

TOWNSHIP OF WOODBRIDGE, MIDDLESEX COUNTY, NEW JERSEY

STRATEGIC RECOVERY PLANNING REPORT

POST SANDY PLANNING ASSISTANCE GRANT

NEW JERSEY DEPARTMENT OF COMMUNITY AFFAIRS, OFFICE OF LOCAL
PLANNING SERVICES

MAY 2014



PREPARED BY HEYER, GRUEL & ASSOCIATES

TABLE OF CONTENTS

2 INTRODUCTION

7 SUMMARY OF VULNERABILITIES AND OPPORTUNITIES

30 APPROACHES TO REBUILDING

34 RECOMMENDATIONS

39 PROPOSED PROJECTS

42 CRITIAL INFRASTRUCTURE

INTRODUCTION

In October of 2012, Super Storm Sandy devastated New Jersey when the storm came on shore creating wide spread power outages, fuel shortages, and damage from high winds and flooding. The Township of Woodbridge, which sits along the Arthur Kill, Raritan River, and the Woodbridge River, suffered substantial flooding and wind damage due to the storm. In the subsequent months after the storm the Township took a proactive approach to its recovery. Woodbridge has been participating in New Jersey's Blue Acres program, which will give residents whose homes were affected by the storm's flood waters, relief. The buy-out process, which Woodbridge is one of the first in the State to receive approval, is currently on-going.

The Township of Woodbridge Strategic Recovery Planning Report will help to organize the Township's recovery efforts and identify further funding sources for planning related recovery efforts from the State of New Jersey. The report includes:

- Summarization of the community's vulnerabilities and opportunities created or exacerbated by the storm
- Identification of approaches to rebuilding that will be more resistant to damage from future storm events

- Recommendations and prioritization of municipal actions to promote recovery from the effects of Sandy and reduce vulnerabilities to future storms
- Description of proposed projects specifically related to an application for a NJ Department of Community Affairs' Post Sandy Planning Assistance Grant.
- Mapping of critical infrastructure and their vulnerability to disruption of services.
- Mapping the areas of critical current and future vulnerability, including FEMA flood plain zones and elevation requirements.

The Woodbridge Report addresses issues within the entire Township, with a focus on the communities and neighborhoods that have suffered the most damage and have been part of the Blues Acres program administered by the State of New Jersey. These neighborhoods include Woodbridge Proper, Port Reading, and Sewaren. The report also focuses on the municipal infrastructure, properties, and buildings that were affected by the storm throughout the Township.

This report is intended to provide guidance for future planning related projects that may be eligible for grant funding under the Post Sandy

Planning Assistance Grant program. As part of the Post Sandy Planning Assistance Grant program, the Township of Woodbridge was awarded funds to complete this report.

Post Sandy Planning Assistance Grant

The Strategic Recovery Planning Report is the first step in the larger Post Sandy Planning Assistance Grant Program administered by the New Jersey Department of Community Affairs, Office of Local Planning Services. The overall goal of the Post Sandy Planning Assistance Grant is to support long range planning for redevelopment in communities and counties that sustained damage during Super Storm Sandy in October 2012. The grant program is intended to provide local municipalities with planning support services to develop community recovery plans that strategically address the issues confronting them. The program’s mission also includes providing local governments with tools needed to efficiently manage municipal operations, supplementing the ongoing efforts of the storm-impacted local and county governments to rebuild and revitalize.

Community Profile: Woodbridge

The Township of Woodbridge is 24.2 square miles in size and is located in northeastern Middlesex County. According to the 2010 US Census, it is the sixth largest municipality in New Jersey with a population of over 99,585. Woodbridge is the oldest original Township in the State, founded in 1664, and is named after Reverend John W. Woodbridge. The Township of Woodbridge is bordered by Clark Township, the City of Rahway, the City of Linden, and the Borough of Carteret to the north; the Arthur Kill and the City of Perth Amboy to the east; the Raritan River to the south; and Edison Township to the west. The Township contains ten distinct sections, each with a unique character and history. Although these are separate sections, the Township functions and thrives as “one community.”

Woodbridge is a mature suburb of the New York Metropolitan region. The Township is one of the most accessible in New Jersey and it is the only municipality where the Garden State Parkway and New Jersey Turnpike intersect. There are a plethora of other major roadways in the Township, including Interstate 287, Route 1, Route 9, Route 440, Route 27 and Route 35. The Township also has three train stations: Avenel, Metropark and Woodbridge. All three stations provide direct service via New Jersey Transit to Newark and New York City. Metropark is also served by Amtrak.

Woodbridge’s location at the mouth of both the Raritan River and Arthur Kill, heightens the potential for flooding. The Township has a history of flooding along the Raritan River in the Keasbey section of the Township, along the Woodbridge River in the Woodbridge Proper section, and along the Arthur Kill in the Sewaren and Port Reading sections.

Background Planning Documents

- *Woodbridge Master Plan, 2009*

The Woodbridge Master Plan was completed in 2009 as a comprehensive vision for the Township. Within the ten elements, the Plan identified issues and goals related to sustainability, resiliency, and alternative energy. These overarching goals include:

- Preserving environmentally sensitive areas within the Township including wetlands, flood plains, water bodies, and areas of significant vegetation.
- Creating a network of recreation areas and permanently preserved open space throughout the Township, as well as preserving natural stream corridors and restricting development in flood hazard areas.
- Preserving existing undeveloped and underdeveloped properties.

- Strengthening and creating non-auto linkages throughout the Township
- Enhancing public access to the waterfront
- Promoting renewable energy

Recommendations for the Township in regards to sustainability and resiliency include:

- The creation of a greenway network
- The expansion of the use of alternative fuels for municipal vehicles
- Encouragement of the construction of “green” buildings
- The preservation of properties for open space and recreation

- *Woodbridge Storm Water Management Plan, 2005*

The Woodbridge Storm Water Management Plan documents the strategy for the Township of Woodbridge to address storm water-related impacts. The standards set forth within the Plan minimize the adverse impact of storm water runoff on water quality and water quantity and the loss of groundwater recharge that provides base flow in receiving water bodies. The plan describes long-term operation and

maintenance measures for existing and future storm water facilities.

Goals set forth in the Plan include:

- Reduce flood damage, including damage to life and property;
 - Minimize, to the extent practical, any increase in storm water runoff from any new development;
 - Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
 - Prevent, to the greatest extent feasible, an increase in nonpoint pollution;
 - Maintain the integrity of stream channels for their biological functions, as well as for drainage;
 - Minimize pollutants in storm water runoff from new and existing development;
 - Protect public safety through the proper design and operation of storm water basins
- *Middlesex County Multi-Jurisdictional Hazard Mitigation Plan, Draft 2013*
Middlesex County developed a Multi-Jurisdictional Hazard Mitigation Plan to increase awareness that natural hazards, especially flood and wind, have the potential to affect people, physical assets and operations in Middlesex County. The Plan

analyzes the County's risk, sets goals and objectives as it pertains to hazard mitigation, and highlights planned projects by the municipality to prevent and mitigate the effects of future natural disasters.

- *Woodbridge Redevelopment Plans*

The Township of Woodbridge has created several redevelopment plans for areas within the Township that have been deemed in need of redevelopment and/or rehabilitation. Several of these redevelopment plans lie within areas of the Township where the effects of Super Storm Sandy were felt. These plans include:

- Port Reading Avenue

Three redevelopment plans, extending along the northern side of Port Reading Avenue from the Township's border with Carteret to Vernon Way, target this area for redevelopment as a gateway into Woodbridge.

- Keasbey

The Keasbey area is largely an industrial area. The majority of the section has been divided into a number of distinct redevelopment areas.

- Pennval Road

The Pennval Road Redevelopment Area is located in the Woodbridge Proper neighborhood of Woodbridge. The 110-acre area is generally defined by Woodbridge Avenue and the Woodbridge River to the east; Pennval Road to the north; the New Jersey Transit North Jersey Coast line to the west; and the southern boundary line of Woodbridge Township to the south. The area is characterized by industrial uses.

SUMMARY OF VULNERABILITIES AND OPPORTUNITIES

Impact Assessment

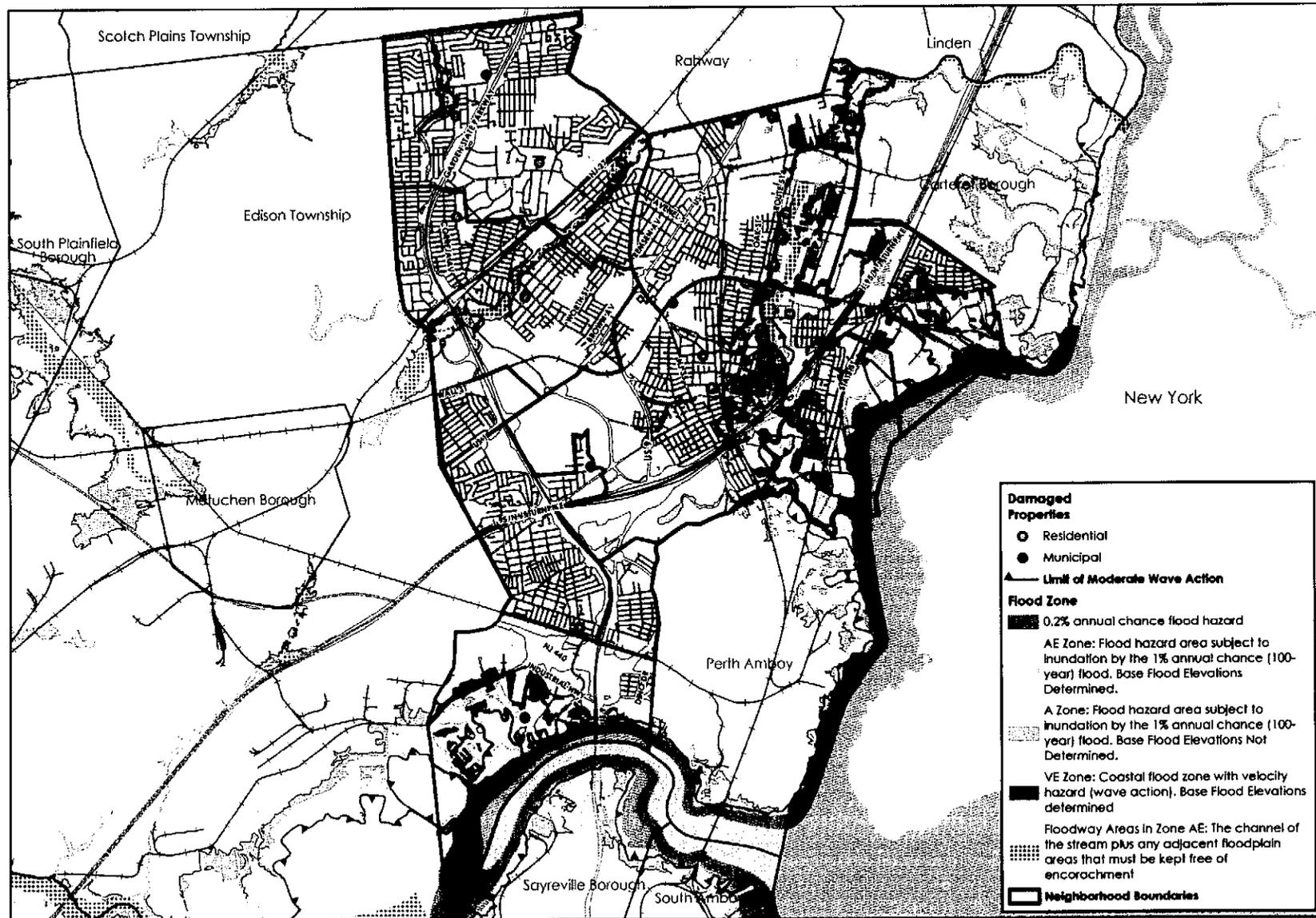
According to Township records, the Township of Woodbridge experienced an assessment reduction of more than \$1.2 million to residential properties, combined with current claims of between \$7-8 million worth of damage to municipal owned facilities as a result of Super Storm Sandy. The damage that was suffered primarily occurred within the Watson-Crampton neighborhood in the Woodbridge Proper section, as well as in the Sewaren and Port Reading sections of the Township. Sporadic damage was also reported in the Colonia, Avenel, Keasbey, Fords, and Iselin sections of the Township.

Sections of the Township most affected by the storm were along the Woodbridge River which over the past 30 years has become an area that has suffered from multiple flooding events due to land development and the industrial uses present at the mouth of the river that have weakened the area's natural defenses.

The municipal and residential properties that were damaged have been compiled. Mapping of the affected areas, as well as maps with FEMA Super Storm Sandy surge overlays show the areas affected by the storm surge along the rivers in the Township.



