of Repetitive Loss Properties in the Flood Zone	Flood Zone Description (See glossary for detailed descriptions)
A	14	An area inundated by 100 year flooding for which no Base Flood Elevations (BFE's) have been established
AE	16	An area inundated by 100 year flooding for which BFE's have been determined
AH	20	An area inundated by 100 year flooding (usually ponding) for which BFE's have been determined, flood depths may range from 1 – 3 feet
B	1	An area inundated by 100 year and 500 year flooding
C	3	An area determined to be outside the 100 year floodplain
A02	1	An area inundated by 100 year flooding for which no BFE's have been established
A07	3	An area inundated by 100 year flooding for which no BFE's have been established
X	8	An area determined to be outside the 100 year floodplain

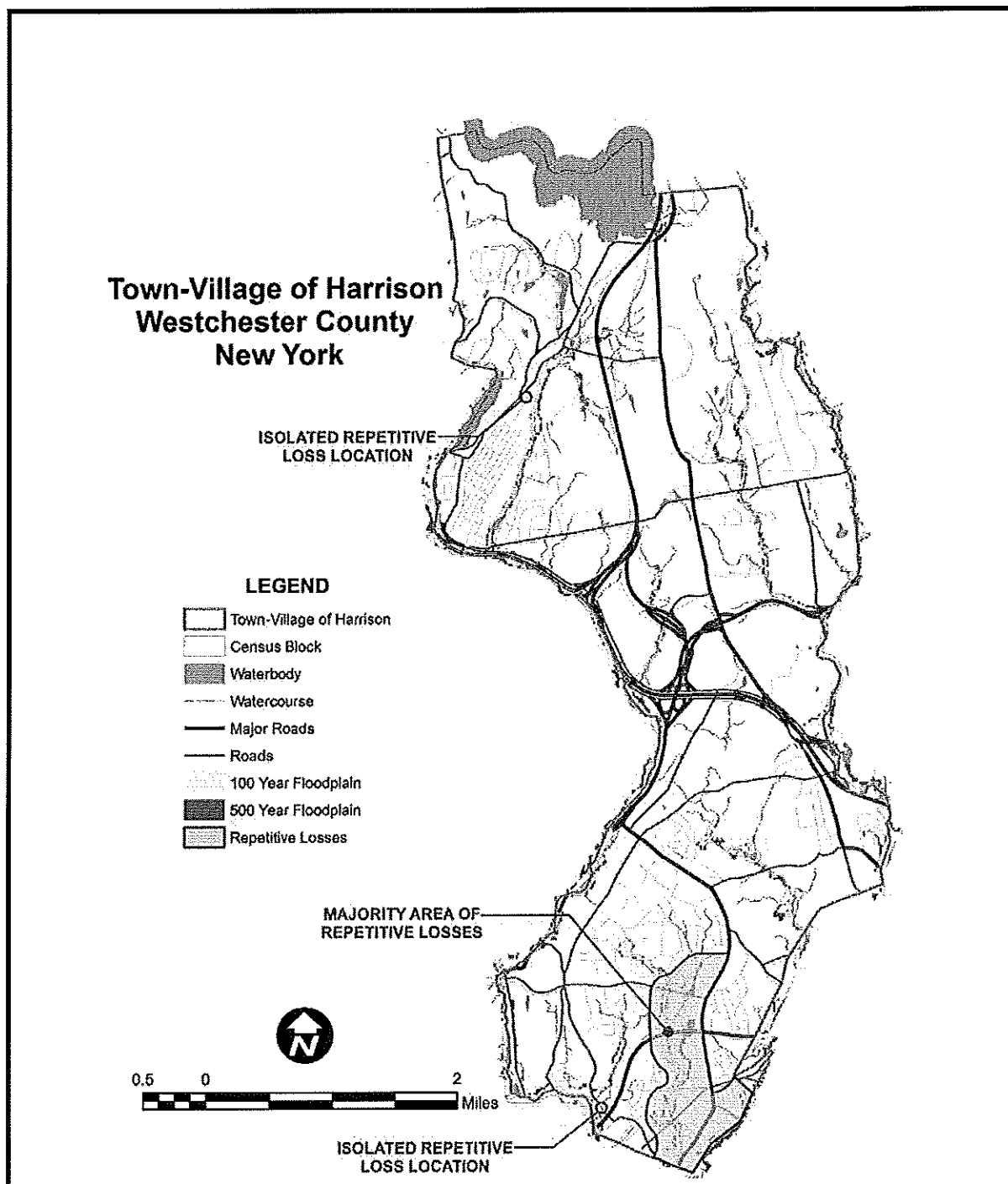
Source: NYSDEC Floodplain Management Section

Taking the Repetitive Flood Loss Data provided and overlaying the loss locations on the study area's FIRM maps, it is estimated that 90% of the Repetitive loss building are located in, or are in close proximity to the 100 and 500 year floodplains. Figure 5.9A shows the 100 and 500 year floodplain areas overlaid with the location of 65 of the 66 Repetitive Loss locations.

In order to estimate the vulnerability in terms of estimated potential dollar losses, actual loss information was taken from the data provided, analyzed and categorized for all the Repetitive Loss Buildings. Based on the data provided, there were 217 reported losses for the 66 identified properties. The total dollar value of these losses was \$1,840,099.00 and the average payout per

loss was \$8,480.00. The largest single payout averaged \$85,786.00 on a non-residential structure with 2 reported claims. The largest single payout on a resident structure averaged \$78,221.00 with 2 reported claims

Figure 5.9A. 100 and 500 year floodplain areas overlaid with Repetitive Loss locations.



Source: HAZUS-MH, NFIP Loss Data

Narrative of Flood Area

The area in which the majority of repetitive losses takes place (99% of all loss properties) is locally identified as the downtown area of Harrison. The area which has sustained the greatest number of impacted properties is bounded by the New England Thruway on the north and west, by Harrison Avenue (NY127) on the east, and the New Haven Division of the Metro North Commuter Railroad on the south. The majority of other impacted areas are just north and south of this area (see Figure 5.9A).

The natural features which make up the area where the majority of losses take place includes the relative consistency in elevation over a large area. Combined with both an aged and outdated stormwater conveyance system, the majority of the area lies in the 100 and 500 year floodplain, or may be influenced by the 100 and 500 year floodplain depending on storm intensity and duration. Land use is primarily residential with single and two family homes on small parcels of 5,000 to 10,000 square feet. Two schools with associated playing fields and a pond are located on the north side of the area. The area is generally considered to be built out with minimal vacant land present.

There are 4 streams which impact the flood loss area. Flowing from the north are Nelson Creek, Woodlands Road Brook 1 and 2, and Brentwood Brook. Flowing along the south side of the impacted area is the Beaver Swamp Brook.. These watercourse features are shown on the Town/Village of Harrison Flood Insurance Rate Maps (FIRMS).

National Flood Insurance Program – Community Rating System

The Town / Village of Harrison is not a participant in the National Flood Insurance Program Community Rating System (CRS) meaning that the community is classified as a 10 and that flood insurance purchased does not receive a discount for efforts by the Town / Village of Harrison to mitigate flooding.

As part of the Town/Village's mitigation efforts, registration with and participation in the National Flood Insurance Program – Community Rating System will be implemented . Details of this effort are included in the Mitigation Strategies section

Estimating Potential Losses

Vulnerability in terms of dollar losses provides the study area and the State with a common framework in which to measure the effects of hazards on vulnerable structures.

HAZUS-MH was utilized to develop estimated losses based on 100 year and 500 year floodplains events. The analysis in Tables 5-19 to 5-23 reflects loss data for 100 and 500 year flood events.

For the 100 year floodplain event it is estimated that 86 buildings will be at least moderately damaged with 19 completely destroyed. (definitions with respect to "damage states" is documented in Volume 1, Chapter 5 of the HAZUS Flood Technical Manual.

Table 5-19 Expected Building Damage by Occupancy and Range of Damage Percent (%) (100 year event)

Occupancy	Count / 1-10%	Count / 11-20%	Count / 21-30%	Count / 31-40%	Count/ 41-50%	Count/ Substantially
Agriculture	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Commercial	0 / 0	3 / 100	0 / 0	0 / 0	0 / 0	0 / 0
Education	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Government	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Industrial	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Religion	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Residential	0 / 0	8 / 9.64	10 / 12.05	22 / 26.51	24 / 28.92	19 / 22.89
Total Count	0 / 0	11	10	22	25	19

Source: HAZUS-MH

Table 5-20 Expected Building Damage by Building Type and Range of Damage Percent (%) (100 year event)

Building Type	Count / 1-10%	Count / 11-20%	Count / 21-30%	Count / 31-40%	Count/ 41-50%	Count/ Substantially
Concrete	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Manufactured Hsg	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Masonry	0 / 0	1 / 12.50	2 / 25.00	1 / 12.50	3 / 37.50	1 / 12.50
Steel	0 / 0	1 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Wood	0 / 0	8 / 10.81	7 / 9.46	21 / 28.38	20 / 27.03	18 / 24.32

Source: HAZUS-MH

For the 500 year floodplain event it is estimated that 145 buildings will be at least moderately damaged with 36 completely destroyed. (definitions with respect to "damage states" is documented in Volume 1, Chapter 5 of the HAZUS Flood Technical Manual.

Table 5-21 Expected Building Damage by Occupancy and Range of Damage Percent (%) (500 year event)

Occupancy	Count / 1-10%	Count / 11-20%	Count / 21-30%	Count / 31-40%	Count/ 41-50%	Count/ Substantially
Agriculture	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Commercial	0 / 0	3 / 100	0 / 0	0 / 0	0 / 0	0 / 0
Education	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Government	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Industrial	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Religion	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Residential	0 / 0	10 / 7.04	17 / 11.97	43 / 30.28	36 / 25.35	36 / 25.35
Total Count	0 / 0	13	17	43	365	36

Source: HAZUS-MH

Table 5-22 Expected Building Damage by Building Type and Range of Damage Percent (%) (500 year event)

Building Type	Count / 1-10%	Count / 11-20%	Count / 21-30%	Count / 31-40%	Count/ 41-50%	Count/ Substantially
Concrete	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Manufactured Hsg	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Masonry	0 / 0	1 / 12.50	3 / 20.00	4 / 26.67	3 / 20.00	4 / 26.67
Steel	0 / 0	1 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Wood	0 / 0	10 / 8.00	14 / 11.20	37 / 29.60	33 / 26.40	31 / 24.80

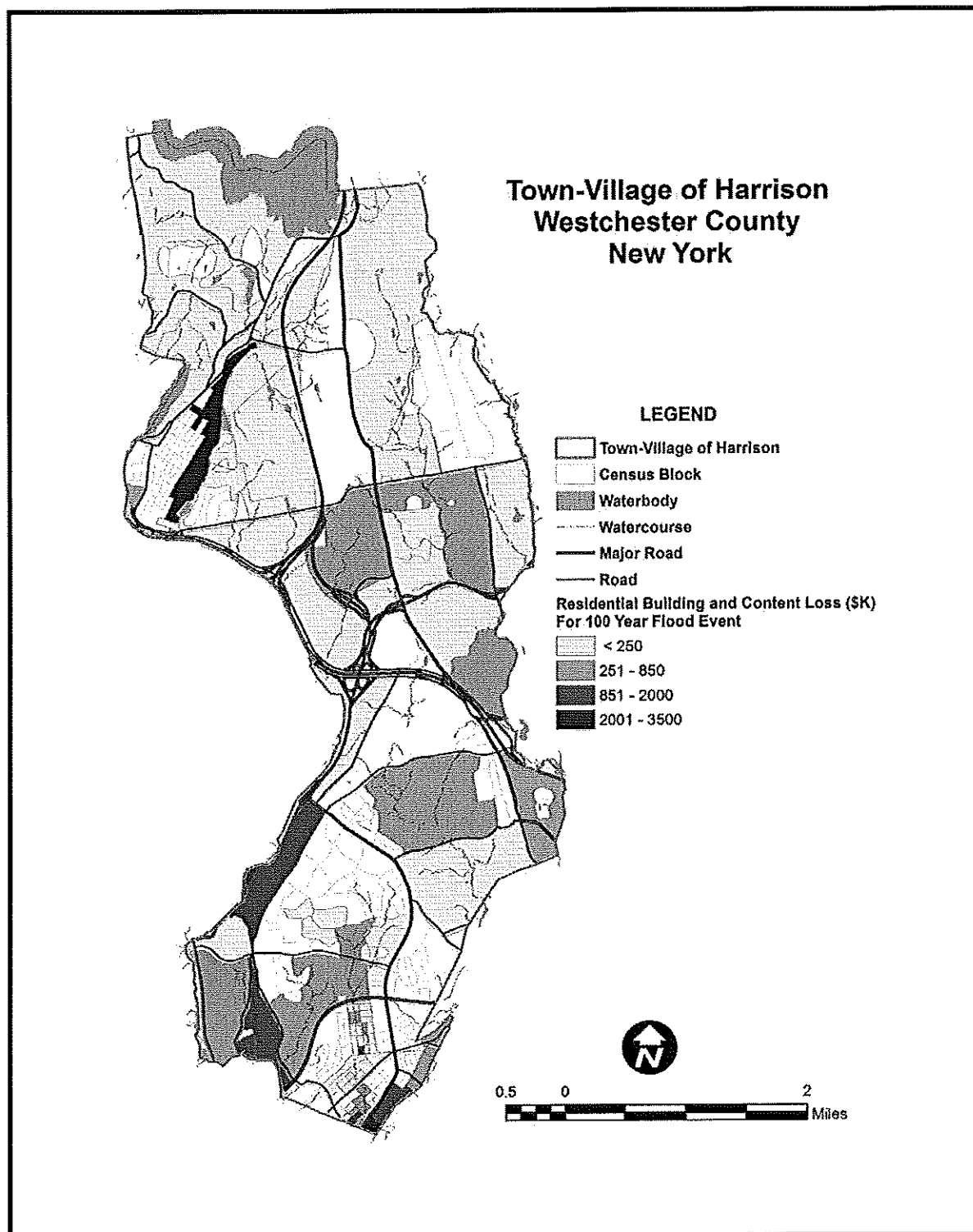
Source: HAZUS-MH

Table 5-23 School Damage and Functionally (\$1,000)

Event Scenario	Count of Schools	Total Building Damage (\$)	Total Content Damage (\$)	Non-Functional Schools	Average Restoration Time
100 Year	1	376.18	2,036.85	0	480
500 Year	3	647.96	3,507.18	1	480

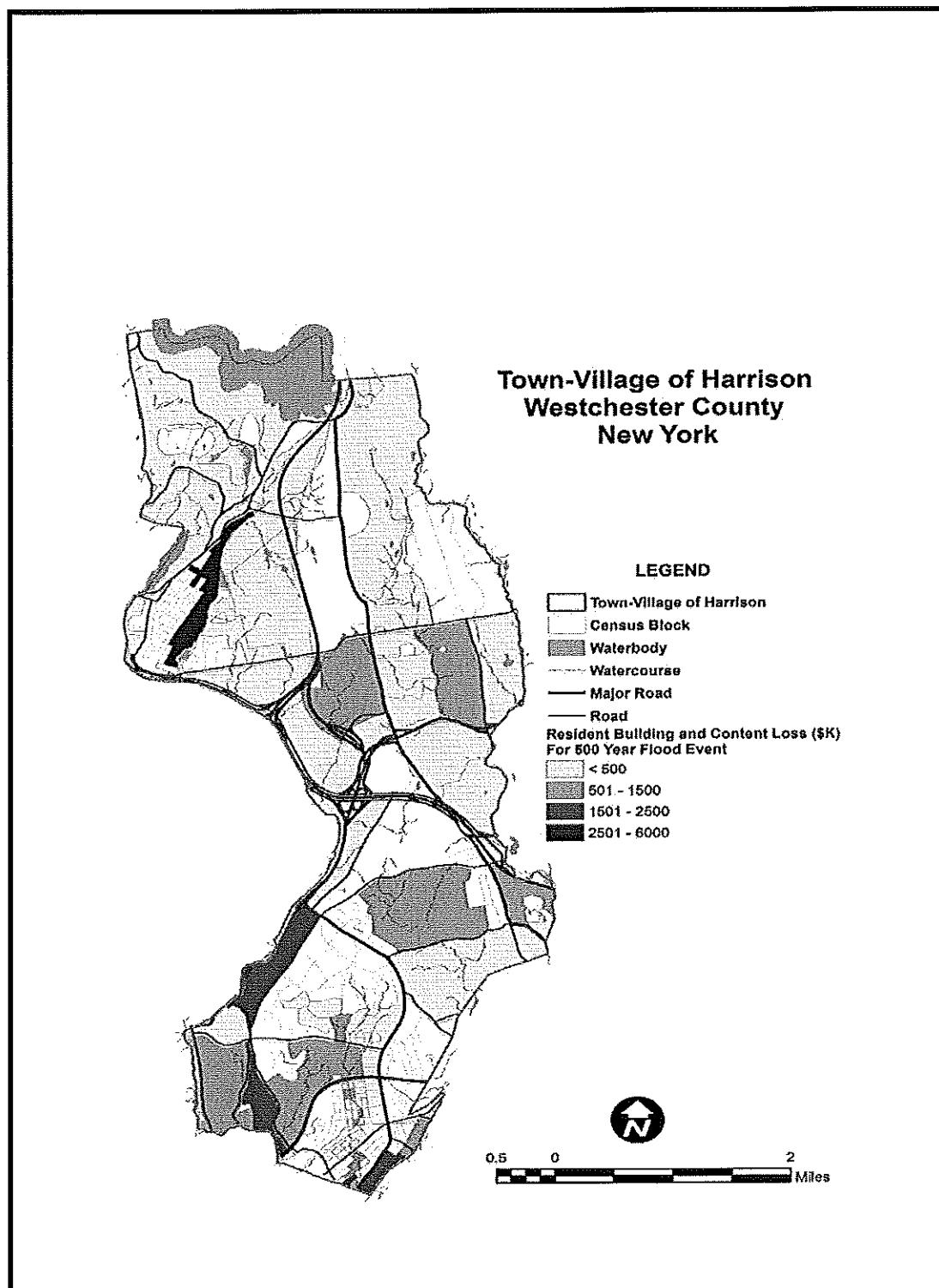
For Transportation and Utility Lifeline System Losses, HAZUS-MH computes that none of these facilities would be flooded / sustain flood damage. Based on past experience, these type of analysis, are better left to local officials since some form of damage, particularly to highways and stormwater culverts has occurred in the past as a result of flood events. The need for further analysis will be addressed in the Mitigation Strategy Section of this Plan.

Figure 5-10 Density of Losses for Residential Buildings (Structure and Content) for the 100 year Flood Event



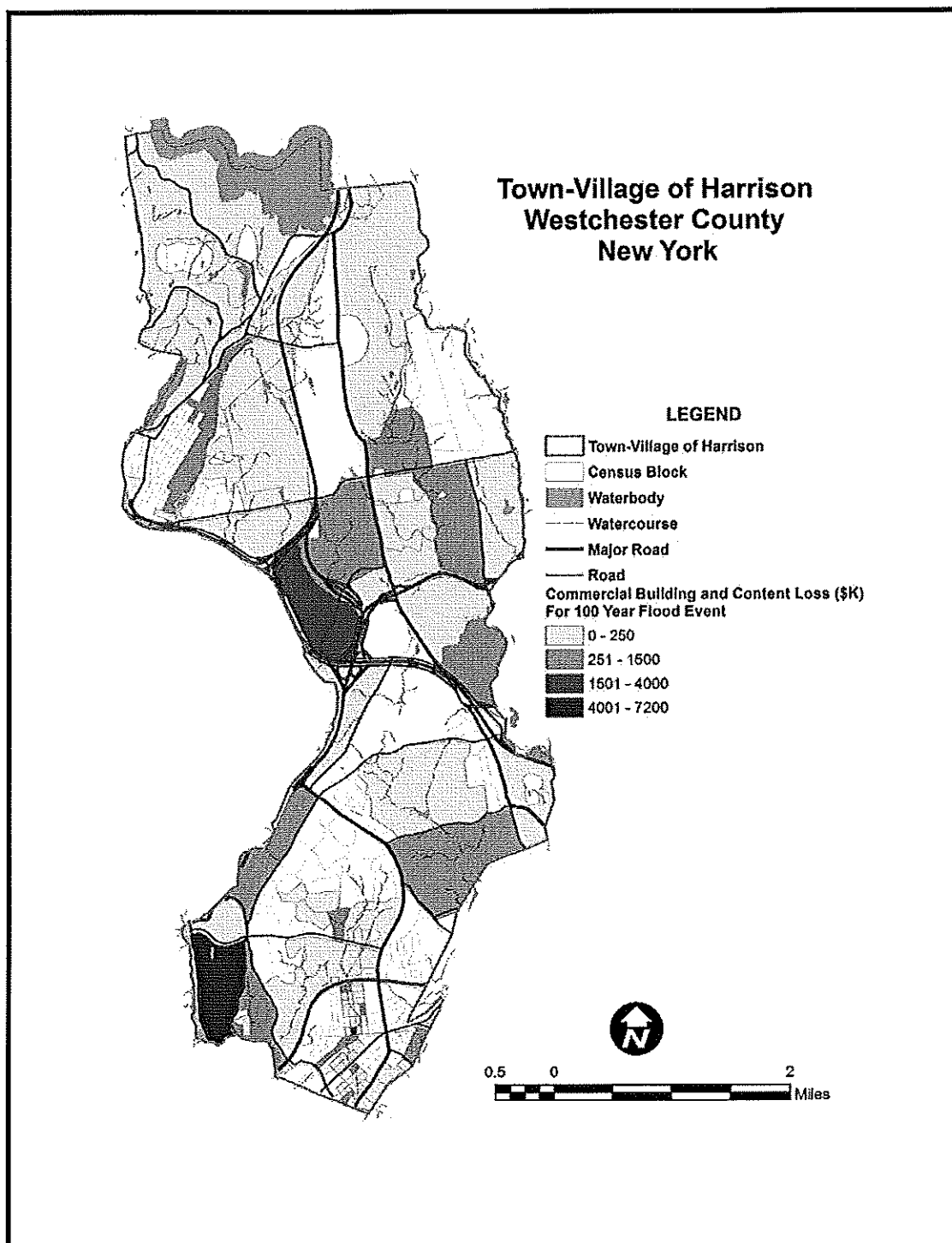
Source: HAZUS -MH

Figure 5-11 Density of Losses for Residential Buildings (Structure and Content) for the 500 year Flood Event



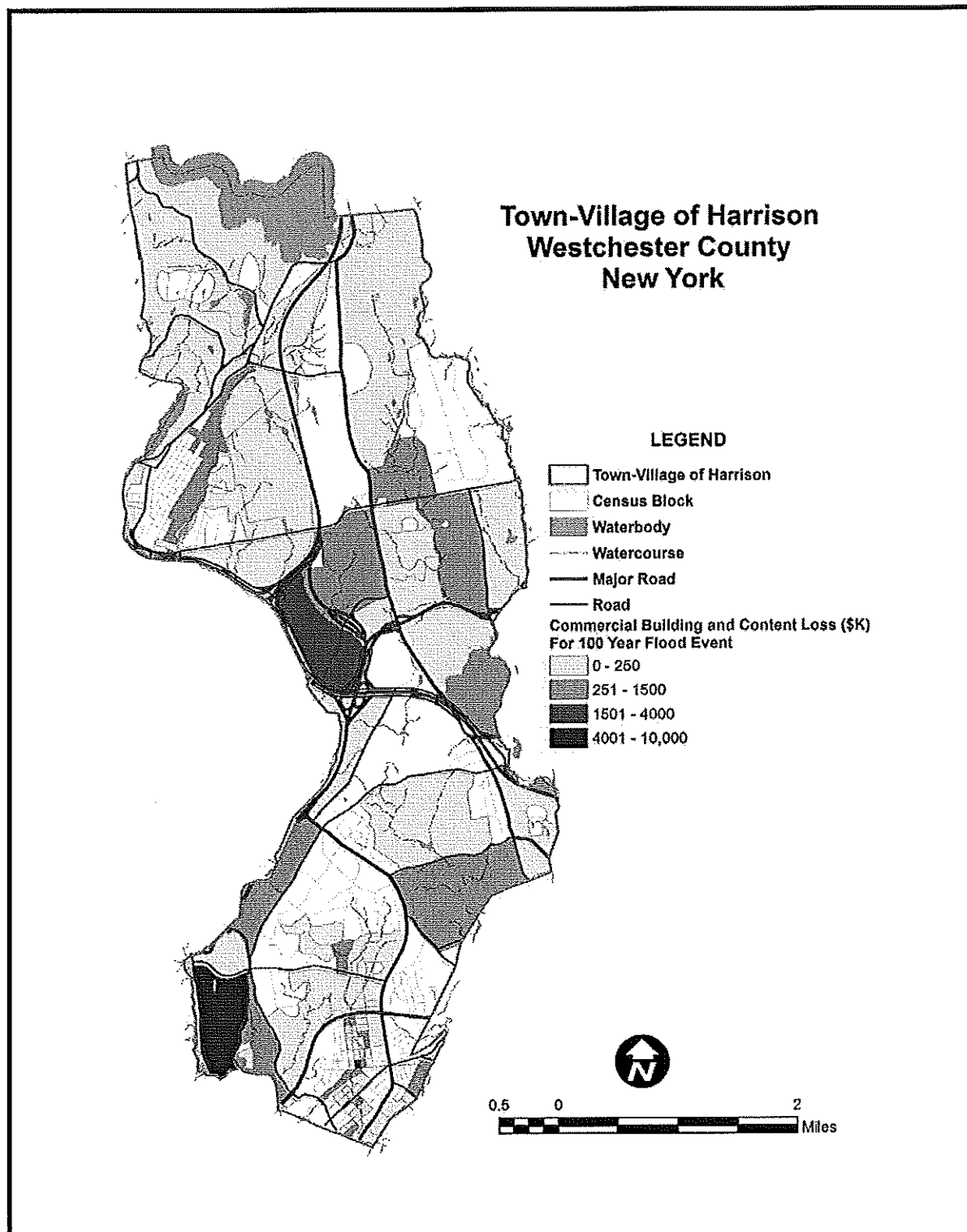
Source: HAZUS -MH

Figure 5-12 Density of Losses for Commercial Buildings (Structure and Content) for the 100 year Flood Event



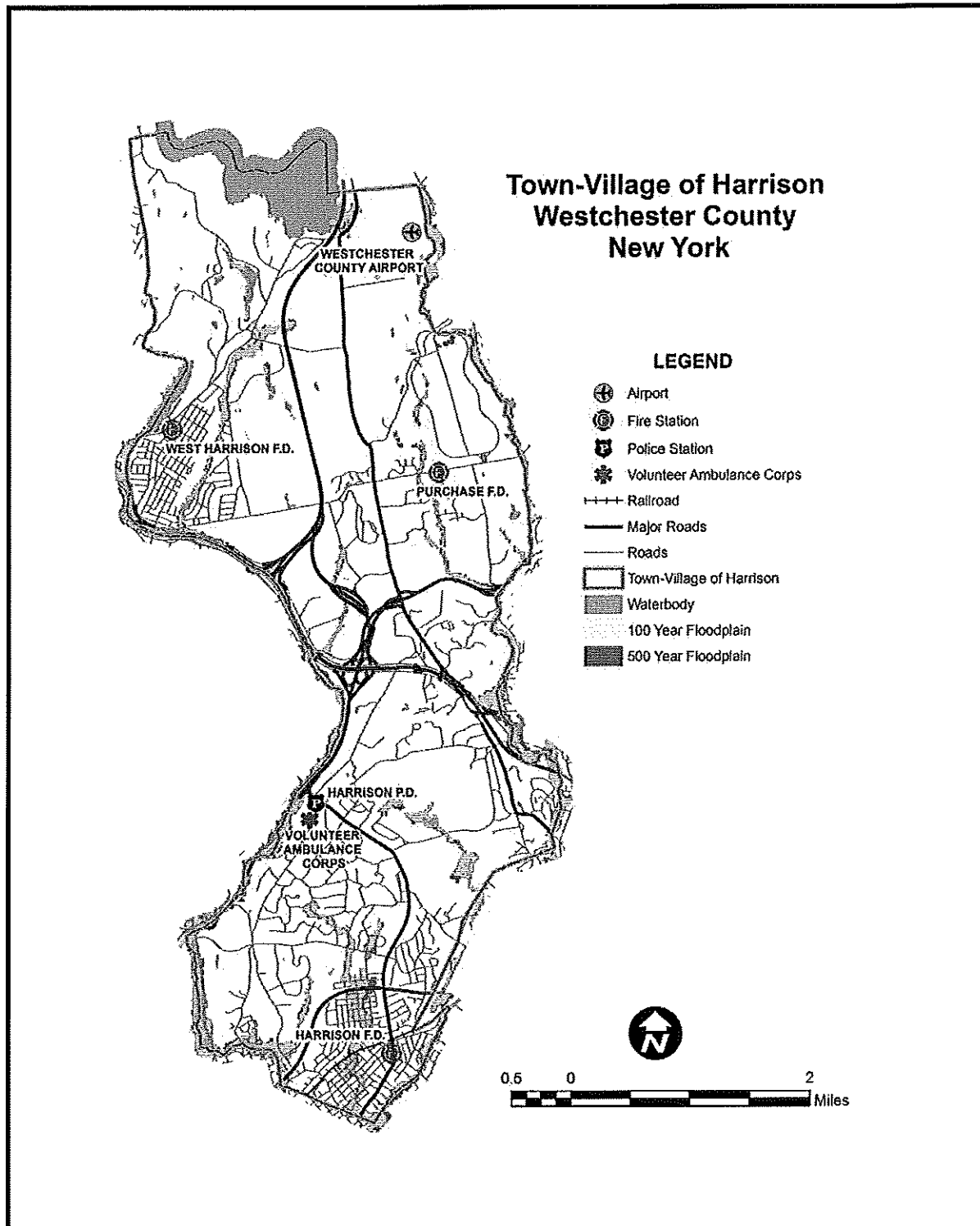
Source: HAZUS -MH

Figure 5-13 Density of Losses for Commercial Buildings (Structure and Content) for the 500 year Flood Event



Source: HAZUS -MH

Figure 5-14 Critical Facilities in relation to the 100 and 500 year floodplains



Source: Local information/HAZUS-MH and WCGIS

In April 2007, the Town / Village sustained severe flooding which resulted in a Federal Disaster Declaration (DR-1692-NY) which provided both individual and public assistance. Widespread areas of the Town Village sustained flooding including the following areas/streets:

Loss data NFIP properties for this flood event is provided elsewhere in this plan. The Town / Village submitted assistance applications to FEMA in the amount of \$ 519,645 which included damage to infrastructure, equipment and debris management.

In addition to general building stock at risk from floods, critical facilities and infrastructure susceptible to floods were also evaluated. Critical facilities include police, fire, EMS, public works, schools, hospitals, senior facilities and transportation/transmission systems. Figure 5-14 depicts where these type facilities are located in the Town/Village of Harrison

According to the analysis, the following critical facilities are in or are in close proximity to the 100 and 500 year floodplains and thus may be susceptible to damage or destruction during a flood hazard event:

- Portions of the Public Works and Fleet Maintenance Facility on Harrison Avenue

As a result of floods, debris is generated as a result of damage to buildings and infrastructure as well as natural features such as trees and rock formations. HAZUS –MH estimates the amount of debris which can be generated by a particular earthquake event. The model breaks the debris into three general categories; finishes, structures and foundations. This distinction is made due to the different types of material handling equipment required to handle the debris. Table: 5-24 shows to amount of debris generated by event scenario.

Table: 5-24 Debris Generated (Tons)

Category	100 Year Event	500 Year Event
Finishes	2,928	4,120
Structures	01,218	1,943
Foundations	948	1,547

Source: HAZUS-MH

Analyzing Development Trends (new buildings, critical facilities and Infrastructure)

Section 4 of this plan Municipal Profile – Future Development identifies several areas in the Town / Village of Harrison where the potential for development or redevelopment exists. As of January 1, 2009, construction underway is limited due to the economic turndown. Recent changes to the New York State Building Code have increased first floor elevations in residential units from 1 foot to 2 feet above the base flood elevation and includes other provisions related to flooding. Any structures which are proposed need to take into account there impact on the surrounding areas due to any increases in impervious surfaces as well as the ability of the existing stormwater conveyance system to accommodate increased flows. Where newly developed or redeveloped sites are proposed the concept of zero (0) runoff should be given due consideration.

Additional Data and Next Steps

The Town/Village of Harrison will continue to monitor and record the impacts of flood hazard events as they occur, better educate the public about flooding and encourage the use of the NFIP Flood Insurance Program. Monitoring and recording of the impacts of flood events will allow for both short term and long range planning for improving stormwater conveyance infrastructure where possible which will in term lessen the impacts of flood hazard events.

Overall vulnerability conclusion

The flood hazard has been determined to be a significant event and has been ranked as a high risk for the Town /Village of Harrison.

Hazard Profile – Severe Winter Storm

Winter storms have been characterized by the Town / Village of Harrison Mitigation Planning Committee as the 3rd most severe hazard event to which the study area is susceptible. Because storm intensity and duration can vary extremely from year to year, The Town / Village must always be prepared for a worst case scenario event. Winter storms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. The cost of snow removal, damage repair, and business losses can have a tremendous impact on the study area. Communications and power can be disrupted for days until damage can be repaired. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibilities to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents can result with injuries and deaths. Information for this hazard was taken from the below listed as well as other sources:

- *Northeast Regional Climate Center (NRCC) based at Cornell University.* A review of the climatic conditions of New York State, and their effects upon persons, property, and economics. This document was obtained from the following Cornell University web site http://nysc.eas.cornell.edu/climate_of_ny.html. The center is a partner of the National Climatic Data Center. The NRCC contact person is Keith Eggleston.
- *NOAA Satellite and Information Services and National Climate Data Center.* <http://www4.ncdc.noaa.gov/cgi-win/wwwcgi.dll?wwevent~storms> . This web-based database maintains the records for many types of disasters dating back to 1950, and allows users to make queries by state, disaster type, and time period, etc.
- *Town of Harrison Department of Public Works files*

The following chart provides the definition of a winter storm:

Table 5-43 Severe Winter Storm Definition

Term	Definition
Winter Storm	Includes ice storms, blizzards, and can be accompanied by extreme cold. The National Weather Service characterizes blizzards as being combinations of winds in excess of 35 miles per hour with considerable falling or blowing snow, which frequently reduces visibility.

Source: NYSEMO 2008 Hazard Mitigation Plan

Winter storms are a common seasonal occurrence in the Town / Village of Harrison although individual storm intensity and duration can vary widely. The most damaging and costly winter season in recent memory is 1996 and in particular the months of January, February and March. Municipal public works officials can testify to the feeling that “it felt like it snowed every 48 hours from January through early March”. Road deicing materials (salt) were in short supply at one point and deliveries became sporadic and less than what was ordered due to transportation problems associated with distribution points. The estimated 18 to 24 inches of snow that fell during the January 1996 Blizzard required a request for assistance to the New York National Guard. Military personnel and equipment assisted the overburdened municipal work force with snow removal following the actual storm event.

Geographic Location and Extent

The entire Town / Village of Harrison is susceptible to winter storms. The Northeast Regional Climate Center (NRCC) based at Cornell University in Ithaca, New York states that the mean snowfall for the study area is 40 to 50 inches annually. A typical snow event can range from a dusting to more than 12 inches. Several factors will determine the severity of a severe winter storm including temperature, wind speed, type of precipitation, day or nighttime event as well as when in the winter season the storm occurs. Typical categories of severe winter storms include heavy snow, blizzard, sleet or freezing rain and ice storms.

The Northeast Snowfall Impact Scale (NESIS) developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service ([Kocin and Uccellini, 2004](#)) characterizes and ranks high-impact Northeast snowstorms. These storms have large areas of 10 inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus NESIS gives an indication of a storm's societal impacts. This scale was developed because of the impact Northeast snowstorms can have on the rest of the country in terms of transportation and economic impact. (<http://www.ncdc.noaa.gov/oa/climate/research/snow-nesis/>)

Table 5-44 Northeast Snowfall Impact Scale

NESIS Snowstorm CategoriesCategory	NESIS Value (Snowfall in Inches)	Description
1	1-2.499	Notable
2	2.5-3.99	Significant
3	4-5.99	Major
4	6-9.99	Crippling
5	10+	Extreme

Source: <http://www.ncdc.noaa.gov/oa/climate/research/snow-nesis/#rankings>

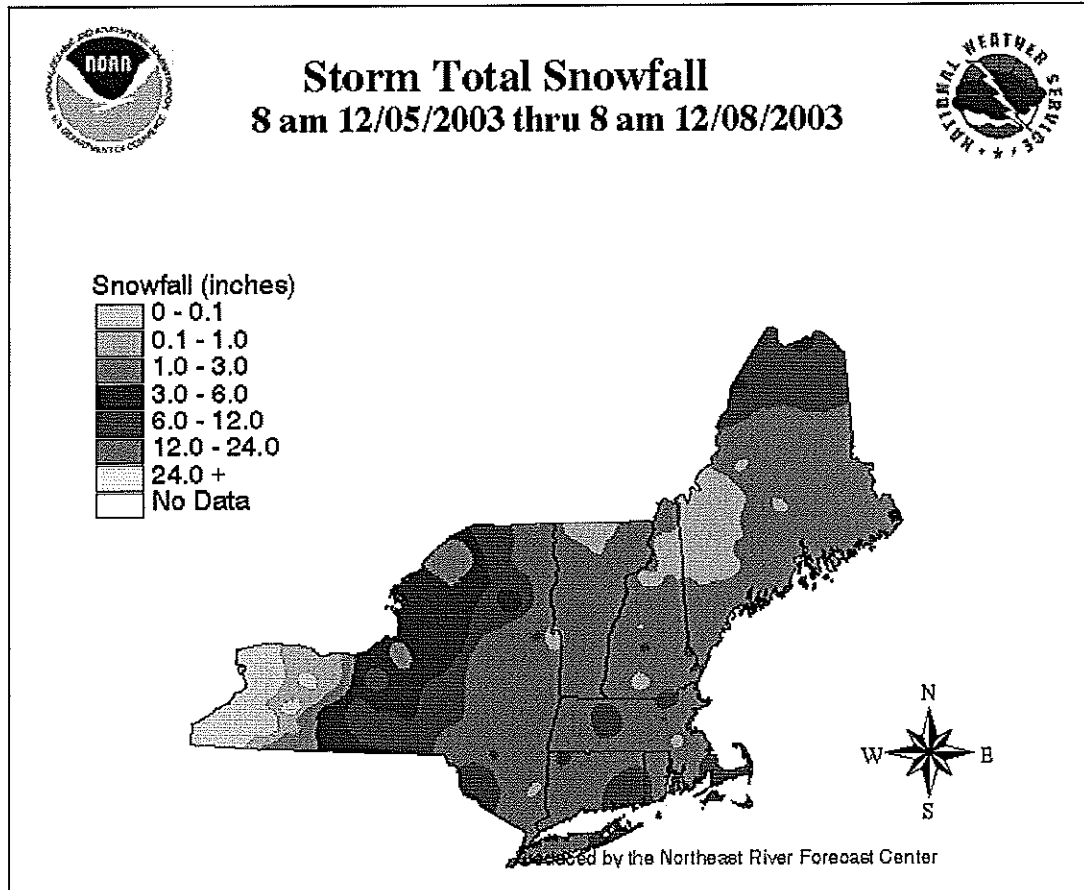
Severe winter storms have the ability to disrupt municipal operations and the every day lives of people over periods of one to several days. Schools and businesses may be closed, municipal workers may be forced to defer routine services in order to clear roads of snow. Snow and ice have the ability to down trees and power lines which can cause homes and businesses to be without the ability to provide heat. Municipal snow and ice control equipment vehicles may cause damage to roads and bridges as a result of several freeze and thaw cycles as well as cumulative damage from road salt and other chlorides.

Previous Occurrences and Losses

Westchester County and the Town / Village of Harrison have experienced some 57 snow / ice storms of varying intensities between January 1950 and May 2008 according to the NOAA National Climatic Data Center. Presidential Disaster Declarations for Severe Winter Storm Events are listed in Table 5-71. The **NEWS FROM THE NORTHEAST REGIONAL CLIMATE CENTER** reported the following on the January 1996 "Blizzard of '96":

ITHACA, N.Y. -- While much of the eastern United States digs out from the Blizzard of '96, the snow has stopped falling but snowfall records continue to fall and storm-related anecdotes pile up, according to climatologists from the Northeast Regional Climate Center at Cornell University. Philadelphia and parts of New Jersey were hammered by the greatest one-storm, snowfall totals ever. In Philadelphia, the storm left 30.7 inches of snow, breaking the old one-storm snowfall total by 9.4 inches - the previous record was the Feb. 11-12, 1983, storm that blanketed the City of Brotherly Love with 21.3 inches of snow. This week's blizzard exceeded the 12 inches of snow left during 1993's so-called "Storm of the Century." The all-time record snowfall for New Jersey - 34 inches in coastal Cape May, in February 1899 - was beaten by 1 inch at Whitehouse Station in northeastern Hunterdon County, N.J., which received 35 inches of snow through Jan. 9. The snowfall record in Newark, N.J. - 22.6 inches set on Feb. 3-4, 1961 - did not measure up to the 1996 blizzard's 27.8 inches. The 1993 "Storm of Century" left but 12.7 inches in Newark, a faint match for this week's onslaught. Central Park in New York City recorded 20.2 inches of snow in this storm, making it the third highest snowfall ever there. On parts of nearby Staten Island, N.Y., more than 27 inches of snow fell. LaGuardia International Airport, N.Y., recorded 24 inches of snow, which exceeds the normal for the entire season of 22.6 inches. Most of upstate New York saw little or no snow. The snow line was very pronounced: In Columbia County, N.Y., between Albany and New York City, weather stations such as Ancram, N.Y., recorded 23 inches of snow, while nearby Valatie, N.Y., saw but 2 inches. Scranton, Pa., recorded 21 inches of snow, while Binghamton, N.Y., just to the north on Interstate 81, recorded only a trace of snowfall from this storm. Through the middle Atlantic corridor, the Blizzard of '96 spared few places. Dulles International Airport, in the Virginia suburbs of Washington, D.C., had a storm total of 24.6 inches of snow, but set a new 24-hour period record of 19.8 inches. Pocahontas County, W.Va., was pounded with between 40 and 48 inches of snow. Webster County, W.Va., recorded between 24 and 46 inches of the white stuff, and Randolph County, W.Va., experienced between 20 and 40 inches of snow. Petersburg and Brandywine, W.Va., both received 30 inches of snow. Shenandoah, Va., caught 37 inches of snow from the blizzard and Sperryville, Va., had 31 inches.

