City of New Rochelle

Multi-Hazard

Mitigation Plan

September 2010

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CITY OF NEW ROCHELLE
MULTI-HAZARD MITIGATION PLAN

SEPTEMBER 2010

Prepared For:

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EXECUTIVE SUMMARY

The City of New Rochelle Multi-Hazard Mitigation Plan was prepared in response to the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 requires states and local governments to prepare all hazard mitigation plans in order to remain eligible to receive pre-disaster mitigation funds that are made available in the wake of federally-declared disasters. **To restate, by not participating in this process and adopting the resulting plan, the City will not be eligible to receive future pre-disaster mitigation funding.** It is also important to remember that pre-disaster mitigation funds are separate and distinct from those federal and state funds used in direct post-disaster relief. The availability of those funds remains unchanged; if there is a federally-declared disaster in Westchester County, the affected municipalities will still receive immediate recovery assistance regardless of their participation in this plan.

The ***Federal Emergency Management Agency*** (FEMA) estimates that for every dollar spent on damage prevention (mitigation), twice that amount is saved through avoided post-disaster damage repair.

However, DMA 2000 effectively improves the disaster planning process by increasing hazard mitigation planning requirements for hazard events and requiring participating municipalities to document their hazard mitigation planning process and identify hazards, potential losses, and mitigation needs, goals, and strategies.

City of New Rochelle Planning Process

DMA 2000 requires States to submit comprehensive Hazard Mitigation Plans for approval to the Federal Emergency Management Agency (FEMA) to be eligible for future pre-disaster mitigation funding. Local entities must also develop plans. To comply, the City of New Rochelle has developed and adopted this Multi-Hazard Mitigation Plan. Once the mitigation plan is completed and approved, the City will begin to work to implement complementary mitigation actions.

To support the planning process for this Hazard Mitigation Plan, the City of New Rochelle accomplished the following:

- Developed a planning group (Planning Committee);
- Identified hazards of concern;
- Profiled and prioritized these hazards;
- Estimated inventory at risk and potential losses associated with these hazards;
- Developed mitigation goals, objectives and actions that address the hazards that impact the area;
- Developed mitigation plan maintenance procedures to be executed upon conditional approval of the plan from the New York State Emergency Management Office (NY SEMO) and FEMA.

As required by DMA 2000, the City has informed the public about these efforts and provided opportunities for public comment and input on the planning process. In addition, numerous agencies and stakeholders were contacted and some have participated as core or support members to provide input and expertise to the City's mitigation planning efforts.

The City of New Rochelle intends to incorporate mitigation planning as an integral component of daily government operations through existing processes and programs. The Plan is posted on the City of New Rochelle's web site and copies of the plan are available for review at the City Hall, along with instructions to facilitate public input and comment on the Plan. Updates to the plan will be similarly

announced after annual plan reviews and 5-year updates. The City of New Rochelle's Manager's Office will be responsible for receiving, tracking, and filing public comments regarding this plan.

City of New Rochelle Multi-Hazard Mitigation Plan Adoption

This mitigation plan will be reviewed and adopted by the City Board. A copy of the resolution regarding adoption of the plan will be included as Appendix B.

City of New Rochelle Profile

The City of New Rochelle is one of the 43 municipalities that make up Westchester County. The City is located in the southeastern portion of the County and occupies approximately 10.3 square miles (land). It is bounded to the north by the Town-Village of Scarsdale; to the east by the Town of Mamaroneck and the Village of Larchmont; to the south, the Long Island Sound; and to the west by the City of Mount Vernon, the Town of Eastchester and the Villages of Pelham and Pelham Manor. The City of New Rochelle does not include any incorporated Villages or Hamlets.

With a total land area of approximately 10.4 square miles, approximately 65.6-percent of the City's land area is developed by residential (Low, Medium and High), commercial, industrial and transportation uses. About 11.7-percent of the City's land area is covered by evergreen and deciduous vegetation. Approximately 17.2-percent of the City's land area is used for recreational grasses (parks, golf courses, etc.) and nearly four-percent of the land is undeveloped (Westchester County GIS, 1999). Soil and exposed rock and water occupy less than one-percent each of the City's total land area.