Woodbridge Township Residential Storm Damage from Super Storm Sandy, 2013							
Address	Structure to Demo	Unsafe	Date Complete	Notes	Original Assessment	Adjusted Assessment	Assessment Reduction
35 Douglas st	Storm damaged / Roof off	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$57,400	\$23,700	\$33,700
96 Elizabeth ave	Garage crushed by tree		12/17/2012	Remove for 2013	\$82,200	\$76,200	\$6,000
3 Warwick rd	Storm Damaged / Tree Porch	owner called	12/3/2012	removed side room for 2013	\$150,800	\$145,600	\$5,200
116 Amherst ave	Storm Damaged / Tree	owner called	12/3/2012	Reduced to 75% storm damaged	\$66,300	\$55,400	\$10,900
306 Kennedy st	Storm Damaged / Tree	Unsafe structure	12/4/2012	Reduced to 10% storm damaged	\$82,800	\$27,000	\$55,800
65 Green st	Storm Damaged / Fire	Unsafe structure	12/5/2012	Reduce to 10% fire damaged	\$61,700	\$30,000	\$31,700
101 Church st	Garage / Storm damaged		11/16/2012		\$71,600	\$68,900	\$2,700
607 Watson ave	Storm Damaged / Foundation	Unsafe structure	12/6/2012	Partial reduction storm damaged	\$88,600	\$78,500	\$10,100
606 Watson ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$63,300	\$22,500	\$40,800
612 Watson ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$53,700	\$21,100	\$32,600
586 Watson ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$70,100	\$23,200	\$46,900
584 Watson ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$70,700	\$23,300	\$47,400
580 Watson ave	Storm Damaged	owner called	12/3/2012	Reduced to 10% storm damaged	\$71,000	\$23,500	\$47,500
534 Watson ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$71,500	\$23,400	\$48,100
537 Heidelberg ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$58,600	\$22,200	\$36,400
535 Vesper ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$68,600	\$23,000	\$45,600
522 Vesper ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$66,400	\$26,400	\$40,000
87 Claire ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$94,800	\$28,800	\$66,000
54 Claire ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$55,200	\$19,600	\$35,600
99 Bridge st	Storm Damaged / Tree	Unsafe structure	12/3/2012	Reduce to 50% storm damaged	\$73,900	\$45,200	\$28,700
83 S Roberts st	Storm Damaged / Electric panel	Unsafe structure	12/3/2012	repaired/ remove finished bsmnt	\$61,400	\$53,500	\$7,900
75 S Roberts st	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$90,300	\$23,600	\$66,700
139 S Roberts st	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$60,500	\$18,700	\$41,800
135 S Roberts st	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$62,400	\$18,800	\$43,600
92 S Roberts st	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$98,100	\$23,300	\$74,800
76 S Roberts st	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$59,700	\$20,600	\$39,100
66 Sewaren ave	Storm Damaged / Foundation	Unsafe structure	12/3/2012	Reduced to 10% storm damaged	\$70,300	\$20,500	\$49,800
4 Sewaren ave	Storm Damaged	owner called	12/31/2012	Reduced 50% of building	\$101,500	\$56,000	\$45,500
10 Cragwood rd	Storm Damaged			Reduced for 13 storm damaged	\$1,042,300	\$904,100	\$138,200
61 E Tappen st	Storm Damaged / Foundation	Unsafe structure	12/6/2012	Reduced to 10% storm damaged	\$65,600	\$26,300	\$39,300
57 E Tappen st	Storm Damaged / Foundation	Unsafe structure	12/6/2012	Reduced to 10% storm damaged	\$55,200	\$21,700	\$33,500
Totals					\$3,246,500	\$1,994,600	\$1,251,900

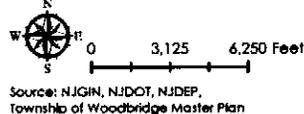
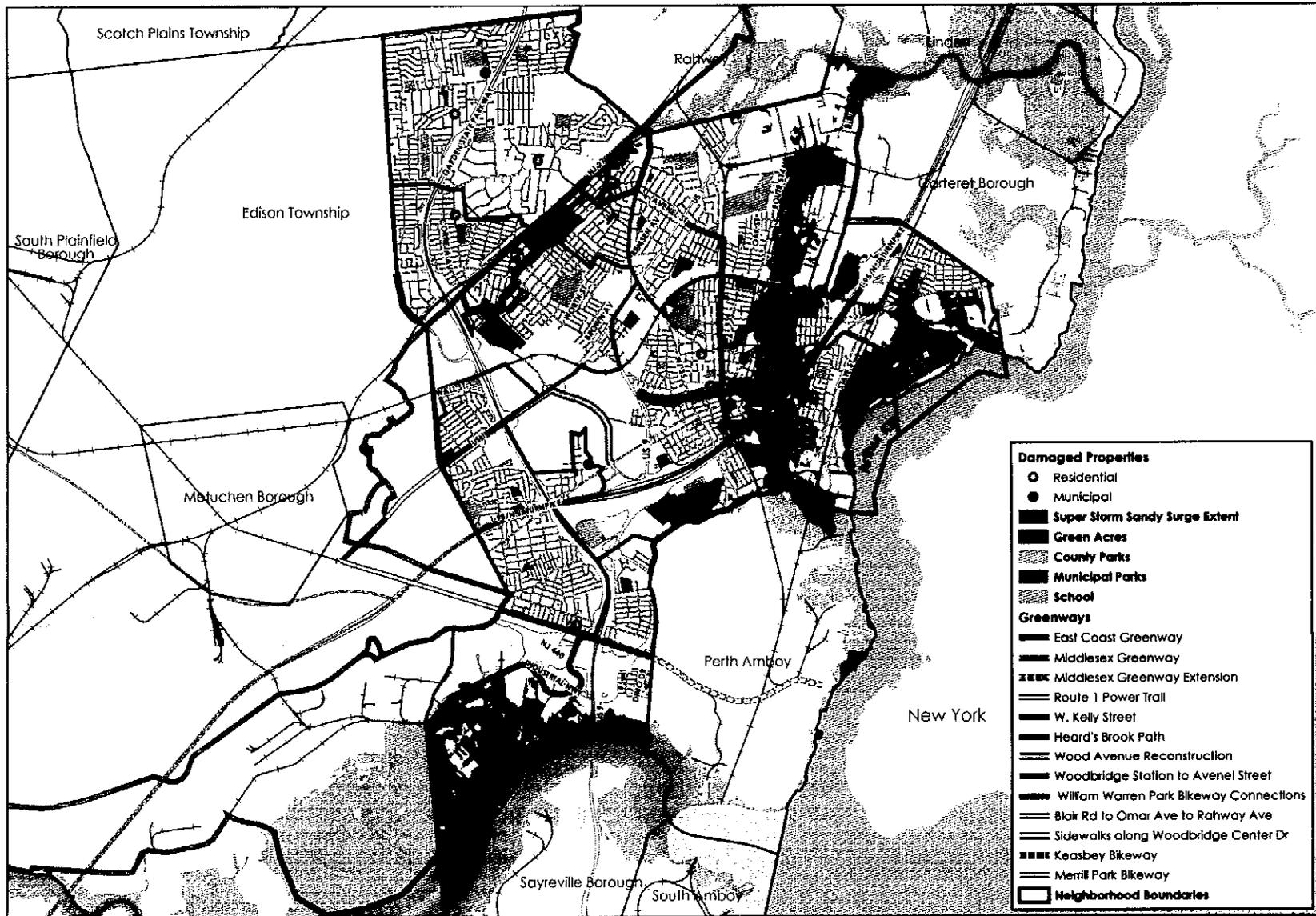


0 3,125 6,250 Feet

Source: NJGIN, NJDOT, NJDEP, Township of Woodbridge, FEMA January 2014 FRM

FEMA Base Flood Elevation Map
Woodbridge SRPR

Heyer, Gruel & Associates
May 2014



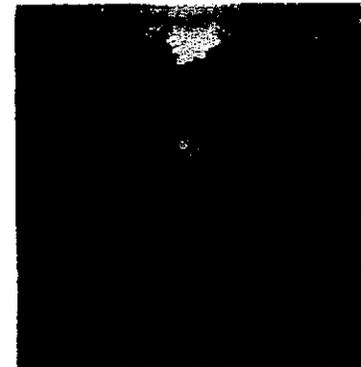
Parks and Open Space
Woodbridge SRPR

 Heyer, Gruel & Associates
May 2014

Vulnerabilities

The identification of vulnerabilities is the first step in understanding how the Township was impacted from the Super Storm Sandy.

- Flooding in the area along the Woodbridge River in the Watson-Crampton and South Robert Street Neighborhoods
- Damage to Township DPW facilities, equipment and resources from flooding along the Raritan River in Keasbey
- Damage to Waterfront Walkway along the Arthur Kill in Sewaren
- Flooding in Saints Field Neighborhood in Port Reading
- Flooding in industrial area along Keasbey Waterfront
- Damage to power substations and utility infrastructure along Woodbridge Avenue and in Sewaren, e.g. PSEG facilities
- Damage to storm and sanitary sewer systems, e.g. pumping stations
- Damage to critical transportation routes such as Route 27, Route 35, West Avenue, Cliff Road, Port Reading Avenue, and Crows Mill Road
- Wind and flooding damage to municipal and community facilities, e.g. town hall, fire/ ambulance facilities, library, animal shelter, community center, parks and school fields, etc.
- Environmental contamination from businesses and industries that store or utilize hazardous materials



Opportunities

The Township of Woodbridge has already begun the process of implementing resources, programs, and policies for residents impacted by Super Storm Sandy.

Proactive Township and Community

- Blue Acres Program

The NJDEP Blue Acres Program is an acquisition program that targets the buyout of flood prone structures and the preservation of the floodplain. It is a subset of the Green Acres State Land Acquisition (SLA) Program. Woodbridge is actively participating in this program with the first round of buy-outs currently scheduled for Summer 2014.

Community Meetings were held by NJDEP on July 23, 2013, December 6, 2013, December 17, 2013, and January 27, 2014.

- Reconstruction, Rehabilitation, Elevation and Mitigation (RREM) Program

The NJDCA RREM Program assists homeowners affected by Super Storm Sandy to complete necessary projects to make homes livable and to comply with requirements for structures located in floodplains. Woodbridge has been actively

participating in the program with many residents receiving recovery funds.

Existing Framework of Regional Open Space Systems

- An opportunity exists to create linkages with linear parks that provide environmental protection and a green buffer to flood prone areas.
- Township and County Open Space Plans- Areas along the Arthur Kill and Woodbridge River may be optimal locations for greenway corridors.

Established Road, Electricity, Public Sewer, and Storm Water Systems

- Woodbridge has extensive infrastructure systems servicing its residents
- An opportunity exists to create a smart parallel electrical micro-grid that can be utilized during storm events.

National Flood Insurance Program Community Rating System Implementation

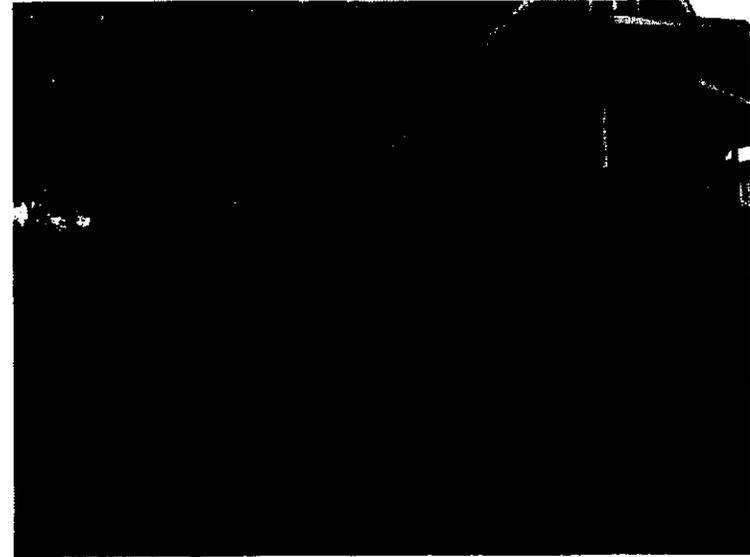
- The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of:

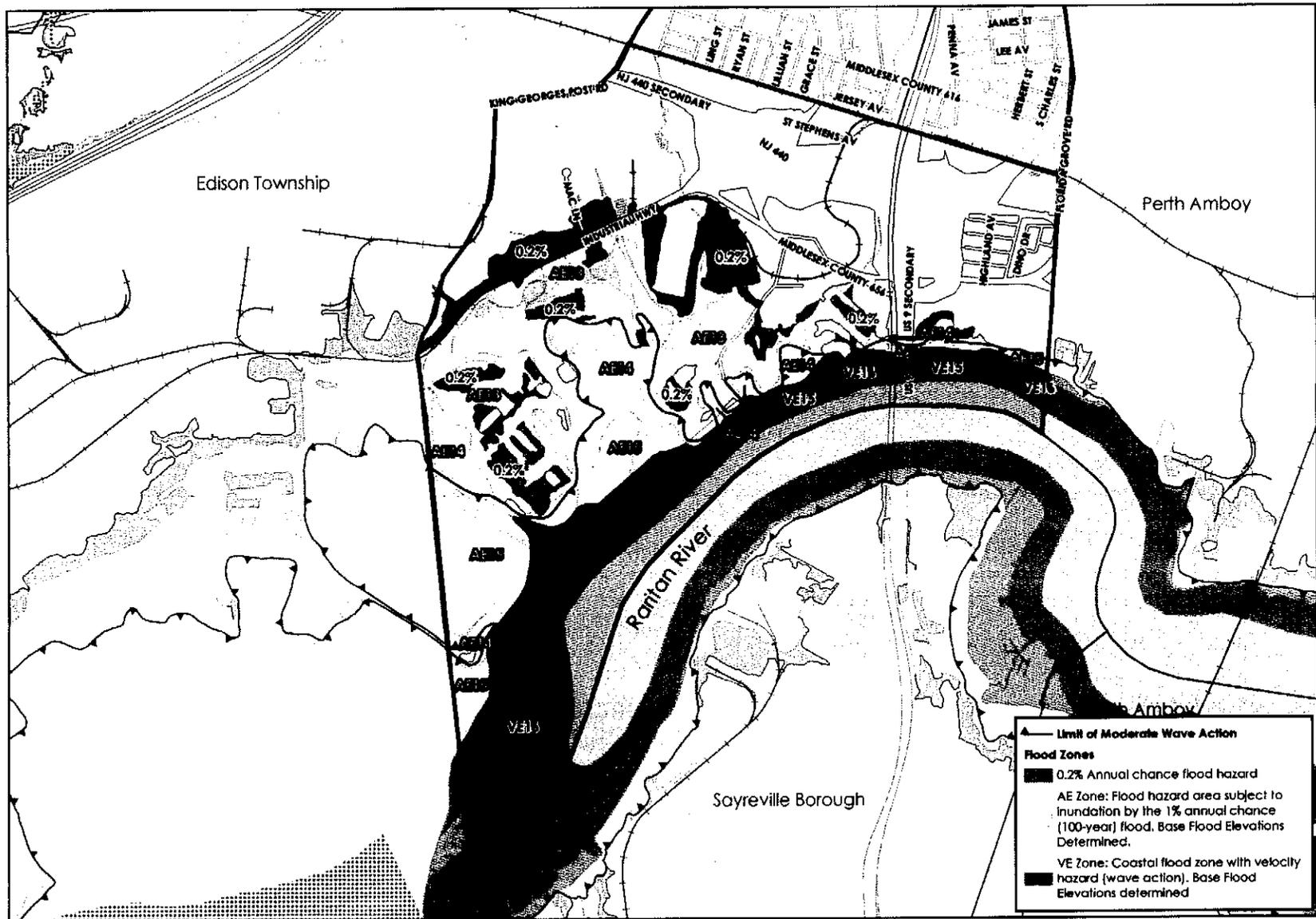
reducing flood damage to insurable property; strengthening and supporting the insurance aspects of the NFIP; and encouraging a comprehensive approach to floodplain management.