Figure 5-26 Snowfall for study area December 5, 2003 storm event



Source: NOAA

On February 12, 2006, the New York Times reported 16-24 inches of snow had fallen in the New York Metropolitan Area. The snow was accompanied by wind gusts of up to 50 miles per hour. Consolidated Edison Company of New York, which provides electric service to the area reported 250 crews had been mobilized for response coverage in Westchester County.

Table: 5-45 Presidential Disaster Declarations for Severe Winter Storm Events

Type of Event	Date	Declaration Number	Municipal Assistance in Dollars
Nor'easter (winter storm)	December 1992	0974-DR-NY	No Information Available
Blizzard	March 1993	3107-EM-NY	\$48,341
Blizzard	January 1996	1083-DR-NY	\$202,697
Snowstorm	February 2003	3184-EM-NY	\$178,822

Source: FEMA Presidential Declarations

Probability of Future Events

The Town / Village of Harrison lies within high latitudes thus making the study area prone to winter storm events. The study area over time can meet the mean average snowfall of 40 to 50 inches. Based on historical records, input from the HMPC and the institutional memory of municipal officials, the probability of occurrence for a severe winter storm in the Town/Village is considered frequent (likely to occur more than once every 5 years)

Vulnerability Assessment

A vulnerability assessment is defined as assessing the vulnerability of people and the built environment to a given level of hazard. After identifying types of risk, a vulnerability analysis can help to determine the weak points in the community. This assessment examines the vulnerability of the existing and future built environment, such as structures, utilities, roads and bridges, as well as environmental vulnerability, such as open space that can suffer from erosion. Once the geographic areas of risk are identified in the Town / Village, vulnerability can be assessed for the population, property and resources at risk in those areas. Vulnerability indicates what is likely to be damaged by the identified hazards and how severe the damage may be. For example, if an area is determined to be at risk of flooding, vulnerability estimates for that area could include residential property losses, impacts to the tax base and damages to public infrastructure. Severe winter storm events can impact the entire Town/Village of Harrison. All assets including population, structures, critical facilities and utilities are vulnerable. The following sections evaluate and estimate the potential impact of severe storms:

- Overview of vulnerability
- Data and methodology used in the evaluation
- Impact on life, safety and health
- Identifying structures including general building stock, critical facilities and critical infrastructure
- Economic impact
- Addressing Repetitive Loss Properties (NFIP data for floods, other hazards as available)
- Estimating Potential Losses
- Analyzing Development Trends (new buildings, critical facilities and Infrastructure)
- Additional Data and Next Steps
- Overall vulnerability conclusion
- Multi-jurisdictional Risk Assessment

Overview of Vulnerability

Severe winter storms are a major concern to the Town / Village of Harrison. As with any weather related event, technology allows for advance warnings as to the intensity and severity of such events. Severe winter storms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize the study area, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. The cost of snow removal, damage repair, and business losses can have a tremendous impact on the study area government. Heavy accumulations of ice can

bring down trees, electrical wires and utility poles. Communications and power may be disrupted for days until damage can be repaired. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibilities to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents can result with injuries and deaths.

Data and Methodology

Information for this hazard was provided by National, Institutional and Local databases as well as HAZUS-MH which provided population and general building stock information. The Town /Village of Harrison provided information with respect to municipal losses and costs associated with cleanups for Presidential Declarations.

Impact on Life, Safety and Health

The disruption of services during a severe winter storm and the ability to move about freely can impact the entire study area's population with particular emphasis on elderly, low and fixed income populations. The elderly are at risk from falls on icy surfaces. Public service transportation may be temporarily disrupted leaving populations with no means of food shopping, attending scheduled appointments and completing everyday activities. Table 5-72 below listed the population most susceptible problems associated with Severe Winter Storms.

Table: 5-46 Population Susceptible to Severe Winter Storms

Population Category	Number of Persons Susceptible
Elderly (Over 65 years of age)	3,537
Low Income (Persons living in households with annual incomes less than \$25,000 per year)	828

Source: Westchester County Department of Planning/2000 US Census

Impact on General Building Stock, Critical Facilities and Infrastructure

All General Building Stock, Critical Facilities and Infrastructure in the study area is susceptible to Severe Winter Storms. Locally available historical data on the impacts of this type event is limited. Discussions with municipal officials with respect to critical facilities impact identified leaking roofs as a common occurrence from ice buildup and damage to snow and ice control equipment.

Utilizing HAZUS – MH, possible severe storm damage scenarios were developed for events which could result in damage to the general building stock of .5%, 1%, 2% and 5%. These damage estimates are for information only in order to identify the potential for losses from such a winter storm event. Actual storm related damage data is not available.

Table: 5-47 General Building Stock Exposure with Percentage Damage Loss Estimates (\$1,000)

Building Occupancy Class	Number of Buildings	Total Value	.5% Damage Loss Estimate	1% Damage Loss Estimate	2% Damage Loss Estimate	5% Damage Loss Estimate
Agriculture	57	9,704	48.52	94.04	188.08	485.2
Commercial	673	669,177	3345.885	6691.77	13,383.54	33,458.85
Education	27	52,876	264.38	528.76	1,057.5	2,643.8
Government	16	18,789	93.945	187.89	375.78	939.45
Industrial	190	180,212	901.06	1802.12	3,604.24	9,010.6
Residential	6,618	1,865,990	9329.95	18659.90	37,379.8	93,399.5
Religion	43	41,243	206.215	412.43	824.86	2,062.15
Total	7,624	2,837,991	14,189.995	28,379.91	56,759.82	141,899.55

Damage to roadways as a result of winter storms is a common occurrence and requires maintenance and repair work once the winter season ends. Freezing and thawing cycles, the application of salt and chloride solutions to roadways creates pavement cracking, potholes and may include loss of overlayed wearing surfaces. Funds to perform this type work are typically incorporated in the Department of Public Works annual operating budget. Other areas where there is a potential for damage from a severe winter storm is the 100 and 500 year floodplain areas. Freezing and thawing cycles, damage to trees and associated debris from ice and heavy snow as well as blocked stormwater conveyance systems has the potential to cause flooding events under the right set of circumstances.

Economic Impact

The fact that severe winter weather is a common occurrence in the study area means that many residents, businesses and visitors are prepared to function to a certain extent under such conditions. Because technology can provide advance warnings for such events, residents will typically stock up on needed food items before such an event while shopping for other goods and services can be put off and appointments rescheduled. There are no data sources available to determine what impact a severe winter storm has on the economy. For the study area, any impact would be short term, typically a day or two based on past events. The most significant economic impact would be to the financial resources of the Town/Village of Harrison local government. Costs to maintain a passable highway network as well as the removal of snow from roadways and sidewalks, especially in the downtown business areas, can quickly escalate to the ten's of thousands or hundred's of thousands of dollars. During the winter storm of January 6-8, 1996, the Town / Village requested and received reimbursement under Presidential Declaration DR-1083 amounting to \$202,697. Additionally the New York National Guard spent several days in the study area and surrounding communities assisting with snow removal.

Addressing Repetitive Loss Properties (NFIP data for floods, other hazards as available)

The National Flood Insurance Program provides information on payments to homeowners resulting from losses due to flooding where a separate insurance policy for such events has been purchased. Under the severe winter storm category, flooding may be a secondary or resulting event brought about by a combination of heavy snows, quickly warming temperatures and rain events before the ground has had time to thaw. Flooding events, repetitive loss properties and the associated analysis are discussed elsewhere in this report.

Estimating Potential Losses

See Table 5-47 above.

Analyzing Development Trends (new buildings, critical facilities and Infrastructure)

Section 4 of this plan Municipal Profile – Future Development identifies several areas in the Town / Village of Harrison where the potential for development or redevelopment exists. As of January 1, 2009, construction underway is limited due to the economic turndown. The New York State Building Code has specific requirements for snow loads on a structure both uniform and concentrated. Severe winter storms have the potential for causing secondary impacts to any development including travel restrictions during such events, power outages, damage from windblown and falling debris. At the design stage of any such development, these factors should be given consideration particularly in the case of critical facilities and infrastructure.

Additional Data and Next Steps

Data available concerning severe winter storms is limited to municipal services related costs where a Presidential Declaration has been issued as a result of an event. There have been 4 such declarations since 1992 for the study area. FEMA HAZUS-MH does not provide modeling for Severe Winter Storm events. Some basic loss information was prepared for evaluating a severe winter storms impact utilizing occupancy class, building values and a percentage of loss. Having the ability to monitor and record individual losses associated with individual properties has the potential to lead to the development of models for evaluating severe winter storm related losses.

Overall vulnerability conclusion

The severe winter storm hazard has been determined to be a significant event and has been ranked as a high risk for the Town /Village of Harrison.

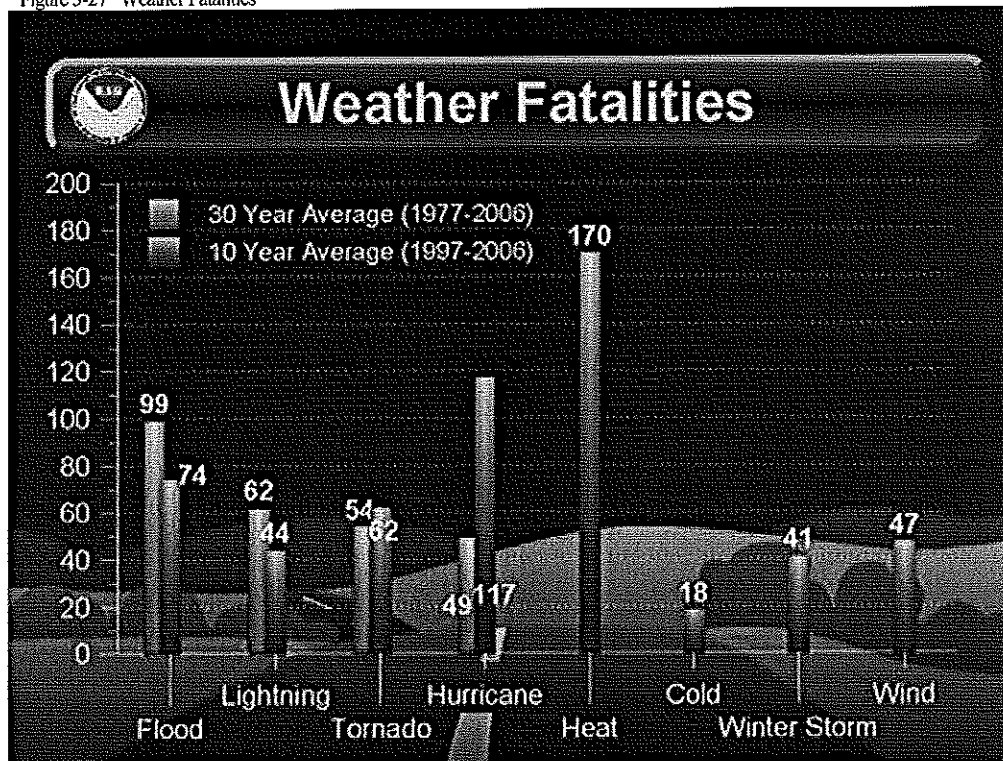
Hazard Profile - Extreme Heat

Description

Extreme Heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Humid and muggy conditions which add to the discomfort of high temperatures, occur when a “dome” of high atmospheric pressure traps hazy, damp air near the ground. Excessive dry and hot conditions can occasionally provoke dust storms and low visibility. Droughts occur when a long period passes without substantial rain. A heat wave combined with a drought creates a very dangerous situation. The National Weather Service has a system in place to initiate alert procedures (advisories or warnings) when the Heat Index (HI) is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued.

There is no information available for heat related fatalities in the study area. In terms of New York State, from 1994 – 2006 there have been 86 fatalities as a result of extreme heat. 79 of the 86 fatalities took place in a period of 7 years, ranging from 1999 – 2006 as shown in Figure 5-27.

Figure 5-27 Weather Fatalities



Source: National Weather Service.
New York State Hazard Mitigation Plan

Location and Extent

The entire study area is susceptible to extreme heat conditions. The severity of such an event is a function of duration, intensity and the impact of extreme heat on public utilities, especially electricity and public water supplies.

Previous Occurrences

The NOAA /NCDC Storm event database contains information on extreme temperature events beginning in 1950 up through the summer of 2008. For these type events, the database indicates that six (6) have occurred in areas including the New York Metropolitan area (Southern Westchester) which includes the Town/Village of Harrison since October 1993. Table 5-48 provides a summary of this data.

Table: 5-48 Summary of Extreme Temperature Events

Location or County	Date	Time	Type	Death	Injury	Property Damage
<u>Areawide</u>	10/08/1993	0000	Record Heat	0	0	0
<u>NYZ067>081</u>	07/04/1999	01:00 PM	Excessive Heat	33	0	0
<u>NYZ067>078 - 080</u>	08/08/2001	04:00 PM	Excessive Heat	4	1	0
<u>NYZ067>081</u>	07/02/2002	12:00 PM	Excessive Heat	0	0	0
<u>NYZ067>081</u>	07/29/2002	12:00 PM	Excessive Heat	0	0	0
<u>NYZ067>081</u>	08/01/2006	11:00 AM	Excessive Heat	42	0	0

Source: NOAA-NCDC <http://www4.ncdc.noaa.gov/cgi-win/www.cgi.dll?wwwevent-storms>

Note: No deaths, injuries or property damage are documented for the study area.

The Westchester County Airport is partially located in the northeast corner of the study area. Information provided by the MyForecast website for the airport indicates that the average high temperature for July is 84 degrees with a recorded high of 107 degrees. The number of days in July where the temperature exceeds 90 degrees was reported as 6.

There have been several instances in recent years where temperatures have exceed the 10 degree threshold above the high average temperature for periods of several days rather than several weeks. Locally, these type events are also considered extreme heat situations and at times have created the same type situations of the longer period occurring events.

Probability of Future Events

The study area is likely to experience extreme heat in the future. Based on historical records and the experience of members of the HMPC, the probability for such events is frequent (likely to occur more than once every 5 years).

Vulnerability Assessment

The entire study area is susceptible to Extreme Heat. The most rigorously documented impacts are health related based on studies conducted by the U.S. Center for Disease Control and Prevention. The study areas elderly population age 65 and over (approximately 3,870 people) may be severely impacted by prolonged events.

Overview of vulnerability

Historical information for the study area clearly indicates extreme heat is a concern. Periods of extreme heat where temperatures are 10 degrees above the average high for several days can clearly have impacts in such areas as health (especially the elderly), transportation, energy, and water resources. Extreme heat situations can have a cascading affect which can lead to drought restrictions being implemented during an intense or prolonged event.

Data and methodology

Data with respect to past extreme heat events was provided by the NOAA – NCDC and information gathered from websites which record temperatures at the Westchester County Airport located in the northeast corner of the study area. HAZUS-MH does not provide any extreme heat related information in its software programs.

Impact on life, safety and health

According to the Cooperative Institute for Research in the Atmosphere, located at Colorado State University in Fort Collins Colorado, on average over the last 30 years, excessive heat accounts for more reported deaths annually than hurricanes, floods, tornadoes, and lightning combined. Heat kills by taxing the human body beyond its abilities. Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise and heat-related illness may develop. Elderly persons, small children, chronic invalids, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where moderate climate usually prevails. Table 5-49 illustrates the relationship of temperature and humidity to heat disorders.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for the issuance

of excessive heat alerts is when the maximum daytime high is expected to equal or exceed 105°F and a nighttime minimum high of 80°F or above is expected for two or more consecutive days.

The Heat Index (HI), created by the National Weather Service is a chart which accurately measures apparent temperature of the air as it increases with the relative humidity. The Heat Index can be used to determine what effects the temperature and humidity can have on the population. Table 5-78 describes the adverse effects that prolonged exposures can have on individuals. To determine the Heat Index, you need the temperature and the relative humidity. Once both values are known, the Heat Index will be the corresponding number with both values. That number provides how it really feels. It is important to know that the Heat Index (HI) values are devised for shady, light wind conditions. Exposure to full sunshine can increase HI values by up to 15 degrees. Also, strong winds, particularly with very hot, dry-air can be extremely hazardous to individuals.

Table 5-49 Accurate measurement of temperature during an extreme heat event
Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

Source: National Weather Service
New York State Hazard Mitigation Plan

Table 5-50 Explanation of Heat Related Disorders

Category	Heat Index	Health Hazards
Extreme Danger	130°F - Higher	Heat Stroke/ Sunstroke is likely with continued exposure.
Danger	105°F - 129°F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90°F - 105°F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity.

Source: NYSEMO HMP

The National Weather Service (NWS) provides alerts when Heat Indices approach hazardous levels. Table 5-51 provides the alert procedures for the National Weather Service. In the event of an extreme heat advisory, The National Weather Service does the following:

- Include HI values and city forecasts;
- Issue special weather statements including who is most at risk, safety rules for reducing risk, and the extent of the hazard and HI values;
- Provide assistance to State/Local health officials in preparing Civil Emergency Messages in severe heat waves.

Table: 5-51 National Weather Service Alert Procedures

Product	Criteria
Heat Advisory (NYC)	The NWS issues a Heat Advisory within 24 hours of the onset of the following conditions: Heat Index of at least 100°F but less than 105°F for any period of time, or when nighttime lows are above 80°F for any period of time. (Note: This weather product was modified for New York City. The national definition places the heat index requirement at 105°F).
Excessive Heat Watch	The NWS issues an Excessive Heat Watch within 24 to 48 hours of the onset of the following conditions: Heat Index of at least 105°F for more than 3 hours per day for 2 consecutive days, or a Heat Index of at least 115°F for any period of time.
Excessive Heat Warning	The NWS issues an Excessive Heat Warning within 24 hours of the onset of the following conditions: Heat Index of at least 105°F for more than 3 hours per day for 2 consecutive days, or a Heat Index of more than 115°F for any time period.

Source: NYC Heat Emergency Plan
New York State Hazard Mitigation Plan

Identifying structures including general building stock, critical facilities and critical infrastructure

Typically the only impact extreme heat has on general building stock and critical facilities is increased demand on air conditioning equipment which in turn may cause strain on electrical systems. Public utility infrastructure such as electrical generating and conveyance systems may become damaged and breakdown causing either localized or widespread power outages. Under these situations, it is important that critical infrastructure have backup electrical generating systems in order to maintain critical functions and services. At times, transportation systems, especially the highway network has been impacted by extreme heat events. Concrete pavements have experienced “blowouts or heaves” both on local highway and the higher volume parkway and interstate systems. Blowouts occur when pavements expand and can not function properly within their allotted spaces. Pavement sections may rise up several inches during such events. These conditions can cause motor vehicle accidents in their initial stages and can shut down traffic lanes or roadways entirely until such times as the conditions are mitigated.

Economic impact

HAZUS-MH does not provide an analysis of the economic impact to the study area as a result of extreme heat. Data for an analysis for the study area is not locally available.

Addressing Repetitive Loss Properties (NFIP data for floods, other hazards as available)

The National Flood Insurance Program provides information on payments to homeowners resulting from losses due to flooding. Under the extreme heat hazard event category, repetitive loss properties are not analyzed.

Estimating Potential Losses

HAZUS-MH does not provide an analysis of structural vulnerability to building stock, critical facilities or infrastructure. Extreme heat may impact buildings by placing increased strain on mechanical systems providing air conditioning and electrical power. Potential loss data is not available locally.

Analyzing Development Trends (new buildings, critical facilities and Infrastructure)

Section 4 of this plan Municipal Profile – Future Development identifies several areas in the Town / Village of Harrison where the potential for development or redevelopment exists. As of January 1, 2009, construction underway is limited due to the economic turnaround. Structures, critical facilities and infrastructure would not be severely impacted by extreme heat. Extreme heat has been known to lead to other problems such as power failures. Critical facilities should have provisions for on site power generation with automatic switching capabilities should a power outage occur. Landscaped areas may suffer due to a decrease in the availability of water from prolonged extreme heat conditions. Landscape designs which have the ability to retain water utilizing ponds, rain gardens and other absorbing features would prove beneficial in the event of a drought.

Additional Data and Next Steps

The Cooperative Institute for Research in the Atmosphere, located at Colorado State University in Fort Collins Colorado suggests that the total impacts of temperature extremes are not fully documented and known. Much of the documentation of temperature impacts combines other meteorological events and uses climatological scales of space and time. The nature of seasonal impacts is more cumulative and complex than the impacts of heat waves. Yet the impacts are measurable. Weather forecasting must take into account the hazards and impacts of temperature extremes to provide useful, understandable and timely information to reduce the impacts of extreme heat events.

Overall vulnerability conclusion

Based on information provided by NOAA-NCDC, local summer weather records and the experience of the HMPC, Extreme Heat has been determined to be a frequent event in the study area and thus a medium risk event.

Hazard Profile - Drought

Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over an extended time period, and it is often not obvious or easy to quantify when a drought begins and ends. Drought is a complex issue involving many factors. It occurs when a normal amount of moisture is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological** drought is usually defined by a period of below average water supply.
- **Agricultural** drought occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological** drought is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic** drought occurs when a drought impacts health, well-being, and quality of life or when a drought starts to have an adverse economic impact on a region.

Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users that have a different water supply. Individual water suppliers may use criteria, such as rainfall/runoff, amount of water in storage, to define their water supply conditions. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. A reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline. The Town / Village of Harrison receives its water from the New York City Water Supply System by way of a private utility known as Westchester Joint Water Works. Water is pumped from the Kensico Reservoir into the Westchester Joint Water Works Distribution System.

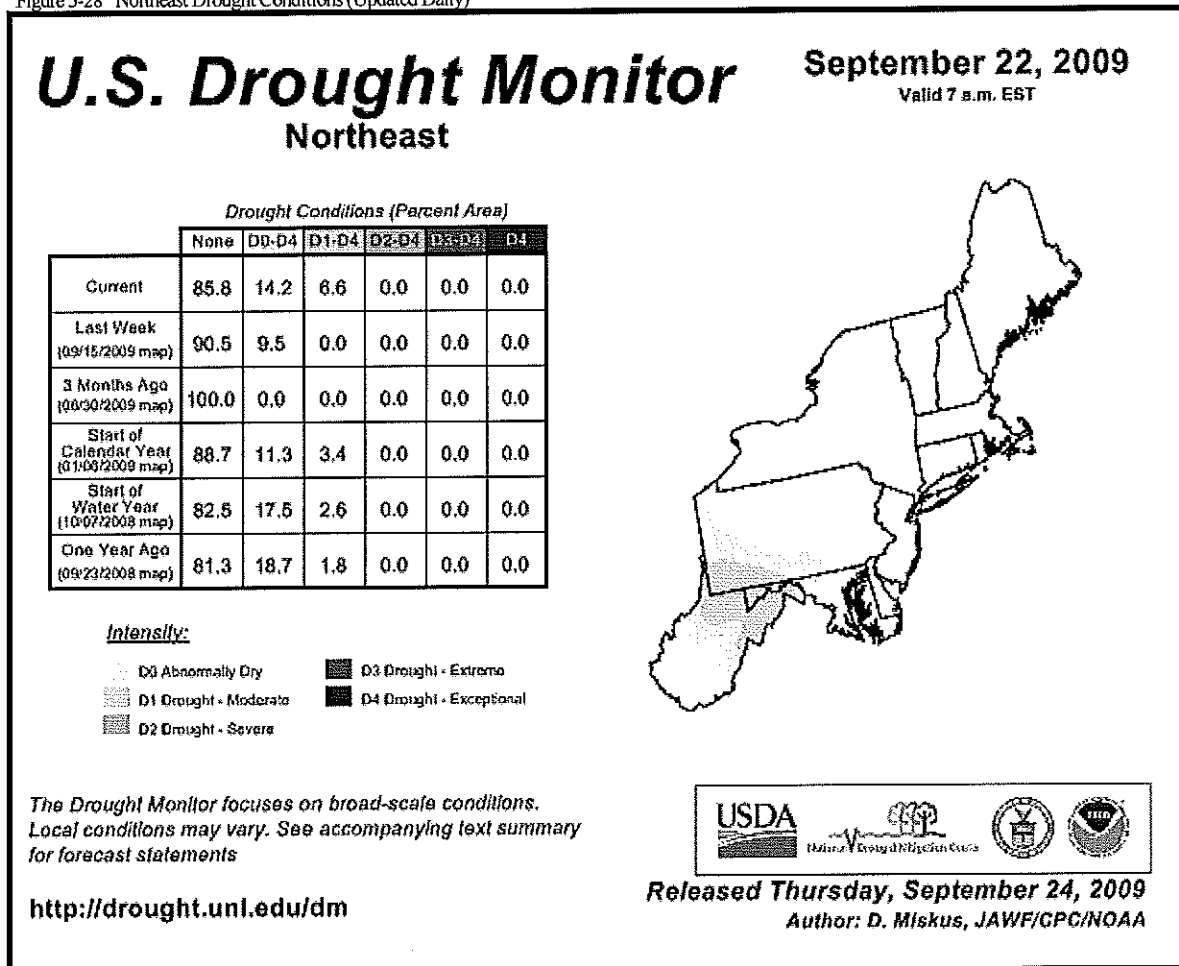
Location and Extent

The entire study area is susceptible to drought. Previous droughts in the study area have been both meteorological or hydrological. Several factors in a variety of combinations contribute to a drought condition including duration (lack of rainfall or mild winter as contributing factors), location as well as demand based on human activity and landscape. While the study area has experienced drought in the

past, the consequences have in general been limited to lawn watering and vehicle washing restrictions. The New York City Water Supply System provides information on a daily basis as to the status of its water supply system. On September 28, 2009, the system stood at 90 % of capacity while the average capacity for this time of year is 75%. The New York City Department of Environmental Protection provides a means for persons with internet access to receive water supply system updates by e-mail.

Figure 5-28 below is updated regularly and shows drought conditions across the northeast United States.

Figure 5-28 Northeast Drought Conditions (Updated Daily)



Source: University of Nebraska, National Drought Mitigation Center

Previous Occurrences

The New York City Water Supply System has experienced 7 periods of drought in the last 46 years. Table 5-52 below illustrates these drought periods as the water supply system status.

Table: 5-52 Drought History (New York City Water Supply System)

Year(s)	Item	Start	End
1963 – 1965	Conservation	11/1/1963	5/1/1964
	Intense Campaign	4/1/1965	
1980 – 1982	Watch	10/16/1980	
	Warning	11/6/1980	
	Emergency (Stage 1)	1/19/1981	
	Emergency (Stage 2)	4/1/1981	
	Modified	5/27/1981	
	Warning	1/18/1982	
1985	Watch	11/30/1982	
	Watch	2/25/1985	
	Warning	4/3/1985	
	Emergency (Stage 1)	4/26/1985	
	Emergency (Stage 2)	6/5/1985	
	Emergency (Stage 3)	7/10/1985	
1989	Normal	2/25/1986	
	Watch	1/17/1989	
	Emergency (Stage 2)	3/22/1989	
	Emergency (Stage 3)	5/1/1989	
	Normal	5/15/89	
1991	Watch	9/25/1991	
	Warning	11/8/1991	
1995	Watch	7/5/1995	
	Warning	9/13/1995	
2002	Watch	12/23/2001	11/14/1995
	Warning	1/27/2002	
	Emergency (Stage1)	4/1/2002	
	Watch	11/1/2002	
			1/3/2003

Source: NYCDEP website

While the water supply for the study area is owned and operated by the NYCDEP, the New York State Department of Environmental Conservation has been designated to implement, monitor, prepare and plan for future droughts. Information concerning drought preparedness can be found on both the New York State Department of Environmental Conservation and New York City Department of Environmental Protection websites.

Probability of Future Events

Based on previous history, the study area is likely to experience droughts in the future. Based on historical records, the probability of a drought impacting the study area is occasional, (likely to be less than once every 5 years, but more than once every 30 years).

Vulnerability Assessment

The entire study area may be impacted due to drought. At risk areas might include open space where ground cover might die often making the area susceptible to erosion when the rains do return. Forested areas would have a higher exposure to fire during periods of drought. Water supply resources would be reduced during extended drought periods. Segments of the population would be at heightened risk because of advanced age or health related conditions.

Overview of vulnerability

While several droughts has occurred in the past, impacts have been limited for the most part to use restrictions such as lawn watering and car washing. The study area has limited agriculture use of its open land areas. When droughts have occurred, an effective public education effort is instituted until the emergency passes. The potential for warming associated with changes in the global climate is being evaluated and conditions may increase the potential for droughts in the future.

Data and methodology used in the evaluation

Data with respect to past drought events was provided by the New York City Department of Environmental Protection which operates and maintains the system which supplies water to the study area. Additional resources were reviewed including NOAA, FEMA and the Westchester County Drought Emergency Response Plan and the National Drought Monitoring Center at the University of Nebraska-Lincoln.

Impact on life, safety and health

Drought by itself has had minimal or no impact on life, safety and health related issues in the study area. Where droughts have been associated with extreme heat events, the potential for life, safety and health issues increases dramatically, especially for the elderly. Extreme heat hazard events are addressed elsewhere in this plan. When droughts have occurred, an effective educational effort is implemented to assist residents and businesses to conserve water.

Identifying structures including general building stock, critical facilities and critical infrastructure

Drought conditions by itself are not anticipated to impact general building stock, critical facilities and infrastructure.

Economic impact

HAZUS-MH does not provide an analysis of the economic impact to the study area as a result of a drought. Economic impacts of drought are closely associated with agricultural, livestock, timber and fishery production, none of which exist in the study area.

Addressing Repetitive Loss Properties (NFIP data for floods, other hazards as available)

The National Flood Insurance Program provides information on payments to homeowners resulting from losses due to flooding. Under the drought hazard event category, repetitive loss properties are not analyzed.

Estimating Potential Losses

HAZUS-MH does not provide an analysis of structural vulnerability to building stock, critical facilities or infrastructure. Drought may impact buildings by increasing the weathering to outside surfaces and placing increased strain on mechanical systems providing air conditioning when high temperatures are associated with a drought. Potential loss data is not available locally.

Analyzing Development Trends (new buildings, critical facilities and Infrastructure)

Section 4 of this plan Municipal Profile – Future Development identifies several areas in the Town / Village of Harrison where the potential for development or redevelopment exists. As of January 1, 2009, construction underway is limited due to the economic turndown. Structures, critical facilities and infrastructure would not be severely impacted by drought. Landscaped areas may suffer due to a decrease in the availability of water. Landscape designs which have the ability to retain water utilizing ponds, rain gardens and other absorbing features would prove beneficial in the event of a drought.

Additional Data and Next Steps

Data available from Federal, State and local resources indicates that drought in general has not had a significant impact on the study area. Over time, this may change as a result of changes in climate in recent and in future years. The New York State Department of Environmental Conservation, New York City Department of Environmental Protection and County of Westchester all have plans as well as educational efforts in place should the potential for a drought arise.

Overall vulnerability conclusion

Drought has been determined to be an occasional event in the study area and thus a low risk event.

Hazard Profile - Earthquake

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a Richter magnitude and is measured directly from the earthquake as recorded on seismographs. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface as felt by humans and defined in the Modified Mercalli scale (see Table 5-54). Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The following databases were searched for information on the potential for earthquakes to impact the study area:

- HAZUS-MH and Associated Guidance
- New York City Consortium for Earthquake Loss Mitigation (NYCEM) <http://www.nycem.org/default.asp>
- United States Geological Survey (USGS), <http://www.usgs.gov>
- New York State 2008 Hazard Mitigation Plan, <http://www.semo.state.ny.us>
- Albany Times Union Newspaper <http://www.timesunion.com>
- Laredo, Texas Morning Times <http://www.lmtonline.com>
- Lamont-Doherty Observatory, Columbia University, New York <http://www.ldeo.columbia.edu>

Table 5-53 Earthquake Definitions

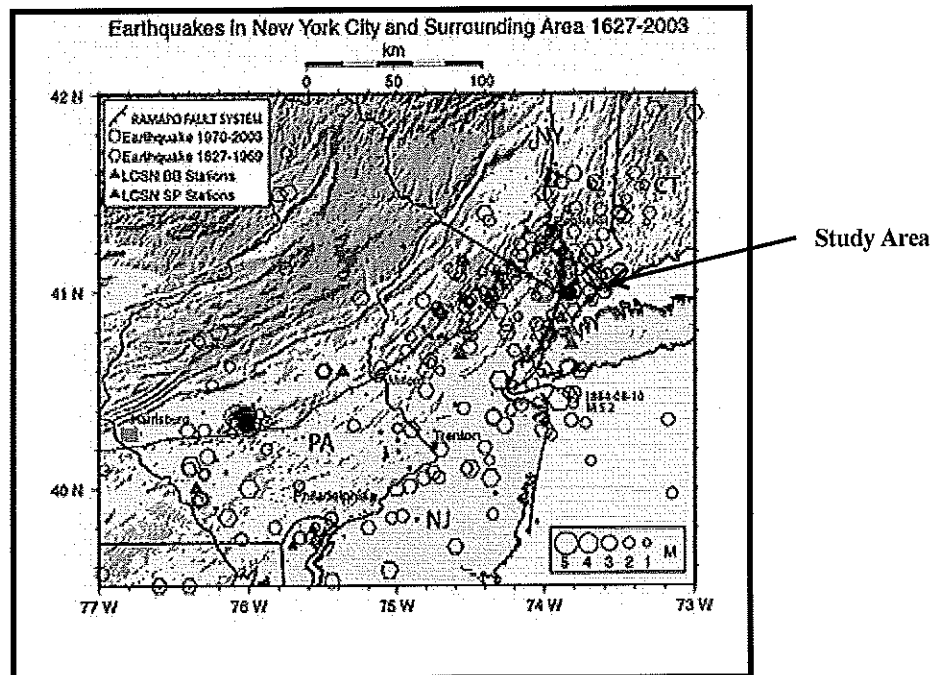
Term	Definition
Earthquake	Both sudden slip on a fault, and the resulting ground shaking and radiated seismic energy caused by the slip, or by volcanic or magmatic activity, or other sudden stress changes in the earth.
Earthquake hazard	Anything associated with an earthquake that may affect the normal activities of people. This includes surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches.
Earthquake risk	The probable building damage, and number of people that are expected to be hurt or killed if a likely earthquake on a particular fault occurs
Magnitude	A number that characterizes the relative size of an earthquake. Magnitude is based on measurement of the maximum motion recorded by a seismograph.
Velocity	How fast a point on the ground is shaking as a result of an earthquake.
Intensity	A number (written as a Roman numeral) describing the severity of an earthquake in terms of its effects on the earth's surface and on humans and their structures.
Acceleration	Change from one speed, or velocity, to another is called acceleration
Peak acceleration	The largest acceleration recorded by a particular station during an earthquake
Seismic Waves	Vibrations that travel outward from the earthquake fault at speeds of several miles per second. Although fault slippage directly under a structure can cause considerable damage, the vibrations of seismic waves cause most of the destruction during earthquakes
Aftershocks	Earthquakes that follow the largest shock of an earthquake sequence. They are smaller than the mainshock and within 1-2 fault lengths distance from the mainshock fault. Aftershocks can continue over a period of weeks, months, or years. In general, the larger the mainshock, the larger and more numerous the aftershocks, and the longer they will continue.
Epicenter	The point on the earth's surface vertically above the hypocenter (or focus), point in the crust where a seismic rupture begins
Hypocenter	The location beneath the earth's surface where the rupture of the fault begins
Fault	A fracture along which the blocks of crust on either side have moved relative to one another parallel to the cture.
For more in-depth definitions regarding Earthquake terminology please reference the U.S. Geological Survey website at www.usgs.gov ,	

Source: NYSHMP/USGS

Geographic Location and Extent

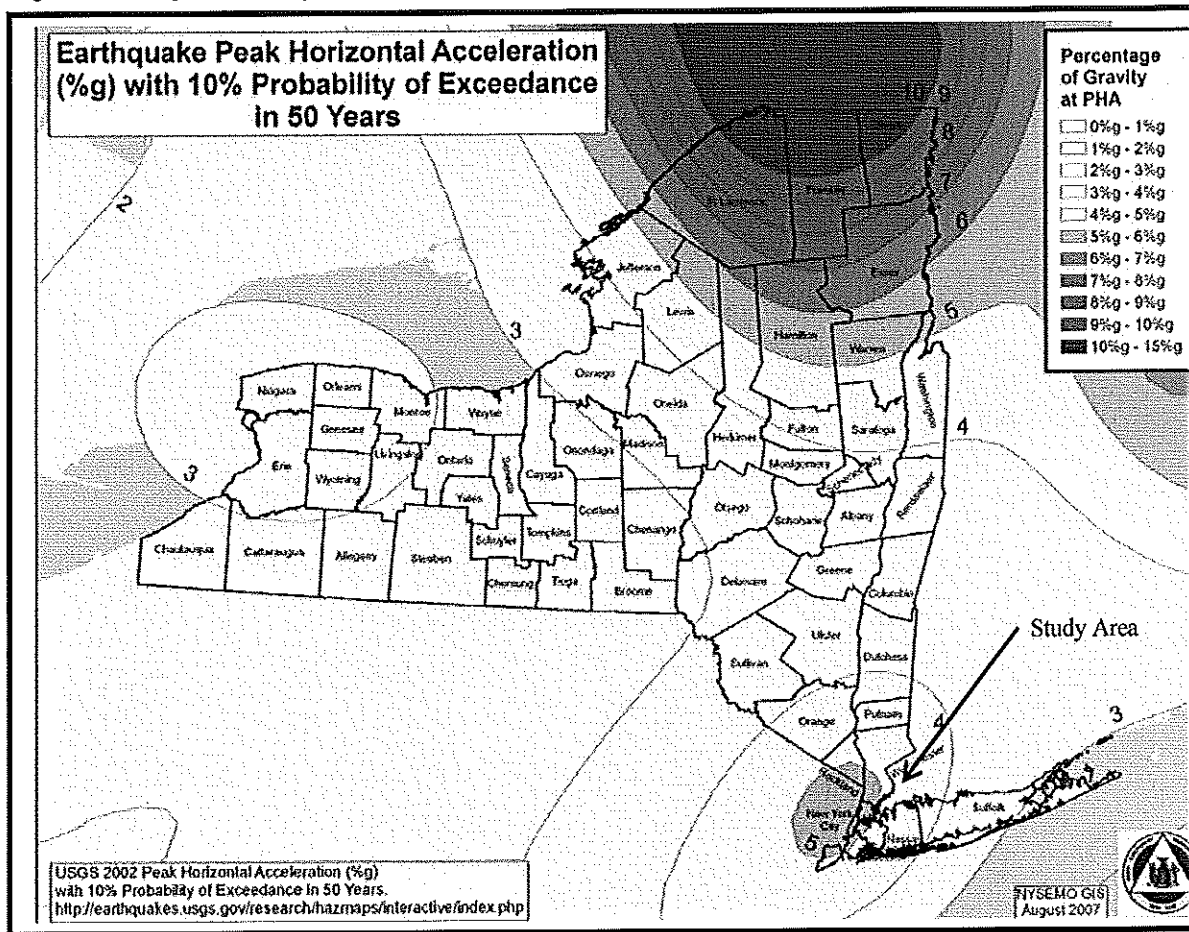
There are no documented faults within the study area. The study area is however, in close proximity to several fault lines including those located in New York City. The Ramapo Fault (see Figure 5-26) runs from Southeastern New York into eastern Pennsylvania. This fault line is of considerable interest due to its close proximity to the Indian Point Nuclear Power Plant in Buchanan, New York. Indian Point is approximately 20 miles from the study area at its closest point. The study area has experienced shaking as a result of earthquake activity, the most recent occurring in April 2002 from an earthquake measuring 5.1 on the Richter Scale and located near Au Sable Forks, New York.

Figure: 5-29 Ramapo Fault (red line) and associated earthquakes / seismic monitoring stations



Source: <http://www.ideo.columbia.edu>

Figure: 5-30 Earthquake Hazard Map of New York State



Source: NYS Multi-Hazard Mitigation Plan 2008

Severity of an earthquake is a function of the amount of energy released and is expressed by its magnitude and intensity. Table 5-54 below combines the Richter and Mercalli Scales in order to present a clear picture as to the relationship of these scales.

