



Strategic Recovery Planning Report Ventnor City Atlantic County

September 2014

RV&W File #: 0122-T-001

Prepared by:
Remington, Vernick and Walberg Engineers
845 North Main Street, Suite 201,
Pleasantville, NJ 08232
(609) 645-7110

Stuart B. Wiser, AICP, PP
Lic. #33LI00559800

George R. Stevenson, Jr., AICP, PP
Lic. #33LI00548700





Ventnor City Administration

Mayor, Mike Bagnell
Commissioner, Frank Sarno
Commissioner, Theresa Kelly
Municipal Administrator, Thomas Russo
City Clerk, Janice K. Callaghan

Steering Committee:

Mayor, Mike Bagnell
David P. Smith, Public Works Director, City of Ventnor
David Holtzman, Planning Board, City of Ventnor
Tom McAdam, McAdam Electric
City Engineer, Charles Sabatini, P.E., P.P., C.M.E., C.P.M.
Emergency Management Coordinator, William J. Melfi

Professional Staff:

Stuart B. Wisner, AICP, PP
George R. Stevenson, Jr., AICP, PP
Joseph M. Petrongolo, LLA, PP
Karen Twisler, LLA, LEED-AP BD+C
Edward D. Dennis, Jr., PE, PP, CPWM, CME
Robert J. Smith III, PE, PP, CME, CPWM
Ryan McGowan, PE, PP, CME

Table of Contents

I.	Introduction	3
II.	City Profile	4
III.	Risk Assessment	11
IV.	Planning Guidance Documents	24
V.	Sandy Impacts	26
VI.	Recovery Efforts	30
VII.	Post-Sandy Recommendations for Ventnor City	32
	Appendices	44
	Works Cited (referenced as ^{WS:#})	47

I. Introduction

The weather event that has come to be known as Superstorm Sandy ("Sandy") was a hurricane that formed in the Caribbean on October 22, 2012 and made landfall near Brigantine, NJ as a post-tropical cyclone at 7:30^{+/-} PM on October 29, 2012. This storm brought damaging winds and storm surges that impacted a significant portion of the North Atlantic coastline, resulted in an estimated 147 deaths, damaged or destroyed at least 650,000 homes and left approximately 8.5 million customers without power.^(WC:1)

The cost of -related damage sustained in New Jersey was outlined in a report prepared by the National Hurricane Center:

The New Jersey Governor's office estimates that 346,000 housing units were damaged or destroyed in that state, with 22,000 of those units uninhabitable. Severe damage to small businesses occurred in New Jersey, with nearly 19,000 businesses sustaining damage of \$250,000 or more, and total business losses estimated at \$8.3 billion. The New Jersey Public Service Electric and Gas Company estimated that 48,000 trees had to be removed or trimmed in order to restore power. Breaks in natural gas lines, occurring as a result of the storm, caused fires in some locations, resulting in the destruction of many residences. Power and gas line repairs are expected to cost roughly \$1 billion and repairs to the waste, water and sewer services are estimated to cost about \$3 billion.^(WC:2)

In order to aid in the recovery efforts of the most severely impacted municipalities, the State of New Jersey has developed the "Post Sandy Planning Assistance Grant Program". This grant program provides funding to develop a planning report which contains community recovery plans for municipalities and counties that have sustained a ratable loss attributable to Sandy of at least 1% or \$1 million.^(WC:3) Pursuant to the award of the grant, the City of Ventnor ("City") commissioned this report in order to advance resiliency planning ~ and through such planning ~ (i) identify aspects of the City's infrastructure / improvements which are vulnerable to damage resulting from future storm events, and (ii) provide for the development and prioritization of strategies aimed at mitigation of future storm damage.

In the preparation of this report, the City commissioned a professional planning firm and established a Steering Committee which guided this effort. Collectively, the individuals assigned undertook a thorough review of the City's Master Plan, existing development regulations and other relevant documents, and reviewed and analyzed the condition of the City's existing infrastructure vis-à-vis resiliency. From this review and analysis, the recommendations contained herein were developed.

It is the intention of the City that this report be incorporated with the municipal Master Plan and thereby serve as a basis for the enactment of the recommendations.

II. City Profile

A. Geography

The City of Ventnor is located in Atlantic County in southeastern New Jersey. The City is located on a barrier island, and is bounded by Atlantic City to the northeast and Margate City to the southwest. Figure 1 illustrates the City's land cover.

Ventnor is approximately 2 square miles in size. The City contains approximately 8,750 linear feet of beachfront facing the Atlantic Ocean on its eastern edge, and is bordered by Beach Thorofare, a tidal bay, to the west. The City is split into two sections by Inside Thorofare, with the western section being referred to as Ventnor Heights.

Ventnor's location on a barrier island brings unique challenges. With an average elevation of 3 feet above sea level, the City is prone to flooding and storm damage. As is typically associated with a barrier island, the soils are primarily sandy and low in nutrients, and the land has minimal slope.

Figure 1. Aerial map of Ventnor City boundaries.



Source: Google Maps

B. Population

Approximately 10,650 people live in Ventnor according to the 2010 Census. This equates to approximately 5,400 people per square mile. From 2000 to 2010, Ventnor's population decreased by approximately 20%, whereas the state population increased 4.5%. Approximately 20% of the population is over 65 years old. This figure has remained stable from 2000 to 2010.

C. Demographics

Ventnor is comprised of four Census tracts. According to the 2008-2012 American Community Survey 5-Year Estimates, the City's median household income is estimated to be approximately \$56,300, and the per capita income is estimated to be approximately \$34,000. Eighty-two percent of the City's population has graduated high school and approximately 27% hold a baccalaureate degree. The 2010 Census reports that approximately 75% of the City's population is white, approximately 18% is Hispanic or Latino and approximately 4% is African American.

D. Housing

The U.S. Census Bureau, 2006-2010 American Community Survey ("ACS") estimates that 66% of Ventnor's housing stock (5,271 units) was constructed prior to 1970. Of these, 2,475 were constructed prior to 1939. The ACS estimate notes that single-family detached dwellings are the predominate housing type in the City (estimated to be 47.4% of the housing stock).

E. Ratables

Ventnor's tax base is primarily residential and totals approximately \$2.5 billion. Table 1 indicates the value of the ratable base and market value ratio for the years 2010 through 2014. As can be seen, the value of the tax base has been decreasing since 2010.

Table 1. Ratables History

Year	Ratable	Ratio
2014	\$2,450,374,150	pending
2013	\$2,514,557,682	103.07%
2012	\$2,580,446,428	98.36%
2011	\$2,613,683,850	96.50%
2010	\$2,644,013,550	95.35%

Source: Ventnor City Tax Assessor's Office
 and the Abstract of Ratables for Atlantic County (2010-2013)

F. Historic and Cultural Resources

Ventnor's City Hall and the John Stafford Historic District (which includes portions of Atlantic, Austen, Baton Rouge, Marion and Vassar Avenues) are included on the National Register of Historic Places. The New Jersey Department of Environmental Protection's ("NJDEP") Historic Preservation Office also identifies the following areas as historically significant:

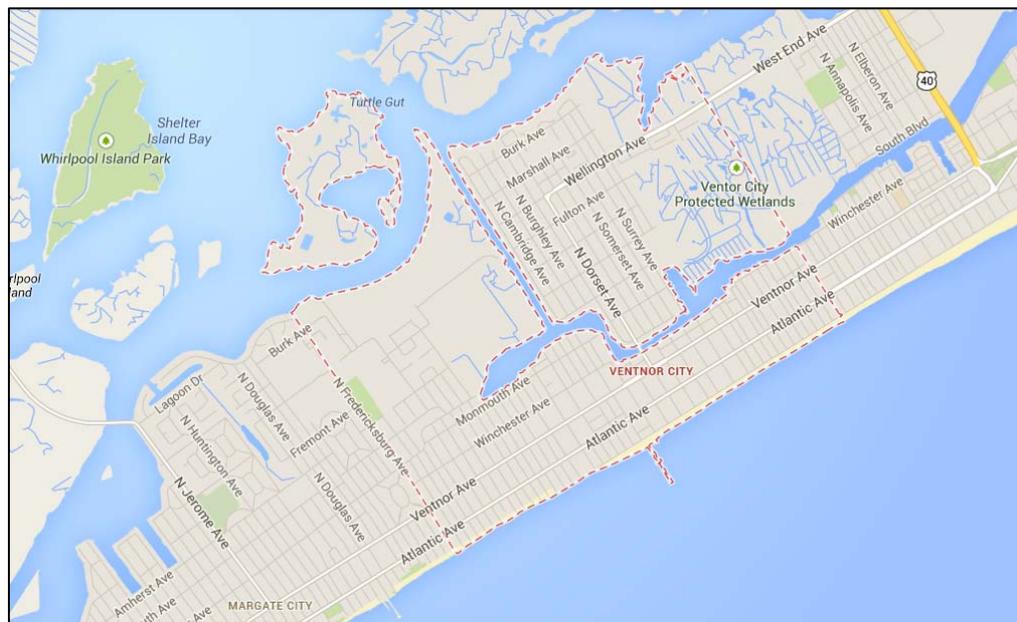
- The New Haven Firehouse, 20 North New Haven Avenue;
- The Saint Leonard's Tract Historic District, bounded by Atlantic, Cambridge, Winchester and South Surrey Avenues; and
- The Tofani House, 12 South Cambridge Avenue.

See Appendix 1 for the table illustrating the effects of flood and storm surge on historic and cultural resources.

G. **Infrastructure**

The City has 36.45 miles of roadways, with 2.42 miles being owned and maintained by Atlantic County and 34.03 miles of roadways being owned and maintained by the municipality.^(WC:5) Figure 2 illustrates the City's grid-shaped urban plan.

Figure 2. Road map of Ventnor City (boundary in red).



Source: Google maps

Ventnor owns and operates the local water system ~ including the water treatment plant and wells ~ as well as the sanitary sewer system piping and pumping stations within its borders. The City does not have its own sewage treatment plant, instead relying on the Atlantic County Utilities Authority ("ACUA") treatment facility in Atlantic City for municipal wastewater processing. Wastewater sent to the ACUA facility is treated and eventually discharged into the Atlantic Ocean.

H. Public Property

City-owned property includes the following buildings:

- City Hall, 6201 Atlantic Avenue, a National Historic Registry property (Figure 3)
- Public Works at the Ventnor Water Works, Cornwall & Winchester Avenues (Figure 4)
- Beach Patrol Headquarters, Suffolk Avenue and the Beach
- Ventnor City Library, 6500 Atlantic Avenue
- Cultural Art Center, 6500 Atlantic Avenue
- Community Building, 6500 Atlantic Avenue

The City also owns the following assets:

- Boardwalk - 1.7 miles (Figure 5)
- Boat Ramp
- Fishing Pier
- Beachfront Park
- Beach Volleyball Courts
- Lafayette Education Complex
- Municipal Parking Lot
- 5 Playgrounds
- Tennis Courts



Figure 3. City Hall and
Police Station.



Figure 4. Ventnor City Public
Works Building.



Figure 5. Ventnor City Boardwalk.

I. Critical Facilities

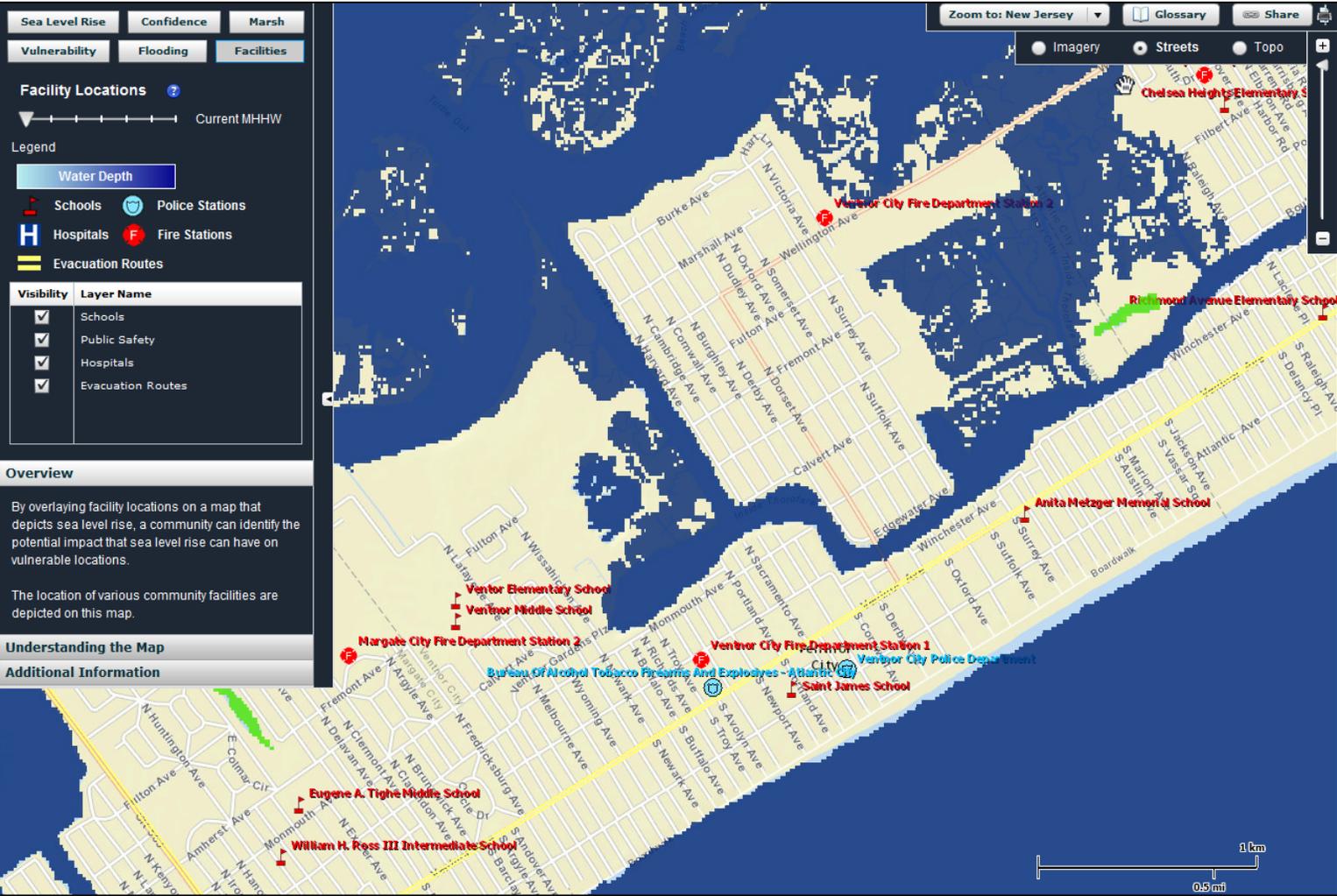
The City's critical facilities, as depicted on Figure 6 below, include:

- Ventnor Elementary School, 400 N. Lafayette Avenue
- Ventnor Middle School, 400 N. Lafayette Avenue
- Saint James School (Catholic elementary), 30 S. Portland Avenue (part of the recently consolidated Holy Trinity Parish school system)
- *Fire Station #1, 20 N. New Haven Avenue
- *Fire Station #2, Ventnor Heights, Little Rock and Wellington Avenues
- *Ambulance Station, 20 N. New Haven Avenue
- *Police Station, 6201 Atlantic Avenue
- *Emergency Operations Center, 6201 Atlantic Avenue

During emergency events, critical facilities marked above with an asterisk (*) must remain in operation.

See Appendix 2 for the table illustrating effects of flood and storm surge on critical facilities.

Figure 6. Critical Facilities Map.



Source: NJFloodmapper.com

III. Risk Assessment

Situated on a barrier island, the City of Ventnor is subject to high winds, nor'easters and other storms, coastal erosion and flooding.

Table 1 sets forth a list of weather-related events for which Ventnor received federal funding in the past five years. The data highlights the frequency of significant storm events and the need to harden the City's infrastructure and improvements to lessen storm damage and costs relating to same.