- Woodbridge Township had entered the program in 1992 with a rating of 10. The Township currently proposes to take action to be reinstated in the program.

Rehabilitation/ Redevelopment Plans

- Rehabilitation and Redevelopment Plans are a tool to be used by the Township to properly plan for the reuse/ proper use of floodplains and flood prone areas within the Township. With the recent revisions in the Redevelopment Law, a non-condemnation option is now available to municipalities.
- Possible Rehabilitation and Redevelopment Plans could be used in the Watson-Crampton Neighborhood and the South Robert Street Neighborhood, as well as revisions to the Keasbey Redevelopment Plans. In conformity with the Blue Acres program regulations, the incorporation of open space into the neighborhood revitalization, rehabilitation and/ or redevelopment plans will be an important aspect of the planning process.





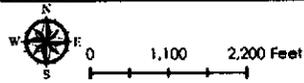
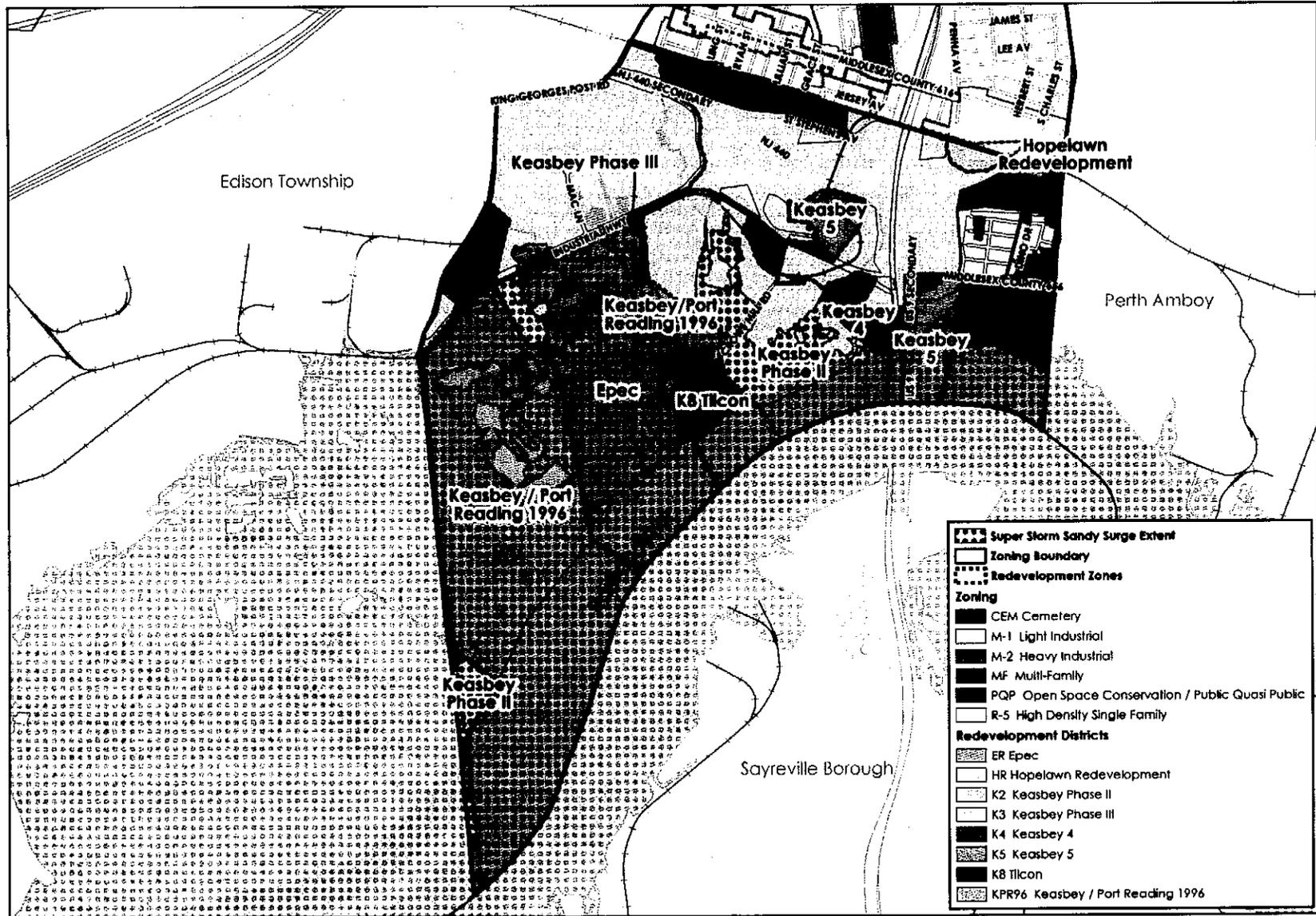
0 1,100 2,200 Feet

Source: NJGIN, NJDOT, NJDEP, Township of Woodbridge, FEMA 2014 Revised BFE Maps

FEMA Base Flood Elevation Map: Kearsbey
Woodbridge SRPR



Heyer, Gruel & Associates
May 2014

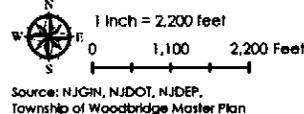
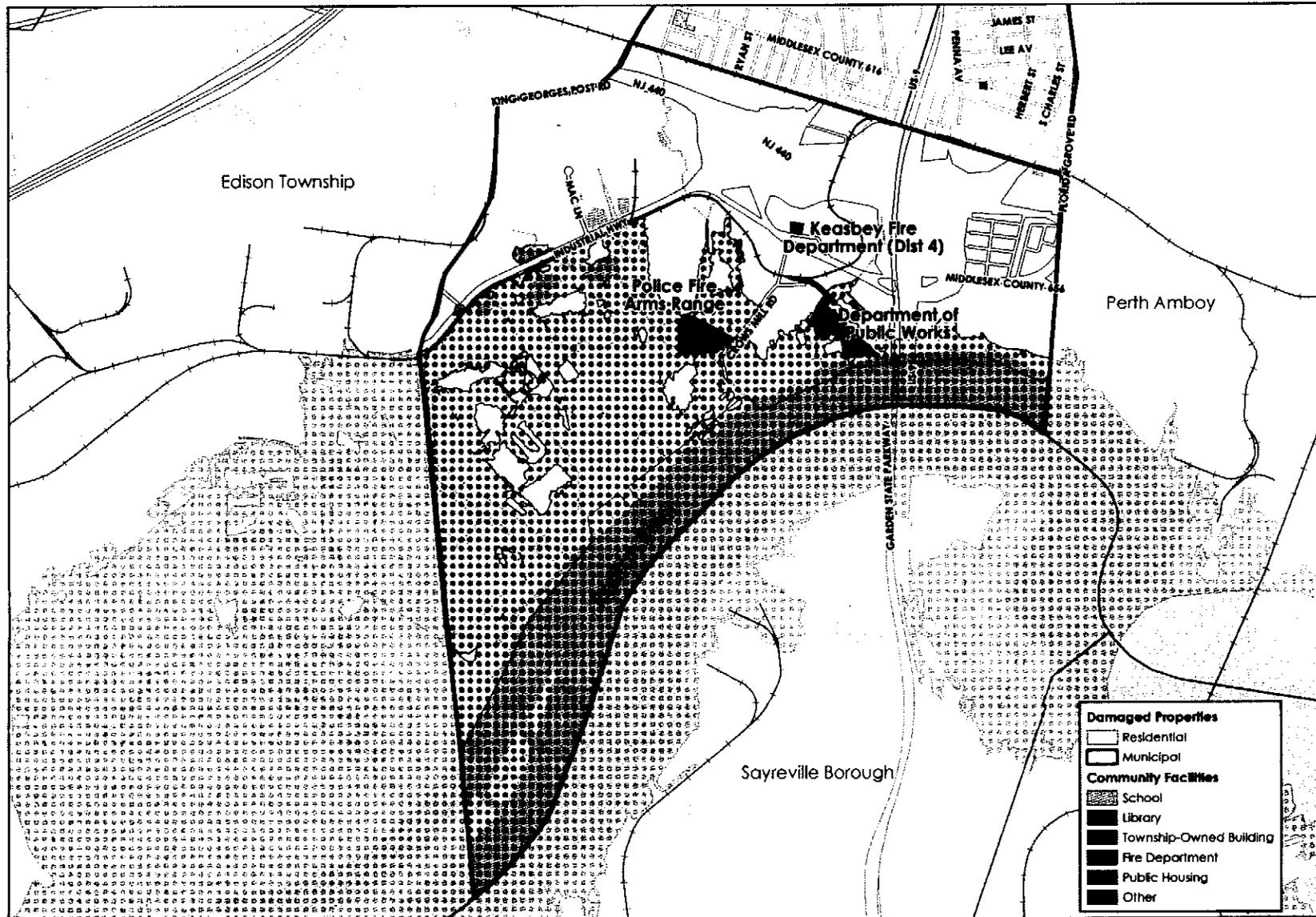


Source: NJGIM, NJDOT, NJDEP, Township of Woodbridge Master Plan

Zoning/Redevelopment: Keasbey
Woodbridge SRPR

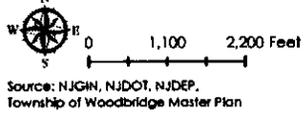


Heyer, Gruel & Associates
May 2014



Community Facilities & Super Storm Sandy Surge Extent:
 Kearsbey
 Woodbridge SRPR

 Heyer, Gruel & Associates
 May 2014

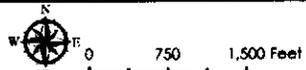
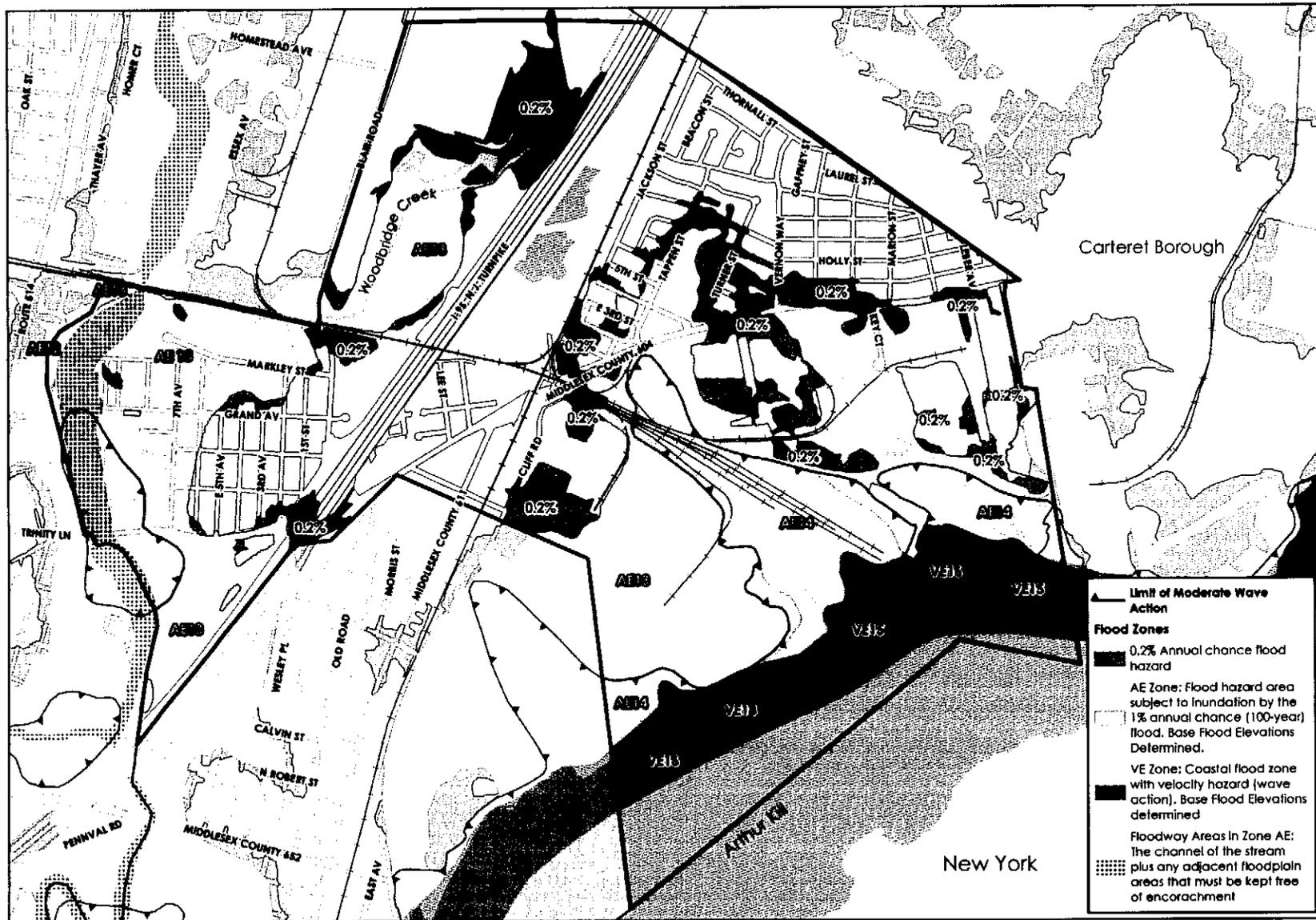