Table 5-54 Richter Scale and Modified Mercalli Scale

Modified Mercalli Intensity	Description	Richter Magnitude
I	Instrumental: detected only by seismographs	3.5
II	Feeble: noticed only by sensitive people	4.2
III	Slight: like the vibrations due to a passing train; felt by people at rest, especially on upper floors	4.3
IV	Moderate: felt by people while walking; rocking of loose objects, including standing houses	4.8
V	Rather Strong: felt generally, most sleepers are awakened and bells ring	4.8-5.4
VI	Strong: trees sway and all suspended objects swing; damage by overturning and falling loose objects	5.5-6.0
VII	Very strong: general alarm; walls crack, plaster falls	6.1
VIII	Destructive: car drivers seriously disturbed; masonry fissures; chimneys fall; Poorly constructed buildings damaged	6.2
IX	Ruinous: some houses collapse where ground begins to crack, and pipes Break open	6.9
X	Disastrous: ground cracks badly; many buildings destroyed and railway lines bend; landslides on steep slopes	7.0-7.3
XI	Very disastrous: few buildings remain standing; bridges destroyed; all services (transportation and Utility) affected; landslides and floods	7.4-8.1
XII	Catastrophic: total destruction; objects thrown into the air, ground rises and falls in waves	>8.1

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, communication, and transportation lines. Other damage-causing effects of earthquakes include surface rupture, fissuring, settlement, and permanent horizontal and vertical shifting of the ground. Secondary impacts can include landslides, soils liquefaction, fires, and dam failure.

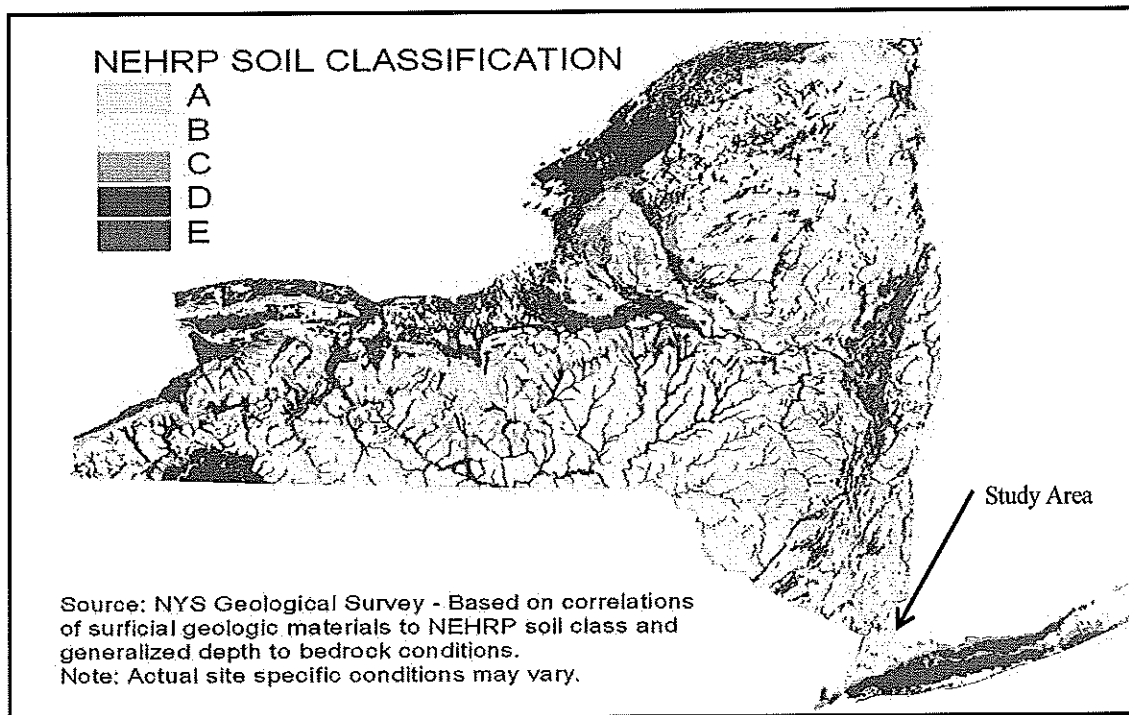
Besides magnitude and intensity of an earthquake, the other factor which can have an impact on damage is the local soil type. The National Earthquake Hazard Reduction Program (NEHRP) lists five soil classifications which can have an impact on the severity of an earthquake. Table 5-55 outlines these soil classifications and Figure 5-31 illustrates them. Westchester County which includes the Town / Village of Harrison, includes in the majority class B, C, and D soils

Table 5-55 Soil Classification Descriptions

Soil Classification	Description	Map Color
A	Very hard rock (e.g. granite, gneiss)	Green
B	Sedimentary rock or firm ground	Yellow
C	Stiff Clay	Orange
D	Soft to mediums clays or sands	Red
E	Soil including fill, loose sand, waterfront, lake bed clays	Pink/Purple

Source: NYS Hazard Mitigation Plan

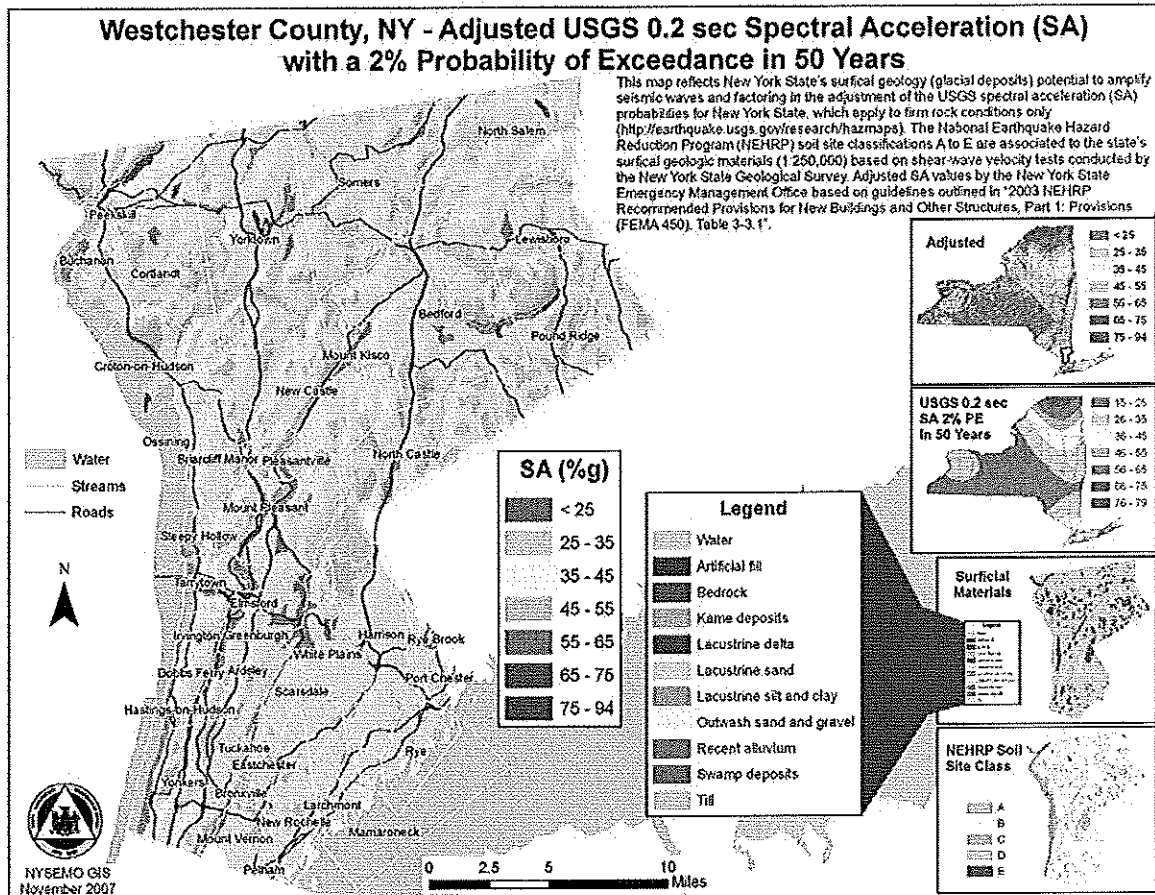
Figure: 5-31 Soils Classification Map for New York State



Source: NYS Hazard Mitigation Plan 2008

This classification of the State's surficial geologic materials by NEHRP soil site class has enabled the affect of soils to be factored with the USGS seismic hazard maps to give an adjusted, more regionally refined picture, of the State's earthquake hazard based. The level of adjustment to USGS map is based on use of the NEHRP's soil site coefficients for each soil class, which varies according to the USGS mapped accelerations. The reference for the appropriate coefficient is found in "The 2003 NEHRP Recommended Provisions for New Building and Other Structures – Part: Provisions (FEMA 450)". These coefficients provide the level of increase or decrease to the USGS's seismic hazard map spectral accelerations.

Figure 5-32 Westchester County, N.Y. – Adjusted USGS 0.2 sec Spectral Acceleration (SA) with a 2% Probability of Exceedance in 50 Years

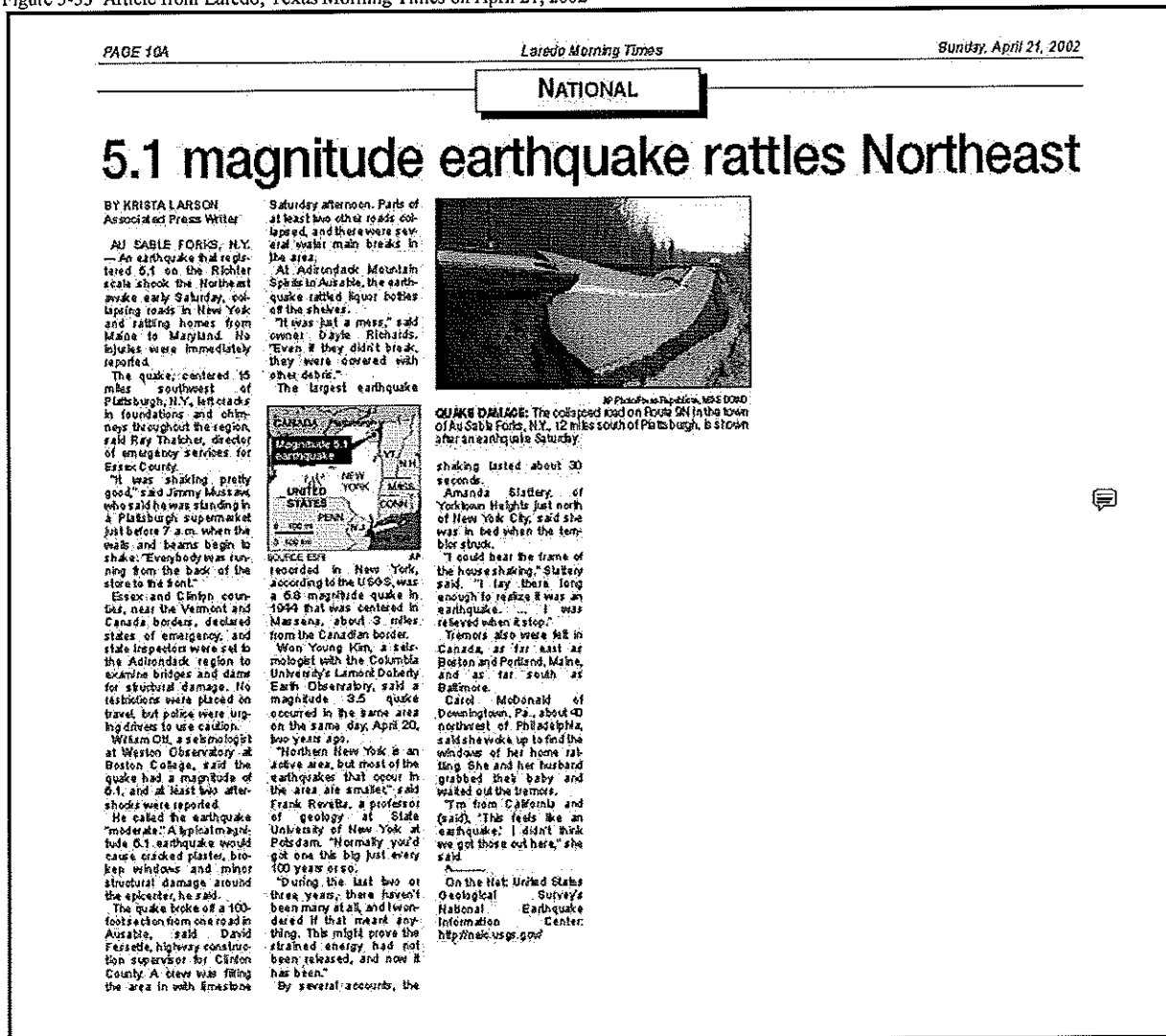


Source: 2008 New York State Hazard Mitigation Plan

Previous Occurrences and Losses

While Westchester County and the study area in particular lie within one of three areas of New York State with a higher risk of experiencing an earthquake event (see Figure 5-30) reports of earthquakes of magnitudes which would be noticeable are rare. The most recent and noticeable earthquake to be felt in the study area had its epicenter near Au Sable Forks in upstate New York on April 20, 2002 and measured 5.1 on the Richter Scale. Table 5-42 documents earthquakes having occurred near the study area between 1638 and 2001. Discussions with Department of Public Works staff as well members of the HMPC found that no records existed with respect to any damage to public infrastructure associated with earthquakes felt in the study area from a magnitude 4.0 event occurring on October 19, 1985 near Ardsley, New York or the April 20, 2002, 5.1 magnitude earthquake which occurred near Au Sable Forks in Essex County, New York. The April 20, 2002 earthquake received national attention including the article in the Laredo, Texas Morning Times shown in Figure 5-33.

Figure 5-33 Article from Laredo, Texas Morning Times on April 21, 2002



The Albany Times Union Newspaper, in an article dated April 21, 2000 and titled "Adirondack Area Gets A Bit Of A Jolt" reported other earthquakes in New York State in recent times occurring on April 20, 2000 at 4:47 AM centered near Newcomb, Essex County, New York and measuring 3.7 on the Richter Scale; on October 7, 1983 in the same general area which was felt in 12 states and 2 Canadian Provinces and measured 5.1 on the Richter Scale and the largest ever occurring in the State of New York on September 5, 1944 near Messina, New York and measuring 5.8 on the Richter Scale. The September 5, 1944 earthquake caused \$2 million in damage in 1944 dollars in a sparsely populated area. That same event in 2000 could be expected to cause 15 to \$20 million in damages.

Table: 5-56 Largest Earthquakes in New York City Area (1637-2001)

Date	Location	Magnitude Richter	Max. Intensity	Remarks
December 19, 1737	Greater New York City Area	5.2	VII	Threw down chimneys
November 30, 1783	Northern New Jersey	4.9	VI	Threw down chimneys
October 26, 1845	Greater New York City Area	3.8	VI	NA
1847	Greater New York City Area	4.5	V	Probably Offshore
September 9, 1848	Greater New York City Area	4.4	V	Felt by population
December 11, 1874	Near Nyack, Tarrytown	3.4	VI	Not Applicable
August 10, 1884	Greater New York City Area	5.2	VII	Threw down chimneys, felt From Maine to Virginia
January 4, 1885	Hudson River Valley	3.4	VI	Not Applicable
September 1, 1895	North Central New Jersey	4.3	VI	Location determined by fire and aftershock
June 1, 1927	Near Asbury Park, New Jersey	3.9	VI-VII	Very high intensity in Asbury Park, possible shallow event
July 19, 1937	Western Long Island, New York	3.5	IV	One of few earthquakes beneath Long Island
August 23, 1938	Central New Jersey	3.8	VI	Not Applicable
September 3, 1951	Rockland County, New York	3.6	V	Not Applicable
March 23, 1957	Central New Jersey	3.5	VI	Not Applicable
March 10, 1079	Central New Jersey	3.2	V-VI	Felt by some people in Manhattan
October 19, 1985	Ardsley, New York	4.0	IV	Felt by many people in NYC area
January 1, 2001	Manhattan, New York City	2.4	IV	Felt in upper East Side of Manhattan, Astoria and Queens, NYC
January 17, 2001	Manhattan, New York City	2.4	IV	Felt in upper East Side of Manhattan, Long Island City and Queens, NYC

Source: <http://www.ldeo.columbia.edu/LCSN/big-ny-eq.html>

While a number of resources were researched for earthquake data for the study area, including the United States Geological Survey, the 2008 New York State Hazard Mitigation Plan, and the Lamont-Doherty Earth Observatory of Columbia University, data was not consistent throughout all the resources utilized. The data provided by Lamont-Doherty was utilized herein because of its close proximity to the study area. Of the 18 earthquakes documented in Table 5-42, two are indicated to have occurred near the study area. The earthquake of December 11, 1874, with a magnitude of 3.4, was located near Tarrytown and Nyack, New York less than 10 miles from the study area. The earthquake of October 19, 1985, with a magnitude of 4.0, originated near Ardsley, New York, also less than 10 miles from the study area.

Probability of Future Events

The NYSHMP notes that New York State can expect a damaging earthquake about once every 22 years, and these events are more likely to occur within one of the three regional areas identified previously. Westchester County and the Town / Village of Harrison are included in the southernmost of these three regions. The State Plan references a NYSGS study by W. Mitrofonas, entitled, "Earthquake Hazard in New York State," which states, "...at present an earthquake of magnitude 3.5 to 4 occurs, on the average every three years somewhere in the State. Such earthquakes do not cause any appreciable damage (except for cracks in plaster, perhaps) but are large enough to be felt strongly by many people near the epicenter."

In the beginning of this plan, the hazards most likely to impact the study were identified by the HMPC and the consultant, discussed as to their impact on the study area, and ranked as to the possibility of an event occurrence. Based on historical records and input from the HMPC, the probability of occurrence for earthquakes in the Town/Village of Harrison is considered occasional (likely to occur less often than once every 5 years, but more often than once every 30 years). While there are no records of damages associated with past earthquake events, future events could affect building stock, critical facilities and infrastructure and the local economy given a severe enough event. There is also a potential for secondary events as a result of an earthquake including fires, utility failures and flooding.

Vulnerability Assessment

A vulnerability assessment is defined as assessing the vulnerability of people and the built environment to a given level of hazard. After identifying types of risk, a vulnerability analysis can help to determine the weak points in the community. This assessment examines the vulnerability of the existing and future built environment, such as structures, utilities, roads and bridges, as well as environmental vulnerability, such as open space that can suffer from erosion. Once the geographic areas of risk are identified in the Town / Village, vulnerability can be assessed for the population, property and resources at risk in those areas. Vulnerability indicates what is likely to be damaged by the identified hazards and how severe the damage may be. If an area is determined to be at risk from an earthquake, vulnerability estimates for that area could include residential property losses, impacts to the tax base and damages to public infrastructure. Earthquake events can impact the entire Town/Village of Harrison. All assets associated with those areas including population, structures, critical facilities and utilities are vulnerable. The following sections evaluate and estimate the potential impact of flooding:

- Overview of vulnerability
- Data and methodology used in the evaluation
- Impact on life, safety and health
- Identifying structures including general building stock, critical facilities and critical infrastructure
- Economic impact
- Addressing Repetitive Loss Properties (NFIP data for floods, other hazards as available)
- Estimating Potential Losses
- Analyzing Development Trends (new buildings, critical facilities and Infrastructure)

- Additional Data and Next Steps
- Overall vulnerability conclusion
- Multi-jurisdictional Risk Assessment

Overview of Vulnerability

Earthquake vulnerability is primarily based upon population and the built environment. Urban areas in high hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The ability to accurately estimate the timing, location, and severity of future earthquake activity in the Town / Village of Harrison is limited due to the lack of good historical data and the relative infrequent occurrence of earthquakes which generate damage.

Ground shaking, the principal cause of damage, is the major earthquake hazard. Many factors affect the potential damageability of structures and systems from earthquake-caused ground motions. Some of these factors include proximity to the fault, direction of rupture, epicentral location and depth, magnitude, local geologic and soils conditions, types and quality of construction, building configurations and heights, and comparable factors that relate to utility, transportation, and other network systems. Ground motions become structurally damaging when average peak accelerations reach 10 to 15 percent of gravity, and when the Modified Mercalli Intensity Scale is about VII (18-34 percent peak ground acceleration), which is considered to be very strong (general alarm; walls crack; plaster falls).

In general, newer construction is more earthquake resistant than older construction because of improved building codes and their enforcement. Manufactured housing is very susceptible to damage because rarely are their foundation systems braced for earthquake motions. Locally generated earthquake motions, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of un-reinforced masonry.

Common impacts from earthquakes include damage to infrastructure and buildings (e.g., crumbling of un-reinforced masonry [brick], failure of architectural facades, rupturing of underground utilities, gas-fed fires, landslides and rock falls, and road closures). Earthquakes can also trigger secondary effects, such as dam failures, explosions, and fires that become disasters themselves.

Data and Methodology

The consultant utilized HAZUS-MH to model earthquake losses for the Town / Village of Harrison. Inventory and risk are from scenarios performed in FEMA's HAZUS software. Scenarios were run to assess potential economic and social losses due to earthquake activity. As previously stated, local historical information is minimal at best and consists principally of institutional knowledge of long tenured municipal staff, comments from the HMPC and public comments.

Assessments were conducted for two Mean Return Periods of 100 and, 500 years which created a range of potential loss estimates. A 100 year Mean Return Period (MRP) indicates that there is a 1% chance that the determined ground motion levels or Peak Ground Acceleration (PGA) will be exceeded in any given year. A 500 year MRP creates a .2% chance that a determined PGA will be exceeded in any given year. For our purposes, **HAZUS –MH utilized an Eathquake**

Magnitude of 5.0 in analyzing potential events. A 4.8-5.4 magnitude event is the point at which people may begin to be awakened and objects begin to fall from shelves.

The 2008 New York State Mitigation Plan's annualized earthquake loss analysis was based on HAZUS model's default soil classification – the National Earthquake Hazard Reduction Program's (NEHRP) soil class "D". This was applied across the entire state. The "D" soil class is next to the worst soil class in terms of ground shaking amplification. Although there are many areas of the state that have been classified with soil class "D" and even worse class "E" in this most recent study, there was overall a better (less amplification) soil class assigned resulting in a significant loss reduction. This demonstrates the significance of soil factors in earthquake risk assessment. For purposes of this study, The class "D" soil will be utilized in all analysis.

Impact on Life, Health and Safety

Impact on life, health and safety combines several factors including the severity of the event as well as one's location and time when the event occurs (e.g. inside a building, adjacent to a building, in open space, driving etc). Based on past history, risk to life, health and safety is minimal. Should an earthquake of sufficient magnitude occur, residents may be displaced and require sheltering or need to seek refuge with relatives and friends outside the earthquake impact area. Low income and senior citizens are particularly susceptible because of their financial or physical condition. According to the 2000 Census, 14% of the study area population is over 65. There are no manufactured type homes in the study area. HAZUS –MH was utilized to develop sheltering and casualty information.

Table: 5-57 Sheltering Requirements

Category	100 Year Event	500 Year Event
Households displaced	0	12
Persons seeking temporary shelter	0	2

Source: HAZUS-MH

HAZUS-MH estimates for casualties are provided for three times of day; (2:00 AM, 2:00 PM and 5:00 PM). These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residency occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and the 5:00 PM represents peak commute time. Table 5-48 provides these estimates. Casualty levels are defined with severities as follows:

- Level 1: Injuries require medical attention but hospitalization is not needed
- Level 2: Injuries will require hospitalization but are not considered life threatening
- Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated
- Level 4: Victims are killed by the earthquake

Table 5-58 Casualty Estimates (number of persons)

Time	Sector	100 Year Level 1	100 Year Level 2	100 Year Level 3	100 Year Level 4	500 Year Level 1	500 Year Level 2	500 Year Level 3	500 Year Level 4
2AM	Commercial	0	0	0	0	0	0	0	0
	Commuting	0	0	0	0	0	0	0	0
	Educational	0	0	0	0	0	0	0	0
	Hotels	0	0	0	0	0	0	0	0
	Industrial	0	0	0	0	0	0	0	0
	Other Residential	0	0	0	0	2	0	0	0
	Single Family	0	0	0	0	2	0	0	0
	Total	0	0	0	0	4	1	1	0
2PM	Commercial	0	0	0	0	5	1	1	0
	Commuting	0	0	0	0	0	0	0	0
	Educational	0	0	0	0	0	0	0	0
	Hotels	0	0	0	0	0	0	0	0
	Industrial	0	0	0	0	1	0	0	0
	Other Residential	0	0	0	0	0	0	0	0
	Single Family	0	0	0	0	0	0	0	0
	Total	0	0	0	0	7	1	1	0
5PM	Commercial	0	0	0	0	3	1	0	0
	Commuting	0	0	0	0	0	0	0	0
	Educational	0	0	0	0	0	0	0	0
	Hotels	0	0	0	0	0	0	0	0
	Industrial	0	0	0	0	1	0	0	0
	Other Residential	0	0	0	0	1	0	0	0
	Single Family	0	0	0	0	1	0	0	0
	Total	0	0	0	0	5	1	0	0

Identifying Structures

According to New York City Consortium for Earthquake Mitigation (NYCEM) most damage and loss to structures and infrastructure is the result of ground shaking. Ground motion and its relationship to gravity are the factors affecting an earthquakes impact on buildings and infrastructure. Data provided by modeling from HAZUS-MH were used to illustrate the earthquake hazard for general building stock in the study area. The following figures represent (PGA) for 100, 500 earthquake events.

Due to the wide ranging impact of an earthquake event, the entire study area is at risk and will be analyzed for structural damage and losses. HAZUS determines the value of the building stock and then assigns a loss value. The analysis considers the age of the building stock, occupancy class, construction composition, examples of structural damage, and building damage based on severity of an event.

Table 5-59 Building Stock Exposure by Occupancy Type

Building Occupancy Class	Number of Buildings	Exposure Value (\$1,000)	Percent of Total Exposure Value
Agriculture	57	9,704	.3%
Commercial	673	669,177	23.6%
Education	27	52,876	1.9%
Government	16	18,789	.7%
Industrial	190	180,212	6.3%
Residential	6,618	1,865,990	65.8%
Religion	43	41,243	1.5%
Total	7,624	2,837,991	100%

Source: HAZUS-MH

Buildings construction composition is one factor which determines a buildings survivability of an earthquake. Wood and steel constructed buildings are more likely to resist earthquake shaking than un-reinforced masonry structures which would tend to bow out and collapse during and event.

Table 5-60 Building Stock by Construction Type as a Percentage of Study Area Total

Building Construction	Count	Percent of Total
Wood	5,409	70.95
Steel	498	6.54
Concrete	183	2.40
Precast	32	.42
Reinforced Masonry	234	3.07
Un-reinforced Masonry	1268	16.63
Manufactured Homes	0	0
Total	7,624	

Source: HAZUS-MH

HAZUS –MH maintains an inventory of Critical Facilities; essential facilities and high potential loss (HPL) facilities. Essential facilities include hospitals, medical clinics, schools, fire stations , police stations, emergency operations facilities and public works operations and maintenance facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazard material sites

Table: 5-61 Critical Facility Inventory

Group	Category	Number of Facilities in Study Area
Essential Facilities		
	Hospitals	0
	Medical Clinics	0
	Schools	10
	Fire Stations	3 *
	Police Stations	1
	Emergency Operations	0
	Public Works Operations and Maintenance	2
High Potential Loss Facilities		
	Dams	3*
	Levees	0
	Military Installations	0
	Nuclear Power Plants	0
	Hazard Materials Sites	0

Source: HAZUS-MH and municipal records * HAZUS-MH identifies 2 fire stations in the study area while there are actually 3.
HAZUS-MH identifies 3 dams in the study area where the NYSDEC has 5 in its inventory

Transportation and Utility Lifeline Facilities are those infrastructure both public and privately owned that provide services which allow communities to function and be economically viable. The HAZUS-MH program maintains a local inventory of these facilities including transportation system which include highways, railways, light rail, bus, ports, ferry and airports. Also included in the inventory are utility systems such as potable water, wastewater, natural gas, crude and refined oil, electric power and communications. The total value of the lifeline inventory exceeds \$1,209,000,000 and includes 96 kilometers of highways, 43 bridges and 481 kilometers of pipes.

Table:5-62 Transportation System Lifeline Inventory

System	Component	No. of locations / segments	Replacement Value (millions of dollars)
Highway	Bridges	43	655.70
	Segments	19	462.50
	Tunnels	0	0
	Subtotal		1,118.20
Railways	Bridges	1	0
	Facilities	0	0
	Segments	2	11.20
	Tunnels	0	0
	Subtotal		11.20
Light Rail	Bridges	0	0
	Facilities	0	0
	Segments	0	0
	Tunnels	0	0
	Subtotal		0
Bus	Facilities	0	0
	Subtotal		0
Ferry	Facilities		0
	Subtotal		0
Port	Facilities	0	0
	Subtotal		0
Airport	Facilities	1	6.40
	Runways	2	73.30
	Subtotal		79.80
	Total		1,209.20

While all of these facilities exist in the study area, only a portion of the highway network is the operating and maintenance responsibility of the Town / Village of Harrison. Highway mileage in the study area is broken down as shown in the Table 5-63

Table: 5-63 Municipal Entity Responsible for Transportation System Lifelines

Municipal Entity Responsible	Mileage
Town/Village of Harrison	81.5
New York State Department of Transportation	23.5
New York State Thruway Authority	6.2
County of Westchester	18.4

Source: New York State Department of transportation Highway Inventory

The railway system is operated and maintained by the Metro-North Commuter Railroad and the Airport is operated and maintained by the County of Westchester.

Table: 5-64 Utility System Lifeline Inventory

System	Component	No. of locations / segments	Replacement Value (millions of dollars)
Potable Water	Distribution Lines	NA	4.80
	Facilities	0	0
	Pipelines	0	0
	Subtotal		4.80
Waste Water	Distribution Lines	NA	2.90
	Facilities	0	0
	Pipelines	0	0
	Subtotal		2.90
Natural Gas	Distribution Lines	NA	1.90
	Facilities	0	0
	Pipelines	0	0
	Subtotal		1.90
Oil Systems	Distribution Lines	0	0
	Facilities	0	0
	Pipelines	0	0
	Subtotal		0
Electric Power	Distribution Lines	0	0
	Facilities	0	0
	Subtotal		0
	Subtotal		0
Communication	Distribution Lines	0	0
	Facilities	0	0
	Subtotal		0
	Subtotal		0
		Total	9.60

In order to fully evaluate the potential for damage and loss based on occupancy class, severity of damage to each type of occupancy must also be considered. Table 5-65 provides definitions for damage categories to a light wood framed building.

Table: 5-65 Example of Structural Damage by Category and Description for Light Wood Framed Buildings

Damage Category	Description
None	
Slight	Small plaster or gypsum board cracks at corners of door and window openings and wall /ceiling intersections; Small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum board cracks at corners of doors and window openings; small diagonal cracks across Shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: HAZUS-MH, 2005

Economic Impact

There is little local information available locally with respect to how an earthquake event may impact the study area economically since events are few and far between and of a magnitude which creates the need to document economic impact. Damage which closes a commercial, industrial or business establishment or limits access to these type facilities will create a loss of sales tax in the municipality from goods and services provided. HAZUS-MH was utilized to estimate economic losses for buildings, critical facilities and transportation and lifeline systems. Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during an earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

Table: 5-66 Building Related Economic Loss Estimates 100 Year MRP Event (Millions of Dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	0	0	0	0	0	0
	Capital -Related	0	0	0	0	0	0
	Rental	0	0	0	0	0	0
	Relocation	0	0	0	0	0	0
	Subtotal	0	0	0	0	0	0
Capital Stock Losses	Structural	0	0	0	0	0	0
	Non-Structural	0	0	0	0	0	0
	Content	0	0	0	0	0	0
	Inventory	0	0	0	0	0	0
	Subtotal	0	0	0	0	0	0
	Total	0	0	0	0	0	0

Source: HAZUS-MH

Table: 5-67 Building Related Economic Loss Estimates 500 Year MRP Event (Millions of Dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	0	.04	.63	.02	.07	.77
	Capital -Related	0	.02	.63	.01	.01	.67
	Rental	.09	.34	.46	.01	.01	.91
	Relocation	.01	.01	.02	0	.01	.05
	Subtotal	.10	.41	1.75	.04	.10	2.40
Capital Stock Losses	Structural	.92	0	.81	.18	.15	2.52
	Non-Structural	2.81	.47	01.83	.56	.37	7.33
	Content	.80	1.76	.91	.38	.20	2.72
	Inventory	0	.42	.01	.06	0	.08
	Subtotal	4.53	0	3.56	1.18	.72	12.64
	Total	4.63	3.05	5.31	1.22	.82	15.04

Source: HAZUS-MH

For Transportation and Utility Lifeline System Losses, HAZUS-MH computes the direct repair cost for each component only. There are no losses computed by HAZUS-MH for business interruption due to

lifeline outages. Long term economic impacts are estimated for 15 years after the earthquake. This information is quantified in terms of income and employment changes within the study area.

Table: 5-68 Transportation System Economic Losses (Millions of Dollars) 100 Year MRP Event (Millions of Dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio(%)
Highway	Segments	462.49	0	0
	Bridges	655.72	0	0
	Tunnels	0	0	0
	Subtotal	1118.20	0	
Railways	Segments	11.20	0	0
	Bridges	.03	0	0
	Tunnels	0	0	0
	Facilities	0	0	0
	Subtotal	11.23	0	
Light Rail	Segments	0	0	0
	Bridges	0	0	0
	Tunnels	0	0	0
	Facilities	0	0	0
	Subtotal	Subtotal	0	
Bus	Facilities	0	0	0
	Subtotal	Subtotal	0	
Ferry	Facilities	0	0	0
	Subtotal	Subtotal	0	
Port	Facilities	0	0	0
	Subtotal	Subtotal	0	
Airport	Facilities	6.43	0	0
	Runways	73.35	0	.04
	Subtotal	79.80	0	0
	Total	1209.20	0	

Source: HAZUS-MH

Table: 5-69 Transportation System Economic Losses (Millions of Dollars) 500 Year MRP Event (Millions of Dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio(%)
Highway	Segments	462.49	0	0
	Bridges	655.72	.17	.03
	Tunnels	0	0	0
	Subtotal	1118.20	.20	
Railways	Segments	11.20	0	0
	Bridges	.03	0	0
	Tunnels	0	0	0
	Facilities	0	0	0
	Subtotal	11.20	0	
Light Rail	Segments	0	0	0
	Bridges	0	0	0
	Tunnels	0	0	0
	Facilities	0	0	0
	Subtotal	0	0	
Bus	Facilities	0	0	0
	Subtotal	0	0	
Ferry	Facilities	0	0	0
	Subtotal	0	0	
Port	Facilities	0	0	0
	Subtotal	Subtotal	0	
Airport	Facilities	6.43	.28	4.36
	Runways	73.35	0	0
	Subtotal	79.80	.30	0
	Total	1209.20	.50	

Source: HAZUS-MH

Table: 5-70 Utility System Economic Losses (Millions of Dollars) 100 Year MRP Event (Millions of Dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0	0	0
	Facilities	0	0	0
	Distribution Lines	4.80	0	.01
	Subtotal	4.82	0	
Waste Water	Pipelines	0	0	0
	Facilities	0	0	0
	Distribution Lines	2.90	0	.01
	Subtotal	2.89	0	
Natural Gas	Pipelines	0	0	0
	Facilities	0	0	0
	Distribution Lines	1.90	0	.02
	Subtotal	1.93	0	
Oil Systems	Pipelines	0	0	0
	Facilities	0	0	0
	Subtotal	0	0	
Electric Power	Facilities	0	0	0
	Subtotal	0	0	
Communication	Facilities	0	0	0
	Subtotal	0	0	
	Total	9.64	0	

Source: HAZUS-MH

Table: 5-71 Utility System Economic Losses (Millions of Dollars) 500 Year MRP Event (Millions of Dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0	0	0
	Facilities	0	0	0
	Distribution Lines	4.80	.010	.012
	Subtotal	4.82	.01	
Waste Water	Pipelines	0	0	0
	Facilities	0	0	0
	Distribution Lines	2.90	0	.16
	Subtotal	2.89	0	
Natural Gas	Pipelines	0	0	0
	Facilities	0	0	0
	Distribution Lines	1.90	0	.25
	Subtotal	1.93	0	
Oil Systems	Pipelines	0	0	0
	Facilities	0	0	0
	Subtotal	0	0	
	Facilities	0	0	0
Electric Power	Subtotal	0	0	
	Facilities	0	0	0
Communication	Subtotal	0	0	
	Facilities	0	0	0
	Total	9.64	.02	

Source: HAZUS-MH

Table: 5-72 Indirect Economic Impact with Outside Aid (Employment as No. of people and Income in millions of dollars) 100 and 500 Year MRP Event

	LOSS	Total 100 Year Event	Percent 100 Year Event	Total 500 Year Event	Percent 500 Year Event
First Year					
	Employment Impact	0	0	0	0
	Income Impact	0	0	0	-.01
Second Year					
	Employment Impact	0	0	0	0
	Income Impact	0	0	0	-.04
Third Year					
	Employment Impact	0	0	0	0
	Income Impact	0	0	0	-.05
Fourth Year					
	Employment Impact	0	0	0	0
	Income Impact	0	0	0	-.05
Fifth Year					
	Employment Impact	0	0	0	0
	Income Impact	0	0	0	-.05
Years 6-15					
	Employment Impact	0	0	0	0
	Income Impact	0	0	0	-.05

Source: HAZUS-MH

Addressing Repetitive Loss Properties (NFIP data for floods, other hazards as available)

The National Flood Insurance Program provides information on payments to homeowners resulting from losses due to flooding where a separate insurance policy for such events has been purchased. Under the earthquake category, flooding may be a secondary or resulting event brought about by a combination of ground motion, overflowing lakes and rivers due to ground motion and dam failures. Flooding events, repetitive loss properties and the associated analysis are discussed elsewhere in this report.

Estimating Potential Losses

Vulnerability in terms of dollar losses provides the study area and the State with a common framework in which to measure the effects of hazards on vulnerable structures.

HAZUS-MH was utilized to develop estimated losses based on three event scenarios. The analysis in Tables 5-73 to 5-0 reflects loss data for 100 and 500 year Mean Return Period earthquake events.

Table: 5-73 Expected Building Damaged by General Occupancy for 100 and , 500 Year Mean Return Period Earthquake Events

Category	100 Year Event					500 Year Event				
	None	Slight	Moderate	Extensive	Complete	None	Slight	Moderate	Extensive	Complete
Agriculture	0	0	0	0	0	53	2	1	0	0
Commercial	0	0	0	0	0	612	39	19	3	0
Education	0	0	0	0	0	25	2	1	0	0
Government	0	0	0	0	0	15	1	0	0	0
Industrial	0	0	0	0	0	173	11	5	1	0
Other Residential	0	0	0	0	0	1,619	96	33	5	1
Religion	0	0	0	0	0	39	3	1	0	0
Single Family	0	0	0	0	0	4,576	225	54	8	1
Total	0	0	0	0	0	7,111	379	114	17	2

Source: HAZUS-MH

Table:5-74 Expected Building Damage by Building Type (All Design Levels) for 100 and 500 Year Mean Return Period Earthquake Events

	100 Year Event					500 Year Event				
	None	Slight	Moderate	Extensive	Complete	None	Slight	Moderate	Extensive	Complete
Wood	0	0	0	0	0	5,195	191	22	1	0
Steel	0	0	0	0	0	456	29	12	1	0
Concrete	0	0	0	0	0	163	14	6	0	0
Precast	0	0	0	0	0	28	2	2	0	0
Reinforced Masonry	0	0	0	0	0	214	12	7	1	0
Unreinforced Masonry	0	0	0	0	0	1,055	132	66	13	2
Manufactured Housing	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	7,111	379	114	17	2

Source: HAZUS-MH

Table: 5-75 Expected Damage to Essential Facilities (Number of Facilities) 100 Year Mean Return Period Event

Classification	Total	At least Moderate Damage > 50%	Complete Damage > 50%	With Functionally >50% on day 1
Hospital	0	0	0	0
Schools	10	0	0	10
EOC's	0	0	0	0
Police Stations	1	0	0	1
Fire Stations*	3	0	0	3

*Study Area has 3 Fire Stations (Downtown, West Harrison and Purchase)
Source: HAZUS-NH

Table: 5-76 Expected Damage to Essential Facilities (Number of Facilities) 500 Year Mean Return Period Event

Classification	Total	At least Moderate Damage > 50%	Complete Damage > 50%	With Functionally >50% on day 1
Hospital	0	0	0	0
Schools	10	0	0	10
EOC's	0	0	0	0
Police Stations	1	0	0	1
Fire Stations*	3	0	0	3

* Study Area has 3 Fire Stations (Downtown, West Harrison and Purchase)
Source: HAZUS-MH

Table: 5-77 Expected Damage to the Transportation Systems for 100 and 500 year Mean Return Period Events

System	Component	Number of Locations/Segments	Number of Locations with At Least Moderate Damage	Number of Locations with Complete Damage	Functionality >50% After Day 1	Functionality >50% After Day 7
Highway	Segments	19	0	0	19	19
	Bridges	43	0	0	43	43
	Tunnels	0	0	0	0	0
Railways	Segments	2	0	0	2	2
	Bridges	1	0	0	1	1
	Tunnels	0	0	0	0	0
Light Rail	Facilities	0	0	0	0	0
	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
Port	Facilities	0	0	0	0	0
	Segments	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	2	0	0	2	2

Source: HAZUS-MH

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these facilities will not be computed

HAZUS-MH performs a simplified system performance analysis for electric power and potable water.