Table 2. History of Weather-Related Events (2009-2014)

Storm	Federal #	Date	Cost
Sandy	DR-4086	Oct-Nov 2012	\$804,972
Derecho	DR-4070	Jun 2012	TBD
Hurricane Irene	DR-4021	Aug-Sep 2011	\$89,983
Severe Winter Storm	DR-1889	Feb 2010	\$62,069
Snowstorm	DR-1873	Dec 2009	\$27,663
Nor'easter	DR-1867	Nov 2009	\$28,701

Source: New Jersey Office of Emergency Management

A. **Wind Events**

Wind events, defined as winds reaching at least 57.5 miles per hour, are frequent events in Atlantic County. National Oceanographic and Atmospheric Administration ("NOAA") data reveals that for the period January 1950 through October 2008, the County experienced a total of 201 such events, equating to an average of 3.5 events per year.^(WC:6)

B. **Tornadoes**

This is little probability of tornadic activity in Atlantic County. NOAA data reveals that for the period September 1975 to February 2008, there was only one tornado of unknown magnitude, which occurred in October 1990.^(WC:7)

C. **Coastal Erosion**

The City's coastline is subject to naturally occurring coastal erosion as a result of coastal storms and what coastal engineers term "island walk", where tidal action causes an accretion of sand in certain areas at the expense of areas from which the sand is lost. To address this issue, ongoing beach renourishment is required. As was reported in an October 8, 2013 article in Shore News Today, 350,000 cubic yards of sands was pumped onto the beach by the Army Corps of Engineers as part of routine beach maintenance in the spring of 2012.

D. Flooding

- (i) 88.3% of the City's land area (1,179 acres) is within the High Flood Risk area, equating to approximately 5.4% of the City's total improved value^(WC:8);
- (ii) There is a high number of repetitive risk properties within the City, being defined as any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program^a ("NFIP") within any rolling 10-year period since 1978; and
- (iii) The City is extremely vulnerable to back bay flooding due to the condition of / lack of bulkheads.

ACCORDINGLY, FLOODING IS A SIGNIFICANT THREAT TO THE CITY AND IS A PREDOMINANT CONCERN FOR CITY POLICYMAKERS.

The Federal Emergency Management Agency's ("FEMA") 1983 Federal Insurance Rate Map ("FIRM") [Figure 7] illustrates the City with the bay to the left and the ocean to the right. The dark gray areas to the left (bay-side) are Zone A8, meaning that this is an area of the 100-year flood. The Base Flood Elevation ("BFE") for this area has been determined to be 8 ft. above sea level. The dark gray areas to the right (ocean-side) are Zone V10, meaning that these areas fall within the 100-year coastal flood with velocity or wave action. BFE for this area has been determined to be 10 ft. above sea level.

Figure 7. FIRM Map of Ventnor from 1983.



Source: FEMA maps

^a Established in 1968 as part of the National Flood Insurance Act, the NFIP is a Federal program that enables property owners in municipalities that adopt community floodplain management regulations to purchase flood insurance at more affordable rates.

The lighter grey areas between the A-8 and V10 zones are Zone B, which illustrates areas between the limits of the 100-year flood and the 500-year flood. These light gray, Zone B areas are less susceptible to flooding.

The preliminary FIRM Maps for 2014 (Figure 8) show a similar pattern, but with additional detail.

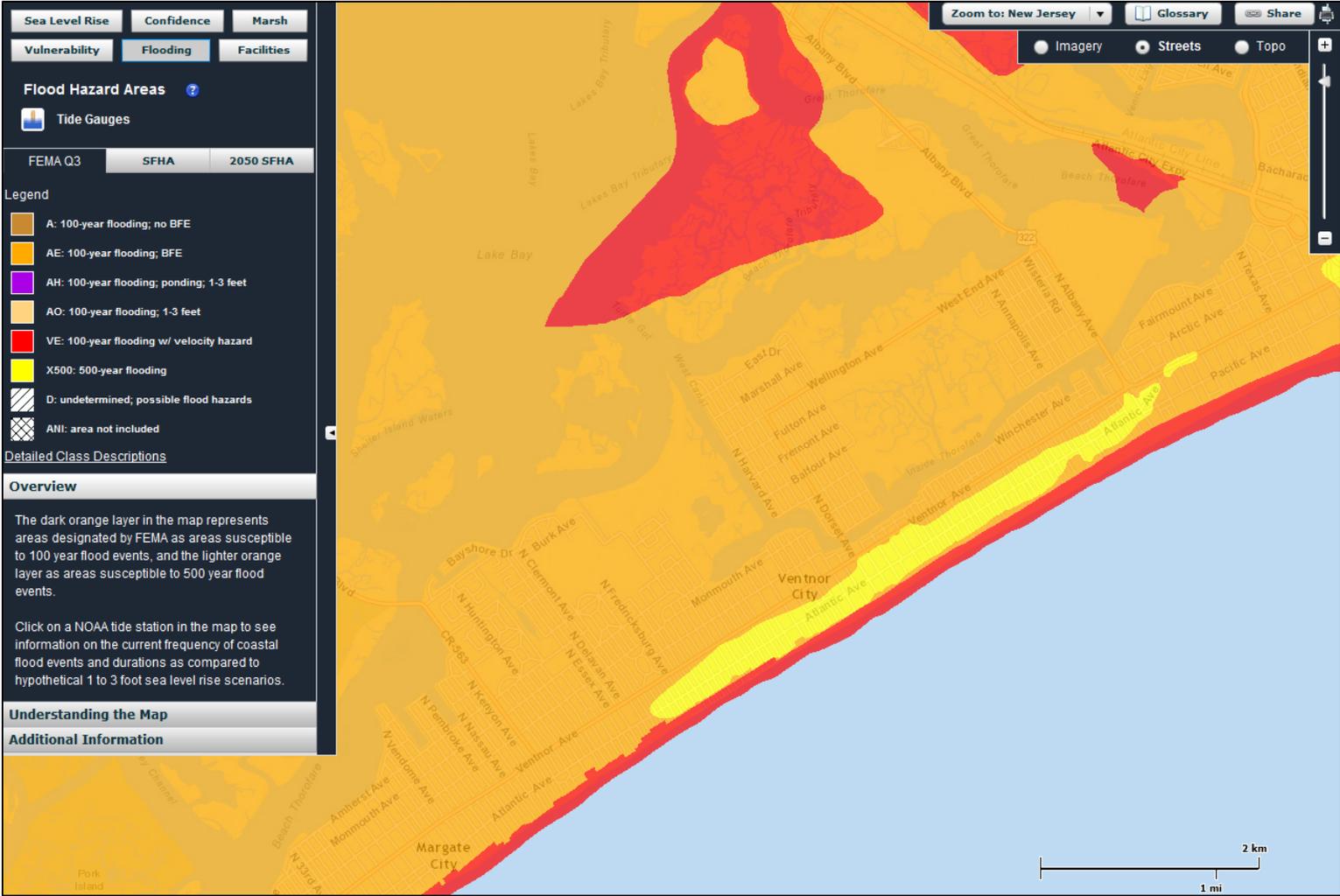
Figure 8. Composite image of 2014 Preliminary FIRM Maps (34001C0451F, 34001C0452F, 34001C0453F and 34001C0454F).



Source: FEMA maps

As seen on the latest FEMA maps (Figure 9), while all of Ventnor is at some degree of flood risk, risk levels vary.

Figure 9. Flood Hazard Areas. Source:



The red areas identified along the Atlantic coast and the bay illustrate 100-year flooding with velocity hazards, such as wave action (VE zone). The orange area that covers the majority of the City identifies 100-year flooding by Base Flood Elevation (AE zone). The yellow band between Ventnor Avenue and Boardwalk represents the 500-year flooding event (X500). As depicted, while the areas of risk are more heavily concentrated along the bay, these locations are marine tidal marsh, and thereby of less practical significance than other sections of the City.