Source: NJGIM, NJDOT, NJDEP, Township of Woodbridge Master Plan

Parks and Open Space: Kearsbey
Woodbridge SRPR



Heyer, Gruel & Associates
May 2014

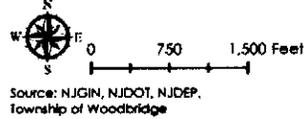
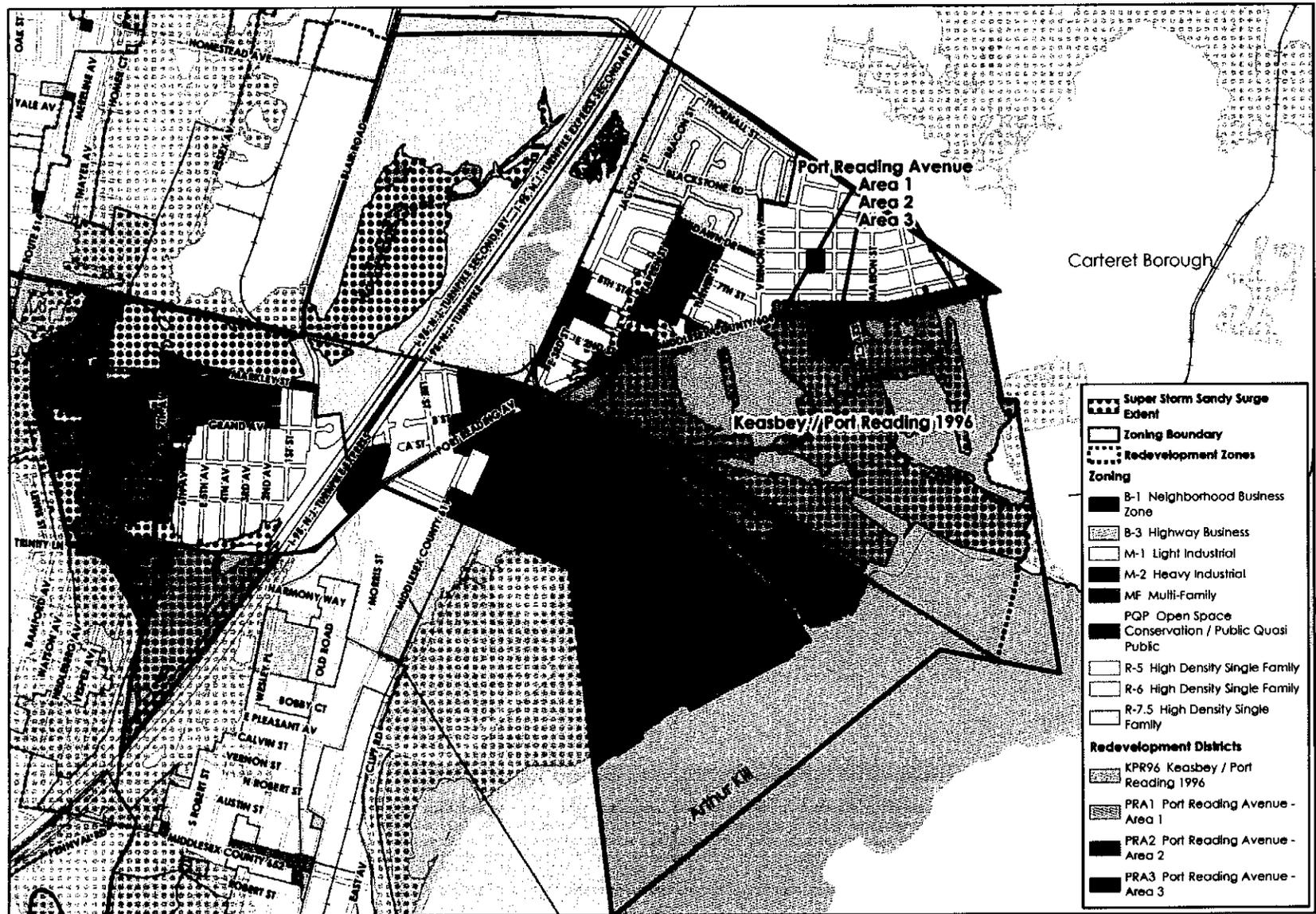


Source: NJGIN, NJDOT, NJDEP, Township of Woodbridge, FEMA January 2014 FIRM

FEMA Base Flood Elevation Map: Port Reading
Woodbridge SRPR



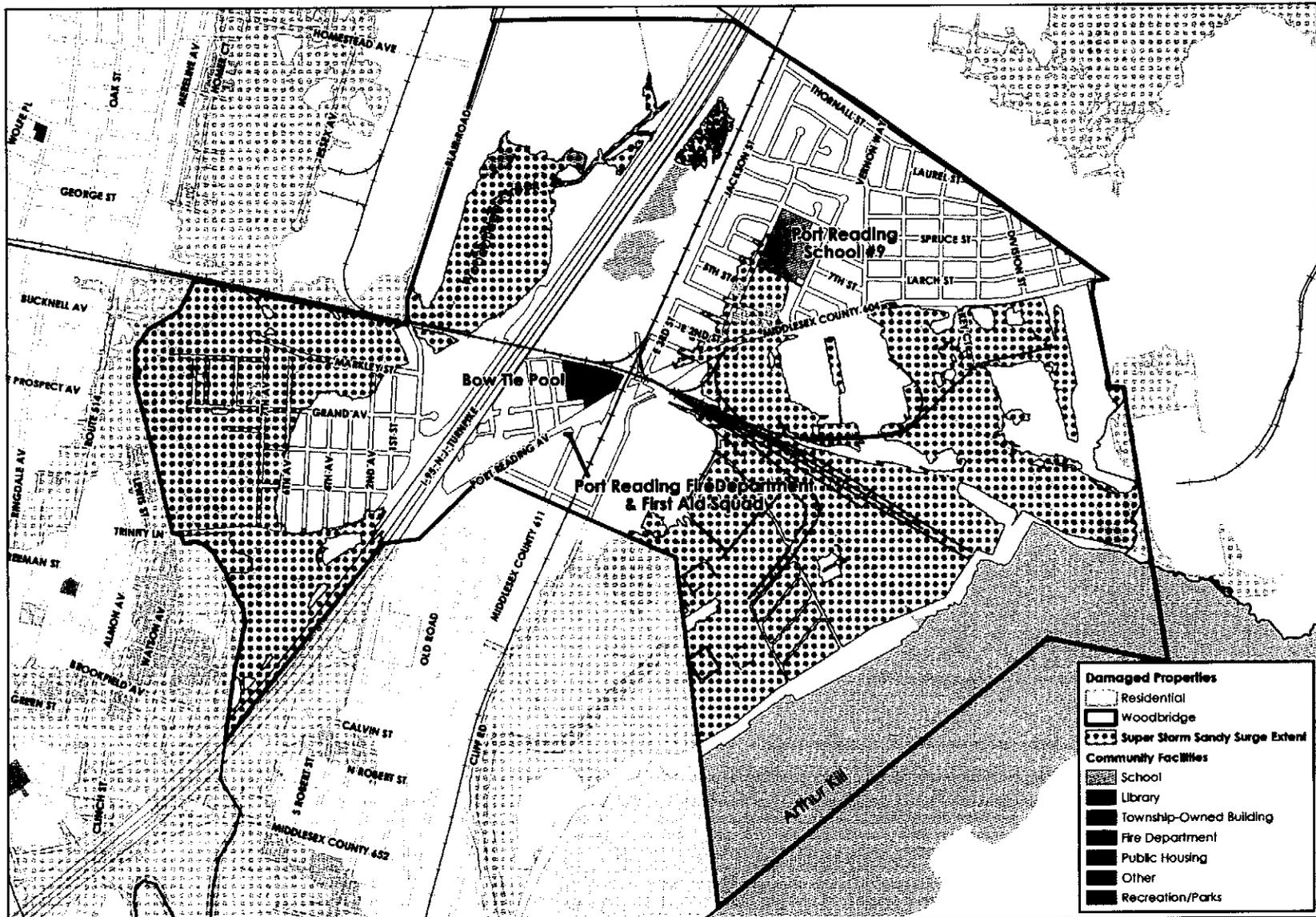
Heyer, Gruel & Associates
May 2014



Zoning/Redevelopment: Port Reading
Woodbridge SRP



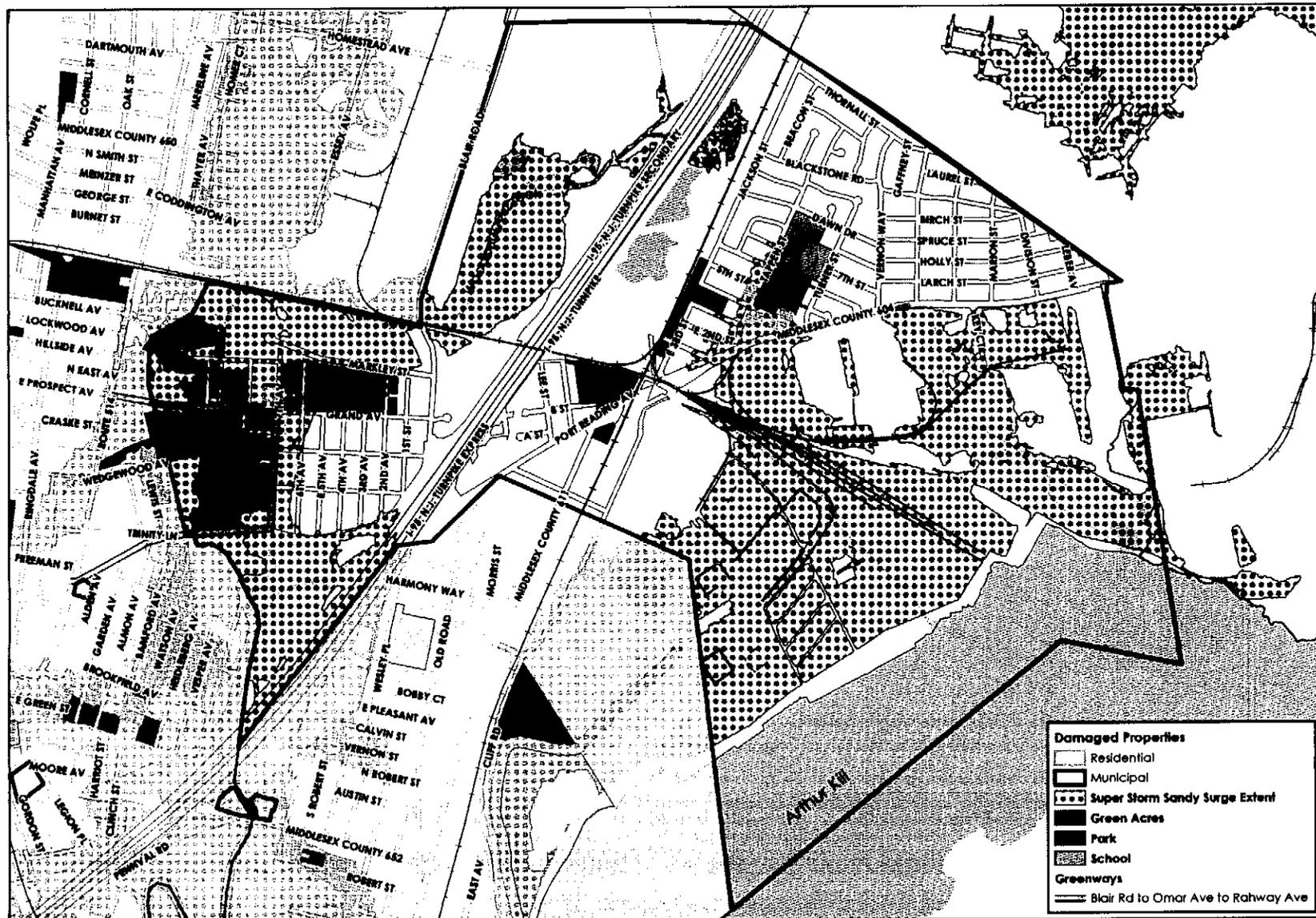
Heyer, Gruel & Associates
May 2014



Source: NJGIN, NJDOT, NJDEP.
 Township of Woodbridge Master Plan

Community Facilities & Super Storm Sandy Surge Extent:
 Port Reading
 Woodbridge SRPR