Table: 5-78 Expected Utility System Facility Damage for 100 and 500 year Mean Return Period Events

System	Total No.	No. of Locations With at least Moderate Damage	No. of Locations with Complete Damage	Functionality >50% After Day 1	Functionality >50% After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Source: HAZUS-MH

Table: 5-99 Expected Utility Pipeline Damage (Site Specific) for 100 and 500 year Mean Return Period Events

System	Total Pipeline Length (in kms)	Number of Leak 100 year event	Number of Leaks 500 Year Event	Number of Breaks 100 year Event	Number of Breaks 500 year Event
Potable Water	241	0	1	0	0
Waste Water	145	0	1	0	0
Natural Gas	96	0	1	0	0
Oil	0	0	0	0	0

Source: HAZUS-MH

Table: 5-80 Expected Potable Water and Electric System Performance for 100 and 500 year Mean Return Period Events

System	Total Number of Households	Number of without Service at Day 1	Number of without Service at Day 3	Number of without Service at Day 7	Number of without Service at Day 30	Number of without Service at Day 60
Potable Water	8,394	0	0	0	0	0
Electric Power	8,394	0	0	0	0	0

Fires often occur after a substantial earthquake. Earthquakes may also damage or disrupt electric and natural gas service as well as domestic drinking water transmission lines. Fires may be fed by broken natural gas transmission lines, downed power lines and burn out of control due to a lack of water. HAZUS-MH used a Monte Carlo Simulation Model * to estimate the ignition of fires and the amount of burnt area. Displaced persons and the dollar value of buildings are also estimated by the model.

* Monte Carlo methods are a class of computational algorithms that rely on repeated random sampling to compute their results. Monte Carlo methods are often used when simulating physical and mathematical systems. Because of their reliance on repeated computation and random or pseudo-random numbers, Monte Carlo methods are most suited to calculation by a computer. Monte Carlo methods tend to be used when it is infeasible or impossible to compute an exact result with a deterministic algorithm.

Table: 5-81 Fires Following Earthquake Data

Category	100 Year Earthquake Event	500 Year Earthquake Event
No. of Fires Ignited as A result of an Earthquake	0	0
Square Miles of Area Burnt / % of Study Area	0	0
People Displaced as a Result of fires	0	0
Value of Buildings Burned (in millions of dollars)	0	0

Source: HAZUS-MH

As a result of earthquakes, debris is generated as a result of damage to buildings and infrastructure as well as natural features such as trees and rock formations. HAZUS –MH estimates the amount of debris which can be generated by a particular earthquake event. The model breaks the debris into two general categories; Brick / Wood and Reinforced Concrete / Steel. This distinction is made due to the different types of material handling equipment required to handle the debris. Table: 5-72 shows to amount of debris generated by event scenario.

Table: 5-72 Debris Generated (Tons)

Category	100 Year Earthquake Event	500 Year Earthquake Event
Brick / Wood	0	0
Reinforced Concrete / Steel	0	0
Truck Loads @ 25 tons / Truck	0	0

Source: HAZUS-MH

Analyzing Development Trends (New Buildings, Critical Facilities, Critical Infrastructure)

Section 4 of this plan Municipal Profile – Future Development identifies several areas in the Town / Village of Harrison where the potential for development or redevelopment exists. As of January 1, 2009, construction underway is limited due to the economic turndown. The New York State Building Code contains several sections which discuss construction requirements based on the potential for earthquakes in the State. New development should also take into consideration interior designs which would have greater stability in the event of an earthquake.

Additional Data and Next Steps

On a regional level, sufficient effort exists to monitor earthquake activity in the area.

Overall Vulnerability Conclusion

The Town / Village of Harrison is located in an area that experiences moderate earthquake activity (some shaking). Earthquakes have occurred in the area occasionally and for the most part go undetected by people, and cause minimal or no damage. Future mitigation efforts should include making the public aware of the potential for earthquakes in the study area as well as both passive and active efforts to guard against potential for life threatening and damaging events. The HMPC ranking for earthquakes is “low”

Hazard Profile – Dam Failure

Description

Dams are manmade structures built for a variety of uses, including flood protection, power, agriculture, water supply, and recreation. Dams typically are constructed of earth, rock or concrete. Two factors that influence the potential severity of a full or partial dam failure are the amount of water impounded and the density, type, and value of development and infrastructure located downstream. Dam failures can result from any one or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which result in overtopping
- Earthquake
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage or piping.
- Improper design
- Improper maintenance
- Failure of upstream dams on the same waterway
- Negligent operation
- Overtopping is the primary cause of earthen dam failure.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Associated water quality and health concerns could also be an issue. Dam construction, operation, maintenance and inspection is regulated by the New York State Department of Environmental Conservation.

Location and Extent

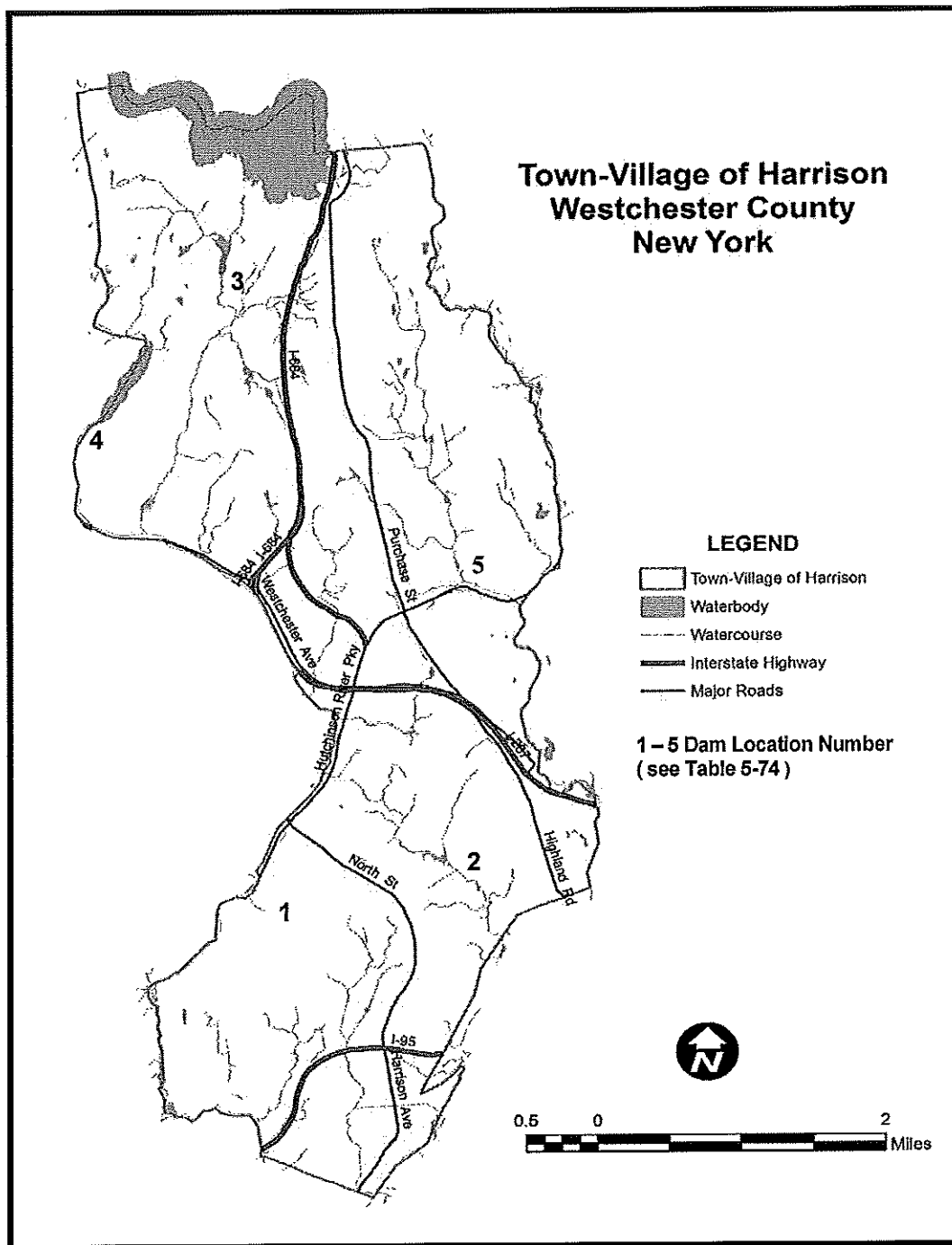
There are five dams located in the study area the details for each of which are indicated in Table 5-83.

Table 5-83 Dams in the Study Area

Location Number	NYSDEC ID Number	Name	Hazard Code	Built	Last Inspected	Type	Purpose	Owner
1	233-4861	Hutchinson River Parkway Detention	A			Earth	Flood Control	State
2	233-4831	Brookside Lower Dam	A	1985		Earth	Flood Control	Private
3	195-1467	Forest Lake Dam	C	1996	2006	Earth	Flood Control	Private
4	146-0506	Silver Lake Dam	B	1815	2007	Earth	Recreation	Local Government
5	232-3111	Fogar Bronfinan Lalor Dam	A	1962	1972	Gravity	Fire/Stock	Private

Source: NYSDEC Dam Inventory

Figure 5-34 Study Area Map with Dam Locations



Source: GIS Base Map and NYSDEC Dam Inventory

The following describes the Hazard Codes of each dam as defined by the New York State Department of Environmental Conservation

- (1) Class A dams are located in areas where failure will damage nothing more than isolated buildings, undeveloped lands, or town or county roads and/or will cause no substantial economic loss or substantial environmental damage. Class A dams are considered to be Low Hazard dams.
- (2) Class B dams are located in areas where failure may damage isolated homes, main highways, minor railroads, interrupt the use of relatively important public utilities and/or will cause substantial economic loss or substantial environmental damage. Class B dams are considered to be Intermediate Hazard dams.
- (3) Class C dams are located in areas where failure may cause loss of human life, substantial damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads and/or will cause extensive economic loss. Class C dams are considered to be High Hazard dams.

Although not physically located in the Town/Village of Harrison, the Kensico Reservoir Dam lies in close proximity to the study area and is classified as a high hazard Class C structure. The New York City Department of Environmental Protection has completed an Emergency Action Plan for the structure with the most recent revision to the Plan dated May 2009. Copies of the plan have been provided to first responder agencies in the study area. Of particular interest are Inundation Maps 20 through 23 which show the impact on areas of the Town/Village of Harrison should a dam failure occur.

Previous Occurrences and Losses

There are no records of any of the dams located in the study area as having failed.

Probability of Future Events

The likelihood of a dam failure in the future is minimal. There would most likely be some warning before such an event with the event being secondary to heavy rain and associated flooding.

Vulnerability Assessment

Overview of vulnerability

While a dam failure is a rare event, impacts to property owners immediately adjoining these type facilities could be substantial.

Data and Methodology

The majority of the data used was obtained from the New York State Department of Environmental Conservation Dam Inventory records. Additionally, a review was made of records available from the National Dam Performance Program and National Inventory of Dams.

Minimal information was available locally. A copy of the New York City Department of Environmental Protection Emergency Action Plan for Kensico Dam, located in close proximity to the study area, was also reviewed.

Impact on life, safety and health

Of the 5 dams in the study area, only one (Forest Lake Dam) carries the highest hazard classification of “C” (see definitions above). A breach of any of these dams in the study area has the potential to cause property damage and generate a response by the Town/Villages Emergency Services organizations. The Forest Lake Dam has the potential to cause a life threatening situation should it fail. The owner(s) of the dam are in the process of having an Emergency Action Plan prepared (draft completed as of March 24, 2009).

Identifying structures including general building stock, critical facilities and critical infrastructure

HAZUS –MH does not provide an analysis for general building stock, critical facilities or critical infrastructure for the dam failure hazard event. As part of its mitigation strategy, the Town / Village will implement a program to identify the downstream impact of a dam failure on these community features.

Economic impact

The economic impact of a failure of any of the 5 dams in the study area is not part of the HAZUS-MH program. An analysis of the downstream impacts to general building stock, critical facilities and critical infrastructure will assist in developing this type of information.

Addressing Repetitive Loss Properties

The National Flood Insurance Program provides information on payments to homeowners resulting from losses due to flooding. Under the dam failure category, flooding may be a secondary or resulting event brought about by large volumes of water suddenly being released. Flooding events, repetitive loss properties and the associated analysis are discussed elsewhere in this report.

Estimating Potential Losses

HAZUS-MH does not estimate potential losses for dam failure events. This type of information will need to be developed and analyzed locally as part of the Town / Village of Harrison long term mitigation strategies.

Analyzing Development Trends (new buildings, critical facilities and Infrastructure)

Section 4 of this plan Municipal Profile – Future Development identifies several areas in the Town / Village of Harrison where the potential for development or redevelopment exists. As of January 1, 2009, construction underway is limited due to the economic turndown. Any structures, critical facilities

and infrastructure contemplated in proximity of a dam, or downstream from a dam, need to be aware of the potential for flooding should a failure or overtopping occur.

Additional Data and Next Steps

Three of the five dams located in the study area are privately owned. Where required by law, owners of all the dams needing an emergency action plan prepared will be notified in order to determine the potential impact to downstream life and property. The New York State Department of Environmental is in the process of updated regulations concerning the ownership, operation and maintenance of dam facilities. The Town / Village will review these updates and inform facility owners where necessary.

Overall vulnerability conclusion

Dam failure has been determined to be a rare and thus a low risk event.

Introduction

The Mitigation Strategy section describes how the Town/Village of Harrison will reduce, control or limit potential losses of life and property from the natural hazards identified in the Risk Assessment section. Mitigation encompasses activities that prevent an emergency, diminish the chance of an emergency from occurring, or lessens the impacts of unavoidable emergencies. The strategy focuses on existing and potential mitigation actions and is the product of a coordinated effort by the Town's departments and partners.

This Mitigation Strategy was developed consistent with the process and steps presented in the Federal Emergency Management Agency's (FEMA) Guide 386-3: Developing the Mitigation Plan. This section satisfies the following requirements:

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy *shall* include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Requirement §201.6(c)(3)(ii): [The mitigation strategy *shall* include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Requirement: §201.6(c)(3)(iii): [The mitigation strategy section *shall* include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization *shall* include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

The Mitigation Strategy section includes: the identification of goals and objectives; developing, evaluating and prioritizing alternate mitigation actions; preparing an implementation plan; and assessing the Town's capabilities to implement the plan.

Goals and Objectives

The first step in developing a hazard mitigation strategy is to establish goals and objectives to reduce or eliminate the Town's long-term vulnerability to natural hazard events. Goals and objectives are the foundation of an effective hazard mitigation plan. They establish a framework for identifying risks and developing strategies to mitigate those risks.

FEMA guidance describes *goals* as general guidelines that explain what a community wants to achieve. They are usually broad policy-type statements, long term and represent global visions. *Objectives* define strategies or implementation steps to attain the identified goals. *Mitigation actions* are specific actions that help a community achieve its goals and objectives.

Based on discussions with the Planning Committee, meetings with local officials and staff, and public input, the following goals and objectives provide the framework for developing the Town's mitigation strategy.

Goal 1: Protect Life and Property

- Objective 1.1 Reduce the impacts of hazards on vulnerable populations, homes, businesses and institutions
- Objective 1.2 Integrate new hazards and risk information into enhancing local building codes and land use planning mechanisms
- Objective 1.3 Educate residents and businesses about insurance coverage for natural hazards
- Objective 1.4 Encourage property owners to take preventative actions especially in repetitive loss areas vulnerable to flooding
- Objective 1.5 Adopt and enforce public policies to minimize impacts of development and enhance safe construction in hazard areas
- Objective 1.6 Identify, pursue and maximize the use of outside sources of funding

Goal 2: Safeguard Critical Public Facilities & Infrastructure

- Objective 2.1 Protect Critical assets
- Objective 2.2 Protect Facility contents
- Objective 2.3 Review and enhance redundancies for critical response networks
- Objective 2.4 Incorporate mitigation strategies into capital improvement projects and maintenance upgrades

Goal 3: Maintain and Enhance Emergency Response Capabilities

- Objective 3.1 Identify the need for and acquire any special emergency services, training and equipment
- Objective 3.2 Ensure continuity of government operations, emergency services, and essential facilities during and immediately after disaster and hazard events
- Objective 3.3 Integrate new hazard and risk information into emergency operation plans

Goal 4: Protect the Environment

- Objective 4.1 Incorporate hazard considerations into natural resource protection
- Objective 4.2 Implement mitigation actions that encourage environmental stewardship and protection of the environment

Goal 5: Increase Awareness & Preparedness

- Objective 5.1 Develop education and outreach programs for the public, public officials, developers, realtors, contractors, and building owners
- Objective 5.2 Enhance understanding of natural hazards and the risks they pose
- Objective 5.3 Improve hazard information, including databases and maps

- Objective 5.4 Partner with the private sector, local schools and institutions of higher learning about natural hazards and disaster preparedness
- Objective 5.5 Support inter-governmental and inter-agency partnerships to foster hazard mitigation activities and projects.

Identification and Analysis of Mitigation Actions

Identification

Mitigation actions include programs, plans, projects, or policies that help reduce or eliminate the long-term risk to human life and property from natural hazards. The Planning Committee identified and analyzed a range of hazard-specific mitigation actions. Existing and potential mitigation actions were identified based on the following criteria:

- Reduce or eliminate the long-term risk to human and life and property from at least one of the seven natural hazards identified in the Risk Assessment Section
- Fall under one or more the six FEMA mitigation action categories
- Achieve one or more of the five hazard mitigation goals and 20 objectives

There are six FEMA classifications of hazard mitigation strategies that can minimize loss of life and property and protect public health and safety during hazard events.

1. **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
2. **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
3. **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers and school-age and adult education programs.
4. **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
5. **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
6. **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

Table 6-1 lists the mitigation actions identified by the Planning Committee and the natural hazards and mitigation goals and objectives they address.

Hazards							Table 6-1 Mitigation Actions	Goals & Objectives					
Flood	Severe Storms	Severe Winter Storms	Earthquake	Extreme Heat	Drought	Dam Failure		Protect Life & Property	Safeguard Critical Facilities & Infrastructure	Enhance Maintain & Emergency Response Capabilities	Protect the Environment	Increase Public Awareness & Preparedness	New / Existing Buildings and Infrastructure
X	X	X	X	X	X	X	1. Conduct inventory and assessment of public facilities and populations that may be vulnerable to natural hazards.	1.1	2.1,2.2	3.2,3.3			New
X	X	X	X	X	X	X	2. Revise Town's capital budgeting process to include 3-5 year capital programming in order to identify priorities for mitigation measures and outside funding for natural hazards that impact Town facilities, equipment, infrastructure and at-risk populations.	1.6	2.1,2.2, 2.4	3.1			New and Existing
X	X	X					3. Identify and pursue funding sources for flood abatement and drainage improvement projects involving public facilities, equipment, and infrastructure.	1.1	2.1,2.2	3.1,3.2			New and Existing
X	X	X					4. Identify and pursue funding sources and other incentives to encourage and monitor flood resistant construction measures and practices for new construction and renovations in floodplains and repetitive flood loss areas.	1.1, 1.4, 1.6	2.1				New and Existing
X	X	X					5. Continue and enhance compliance with NFIP Program. Participate in the CRS (Community Rating System) program.	1.1, 1.4, 1.6	2.1				New And Existing
X	X	X	X		X		6. Integrate hazard resistant mitigation measures into the repair and rehabilitation of Town facilities and infrastructure.		2.1,2.2, 2.4	3.2			New and Existing
X	X	X	X	X			7. Assess the capability to shelter residents during hazard events including the availability of adequate back-up power for cooling and heating at critical facilities.	1.1	2.1	3.2			New and Existing

Hazards							Table 6-1 Mitigation Actions						Goals & Objectives					
Flood	Severe Storms	Severe Winter Storm	Earthquake	Extreme Heat	Drought	Dam Failure							Protect Life & Property	Safeguard Critical Facilities & Infrastructure	Enhance Maintain & Emergency Response Capabilities	Protect the Environment	Increase Public Awareness & Preparedness	New / Existing Buildings and Infrastructure
			X				8. For new or remodeled buildings enforce strict compliance with NYS Building Code earthquake construction recommendations.	1.1, 1.2,					1.1, 1.2,					New and Existing
X	X	X					9. Maintain and enhance cleaning of stormwater collection and conveyance system especially in flood prone areas.	1.1					1.1	2.1, 2.2	3.2	4.1		
X	X	X					10. Partner with neighboring communities to encourage Westchester County to restore and add flood gauges on the Blind Brook, Beaver Swamp Brook, Brentwood Brook, and Mamaroneck River.	1.1					1.1	2.1, 2.2	3.2	4.1	5.3, 5.5	
X	X	X			X	X	11. Update and adopt an emergency response plan.	1.1					1.1	2.3	3.2, 3.3			
X	X	X		X			12. Investigate enhanced weather forecasting and warning systems.	1.1					1.1	2.1, 2.2	3.2		5.2, 5.3	
X	X	X	X	X			13. Implement reverse 911 for Town.	1.1, 1.4					1.1, 1.4		3.2		5.1	
X	X	X	X			X	14. Apply for new Town-wide communication frequencies to include all emergency services.				X			2.3	3.2			
X	X	X	X	X			15. Upgrade and acquire new portable generators for emergency services.	1.1					1.1	2.1	3.2			

Hazards							Table 6-1 Mitigation Actions						Goals & Objectives					
Flood	Severe Storms	Severe Winter Storms	Earthquake	Extreme Heat	Drought	Dam Failure							Protect Life & Property	Safeguard Critical Infrastructure	Enhance Maintain & Emergency Response Capabilities	Protect the Environment	Increase Public Awareness & Preparedness	New / Existing Buildings and Infrastructure
X	X	X	X	X	X	X	16. Continue to support and provide for training opportunities for emergency service personnel.	1.1	2.1,2.2	3.1,3.2			1.1	2.1,2.2	3.1,3.2			
X	X	X	X	X	X	X	17. Prepare and provide informational materials on natural hazard preparation for the Town's website, Cable TV access channel, schools, community centers, day care centers, senior centers and other community venues.	1.1,1.3 1.4					1.1,1.3 1.4				5.1,5.2 5.3, 5.4	
X	X	X	X				18. Integrate hazard mitigation measures into the Comprehensive Plan Update.	1.1,1.2 1.5					1.1,1.2 1.5			4.1 4.2	5.2,5.3	
X	X						19. Encourage low-impact design in order to reduce surface water flows.	1.2,1.5					1.2,1.5			4.1 4.2		
X	X	X			X		20. Revise and adopt an updated wetland local law and map.	1.2,1.5					1.2,1.5			4.1 4.2		
X	X						21. Make available a GIS link on the Town website identifying floodplain and repetitive loss areas.	1.2					1.2				5.2,5.3	
X	X						22. Revise, strengthen, and adopt a steep slope protection law.	1.2,1.5					1.2,1.5			4.1 4.2		
	X	X	X				23. Closely monitor the placement and maintenance of trees on public property and rights-of-way	1.1	2.1,2.2	3.2			1.1	2.1,2.2	3.2			

Hazards							Table 6-1 Mitigation Actions	Goals & Objectives					
Flood	Severe Storms	Severe Winter Storm	Earthquake	Extreme Heat	Drought	Dam Failure		Protect Life & Property	Safeguard Critical Facilities & Infrastructure	Enhance Maintain & Emergency Response Capabilities	Protect the Environment	Increase Public Awareness & Preparedness	New / Existing Buildings and Infrastructure
X	X	X	X	X			24. Partner with utility providers to incorporate hazard mitigation measures into their maintenance operations and capital plans.	1.1	2.1, 2.2	3.2	4.2	5.4	New and Existing
					X		25. Provide information to residents and businesses regarding water conservation measures.	1.1				5.1,5.2 5.4,5.5	
X	X	X	X	X	X	X	26. Develop a public information outreach program for residents, businesses, community groups and organizations including area colleges addressing concerns and risks of natural hazards as well as preparation and preventative measures.	1.1,1.3				5.1,5.2 5.4,5.5	

Analysis

The Planning Committee next analyzed potential mitigation actions using the FEMA STAPLEE method. STAPLEE is an evaluation methodology to help identify the benefits and constraints of a particular mitigation action. The STAPLEE criteria are defined below.

- **Social**
 - Community Acceptance, public support and involvement
 - Consider effects on selected segments of the population
- **Technical**
 - Technical Feasibility
 - Effective in reduction of long-term losses, impacts and risks
 - Effective in minimizing secondary losses
- **Administrative**
 - Available staffing and funding to implement the proposed actions
 - Ability to maintain and manage the mitigation measures
- **Political**
 - Acceptable to and support by community elected officials
 - Public support and involvement
- **Legal**
 - Existing local and State authority to undertake an action
 - Meet regulatory requirements
 - Consider legal liabilities for an action
- **Economic**
 - Costs and benefits of an action
 - Identify outside funding requirements
 - Burden to the tax base or local economy
- **Environmental**
 - Effect on land and water
 - Compliance with environmental laws and regulations
 - Consistent with community environmental goals

Table 6-2 summarizes the STAPLEE evaluation of potential mitigation actions. The seven STAPLEE evaluation criteria were assigned a plus (+), if the proposed action is favorable; a minus (-), if the action is unfavorable; or a Not Applicable (N) if the evaluation criteria does not apply to the mitigation action.

Table 6-2 STAPLEE ACTION EVALUATION: TOWN/VILLAGE OF HARRISON

Alternative Actions	STAPLEE Criteria Considerations																					
	+ Favorable - Less favorable N Not Applicable																					
	S (Social)		T (Technical)			A (Administrative)		P (Political)		L (Legal)			E (Economic)			E (Environmental)						
1. Conduct inventory and assessment of public facilities and populations that may be vulnerable to natural hazards.	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Consistent with Community Environmental Goals	Consistent with Federal Laws	
			+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	N	-	N	N	
			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2. Revise Town's capital budgeting process to include 3-5 year capital programming in order to identify priorities for mitigation measures and outside funding for natural hazards that impact Town facilities, equipment, infrastructure and at-risk populations.	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	N	N	N		
3. Identify and pursue funding sources for flood abatement and drainage improvement projects involving public facilities, equipment, and infrastructure.	+	+	+	+	+	+	N	+	+	+	+	+	+	+	+	+	+	-	+	+	N	

Table 6-2 STAPLEE ACTION EVALUATION: TOWN/VILLAGE OF HARRISON

STAPLEE Criteria Considerations																						
Alternative Actions		+ Favorable - Less favorable N Not Applicable																				
		S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E				E (Environmental)		
																(Economic)						
		Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Consistent with Community Environmental Goals	Consistent with Federal Laws
4. Identify and pursue funding sources and other incentives to encourage and monitor flood resistant construction measures and practices for new construction and renovations in floodplains and repetitive flood loss areas.		+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	+	+	N	N
5. Continue and enhance compliance with NFIP Program. Participate in the CRS (Community Rating System) program.		+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	+	+	N	N
6. Integrate hazard resistant mitigation measures into the repair and rehabilitation of Town facilities and infrastructure.		+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	N	+	+	N	N
7. Assess the capability to shelter residents during natural hazard events including the availability of adequate back-up power for cooling and heating at critical facilities.		+	+	+	+	+	+	+	N	+	+	+	+	+	N	+	+	N	+	N	N	N

Table 6-2 STAPLEE ACTION EVALUATION: TOWN/VILLAGE OF HARRISON

Alternative Actions	STAPLEE Criteria Considerations																			
	+ Favorable - Less favorable N Not Applicable																			
	S (Social)		T (Technical)			A (Administrative)			P (Political)		L (Legal)			E (Economic)			E (Environmental)			
Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Consistent with Community Environmental Goals	Consistent with Federal Laws
8. For new or remodeled buildings enforce strict compliance with NYS Building Code earthquake construction recommendations.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	N	N
9. Maintain and enhance cleaning of stormwater collection and conveyance system especially in flood prone areas.	+	+	+	-	+	+	+	+	+	+	N	+	N	+	-	+	-	+	N	N
10. Partner with neighboring communities to encourage Westchester County to restore and add flood gauges on the Blind Brook, Beaver Swamp Brook, Brentwood Brook, and Mamaroneck River.	+	+	+	+	+	-	-	+	+	+	+	+	N	+	+	+	-	+	N	N
11. Update and adopt an emergency response plan.	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	N	N	N	N
12. Investigate enhanced weather forecasting and warning systems.	+	+	+	-	+	+	+	+	+	+	N	+	N	+	+	+	N	N	N	N
13. Implement reverse 911 for Town.	+	+	+	-	+	+	-	+	+	+	+	+	N	+	-	N	-	N	N	N

Table 6-2 STAPLEE ACTION EVALUATION: TOWN/VILLAGE OF HARRISON

[illegible]

Table 6-2 STAPLEE ACTION EVALUATION: TOWN/VILLAGE OF HARRISON

STAPLEE Criteria Considerations																						
Alternative Actions		+ Favorable - Less favorable N Not Applicable																				
		S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)		
		Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Consistent with Community Environmental Goals	Consistent with Federal Laws
		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	+
19. Encourage low-impact design in order to reduce surface water flows.		+	+	+	+	+	+	-	N	+	+	+	+	+	+	+	+	N	+	+	+	+
20. Revise and adopt an updated wetland local law and map.		+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	N	+	+	+	+
21. Make available a GIS link on the Town website identifying floodplain and repetitive loss areas.		+	+	+	+	+	+	-	+	+	+	+	+	+	N	+	+	+	N	+	+	+
22. Revise, strengthen, and adopt a steep slope protection law.		+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	N	+	+	+	+
23. Closely monitor the placement and maintenance of trees on public property and rights-of-way.		+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	N	N	N	N	N
24. Partner with utility providers to incorporate hazard mitigation measures into their maintenance operations and capital plans.		+	+	+	+	+	+	-	+	+	+	+	+	+	N	+	+	N	-	N	N	N

Table 6-2 STAPLEE ACTION EVALUATION: TOWN/VILLAGE OF HARRISON

STAPLEE Criteria Considerations																						
+ Favorable - Less favorable N Not Applicable																						
Alternative Actions	S (Social)			T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)		
	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Consistent with Community Environmental Goals	Consistent with Federal Laws	
25. Provide information to residents and businesses regarding water conservation measures.	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	+	+	+	+	
26. Develop a public information outreach program for residents, businesses, community groups and organizations including area colleges addressing concerns and risks of natural hazards as well as preparation and preventative measures.	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	+	+	+	+	

Prioritization and Benefit/Cost Review

Prioritization

Section 201.c.3.iii of 44 CFR requires that the review of alternative mitigation actions include a description of how they will be prioritized including a benefit/cost review. The Town of Harrison's Planning Committee, along with their consultant, researched the methodology included in other recently approved Hazard Mitigation Plans. Accordingly, the mitigation actions identified earlier in this section were prioritized according to the criteria defined below.

High Priority: A project that meets multiple goals and objectives, benefits exceed cost, has funding secured under existing programs or authorizations, or is grant-eligible, and can be completed in 1 to 5 years (short-term project) once the project is funded.

Medium Priority: A project that meets at least one plan goal and objective, benefits exceed cost, funding has not been secured and would require a special funding authorization under existing programs, grant eligibility is questionable, and can be completed in 1 to 5 years once the project is funded.

Low Priority: A project that will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, and project is not grant-eligible and/or timeline for completion is considered long term (5 to 10 years).

Benefit/Cost Criteria

As part of the prioritization process, Section 201.6(c)(3)(iii) of 44 CFR requires that attention be paid on the extent to which benefits are maximized according to a cost benefit review of the mitigation actions and their associated costs. A benefit-cost analysis is a method for determining the potential positive effects of a specific mitigation action and comparing them to the cost of the action.

As described below this benefit/cost analysis did not include the level of detail required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A more qualitative approach was used for a variety of reasons including the timing and available funding for implementation of the project as the associated costs and benefits could change dramatically over time. Therefore, a review of the apparent benefits versus the apparent cost of each project was performed.

Ratings of high, medium, or low was assigned to the costs and benefits of the mitigation actions and are defined below.

Cost Rating Definition

High: Existing funding levels are not adequate to cover the costs of the proposed project and would require an increase in revenue through an alternative source (for example, bonds, grants, and fee increases) to implement.

Medium: The project could be implemented with existing funding but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.

Low: The project could be funded under the existing budget. The project is part of or can be part of an existing, ongoing program.

Benefit Rating Definition

High: Project will have an immediate impact on the reduction of risk exposure to life and property.

Medium: Project will have a long-term impact on the reduction of risk exposure to life and property or project will provide an immediate reduction in the risk exposure to property.

Low: Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly.

If the Town decides to seek funding for projects from FEMA's HMGP or PDM programs the required detailed benefit/cost analysis will be done as part of the application preparation and submission. The Town intends to pursue an overall mitigation strategy with benefits that exceeds costs. For projects not seeking financial assistance from grant programs that require a detailed cost/benefit analysis, "benefits" will be evaluated according to parameters that meet its needs and the goals and objectives of this plan. The prioritization of mitigation actions will also be reviewed and updated as needed annually as part of the plan maintenance strategy described in Section 7 of this plan.

Table 6-3 presents the prioritization of alternate mitigation actions by the methodology described above. The prioritization evaluation took into consideration the number of objectives met; cost/benefit analysis, and the availability of funding.

Table 6-3 Prioritization of Alternative Mitigation Actions

Mitigation Action #	Applies to New (N) and/or Existing (E) Structures	Goals & Objectives	# of Objectives Met	Benefits	Costs	Cost/Benefit (Y/N)	Grant Eligible (Y/N)	Can Project Be Funded under Existing Programs/Budgets (Y/N)	Priority
1.	NA	1.1,2.1,2.2,3.2	4	M	L-M	Y	N	Y	M
2.	N/E	1.6,2.1,2.2,4.3,1	5	M	L	Y	N	Y	M-L
3.	N/E	1.1,2.1,2.2,3.1,3.2	5	M	L	Y	N	Y	M
4.	N/E	1.1,1.4,1.6,2.1	4	M	L	Y	N	Y	H
5.	N/E	1.1,1.4,1.6,2.1	4	M	M	Y	N	Y	H
6.	E	2.1,2.2,4.3,2	4	M	M	Y	N	N	M
7.	NA	1.1,2.1,3.2	3	M	L	Y	N	N	H
8.	N/E	1.1,1.2	2	M	L	Y	N	Y	H
9.	N/E	1.1,2.1,2.2,3.2,4.1	5	H	L	Y	N	Y?	H
10.	N/E	1.1,2.1,2.2,3.2,5.5	5	M	L	Y	Y	N	L-M
11.	NA	1.1,2.3,3.2,3.3	4	M	L	Y	N	Y?	M-H
12.	NA	1.1,2.1,2.2,3.2,5.2,5.3	6	M	L	Y	N	Y	H
13.	NA	1.1,1.4,3.2,5.1	4	M-H	H	Y	Y	N	M
14.	NA	2.3,3.2	2	L	L	Y	N	Y	M-H
15.	NA	1.1,2.1,2.2,3.2	4	M	M-H	Y	Y	N	M
16.	NA	1.1,2.1,2.2,3.1,3.2	5	L	L-M	Y	N	Y	H
17.	N/E	1.1,1.3,1.4,5.1,5.2,5.4	6	H	L-M	Y	N	Y	M
18.	N/E	1.1,1.2,1.5,4.1,4.2,5.2,5.3	7	M	L-M	Y	N	N	M
19.	N/E	1.2,1.5,4.1,4.2	4	M	L-M	Y	N	Y	M
20.	N/E	1.2,1.5,4.1,4.2	4	M	L-M	Y	N	N	M
21.	NA	1.2,5.2,5.3	3	M	L-M	Y	N	Y	H
22.	N/E	1.2,1.5,4.1,4.2	4	M	L-M	Y	N	N	M
23.	N/E	1.1,2.1,2.2,3.2	4	H	L	Y	N	Y	H
24.	NA	1.1,2.1,2.2,3.2,4.2,5.4	6	M	L	Y	N	Y	H
25.	NA	1.1,5.1,5.2,5.4,5.5	5	H	L	Y	N	Y	H
26.	N/E	1.1,1.3,5.1,5.2,5.4,5.5	6	H	L-M	Y	N	Y	M-H

Capability Assessment

Performing a Capability Assessment is an important part of preparing a hazard mitigation plan. A mitigation planning Capability Assessment consists of taking an in-depth look at community mechanisms (such as plans, codes, ordinances, etc.) that can affect the successful implementation of identified and prioritized mitigation actions. It provides information that can be used to develop an approach for Plan integration (the step of identifying how the plan, once it is adopted, will tie into existing plans, policies, regulations, and procedures), who in the jurisdiction will take the lead on moving forward with the mitigation actions, and the administrative, technical, regulatory and fiscal resources in the municipality.

FEMA has developed local hazard mitigation capability questionnaires that assist the community in identifying its legal and regulatory authority, administrative, technical and fiscal resources. Tables 6-4 through 6-6 represent the Capability Assessment for the Town/Village of Harrison.

Table 6-4 Legal and Regulatory Authority

Regulatory Tools (ordinances, codes, plans)	Local Authority (Y/N)	Does State Prohibit (Y/N)	Higher Level Jurisdiction Authority (Y/N)	Codes, Ordinances and Plans
Building Code	Y	N	Y	Chapter 103 Building construction, Chapter 105 Building Enforcement, Chapter 109 Unsafe Buildings of the Harrison Town Code
Zoning Ordinance	Y	N	N	Chapter 235
Subdivision ordinance or regulations	Y	N	N	Chapter 204
Special purpose ordinances (floodplain management, stormwater management, hillside or steep slope ordinances, wildfire, hazard setback requirements)	Y	N	N	Chapter 126 Environmental Quality Review, Chapter 130 Stormwater Management & Erosion & Sediment Control, Chapter 131 Illicit Discharge, Chapter 133 Excavation & Soil Removal, Chapter 139 Filling & Grading, Chapter 146 Flood Damage Prevention, Chapter 149 Freshwater Wetlands, Chapter 199 Steep Slope Protection, Chapter 220 Trees, Chapter 230 Water Pollution
Growth management ordinances (also called "smart growth" or anti-sprawl programs)	N	N	N	No
Site plan review requirements	Y	N	N	Section 235-71 of the Zoning Ordinance

General or Comprehensive Plan	Y	N	N	2006 Update Draft
A capital improvements plan	Y	N	N	Town only adopts a 1 year capital budget
An economic development plan	N	N	N	No
An emergency response plan	Y	N	N	Preparation in process by Town/Village
A post-disaster recovery plan	N	N	N	No
A post-disaster recovery ordinance	N	N	N	No
Real estate disclosure requirements	N	N	N	No

Table 6-5 Administrative and Technical Capability

Staff/Personnel Resources	Yes/No	Department and Position
Planner (s) or engineer(s) with knowledge of land development and land management practices	Yes	Building Inspector and Assistant Building Inspectors; Town-Village Engineer/Commissioner of Public Works; Town/Village Planning Consultant
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Building Inspector and Assistant Building Inspectors, Code Enforcement Officer; Town-Village Engineer/Commissioner of Public Works
Planner(s) or engineers(s) with an understanding of natural and/or human caused hazards	Yes	Town-Village Engineer/Commissioner of Public Works; Town/Village Planning Consultant
Floodplain manager	Yes	Building Inspector ; Town-Village Engineer/Commissioner of Public Works
Surveyors	No	The Town/Village will contract for these services as needed

Staff with education or expertise to assess the community's vulnerability to hazards	Yes	Building Inspector; Town-Village Engineer/Commissioner of Public Works; Fire Marshall & Fire District Chiefs; Police Commissioner
Personnel skilled in GIS and/or HAZUS	Yes	Assistant Town/Village Engineer; Westchester County GIS Department; Outside Consultants
Scientists familiar with the hazards of the community	No	The Town/Village will contract with consultants as needed
Emergency manager	Yes	Police Commissioner; Fire Marshall & Fire District Chiefs; Town/Village Engineer/Commissioner of Public Works
Grant writer	Yes	Town-Village Engineer/Commissioner of Public Works; Outside Consultants

Table 6-6 Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
Community Development Block Grants (CDBG)	The Town/Village is a member of the Westchester Urban County Consortium and is eligible for CDBG funding. Eight census block groups were identified as HUD low and moderate income areas.
Capital Improvements project funding	The Town/Village Board annually approves a Capital Budget for a single fiscal year.
Authority to levy taxes for specific purposes	The Town/Village Board establishes an annual tax rate as part of the budget process. The Board can also authorize the issuance of Tax Anticipation Notes and Serial Bonds if necessary.
Fees for water, sewer, gas or electric service	Water rates are set by the Westchester Joint Water Works of which the Town is a member. Sewer district taxes are levied by Westchester County. All other utility services are provided by private companies.
Impact fees for home buyers or developers for new developments/homes	None, other than recreation fees which can be assessed as part of new subdivisions as permitted by NYS law.

Incur debt through general obligation bonds	The Town/Village Board has the authority to issue general obligation bonds.
Incur debt through special tax bonds	The Town/Village Board can issue various bonds and notes to finance improvements and address emergencies.
Incur debt through private activity bonds	Not permitted in New York State
Withhold spending in hazard-prone areas	The Town/Village Board as part of its budgeting process is responsible for determining how and where funds are allocated and spent.
Other	

National Flood Insurance Program and Community Rating System

The National Flood Insurance Program (NFIP) provides federally backed flood insurance that encourages communities to enact and enforce floodplain regulations. To be covered by a flood insurance policy, a property must be in a community that participates in the NFIP. To qualify for the program, a community adopts and enforces a floodplain management ordinance to regulate development in flood hazard areas. The Town of Harrison participates in the NFIP.

The NFIP's Community Rating System (CRS) was implemented in 1990 as a program recognizing and encouraging floodplain management activities that exceed the minimum NFIP standards. Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet the goals of CRS.

The Town does not currently participate in the CRS program but will join the program as one of its mitigation strategies (mitigation strategy #5). In addition, the Plan's risk assessment which provides historical flood information and the mitigation strategies developed as part of this Plan meet the Floodplain Management Plan criteria under Activity 510 in the CRS program and will be utilized in the development of the Town's CRS Program.