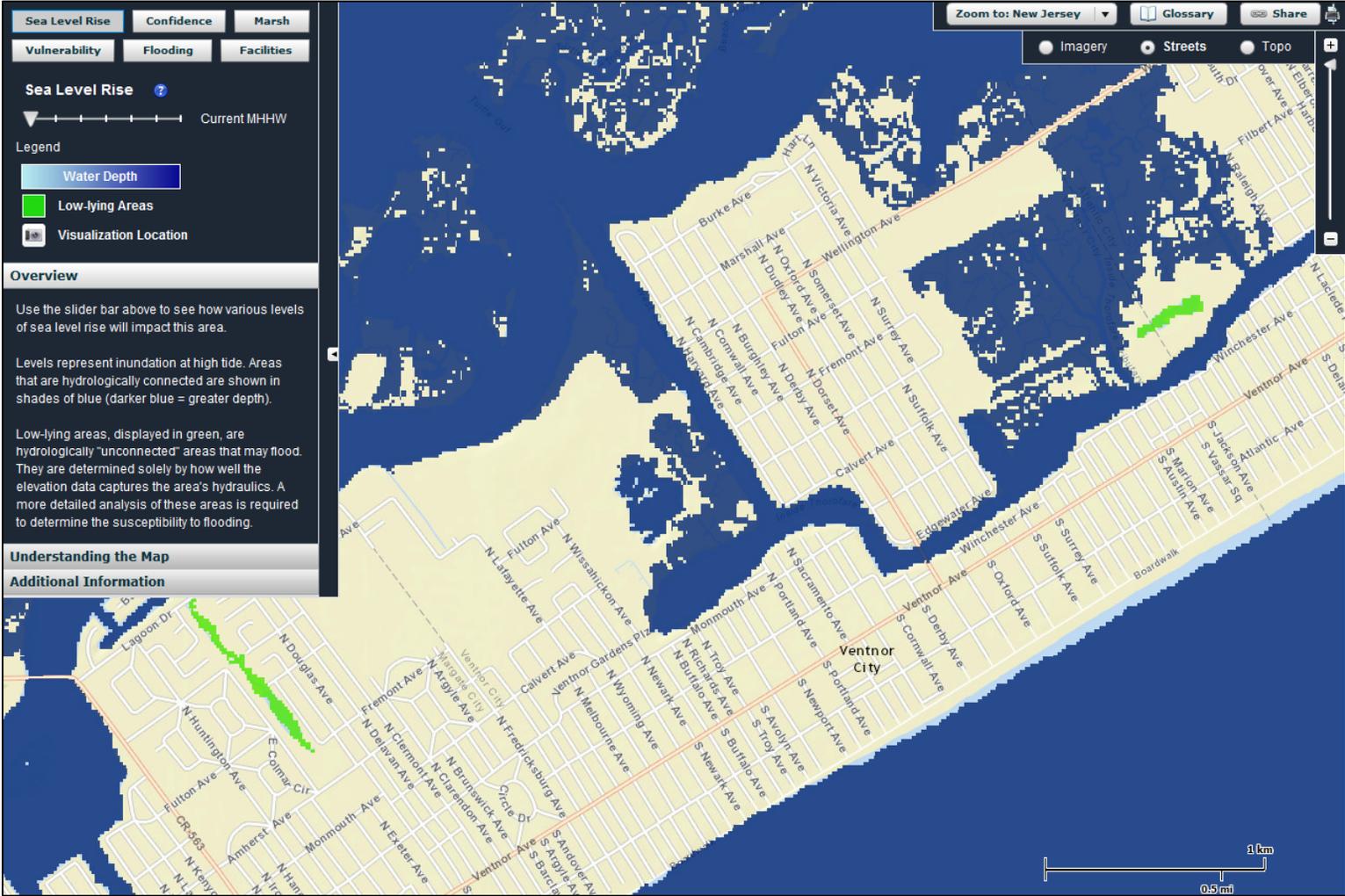
During routine storm events, flooding is typically found in the following areas:

- Newark to Fredericksburg Avenues;
- Ventnor Avenue;
- Ventnor Garden Plaza (Ventnor Heights);
- Wellington Avenue (Ventnor Heights);
- Dudley Avenue (Ventnor Heights); and
- Dorset Avenue and the surrounding side streets (Ventnor Heights).

E. Rising Sea Levels

NOAA has stated in a 2012 report that scientists have very high confidence (greater than 90% chance) that global mean sea level will rise at least 8 inches (0.2 meters) and no more than 6.6 feet (2.0 meters) by the year 2100. Such increase is depicted in Figures 10 through 14.

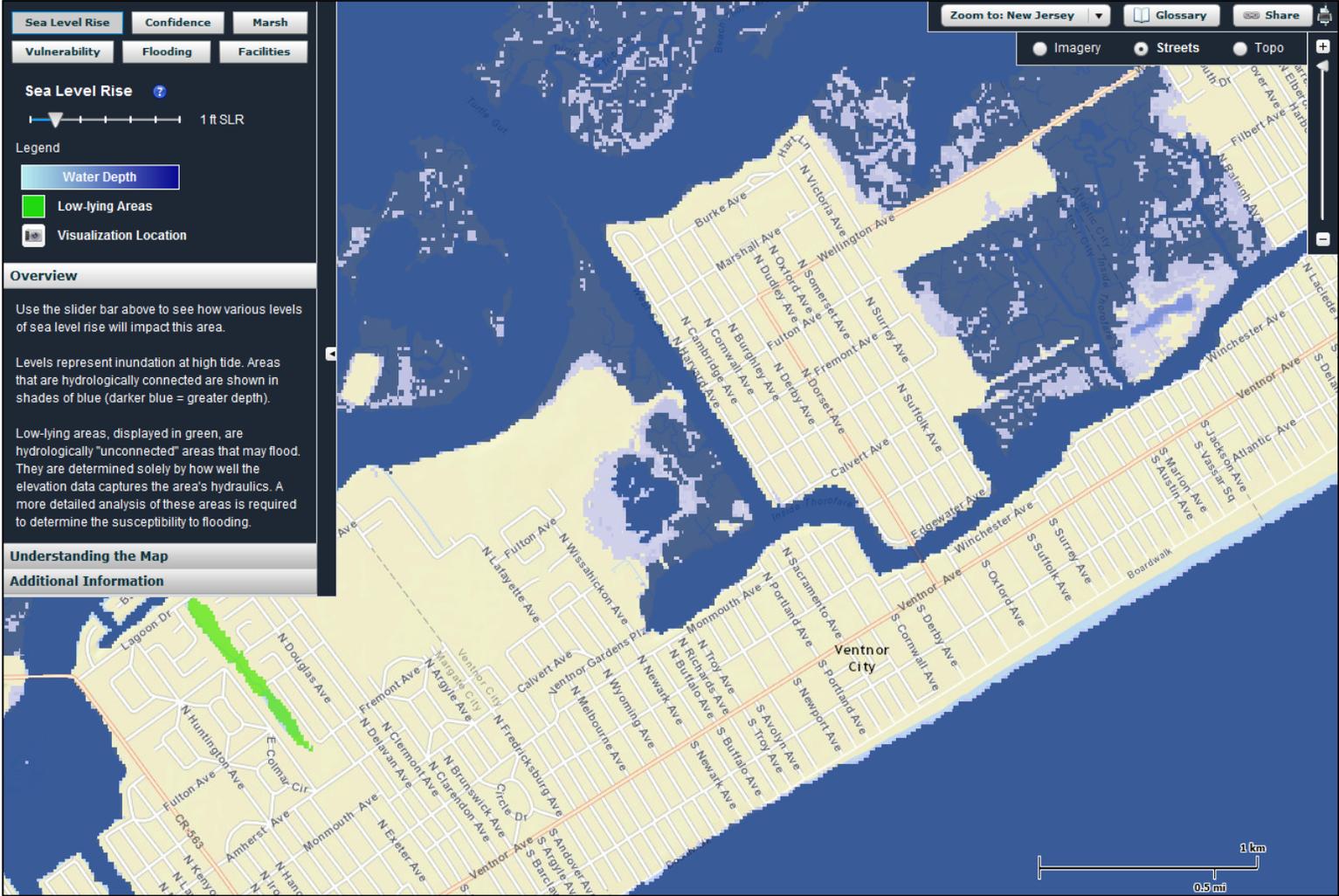
Figure 10. Current State of Mean Higher High Waters ("MHHW")



Source: NJFloodmapper.com

An increase of 1-foot in sea level, with the affected areas shown in purple. This area is predominantly marine tidal marsh in Ventnor Heights. Again, this circumstance does not appear to impact any facilities or homes.