Heyer, Gruel & Associates
 May 2014

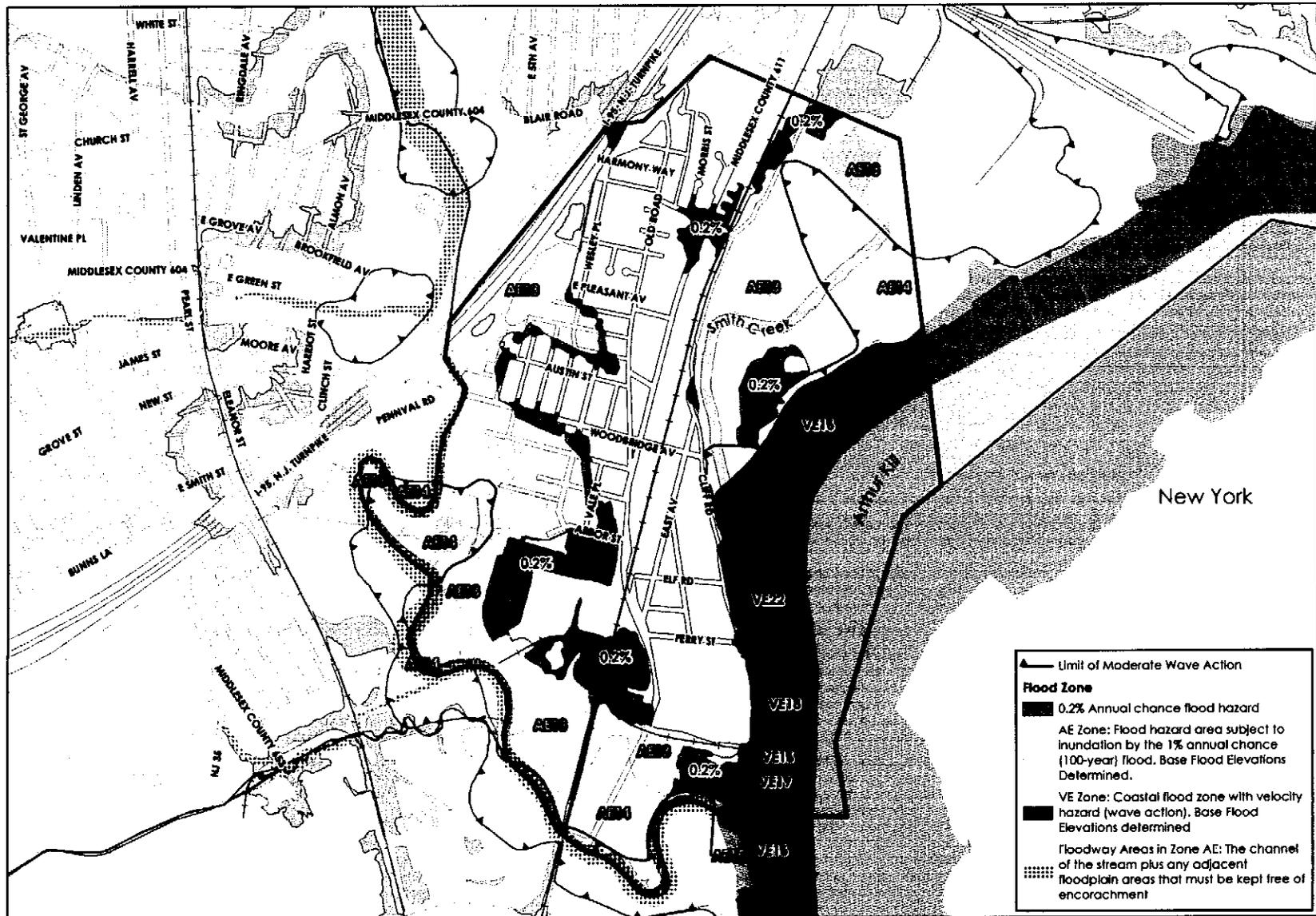


Source: NJGIN, NJDOT, NJDEP,
Township of Woodbridge Master Plan

Parks and Open Space: Port Reading
Woodbridge SRPR



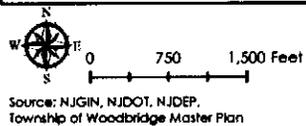
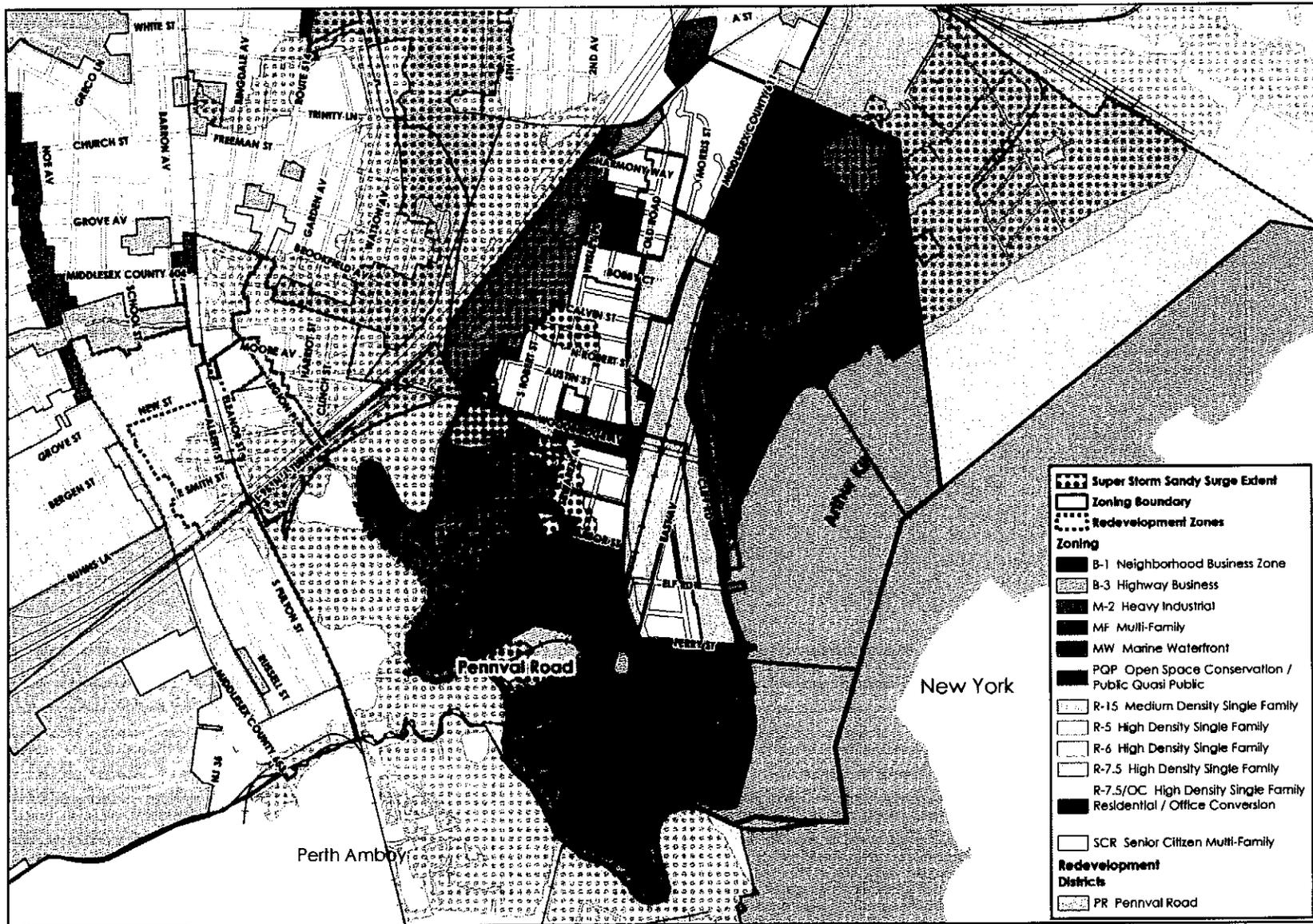
Heyer, Gruel & Associates
May 2014



Source: NJGIN, NJDOT, NJDEP, Township of Woodbridge, FEMA 2014 Revised BFE Maps

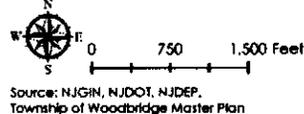
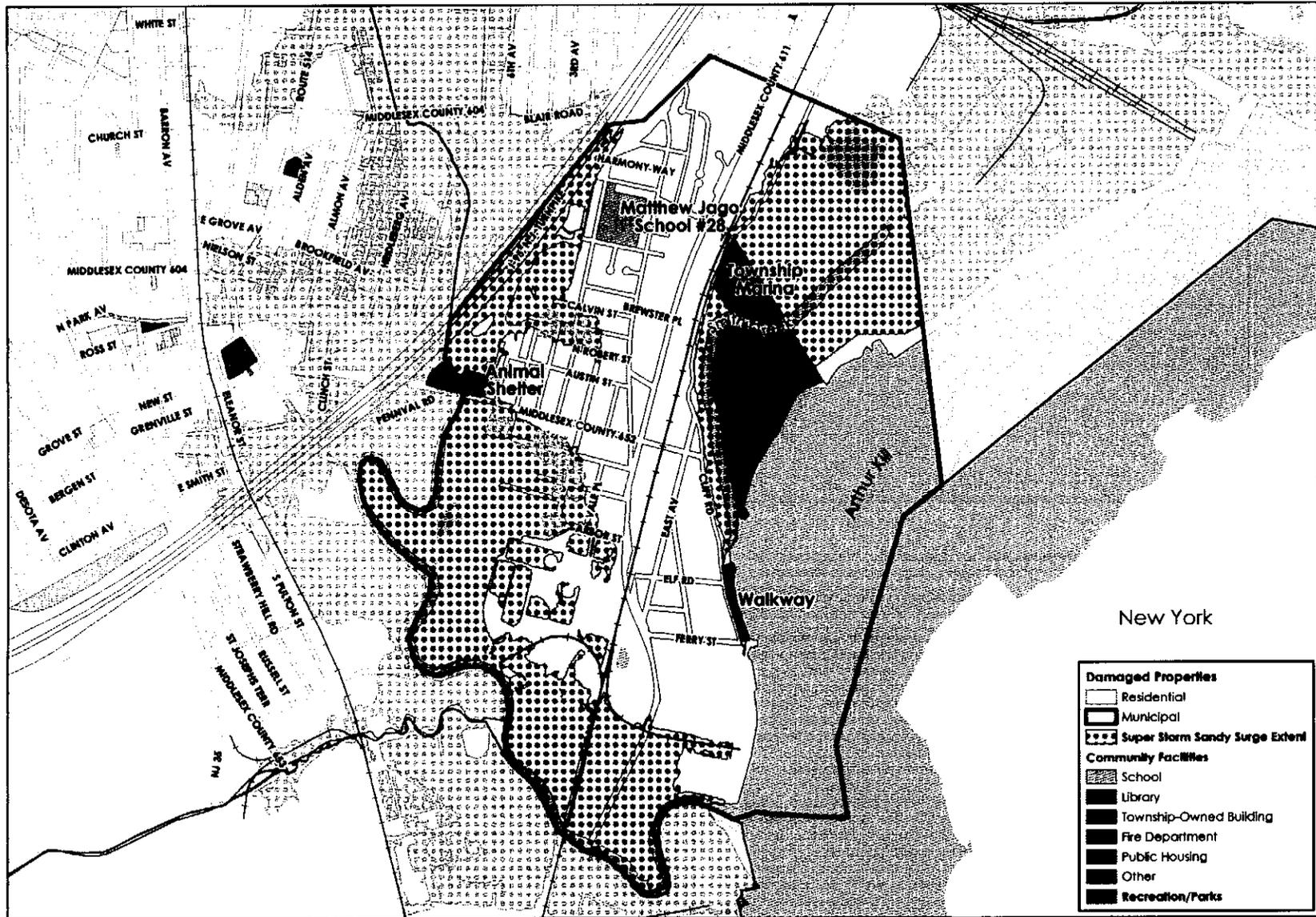
FEMA Base Flood Elevation Map: Sewaren Woodbridge SRPR

Heyer, Gruel & Associates
May 2014



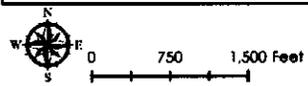
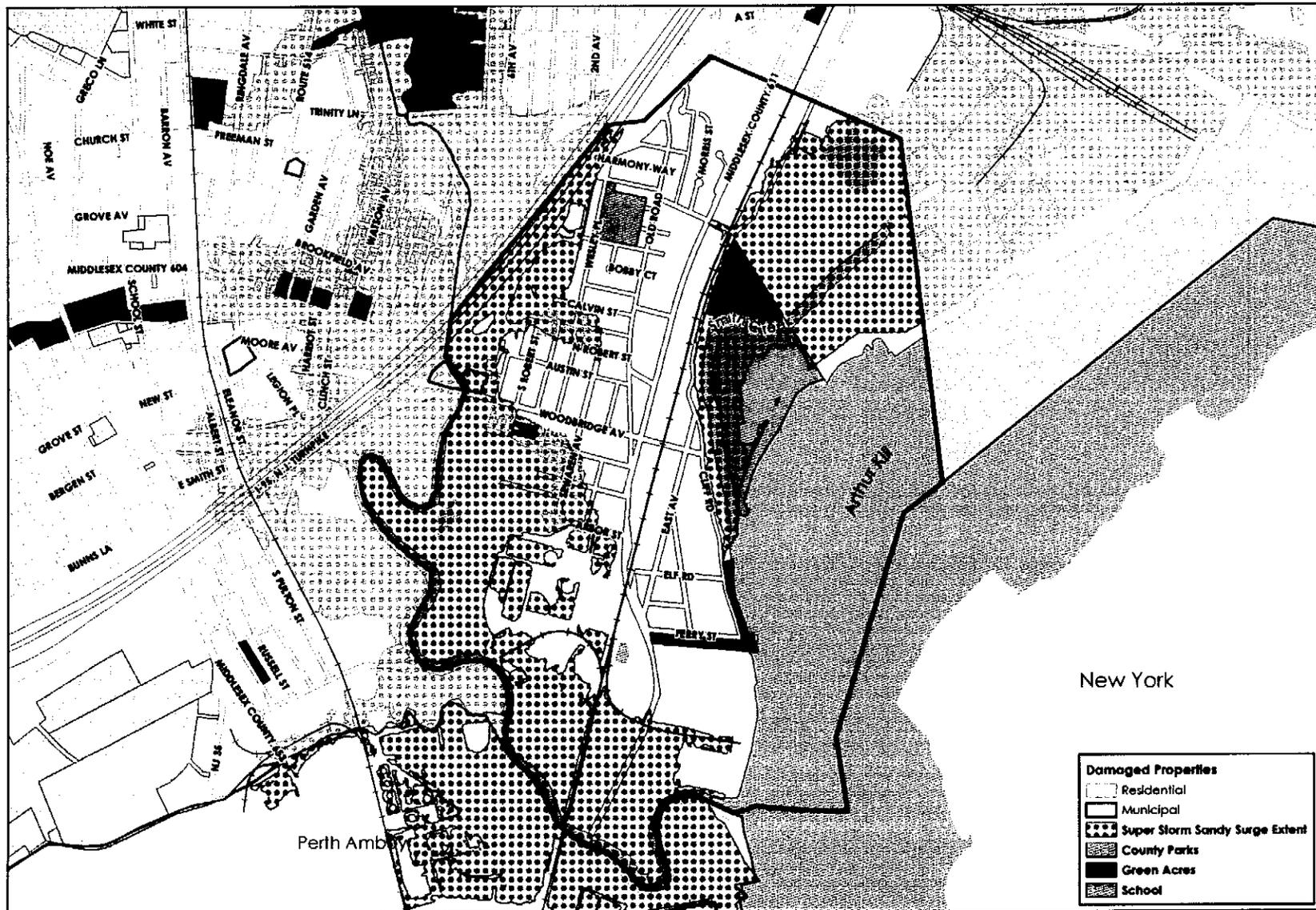
Zoning/Redevelopment: Sewaren Woodbridge SRPR