This combination of natural and developed features lays the foundation for the City of New Rochelle's vulnerability to natural hazards, both in terms of exposure to hazard events and the potential impact of hazard events. The City of New Rochelle's Multi-Hazard Mitigation Plan provides a general overview of current and anticipated population and land use within the study area. This information provides a basis for making decisions regarding the type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support decisions regarding future development in vulnerable areas. For potential increases in vulnerability, the City can then plan ahead to mitigate those vulnerabilities early in the development process or can direct development to areas of lower risk. The Planning Committee will revisit the mitigation plan regularly to ensure that mitigation actions support sustainability in order to minimize increased risk and to support the implementation and targeting of specific mitigation actions to address the potential impacts of development over time.

Risk Assessment

A key component of a mitigation plan is the accurate identification of risks posed by a hazard and the corresponding impacts to the community. The process of identifying hazards of concern, profiling hazard events, and conducting a vulnerability assessment is known as a risk assessment. The risk assessment portion of the mitigation planning process included the steps shown in Figure ES-1. Each of these steps is summarized below.

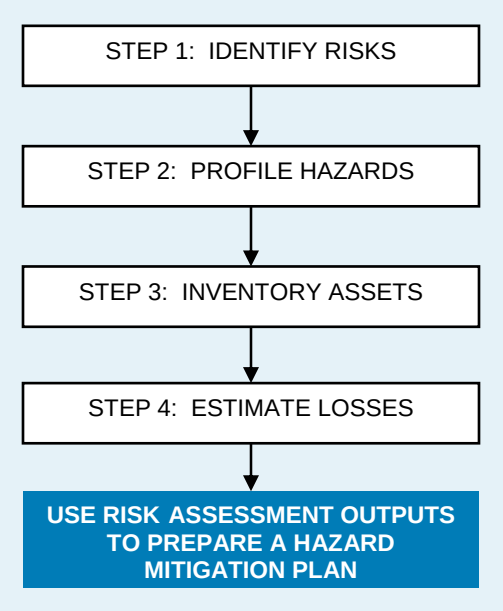
Step 1: The first step of the risk assessment process is to identify the hazards of concern. FEMA's current regulations only require an evaluation of natural hazards. Natural hazards are natural events that threaten lives, property, and many other assets. Often, natural hazards can be predicted, where they tend to occur repeatedly in the same geographical locations because they are related to weather patterns or physical characteristics of an area.

The City of New Rochelle focused on a full range of natural hazards that could impact the area, and then identified and ranked those hazards that presented the greatest concern. The following list of five (5) hazards of concern, in order of hazard ranking determined by the Planning Committee, was selected for further evaluation in the mitigation plan:

1. Coastal Storm
2. Severe Winter Storm
3. Flood
4. Coastal Erosion
5. Earthquake

Step 2: The next step of the risk assessment is to prepare a profile for each hazard of concern. These profiles assist communities in evaluating and comparing the hazards that can impact their area. Each type of hazard has unique characteristics that vary from event to event. That is, the impacts associated with a specific hazard can vary depending on the magnitude and location of each event (a hazard event is a specific, uninterrupted occurrence of a particular type of hazard). Further, the probability of occurrence of a hazard in a given location impacts the priority assigned to that hazard. Finally, each hazard will impact different communities in different ways, based on geography, local development, population distribution, age of buildings, and mitigation measures already implemented.

Figure ES-1. Risk Assessment Process



Steps 3 and 4: To understand risk, a community must evaluate what assets they possess and which are exposed or vulnerable to the identified hazards of concern. Hazard profile information combined with data regarding population, demographics, general building stock, and critical facilities at risk prepares the community to develop risk scenarios and estimate potential damages and losses for each hazard.

For this risk assessment, loss estimates and exposure calculations 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 effects on the inventory, or built, environment. Therefore, potential exposure and loss estimates are approximate and do not predict precise results but rather are used to characterize risk and assign priorities for mitigation efforts.

As part of the risk assessment, annualized losses were calculated for the earthquake, flood and wind hazards using HAZUS-MH MR4. Annualized losses are useful for mitigation planning because they provide a baseline upon which to 1) compare the risk of one hazard across multiple jurisdictions and 2) compare the degree of risk of all hazards for each participating jurisdiction. Please note that annualized loss does not predict what losses will occur in any particular year. The table below compares the annualized losses by hazard for the City of New Rochelle. Flood has the highest potential for general building stock losses per year compared to the earthquake and wind hazards.