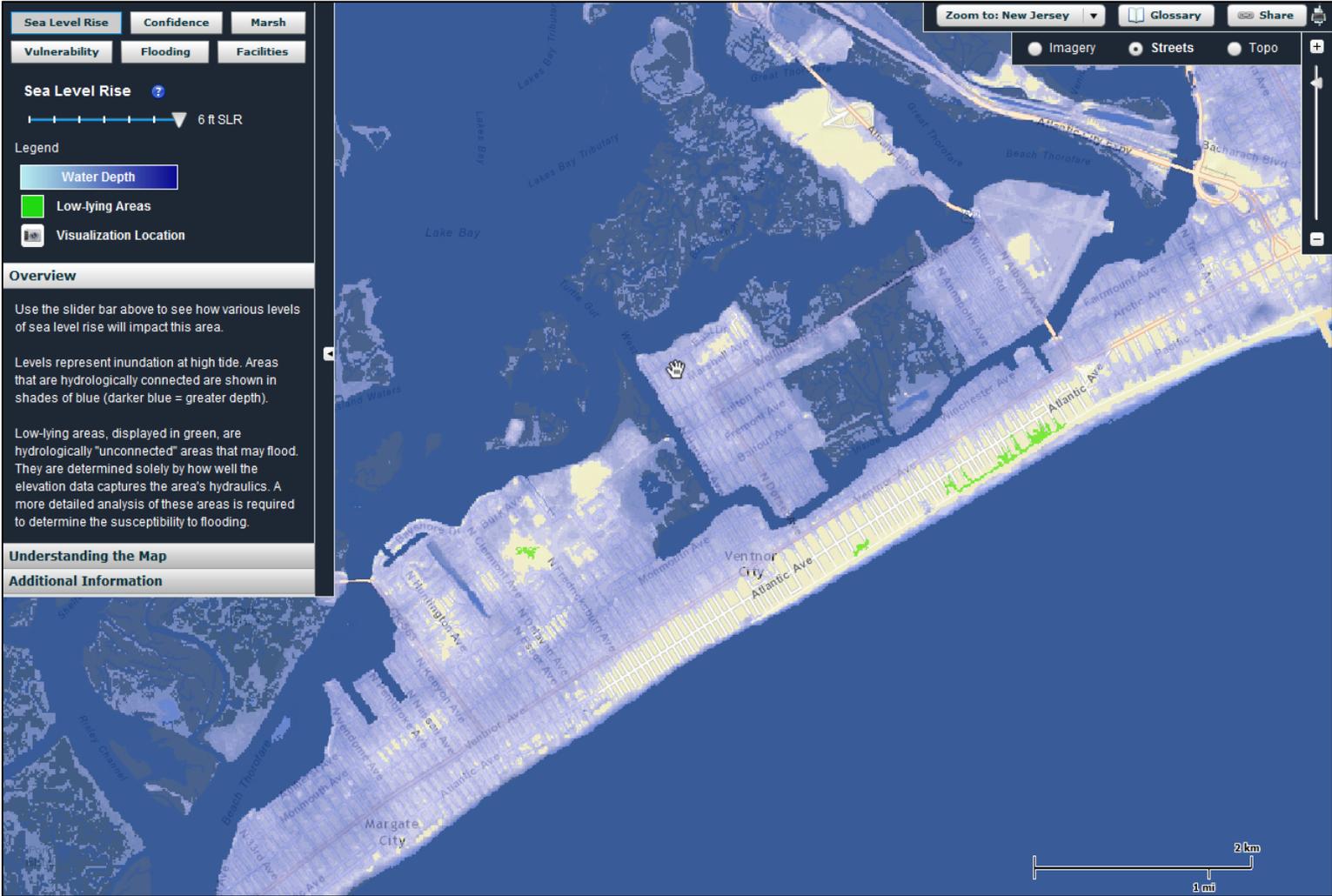
Figure 11. Predicted Impacts of 1-Foot Increase in Sea Level Rise ("SLR").



Source: NJFloodmapper.com

- A six-foot increase in sea levels causes the Atlantic to creep closer to Boardwalk and eliminates virtually all housing north of Ventnor Avenue (Figure 14).

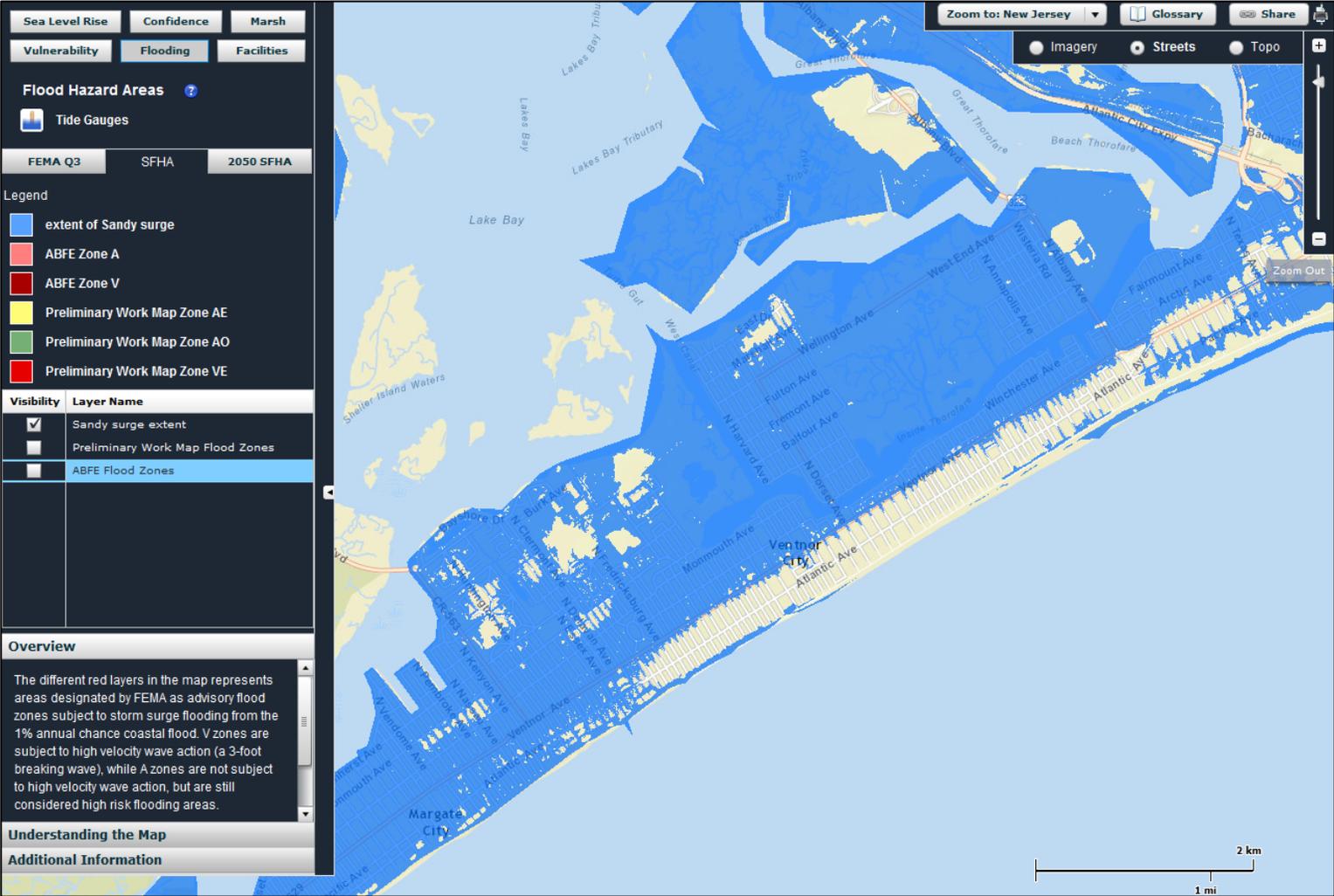
Figure 14. Predicted Impacts of 6-Foot Increase in Sea Level Rise.