Heyer, Gruel & Associates
May 2014



Community Facilities & Super Storm Sandy Surge Extent:
Sewaren
Woodbridge SRPR

Heyer, Gruel & Associates
May 2014

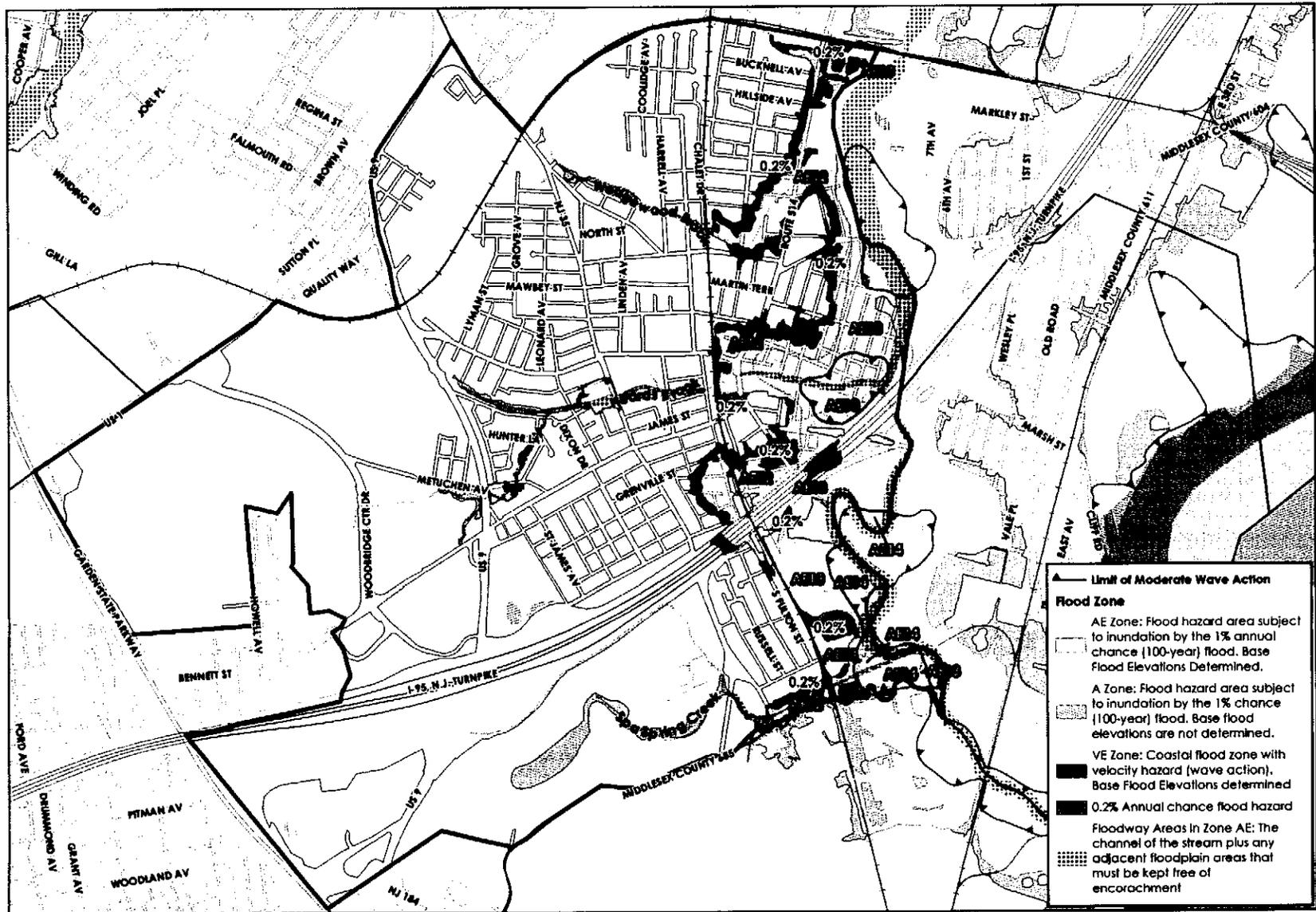


Source: NJGIN, NJDOT, NJDEP, Township of Woodbridge Master Plan

Parks and Open Space: Sewaren
Woodbridge SRPR



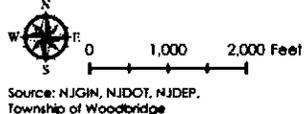
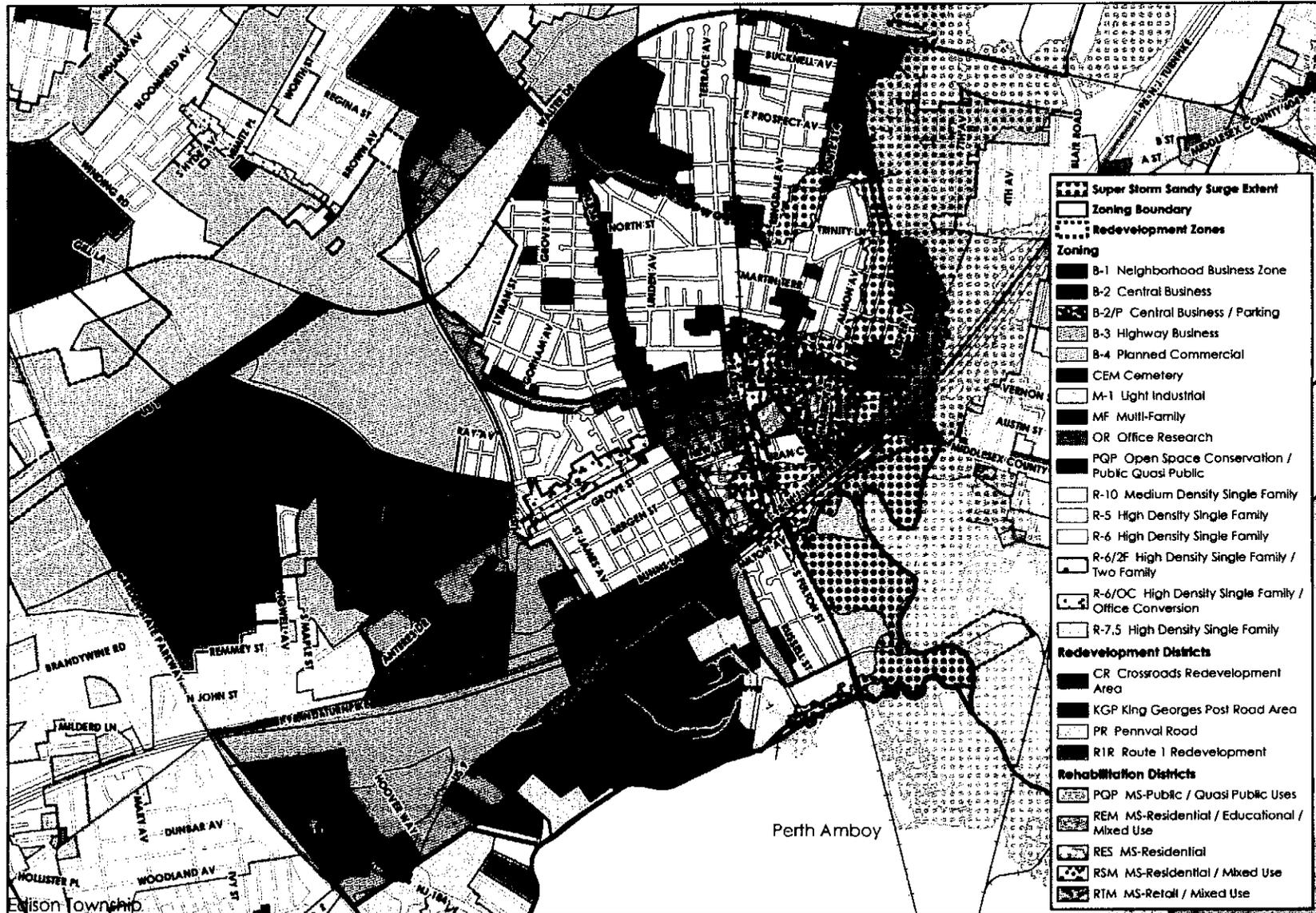
Heyer, Gruel & Associates
May 2014



FEMA Base Flood Elevation Map: Woodbridge Proper
Woodbridge SRPR

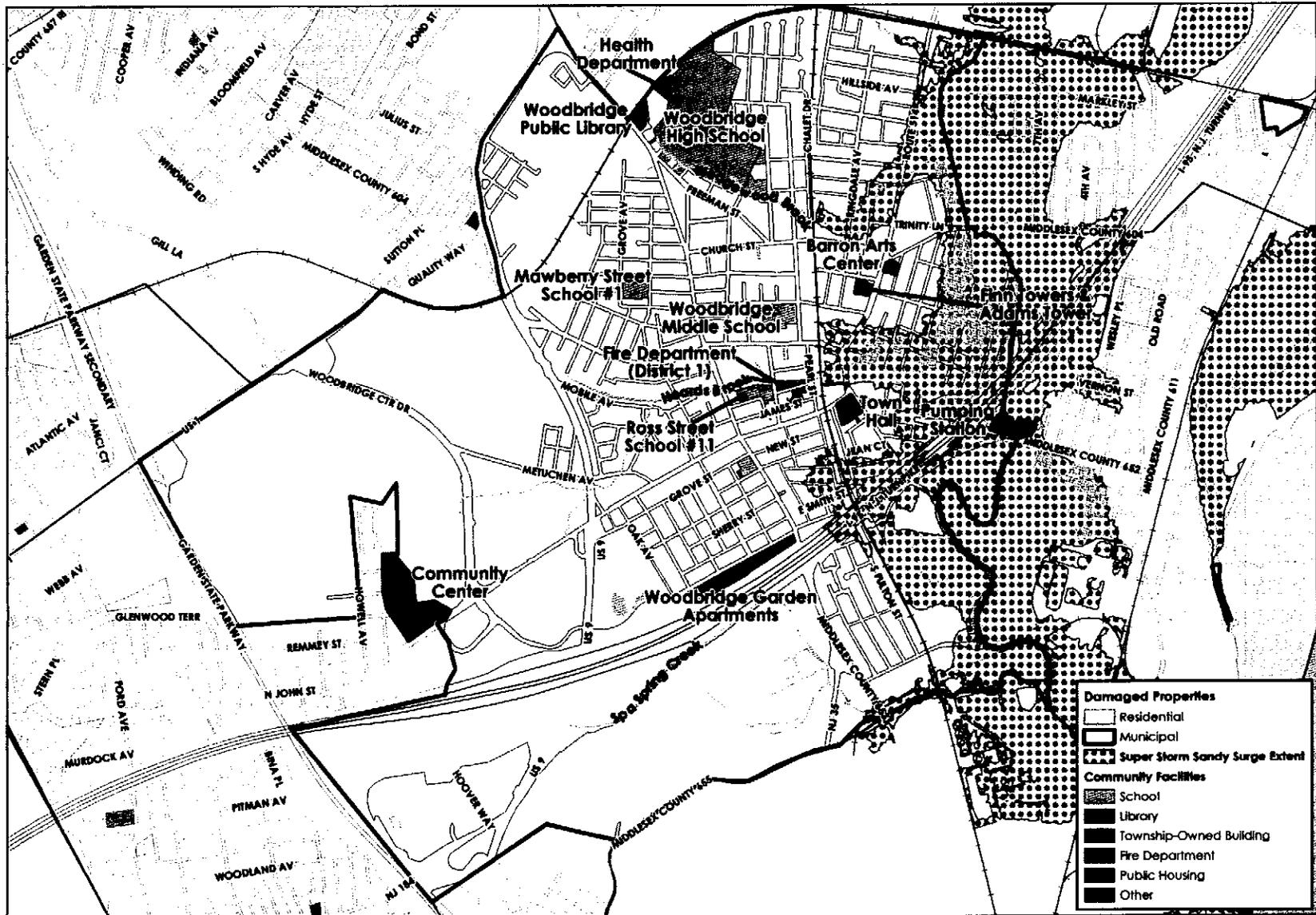
Source: NJGIN, NJDOT, NJDEP, Township of Woodbridge, FEMA January 2014 FIRM