As part of the Town Village's efforts to reduce the risks associated with flooding and flood losses, the Department of Public Works and the Building Department will assess their current operating procedures against those outlined by the Federal Emergency Management Agency in the National Flood Insurance Program (NFIP) to insure actions that address the administration of the Town /Village's National Flood Insurance Program participation. Where not currently in place, an educational effort for the public as well as municipal staff and board members will be developed as outlined in Table 6-7 Item # 5, posted on the Town website and made available for distribution from the Department of Public Works and Building Department Offices located at 1 Heineman Place, Harrison, New York 10528. The educational effort will include a package consisting of a welcome letter to the program and will include contact information for the Town/Village's NFIP Coordinator,

reference the Multi-Hazard Mitigation Plan and copies of educational material downloaded from the FEMA /NFIP website or obtained from the FEMA publications warehouse.

All new construction, additions or modifications to structures within the 100 year and 500 year floodplains, or within 500 feet of the floodplain boundaries will receive as part of their permitting/building process package, copies of all relevant floodplain information. The latest copies of the Town/Village's Flood Insurance Rate Maps dated September 2007 are available for review in the Offices of the Department of Public Works and Building Departments located at 1 Heineman Place, Harrison, New York during regular business hours. These September 2007 FIRMS were reviewed by the Town/Village and determined to be accurate and that no additional studies were needed at the time. The 100 year and 500 year FIRMS are shown on maps of the Town /Village in Figures 5-1 and 5-2 and a map of the Repetitive Loss areas are shown on a map of the Town in Figure 5-9A, in the Section 5, Risk Assessment – Flood.

There will be one person from the Departments of Public Works and Buildings who will be knowledgeable of the responsibilities for coordinating the operation and updating of the Town/Village NFIP. There is one designated person for contact and published information purposes. New and updated training needs will be determined by the Coordinator and training sessions sponsored by FEMA, the Association of State Floodplain Managers, the New York State Floodplain and Stormwater Managers Association or other professional organization will be scheduled as available. The Town / Village will join a professional floodplain organization. At the present time, there is no Community Assistance Visit (CAV) anticipated or scheduled.

Implementation

The Implementation Strategies found in Table 6- 7 identifies the following categories of information for each mitigation action that will guide Harrison in the implementation and administration of the actions: hazard description, lead and supporting agencies, timeframe, cost, and funding source. It also serves to coordinate the various departments involved to avoid duplicating or conflicting efforts. The Implementation Table contains a variety of prioritized actions that mitigate the effects of natural hazards on the population and property of the Town.

Table 6-7 Implementation Strategies								
Hazard	Mitigation Action	Lead Agency	Supporting Agency	Project Timeline (Years)	Estimated Project Cost	Possible Funding Source	FEMA Category P= prevention PP= property protection PE= public education NR= natural resources ES= emergency services SP= structural projects	Goals And Objectives
All	1. Conduct inventory and assessment of public facilities and populations that may be vulnerable to natural hazards.	DPW TE	PL CS WCDP	<1	L	Town	P,PP,ES,SP	1.1,2.1,2.2,3.2
All	2. Revise Town's capital budgeting process to include 3-5 year capital programming in order to identify priorities for mitigation measures and outside funding for natural hazards that impact Town facilities, equipment, infrastructure and at-risk populations.	Town Board	DPW Police Fire EMS	1-2	L	Town	P,PP	1.6,2.1,2.2,2.4,3.1
Flood, Severe Storm, Severe Winter Storm	3. Identify and pursue funding sources for flood abatement and drainage improvement projects involving public facilities, equipment, and infrastructure.	DPW TE	NYS DEC WCDP SEMO	Ongoing	L	Town CIP HMGP PDM NYS DEC	SP	1.1,2.1,2.2,3.1,3.2
Flood, Severe Storm, Severe Winter Storm	4. Identify and pursue funding sources and other incentives to encourage and monitor flood resistant construction measures and practices for new construction and renovations in floodplains and repetitive flood loss areas.	TE BLDG	DPW PL	1-2	L	Town	P,PP	1.1,1.4,1.6,2.1
Flood, Severe Storm, Severe Winter Storm	5. Continue and enhance compliance with NFIP Program. Participate in the CRS (Community Rating System) program	DPW BLDG	TE PL SEMO	2-3	L	Town	P,PP,S	1.1,1.4,1.6,2.1
Flood, Severe Storm, Severe Winter Storm, Earthquake, Drought	6. Integrate hazard resistant mitigation measures into the repair and rehabilitation of Town facilities and infrastructure.	TE DPW	BLDG	2-3	M	Town	PP,SP	2.1,2.2,2.4,3.2

Hazard	<u>Table 6-7 Implementation Strategies</u> Mitigation Action	Lead Agency	Supporting Agency	Project Timeline (Years)	Estimated Project Cost	Possible Funding Source	FEMA Category P= prevention PP= property protection PE= public education NR= natural resources ES= emergency services SP= structural projects	Goals And Objectives
Flood, Severe Storm, Severe Winter Storm, Earthquake, Extreme Heat	7. Assess the capability to shelter residents during natural hazard events including the availability of adequate back-up power for cooling and heating at critical facilities.	TE DPW	BLDG School District WOEM Red Cross	1-2	L	Town County SEMO	ES	1.1,2.1,3.2
Earthquake	8. For new or remodeled buildings enforce strict compliance with NYS Building Code earthquake construction recommendations.	BLDG	TE	1-3	L	Town	P	1.1,2.1
Flood, Severe Storm, Severe Winter Storm	9. Maintain and enhance cleaning of stormwater collection and conveyance system especially in flood prone areas.	DPW	DPW WC DPW NYS DOT	Ongoing	M	Town County NYS	P,PP	1.1,2.1,2.2,3.2,4.1
Flood, Severe Storm, Severe Winter Storm	10. Partner with neighboring communities to encourage Westchester County to restore and add flood gauges on the Blind Brook, Beaver Swamp Brook, Brentwood Brook, and Mamaroneck River.	TE DPW	WC DPW WCOEM Other Towns & Villages	2-3	M-H	Town WCDPW, WCOEM	P,ES	1.1,2.1,2.2,3.2,5.5
All	11. Update and adopt an emergency response plan.	Police	EMS DPW	1-2	L	Town	P,PP,ES	1.1,2.3,3.2,3.3

Hazard	Mitigation Action	Lead Agency	Supporting Agency	Project Timeline (Years)	Estimated Project Cost	Possible Funding Source	FEMA Category P= prevention PP= property protection PE= public education NF= natural resources ES= emergency services SP= structural projects	Goals And Objectives
Flood, Severe Storm, Severe Winter Storm, Extreme Heat	12. Investigate enhanced weather forecasting and warning systems.	Fire DPW	Town Board	1-2	M	Town SEMO WCOEM	ES	1.1,2.1,2.2,3.2,5.2,5.3
Flood, Severe Storm, Severe Winter Storm, Earthquake, Extreme Heat	13. Implement reverse 911 for Town.	Police	Fire, EMS DPW, Town Board	3-4	H	Town SEMO FEMA	ES, PE	1.1,1.4,3.2,5.1
Flood, Severe Storm, Severe Winter Storm, Dam Failure	14. Apply for new Town-wide communication frequencies to include all emergency services.	Police	Fire EMS DP W	1-2	L	Town	ES	3,3.2
Flood, Severe Storm, Severe Winter Storm, Earthquake, Extreme Heat	15. Upgrade and acquire new portable generators for emergency service personnel.	Fire	Police DPW	1-2	M-H	Town FEMA SEMO	ES	1.1,2.1,2.2,3.2
All	16. Continue to support and provide for training opportunities for emergency service personnel.	Town Board	Police Fire EMS	Ongoing	L-M	Town County SEMO FEMA	ES, P	1.1,2.1,2.2,3.1,3.2
All	17. Prepare and provide informational materials on natural hazard preparation for the Town's website, Cable TV access channel, schools, community centers, day care centers, senior centers and other community venues.	Town Board Town Clerk TE	DPW DPW BLDG Fire, Police EMS WCOEM	1-2	L-M	Town	PE	1.1,1.3,1.4,5.1,5.2,5.4.1

Hazard	Mitigation Action	Lead Agency	Supporting Agency	Project Timeline (Years)	Estimated Project Cost	Possible Funding Source	FEMA Category P= prevention PP= property protection PE= public education NR= natural resources ES= emergency services SP= structural projects	Goals And Objectives
Flood, Severe Storm, Severe Winter Storm, Earthquake	18. Integrate hazard mitigation measures into the Comprehensive Plan Update.	Town Board PL, PB	TE BLDG WCDDP	1-2	L-M	Town	P, NR	1.1, 1.2, 1.5, 4.1, 4.2, 5.2, 5.3
Flood, Severe Storm	19. Encourage low-impact design in order to reduce surface water flows.	TE	PL BLDG PB	1-2	L	Town	P, PP, NR	1.2, 1.5, 4.1, 4.2
Flood, Severe Storm, Severe Winter Storm, Drought	20. Revise and adopt an updated wetland local law and map.	PL	TE, PB BLDG	2-3	M	Town	P, PP, NR	1.2, 1.5, 4.1, 4.2
Flood, Severe Storm	21. Make available a GIS link on the Town website identifying floodplain and repetitive loss areas.	TE	IT Dept. WCGIS	Ongoing	M	Town	P, PE	1.2, 5.2, 5.3
Flood, Severe Storm	22. Revise, strengthen, and adopt a steep slope protection law.	TE, PL	BLDG PB	2-3	M	Town	P, PP, NR	1.2, 1.5, 4.1, 4.2
Severe Storm, Severe Winter Storm, Earthquake	23. Closely monitor the placement and maintenance of trees on public property and rights-of-way.	DPW	BLDG PL	Ongoing	M	Town	P, PP, NR	1.1, 2.1, 2.2, 3.2
Flood, Severe Storm, Severe Winter Storm, Earthquake, Extreme Heat	24. Partner with utility providers to incorporate hazard mitigation measures into their maintenance operations and capital plans.	DPW	Con Ed WJWW Cablevision	2-3	L	Town	P, PP	1.1, 2.1, 2.2, 3.2, 4.2, 5.4

Hazard	Mitigation Action	Lead Agency	Supporting Agency	Project Timeline (Years)	Estimated Project Cost	Possible Funding Source	FEMA Category P= prevention PP= property protection PE= public education NF= natural resources ES= emergency services SP= structural projects	Goals And Objectives
Drought	25. Provide information to residents and businesses regarding water conservation measures.	Town Clerk Town Board DPW	WJWW WC Water Agency	Ongoing	L	Town	P, PE	1.1, 5.1, 5.2, 5.4, 5.5
All	26. Develop a public information outreach program for residents, businesses, community groups and organizations including area colleges addressing concerns and risks of natural hazards as well as preparation and preventative measures.	Town Board Town Clerk DPW, TE	Police Fire EMS CS WCOEM	2-3	L-M	Town	P, PP, PE	1.1, 1.3, 5.1, 5.2, 5.4, 5.5

Table 6-7 Implementation Strategies (Continued)

Legend

BLDG	=	Town Building Inspector/Building Department
CS	=	Town Community Services Department
DPW	=	Town Department of Public Works
FEMA	=	Federal Emergency Management Agency
HMGP	=	Hazard Management Grant Program
IT	=	Town Information Technology Department
NYS DEC	=	NYS Department of Environmental Conservation
NYSDOT	=	NYS Department of Transportation
PB	=	Planning Board
PDM	=	Pre-Disaster Mitigation
PL	=	Town Planner
SEMO	=	NYS Emergency Management Office
TE	=	Town Engineer
WC	=	Westchester County
WCDP	=	Westchester County Department of Planning
WCGIS	=	Westchester County GIS Office
WCOEM	=	Westchester County Office of Emergency Management

Estimated Project Cost Key

L	=	Low: Less than \$10,000
M	=	Medium: Between \$10,000 and \$100,000
H	=	High: Over \$100,000

Plan Maintenance Process

Section 201.6(c)(4) of 44 CFR requires a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle. It is a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate and a discussion on how the community will continue public participation in the plan maintenance process.

Monitoring, Evaluating and Updating the Plan

The Town/Village of Harrison has established a mechanism to monitor, evaluate, and update it's Multi-Hazard Mitigation Plan, implement the plan through existing municipally sponsored programs and, solicit continued public involvement with plan maintenance.

Monitoring

Shall be an ongoing process conducted by Town / Village of Harrison Department of Public Works in cooperating with other municipal agencies having responsibility for implementing the various mitigation strategies and coordinating with the Hazard Mitigation Planning Committee (HMPC) on an annual basis via a report memorandum to be submitted by January 31st of each year for activities undertaken and completed during the previous calendar year. The Hazard Mitigation Planning Committee will meet annually to review the memorandum report prepared by the Department of Public Works on mitigation activities and additionally, immediately after any disaster event warranting a reexamination of the mitigation actions being implemented or proposed for future implementation. Monitoring of the plan minimally on an annual basis will allow the HMPC to access which projects have been completed, those which may no longer be possible, those requiring modification of scope, as well as current and future funding needs. The public will be updated annually by way of an advertised publicly held meeting and posting in the emergency management section of the Town/Village website.

Implementation of Strategies and Annual Review

Upon approval of the Town's Multi-Hazard Mitigation Plan by the Federal Emergency Management Agency, the Town will begin the process of implementing the strategies outlined in Table 6-7. The HMPC will meet to review the 26 mitigations actions indicated in Table 6-7 and the respective Lead Agency and associated supporting agencies will take responsibility for their respective mitigations actions with the goal of implementation with the projected timelines. The Department Head of the Respective Lead Agency will have overall responsibility for the implementation of his/her associated mitigation actions. Those mitigation actions capable of being undertaken within the current budget year funding capabilities of the Town/Village of Harrison will be undertaken immediately. Projects in need of funding will wait for the annual budgetary process to begin, or the Town / Village may seek to fund projects through borrowing, or seek funding through grants or funding by other agencies.

Within 6 months of Plan approval by the Federal Emergency Management Agency, Lead Agency Department Heads will provide a written report to Commissioner of Public Works and the HMPC on the ability to implement their respective mitigation actions within the projected timeline. Individual mitigation actions will be classified using four (4) parameters including those actions which are Funded, Unfunded, Underway, in need of Modification or Completed. Unfunded projects will be submitted to the Town Board for consideration of funding within the projected timelines in Table 6-7 as part of the Town/Village's Operating or Long Range (Strategic) funding process. The Town Board will also seek outside funding sources such as grants or outright funding by other agencies and institutions.

Twelve (12) months after Plan approval by the Federal Emergency Management Agency, The Commissioner of Public Works and the HMPC will meet to review the past years mitigation action implementation efforts and report on progress to the Town Board.

Status reports on mitigation efforts will be made every six (6) months by the respective lead agency Department Heads to the Commissioner of Public Works and the HMPC. The Commissioner of Public Works and the HMPC will determine if a meeting of the HMPC is needed immediately or if the report shows satisfactory progress and can be reviewed at the Annual HMPC review. Both six (6) month interim and twelve (12) month annual reports on mitigation action implementation will be available on the Town/Village's website <http://www.town.harrison.ny.us/HHMP/whatsnews.aspx> and will be available for public inspection during regular business hours in the Office of the Commissioner of Public Works, 1 Heineman Place, Harrison, New York 10528.

Evaluating

Evaluation of progress of the mitigation strategies effort will be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or
- Increased vulnerability as a result of new development (and/or annexation).

Updates to this plan will:

- Consider changes in vulnerability due to project implementation,
- Document success stories where mitigation efforts have proven effective,
- Document areas where mitigation actions were not effective,
- Document any new hazards that may arise or were previously overlooked,
- Incorporate new data or studies on hazards and risks,
- Incorporate new capabilities or changes in capabilities,
- Incorporate growth and development-related changes to city inventories, and
- Incorporate new project recommendations or changes in project prioritization.

In order to best evaluate any changes in vulnerability as a result of plan implementation, the HMPC will monitor the following process:

- A representative from the responsible office identified in each mitigation measure will be responsible for tracking and reporting on an annual basis to the Commissioner of Public Works on project status and provide input on whether the project as implemented meets the defined objectives and is likely to be successful in reducing vulnerabilities.
- If the project does not meet identified objectives, the HMPC will determine what additional measures may be implemented and an assigned individual will be responsible for defining project scope, implementing the project, monitoring success of the project, and making any required modifications to the plan.

Changes will be made to the plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with established criteria, the time frame, municipal priorities, and/or funding resources. Priorities that were not ranked high but were identified as potential mitigation strategies will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and submissions, as the HMPC deems appropriate and necessary, and as approved by the Town / Village of Harrison Board of Trustees. In keeping with the process of adopting the plan, a public involvement process to receive public comment on plan maintenance and updating will be held during the annual review period, and the final product will be adopted by Board.

Updating the Plan

The Multi-Hazard Mitigation Plan will be upgraded every 5 years (beginning 5 years after approval of the original by FEMA) and will include the adjustments based on the annual reviews by those implementing the mitigation strategies and the Hazard Mitigation Plan Committee. The HMPC will recommend to the Town/Village of Harrison Town Board how best to implement the needed changes to the plan. The HMPC will meet as deemed necessary until all updates and /or changes have been completed and incorporated into the Multi-Hazard Mitigation Plan. Upon preliminary approval of updates and/or changes to the plan by the Town / Village of Harrison Board, the plan will be resubmitted to FEMA for approval.

The formal process of updating the Town / Village's Multi-Hazard Mitigation Plan will begin 18 months prior to the five (5) year anniversary of the Plan's original approval by the Federal Emergency Management Agency. This will allow the HMPC, Lead Agencies and Supporting Agencies to thoroughly evaluate what has taken place to date, what mitigation actions have been completed, an analysis of why mitigations actions may have not been funded, what has changed with respect to natural hazards which no longer or have only begun to impacting the Town / Village, what data updates are available from the resource agencies and documents utilized in the development of the plan

(especially HAZUS-MH) and what the actual changes to the Multi-Hazard Mitigation Plan will consist of.

Upon approval of the initial Plan by the Federal Emergency Management Agency, copies will be provided to those municipal and private sector agencies outlined in Section 3: Planning Process, Step 3, Coordinate with other agencies and departments. This will allow agencies and departments which may operate and maintain infrastructure within the boundaries of the Town/Village of Harrison to become aware of the Town/Village's proposed mitigation activities so that any infrastructure improvements proposed by those agencies and departments may be coordinated and not adversely impact one another. As part of its 6 and 12 month review and reporting process, the Town/Village will notify other departments and agencies having operation and maintenance responsibilities for infrastructure within the boundaries of the Town/Village of Harrison of any proposed structural improvements to infrastructure which may impact their respective facilities.

Timeline for Plan Maintenance and Update

Table 7.1 Timeline for Plan Maintenance and Update

Date Item	Initial Plan Approval By FEMA	6 months	12 months	18 months	24 months	30 months	36 months	42 months	48 months	54 months	60 months
Initial Plan Approval By FEMA											
Status Report on Efforts to CPW/HMPC/TVB											
Annual mitigation action implementation effort review											
Posting of 6 and 12 month reports on website											
Begin 5 year plan update process											
5 year update Process on-going											
Notify other departments and agencies of proposed changes to mitigation actions and invite comments											
Inform public of update process and invite comments											
Finalize Update and Submit to NYSEMO/FEMA											

CPW -- Commissioner of Public Works

TVB -- Town/Village Board

Incorporation into Existing Planning Mechanisms

Upon approval of the Town / Village of Harrison Multi-Hazard Mitigation Plan, copies of the document will be distributed to all participating municipal departments and other interested agencies. The goal is to integrate the various program elements of the Hazard Mitigation Plan into the every day operations of the Town / Village of Harrison and other interested agencies.

Table 7-2 below identifies existing organizational functions of the Town/Village of Harrison through which the mitigation plan may be implemented

Table 7-2 Existing Functions and Programs for Mitigation Plan Implementation in the Town/Village of Harrison

Function	Action	Implementation of the Plan in the Town/Village of Harrison
Administrative	Department work plans, policies and procedures	<ul style="list-style-type: none"> Harrison Department of Public Works and Engineering Harrison Building Department Harrison Planning and Zoning Boards
Administrative	Other agency plans	<ul style="list-style-type: none"> Westchester County Emergency Management Plan Westchester County Health Department Westchester County Department of Transportation New York State Department of Transportation New York State Thruway Authority Metro-North Commuter Railroad Westchester Joint Water Works
Administrative	Jobs and job descriptions	<ul style="list-style-type: none"> Volunteer / contractual assistance for hazard mitigation plan maintenance Assistance for grant applications and administration
Budgetary	Capital and operating budgets	<ul style="list-style-type: none"> Annual review of operating and capital budget plans for inclusion of mitigation actions
Regulatory	Executive Orders, ordinances and other directives	<ul style="list-style-type: none"> Comprehensive Planning -- include hazard mitigation considerations for new construction and land use Zoning and Ordinances Building Codes Stormwater Management Plan Capital Improvement Plan -- Evaluate all new construction with respect to proximity to high hazard areas, floodplains in order to mitigate risk Continue participation in the National Flood Insurance Program Changes to any of the above plans to consider they are consistent with hazard mitigation plan

Table 7-2 Existing Functions and Programs for Mitigation Plan Implementation in the Town/Village of Harrison (Continued)

Funding	Secure traditional sources of financing	<ul style="list-style-type: none"> Consider user fees to finance projects Apply for grants from federal, state and county governments, nonprofit organizations, foundations, other private sources and Pre-Disaster Mitigation Program (PDM-DMA 2000), Flood Mitigation Assistance Program (FMA), and the Hazard Mitigation Grant Program (HMGP-Stafford Act, Section 404) Utilize Research grant opportunities through U.S. Department of Housing and Urban Development Community Development Block Grant (CDBG) Utilize other potential funding sources including: <ul style="list-style-type: none"> Stafford Act, Section 406 -- Public Assistance Program Mitigation Grants Federal Highway Administration Catalog of Federal Domestic Assistance U.S. Fire Administration -- Assistance to Firefighters U.S. Small Business Administration Pre and Post Disaster Mitigation Loans U.S. Department of Economic Development Administration Grants U.S. Army Corps of Engineers National Fish and Wildlife Federation New York State Department of Environmental Conservation Other sources as they become available
Partnerships	Develop creative partnerships, funding and incentives	<ul style="list-style-type: none"> Public-Private Partnerships State and Local Government Cooperation In-kind resources
Partnerships	Existing Committees and Councils	<ul style="list-style-type: none"> Long Island Sound Watershed Inter-municipal Council (LISWIC) Sound Shore Fire Chiefs Chamber of Commerce Neighborhood and Property Owners Associations
Partnerships	Working with other federal, state and local agencies	<ul style="list-style-type: none"> American Red Cross Federal Emergency Management Agency National Weather Service New York State Emergency Management Office

Source: Town/Village of Harrison

Continued Public Involvement

The Town/Village of Harrison is responsible for maintaining an element of public involvement in the hazard mitigation process as well as its maintenance and updating. Copies of the Town/Village of Harrison Multi-Hazard Mitigation Plan will be maintained and be made available for review at the following locations:

Town / Village Hall
Office of the Town/Village Clerk
1 Heineman Plaza
Harrison, New York 10528

Harrison Public Library (Downtown)
2 Bruce Avenue
Harrison, New York 10528

Harrison Public Library (West Harrison Branch)
2 Madison Avenue
West Harrison, New York 10604

Town / Village of Harrison website: <http://www.town.harrison.ny.us/HHMP/whatsnews.aspx>

Following the Hazard Mitigation Planning Committee's annual review effort, any document changes will be made and appended the documents at the locations listed above. A notice of the plan updates will be posted annually on the Town/Village's website.

The Commissioner of Public Works will be responsible ensuring sufficient notice to the public of the annual plan review and for receiving, tracking and filing public comments regarding the Multi-Hazard Mitigation Plan. Contact information will be provided in all documents referencing the Multi-Hazard Mitigation Plan.

The public will be notified of and given the opportunity to comment on the plan at the annual review meeting and to participate in the 5 year plan update. The Commissioner of Public Works will be responsible for the overall plan implementation and update effort including coordination among municipal, outside agency and private sector entities. The Commissioner of Public Works will ensure that sufficient opportunity exists for soliciting comments and receiving feedback, be responsible for collecting and reviewing comments and where appropriate incorporating them into the 5 year plan update. The HMPC will meet for the annual review and at other times as needed.

INSERT

MUNICIPAL

RESOLUTION

BEHIND

October 1, 2009

2009 - - 392 - - b

ADOPTION OF THE FEMA MULTI-HAZARD MITIGATION GRANT
TIME EXTENSION AND DRAFT MITIGATION PLAN

On motion of Councilman Scappaticci, seconded by Councilman Vetere,

it was

BE IT RESOLVED that;

WHEREAS, the Town /Village of Harrison, with the assistance from Dolph Rotfeld Engineering, PC, has gathered information and prepared the Town/Village of Harrison Multi-jurisdiction Hazard Mitigation Plan; and

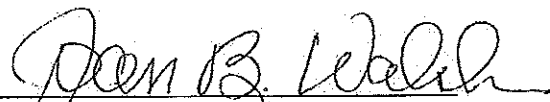
WHEREAS, the Town/Village of Harrison Multi-jurisdiction Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and


WHEREAS, the Town/Village of Harrison is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the Town/village Board of the Town/Village of Harrison has reviewed the Plan and affirms that the plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the Town/Village Board that, the Town/Village of Harrison adopts the Town/Village of Harrison Multi-jurisdiction Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan,

Adopted this 1st day of October, 2009 at the meeting of the Town/Village Board of the Town/Village of Harrison.


Mayor


Town/Village Clerk

Acronyms and Abbreviations

ARC American Red Cross
CBD Central Business District
CEMP Comprehensive Emergency Management Plan
CFR Code of Federal Regulations
CIP Capitol Improvement Program
CRS Community Rating System
DEM Digital Elevation Model
DHS Department of Homeland Security
DMA 2000 Disaster Mitigation Act of 2000
DPW Department of Public Works
DR Disaster Declarations
EM Emergency Management
EMP Emergency Management Plan
EMS Emergency Medical Services
EOC Emergency Operation Center
EOP Emergency Operation Plan
EPA U.S. Environmental Protection Agency
FAA Federal Aviation Administration
FD Fire Department
FEMA Federal Emergency Management Agency
FHMP Flood Hazard Mitigation Program
FHWA Federal Highway Administration
FIA Flood Insurance Administration
FIRM Flood Insurance Rate Map
FMAP Flood Mitigation Assistance Program
GIS Geographic Information System
HAZUS Hazards U.S.
HAZUS-MH Hazards U.S. Multi-Hazard
HAZMAT Hazardous Material
HAZNY Hazards New York
HMGP Hazard Mitigation Grant Program
HMP Hazard Mitigation Plan
ICS Incident Command System
IT Information Technology
MGD Million gallons per day
MOA Memorandum of Agreement
MRP Mean Return Period
N/A Not Applicable
NA Not Available
NCDC National Climate Data Center
NDMC National Drought Mitigation Center
NEHRP National Earthquake Hazard Reduction Program
NESEC Northeast States Emergency Consortium
NFIP National Flood Insurance Program

NFIRS National Fire Incident Reporting System
NFPA National Fire Protection Association
NID National Inventory of Dams
NIMS National Incident Management System
NLCD National Land Cover Dataset
NOAA National Oceanic and Atmospheric Administration
NPDP National Performance of Dams Program
NPL National Priorities List
NRCS Natural Resource Conservation Service
NWS National Weather Service
NY New York
NYC New York City
NYCDEP New York City Department of Environmental Protection
NYS New York State
NYSDEC New York State Department of Environmental Conservation
NYSDOH New York State Department of Health
NYSDOT New York State Department of Transportation
NYSFSMA New York State Floodplain and Stormwater Managers Association
NYSEMO New York State Emergency Management Office
NYSOFP New York State Office of Fire Prevention and Control
NYS TMC New York State Traffic Management Center
% Percent
PBS Public Broadcast System
PD Police Department
PDM Pre-Disaster Mitigation Program
PGA Peak Ground Acceleration
Pop Population
PSA Public Service Announcement
SBA Small Business Association
SDWIS Safe Drinking Water Information System
SHELDUS Spatial Hazard Events and Losses Database for United States
SLOSH Sea, Lake and Overland Surges from Hurricanes
Sq.mi. Square mile
SUNY State University of New York
TBD To Be Determined
TRI Toxic Release Inventory
USACE United States Army Corps of Engineers
USDA United States Department of Agriculture
USEPA United States Environmental Protection Agency
USDOT United States Department of Transportation
USFA United States Fire Administration
USFWS United States Fish and Wildlife Service
USGS United States Geological Survey
WCOEM Westchester County Office of Emergency Management
WWTP Wastewater Treatment Plant

Glossary of Terms

This resource defines terms that are used in or support the risk assessment document. These definitions were based on terms defined in documents utilized to prepare this document, with modifications as appropriate to address the Town / Village of Harrison specific definitions and requirements.

100-year flood – A flood that has a 1-percent chance of being equaled or exceeded in any given year. This flood event is also referred to as the base flood. The term "100-year flood" can be misleading; it is not the flood that will occur once every 100 years. Rather, it is the flood elevation that has a 1- percent chance of being equaled or exceeded each year. Therefore, the 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management to determine the need for flood insurance.

500-year flood – A flood that has a 0.2-percent chance of being equaled or exceeded in any one year.

Aggregate Data – Data gathered together across an area or region (for example, census tract or census block data).

Annualized Loss – The estimated long-term value of losses from potential future hazard occurrences of a particular type in any given single year in a specified geographic area. In other words, the average annual loss that is likely to be incurred each year based on frequency of occurrence and loss estimates. Note that the loss in any given year can be substantially higher or lower than the estimated annualized loss.

Annualized Loss Ratio – Represents the annualized loss estimate as a fraction of the replacement value of the local building inventory. This ratio is calculated using the following formula: Annualized Loss Ratio = Annualized Losses / Exposure at Risk. The annualized loss ratio gauges the relationship between average annualized loss and building value at risk. This ratio can be used as a measure of relative risk between hazards as well as across different geographic units

Areal Locations of Hazardous Atmospheres (ALOHA) – A computer program that uses information provide by the user, along with physical property data from its chemical library, to predict how a hazardous gas cloud might disperse in the atmosphere after an accidental chemical release. ALOHA can predict rates of chemical release from broken gas pipes, leaking tanks, and evaporating puddles. ALOHA can model the dispersion of both neutrally buoyant and heavier-than-air gases.

Asset – Any man-made or natural feature that has value, including but not limited to people, buildings, infrastructure (such as bridges, roads, and sewer and water systems), and lifelines (such as electricity and communication resources or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks).

At-Risk – Exposure values that include the entire building inventory value in census blocks that lie within or border the inundation areas or any area potentially exposed to a hazard based on location.

Base Flood – Flood that has a 1-percent probability of being equaled or exceeded in any given year. It is also known as the 100-year flood.

Base Flood Elevation (BFE) – Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The BFE is used as the standard for the National Flood Insurance Program.

Benefit – Net project outcomes, usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of conducting a benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including a reduction in expected property losses (building, content, and function) and protection of human life.

Benefit-cost analysis (BCA) – Benefit-cost analysis is a systematic, quantitative method of comparing the projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Building – A structure that is walled and roofed, principally aboveground and permanently fixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.

Building Codes – Regulations that set forth standards and requirements for construction, maintenance, operation, occupancy, use, or appearance of buildings, premises, and dwelling units. Building codes can include standards for structures to withstand natural disasters.

Capability Assessment – An assessment that provides a description and analysis of a community or state's current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community or state's vulnerability to hazards or specific threats.

Community Rating System (CRS) – CRS is a program that provides incentives for National Flood Insurance Program communities to complete activities that reduce flood hazard risk. When the community completes specific activities, the insurance premiums of these policyholders in communities are reduced.

Comprehensive Plan – A document, also known as a "general plan", covering the entire geographic area of a community and expressing community goals and objectives. The plan lays out the vision, policies, and strategies for the future of the community, including all of the physical elements that will determine the community's future development. This plan can discuss the community's desired physical development, desired rate and quantity of growth, community character, transportation services, location of growth, and siting of public facilities and transportation. In most states, the comprehensive plan has no authority in and of itself, but serves as a guide for community decision-making.

Critical Facility – Facilities that are critical to the health and welfare of the population and that are especially important following a hazard. Critical facilities include essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities, and hazardous material facilities. As defined for the Town/Village of Harrison risk assessment, this category includes police stations, fire and/or EMS stations, major medical care facilities and emergency communications.

Dam Failure – A partial or complete breach in a dam, which impacts its integrity. Dam failures occur for a number of reasons such as flash flooding, inadequate size of spillways, mechanical failure of valves and other equipment, rodent activities in earthen dams, freezing and thawing cycles, earthquakes, and intentional destruction.

Debris – The scattered remains of assets broken or destroyed during the occurrence of a hazard. Debris caused by a wind or water hazard event can cause additional damage to other assets.

Digital Elevation Model (DEM) – U.S. Geological Survey (USGS) Digital Elevation Model (DEM) data files that are digital representations of cartographic information in a raster form. DEMs include a sampled array of elevations for a number of ground positions at regularly spaced intervals. These digital cartographic/geographic data files are produced by USGS as part of the National Mapping Program.

Displacement Time – After a hazard occurs, the average time (in days) that a building's occupants must operate from a temporary location while repairs are made to the original building due to damages resulting from the hazard.

Disaster Mitigation Act of 2000 (DMA 2000) – Law that requires and rewards local and state predisaster planning, promotes sustainability as a strategy for disaster resistance, and is intended to integrate state and local planning with the aim of strengthening state-wide mitigation planning.

Drought – A period of time without substantial rainfall that persists from one year to the next. Droughts can affect large areas and can impact areas that range from a few counties to several states. Along with decreasing water supplies for human consumption and use, droughts can kill crops, livestock, grazing land, edible plants, and even in severe cases, trees.

Duration – The length of time a hazard occurs.

Earthquake – A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.

Erosion – Wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.

Erosion Hazard Area – Area anticipated to be lost to shoreline retreat over a given period of time. The projected inland extent of the area is measured by multiplying the average annual long-term recession rate by the number of years desired.

Essential Facility – A facility that is important to ensure a full recovery of a community or state following the occurrence of a hazard. These facilities can include: government facilities, major employers, banks, schools, and certain commercial establishments (such as grocery stores, hardware stores, and gas stations). For the Town / Village of Harrison risk assessment, this category was defined to include schools, colleges, shelters, adult living and adult care facilities, medical facilities and health clinics, hospitals.

Exposure – The number and dollar value of assets that are considered to be at risk during the occurrence of a specific hazard.

Extent – The size of an area affected by a hazard or the occurrence of a hazard.

Federal Emergency Management Agency (FEMA) – Independent agency (now part of the Department of Homeland Security) created in 1978 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery.

Fire Potential Index (FPI) – Developed by USGS and the U.S. Forest Service (USFS) to assess and map the potential for a fire hazard over broad, defined areas. Based on such geographic information, national policy makers and “on-the-ground” fire managers established priorities for prevention activities in the defined areas to reduce the risk of managed and wildfire ignition and spread. This index helps to shorten the time between fire ignition and initial attack by enabling fire managers to pre-allocate, target, and stage suppression forces to high-fire risk areas.

Flash Flood – A flood occurring with little or no warning where water levels rise at an extremely fast rate.

Flood – A general and temporary condition of partial or complete inundation of normally dry land areas resulting from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

Flood Depth – Height of the flood water surface above the ground surface.

Flood Elevation – Height of the water surface above an established datum (for example, the National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or mean sea level).

Flood Hazard Area – Area shown to be inundated by a flood of a given magnitude on a map.

Flood Information Tool (FIT) – Hazard U.S. Multi-Hazard (HAZUS-MH)- related tool designed to process and convert locally available flood information to data that can be used by the HAZUS-MH Flood Module. The FIT is a system of instructions, tutorials and geographic information system (GIS) analysis scripts. When provided with user-supplied inputs (such as ground elevations, flood elevations, and floodplain boundary information), the FIT calculates flood depth and elevation for river and coastal flood hazards.

Flood Insurance Rate Map (FIRM) – Map of a community, prepared by the FEMA that shows both the special flood hazard areas and the risk premium zones applicable to the community.

Flood Insurance Study (FIS) – A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.

Flood Mitigation Assistance (FMA) Program – A program created as a part of the National Flood Insurance Report Act of 1994. FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurance structures, with a focus on repetitive loss properties.

Floodplain – Any land area, including a watercourse, susceptible to partial or complete inundation by water from any source.

Flood Polygon – A geographic information system vector file outlining the area exposed to the flood hazard. HAZUS-MH generates this polygon at the end of the flood computations in order to analyze the inventory at risk.

Flood Zone A – An area inundated by 100 year flooding for which no Base Flood Elevations (BFE's) have been established.

Flood Zone AE - An area inundated by 100 year flooding for which BFE's have been determined.

Flood Zone AH - An area inundated by 100 year flooding (usually an area of ponding), for which BFE's have been determined; flood depths range from 1 to 3 feet.

Flood Zone A02 - An area inundated by 100 year flooding for which no BFE's have been established.

Flood Zone A07 - An area inundated by 100 year flooding for which no BFE's have been established.

Flood Zone B - An area inundated by 500 year flooding; an area inundated by 100 year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100 year flooding.

Flood Zone C - An area that is determined to be outside the 100 and 500 year floodplains.

Flood Zone X - An area that is determined to be outside the 100 and 500 year floodplains.

Frequency - A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1-percent chance of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.

Fujita Scale of Tornado Intensity - Rates tornadoes with numeric values from F0 to F5 based on tornado wind speed and damage sustained. An F0 (wind speed less than 73 mph) indicates minimal damage such as broken tree limbs or signs, while an F5 (wind speeds of 261 to 318 mpg) indicated severe damage sustained

Goals - General guidelines that explain what you want to achieve. They are usually broad policy-type statements, long term in nature, and represent global visions.

Geographic Information Systems (GIS) - A computer software application that relates data regarding physical and other features on the earth to a database to be used for mapping and analysis.

GIS Shape Files - A type of GIS vector file developed by ESRI for their ArcView software. This type of file contains a table and a graphic. The records in the table are linked to corresponding objects in the graphic.

Hailstorm - Storm associated with spherical balls of ice. Hail is a product of thunderstorms or intense showers. It is generally white and translucent, consisting of liquid or snow particles encased with layers of ice. Hail is formed within the higher reaches of a well-developed thunderstorm. When hailstones become too heavy to be caught in an updraft back into the clouds of the thunderstorm (hailstones can be caught in numerous updrafts adding a coating of ice to the original frozen droplet of rain each time), they fall as hail and a hailstorm ensues.

Hazard - A source of potential danger or an adverse condition that can cause harm to people or cause property damage. For this risk assessment, priority hazards were identified and selected for the pilot project effort. A natural hazard is a hazard that occurs naturally (such as flood, wind, and earthquake). A man-made hazard is one that is caused by humans (for example, a terrorist act or a hazardous material spill). Hazards are of concern if they have the potential to harm people or property.

Hazards of Interest – A comprehensive listing of hazards that may affect an area.

Hazards of Concern – Those hazards that have been analytically determined to pose significant risk in an area, and thus the focus of the particular mitigation plan for that area (a subset of the Hazards of Interest).

Hazard Identification – The process of identifying hazards that threaten an area.

Hazardous Material Facilities – Facilities housing industrial and hazardous materials, such as corrosives, explosives, flammable materials, radioactive materials, and toxins.

Hazard Mitigation – Sustained actions taken to reduce or eliminate the long-term risk and effects that can result from the occurrence of a specific hazard. For example, building a retaining wall can protect an area from flooding.

Hazard Mitigation Grant Program (HMGP) – Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.

Hazard Mitigation Plan – A collaborative document in which hazards affecting the community are identified, vulnerability to hazards assessed, and consensus reached on how to minimize or eliminate the effects of these hazards.

Hazard Profile – A description of the physical characteristics of a hazard, including a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

Hazard Risk Gauge – The graphic icon used during the initial planning process to convey the relative risk of a given hazard in the study area. The scale ranges from green indicating relatively low or no risk to red indicating severe risk.

Hazard Analysis New York (HAZNY) - Developed by the American Red Cross and the New York State Emergency Management Office (NYSEMO) on October 2, 2003. It is an automated interactive spreadsheet that asks specific questions on potential hazards in a community and records and evaluates the responses to these questions.

Hazards U.S. (HAZUS) – A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA. HAZUS was replaced by HAZUS-MH (see below) in 2003.

Hazards U.S. – Multi-Hazard (HAZUS-MH) – A GIS-based nationally standardized earthquake, flood, and wind loss estimation tool developed by FEMA. The purpose of this pilot project is to demonstrate and implement the use of HAZUS-MH to support risk assessments

HAZUS-MH Risk Assessment Methodology – This analysis uses the HAZUS-MH modules (earthquake, wind--hurricane and flood) to analyze potential damages and losses. For this pilot project risk assessment, the flood and hurricane hazards were evaluated using this methodology.

HAZUS-MH-Driven Risk Assessment Methodology – This analysis involves using inventory data in HAZUS-MH combined with knowledge such as (1) information about potentially exposed areas, (2) expected impacts, and (3) data regarding likelihood of occurrence for hazards. For this risk assessment, a HAZUS-Driven Risk Assessment Methodology could not be used to estimate losses associated with any hazards because of a lack of adequate data. However, the methodology was used, based on more limited data to estimate exposure for the dam failure, urban fire, fuel pipeline breach, and HazMat release hazards.

High Potential Loss Facilities – Facilities that would have a high loss associated with them, such as nuclear power plants, dams, and military installations.