Summary of Estimated Annualized General Building Stock Losses (Buildings and Contents) by Hazard for the City of New Rochelle

Planning Area	Earthquake	Flood	Wind
City of New Rochelle	$85,000	$8,157,000	$2,733,022

Source: HAZUS-MH MR4
Note: HAZUS-MH MR4 does not analyze the severe winter storm or coastal erosion hazard.

City of New Rochelle Mitigation Strategy

The outcomes of the risk assessment, supplemented by Plan participant input, provided a basis to review past mitigation actions, future goals, and appropriate local mitigation actions.

The mitigation strategy portion of the plan includes:
- A summary of past and current mitigation efforts;
- Local hazard mitigation goals and objectives;
- Identification and analysis of mitigation measures and projects being considered;
- Mitigation strategy (goals and objectives);
- Mitigation action plan (summary of specific actions).

Goals

The Planning Committee identified the following five over-arching mitigation goals that summarize the hazard reduction outcomes that the City wants to achieve:

1. Protect Life and Property
2. Increase Public Awareness and Preparedness
3. Enhance Disaster Preparedness, Response and Recovery
4. Protect the Environment and Natural Resources
5. Promote Partnerships

Objectives and Capability Assessment

The Planning Committee developed 27 objectives that meet multiple goals. The goals, along with their corresponding objectives, then guided the development and evaluation of specific mitigation actions.

A capability assessment was prepared by the City of New Rochelle. According to FEMA 386-3, a capability assessment is an inventory of a community's missions, programs and policies; and an analysis of its capacity to carry them out. This assessment is an integral part of the planning process. It identifies, reviews, and analyzes local and state programs, polices, regulations, funding and practices currently in place that may either facilitate or hinder mitigation.

By completing this assessment, the City learned how or whether they would be able to implement certain mitigation actions by determining the following:

- Types of mitigation actions that may be prohibited by law;
- Limitations that may exist on undertaking actions; and
- The range of local and/or state administrative, programmatic, regulatory, financial and technical resources available to assist in implementing their mitigation actions.

Identification, Prioritization, Analysis, and Implementation of Mitigation Actions

Throughout the mitigation planning process, potential mitigation actions were submitted by the Planning Committee members. In addition, Committee members reviewed information garnered from the risk assessment and the public involvement strategy and were provided with a catalog of potential mitigation

actions (see Appendix F) that addressed the various hazards of concern, met the stated plan goals and objectives, and were within the capabilities of the City. The City identified appropriate local mitigation actions, along with the hazards mitigated, goals and objectives met, lead agency, estimated cost, potential funding sources and the proposed timeline. These actions are presented in Section 6.

The Planning Committee performed a qualitative benefit/cost review on the identified mitigation actions that weighed the estimated benefits of a project versus the estimated costs to establish a parameter to be used in the prioritization of a project. 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 were prioritized accordingly.

Plan Maintenance Procedures

Hazard mitigation planning is an ongoing process. Section 7 of this plan presents procedures for plan maintenance and updates. Therefore, the Planning Committee will continue ongoing mitigation efforts to implement the mitigation plan and revise and update the plan as necessary.

To monitor implementation of the mitigation plan, the Planning Committee members will meet annually to discuss the status of plan implementation and will prepare a summary report of the plan status and any needed updates. The mitigation evaluation will address changes as new hazard events occur, as the area develops, and as more is learned about hazards and their impacts. The evaluation will include an assessment of whether the planning process and actions have been effective, whether development or other issues warrant changes to the plan or its priorities, if the communities' goals are being reached, and whether changes are warranted. In addition, the mitigation plan will be updated at a minimum within the 5-year cycle specified by DMA 2000.

POINT OF CONTACT

To request information or provide comments regarding this plan, contact the City of New Rochelle Manager's Office.