Heyer, Gruel & Associates
May 2014



Zoning/Redevelopment: Woodbridge Proper
Woodbridge SRPR

Heyer, Gruel & Associates
May 2014

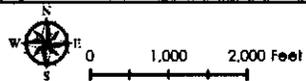
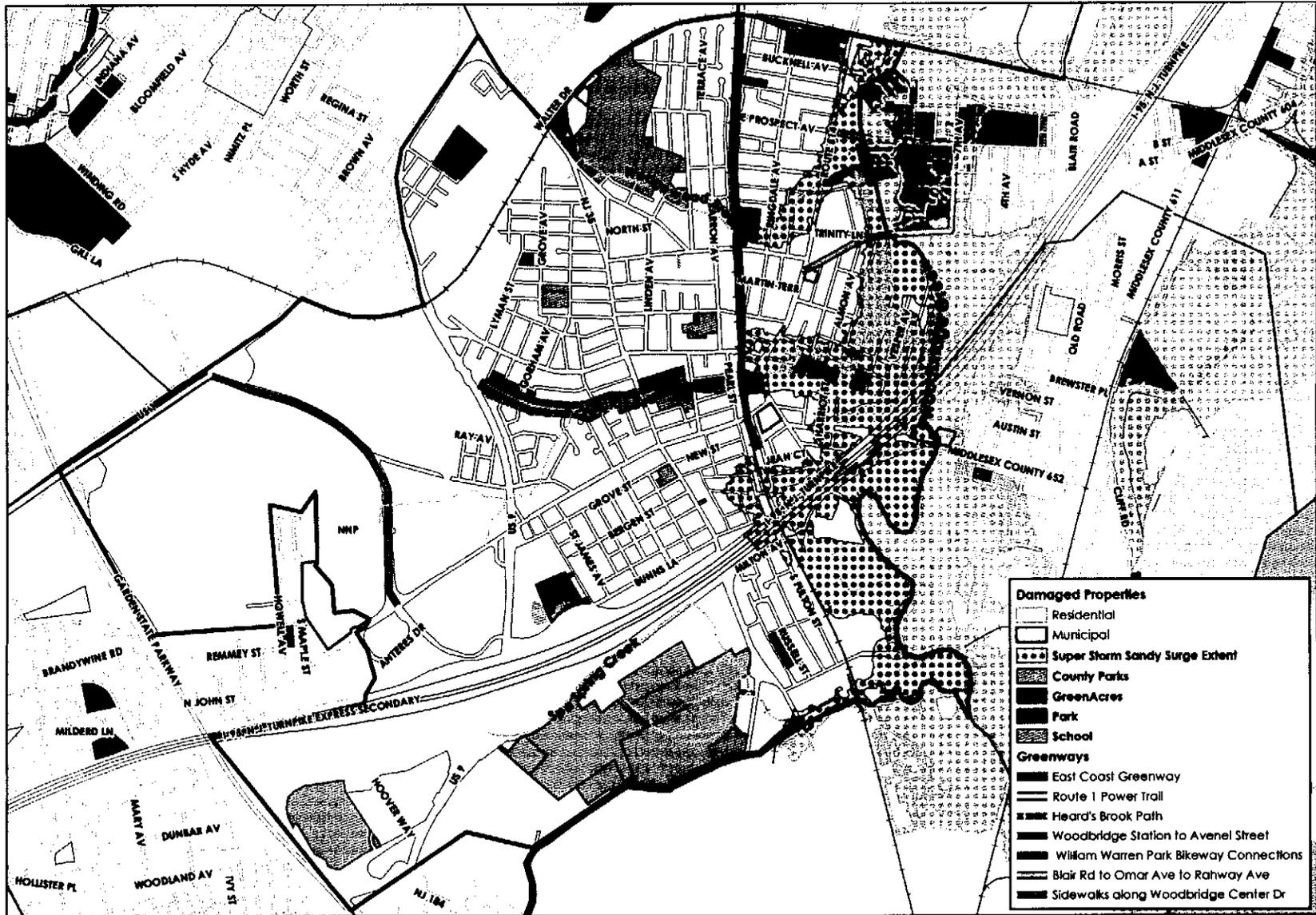


Source: NJGIN, NJDOT, NJDEP,

 Township of Woodbridge Master Plan

Community Facilities & Super Storm Sandy Surge Extent:
 Woodbridge Proper
 Woodbridge SRPR

Heyer, Gruel & Associates
 May 2014



Source: NJGIN, NJDOT, NJDEP, Township of Woodbridge Master Plan

Parks and Open Space: Woodbridge Proper
Woodbridge SRPR



Heyer, Gruel & Associates
May 2014

APPROACHES TO REBUILDING

The following strategies are specific to the Township of Woodbridge and have been identified as approaches to rebuilding that will make the Township more resilient to damage from future storm events.

Strategic Buy-Out of Flood Prone Residential Properties and Flood Insurance Assistance in Affected Neighborhoods

- **State of New Jersey Blue Acres Program**

The NJDEP Blue Acres Program is an acquisition program that targets the buyout of flood prone structures and the preservation of the floodplain. It is a subset of the Green Acres State Land Acquisition (SLA) Program.

The program has been in demand for years throughout the State along coastal New Jersey and the Passaic River Basin, however funds have been limited. Following Super Storm Sandy, \$300 million in federal aid has been earmarked for the program and will allow New Jersey to purchase as many as 1,300 homes in repetitive loss areas.

- **National Flood Insurance Program Community Rating System**

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that

Sustainable/ Resilient Design Best Practices

- Locate critical systems to avoid flooding, protect the Aqueducts.
- Outfit the Aqueducts with emergency pumps.
- Provide a secondary water storage system for emergency use.
- Provide redundant water systems to avoid interruption of water supply and availability to the community. The design should consider that the existing water system will have high capacity.
- Design water treatment and distribution systems to reduce the risk of contamination from storm water.
- Design and build resilient physical infrastructure, such as elevated water supply lines and pumps, to handle increased storm water flow.
- Work to ensure there is a way to evacuate water out of a community in the event of a major storm event.
- Consider protection of critical infrastructure, such as water treatment plants, to ensure the availability of water.

recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS:

1. Reduce flood damage to insurable property
2. Strengthen and support the insurance aspects of the NFIP
3. Encourage a comprehensive approach to floodplain management.

In 2013, the NFIP enacted changes to the CRS Coordinators Manual for the Community Rating System. The upcoming changes will drive new achievements in the following six core flood loss reduction areas important to the NFIP:

1. Reduce liabilities to the NFIP Fund
2. Improve disaster resiliency and sustainability of communities
3. Integrate a Whole Community approach to addressing emergency management
4. Promote natural and beneficial functions of floodplains
5. Increase understanding of risk
6. Strengthen adoption and enforcement of disaster-resistant building codes.

Rehabilitation and Redevelopment of Existing Properties with more Resilient Standards

- Enact a Continuing Certificate of Occupancy Permit Ordinance
- Continue support of RREM Program
- Revise Zoning Code
- Create Sustainable/ Resilient Design Standards

An important aspect of resiliency measures are design standards that can be used in an ordinance driven approach for retrofits, rehabilitation, and new development as it relates to residential, commercial, and industrial properties throughout the Township. The Sustainable/ Resilient Design Best Practices listed on the previous page may act as a basis for proposed Township standards.

Strengthen Regional Greenways and Linear Park Linkages

- Amend the Township's Open Space Plan to create linkages to the existing regional open space system

Development of Green Infrastructure and Green Buffers

- Prepare guidelines and ordinances that use green infrastructure techniques towards resilient design.
- Future storm surges will inevitably be exacerbated by continued rising sea levels. Guidelines and ordinances encouraging sustainable engineering techniques may be

utilized to mitigate the effects of future storm surges along greenways, parks, and within the residential neighborhoods most affected by Super Storm Sandy. These guidelines and ordinances may include “green” engineering techniques to be reinforced during future infrastructure replacement and upgrades throughout the Township.

Revision of the Emergency Management Plan to address the relocation/ modification of critical equipment and other infrastructure during Storm events, e.g. DPW, Animal Shelter, pumping station, etc.

Rehabilitation and/ or relocation of municipal facilities to withstand storm events where feasible

- Relocation of the Emergency Management Center and DPW
- Hazard Mitigation Grant Program
- E.g. community center

Development of Codes requiring and specifying the location of emergency generators and/ or alternative energy for public and private uses located in the floodplain.

- Encourage the development of Sustainable Alternative Energy, and the construction of a smart parallel micro-grid.



Damaged Roof of Community Center

Community Hubs and Education Programs

- Establish programs that can disseminate information about resilient design, proper rehabilitation strategies, and storm preparation.
- Create community hubs that can serve as gathering places during emergencies and interruptions in services, and outfit such facilities with access to key services, including water, electricity for charging cell phones, etc. Such capabilities could be integrated into schools and other existing community facilities.

RECOMMENDATIONS

Recommendations for projects listed by priority.

1. *Preparation of Neighborhood Plans for the Watson-Crampton Neighborhood, South Roberts Street Neighborhood and Saints Field Neighborhood*

These neighborhoods have been identified as areas within the Township that would best be suited for rehabilitation and redevelopment programs. Within these neighborhoods several rehabilitation and neighborhood revitalization programs are already underway, including the RREM and Blue Acres programs.

Neighborhood plans shall set goals and objectives, as well as guide development as these communities rebuild. These plans shall establish a vision for each community that will incorporate resiliency and sustainable techniques at the community level.

2. *Enactment of a Continuing Certificate of Occupancy Permit Ordinance*

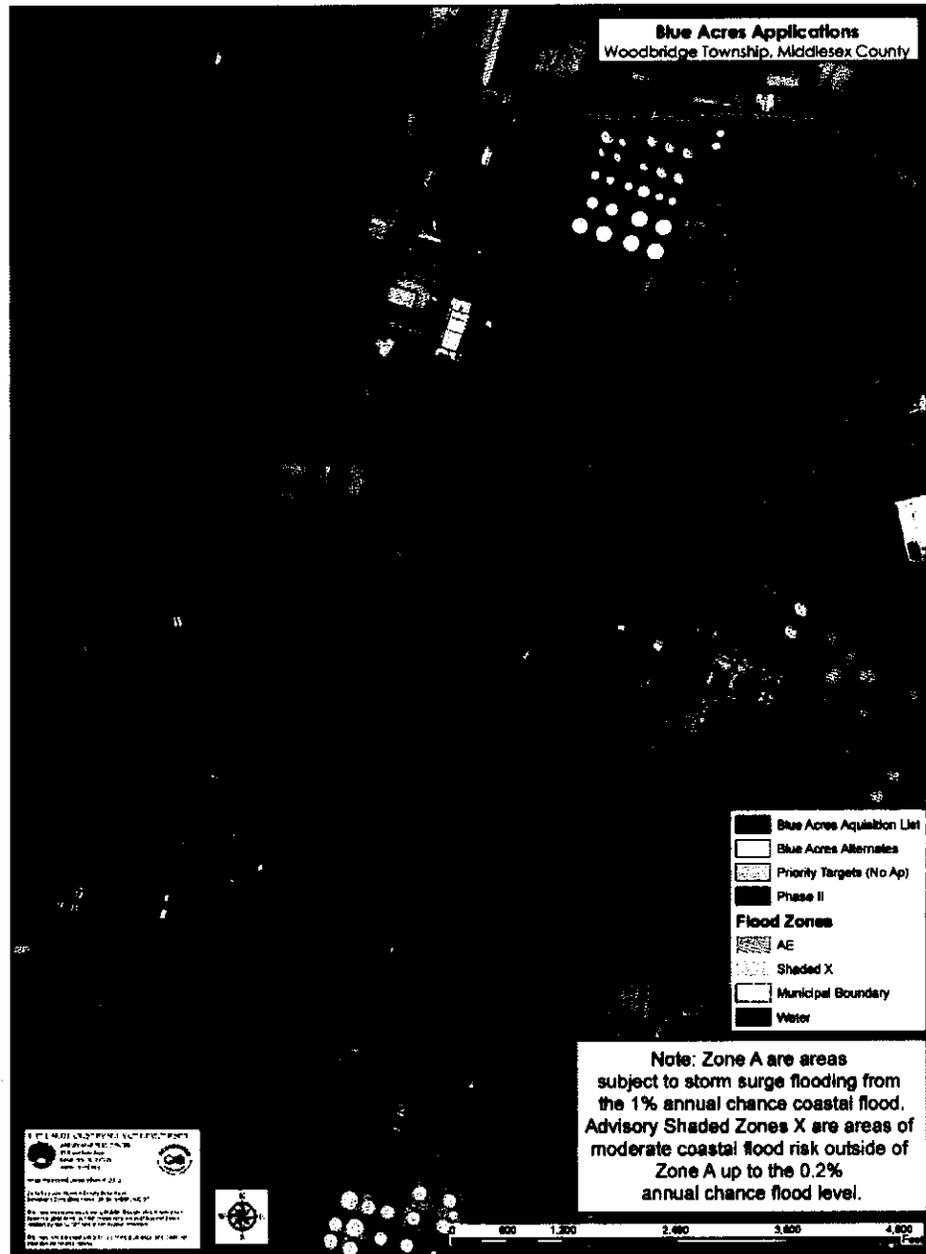
The Continuing Certificate of Occupancy is meant as a proactive rebuilding measure so to encourage the

rehabilitation of homes in flood prone areas after a storm event.

Buyers who purchase properties within flood prone areas shall be required to apply for a CCO permit. The permit shall be granted if the property complies with resiliency oriented building standards that will mitigate further damage from storm events.

3. *Continuation of Blue Acres Buy-Out Program, Phase 2*

The first round of Blue Acres Buy-Outs is currently underway. It is important that momentum not be diminished as funds are provided from the State of New Jersey and the program moves on to Phase 2. Phase 2 identifies additional properties in reoccurring flood prone areas that were not placed in the Phase 1 buy-out area. These properties are located near the Watson-Crampton neighborhood, in the South Roberts Street Neighborhood and in the Port Reading section of Woodbridge.



4. *Application to the NFIS Community Rating System*

NFIS Community Rating System is an important program that allows communities to reduce their resident's flood insurance payments. The program sets criteria for communities to establish standards and implement programs to mitigate the effects of damaging storms and flooding.

The NFIS CRS program has an extensive application process and provides targets for municipalities to reach to improve their community's rating. A set of goals should to be established by the Township of Woodbridge with reasonable target dates established to complete the new standards and develop the new programs needed to obtain a targeted rating.

5. *Update and Revision of Open Space Plan and ERI for flood prone areas*

Woodbridge Township has established an Open Space Plan and ERI that with the recent storm damage and rehabilitation programs should be updated to reflect how floodplains and recently devoted open space can be used most effectively.