Source: NJFloodmapper.com

It is important to note that Ventnor’s position is much more favorable than neighboring Margate or Atlantic City, which are shown as nearly submerged. Note the similarity of Figures 10 through 14 with Figure 15, which illustrates the storm surge associated with Sandy.

Figure 15. Extent of Surge Associated with Sandy.



Source: NJFloodmapper.com

A June 2014 NOAA report identified Atlantic City as third in a list of the Top 10 U.S. Areas with an Increase in Nuisance Flooding.^b The report noted that the average number of nuisance flooding days increased 682% between 1957-1963 (3.1 nuisance flooding days) and 2007-2013 (24.6 nuisance flooding days).

NOAA concluded that increases in sea levels will further intensify nuisance flooding impacts over time and will further reduce the time between flood events. Although this data is not specific to Ventnor, it is reasonable to presume that flooding impacting Atlantic City will similarly impact Ventnor.

In sum, the City is subject to damage resulting from:

- periodic wind events (although with little likelihood of damage occurring from tornadic activity); and
- tidal and storm surge flooding.

F. Risks & Opportunities

Given that 88.3% of the City's land area is within the High Flood Risk area, flooding is the more significant of the two issues facing the City and its residents.

While Ventnor is impacted by flooding from the Ocean, bay and channels separating Ventnor and Ventnor Heights, the oceanfront beach and dune system as well as the bulkheading along the Beach mitigates the impact of storm surge and, therefore, property damage in all but the most significant storms. However, *constant* wave action during severe or prolonged coastal storm events such as hurricanes and Nor'easters erode the beach and dunes, thereby reducing the ability of these systems to protect life and property during a single storm and requiring maintenance and restoration costs between storms. This type of risk may be expected to increase as sea levels rise and storms become more frequent and more severe.

While wave action is not typically experienced from bay and channel waters, storm surge and tidal flooding can be quite significant. Protection from these impacts is achieved primarily by the City's bulkhead system. However, the bulkheads in this section of Ventnor are in varying states of repair and, in some locations, are non-existent. Further, infrastructure improvements designed to increase the speed and volume with which flood waters can be abated should be explored.

Accordingly, resiliency measures to protect against and ameliorate flooding are viewed as critically important to the City.

As an older barrier island community, the public infrastructure in Ventnor (subsurface utilities, overhead lines and civic and community buildings) is, in many cases, decades old and has been battered over the years by Mother Nature.

^b Not defined but referenced by FEMA as "flooding that causes minor inconveniences".
Defined by ecologydictionary.org as "Flooding which causes public inconvenience, but little or no property damage."

Bulkheads deteriorate, water and sewer lines degrade with repeated exposure to salt water, overhead lines are susceptible to wind damage and buildings require ongoing maintenance.

The City's housing and commercial stock is similarly older (reference section II D. herein) and was developed, generally, without regard for resiliency. A large number of homes and stores are built on or near grade, which itself is located within the Flood Plain. As with infrastructure, repeated exposure to the elements degrades roofing and siding, and flooding undermines structures and, if not immediately and properly addressed, can lead to health-related problems.

The ever-increasing difficulty of maintaining aging systems, coupled with increasing frequency and severity of infrastructure-impacting events such as Hurricane Irene in August 2011, the June 2012 Derecho and Sandy in October 2012, has resulted in a double burden to Ventnor residents and taxpayers. Not only must they address damage to their own homes and businesses, but they are ultimately responsible to finance repairs to municipal facilities via taxes.

With the advent of Sandy, the State and Federal Governments have made funding available to municipalities and, in certain circumstances, individual property-owners to plan for, fund and implement a variety of resiliency-related projects. These range from studies and analyses to purchasing and construction.

While nobody would have wished for Sandy, the opportunity now exists for the City to address issues which ~ prior to the storm ~ might have been considered too costly, or may have been deferred to the future. Further, while many of these projects directly address the impacts of Sandy, many would have been necessary without Sandy, and can now be viewed within the context of storm preparedness, resiliency and recovery. Approaches based on post-Sandy data will provide more efficient and effective solutions, and new methods and technologies can be brought to bear which otherwise might not have been considered.

Finally, *with proper planning*, responses to issues can be addressed within a comprehensive framework of well-thought-out components, and not as discrete, individual projects.

IV. Planning Guidance Documents

A. Master Plan

Ventnor's current Master Plan was initially prepared in 1996, and was a evolution of the City's Master Plan Land Use Plan Element adopted in 1988.

The City's most recent Master Plan Re-examination Report was adopted in 2006 (conforming to the then-mandated six-year Master Plan cycle pursuant to N.J.S.A. 40:55D-89). In 2011, the Municipal Land Use Law was amended to require that municipal Master Plans be re-examined every 10-years; meaning that Ventnor's next mandated Re-examination is due in 2016 (although the law does not prohibit more frequent re-examinations if the municipality so desires).

At the time of the 2006 Re-examination, the Planning Board saw as an overarching concern, the protection and preservation of the history of Ventnor as revealed through its historic development patterns, and the need to balance this concern with development pressures resulting from high land costs. In summary, the 2006 document:

- (i) continued the policies and objectives of the 1996 effort;
- (ii) recognized the continued validity of the existing Updated Land Use Plan Element;
- (iii) recommended various enhancements to the development regulations; and
- (iv) incorporated by reference the Northeast Ventnor Redevelopment Plan.

B. Northeast Ventnor Redevelopment Plan

The Northeast Ventnor Redevelopment Plan was adopted in 2001 and regulates redevelopment activity over lands bounded by Winchester Avenue to the north, Atlantic Avenue to the south, Little Rock Avenue to the west, and Jackson Avenue to the east. The plan principally calls for the reduction of residential density through the voluntary conversion of multi-family residential structures to seasonal occupancy as an alternative to year-round occupancy. To incent such conversion, the Redevelopment Plan calls for the City to provide funding to property owners willing to voluntarily convert existing one, two or three unit, year-round residential buildings to seasonal use. The Redevelopment Plan was implemented via adoption of Ordinance No. 2001-6.

The Redevelopment Plan is silent as to resiliency, which, with the benefit of hindsight, has taken on renewed urgency.

C. Citywide Declaration of Area in Need of Rehabilitation

To stimulate redevelopment of storm-damaged and non-storm-damaged properties, the City, in 2014 via Resolution No. 107-2014, declared the entirety of the municipality to be an Area In Need of Rehabilitation pursuant to section 14 of the Local Redevelopment and Housing Law (N.J.S.A. 40A:12A-1 et seq.). This

declaration was based on the age of the housing stock and age / condition of the water and sewer infrastructure in the City.

Such a declaration enables the City to employ certain tools and powers ~ including, but not limited to, five year residential tax abatement ~ available only in designated Rehabilitation Areas. An additional prerequisite for the use of these tools and powers is the adoption of one or more Redevelopment Plan(s),^c which can be tailored to the specific needs of specific sections of the City.

D. Zoning Ordinance

Ventnor's zoning regulations are found within Chapter 102 of the City Code, which was amended in its entirety in 1990. The zoning regulations provide for 17 zoning classifications: 12 residential, 4 commercial and 1 environmental. The adoption of Chapter 102 predates Sandy and therefore does not incorporate provisions addressing resiliency.

^c N.J.S.A. 40A:12A-3 defines a Redevelopment Plan as

*a plan adopted by the governing body of a municipality for the redevelopment **or rehabilitation** of all or any part of a redevelopment area, or an area in need of rehabilitation, which plan shall be sufficiently complete to indicate its relationship to definite municipal objectives as to appropriate land uses, public transportation and utilities, recreational and municipal facilities, and other public improvements; and to indicate proposed land uses and building requirements in the redevelopment area or area in need of rehabilitation, or both" [**emphasis added**].*

Accordingly, despite its name, a Redevelopment Plan is the statutory mechanism for addressing conditions in a *Rehabilitation Area*.