Hurricane – An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles-per-hour or more and blow in a large spiral around a relatively calm center or "eye." Hurricanes develop over the North Atlantic Ocean, northeast Pacific Ocean, or the South Pacific Ocean (east of 160°E longitude). Hurricane circulation is counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Hydraulics – That branch of science, or of engineering, which addresses fluids (especially, water) in motion, its action in rivers and canals, the works and machinery for conducting or raising it, its use as a prime mover, and other fluid-related areas.

Hydrology – The science of dealing with the waters of the earth (for example, a flood discharge estimate is developed through conduct of a hydrologic study).

Infrastructure – The public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities, transportation system (such as airports, heliports; highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, dry docks, piers and regional dams).

Intensity – A measure of the effects of a hazard occurring at a particular place.

Inventory – The assets identified in a study region. It includes assets that can be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Landslide – Downward movement of a slope and materials under the force of gravity.

Level 1 Analysis – A HAZUS-MH analysis that yields a rough estimate or preliminary analysis based on the nationwide default database included in HAZUS-MH. A Level 1 analysis is a great way to begin the risk assessment process and prioritize high-risk communities without collecting or using local data.

Level 2 Analysis – A HAZUS-MH analysis that requires the input of additional or refined data and hazard maps that will produce more accurate risk and loss estimates. Assistance from local emergency management personnel, city planners, GIS professionals, and others may be necessary for this level of analysis.

Level 3 Analysis – A HAZUS-MH analysis that yields the most accurate estimate of loss and typically requires the involvement of technical experts such as structural and geotechnical engineers who can modify loss parameters based on the specific conditions of a community. This level analysis will allow users to supply their own techniques to study special conditions such as dam breaks and tsunamis. Engineering and other expertise is needed at this level.

Lifelines – Critical facilities that include utility systems (potable water, wastewater, oil, natural gas, electric power facilities and communication systems) and transportation systems (airways, bridges, roads, tunnels and waterways).

Loss Estimation – The process of assigning hazard-related damage and loss estimates to inventory, infrastructure, lifelines, and population data. HAZUS-MH can estimate the economic and social loss for specific hazard occurrences. Loss estimation is essential to decision making at all levels of government and provides a basis for developing mitigation plans and policies. It also supports planning for emergency preparedness, response, and recovery.

Lowest Floor – Under the NFIP, the lowest floor of the lowest enclosed area (including basement) of a structure. For the HAZUS-MH flood model, this information can be used to assist in assessing the damage to buildings.

Magnitude – A measure of the strength of a hazard occurrence. The magnitude (also referred to as severity) of a given hazard occurrence is usually determined using technical measures specific to the hazard. For example, ranges of wind speeds are used to categorize tornados.

Major Disaster Declarations – Post-disaster status requested by a state's governor when local and state resources are not sufficient to meet disaster needs. It is based on the damage assessment, and an agreement to commit state funds and resources to the long-term recovery. The event must be clearly more than the state or local government can handle alone.

Mean Return Period (MRP) – The average period of time, in years, between occurrences of a particular hazard (equal to the inverse of the annual frequency of exceedance).

Mitigation Actions – Specific actions that help you achieve your goals and objectives.

Mitigation Goals – General guidelines that explain what you want to achieve. They are usually broad policy-type statements, long term, and represent global visions.

Mitigation Objectives – Strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.

Mitigation Plan – A plan that documents the process used for a systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in a state or community. The plan includes a description of actions to minimize future vulnerability to hazards. This plan should be developed with local experts and significant community involvement.

National Flood Insurance Program (NFIP) – Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 Code of Federal Regulations (CFR) §60.3.

National Weather Service (NWS) – Organization that prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and state entities in preparing weather and flood warning plans.

Objectives – Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.

Occupancy Classes – Categories of buildings used by HAZUS-MH (for example, commercial, residential, industrial, government, and “other”).

Ordinance – A term for a law or regulation adopted by local government.

Outflow – Associated with coastal hazards and follows water inundation creating strong currents that rip at structures and pound them with debris, and erode beaches and coastal structures.

Parametric Model – A model relating to or including the evaluation of parameters. For example, HAZUS-MH uses parametric models that address different parameters for hazards such as earthquake, flood and wind (hurricane). For example, parameters considered for the earthquake hazard include soil type, peak ground acceleration, building construction type and other parameters.

Pilot Project – In this case, a project sponsored by FEMA to support the implementation of studies conducted in coordination with communities. The project focuses on demonstrating the value and benefits of using HAZUS-MH for the risk assessment portion of all-hazard mitigation plans required by the Disaster Mitigation Act of 2000. The projects demonstrate the value of using HAZUS-MH to evaluate, and analyze natural hazards that a number of state and local communities might address in their planning process. The pilot projects demonstrate that HAZUS-MH can provide defensible cost and loss estimates using the engineering and scientific risk calculations included in the software.

Planimetric – Maps that indicate only man-made features like buildings.

Planning – The act or process of making or carrying out plans; the establishment of goals, policies and procedures for a social or economic unit.

Post-disaster mitigation – Mitigation actions taken after a disaster has occurred, usually during recovery and reconstruction.

Presidential Disaster Declaration – A post-disaster status that puts into motion long-term federal recovery programs, some of which are matched by state programs, and designed to help disaster victims, businesses, and public entities in the areas of human services, public assistance (infrastructure support), and hazard mitigation. If declared, funding comes from the President’s Disaster Relief Fund and disaster aid programs of other participating federal agencies.

Preparedness – Actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Priority Hazards – Hazards considered most likely to impact a community based on frequency, severity, or other factors such as public perception. These are identified using available data and local knowledge.

Provided Data – The databases included in the HAZUS-MH software that allow users to run a preliminary analysis without collecting or using local data.

Probability – A statistical measure of the likelihood that a hazard event will occur.

Public education and outreach programs – Any campaign to make the public more aware of hazard mitigation and mitigation programs, including hazard information centers, mailings, public meetings, etc.

Q3 Flood Zone Data – FEMA flood data that delineate the 100- and 500-year flood boundaries. The Q3 Flood Data are digital representations of certain features of FEMA's Flood Insurance Rate Map (FIRM) product, intended for use with desktop mapping and GIS technology.

Recovery – The actions taken by an individual or community after a catastrophic event to restore order and lifelines in the community.

Regulation – Most states have granted local jurisdictions broad regulatory powers to enable the enactment and enforcement of ordinances that deal with public health, safety, and welfare. These include building codes, building inspections, zoning, floodplain and subdivision ordinances, and growth management initiatives.

Recurrence Interval – The average time between the occurrences of hazardous events of similar size in a given location. This interval is based on the probability that the given event will be equaled or exceeded in any given year.

Repetitive Loss Property – A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least \$1,000 each have been paid within any 10-year period since 1978.

Replacement Value – The cost of rebuilding a structure. This cost is usually expressed in terms of cost per square foot and reflects the present-day cost of labor and materials to construct a building of a particular size, type and quality.

Resolutions – Expressions of a governing body's opinion, will, or intention that can be executive or administrative in nature. Most planning documents must undergo a council resolution, which must be supported in an official vote by a majority of representatives to be adopted. Other methods of making a statement or announcement about a particular issue or topic include proclamations or declarations.

Resources – Resources include the people, materials, technologies, money, etc., required to implement strategies or processes. The costs of these resources are often included in a budget.

Risk – The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard occurring and resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment – A methodology used to assess potential exposure and estimated losses associated with priority hazards. The risk assessment process includes four steps: (1) identifying hazards, (2) profiling hazards, (3) conducting an inventory of assets, and (4) estimating losses. This pilot project report documents this process for selected hazards addressed as part of the pilot project.

Risk Factors – Characteristics of a hazard that contribute to the severity of potential losses in the study area.

Riverine – Of or produced by a river (for example, a riverine flood is one that is caused by a river overflowing its banks).

Scale – A proportion used in determining a dimensional relationship; the ratio of the distance between two points on a map and the actual distance between the two points on the earth's surface.

Scour – Removal of soil or fill material by the flow of floodwaters. This term is frequently used to describe storm-induced, localized, conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.

Special Facility – A facility of special importance to a particular community. For the Village of Briarcliff Manor risk assessment, this category includes [TBD].

Special Flood Hazard Area (SFHA) – An area within a floodplain having a 1-percent or greater chance of flood occurrence in any given year (that is, the 100-year or base flood zone); represented on FIRMS as darkly shaded areas with zone designations that include the letter "A" or "V."

Stafford Act – The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law (PL) 100-107 was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.

Stakeholder – Stakeholders are individuals or groups, including businesses, private organizations, and citizens, that will be affected in any way by an action or policy.

State Hazard Mitigation Officer (SHMO) – The representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.

Structure – Something constructed (for example, a residential or commercial building).

Study Area – The geographic unit for which data are collected and analyzed. A study area can be any combination of states, counties, cities, census tracts, or census blocks. The study area definition depends on the purpose of the loss study and in many cases will follow political boundaries or jurisdictions such as city limits.

Substantial Damage – Damage of any origin sustained by a structure in a SFHA, for which the cost of restoring the structure to its pre-hazard event condition would equal or exceed 50 percent of its pre-hazard event market value.

Topographic – Map that shows natural features and indicate the physical shape of the land using contour lines based on land elevation. These maps also can include man-made features (such as buildings and roads).

Tornado – A violently rotating column of air extending from a thunderstorm to the ground.

Transportation Systems – One of the lifeline system categories. This category includes: airways (airports, heliports, highways), bridges, tunnels, roadbeds, overpasses, transfer centers; railways (tracks, tunnels, bridges, rail yards, depots), and waterways (canals, locks, seaports, ferries, harbors, dry docks, piers).

Utility Systems – One of the lifeline systems categories. This category includes potable water, wastewater, oil, natural gas, electric power facilities and communication systems.

Vulnerability – Description of how exposed or susceptible an asset is to damage. This value depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. If an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect affects can be much more widespread and damaging than direct affects.

Vulnerability Assessment – Evaluation of the extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard occurrences on the existing and future built environment.

Watershed – Area of land that drains down gradient (from areas of higher land to areas of lower land) to the lowest point; a common drainage basin. The water moves through a network of drainage pathways, both underground and on the surface. Generally, these pathways converge into streams and rivers, which become progressively larger as the water moves downstream, eventually reaching an estuary, lake, or ocean.

Wildfire – An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

Windstorm – A storm characterized by high wind velocities.

Zone – A geographical area shown on a National FIRM that reflects the severity or type of flooding in the area.

Zoning Ordinance – Designation of allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

Total Questionnaires Returned 135
Summary of Responses

Note: Not all questions were answered by each respondent; therefore the percentage presented has been calculated based on the number of respondents that answered the specific question and not the overall number of questionnaires received.

Natural Hazard Information

1. In the past 5 years, have you or someone in your household / business experienced a natural disaster such as a flood, earthquake, winter storm, severe windstorm, wildfire, or other type of natural disaster ?

65 % Yes
35% No

- 1.1 If yes to question 1, which of the following types of natural hazard events have you or someone in your household experienced ? (Respondent could choose as many hazards as they felt applied).

Hazard	% of total responses
Drought	0
Dust Storm	0
Earthquake	0
Flood	54
Landslide	10
Wildfire	0
Household Fire	0
Wind Storm	19
Winter Storm	23
Other	4

2. How concerned are you personally about the following disasters affecting the Town/Village of Harrison ? (Number of Respondents to Question)

Natural Disasters	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Drought	3	6	10	28	64
Dust Storm	3	1	4	7	96
Earthquake	4	2	8	23	72
Flood	47	25	22	16	17
Landslide	7	5	17	19	62
Wildfire	3	5	18	28	55
Household Fire	12	20	36	33	15
Wind Storm	18	31	30	23	17
Winter Storm	21	34	31	23	8
Other	0	1	0	0	0

3. Have you ever received information about how to make your family / home / business safer from natural disasters ?

39% Yes
61% No

- 3.1. If Yes, how recently ?

20% Within Last 6 months
27% Between 6 and 12 months
29% Between 1 and 2 years
18% Between 2 and 5 years
6% 5 years or more

- 3.2 From whom did you last receive information about how to make your family / home / business safer from natural disasters ? (Respondents could choose only one)

8% News Media
10% Town / Village of Harrison
23% Insurance Agent or Company
10% Utility Company
12% County Department of Emergency Management
10% American Red Cross
3% Other non-profit organization
12% FEMA
4% Other
8% Not Sure

4. Who would you most trust to provide you with information about how to make your family / home / business safer from natural disasters ? (Respondents could choose as many as they felt applied)

13% News Media
44% Town / Village of Harrison
30% Insurance Agent or Company
33% Utility Company
47% County Department of Emergency Management
28% American Red Cross
8% Other non-profit organization
31% FEMA
8% Other
9% Not Sure

- 5 What is the most effective way for you to receive information about how to make your family / home / business safer from natural disasters ? (Respondents could choose as many as they felt applied)

41%	Newspaper stories
10%	Newspaper Ads
38%	Television News
10%	Television Ads
24%	Radio News
21%	Schools
4%	Outdoor Advertisement (billboards)
6%	Books
51%	Mail
15%	Fire Department / Rescue
58%	Internet
48%	Fact Sheet / Brochure
6%	Radio Ads
4%	Chamber of Commerce
16%	Public Workshop / Meeting
3%	Magazine
5%	Academic Institutions
7%	Other

6. To assist in communicating information about how to better prepare for a natural disaster, which of the following phrases do you thin is the easiest to understand ? (Respondents could choose only one)

30%	Natural disaster readiness
19%	Disaster preparedness
45%	Emergency preparedness
3%	Natural hazard risk reduction
3%	Other

Preparedness Activities in your household

7. In the following list, please check those activities that you have done in your household, plan to do in the near future, have not done, or are unable to do. (Respondents could choose only one)

In your household, have you or someone in your household: (% of respondents by category)

Preparedness Activity	Have Done	Plan to Do	Not Done	Unable to Do
Attended meetings or received written information on natural disasters or emergency preparedness ?	37%	7%	55%	1%
Talked with members in your household about what to do in case of a natural disaster or emergency ?	43%	22%	33%	2%
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a household emergency ?	33%	28%	38%	1%
Prepared a "Disaster Supply Kit" (Stored extra food, water, batteries, or other emergency supplies) ?	31%	25%	44%	0%
In the last year, has anyone in your household trained in first aid, or CPR ?	35%	6%	58%	1%

8. Building a disaster supply kit, receiving first aid training and developing a family / household or business emergency plan are inexpensive activities that require a personal time commitment. How much time (per year) are you willing to spend on preparing yourself / household / business for a natural disaster or emergency event ? (Respondents could choose only one)

10% 0 –1 hour
6% 2 – 3 hours
45% 4 – 7 hours
20% 8 – 15 hours
13% 16 + hours
6% Other

9. What steps, if any, have you or someone in your household taken to prepare for a natural disaster ? (Respondents could choose as many as they felt applied)

41% Food
48% Water
80% Flashlight(s)
71% Batteries
52% Battery Powered Radio
46% Medical Supplies (First Aid Kit)
66% Fire Extinguisher
83% Smoke Detector on each level of the house
16% Prepared a Disaster Supply Kit
39% Received First Aid / CPR Training
32% Made a Fire Escape Plan
22% Developed a Reconnection Plan. Where to go and Who to Call
16% Discussed utility cutoffs
5% Other

10. Does your household or business have insurance coverage for floods ?

35% Yes

65% No

10.1 If "No", what is the main reason your household does not have insurance for flood events ?

55% Not located in floodplain

11% Too expensive

11% Not necessary

6% Never considered it

1% Deductibles to high / not worth it

8% Not familiar with it / don't know about it

8% Other

11. Does your household or business have insurance coverage for natural disasters / storm related events ?

15% Not Available

3% Too expensive

7% Not necessary

8% Never considered it

3% Deductibles to high / not worth it

27% Not familiar with it / don't know about it

37% Other

Natural Hazard Risk Reduction

12. Did you consider the possible occurrence of a natural disaster when you bought / moved into your current home or business ?

27% Yes

72% No

13. Would you be willing to spend more money on a home or business that had features that made it more disaster resistant ?

74% Yes

26% No

14. How much more money are you willing to spend to better protect your family and home or business from natural disasters ? (Respondents could choose only one)

22%	\$5,000 and above
5%	\$2,500 - \$4,900
13%	\$1,000 - \$2,499
7%	\$500 - \$999
9%	\$100 - \$499
2%	Less than \$100
5%	Nothing
27%	Don't know
10%	Other

15. What non-structural and non-structural modifications for earthquakes have you made to your home or business ?

Non-Structural

8%	Anchor bookcases, cabinets to walls
0%	Secure water heater to wall
2%	Install latches on drawers / cabinets
10%	Fit gas appliances with flexible connections
0 %	Other

Structural

8%	Secure home to foundation
2%	Brace inside of cripple wall with sheathing
3%	Brace un-reinforced chimney
0%	Brace un-reinforced masonry and concrete walls and foundation
8%	Other

16. Which of the following incentives, if any, would motivate you to take additional steps to better protect your family / home / business from a natural disaster ? (Respondents could choose as many as they felt applied)

71%	Insurance discount
16%	Low interest rate loan
12%	Lower new home construction costs
33%	Mortgage discount
79%	Tax break or incentive
6%	None
1%	Other

General Household Information

17. 3% between 18 and 30 years of age
 7% between 31 and 40 years of age
 32% between 41 and 50 years of age
 31% between 51 and 60 years of age
 17% between 61 and 64 years of age
 10% over 65 years of age
18. Gender:
- 60% Male
 40% Female
19. Please indicate your level of education
- 0% Grade School / No Education
 1% Some high school
 06% High school graduate / GED
 14% Some college / trade school
 35% College degree
 42% Postgraduate degree
 02% Other
20. Zip Code
- 51% 10528
 12% 10580
 18% 10604
 19% 10577
 01% 10607

21. Community

28%	Downtown
25%	Purchase
15%	West Harrison / Silver Lake / Park Lane
7%	Harrison Central Business District
25%	Southern Harrison

22. How long have you lived / owned a business in the Town / Village of Harrison ?

0%	Less than 1 year
14%	1-5 years
13%	5-9 years
28%	10-19 years
45%	20 years or more

23. If you have lived / owned a business in Harrison less than 20 years, in what state did you live before you moved to Harrison ?

75%	New York
25%	Other

24. Do you have access to the Internet or World Wide Web ?

98%	Yes
2%	No

25. Do you own or rent your home or business ?

4%	Rent
96%	Own

26. Do you own / rent a:

82%	single family home
10%	Duplex
0%	Apartment (3-4 units in structure)
3%	Apartment (5 or more units in structure)
1%	Condominium / Town House
0%	Manufactured Home
2%	Single Unit Business
1%	Building with more than 1 business
1%	Other

Comments: Number _____

Sampling of Comments:

- Its great that you're doing this, the more information you provide, the more we will do and I suspect others will too as they become aware of potential problems and preventative steps to take to safeguard ourselves and our homes.
-

Title 44: Emergency Management and Assistance

PART 201—MITIGATION PLANNING

Section Contents

§ 201.1 Purpose.

§ 201.2 Definitions.

§ 201.3 Responsibilities.

§ 201.4 Standard State Mitigation Plans.

§ 201.5 Enhanced State Mitigation Plans.

§ 201.6 Local Mitigation Plans.

§ 201.7 Tribal Mitigation Plans.

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 through 5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; Homeland Security Act of 2002, 6 U.S.C. 101; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; E.O. 13286, 68 FR 10619, 3 CFR, 2003 Comp., p. 166.

Source: 67 FR 8848, Feb. 26, 2002, unless otherwise noted.

§ 201.1 Purpose.

(a) The purpose of this part is to provide information on the policies and procedures for mitigation planning as required by the provisions of section 322 of the Stafford Act, 42 U.S.C. 5165.

(b) The purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

§ 201.2 Definitions.

Administrator means the head of the Federal Emergency Management Agency, or his/her designated representative, appointed under section 503 of the Post-Katrina Emergency Management Reform Act of 2006 (Pub. L. 109-295). The term also refers to the Director as discussed in part 2 of this chapter.

Flood Mitigation Assistance (FMA) means the program authorized by section 1366 of the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4104c, and implemented at parts 78 and 79.

Grantee means the government to which a grant is awarded, which is accountable for the use of the funds provided. The grantee is the entire legal entity even if only a particular component of the entity is designated in the grant award document. Generally, the State is the grantee. However, after a declaration, an Indian tribal government may choose to be a grantee, or may act as a subgrantee under the State. An Indian tribal government acting as grantee will assume the responsibilities of a "state", as described in this part, for the purposes of administering the grant.

Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Hazard Mitigation Grant Program (HMGP) means the program authorized under section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5170c, and implemented at part 206, subpart N of this chapter.

Indian tribal government means any Federally recognized governing body of an Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Local government is any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Managing State means a State to which FEMA has delegated the authority to administer and manage the HMGP under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c). FEMA may also delegate authority to tribal governments to administer and manage the HMGP as a Managing State.

Pre-Disaster Mitigation Program (PDM) means the program authorized under section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5133.

Regional Director is a director of a regional office of FEMA, or his/her designated representative.

Repetitive Flood Claims (RFC) program means the program authorized under section 1323 of the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4011, which provides funding to reduce flood damages to individual properties for which 1 or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Program (NFIP) in the shortest period of time.

Severe Repetitive Loss (SRL) program means the program authorized under section 1361(a) of the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4102a, and implemented at part 79 of this chapter.

Severe Repetitive Loss properties are defined as single or multifamily residential properties that are covered under an NFIP flood insurance policy and:

- (1) That have incurred flood-related damage for which 4 or more separate claims payments have been made, with the amount of each claim (including building and contents payments) exceeding \$5,000, and with the cumulative amount of such claims payments exceeding \$20,000; or
- (2) For which at least 2 separate claims payments (building payments only) have been made under such coverage, with cumulative amount of such claims exceeding the market value of the property.
- (3) In both instances, at least 2 of the claims must be within 10 years of each other, and claims made within 10 days of each other will be counted as 1 claim.

Small and impoverished communities means a community of 3,000 or fewer individuals that is identified by the State as a rural community, and is not a remote area within the corporate boundaries of a larger city; is economically disadvantaged, by having an average per capita annual income of residents not exceeding 80 percent of national, per capita income, based on best available data; the local unemployment rate exceeds by one percentage point or more, the most recently reported, average yearly national unemployment rate; and any other factors identified in the State Plan in which the community is located.

The Stafford Act refers to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended (42 U.S.C. 5121-5206).

State is any State of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

State Hazard Mitigation Officer is the official representative of State government who is the primary point of contact with FEMA, other Federal agencies, and local governments in mitigation planning and implementation of mitigation programs and activities required under the Stafford Act.

Subgrantee means the government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided. Subgrantees can be a State agency, local government, private non-profit organizations, or Indian tribal government. Indian tribal governments acting as a subgrantee are accountable to the State grantee.

[67 FR 8848, Feb. 26, 2002, as amended at 72 FR 61747, Oct. 31, 2007]

§ 201.3 Responsibilities.

(a) *General*. This section identifies the key responsibilities of FEMA, States, and local/tribal governments in carrying out section 322 of the Stafford Act, 42 U.S.C. 5165.

(b) *FEMA*. The key responsibilities of the Regional Director are to:

- (1) Oversee all FEMA related pre- and post-disaster hazard mitigation programs and activities;

-
- (2) Provide technical assistance and training to State, local, and Indian tribal governments regarding the mitigation planning process;
- (3) Review and approve all Standard and Enhanced State Mitigation Plans;
- (4) Review and approve all local mitigation plans, unless that authority has been delegated to the State in accordance with §201.6(d);
- (5) Conduct reviews, at least once every three years, of State mitigation activities, plans, and programs to ensure that mitigation commitments are fulfilled, and when necessary, take action, including recovery of funds or denial of future funds, if mitigation commitments are not fulfilled.
- (c) *State*. The key responsibilities of the State are to coordinate all State and local activities relating to hazard evaluation and mitigation and to:
- (1) Prepare and submit to FEMA a Standard State Mitigation Plan following the criteria established in §201.4 as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. In addition, a State may choose to address severe repetitive loss properties in their plan as identified in §201.4(c)(3)(v) to receive the reduced cost share for the Flood Mitigation Assistance (FMA) and Severe Repetitive Loss (SRL) programs, pursuant to §79.4(c)(2) of this chapter.
- (2) In order to be considered for the 20 percent HMGP funding, prepare and submit an Enhanced State Mitigation Plan in accordance with §201.5, which must be reviewed and updated, if necessary, every three years from the date of the approval of the previous plan.
- (3) At a minimum, review and update the Standard State Mitigation Plan every 3 years from the date of the approval of the previous plan in order to continue program eligibility.
- (4) Make available the use of up to the 7 percent of HMGP funding for planning in accordance with §206.434.
- (5) Provide technical assistance and training to local governments to assist them in applying for HMGP planning grants, and in developing local mitigation plans.
- (6) For Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c), review and approve local mitigation plans in accordance with §201.6(d).
- (7) If necessary, submit a request from the Governor to the Director of FEMA, requesting an extension to the plan deadline in accordance with §201.4(a)(2).
- (d) *Local governments*. The key responsibilities of local governments are to:
- (1) Prepare and adopt a jurisdiction-wide natural hazard mitigation plan as a condition of receiving project grant funds under the HMGP, in accordance with §201.6.
- (2) At a minimum, review and update the local mitigation plan every 5 years from date of plan approval of the previous plan in order to continue program eligibility.
- (e) *Indian tribal governments*. The key responsibilities of the Indian tribal government are to coordinate all tribal activities relating to hazard evaluation and mitigation and to:
- (1) Prepare and submit to FEMA a Tribal Mitigation Plan following the criteria established in §201.7 as a condition of receiving non-emergency Stafford Act assistance as a grantee. This plan will also allow Indian tribal governments to apply through the State, as a subgrantee, for any FEMA mitigation project grant. Indian tribal governments with a plan approved by FEMA on or before October 1, 2008 under §201.4 or §201.6 will also meet this planning requirement. All Tribal Mitigation Plans approved after that date must follow the criteria identified in §201.7. In addition, an Indian tribal government may choose to address severe repetitive loss properties as identified in §201.4(c)(3)(v) as a condition of receiving the reduced cost share for the FMA and SRL programs, pursuant to §79.4(c)(2) of this chapter.
- (2) Review and update the Tribal Mitigation Plan at least every 5 years from the date of approval of the previous plan in order to continue program eligibility.
- (3) In order to be considered for the increased HMGP funding, the Tribal Mitigation Plan must meet the Enhanced State Mitigation Plan criteria identified in §201.5. The plan must be reviewed and updated at least every 3 years from the date of approval of the previous plan.
- [67 FR 8848, Feb. 26, 2002, as amended at 67 FR 61515, Oct. 1, 2002; 69 FR 55096, Sept. 13, 2004; 72 FR 61748, Oct. 31, 2007]

§ 201.4 Standard State Mitigation Plans.

(a) *Plan requirement.* States must have an approved Standard State Mitigation Plans meeting the requirements of this section as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. Emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. Mitigation planning grants provided through the Pre-disaster Mitigation (PDM) program, authorized under section 203 of the Stafford Act, 42 U.S.C. 5133, will also continue to be available. The mitigation plan is the demonstration of the State's commitment to reduce risks from natural hazards and serves as a guide for State decision makers as they commit resources to reducing the effects of natural hazards.

(b) *Planning process.* An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other State agencies, appropriate Federal agencies, interested groups, and be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives.

(c) *Plan content.* To be effective the plan must include the following elements:

(1) Description of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated.

(2) *Risk assessments* that provide the factual basis for activities proposed in the strategy portion of the mitigation plan. Statewide risk assessments must characterize and analyze natural hazards and risks to provide a statewide overview. This overview will allow the State to compare potential losses throughout the State and to determine their priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk and vulnerability assessments. The risk assessment shall include the following:

(i) An overview of the type and location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate;

(ii) An overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State shall describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned or operated critical facilities located in the identified hazard areas shall also be addressed;

(iii) An overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment. The State shall estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.

(3) A *Mitigation Strategy* that provides the State's blueprint for reducing the losses identified in the risk assessment. This section shall include:

(i) A description of State goals to guide the selection of activities to mitigate and reduce potential losses.

(ii) A discussion of the State's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; a discussion of State funding capabilities for hazard mitigation projects; and a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

(iii) An identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section should be linked to local plans, where specific local actions and projects are identified.

(iv) Identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.

(v) A State may request the reduced cost share authorized under §79.4(c)(2) of this chapter for the FMA and SRL programs, if it has an approved State Mitigation Plan meeting the requirements of this section that also identifies specific actions the State has taken to reduce the number of repetitive loss properties (which must include severe

repetitive loss properties), and specifies how the State intends to reduce the number of such repetitive loss properties. In addition, the plan must describe the strategy the State has to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local mitigation plans.

(4) A section on the *Coordination of Local Mitigation Planning* that includes the following:

- (i) A description of the State process to support, through funding and technical assistance, the development of local mitigation plans.
- (ii) A description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.
- (iii) Criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures. Further, that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.

(5) A *Plan Maintenance Process* that includes:

- (i) An established method and schedule for monitoring, evaluating, and updating the plan.
- (ii) A system for monitoring implementation of mitigation measures and project closeouts.
- (iii) A system for reviewing progress on achieving goals as well as activities and projects identified in the Mitigation Strategy.

(6) A *Plan Adoption Process*. The plan must be formally adopted by the State prior to submittal to us for final review and approval.

(7) *Assurances*. The plan must include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c) of this chapter. The State will amend its plan whenever necessary to reflect changes in State or Federal statutes and regulations as required in 44 CFR 13.11(d) of this chapter.

(d) *Review and updates*. Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities and resubmitted for approval to the appropriate Regional Director every three years. The Regional review will be completed within 45 days after receipt from the State, whenever possible. We also encourage a State to review its plan in the post-disaster timeframe to reflect changing priorities, but it is not required.

[67 FR 8848, Feb. 26, 2002, as amended at 67 FR 61515, Oct. 1, 2002; 69 FR 55096, Sept. 13, 2004; 72 FR 61565, 61738, Oct. 31, 2007]

§ 201.5 Enhanced State Mitigation Plans.

(a) A State with a FEMA approved Enhanced State Mitigation Plan at the time of a disaster declaration is eligible to receive increased funds under the HMGP, based on twenty percent of the total estimated eligible Stafford Act disaster assistance. The Enhanced State Mitigation Plan must demonstrate that a State has developed a comprehensive mitigation program, that the State effectively uses available mitigation funding, and that it is capable of managing the increased funding. In order for the State to be eligible for the 20 percent HMGP funding, FEMA must have approved the plan within three years prior to the disaster declaration.

(b) Enhanced State Mitigation Plans must include all elements of the Standard State Mitigation Plan identified in §201.4, as well as document the following:

- (1) Demonstration that the plan is integrated to the extent practicable with other State and/or regional planning initiatives (comprehensive, growth management, economic development, capital improvement, land development, and/or emergency management plans) and FEMA mitigation programs and initiatives that provide guidance to State and regional agencies.
- (2) Documentation of the State's project implementation capability, identifying and demonstrating the ability to implement the plan, including:
 - (i) Established eligibility criteria for multi-hazard mitigation measures.

- (ii) A system to determine the cost effectiveness of mitigation measures, consistent with OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, and to rank the measures according to the State's eligibility criteria.
- (iii) Demonstration that the State has the capability to effectively manage the HMGP as well as other mitigation grant programs, including a record of the following:
 - (A) Meeting HMGP and other mitigation grant application timeframes and submitting complete, technically feasible, and eligible project applications with appropriate supporting documentation;
 - (B) Preparing and submitting accurate environmental reviews and benefit-cost analyses;
 - (C) Submitting complete and accurate quarterly progress and financial reports on time; and
 - (D) Completing HMGP and other mitigation grant projects within established performance periods, including financial reconciliation.
- (iv) A system and strategy by which the State will conduct an assessment of the completed mitigation actions and include a record of the effectiveness (actual cost avoidance) of each mitigation action.
- (3) Demonstration that the State effectively uses existing mitigation programs to achieve its mitigation goals.
- (4) Demonstration that the State is committed to a comprehensive state mitigation program, which might include any of the following:
 - (i) A commitment to support local mitigation planning by providing workshops and training, State planning grants, or coordinated capability development of local officials, including Emergency Management and Floodplain Management certifications.
 - (ii) A statewide program of hazard mitigation through the development of legislative initiatives, mitigation councils, formation of public/private partnerships, and/or other executive actions that promote hazard mitigation.
 - (iii) The State provides a portion of the non-Federal match for HMGP and/or other mitigation projects.
 - (iv) To the extent allowed by State law, the State requires or encourages local governments to use a current version of a nationally applicable model building code or standard that addresses natural hazards as a basis for design and construction of State sponsored mitigation projects.
 - (v) A comprehensive, multi-year plan to mitigate the risks posed to existing buildings that have been identified as necessary for post-disaster response and recovery operations.
 - (vi) A comprehensive description of how the State integrates mitigation into its post-disaster recovery operations.
- (c) *Review and updates.* (1) A State must review and revise its plan to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities, and resubmit it for approval to the appropriate Regional Director every three years. The Regional review will be completed within 45 days after receipt from the State, whenever possible.
- (2) In order for a State to be eligible for the 20 percent HMGP funding, the Enhanced State Mitigation plan must be approved by FEMA within the three years prior to the current major disaster declaration.

§ 201.6 Local Mitigation Plans.

The local mitigation plan is the representation of the jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Local plans will also serve as the basis for the State to provide technical assistance and to prioritize project funding.

- (a) *Plan requirements.* (1) A local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. The Administrator may, at his discretion, require a local mitigation plan for the Repetitive Flood Claims Program. A local government must have a mitigation plan approved pursuant to this section in order to apply for and receive mitigation project grants under all other mitigation grant programs.
- (2) Plans prepared for the FMA program, described at part 79 of this chapter, need only address these requirements as they relate to flood hazards in order to be eligible for FMA project grants. However, these plans must be clearly identified as being flood mitigation plans, and they will not meet the eligibility criteria for other mitigation grant programs, unless flooding is the only natural hazard the jurisdiction faces.
- (3) Regional Directors may grant an exception to the plan requirement in extraordinary circumstances, such as in a small and impoverished community, when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project grant. If a plan is not provided within this timeframe, the project

grant will be terminated, and any costs incurred after notice of grant's termination will not be reimbursed by FEMA.

(4) Multi-jurisdictional plans (e.g. watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan. State-wide plans will not be accepted as multi-jurisdictional plans.

(b) *Planning process.* An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
- (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

(c) *Plan content.* The plan shall include the following:

- (1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.
- (2) A *risk assessment* that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:

- (i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
- (ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

- (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;
 - (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate;
 - (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.
- (iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

(3) A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:

- (i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
- (ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.
- (iii) An action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

(4) A *plan maintenance process* that includes:

- (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

- (ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.
 - (iii) Discussion on how the community will continue public participation in the plan maintenance process.
 - (5) *Documentation* that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.
 - (d) *Plan review.* (1) Plans must be submitted to the State Hazard Mitigation Officer (SHMO) for initial review and coordination. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval. Where the State point of contact for the FMA program is different from the SHMO, the SHMO will be responsible for coordinating the local plan reviews between the FMA point of contact and FEMA.
 - (2) The Regional review will be completed within 45 days after receipt from the State, whenever possible.
 - (3) A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.
 - (4) Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c) will be delegated approval authority for local mitigation plans, and the review will be based on the criteria in this part. Managing States will review the plans within 45 days of receipt of the plans, whenever possible, and provide a copy of the approved plans to the Regional Office.
- [67 FR 8848, Feb. 26, 2002, as amended at 67 FR 61515, Oct. 1, 2002; 68 FR 61370, Oct. 28, 2003; 69 FR 55096, Sept. 13, 2004; 72 FR 61748, Oct. 31, 2007]

§ 201.7 Tribal Mitigation Plans.

The Indian Tribal Mitigation Plan is the representation of the Indian tribal government's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards.

- (a) *Plan requirement.* (1) Indian tribal governments applying to FEMA as a grantee must have an approved Tribal Mitigation Plan meeting the requirements of this section as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. Emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. Mitigation planning grants provided through the PDM program, authorized under section 203 of the Stafford Act, 42 U.S.C. 5133, will also continue to be available.
- (2) An Indian tribal government may choose to address severe repetitive loss properties in their plan, as identified in §201.4(c)(3)(v), to receive the reduced cost share for the FMA and SRL programs.
- (3) Indian tribal governments applying through the State as a subgrantee must have an approved Tribal Mitigation Plan meeting the requirements of this section in order to receive HMGP project grants. The Administrator, at his discretion may require a local mitigation plan for the Repetitive Flood Claims Program. A tribe must have an approved Tribal Mitigation Plan in order to apply for and receive FEMA mitigation project grants, under all other mitigation grant programs.
- (4) Multi-jurisdictional plans (e.g. county-wide or watershed plans) may be accepted, as appropriate, as long as the Indian tribal government has participated in the process and has officially adopted the plan. Indian tribal governments must address all the elements identified in this section to ensure eligibility as a grantee or as a subgrantee.
- (b) An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other tribal agencies, appropriate Federal agencies, adjacent jurisdictions, interested groups, and be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA mitigation programs and initiatives.
- (c) *Plan content.* The plan shall include the following:
 - (1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. This shall include:
 - (i) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval, including a description of how the Indian tribal government defined "public;"

- (ii) As appropriate, an opportunity for neighboring communities, tribal and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process;
 - (iii) Review and incorporation, if appropriate, of existing plans, studies, and reports; and
 - (iv) Be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives.
- (2) A *risk assessment* that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Tribal risk assessments must provide sufficient information to enable the Indian tribal government to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:
- (i) A description of the type, location, and extent of all natural hazards that can affect the tribal planning area. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
 - (ii) A description of the Indian tribal government's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the tribe. The plan should describe vulnerability in terms of:
 - (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;
 - (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate;
 - (C) A general description of land uses and development trends within the tribal planning area so that mitigation options can be considered in future land use decisions; and
 - (D) Cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.
- (3) A *mitigation strategy* that provides the Indian tribal government's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:
- (i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
 - (ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
 - (iii) An action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the Indian tribal government.
 - (iv) A discussion of the Indian tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: An evaluation of tribal laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; and a discussion of tribal funding capabilities for hazard mitigation projects.
 - (v) Identification of current and potential sources of Federal, tribal, or private funding to implement mitigation activities.
 - (vi) An Indian tribal government may request the reduced cost share authorized under §79.4(c)(2) of this chapter of the FMA and SRL programs if they have an approved Tribal Mitigation Plan meeting the requirements of this section that also identify actions the Indian tribal government has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the Indian tribal government intends to reduce the number of such repetitive loss properties.
- (4) A *plan maintenance process* that includes:
- (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan.
 - (ii) A system for monitoring implementation of mitigation measures and project closeouts.
 - (iii) A process by which the Indian tribal government incorporates the requirements of the mitigation plan into other planning mechanisms such as reservation master plans or capital improvement plans, when appropriate.
 - (iv) Discussion on how the Indian tribal government will continue public participation in the plan maintenance process.

(v) A system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy.

(5) *Plan Adoption Process.* The plan must be formally adopted by the governing body of the Indian tribal government prior to submittal to FEMA for final review and approval.

(6) *Assurances.* The plan must include assurances that the Indian tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with §13.11(c) of this chapter. The Indian tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in §13.11(d) of this chapter.

(d) *Plan review and updates.* (1) Plans must be submitted to the appropriate FEMA Regional Office for formal review and approval. Indian tribal governments who would like the option of being a subgrantee under the State must also submit their plan to the State Hazard Mitigation Officer for review and coordination.

(2) The Regional review will be completed within 45 days after receipt from the Indian tribal government, whenever possible.

(3) Indian tribal governments must review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for non-emergency Stafford Act assistance and FEMA mitigation grant funding, with the exception of the Repetitive Flood Claims program.