One of the focuses of the Open Space Plan update should be on the Woodbridge River area, especially within the Blue Acres program. The acquisitions by the State through the Blue Acres program will add to the amount of Open Space in the Township. These areas can be planned as parks, preserves, and linear linkages to the existing network of parks and community facilities within the Township.

6. *Update of Sustainability Master Plan Element*

By updating its Sustainability Master Plan Element, Woodbridge Township will be able to outline resiliency guidelines to better mitigate future storm impacts. These programs and initiatives should lay the groundwork for future programs to be enacted that better prepare the Township for future storm events.

7. *Implementation of Resiliency Design Standards*

Resiliency techniques should be used to prepare and enact resiliency design standards that can encourage and require future development to be more resilient to major storm events. These standards should be specifically geared towards areas of the Township that are located in flood prone areas.

Township of Woodbridge, Post Sandy Planning Assistance Grant Projects Timeline																					
Planning Project	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21
Strategic Recovery Planning Report																					
Neighborhood Plans, Crampton-Watson, S. Roberts, Saints Field																					
Continuing Certificate of Occupancy Permit Ordinance																					
Blues Acres Buy-Out																					
NFIS Community Rating System																					
Update/ Revision to Open Space Plan and ERI																					
Update to Sustainability Master Plan Element																					
Resiliency Design Standards																					
Revision to Woodbridge Municipal Hazard Mitigation Plan																					
Revision to Codes/ Ordinances/ Standards/ Regulations																					
Hazardous Material Facility Provisions																					
Reevaluation/ Revision to Redevelopment Plans																					

SRPR State

PROPOSED PROJECTS

Post Sandy Planning Assistance Grant Projects

Municipal Land Use Law Comprehensive Plans; Reexamination Reports; Plan Elements; Community Resiliency Plans; and Master Plan Re-examination Reports (Maximum Grant Award: \$50,000)

- Update to Sustainability Element- Master Plan
An update to the Sustainability Element within the Township’s Master Plan will allow the Township to plan accordingly the implementation of various ordinances and guidelines to make the Township more sustainable. The Element should lay the groundwork for future programs to be enacted that better prepare the Township for future storm events.
- Update and Revise Open Space Plan and ERI for flood prone areas
The revised and updated Open Space Plan and ERI will allow the Township to reassess the needs of the Township’s residents in relation to open space as well as incorporate newly devoted lands from the Blue Acres program.

Community Development and Neighborhood Plans (Maximum Grant Award: \$50,000)

- Prepare Neighborhood Plan for Watson-Crampton Neighborhood, South Roberts Street Neighborhood & Saints Field Neighborhood
The three neighborhood plans should help to mitigate the effects of Super Storm Sandy that were felt in these communities. Practical and forward thinking solutions to infrastructure issues and storm surge events should be recommended along with rehabilitation and possible redevelopment solutions in certain areas. The neighborhood plans should integrate the outcome of the Blue Acres acquisitions and develop strategies for the remaining neighborhoods surrounding these areas. The Plans shall also set forth a long term vision for each neighborhood that stress sustainability, resiliency, and continued economic viability.
- Reevaluate and Revise Township Redevelopment Plans where appropriate
The Township has several redevelopment plans within areas that were affected by the storm surge from Super Storm

Sandy. The reevaluation and revision of these plans will allow for further analysis to be conducted on how to mitigate existing and future development from storm surge events.

Permit and Application Process Quality Improvement (Maximum Grant Award: \$25,000)

- Prepare Continuing Certificate of Occupancy Permit Ordinance

The Continued Certificate of Occupancy Permit Ordinance allows for the Township to be proactive in encouraging buyers who purchase properties within flood prone areas to rehabilitate and upgrade existing structures. The permit shall be granted if the property complies with resiliency oriented building standards that will mitigate further damage from storm events.

- Continue Blue Acres Program Support

The first phase of Blue Acres Buy-Out Program are currently underway. A second phase is scheduled for the upcoming months. Continued support of the program through the second phase buy-outs will allow the Township to help many more residents who have been affected by persistent flooding events. The Township will be able to actively encourage participation in the program and educate the

public about upcoming requirements to ensure an efficient buy-out process.

Design Standards (Maximum Grant Award: \$50,000)

- Prepare Woodbridge Township Resiliency Design Standards
Resiliency Design Standards encourage and require future development to be more resilient to storm events. These standards should be specifically geared towards areas of the Township that are located in flood prone areas. The goal of the standards shall be to provide affordable, realistic, and practical options for property owners to rebuild and for future development to be more resilient. These designs options shall incorporate contextual aesthetics as well as stress sustainability and resiliency.

Urban and Suburban Environmental Design (Maximum Grant Award: \$50,000)

- Revise Woodbridge Township Municipal Hazard Mitigation Plan, where appropriate
Revisions to the Municipal Hazard Mitigation Plan will allow for further investigation on how the effects of Super Storm Sandy impacted and exacerbated hazards throughout the Township. The Plan may include action items that will enhance the resiliency in existing and future development

through a sustainable manner and respond to natural hazards.

- Implement NFIS Community Rating System

Implementation of the NFIS CRS will offer further relief in the form of discounts on flood insurance to Township residents. The goals of this project shall be to analyze and review Township activities to date, identify additional opportunities for further points and outline activities needing to be performed to achieve said points, and create an action plan to ensure the Township maintains and advances its rating in the future.

Development of codes, ordinances, standards and regulations

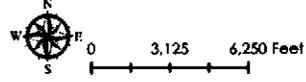
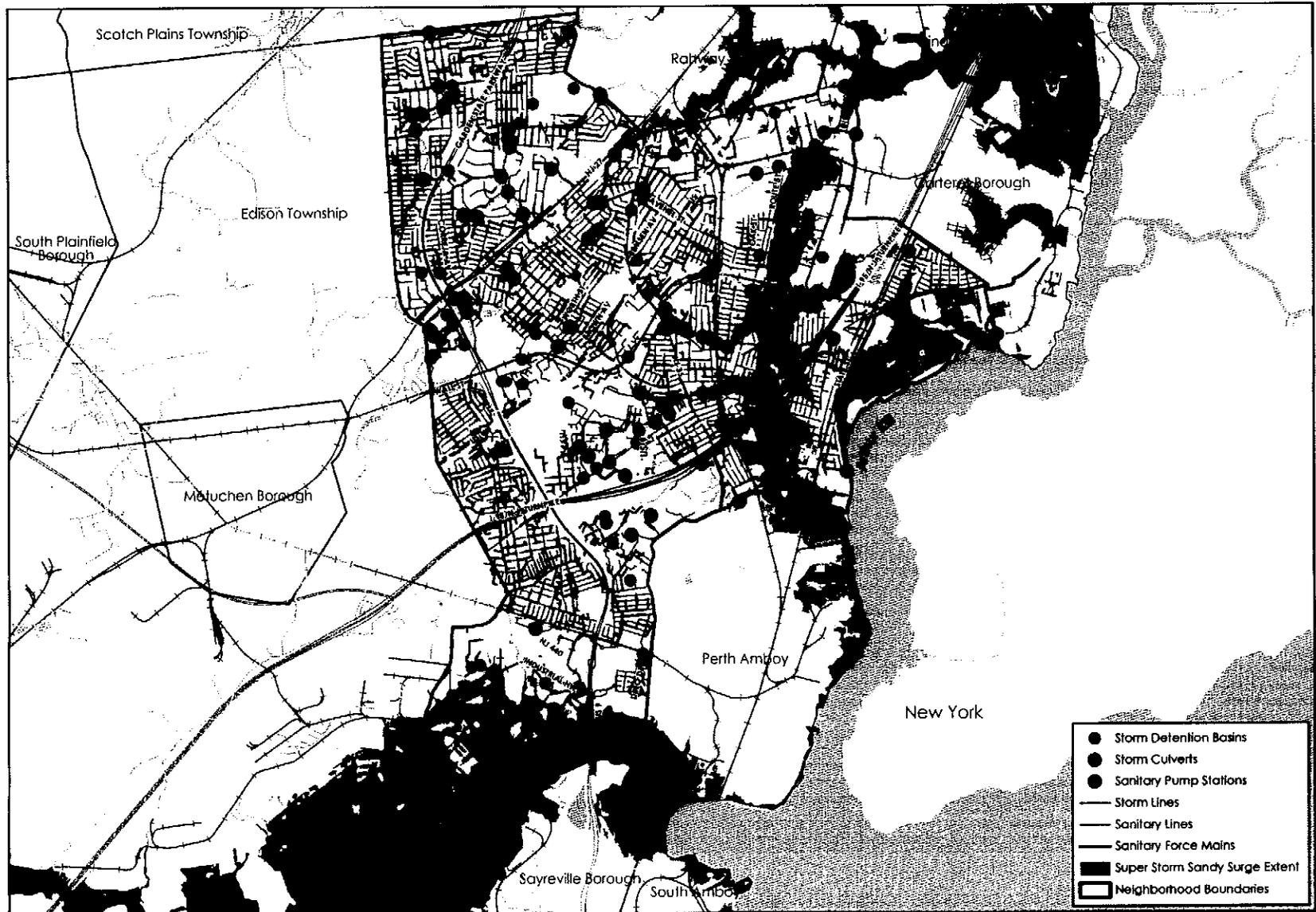
Maximum Grant Award: \$20,000)

- Revise and prepare codes, ordinances, standards and regulations

Additional codes, ordinances, standards, and regulations shall be reviewed and revised to better prepare the Township for future storm surge events. These actions will allow the Township to enact many of the planning goals and strategies outlined in other projects within the Grant.

CRITICAL INFRASTRUCTURE

Hazard Mitigation Projects (from Middlesex County Multi-Jurisdictional Hazard Mitigation Plan 2013 DRAFT)								
	Mitigation Action, Program, or Project	Hazard Addressed	Existing Implementation Mechanism	Responsible Party	Target Date	Estimated Cost (\$)	Funding Source	Priority
1	Reconstruction of Rt. 35 culvert over the Herds Brook between North and South Park Drive (non-maintenance related costs only)	Flood	Floodplain Management Plan	Woodbridge Township OEM	2 years	\$20 million	FMA, PDM-C & HMGP if available	High
2	Reconstruction of Cove Creek culvert on Saints Boulevard (non-maintenance related costs only)	Flood	Floodplain Management Plan	Woodbridge Township OEM	1 Year	\$10 million	FMA, PDM-C & HMGP if available	High
3	Stream bank stabilization/ conveyance of the South Branch of the Rahway River from Merrill Park to New Dover Road.	Flood	Floodplain Management Plan	Woodbridge Township OEM	1 Year	\$8 million	FMA, PDM-C & HMGP if available	High
4	Stream Bank stabilization of the Pumpkin Patch Brook from Inwood Way to the Municipal Boundary.	Flood	Capital Improvement Plan	Woodbridge Township OEM	1 year	\$5 million	FMA, PDM-C & HMGP if available	High
5	Construction of berm and tide gate along the Woodbridge Creek at Woodbridge Avenue to prevent flooding in the Crampton Avenue area.	Flood	Capital Improvement Plan	Woodbridge Township OEM	1 year	\$10 million	NJDEP, Army Corps of Engineers, USDA	High
6	Reconstruction of Port Reading Avenue and the Woodbridge Creek culvert to eliminate flooding (nonmaintenance related costs only).	Flood	Capital Improvement Plan	Woodbridge Township OEM	2 years	\$7 million	NJDEP, Army Corps of Engineers, USDA	High
7	Improved retention and engineering study to assess risk of dams.	Flood	Floodplain Management Plan	Woodbridge Township Engineer	3 year	\$75,000	FMA, PDM-C & HMGP if available	High
8	Envelope hardening, securing external infrastructure, securing roof ballast and public outreach and education programs of Senior Citizen Complex.	Wind	Capital Improvement Plan	Woodbridge Township OEM	1 year	\$1 million	FMA, PDM-C & HMGP if available	High
9	Working with NJDEP, develop a public outreach program to educate communities and residents that are subject to inundation as a result of rapid rise/storm surge.	Storm Surge	Capital Improvement	Middlesex County OEM	Ongoing Staff time		PDM-C and HMGP	High
10	Use United States Army Corps of Engineers (USACE) surge maps for community education and outreach.	Storm Surge	Capital Improvement	Middlesex County OEM	Ongoing Staff time		OEM Budget	High
11	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness.	All	Emergency Management	Middlesex County OEM, MCOEM	One Year Staff Time		PDM-C and HMGP	High
12	Construction of a Smart Alternative Energy Micro-Grid	All	Capital Improvement Plan	Woodbridge Township	3 Years	\$50 million	PSEG, NJBPU if available	High
13	Continued restoration of remaining sections of the Woodbridge Creek tidal wetlands area from Port Reading Avenue to the outfall at the Arthur Kill.	Flood	Capital Improvement Plan	Woodbridge Township OEM	2 years	\$10 million	NJDEP, Army Corps of Engineers, USDA	Medium
14	Dredging of Smith's Creek from the Municipal Marina to the outlet at the Arthur Kill.	Flood	Capital Improvement Plan	Woodbridge Township OEM	1 year	\$15 million	NJDEP, Army Corps of Engineers, USDA	Low
15	Dredging of the Woodbridge Creek from the intersection with the railroad to the Trailer Court	Flood	Capital Improvement Plan	Woodbridge Township OEM	1 year	\$5 million	NJDEP, Army Corps of Engineers, USDA	Low
16	Improved conveyance/dredging (Going into Raritan Bay), waterway bank repairs, of Rahway River.	Flood	Floodplain Management Plan	Woodbridge Township	2 Years	\$4 million	NJDEP, Army Corps of Engineers, USDA	Low



Source: NJGIN, NJDOT, NJDEP, Township of Woodbridge Division of Engineering

Infrastructure
Woodbridge SRPR



Heyer, Gruel & Associates
May 2014