V. Sandy Impacts

A. Post-Sandy Expenditures

November / December 2012: Substantial damage attributable to flooding at:

- City Hall, to include the Police Department;
- Fire House,
- Public Works
- Ball fields

In excess of 6 million pounds of storm debris was removed.

Fall 2013:

- 530,000 cubic yards of sand was pumped onto the beach by the U.S. Army Corps of Engineers.
- Restoration of the 100-foot-wide berm to an elevation of 12.75 ft.

The overall project for Absecon Island cost \$60.6 million.

As depicted in Table 2, approximately \$1,144,350 was spent by the federal government and \$381,450 was spent by the City for emergency management and protective measures.

Table 3. Expenditures

APP_ID#	Ref #	Title	CAT	PS	Project 100%	FEMA 75% SHARE	50% Advance	Final Payment	Status	Local 25%
7562001	PW-00579	Debris Removal	A	L	\$ 1,018,162.22	\$ 763,621.67	\$ 381,810.83	\$ 381,810.83	Awarded	\$ 254,540.56
7562002	PW-00938	Emergency Protective Measures	B	L	\$ 165,120.17	\$ 123,840.13	\$ 61,920.06	\$ 61,920.06	Awarded	\$ 41,280.04
7562003	PW-00158	Water Main Newport & Winch	F	S	\$ 9,441.88	\$ 7,081.41	\$ 7,081.41	\$ -	Awarded	\$ 2,360.47
7562004	PW-01055	Traffic Control Lights	C	S	\$ 52,387.11	\$ -	\$ -	\$ -	Ineligible	Sent to NJDOT
7562005	PW-03514	DPW Buildings	E	L	\$ 120,290.04	\$ 90,217.53	\$ 45,108.70	\$ 45,108.77	In Progress	\$ 30,072.51
7562006	PW-02687	City Municipal Building	E	S	\$ 2,439.50	\$ 1,829.63	\$ 1,829.63	\$ -	Awarded	\$ 609.88
7562007	PW-02686	Fire House Roof, Boiler & Window	E	S	\$ 593.92	\$ 445.44	\$ 445.44	\$ -	In Progress	\$ 148.48
7562008	PW-02248	Recreation & Concession Bldgs	G	S	\$ 18,033.62	\$ 13,525.22	\$ 13,525.22	\$ -	Awarded	\$ 4,508.41
7562009	PW-00940	Police Equipment, Uniforms, Etc	E	S	\$ 1,166.92	\$ 875.19	\$ 875.19	\$ -	Awarded	\$ 291.73
7562010	PW-02387	Repair of Wells #4 & #8	F	S	\$ 66,864.50	\$ 50,148.38	\$ 50,148.38	\$ -	Awarded	\$ 16,716.13
7562011	PW-01687	City Hall Emer Prot Measures	B	L	\$ 123,692.23	\$ 92,769.17	\$ 46,384.59	\$ 46,384.59	Awarded	\$ 30,923.06
7562012	PW-03513	Water Check Valve	B	S	\$ 29,958.50	\$ 22,468.88	\$ -	\$ -	Ineligible	Appeal in Progress
					\$ 1,608,150.61	\$ 887,461.79	\$ 609,129.45	\$ 535,224.25		\$ 381,451.25
		50% Advance					\$ 609,129.45		Local 25%	\$ 381,451.25
									FEMA 75%	\$ 1,144,353.70
									TOTAL	\$ 1,525,804.95

Source: Ventnor City Engineer.

B. Ratable Base

The Ventnor City Tax Assessor reports an total tax abatement (reduction) of approximately \$5 million due to Storm damage. This decrease in the ratable base does not reflect the yet indeterminate number of damaged dwelling units that have been abandoned, especially in lower elevation areas by the bay and Ventnor Heights. It is anticipated that the full effect of Sandy's far-reaching damage will not be fully assessed for at least two years.

C. **Repetitive Loss Properties**

According to FEMA, a Repetitive Loss ("RL") property is defined as any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A RL property may or may not be currently insured by the NFIP. According to the 2010 Atlantic County Natural Hazard Mitigation Plan, twenty percent of all RL properties in the County are located in Ventnor. Of the 11 properties in Atlantic County that have reported 10 or more losses, seven are located in Ventnor.

According to FEMA, a Severe Repetitive Loss ("SRL") Property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- (a) Has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- (b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.
- (c) For both (a) and (b), at least two of the referenced claims must have occurred within any 10-year period, and must be greater than 10 days apart.

Historically, Atlantic City, *Ventnor* and Brigantine have had the highest numbers of repetitive risk properties in Atlantic County. As of June 30, 2008, FEMA determined that Ventnor had a total of 159 such properties.^(WC:9)

Figure 16 identifies the locations of Sandy-Damaged Properties (orange) and Repetitive Loss Properties (yellow).

Figure 16. NFIP Repetitive Loss Property Cluster Areas.



Source: Atlantic County Department of
Regional Planning & Development.

New Jersey's 2014 Hazard Mitigation Plan reported that the City has 191 RL properties (of which 4 have a nonresidential use) and a total of 30 SRL properties. NFIP payments from Sandy were respectively \$14,711,875 and \$3,603,796.

The following Tables highlight Ventnor's flood damage claims and repetitive losses.

Table 4. NFIP Policies and Claims (2013) and Repetitive Losses

Total Claims	
Number of Policies:	4,888
Number of Properties in the V Zone:	10
Number of Properties in the A Zone:	4,170
Total Number of Claims:	3,821
Sum of Total Paid:	\$78,338,582
Repetitive Loss Properties	
Number of Repetitive Loss Properties:	191
Sum of Total Paid:	\$14,711,875
Number of Severe Repetitive Loss Properties:	30
Sum of Total Paid:	\$3,603,796

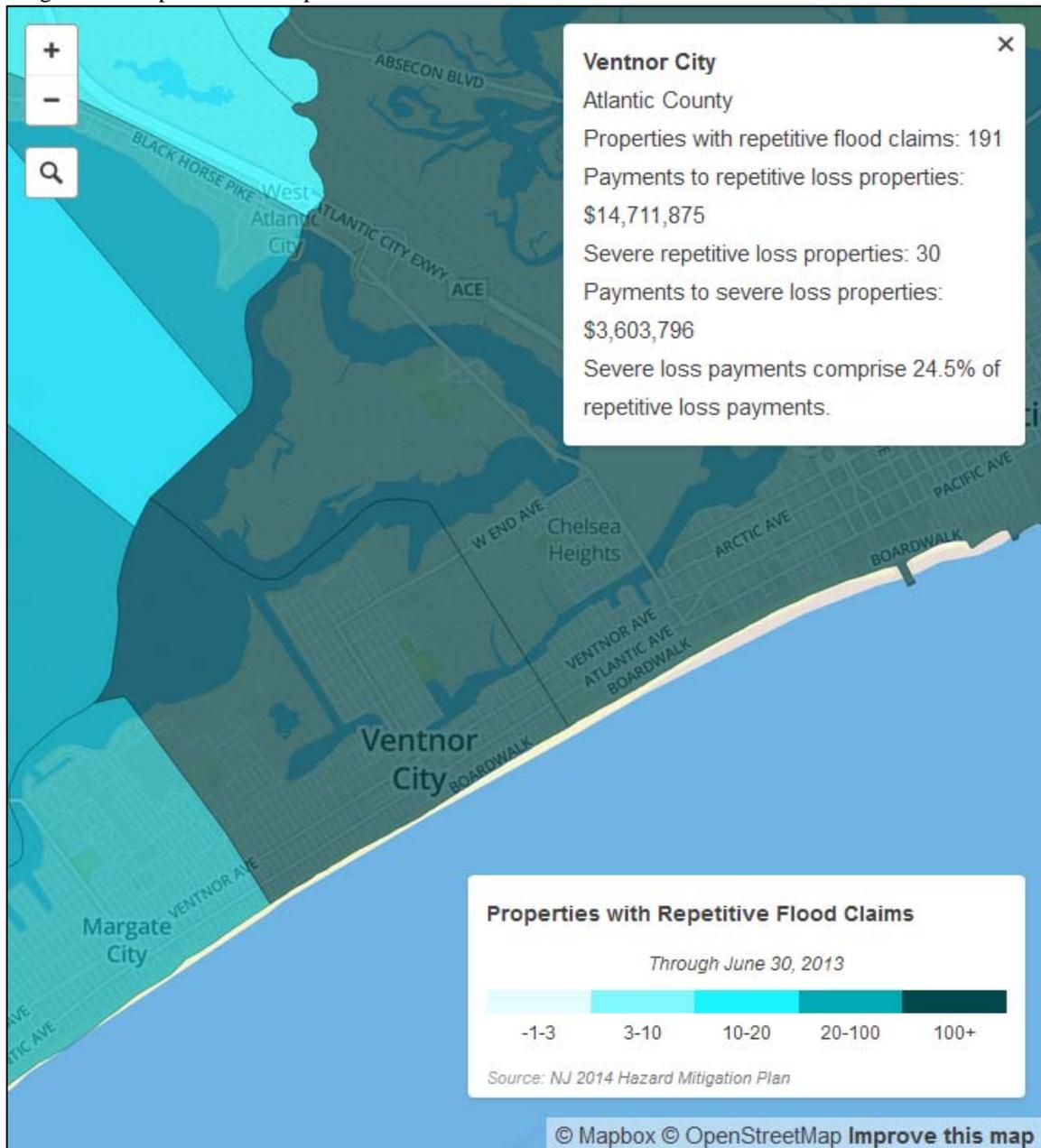
Source: Appendix U, NFIP Statistics, New Jersey
2014 Hazard Mitigation Plan