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AAA	American Avalanche Association
AMSL	Above mean sea level
ASFPM	Association of State Floodplain Managers
B	Billion ($)
BCA	Benefit Cost Analysis
BCEGS	Building Code Effectiveness Grading Schedule
BFE	Base Flood Elevation
BGR	Federal Institute of Geosciences and Natural Resources
BOCA	Building Officials Code Administration
CDC	Center of Disease Control
CEMP	Comprehensive Emergency Management Plan
CFS	Cubic Feet Per Second
CPC	Climate Prediction Center
CRREL	Cold Regions Research and Engineering Laboratory
CRS	Community Rating System
DEM	Digital Elevation Model
DFIRMs	Digital Flood Insurance Rate Maps
DIR	Drought Impact Reporter
DIs	Damage Indicators
DMA 2000	Disaster Mitigation Act of 2000
DOD	Degrees of Damage
DPW	Department of Public Works
DR	Disaster Declarations
EF Scale	Enhanced Fujita Scale
EM	Emergency Management
EMS	Emergency Medical Services
EOC	Emergency Operation Center
F Scale	Fujita Scale
FD	Fire Department
FEMA	Federal Emergency Management Agency
FHMP	Flood Hazard Mitigation Program
FIA	Flood Insurance Administration
FIRM	Flood Insurance Rate Map
FIT	Flood Information Tool

FIS	Flood Insurance Study
FMPs	Flood Mitigation Plans
FMA	Flood Mitigation Assistance
GeoMAC	Geospatial Multi-Agency Coordination
GIS	Geographic Information System
GPM	Gallons Per Minute
HA	Housing Program (FEMA)
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
HPC	Hydrometeorological Prediction center
HPDE	Earth Dam (HAZUS Defined)
HPDG	Gravity Dam (HAZUS Defined)
HPDM	Masonry Dam (HAZUS Defined)
HPDR	Rockfill Dam (HAZUS Defined)
HQ	Headquarters
HS	High School
IA	Individual Assistance (FEMA grant)
IFG	Individual and Family Grants
IPCC	Intergovernmental Panel of Climate Change
K	Thousands ($)
LIDAR	Light Detection and Ranging
M	Million ($)
MARFC	Middle Atlantic River Forecast Center
MESO	Multi-County Environmental Storm Observatory
MGD	Million Gallons per Day
MMI	Modified Mercalli Scale
MPC	Mitigation Planning Community
Mph	Miles per Hour
MS	Middle School
MRP	Mean Return Period

NA	Not Available/Not Applicable
NAC	National Avalanche Center
NCDC	National Climate Data Center
NEHRP	National Earthquake Hazard Reduction Program
NESIS	Northeast Snowfall Impact Scale
NFIP	National Flood Insurance Program
NHC	National Hurricane Center
NID	National Inventory of Dams
NOAA	National Oceanic and Atmospheric Administration
NPDP	National Performance of Dams Program
NR	Not Required
NRCC	Northeast Regional Climate Center
NRCS	Natural Resource Conservation Service
NSF	National Science Foundation
NSSL	National Severe Storms Laboratory
NVRC	Northern Virginia Regional Commission
NWIS	National Water Information System
NWS	National Weather Service
NY	New York
NYC	New York City
NYCEM	New York City Area Consortium for Earthquake Loss Mitigation
NYCOEM	New York City Office of Emergency Management
NYS	New York State
NYSC	New York State Climate
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSDPC	New York State Disaster Preparedness Commission
NYSEMO	New York State Emergency Management Office
PA	Public Assistance (FEMA grant)
PD	Police Department
PDM	Pre-Disaster Mitigation Program
PGA	Peak Ground Acceleration
RL(P)	Repetitive Loss (Property)
RCV	Replacement Cost Value

RR	Railroad
RV	Replacement Value
SA	Spectral Acceleration
SBA	Small Business Association
SFHA	Special Flood Hazard Area
SHELDUS	Spatial Hazard Events and Losses Database for United States
SPC	Storm Prediction Center
SPI	Standard Precipitation Index
SRL(P)	Severe Repetitive Loss (Property)
SWOO	Strengths, Weaknesses, Obstacles and Opportunities
SWSI	Surface Water Supply Index
TBA	To Be Announced
TBD	To Be Determined
TSTM	Thunderstorm
UA	Urbanized Area
UC	Urban Cluster
U.S.	United States
USACE	U.S. Army Corps of Engineers
USD	U.S. Dollar
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WC	Westchester County
WCI	Wind Chill Index
WCT	Wind Chill Temperatures
WIMS	Weather Information Management System
WWPS	Wastewater Pump Station
WWTP	Wastewater Treatment Plant