[72 FR 61749, Oct. 31, 2007]

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Hazard Mitigation Planning Committee Members

<u>Name</u>	<u>Title</u>	<u>Affiliation</u>	<u>Responsibilities</u>
Frank Balbi, P.E.	Assistant Engineer	Town/Village of Harrison	Public Works Infrastructure
Gerri Barbagallo	Resident	West Harrison Neighborhood Assn.	Neighborhood Concerns, (West Harrison)
Joseph Bilotto	Chief	Harrison Volunteer Ambulance Corp.	Emergency Medical Concerns
Joseph Brefere	Sr. Office Assistant	Purchase Fire Department	Fire and Rescue Concerns (Purchase Area)
Florinda Broderick	Planning Consultant	Town/Village of Harrison	Public Works Data Gathering Liaison
Patrick Cleary	Assessor	Town/Village of Harrison	Overall Town Wide Planning
James Calandrucchio	Manager	Town/Village of Harrison	Property Values
Anthony Conetta, P.E.	Manager	Westchester Joint Water Works	Water Supply Utility Infrastructure
Dennis Delborgo	Assistant Fire Chief	Westchester County OEM	Westchester County Government Representative
Dino DelSignore	Building Inspector	Town/Village of Harrison	Fire and Rescue Concerns (Downtown Area)
Robert Fitzsimmons	Fire Chief	Town/Village of Harrison	Townwide Building Concerns, Flooding
John Fishbein	Resident	NYSEMO	NYSEMO Contact
Patrick Galluzzo	Fire Chief	West Harrison Fire Department	Fire and Rescue Concerns, (West Harrison)
Ann Gold	Resident	Purchase Environmental Protection Assn.	Neighborhood Concerns (Purchase Area)
David Hall	Police Chief	Town/Village of Harrison	Overall Emergency Response During Events
Edward Kear	Director Facilities/Operations	Harrison Central School District	School District Concerns
Ray Kraus	Resident	Brentwood Preservation Committee	Neighborhood Concerns (Brentwood Brook)
Jonathan Kraut	Attorney	Town/Village of Harrison	Legal Concerns and Plan Development
Michael LaDore	Resident	Harrison Residents Committee	Neighborhood Concerns, (Downtown Area)
Nadine Macura	Asst. Fire Chief	NYSEMO	NYSEMO Region II Representative
Steven Mancini	Lieutenant	West Harrison Fire Department	Fire and Rescue Concerns, (West Harrison)
Lawrence Marshall	Comptroller	Harrison Police Department	Police Department Response, Planning
James Maxwell	Fire Chief	Dolph Rotfeld Engineering, P.C.	Consultant Team, Plan Development
Maureen McKenzie		Town/Village of Harrison	Municipal Budgeting
Henry Mohr		Town/Village of Harrison	Fire and Rescue Concerns (Downtown Area)

<u>Name</u>	<u>Title</u>	<u>Affiliation</u>	<u>Responsibilities</u>
Lynn Oliva	Project Planner	Dolph Rotfeld Engineering, P.C.	Consultant Team, Plan Development
Robert Paladino	Attorney	Town/Village of Harrison	Committee Co-Chair, Staff Coordination
Michael Picini	Coordinator Computers Svcs.	Town/Village of Harrison	Website Information and Public Questionnaire
Michael Ritchie	Project Manager	Dolph Rotfeld Engineering, P.C.	Consultant Team, Plan Development
Robert Schanil	Sergeant	Harrison Police Department	Police Department Response, Planning
Mark Scocchera	EMS Chief	Town/Village of Harrison	Overall EMS Response During Events
Jeff Strozza	Fire Department	Town/Village of Harrison	Fire Department Liason
Steve Surace	Fire Marshal	Town/Village of Harrison	Building Fire Safety
Neil Sweeting		Westchester County	Westchester County Government Representative
Joan Walsh	Mayor/Supervisor	Town/Village of Harrison	Town Wide Emergency Management
Robert Wasp, P.E.	Commissioner of DPW	Town/Village of Harrison	Committee-Co Chair, Staff Coordination

Individual municipal staff were responsible for data gathering within their respective municipal agencies as well as providing insight on past events. Department Heads for Police, Fire, Emergency Medical Services and Public Works provided insight as to agency capabilities as well as direction as to the mitigation actions for overall Committee review and consideration.

Neighborhood Representatives on behalf of residents and businesses in the Downtown, Purchase, West Harrison and Brentwood Brook areas provided insight to local problems including repetitive flooding issues, restoration of services during severe and winter storm events and overall natural hazard mitigation needs.

Record of Review

The following Table shows the data, documents, plans, reports and information resources used in the preparation of this plan.

Source of Information (Level of Government /Private Sector)	Government Agency / Private Sector Business	Name of Document, Plan, Report, Data, Article, Press Release	Form of Document
Local	Town/Village of Harrison	Town/Village of Harrison Master Plan	Hard Copy On File in Town Hall
Local	Town/Village of Harrison	Town/Village of Harrison Stormwater Management Plan	Hard Copy On File in Town Hall
Local	Town/Village of Harrison	Town/Village of Harrison Zoning Regulations	Hard Copy On File in Town Hall
Local	Town/Village of Harrison	Town/Village of Harrison Planning Regulations	Hard Copy On File in Town Hall
Local	Town/Village of Harrison	Town/Village of Harrison Municipal Code	Hard Copy On File in Town Hall
Local	Town/Village of Harrison	Town/Village of Harrison Emergency Response Plan	Hard Copy On File in Town Hall
Local	Town/Village of Harrison	Department of Public Works Annual Pump Station Report, 2007	Hard Copy On File in Town Hall
Local	Town/Village of Harrison	Town/Village of Harrison Comprehensive Plan Draft 2006, BEJ Planning	Hard Copy On File in Town Hall
Local	Town/Village of Harrison	FEMA FIRM Maps (September 2007	Hard Copy On File in Town Hall
Local	County of Westchester	Department of Emergency Services Comprehensive Emergency Management Plan Version November 2005	Website http://www.westchestergov.com/EmergServ/reports/cemp2005.pdf
Local	County of Westchester	Department of Planning Data Books 2006 and 2008	Website http://planning.westchestergov.com/index.php?option=com_content&task=view&id=842&Itemid=1484
Local	City of New York	Department of Environmental Protection Kensico Dam Emergency Action Plan May 2009	Hard Copy On File in Town Hall

Source of Information (Level of Government / Private Sector)	Government Agency / Private Sector Business	Name of Document, Plan, Report, Data, Article, Press Release	Form of Document
Local	County of Westchester	Geographic Information Systems Mapping	Website http://giswww.westchestergov.com/
Local	County of Westchester	Department of Planning Drought Emergency Plan	Website http://blog.westchestergov.com/index.php?option=com_content&task=view&id=1415&Item=2... 10/28/2008
Local	Westchester Joint Water Works City of New York	Infrastructure Information Files	Hard Copy
Local	City of New York	Heat Emergency Plan	Website http://www.nyc.gov/html/oem/html/hazard/s/heat_safety.shtml
Local	City of New York	Department of Environmental Protection History of Drought History and Water Consumption	Website http://www.nyc.gov/html/dep/html/drinking_water/droughthist.shtml 7/8/2008
Local	City of Rye	Mitigation Study, Bowman Avenue Dam Site, City of Rye and Village of Rye Brook Presentation October 17, 2007	Website http://www.rveny.gov/reports%20and%20publications/flood%20mitigation%20presentation%20oct%2017.pdf
Local	City of Rye	Hazard Mitigation Plan	Website http://www.rveny.gov/planning/Reports/Aadopted%20Hazard%20Plan.pdf
Local	Village of Rye Brook	Hazard Mitigation Plan	Website http://www.rvebrook.org/documents/administration/adophazmit.pdf
State	New York State Department of Environmental Conservation	Bureau of Flood Protection and Dam Safety List of Dams	Website http://www.dec.state.ny.gov/pubs/42978.html

Source of Information (Level of Government / Private Sector)	Government Agency / Private Sector Business	Name of Document, Plan, Report, Data, Article, Press Release	Form of Document
State/Academic	New York State Climate Office	Department of Earth and Atmospheric Sciences at Cornell University The Climate of New York Physical Description Highway Mileage Inventory	Website http://nysc.eas.cornell.edu/climate_of_ny.html
State	New York State Department of Transportation		Website https://www.nysdot.gov/divisions/engineering/technical-services/highway-data-services/highway-mileage-summary
State	New York State Office of Emergency Management	New York State Hazard Mitigation Plan 2008	Website http://www.semo.state.ny.us/programs/planning/hazmitplan.cfm
Federal	Federal Emergency Management Agency	State and Local Mitigation Planning How To Guides 386-1 to 386-8	Hard Copy
Federal	Federal Emergency Management Agency	Local Multi Hazard Mitigation Planning Guidance, July 1, 2008	Hard Copy
Federal	Federal Emergency Management Agency	Region II Mitigation Planning "Tool Kit"	Website http://www.fema.gov/about/regions/region_ii/toolkit_table.shtml
Federal	Federal Emergency Management Agency	Listing of Federal Presidential Disaster Declarations	Website http://www.fema.gov/news/disasters_state_fema?id=36
Federal	Federal Emergency Management Agency	National Flood Insurance Program BureauNet (Loss Statistics)	Website http://bsa.nfipstat.com/reports/1040.htm#36
Federal	Federal Emergency Management Agency	Nation Flood Insurance Program Flood Zone Designations	Website http://www.fema.gov/business/nfip
Federal	Federal Emergency Management Agency	HAZUS-MH	Computer Data Program

Source of Information (Level of Government / Private Sector)	Government Agency / Private Sector Business	Name of Document, Plan, Report, Data, Article, Press Release	Form of Document
Federal	Federal Emergency Management Agency/NFIP	List of Repetitive Losses for Study Area	Hard Copy / CD
Federal	Census Bureau	Summary Files (SF3) Population, Social Characteristics Ethnicity	Website http://factfinder.census.gov/servlet/DatasetMainPageServlet?_ds_name=DEC_2000_SF3_U&_program=DEC&_lang=en
Federal	Geological Survey	Natural Hazards-Floods	Website http://www.usgs.gov/themes/flood.html
Federal	National Oceanic and Atmospheric Administration	National Climate Data Center	Website http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/us_a.shtml
Federal	National Oceanic and Atmospheric Administration	Historical Storm Data	Website http://www.spc.noaa.gov/climo/historical.html
Federal	National Oceanic and Atmospheric Administration	Coastal Services Center	Website http://www.csc.noaa.gov/
Federal	National Oceanic and Atmospheric Administration	Tropical Prediction Center	Website http://seahorse.nhc.noaa.gov/pastall.shtml?text
Federal	National Oceanic and Atmospheric Administration	Satellite and Information Services (NESIS)	Website http://www.nesdis.noaa.gov/

Source of Information (Level of Government / Private Sector)	Government Agency / Private Sector Business	Name of Document, Plan, Report, Data, Article, Press Release	Form of Document
Federal	Geological Survey	Lamont Doherty Laboratory – Earthquake Data	Website http://www.ideo.columbia.edu/research/databases-repositories
Government/Private	The Disaster Center	Hurricane Floyd Tracking Map	Website http://www.disastercenter.com/hurricane/FloydTrc.html
Private/Academic	University of Nebraska	National Drought Mitigation Center	Website http://drought.unl.edu/
Private (Journalism)	Laredo, Texas Morning Times	Article on Earthquake in Upstate New York April 21, 2002, Page 10A	Website http://airwolf.lmtonline.com/news/archive/042102/pasea10.pdf
Private	Geological Society of America	Article on Upstate New York Earthquake, April 20, 2002	Website http://gsa.confex.com/gsa/2008NE/finalprogram/abstract_133814.htm
Private (Academic)	Colorado State University	Impacts of Temperature Extremes	Website http://sciencepolicy.colorado.edu/socasp/weather1/adams.htm 1/23/2009
Private (Journalism)	The Journal News	Article: "Tornado Slams Region"	Hard Copy
Private (Academic)	Columbia University	Science Earthquake Codes Adopted	Website http://www.columbia.edu/cu/record/archives/vol20/vol20_iss19/record_2019_18.html 3/6/2009

A listing of the HMPC Committee and Public meetings is shown on Page 12 of the Planning Process Section in Table 3-2 Hazard Mitigation Planning Committee Schedule and Topics. The agendas / minutes of those meetings follow in chronological order.

Additionally, three meetings (3) were held with municipal staff in order to gather basic data about municipal infrastructure, assets and capabilities. The meetings were held as follows:

Date	Municipal Department	Attendees
April 2, 2009	Public Works	Robert Wasp, P.E. Commissioner / Co-Chair Anthony Robinson, Deputy Commissioner Frank Balbi, P.E., Assistant Engineer Consultant Staff
April 20, 2009	Public Safety	Robert Paladino, Co-Chair Robert Wasp, P.E., Co-Chair Robert Schanil, Police Department Steve Surace, Fire Marshall Consultant Staff
April 22, 2009	Planning	Michael Amodeo, P.E. Engineer Patrick Cleary, Planner Robert Fitzsimmons, Building Inspector Robert Wasp, P.E. Co-Chair Consultant Staff

**Town of Harrison
Hazard Mitigation Plan**

**Kickoff Meeting with NYS SEMO
May 6, 2008**

Proceedings of Meeting

Attendees

New York State Emergency Management Office: Edward J. Lips, John Fishbein
Town/Village of Harrison: Steven Mancini, Assistant Chief, West Harrison Fire Department; Dino Del Signore, Assistant Chief, Harrison Fire Department; Robert Fitzsimmons, Building Inspector; Frank Balbi, Assistant Engineer; Robert Wasp, Public Works Commissioner; Joseph Bilotto, EMS Chief; Maureen MacKenzie, Comptroller; Jonathan Kraut, Attorney; Joseph Brefere, Chief, Purchase Fire Department; Robert Scharile, Sergeant, Harrison Police Department; Laurence Marshall, Lieutenant, Harrison Police Department
Westchester Joint Water Works: Hugh Greechan, Manager
Dolph Rotfeld Engineering: Dolph Rotfeld, Principal; Michael Ritchie, Project Manager; Jim Maxwell, Project Engineer; P. Lynn Oliva, Project Planner

Edward J. Lips of the New York State Emergency Management Office (SEMO) provided handouts and made a power point presentation on the phases of emergency management, and the value and components of a complete and properly prepared Hazard Mitigation Plan (HMP). Mr. Lips also distributed a checklist and local mitigation plan review summary as a guide for use in the preparation of the HMP. These documents identify all of the elements that must be addressed in the Town/Village plan in order for it to get State and Federal approval. Once approved the Town/Village will be eligible to apply for implementation funds.

Mr. Lips emphasized the following in his presentation and handouts:

- The purpose of a local hazard mitigation plan is to develop a locally based strategy to identify, avoid and reduce the potential social and economic impacts on lives and property that could be effected by natural hazard events (eg hurricanes; winter storms, drought, earthquake, flooding, wildfire, tornado, extreme heat, and hail storms). Some communities have chosen to also address manmade hazards such as the potential for major oil or radioactive material spills due to the proximity of major highways. However, manmade hazards are not a required HMP component.
- The foundation of the Plan starts with a thorough Risk Assessment. This includes identifying known and potential natural hazards, profiling past hazard events, assessing the vulnerability of physical assets and population in the community to the hazards, estimating potential economic, social and cultural losses, and

analyzing demographic and development trends as they relate to areas potentially impacted by hazard events.

- Once the Risk Assessment is complete, a Mitigation Strategy must then be developed. This includes formulation of local hazard mitigation goals and objectives, identification and analysis of mitigation measures, and a program to implement the mitigation measures.
- The HMP must also incorporate a Plan Maintenance element including how the community will monitor and evaluate its mitigation strategy on an annual basis. The HMP as a whole must be updated every 5 years.
- The establishment of a Planning Committee to guide the entire HMP process is essential. Representation should be broad based. The Committee should include local and regional agencies and departments responsible for managing and responding to public safety and emergency service events. A representative of the local school district would be a good idea since the district would also be eligible to apply for implementation funds if it participates in the planning process. Mr. Lips suggested that a Chairman be designated as soon as possible and that the Town/Village Board formally appoint members to the Committee in order to better ensure commitment and participation in the Plan's preparation.
- The entire planning process should be inclusive and thoroughly documented as part of the Plan. Opportunities must be given for the general public to participate in and comment on the HMP including the ongoing and annual evaluation of the HMP mitigation goals and strategies.
- The Town/Village Board must formally adopt the HMP before it is submitted to SEMO and FEMA for approval.
- There is a State Hazard Mitigation Plan. It contains data and strategies that the Town/Village should feel free to incorporate in its Plan. Westchester County also adopted a Plan but it only addresses county owned assets.
- A number of communities in Westchester have prepared HMPs. This includes Rye Brook, the City of Rye, Peekskill, Croton and Briarcliff Manor. Port Chester is working on a Plan and Mamaroneck Village's is at FEMA for approval. Some of these Plan's were prepared before the new and more quantitative Risk Assessment requirements were instituted. Those older plans will have to include the new risk assessment methodology when they are up for renewal (every five years). The Village of Briarcliff's Plan was prepared in 2007 and would be a good model to reference especially for the Risk Assessment component.
- The preparation of an HMP requires a lot of detail and data and is one of the reasons why SEMO recommends that communities hire consultants to assist in the Plan's preparation.

- On average it takes 5 years to produce an approved HMP from the time the initial planning grant is awarded to the final approval by FEMA. While FEMA has a 45-day review period in reality it is taking at least one year for submitted Plan's to be reviewed and approved by that agency.

Dolph Rotfeld from Dolph Rotfeld Engineering introduced member of the planning team. Mike Ritchie, Project Manager, indicated that this was the first of many meetings. Since some agencies were unable to attend this meeting, there will be another overview/introduction of the HMP at the next meeting. Mr. Ritchie asked Mr. Wasp to advise him on who the Committee Chair will be as well as the members of the Planning Committee so that a planning meeting to start the risk assessment can be scheduled.

May 15, 2008 version

TOWN BOARD AGENDA
MEETING OF THE TOWN BOARD OF THE TOWN OF HARRISON,
TO BE HELD AT THE MUNICIPAL BUILDING,
1 HEINEMAN PLACE, HARRISON, NY., IN WESTCHESTER COUNTY,
ON THURSDAY, MAY 15, 2008, AT 7:30 PM,
EASTERN DAYLIGHT SAVINGS TIME

PRESENTATION OF THE 2008 MAYOR'S CHOICE AWARD

Celeste Hofland - Harrison High School
Johnny Principe - Harrison High School
Victoria Acevedo - Louis M. Klein Middle School
Samantha Lisk - Preston, West Harrison

Presentation by Acting Town Engineer Bob Wasp
re: the Fifth Annual Stormwater Report.

Presentation by Veterans' Officer Ben DeFonce
re: Memorial Day Parade

- A. **REPORT FROM SUPERVISOR WALSH ON DECISIONS MADE**
FOLLOWING TOWN BOARD MEETINGS HELD ON APRIL 17, 2008 .
1. Appointment of Susan Weintraub to the part-time availability list in the Supervisor's office.
 2. Settlement of claim.
 3. Authorization to increase the cap on legal fees regarding a litigation matter.
- B. **CORRESPONDENCE AND REPORTS:**
- 1a. Monthly report from the Town Clerk for April 2008.
 - 1b. Monthly report from the Fire Marshal for April 2008.
 - 1c. Monthly report from the Receiver of Taxes for April 2008.
 - 1d. Monthly report from the Building Inspector for April 2008.
 - 1e. Monthly report from the Recreation Department for April 2008.
 2. Notification by the Town of North Castle Planning Board Chairperson, Peg Michelman, that a Public Hearing will take place on May 28, 2008, RE: A Local Law to amend Section 213-21, Part I of the Town of North Castle Town Code to Permit the Expansion of Buildings within the RO Zoning District for Conversion to Professional Office and to Create a Maximum Floor Area Ratio in the RO Zoning District.
 3. Notification from Holly Bukofser that she can no longer be a member of the Environmental Advisory Committee of Harrison. Mrs. Bukofser has taken on a number of commitments, both professional and personal and she can no longer devote the time and attention the Environmental Committee deserves.

4. Notification from Rev. Christopher Monturo of St. Anthony's Church in West Harrison, that the parish will be holding a "Blue Mass" on Friday, May 30, 2008 at 7:30 pm. A Blue Mass, as is the usual custom in many cities across our nation, is held to show our appreciation to the Police and Fire Departments and Civil Officials of our Community. Everyone in Harrison is welcome to join us that night to say thank you.

5. Notification from Doug Wilk of his resignation from the Architectural Review Board, effective May 5, 2008, Mr. Wilk has decided to become involved with the Downtown Revitalization Committee.

LATE

ITEM: 6. Notification from Janet Insardi, Village Attorney for the Village of Mamaroneck that a public hearing will be held on May 20th at 6:30 pm, at 169 Mount Pleasant Ave, Mamaroneck, NY, RE: Local Law No. 8-2008, Extension of Interim Development Moratorium for Multifamily Dwellings within the Village of Mamaroneck.

C. PUBLIC HEARING:

1. **PUBLIC HEARING** – Pursuant to Article 2, Section 10 and Article 3, Section 20 of the Municipal Home Rule Law, by adding Chapter 16 to the Town/Village Code entitled "Disciplinary Proceedings" as Local Law No. ____ of 2008.

REVISED: 2. **PUBLIC HEARING** – Pursuant to Article 2, Section 10 and Article 3, Section 20 of the Municipal Home Rule Law, by adding Chapter 190 to the Town/Village Code entitled "Establishment of Terms and Conditions for Use of Rights of Way by Companies Providing Voice, Video or Information Services, and Establishing Special Conditions on Providers of Cable Service" as Local Law No. ____ of 2008.

D. PERSONNEL:

1. Request by Chief of Police Dave Hall for approval to attend the NYS Chiefs of Police annual training conference, from July 27th through July 30, 2008, in Lake George, NY, at a cost, including travel expenses, not to exceed \$1,500. This is a budgeted item.

2. Request by Fire Marshal Steve Surace for approval to attend the NYS Association of Fire Chiefs Conference, from June 11th through June 15, 2008, in Lake George, NY, at a cost not to exceed \$1,200. Further requested to authorize the Comptroller to issue an advance check in the amount of \$1,200. This is a budgeted item.

3. Request by Chief of Police Dave Hall for approval to appoint Paul Marcone of Harrison and Christopher Romero of Port Chester, to the part time summer employees list, at the hourly salary of \$11. They will be assigned to the Traffic Division, effective May 19, 2008.

4. Request by Harrison Fire Department #2, Chief Henry Mohr, for approval for seven (7) firemen to attend the NYS Chiefs Convention, in Lake George, NY, from June 12th through June 14, 2008, at a cost of \$3,500. Further requested to authorize the Comptroller to issue an advance check in the amount of \$3,500. This is a budgeted item.

5. Request by West Harrison Fire Chief Patrick Galluzzo for approval to attend the NYS Chiefs Convention in Lake George, NY, from June 11th through June 15, 2008, Further requested to authorize the Comptroller to issue an advance check in the amount of \$1,500 to cover these expenses.

6. Request by Superintendent of Recreation Ron Belmont for approval for the additions to the Recreation Part-time Availability List.

7. Request by Superintendent of Recreation Belmont for approval for himself, Anthony Zaccagnino and Recreation staff members to attend the National Recreation and Parks Conference, from October 14 through the October 18, 2008, in Baltimore, MD, at a cost not to exceed \$3,500. As the conference date approaches Mr. Belmont will specify which staff members will be attending. This is a budgeted item.

8. Notification from Chief of Police Dave Hall that P.O. William Duffelmeyer enrolled at Manhattanville College for the 2008 Spring Semester. He took the following course: "Play, Games and Sports in Historical Aspects" The tuition for the above course and books totaled \$2,374.75. Requested, that because P.O. Duffelmeyer's attendance at the above listed course has been submitted, the Comptroller be authorized to audit and pay expenses outlined as per the contract with Harrison Police Association.

E. ACTIONS AND RESOLUTIONS:

1. Request by Burton Ward, General Manager of the Century Country Club for authorization to hold their Annual Fourth of July Fireworks Display on Club grounds, Friday, July 4, 2008, with a rain date of Sunday, July 6th. Upon Town Board approval, Mr. Burton will forward a Certificate of Insurance and will notify all the necessary departments.

2. Request by Comptroller Maureen MacKenzie for approval for a Budget Transfer.

3. Request by Seth Mandelbaum, attorney with the law firm of McCullough, Goldberger & Staudt, on behalf of his client Old Oaks Country Club, for approval to set the date of June 5th for a Public Hearing for a Special Exception Use Permit, RE: A new maintenance building on its property at 3100 Purchase St, Purchase, NY. (Planning Board approval has been granted PB2008/38)

4. Request by Linda Whitehead, attorney with the law firm of McCullough, Goldberger & Staudt on behalf of the applicant, Calvert Street Associates, to set the date of June 5th for a Public Hearing for a Special Exception Use Permit, with the proposed redevelopment of the property at 33-55 Calvert Street, to be known as Seville Plaza. (Planning Board approval has been granted PB2008/41, 42,43)

5a. Request by Commissioner of Public Works Bob Wasp for approval for the Agreement with FEMA/SEMO for the preparation of a Multi-Hazard Mitigation Plan, contingent upon review and approval by the Law Department. The Town was notified in November 2007 of the award of a grant in the amount of \$100,000.00 (25% local match) for the preparation of a Multi-Hazard Plan. The Board authorized the hiring of Dolph Rotfeld Engineering to prepare this plan.

5b. Notification by Commissioner of Public Works Wasp that, as required by FEMA/SEMO as part of the Hazard Mitigation Plan, the Town must establish a committee to assist in the process of creating the Hazard Mitigation Plan. The committee met with representatives from FEMA/SEMO on Tuesday, May 6, 2008 to discuss the planning process. We are also required to appoint a committee chairman. Request for authorization to appoint a Chairman of the Hazard Mitigation Plan Committee.

6. Request by Director of Purchasing Judy D'Agostinis for approval for PO#281613 for miscellaneous items for the Chief of Fire District #1's 2008 Tahoe, at a cost of \$13,450.

7. Request by Daniel Richmond of the law firm of Zarin & Steinmetz that the Town Board declare itself as an Involved Agency with respect to the Planning Board's review of the Sherman Avenue subdivision as proposed by the Falcon Group. Mr. Richmond points out that the Falcon Group proposes to construct a bridge across the Mamaroneck River, connecting to Dorado Drive, and contends that only the Town Board can approve such a new road. He also states that the Town Board was not given the opportunity to comment on the Draft Environmental Impact Statement submitted by the applicant although there are significant erosion, flooding and drainage problems. A Public Hearing on the application is scheduled before the Planning Board on May 20th. Mr. Richmond requests that the Town Board ask the Planning Board to adjourn the Public Hearing to a later date or at least hold the Hearing open until the Town Board has a chance to contribute to the SEQRA review.

F. OLD BUSINESS:

1. Harrison Townhouse Space Study by D'Amore Design Studio.
2. Town Car Use Policy.

LATE

ITEM: 3. Adoption of Determination of Findings re: 7 Meadow Lane.

G. MATTERS FOR EXECUTIVE SESSION:

May 15, 2008

2008 -- 291 -- b

APPOINTMENT OF VILLAGE ATTORNEY ROBERT PALADINO AS
CHAIRMAN OF THE HAZARD MITIGATION PLAN COMMITTEE

On motion of Councilman Cannella, seconded by Councilman Scappaticci,

it was

RESOLVED to appoint Village Attorney Robert Paladino as Chairman of the Hazard Mitigation Plan Committee.

FURTHER RESOLVED to forward a copy of this Resolution to the Town Attorneys, the Commissioner of public Works and the Comptroller.

Adopted by the following vote:

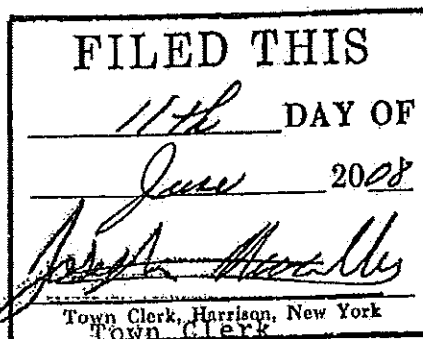
AYES: Councilmen Cannella, Sciliano, Scappaticci and Vetere
Supervisor Walsh

NAYS: None

ABSENT: None

Copies to:

☐ Assessor
☐ Benefits
☐ Bldg
☒ Compt'lr
☒ Engrng
☒ Law
☐ Police
☒ P. Wrks
☒ Purch'g
☐ Recr'tn
☒ Supvs'r



May 15, 2008

2008 -- 291 -- a

AUTHORIZATION TO EXECUTE THE CONTRACT WITH
THE ENGINEERING FIRM OF DOLPH ROTFELD FOR
THE PREPARATION OF A MULTI-HAZARD MITIGATION PLAN WITH SEMO

Commissioner of Public Works Robert Wasp stated that this \$75,000 is the federal share, and \$25,000 is the local share for starting the project.

On motion of Councilman Cannella, seconded by Councilman Scappaticci,

it was

RESOLVED to approve the request of Commissioner of Public Works Robert Wasp for authorization of the execution of the agreement for the preparation of a Multi-Hazard Mitigation Plan with SEMO, contingent upon review and approval by the Law Department.

FURTHER RESOLVED to forward a copy of this Resolution to the Comptroller, the Commissioner of Public Works and the Town Attorneys.

Adopted by the following vote:

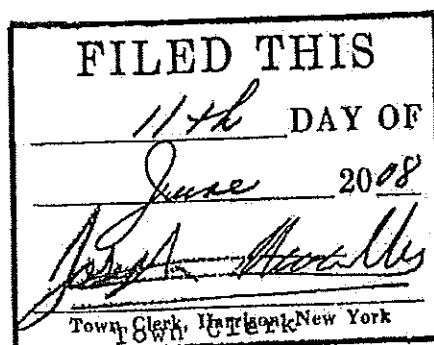
AYES: Councilmen Cannella, Sciliano, Scappaticci and Vetere
Supervisor Walsh

NAYS: None

ABSENT: None

Copies to:

☐ Assessor
☐ Benefits
☐ Bldg
☒ Compt'lr
☒ Engrng
☒ Law
☐ Police
☒ P. Wrks
☒ Purch'g
☐ Recr'tn
☒ Supvs'r



Town/Village of Harrison
Hazard Mitigation Plan Committee
Meeting #2

Wednesday, June 18, 2008
10 AM Town House Courtroom

A G E N D A

- I. Welcome & Introduction of Committee Members
- II. Questions on HMP Process
- III. Hazard Identification
 - Natural
 - Manmade
- IV. Inventory of Community Facility Assets
- V. Public Outreach
- VI. Other Committee Issues
- VII. Next Steps
- VIII. Next Meeting Date

TO: Town/Village of Harrison Hazard Mitigation Planning Committee

FROM: Michael Ritchie, Project Coordinator
Dolph Rotfeld Engineering

DATE: June 12, 2008

RE: Meeting Agenda for June 18, 2008

At our kickoff meeting on May 6, 2008 Ed Lips, from the New York State Emergency Management Office (SEMO) reviewed the purpose and components of a Hazard Mitigation Plan (HMP). I have attached a summary of the points raised at that meeting.

The basic building block of the HMP rests on a thorough and careful *Risk Assessment*. As described by FEMA, risk assessment is "*the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards by assessing the vulnerability of people, buildings, and infrastructure to natural hazards.*"

Risk assessment involves four basic steps:

- 1) Identify the hazards;
- 2) Profile the hazard events;
- 3) Inventory assets; and
- 4) Estimate losses (generally losses represent the monetary damage to structures and contents, interruption of services, and displacement of residents and businesses).

Although we anticipate the research and analysis involving all risk assessment phases will to some extent go on concurrently, at our meeting on June 18 and continuing for the next several weeks we need to work on identifying and then profiling the hazard events that have in the past or could in the future affect the Town/Village of Harrison.

Attached is Worksheet #1, Identify the Hazards and some simple instructions on how to use and complete the form. This is what we will be primarily discussing at the meeting on June 18. We ask that you look it over and come to the meeting with your list of the natural hazards you think the plan should address as well as information on the date of the event, extent of damage, and source of information.

Although the main focus of the HMP is on natural hazard events other communities have also addressed manmade hazards such as hazardous materials or transportation accidents on major highways or transit facilities (railroads, airport). Although manmade events are not required by FEMA or SEMO to be included in an HMP, a decision should be made as soon as possible on whether or not the Committee wants to include any man-made hazard events and if so, which ones.

**Town of Harrison
Hazard Mitigation Plan**

**Hazard Mitigation Identification
June 18, 2008**

Proceedings of Meeting

Attendees

New York State Emergency Management Office (SEMO): Nadine Macura
Town/Village of Harrison: Robert Paladino, Law Department, Committee Chair; Frank Balbi, Assistant Engineer; Florinda Broderick, Engineering; F. Brodinll, DPW; Pat Cleary, Town Planner; Dino Del Signore, Assistant Chief, Harrison Fire Department; Robert Fitzsimmons, Building Inspector; Maureen MacKenzie, Comptroller; Robert Schanil, Sergeant, Harrison Police Department; Jeff Strozza, Harrison Fire Department; Robert Wasp, Public Works Commissioner
Dolph Rotfeld Engineering: Michael Ritchie, Project Manager; Jim Maxwell, Project Engineer; P. Lynn Oliva, Project Planner

Welcome and Introductions: Bob Paladino has been appointed the Chair of the Harrison Hazard Mitigation Planning Committee. He welcomed members and with Mike Ritchie from Rotfeld Engineering reviewed the purpose of the plan and its components as well as the responsibilities of Committee members to actively participate in the plan's preparation. Chairman Paladino indicated that he would contact Committee members who were not in attendance to bring them up to date on what is going on and to solicit their participation or designation of a representative for future meetings. He stressed the importance of continuity at Committee meetings. Nadine Macura was also introduced. She is the NYSEMO regional representative and will be available to provide advice and guidance during the plan's preparation.

Documenting In-Kind Time: Mike Ritchie and Bob Wasp discussed the importance of Committee members and staff who work on the plan to document the time they spend on it. This includes attending Committee meetings, preparing for meetings, and researching and providing materials for the plan. This will go towards the Town's "in-kind" 25% match for the FEMA grant that was received to prepare the plan. The timesheets should be submitted to the Town Comptroller on a monthly basis. Rotfeld Engineering will send a sample timesheet to Comptroller MacKenzie who will distribute it to Committee members and staff.

Hazard Identification: This is the first step in developing the Town/Village's risk assessment. It initially involves Committee members identifying major natural hazard events that have affected the Town in past years. It was noted that the Hazard Mitigation Plan's emphasis is on natural events although communities have also addressed manmade hazards. Commissioner Wasp recommended that the focus be on natural hazards. He felt that the Town's Emergency Response Plan addresses manmade events. Pat Cleary

thought that there might also be an overlap in manmade and natural events such as an accident at the airport or a major road which spills into the Rye Lake drinking water supply system or other waterbody.

A FEMO produced worksheet, "Identify the Hazards", had been distributed prior to the meeting. During the meeting, Committee members checked off which hazards they thought were applicable to the Town/Village. The following were those which were identified and discussed.

- Heat/Drought
- Earthquake
- Flood
- Hailstorm
- Hurricane/Noreaster/Tropical Storm
- Severe Winter Storm
- Tornado
- Wildfire
- Windstorm
- Land Subsidence/Steep Slopes

It was the general consensus that the **top three hazards of concern** are: **Floods, Severe Winter Weather, and Severe Storms** (Hurricanes, micro-tornados, noreasters and tropical storms).

Committee members were asked to go through their records and provide information (e.g. date and year, type and extent of loss, geographic area affected, the source for this information) on each of the identified hazard events. Examples of sources of information which Committee members discussed included Public Works and Fire Department records on pumpouts and damages especially past flood events that don't take place in floodplains. The Police Department has good records on events and logs on requests for assistance. The Law Department has records on claims and the Comptroller can get information from the Town's insurance broker on claim records involving damages to Town facilities.

Committee members noted that the Forest Lake Dam near Park Lane (designed by Rotfeld Engineering), a concrete control weir at the end of Silver Lake, and a control weir at Bauman Avenue (half in Rye/half in Harrison) as well as ponds with flood control structures needed to be researched as hazard events could effect them and impact surrounding areas. There was also discussion on the Lake Street Quarry.

Inventory of Community Facility Assets: A draft was shared with Committee members. Information is still being collected. Major employers and churches might also be included. It was noted that a major governmental facility is the Post Office's Regional Distribution Center on Westchester Avenue. Comptroller MacKenzie will work with the Town's insurance broker to see what data is available on the size, age, occupancy, and value of these facilities.

Public Outreach: All agreed that this is an important component of the Plan. Chairman Paladino will develop a list of community organizations and groups and will contact them to participate in the planning process. A public questionnaire will also be prepared. Posting on the Town website as well as other venues for distribution will be discussed at a future meeting.

It was stressed that it is important that the public understands that this Plan does not address site specific problems or construction mitigation proposals for individual properties. It is the first step in identifying and understanding what types of natural hazards have in the past and could in the future affect the town, the extent of the impact, and ways to help reduce impacts prior to the event. The development of the Plan will allow the Town to apply for federal, state, and other funds which can be then used to develop more specific design and construction plans.

There will also be outreach to surrounding communities to get their input on the Plan. It was noted by Commissioner Wasp that the City of Rye and Village of Mamaroneck are working with the Town on a flood mitigation project for Beaver Swamp Brook.

Next Meeting: Wednesday, July 9 at 10 AM to collect reports and maps on hazard events.

Town/Village of Harrison
Hazard Mitigation Planning Committee Meeting
June 18, 2008

Identification of Hazards

Identification of Hazards to which the Town /Village of Harrison may be susceptible is an initial step in the development and implementation of the Town / Village's overall Hazard Mitigation Program.

Committee members are requested to complete "TASK A" of the attached Worksheet # 1. Follow the instructions on line 5 only in the box in the upper left corner. Refer to the Town / Village of Harrison only, and not the State.

Prior to attending the Hazard Mitigation Planning Committee Meeting, please check off those hazards listed under "TASK A" which to the best of your knowledge have occurred in the Town / Village during the period you have worked / lived in the Town / Village or, of which you have personal knowledge.

Following the development of a consensus at the meeting as to what hazards should be addressed the consultant will research various sources (as instructed in the TASK A instructions) in order to gather historical information and to perform a risk and vulnerability assessment of the hazards.

Worksheet #1

Identify the Hazards

step **1**

Date:

What kinds of natural hazards can affect you?

Task A. List the hazards that may occur.

1. Research newspapers and other historical records.
2. Review existing plans and reports.
3. Talk to the experts in your community, state, or region.
4. Gather information on Internet Websites.
5. Next to the hazard list below, put a check mark in the Task A boxes beside all hazards that may occur in your community or state.

Task B. Focus on the most prevalent hazards in your community or state.

1. Go to hazard Websites.
2. Locate your community or state on the Website map.
3. Determine whether you are in a high-risk area. Get more localized information if necessary.
4. Next to the hazard list below, put a check mark in the Task B boxes beside all hazards that pose a significant threat.

	Task A	Task B
Avalanche	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Erosion	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Storm	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Dam Failure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Drought	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Earthquake	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Expansive Soils	<input type="checkbox"/>	<input type="checkbox"/>
Extreme Heat	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3 Flood	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hailstorm	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 Hurricane	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Land Subsidence	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Landslide	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Severe Winter Storm	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tornado	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tsunami	<input type="checkbox"/>	<input type="checkbox"/>
Volcano	<input type="checkbox"/>	<input type="checkbox"/>
Wildfire	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Windstorm	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>

Use this space to record information you find for each of the hazards you will be researching. Attach additional pages as necessary.

Hazard or Event Description (type of hazard, date of event, number of injuries, cost and types of damage, etc.)	Source of Information	Map Available for this Hazard?	Scale of Map

Note: **Bolded hazards** are addressed in this How-To Guide.

**Harrison Hazard Mitigation Committee
Meeting July 9, 2008**

Identification of Hazards

Potential Hazards

(per FEMA Guidance 386-2, Understanding Your Risks)

Avalanche
Coastal Erosion
Coastal Storm
Dam Failure
Drought
Earthquake
Expansive Soils
Extreme Heat
Flood
Hailstorm
Hurricane
Land Subsidence
Landslide
Severe Winter Storm
Tornado
Tsunami
Volcano
Wildfire
Windstorm
Other: _____

**Hazards Selected By Committee
For Assessment**

1. Flood
2. Severe Storms (Windstorms, Hurricane, Coastal Storm, Hailstorm, Tornado)
3. Severe Winter Storm (ice storm, blizzard)
4. Extreme Heat
6. Earthquakes
7. Dam Failure
8. Drought
9. Expansive Soils, Land Subsidence, Landslide*
10. Wildfires*

* Based on Committee discussions, these type disasters shall have a limited Risk Assessment review.

Note: Dam Failure: There are 5 dams in the Town / Village which are classified by the NYSDEC Transportation Hazard covered under Municipal Response Plan

Table 5.1 Hazards of Concern

Hazard of Concern	Is there a potential for this hazard to occur in the Town / Village	If yes, does this hazard pose a significant threat to the Town / Village	Reason for Determination	Sources of Information
Avalanche	No	No	Town / Village does not have topography to sustain such events	Input from HMPC and Town/Village DPW
Coastal Erosion	No	No	Town / Village does not have any coastline	Municipal Map
Coastal Storm	Yes	Yes	Municipality lies within 1 mile of Long Island Sound	FEMA Disaster Records, NYS (NYSEMO) Plan
Dam Failure	Yes	Yes	5 dams exist within the municipality	NYSDEC, Local Public Works database
Drought	Yes	Yes	Identified in the NYS Plan, Identified as a concern by the HMPC	NOAA NCDC, NYCDEP Database, Input from HMPC members
Earthquakes	Yes	Yes	Identified in the NYS Plan, Identified as a concern by the HMPC	USGS Earthquakes Hazards Program, NYS Plan (NYSEMO), Lamont Cooperative Seismographic Network

Hazard of Concern	Is there a potential for this hazard to occur in the Town / Village	If yes, does this hazard pose a significant threat to the Town / Village	Reason for Determination	Sources of Information
Expansive Soils	No	No	No History of such events, soils in area not conducive to such events, not identified in NYS Plan	USGS Landslide Hazards Program, NYS (NYSEMO) Plan
Extreme Heat	Yes	Yes	Identified as a concern by the HMPC	Input from HMPC members
Flood	Yes	Yes	Presidential Disaster Declarations (FEMA 1692-DR-NY, FEMA 1296-DR-NY), Flooding identified as a major concern by the HMPC, Floods are identified as a hazard in the NYS Plan	NOAA NCDC, FEMA Disaster Records, NYS Plan (NYSEMO), Local Records, Input from HMPC members
Hailstorm	Yes	Yes	See Severe Storm	See Severe Storm
Hurricane	Yes	Yes	See Severe Storm	See Severe Storm
Land Subsidence	No	No		
Landslide	No	No		
Severe Storms (Windstorms, Hurricane, Hailstorm, Thunder Storm, Tomado)	Yes	Yes	Presidential Declarations (FEMA 1692-DR-NY, FEMA 1146-EM-NY, FEMA 0974-DR-NY), Severe Storms are identified as a hazard in the NYS Plan, Severe storms identified as a major concern by the HMPC	NOAA NCDC, FEMA Disaster Records, NYS Plan (NYSEMO), Local Records, Journal News (July 14, 2006), Input from HMPC members.

Hazard of Concern	Is there a potential for this hazard to occur in the Town / Village	If yes, does this hazard pose a significant threat to the Town / Village	Reason for Determination	Sources of Information
Severe Winter Storm (blizzard, ice storm)	Yes	Yes	Presidential Declarations (FEMA 3184-EM-NY, FEMA 1083-DR-NY, FEMA 3107-EM-NY)	NOAA NCDC, FEMA Disaster Records, NYS Plan (NYSEMO), Local Records, Input from HMPC members
Tornado	Yes	Yes	See Severe Storm	See Severe Storm
Tsunami	No	No	Not identified as a hazard of concern in NYS Plan	NYS (NYSEMO) Plan, Input from HMPC members
Volcano	No	No	There are no volcanos located in NYS	NYS (NYSEMO) Plan
Wildfires	No	No	Identified as a minor concern by the HMPC	Input from HMPC members
Windstorm	Yes	Yes	See Severe Storm	See Severe Storm

**Harrison Hazard Mitigation Committee
Meeting June 18, 2008**

Identification of Hazards

Potential Hazards

(per FEMA Guidance 386-2, Understanding Your Risks)

Avalanche
Coastal Erosion
Coastal Storm
Severe Winter Storm
Dam Failure
Drought
Earthquake
Expansive Soils
Hailstorm
Hurricane
Land Subsidence
Landslide
Severe Winter Storm
Tornado
Tsunami
Volcano
Wildfire
Windstorm

Other: Transportation

**Hazards Selected By Committee
For Assessment**

1. Flood
2. Severe Storms (Windstorms, Hurricane, Coastal Storm, Hailstorm, Tornado, Microbursts)
3. Severe Winter Storm (ice storm, blizzard)
4. Extreme Heat
5. Drought
6. Earthquakes
7. Dam Failure
8. Transportation

The following natural disasters were also selected for consideration by the committee but may not be applicable based on further review and research.

1. Expansive Soils, Landslide, Land Subsidence: Area does not meet USGS Criteria (No local history). Public Works Director should review for final decision per guidance document.
2. Wildfires: Low Hazard Area per National Interagency Fire Center

Note: Dam Failure: There are 5 dams in the Town/Village which are classified by the NYSDEC

**Town of Harrison
Hazard Mitigation Plan**

**Hazard Selection for Risk Assessment
July 9, 2008**

Proceedings of Meeting

Attendees

Town/Village of Harrison: Robert Paladino, Law Department, Committee Chair; A. Ankola; Joe Bilotto, EMS Chief; Florinda Broderick, Engineering; Pat Cleary, Town Planner; Maureen MacKenzie, Comptroller; Steve Mancini, West Harrison Fire Department; Robert Schanil, Sergeant, Harrison Police Department; Steve Surace; Lucinda Velasquez, EMS Lieutenant

Dolph Rotfeld Engineering: Michael Ritchie, Project Manager; Jim Maxwell, Project Engineer; P. Lynn Oliva, Project Planner

Handouts: The following handouts were distributed: 1) proceedings of June 18 meeting; 2) identification of hazards from June 18 meeting; 3) information sources for local hazard events; 4) FEMA declared recent disaster/hazard events; 5) NYS DEC dam inventory map; and 6) draft of public information questionnaire.

Documenting In-Kind Time: A timesheet has been finalized for Harrison staff and Committee members to document their in-kind time spent on the project. This information constitutes Harrison's match for the grant. Comptroller MacKenzie has the forms on line. These should be submitted to her every 4-6- weeks. Time spent at Committee meetings, preparing for the meeting, and searching records are among the items that the Committee and other Harrison staff should include.

Public Outreach Program: Mike Ritchie reviewed the draft of a questionnaire and letter to be made available to residents in order to get their input on hazards and storm events that have affected them. It was suggested that the questionnaire be put on the Town's website. The Committee should also think about other distribution options (e.g. mailings, put in places of public assembly like Town Hall and the Community Center). It was suggested that the business community also be asked for their input. Bob Paladino stressed that inclusion is key in the development of the Plan. A Press Release will also be distributed to help publicize the development of the Plan and the request for public input. He asked that Committee members provide him with the names of specific individuals or organizations that should be contacted or invited to meetings. Pat Cleary suggested that the Town IS department work with the Committee to make sure that multiple submissions by a single individual can be screened out so that the survey results are statistically valid and not skewed.

Hazard Identification: Based on the discussion at the Committee meeting on June 18 Jim Maxwell presented the following as the natural hazards which will be the focus of the

Plan's risk assessment: 1) Flood; 2) Severe Storms (windstorms, hurricane, coastal storm, hailstorm, tornado, microbursts); 3) Severe Winter Storm (ice storm, blizzard); 4) Extreme Heat; 5) Drought; 6) Earthquakes; 7) Dam Failure; and 8) Transportation. Between now and a Fall meeting Committee members were asked to review this list for completeness and also continue to look through files for documentation on the year, type, geographic location, and the impacts, extent and cost of damage. Mike Ritchie indicated that Rotfeld Engineering was available to meet with Committee members in their offices and assist in going through the records.

Jim Maxwell shared with the Committee the DEC Dam Inventory for the Town. It was noted that the Bauman Avenue Dam discussed at the last meeting is the sole responsibility of the City of Rye. There are weir structures that have overtopped during storms at Brookside Lane, Ophir Farm/Purchase Subdivision, Sprain Lake Drive as well as dozens of impounded waterbodies throughout the Town that have control devices. What defines a dam by DEC? There is concern in the Town about failing private control devices but the Committee needs to think about whether or not there is any benefit from a monetary perspective in categorizing those retention/detention basins as dams. On the other hand if they come under DEC's jurisdiction making minor repairs could become very costly and time consuming. It was the consensus of those in attendance that these small and private systems should be discussed in the mitigation objections section of the Plan as well as a description of the difference between a dam's function and that of retention/detention basins.

The Committee again discussed whether certain manmade hazards such as those that might be associated with the Airport or the surrounding highway system should be included in the Plan. It was the consensus that other levels of government with jurisdiction for those facilities have already developed response plans and that there was no need to undertake a separate risk assessment as part of this Plan. The Plan, however, should make reference to those plans.

Next Meeting: Wednesday, September 10 at 10 AM (note: the date of this meeting is being rescheduled in order to allow more time for research and data collection).

AGENDA
Hazard Mitigation Plan Committee
Oct. 22, 2008
10:00am
1 Heineman Place
Harrison, New York

- I. Introductions
- II. Review of Planning Process to date
- III Review of Draft Chapters 1,2,and 3
- III. Next Phase: Risk Assessment
- IV. Discussion

**Town of Harrison
Hazard Mitigation Plan**

October 22, 2008

Proceedings of Meeting

Attendees

Town/Village of Harrison: Robert Paladino, Law Department, Committee Chair; Joe Bilotto, EMS Chief; Florinda Broderick, Engineering; Pat Cleary, Town Planner; Maureen MacKenzie, Comptroller; Steve Mancini, West Harrison Fire Department; Robert Schanil, Sergeant, Harrison Police Department; Steve Surace

Dolph Rotfeld Engineering: Michael Ritchie, Project Manager; Jim Maxwell, Project Engineer; P. Lynn Oliva, Project Planner

Review of Planning Process to Date: Mr. Ritchie reported to the Committee that work is progressing on the community profile and critical facilities inventory but that a lot of information was still outstanding from Town departments. Information is also complete on the impacts, location, and losses associated with the seven natural hazards that are the focus of the plan. Mr. Ritchie indicated that meetings with individual departments and committee members will continue.

Review of Draft Chapters 1, 2, and 3: Mr. Maxwell distributed drafts of these introductory chapters. This includes the purpose and goals of the plan, how it will be adopted and implemented, the participation of the Committee and other Town departments and officials in the preparation of the future and how it will be implemented and monitored in the future. A list of all the relevant state, federal, and county emergency response and hazard mitigation plans, goals, and objectives was also compiled and described. A draft of the Community Profile and Critical Facilities Inventory will be available at the next meeting.

Risk Assessment: Mr. Maxwell indicated that the risk assessment associated with the natural hazards has begun. The FEMA HAZUS software will be used in preparing this. The risk assessment identifies areas and facilities in the town that could be vulnerable to natural hazard events, potential losses should an event occur, and how this relates to future development and facilities.

Public Involvement: The final public survey questionnaire was reviewed and approved by the Committee. Mr. Paladino indicated that representatives of some neighbor associations and civic organizations have been approached to be members of the committee. Mr. Ritchie has already spoken with them, and provided information presented at prior meetings, received input and suggestions, and provided them with handouts distributed at prior meetings. The community representatives will attend the next meeting.

Next Meeting Date: The next meeting will take place in the first quarter of next year.

**Town of Harrison
Hazard Mitigation Plan**

March 24, 2009

Proceedings of Meeting

Attendees

Town/Village of Harrison: Robert Paladino, Law Department, Committee Chair; Joe Bilotto, EMS Chief; Florinda Broderick, Engineering; Pat Cleary, Town Planner; Maureen MacKenzie, Comptroller; Steve Mancini, West Harrison Fire Department; Robert Schanil, Sergeant, Harrison Police Department; Steve Surace

Dolph Rotfeld Engineering: Michael Ritchie, Project Manager; Jim Maxwell, Project Engineer; P. Lynn Oliva, Project Planner

Review of Draft Chapter 4: A copy of the Community Profile and Critical Facilities Inventory was distributed to the Committee for its review. There are still gaps in the inventory data and Committee members were asked to see if they could “fill in the blanks” from their reports. A few more maps are still being finalized.

Risk Assessment: Mr. Maxwell distributed a handout and discussed the progress and findings of the risk assessment to date. It is expected that the risk assessment will be completed within the next month.

Mitigation Strategies: The Committee discussed the draft distributed by Ms. Oliva of the Town’s hazard mitigation goals and objectives. Five Goals were agreed upon: Protect Life and Property, Safeguard Critical Public Facilities & Infrastructure, Maintain and Enhance Emergency Response Capabilities, Protect the Environment, and Increase Awareness & Preparedness. The Committee also reviewed and refined the preliminary list of objectives associated with each goal. A list of potential mitigation actions related to the natural hazards was also discussed. It was stressed that this needed further review with Town departments and officials. Meetings were then set up with several Committee members.

Next Meeting Date: A date will be set after the conclusion of the meetings with the departments at which time a draft of the mitigations actions, priorities and cost-benefits will be available for review and discussion.

Town/Village of Harrison
Public Meeting
May 11, 2009
Town Hall
Hazard Mitigation Plan Committee

The meeting was called to order at 7:30pm by the Committee Chair, Mr. Robert Paladino.

The meeting was conducted by the consultants to the Town, Dolph Rotfeld Engineering(DRE), in order to obtain input and feedback for the draft Hazard Mitigation Plan from the Committee and the public.

A notice of the meeting had been posted and was available to the public.

A presentation of the overview of the Plan was conducted by the consultant(DRE) for the public in attendance.

Following the presentation the public was invited to comment and/or ask questions.

There was an extended discussion of the purpose of the Plan and it's impact on flooding conditions in the Town.

The meeting was adjourned following the final question.

MEMO

Public Meeting

To: Harrison Hazard Mitigation Planning Committee

Fr: Michael D. Ritchie, Project Manager
Dolph Rotfeld Engineering, P.C.

Date: May 1, 2009

Subject: Preliminary Draft Hazard Mitigation Plan

The attached preliminary draft represents the efforts of the Hazard Mitigation Planning Committee and Dolph Rotfeld Engineering, P.C., the Town's Planning Consultant, beginning with the kickoff meeting in May 2008.

The individual sections of the Plan are 95 % complete with the exception of the following sections which are not included in this preliminary draft:

- Mitigation Strategies which will be discussed at the May 11, 2009 meeting
- Capability Assessment which is a snapshot of the Town's resources and abilities
- Public Participation Questionnaire which is being compiled at the present time

We ask that each member of the Committee review this preliminary draft plan and as necessary, be prepared to discuss it at the May 11th meeting. The Mitigation Strategies will be the principal focus of the meeting for the purpose of getting Committee input.

Once the Mitigation Strategies have been finalized, any additions, changes or deletions to the Plan will be completed and a final draft prepared.

We appreciate the efforts of each member of the Committee in the preparation of this Plan which will assist the Town in being better prepared for natural disasters.

cc: Robert Paladino, Committee Chairman
Robert Wasp, P.E., Commissioner of Public Works
Joan Walsh, Supervisor

TOWN BOARD AGENDA
MEETING OF THE TOWN BOARD OF THE TOWN OF HARRISON,
TO BE HELD AT THE MUNICIPAL BUILDING,
1 HEINEMAN PLACE, HARRISON, NY., IN WESTCHESTER COUNTY,
ON THURSDAY, SEPTEMBER 17, 2009, AT 7:30 PM,
EASTERN DAYLIGHT SAVINGS TIME

PRESENTATION BY DOLPH ROTFELD RE: THE DRAFT MULTI-HAZARD MITIGATION PLAN, DATED SEPTEMBER 17, 2009, AS REQUIRED BY FEMA/SEMO.
(The PLAN will be available for review at the Harrison Public Library, 3 Bruce Avenue and in the Town Clerk's Office beginning September 17, 2009. Any comments should be returned to the Engineering Department, who will then forward to Dolph Rotfeld Engineering for discussion and possible inclusion on the plan.

REPORT BY RJ SUHRE RE: DOG PARK IN THE TOWN OF HARRISON
(No back up)

A. **REPORT FROM SUPERVISOR WALSH ON DECISIONS MADE**
FOLLOWING TOWN BOARD MEETINGS HELD ON SEPTEMBER 3, 2009.

None

B. **CORRESPONDENCE AND REPORTS:**

- 1a. Monthly report from the Town Clerk for August 2009.
- 1b. Monthly report from the Building Inspector for August 2009.
- 1c. Monthly report from Building Inspector RE: Fire Prevention for August 2009.
- 1d. Monthly report by the Commissioner of Public Works for August 2009, along with a chart of complaints/requests for services.

2. Notification by Supervisor Joan Walsh that due to a conflict with the annual inspection and dinner of the Purchase Fire Department, the second Town Board Meeting in October has been moved from Thursday, October 15th to **Thursday, October 22, 2009.**

C. **PUBLIC HEARING:**

LATE

ITEM: 1. PUBLIC HEARING – Continuation of the Public Hearing RE: Chapter 169, Landlord Registry.

D. **PERSONNEL:**

1. Notification by Chief of Police David Hall that P.O. Antony Salvo has enrolled at Westchester Community College for the 2009 Fall Semester, at a cost of \$1,369 for tuition and books, for the following courses:

1. Criminal Justice Seminar
2. Intro to Forensic Science

Chief Hall recommends that upon satisfactory completion and submission of P.O. Salvo's

attendance at the above listed courses, and that, upon submission of proof of payment, the Comptroller be authorized to audit and pay expenses outlined as per the HPA.

LATE

ITEM: 2. Request by the Chief of Police for approval for P.O. Robert Schanil and P.O. Thomas Milone to attend the 2009 New York Highway Safety Symposium, from October 18th through October 20, 2009, in Saratoga Springs, NY, at a total cost of \$700 for the registration fee, all meals, hotel and gas, for the two officers. This is a budgeted item. Funding is available in the Schooling Account 3120.415.

E. ACTIONS AND RESOLUTIONS:

1. Request by Joseph Hinchey, Director of Campus Safety & Security of Manhattanville College, on behalf of President Smith for approval to use the Recreation Department's portable stage for a Student Event. Upon Board approval Mr. Hinchey needs the stage to be delivered on Friday, October 23, 2009 and can be picked up on Monday, October 26th. There will be no rain date.

LATE

ITEM: 2. Request by Building Inspector Robert FitzSimmons that TBR #2002-432 be amended to name the Fire Inspector or the Assistant Fire Inspector as the driver of the Fire Safety Trailer. The present Resolution names only Steve Surface. Since Mr. Surface has now retired it is essential that other drivers be listed by title. The Fire Marshal or Assistant Fire Marshal.

LATE

ITEM: 3. Request by Building Inspector Robert FitzSimmons on behalf of Cerebral Palsy of Westchester for approval for a Special Events Permit RE: The Designer Showhouse of Westchester, from October 1st through November 8, 2009, at 11 Sarocosa Farm Lane, Purchase, NY. Further requested that the fee be waived. (Approval, only to hang a banner, was received at the September 3rd Meeting)

F. OLD BUSINESS:

G. MATTERS FOR EXECUTIVE SESSION:

October 1, 2009 version

TOWN BOARD AGENDA
MEETING OF THE TOWN BOARD OF THE TOWN OF HARRISON,
TO BE HELD AT THE MUNICIPAL BUILDING,
1 HEINEMAN PLACE, HARRISON, NY., IN WESTCHESTER COUNTY,
ON THURSDAY, OCTOBER 1, 2009, AT 7:30 PM,
EASTERN DAYLIGHT SAVINGS TIME

**PRESENTATION: BY SHEILA ABRAMS, RESOURCE DEVELOPMENT ASSOCIATE
FOR UNITED WAY OF WESTCHESTER AND PUTNAM COUNTIES
RE: "UNITED WAY'S FINANCIAL EDUCATION PROGRAM AT THE WORKPLACE"**

- A. **REPORT FROM SUPERVISOR WALSH ON DECISIONS MADE
FOLLOWING TOWN BOARD MEETINGS HELD ON SEPTEMBER 17, 2009.**
1. On motion of Councilman Cannella, seconded by Councilman Sciliano, with all members voting in favor, it was RESOLVED to settle a claim in the amount of \$4,764.50.
 2. On motion of Councilman Sciliano, seconded by Councilman Vetere, with all members voting in favor, it was RESOLVED to authorize the payment of the invoice of Angelo MacDonald, RE: disciplinary proceedings of Officer Tancredi as Counsel for charging party David Hall, in the amount of \$20,700.
- B. **CORRESPONDENCE AND REPORTS:**
- 1a. Monthly report by the Superintendent of Recreation for August 2009.
 - 1b. Monthly report by the Chief of Police for August 2009.
 2. Notification by Mae Carpenter, Commissioner, Department of Senior Programs & Services that Senior Law Day in Westchester a program offering Free Legal Advice to Older Adults, their Families and Significant Others, will take place at the Westchester County Center in White Plains, on Thursday, October 15th from 9 am to 1 pm. Pre-registration is required by October 6th, please call (914)813-6400. Free Breakfast and Free Parking will be provided.
 3. An invitation by Superintendent of Recreation Ron Belmont to the Supervisor/Mayor, Town Board Members and to all Residents of Harrison to participate in "It's Great to Live in Harrison/Columbus Day Observance" weekend of activities:

Saturday	October 10 th	Open House 10am-2pm Harrison Police Headquarters Fireworks, 7pm West Harrison Fire Department
Sunday	October 11 th	Car Show 10am-4pm Harrison Train Station Parking Lot
Monday	October 12 th	Parade 10am (line-up 9:30am) Festival in Riis Park immediately following
 4. Notification by the Superintendent of Recreation that it is an honor and a pleasure

to announce the recipient of this year's "Citizen of the Year" as Joseph Ruto. Mr. Ruto is a lifelong resident of Harrison, a Veteran and a volunteer member of the Harrison Fire Department for 50 years. The official presentation will be made at the It's Great to Live in Harrison Celebration/Columbus Day Observance, Monday, October 12, 2009.

C. PUBLIC HEARING:

1. PUBLIC HEARING – Amending Article VI, Supplemental Use and Dimensional Regulations that pursuant to Article 2, Section 10 and Article 3, Section 20 of the Municipal Home Rule Law, by Amending Section 235-18 (B) of the Town Code of the Town of Harrison entitled "Placement of accessory buildings and uses; garages; off-street parking; truck loading spaces by adding paragraph (6) in the B Residential Zoning District the maximum driveway width through the lot and at the street line shall be 20 feet". This amendment shall be known as Local Law No. __ of 2009.

2. PUBLIC HEARING – Amending Residence District, Table of Dimensional Regulations the Modification of the "B" Zone that pursuant to Article 2, Section 10 and Article 3, Section 20 of the Municipal Home Rule Law, by Amending the Residence Districts, Table of Dimensional Regulations to consider the modification of the "B" zone with an increase of the lot coverage from [30] to 35% (Footnote to table: All area under a roof shall be measured at the outermost exterior wall and included as Lot Coverage in this zone) and increase side yard minimums in the "B" zone from [5] feet to 7 feet and decrease abutting side street minimums on corner lot from [10] to 8 feet to the Town of Harrison Zoning Ordinance as Local Law No. __ of 2009.

D. PERSONNEL:

1. Request by Chief of Police David Hall for approval for P.O. Derka Cannon and P.O. Alexdra Graminga to attend the 2009 Northeast Sungard Public Sector Users Group (SUGA) Regional Training Conference in New Haven, Ct., from November 17th through November 20, 2009. The registration fee for this conference is \$100 per officer and with travel expenses for both officers should not exceed \$1,000. This is a budgeted item. Funding is available in Account 3120.415.

E. ACTIONS AND RESOLUTIONS:

1. Notification by Attorney Seth Mandelbaum, with the law firm of McCullough, Goldberger & Staudt, on behalf of his client Manhattanville College, that due to current budgetary constraints, the College will not be able to comply with the requirement that a building permit be applied for within 90 days of the Town Board's action (or by November 6, 2009). Mr. Mandelbaum is requesting approval for a 270 day extension of the time to apply for a building permit, until August 6, 2010.

2. Request by Joseph Bilotto, Chief of Operation for the HVAC, for approval for their fourth (4th) and final installment payment, in the amount of \$125,000. (**No back up**)

3. Notification by Superintendent of Recreation Ron Belmont that he is in receipt of

a letter by Mr. Glen DeFaber regarding the renaming of Congress Street Park. Mr. DeFaber feels, as many other residents do, that it would be appropriate to rename the park after Emilio Scantenato.

4. Request by Linda Whitehead, Attorney with the law firm of McCullough, Goldberger & Staudt, on behalf of her client Westchester Avenue Associates, LLC the owner of Harrison Executive Park located at 3000-3030 Westchester Avenue for approval to set the date of October 22, 2009 for a Public Hearing for a Special Exception Use Permit to build a new office building which would complete the quadrant of buildings at the office park. **(Planning Board approval has been granted. Resolution to follow.)**

5. Request by Acting Town Engineer Robert Wasp for authorization for the Law Department to review the Westchester County Intermunicipal Agreement Shared GIS Services. This Agreement would run from October 1, 2009 through September 30, 2014. Further, it is requested that upon review and approval, the Supervisor to sign same.

The Scope of services included in this IMA includes, but is not limited to:

- Development of internet, desktop and mobile mapping applications

- Providing of geospatial data warehouse services

- Assistance in database development projects

- Conducting Local Government GIS User Needs Assessment and project implementations

- Provided customized user training.

If the Town chooses to utilize these services, the standard rate for any service will be billed at \$51 per hour.

LATE

ITEM: 6. Request by Mark Mustacato, AIA for R.M.G. Associates on behalf of his clients, The Northeast Potter's House, Inc., for approval to set the date of October 22, 2009 for a Public Hearing for a Special Exception Use Permit RE: proposed change of use for 211-223 (217) Harrison Avenue, Block 133, Lot 31&(31&Po27). The Planning Board has agreed that this Use complies with the general conditions set forth in section 235-16 and 235-17 of the Zoning Code. Their Mission Statement is attached.

LATE

ITEM: 7. Request by Rosa Acocella, Cheerleading coach for the Harrison High School football team for a Special Events Permit for the traditional Rye Game Pep Rally and Bonfire to be held on Friday, October 16, 2009 at the Harrison High School, with the Bonfire to begin at approximately 8:30 PM. Ms. Acocella will notify the Police and Fire Department.

LATE

ITEM: 8. Notification from Supervisor Joan Walsh that she received a donation in the amount of \$250 from an anonymous donor, to be used for the Van Program that transports our Seniors to doctor appointments and to various Senior activities. Request for authorization to accept the donation.

LATE

ITEM: 9. Request by Acting Town Engineer Robert Wasp for authorization, that upon review and approval by the Law Department, for the Supervisor to execute the Agreement with the Federal Emergency Management Office and the State Emergency Management Office (FEMA/SEMO) for a time extension through May 1, 2010 to complete and file the Town's Multi-Hazard Mitigation Grant. A time extension was requested because the final draft, although almost complete at the submission deadline, needed some additional information to complete. Upon adoption of the plan, a copy of the plan and Resolution (sample attached) will be forwarded to the New York State Emergency Management Office (SEMO) for review and approval before it is submitted to The Federal Office of Emergency Management (FEMA) for their final action.

LATE

ITEM: 10. Request by Deputy Village Attorney Jonathan Kraut for approval, subject to review by the Law Department, for the Utility Easement and Sewer Pump Station Easement between Sarosca Farm Estates, LLC and the Town of Harrison.

F. OLD BUSINESS:

1. RJ Suhre -- Dog Park

G. MATTERS FOR EXECUTIVE SESSION:

October 1, 2009

2009 -- 392 -- b

ADOPTION OF THE FEMA MULTI-HAZARD MITIGATION GRANT
TIME EXTENSION AND DRAFT MITIGATION PLAN

On motion of Councilman Scappaticci, seconded by Councilman Vetere,

it was

BE IT RESOLVED that;

WHEREAS, the Town/Village of Harrison, with the assistance from Dolph Rotfeld Engineering, PC, has gathered information and prepared the Town/Village of Harrison Multi-jurisdiction Hazard Mitigation Plan; and

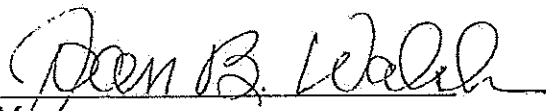
WHEREAS, the Town/Village of Harrison Multi-jurisdiction Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Town/Village of Harrison is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

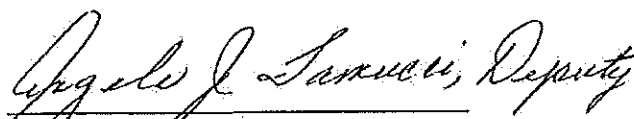
WHEREAS, the Town/village Board of the Town/Village of Harrison has reviewed the Plan and affirms that the plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the Town/Village Board that, the Town/Village of Harrison adopts the Town/Village of Harrison Multi-jurisdiction Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan,

Adopted this 1st day of October, 2009 at the meeting of the Town/Village Board of the Town/Village of Harrison.



Mayor



Town/Village Clerk

Public Participation

There were several points during the drafting of the Town/Village of Harrison Multi-Hazard Mitigation Plan where the general public, business owners and municipal officials from surrounding municipalities, as well as other agencies who operated and maintained facilities within the municipal boundaries of the Town/Village had an opportunity to ask questions and receive answers relative to the proposed plan. Additionally, four (4) members of the planning committee represented the three hamlets in the Town/Village (West Harrison, Purchase, Downtown Harrison) and one neighborhood which is impacted by the Brentwood Brook. Questions raised by the committee representing the four (4) hamlets and the Brentwood Brook Neighborhood were part of the overall discussions at the meetings and not specifically identified as stakeholder or public comments.

The Questionnaire that was available both in hard copy at the Town Hall, 1 Heineman Place, Harrison, New York, and on the Town/Village website (See Appendix D), had a total of thirty-two (32) additional stakeholder and public comments beyond those asked in the questionnaire. Twenty-two (22) related to the seven (7) natural hazards identified in the plan are indicated in the following Table.

Hazard \ Comments	Flood	Severe Storm	Severe Winter Storm	Extreme Heat	Drought	Earthquake	Dam Failure
Number/Hazard	19	0	1	0	0	2	0

Other stakeholder and public comments generic to the planning process as well as other hazards are listed in the following Table.

Concern \ Comments	Terrorism or Manmade Hazards	Need For Public Education	Need For Better Tree Maintenance	Inter-agency Communications	Stormwater	All Hazards
Number	4	1	1	1	1	2

Hazard Related Comments And Their Incorporation Into The Plan

Flood

The 19 stakeholder and public comments related to individual experiences with flooding on single properties as well as the overall need to improve drainage along watercourses and areas which often flood in the study area. Flooding has been determined to be the most prevalent natural hazard threat to the study area. Flooding concerns are addressed in Table 6-1 Mitigation Actions on Pages 168-171 and more specifically Mitigation Actions 1-7, 9-22, 24 and 26. Repetitive Flood event areas have been identified in the Risk Assessment – Flood Section, Figure 5-9A on Page 81 as well as individual areas in Table 5-4 on Page 65.

Severe Winter Storm

The one stakeholder and public comment related to alternate side parking for snow removal during winter events. The Town/Village currently has the ability to temporarily post on an emergency basis, alternate side parking should the need arise and as such is not addressed in the plan.

Earthquake

The two stakeholder and public comments related to earthquakes included a resident who did not know that the Town/Village was in an area which may be susceptible to earthquakes and the other suggested an educational effort specific to earthquakes. Earthquake information for the study area is indicated in Figures 5-30 and 5-32 on Pages 137 and 140 respectively. Table 6-1, Mitigation Action on Pages 168-171 addressed Earthquakes in items 1,2,6,7,8,11,13,14,15,16,17,18,23,24,26.

Terrorism or Manmade Hazards

Four stakeholder and public comments were received. These concerns are not part of the Town's current Multi-Hazard Mitigation Plan process. They may be part of the Town/Village's Emergency Response Plan which is scheduled to be updated / completed as part of Mitigation Action # 11 in Table 6-1 on Page 169.

Need for Public Education

One stakeholder and public comment indicated that educating the public is needed for all identified hazards. Mitigation Actions 16, 17 and 26 in Table 6-1 on Pages 170 and 171 address education and training for both the public and emergency responders.

Need for Better Tree Maintenance

One stakeholder commented on the need for better tree maintenance. Mitigation Action # 23 in Table 6-1, on Page 170 indicates that this is a concern during Severe Storms, Severe Winter Storms and Earthquakes and will be addressed.

Interagency Communications

One stakeholder commented on the need for coordination by emergency responders during hazard events and offered assistance where needed. Mitigation Action # 14 in Table 6-1 on Page 169 indicates that this need will be addressed.

Stormwater

One stakeholder commented that a loss of wetland areas in the study areas was contributing to the inability of stormwater runoff to be absorbed thus contributing to the potential for flooding. Mitigation Actions 19 and 20 on Page 170 are directly related to this concern.

All Hazards

One stakeholder raised concerns for all hazards which may impact the study area. Table 6-1 on Pages 168 -171 address all hazards identified as needing to be considered and the associated mitigation actions required.

Participation by Local, State and Federal Agencies, Neighboring Jurisdictions

The Table below depicts agencies which could have had an interest in the Town/Village's Multi-Hazard Mitigation Plan as well as municipalities which border the Town/Village. Of the ten entities contacted, five had an interest either as a member of the HMPC or because the same waterways pass through adjoining municipalities.

Agency and Function	Type of Outreach	Response to Outreach
New York State Department Of Environmental Conservation	Letter (local office) E-mail (Main Office)	Discussion via e-mail by Consultant with Floodplain Section Chief on Repetitive Loss Data and CRS program participation
New York State Department of Transportation	Letter	None
New York State Thruway Authority	Letter	None
City of Rye	Letter	Discussion with City Engineer by Consultant with respect to Blind Brook Flooding Issues and City Hazard Mitigation Plan
Village of Rye Brook	Letter	Discussion with Village Engineer by Consultant on any proposed watercourse projects
Village of Mamaroneck	Letter	None
Village of Scarsdale	Letter	None
City of White Plains	Letter	None
Westchester Joint Water Works (Water Utility)	Letter	Membership on HMPC Committee
NYSEMO	NA	Membership on HMPC, Plan Development Guidance

Appendix J contains copies of mailing to municipalities and agencies which may have an interest in the Town / Village of Harrison's Multi-Hazard Mitigation Plan being developed . This interest may be due to a municipalities sharing a border with the Town / Village or that a portion of an agencies infrastructure passes through the Town / Village. Response by those municipalities and agencies is documented in Appendix I Stakeholder and Public Comments.

Also contained herein is a copy of the Supervisor / Mayor's letter to residences and businesses in the study area announcing the development of the plan, inviting participation by completing the questionnaire available in Town Hall and on the Town website, as well as the actual website announcement with drop down to the questionnaire.



TOWN OF HARRISON
VILLAGE OF HARRISON
HARRISON MUNICIPAL BUILDING
1 HEINEMAN PLACE
HARRISON, NEW YORK 10528

Telephone: (914) 670-3009
jwalsh@harrison-ny.gov



JOAN B. WALSH
Supervisor of the Town of Harrison
Mayor of the Village of Harrison

November 6, 2008

Alfred A. Gatta
Village Manager
Village of Scarsdale
1001 Post Road
Scarsdale, NY 10583

Re: Town/Village of Harrison Hazard Mitigation Plan

Dear Mr. Gatta:

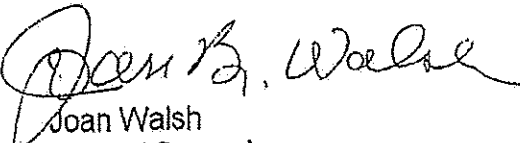
The Town/Village of Harrison has begun the process of developing a Multi-Hazard Mitigation Plan.

Work began on the plan in May 2008 and is expected to continue into early 2010. Information on the Town/Village's efforts will be posted on our website (<http://www.town.harrison.ny.us>) as the plan progresses. The website also includes a questionnaire that homeowners and businesses are being asked to complete and return.

Should you have any questions about our overall efforts to develop this plan, have projects underway in your jurisdiction which may be relevant to our efforts, or simply wish to be kept informed as to our progress, please contact Robert Wasp, P.E., Commissioner of Public Works, 1 Heineman Place, Harrison, New York 10528, telephone no. 914-670-3100.

Thank you.

Very truly yours,


Joan Walsh
Mayor / Supervisor



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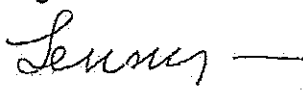


JOAN B. WALSH
Supervisor of the Town of Harrison
Mayor of the Village of Harrison

November 6, 2008

Leonard Verrastro
Village Manager
Village of Mamaroneck
123 Mamaroneck Avenue
Mamaroneck, NY 10543

Re: Town/Village of Harrison Hazard Mitigation Plan

Dear Mr. Verrastro: 

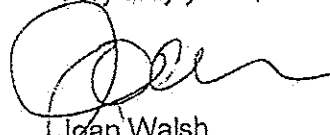
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Thank you.

Very truly yours,


Joan Walsh
Mayor / Supervisor



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jwalsh@harrison-ny.gov



JOAN B. WALSH
Supervisor of the Town of Harrison
Mayor of the Village of Harrison

November 6, 2008

William Janeway
Regional Director
NYS DEC
21 South Putt Corners Road
New Paltz, NY 12561-1696

Re: Town/Village of Harrison Hazard Mitigation Plan

Dear Mr. Janeway:

The Town/Village of Harrison has begun the process of developing a Multi-Hazard Mitigation Plan.

Work began on the plan in May 2008 and is expected to continue into early 2010. Information on the Town/Village's efforts will be posted on our website (<http://www.town.harrison.ny.us>) as the plan progresses. The website also includes a questionnaire that homeowners and businesses are being asked to complete and return.

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Thank you.

Very truly yours,

Joan Walsh
Mayor / Supervisor



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jwalsh@harrison-ny.gov



JOAN B. WALSH
*Supervisor of the Town of Harrison
Mayor of the Village of Harrison*

November 6, 2008

Joseph Delfino
Mayor
City of White Plains
255 Main Street
White Plains, NY 10601

Re: Town/Village of Harrison Hazard Mitigation Plan

Dear Mr. Delfino:

The Town Village of Harrison has begun the process of developing a Multi-Hazard Mitigation Plan.

Work began on the plan in May 2008 and is expected to continue into early 2010. Information on the Town/Village's efforts will be posted on our website (<http://www.town.harrison.ny.us>) as the plan progresses. The website also includes a questionnaire that homeowners and businesses are being asked to complete and return.

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Thank you.

Very truly yours,

Joan Walsh
Mayor / Supervisor



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JOAN B. WALSH
*Supervisor of the Town of Harrison
Mayor of the Village of Harrison*

November 6, 2008

O. Paul Shew
City Manager
City of Rye
1051 Boston Post Road
Rye, NY 10580

Re: Town/Village of Harrison Hazard Mitigation Plan

Dear Mr. Shew:

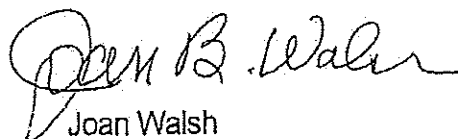
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Thank you.

Very truly yours,


Joan Walsh
Mayor / Supervisor



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jwalsh@harrison-ny.gov



JOAN B. WALSH
Supervisor of the Town of Harrison
Mayor of the Village of Harrison

November 6, 2008

Christopher Bradbury
Village Administrator
Village of Rye Brook
938 King Street
Rye Brook, NY 10573

Re: Town/Village of Harrison Hazard Mitigation Plan

Dear Mr. Bradbury:

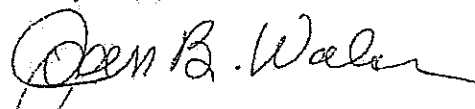
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Thank you.

Very truly yours,


Joan Walsh
Mayor / Supervisor



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JOAN B. WALSH
*Supervisor of the Town of Harrison
Mayor of the Village of Harrison*

November 6, 2008

Ramesh Mehta
Division Director
NYS Thruway Authority
4 Executive Blvd.
Suffern, NY 10901

Re: Town/Village of Harrison Hazard Mitigation Plan

Dear Mr. Mehta:

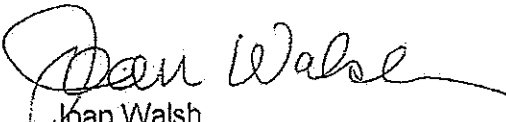
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Thank you.

Very truly yours,


Joan Walsh
Mayor / Supervisor



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jwalsh@harrison-ny.gov



JOAN B. WALSH
Supervisor of the Town of Harrison
Mayor of the Village of Harrison

November 6, 2008

Joan DuPont, P.E.
Regional Director
New York State Department of Transportation
Region 8 Office
4 Burnett Blvd.
Poughkeepsie, NY 12603

Re: Town/Village of Harrison Hazard Mitigation Plan

Dear Ms. DuPont:

The Town Village of Harrison has begun the process of developing a Multi-Hazard Mitigation Plan.

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Very truly yours,

Joan Walsh
Mayor / Supervisor



TOWN OF HARRISON
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1 HEINEMAN PLACE
HARRISON, NEW YORK 10803
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Telephone: (914) 670-3009
jwalsh@harrison-ny.gov

JOAN B. WALSH
Supervisor of the Town of Harrison
Mayor of the Village of Harrison

November 21, 2008

RE: Hazard Mitigation Plan – Preparing for the Future

Dear Friends:

Here in Harrison as well as in other parts of the country, severe weather has an impact on all of us whether it is snow, rain, or floods. To prepare for the future, we need a way to minimize those impacts, to know what has to be done for each type of event. Therefore the Town is working on a "Hazard Mitigation Plan." A Committee has been formed with members from Town departments as well as school officials. We are still in the early stages, and at this time are asking for your help.

Our intention is to prepare for a natural disaster before it occurs, to reduce the physical, social and economic impact on our residents. Having a Plan will also allow us to apply for federal, state and county funding that is specifically earmarked for hazard mitigation.

For the best possible Plan, we need your input as one of our vital sources of information. Your experiences with natural hazards that have occurred, or identification of potential hazards that could occur in the future, are important to our study and the Plan. It will be very useful to us to know about your experiences, here or elsewhere, with natural weather events such as winter storms, hurricanes, n'or easters, tropical storms, flooding, excessive heat and drought as well as earthquakes and tornados.

To make it easier for you to share this information with us, we have prepared a questionnaire. It is available at the Town Hall Reception Desk, or there is a "write-in" version on the Town's website: www.harrison-ny.gov, under "Important Announcements" and you can answer it online. It will take only a few minutes to complete, but the information will be invaluable to us.

Developing this Plan will help us apply for, and receive, funds for drainage and drainage-related improvements. As you know, we are actively designing and building storm water improvements, and outside sources of funding would be very welcome.

Thank you in advance for your cooperation, and your information. I will keep you informed as the Plan progresses.

Very truly yours,

Joan Walsh
Supervisor/ Mayor



HAZARD MITIGATION PLAN QUESTIONNAIRE

Everything you need to know about Harrison.



JOAN B. WALSH
Supervisor of the Town of Harrison
Mayor of the Village of Harrison

TOWN OF HARRISON
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1 HEINEMAN PLACE
HARRISON, NEW YORK 10528

Telephone: (914) 670-3009
jwalsh@harrison-ny.gov



October 27, 2008

RE: Hazard Mitigation Plan – Preparing for the Future

Dear Friends:

Here in Harrison, as well as in other parts of the country, severe weather has an impact on all of us whether it is snow, rain, or floods. To prepare for the future, we need a way to minimize those impacts, to know what has to be done for each type of event. Therefore we are working on a "Hazard Mitigation Plan." A Committee has been formed with members from town departments as well as school officials. We are still in the early stages, and at this time are asking for your help.

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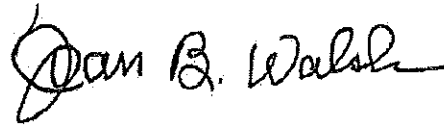
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Thank you in advance for your cooperation, and information. I will keep you informed as the Plan progresses.

Very truly yours,

A handwritten signature in black ink that reads "Joan B. Walsh". The signature is fluid and cursive, with a long horizontal stroke at the end.

Joan Walsh

Supervisor/ Mayor

[Please Click here to continue to the survey](#)