Table 5. Census Tracts with Damaged Homes

Census Tract	% Households w/ Major / Severe Storm Damage	# Households	Median Household Income	% Households Over 65 Living Alone	% Owner-Occupied Households
34001013202	45%	962	\$42,500	13%	56%
34001013302	39%	1386	\$48,750	15%	62%
34001013301	31%	1200	\$66,917	14%	73%
34001013201	24%	998	\$54,286	16%	59%

Source: New Jersey Department of Community Affairs,
CDBG Disaster Recovery Action Plan, 2013

Figure 17: Properties with Repetitive Flood Claims.



Source: NJSpotlight.com

VI. Recovery Efforts

A. Short-Term Projects (completed)

1. Emergency Notification System – CodeRED

The CodeRED system allows residents to register for notifications by the local emergency response team in the event of emergency situations or critical community alerts.

Critical communications can be received via phone or text message, and could include evacuation notices, bio-terrorism alerts, boil water notices and missing child reports.

2. Elevation Certificates for City-Owned Buildings

Elevation Certificates ("EC") are administrative tools of the NFIP used to provide elevation information necessary to ensure compliance with community Floodplain Management Ordinances, to determine the proper insurance premium rate, or to support a request for a Letter of Map Amendment ("LOMA") from FEMA.

A community's (building) permit file must include an official record that shows that new buildings and substantial improvements in all identified Special Flood Hazard Areas ("SFHA") are properly elevated in compliance with the Floodplain Management Ordinance.

3. Piping, Wells and Generators

The water main break at Newport Avenue and Winchester Avenue, which occurred during Sandy, has been repaired.

Well #8, which flooded-out during Sandy, is currently being replaced.

Large generators have been installed at:

- City Hall, to include the Police Department;
- the sewer station in Ventnor Heights;
- the sewer station on Lafayette Avenue; and
- Wells #8 and #10.

B. Long-Term Projects (planned but not yet completed)

Table 6. Planned Infrastructure Projects

Improvement	Hazard to Address	Project Location	Cost	Funding	Priority	Target Completion Date
Stormwater Pumping Station & Emergency Generator	Protection of critical facilities & flooding	Ventnor Garden Plaza and the Bay	\$2,875,720	HMGP grant	HIGH	2015
Emergency Generators for Water & Sewer Pumping Stations	Loss of power due to storms, high winds or other hazards	Lafayette Avenue & Fremont Avenue	\$100,000 each	local bond	HIGH	2015
Ventnor Heights Drainage Improvements North	Flooding	north Ventnor Heights	\$2,403,748	HMGP grant	MEDIUM	2015
Ventnor Heights Stormwater Pumping Station	Flooding	northeast Ventnor Heights	\$743,896	HMGP grant	HIGH	2015
Installation of Duck Bill Valves	Prevent back-ups in storm drainage systems during periods of minor to moderate tidal flooding	various locations	\$1,449,300	HMGP grant, budget, local bonds	MEDIUM	2015
Installation of Citywide Warning Siren System for Emergencies	Public warning for all hazards	citywide	\$100,000	pending if funding available	LOW	2017

VII. Post-Sandy Recommendations

A. **Vulnerability Assessment (\$20,000)**

The next step after completing the Strategic Recovery Planning Report is to prepare a complete Vulnerability Assessment to help guide the City in its resiliency planning efforts. Such an analysis is most effectively undertaken by considering surge scenarios *at the parcel level*, utilizing the latest mapping technology to identify areas where infrastructure, natural resources and special needs populations overlap areas most prone to inundation ~ under current conditions and (reasonable) future expectations (e.g., most vulnerable).

Such information is then used to identify opportunities to improve resiliency through mitigation, preparedness, response mechanisms, planning policy and outreach. NJDCA Post-Sandy Planning Assistance Grant funding may be available for such a project.

B. **Planning Policy Documents (\$50,000)**

Ventnor's Master Plan, Zoning Ordinance, Redevelopment Plan for Northeast Ventnor and other existing planning documents predate Sandy. As such, they are silent as to resiliency planning. It is therefore recommended that these documents, as well as future planning efforts, including, but not limited to, plans which may emerge from the Citywide Rehabilitation Area designation, be updated to appropriately address resiliency. Specifically:

1. Master Plan

Ventnor's current Master Plan dates to 1996 and the most recent Re-examination was completed in 2006. The next Re-examination is not statutorily-mandated until 2016.

A Master Plan Reexamination is designed to review *existing* assumptions, problems and objectives and provide recommendations addressing issues facing a municipality. Such an analysis, by definition, takes an incremental approach to problem identification and problem solving. Accordingly, there are times when a new Master Plan, taking a fresh look at a community, is recommended.

In light of the trends and challenges facing Ventnor at this time, consideration should be given to developing a Comprehensive Master Plan Update. Via the Mandatory and Optional Master Plan Elements provided for under the New Jersey *Municipal Land Use Law*, such an effort would build on the existing Master Plan, but would enable the introduction of a consistent theme of resiliency throughout the following Master Plan Elements.

Mandatory Master Plan Elements:

- Statement of Objectives, Assumptions, Policies and Standards, addressing resiliency and reduction in vulnerability to flooding wind and other events via sound land use planning;

- Land Use Plan Element, taking into consideration new FEMA flood mapping and Sandy-related regulations; and
- Housing Plan Element.

Optional Master Plan Elements:

- Utility Service Plan Element, including planning necessary to ensure resiliency for critical infrastructure.
- Community Facilities Plan Element, including planning necessary to ensure resiliency for critical facilities and public properties.
- Open Space Plan Element, including planning for the Ventnor West section of the City;
- Economic Plan Element;
- Historic Preservation Plan Element; and
- Green Buildings and Environmentally Sustainability Plan Element.

2. Redevelopment / Rehabilitation Planning (\$20,000)

As noted, the City has a Redevelopment Plan in place for Northeast Ventnor and the entirety of the City has been declared to be In Need of Rehabilitation (which permits the City to prepare and adopt individual Redevelopment Plans tailored to the needs of individual sections of the municipality.

Under New Jersey's Local Redevelopment and Housing Law, municipalities are authorized to enter into what are termed Redevelopment Agreements with private property owners developing under a Redevelopment Plan.

As part of this Redevelopment Plan / Redevelopment Agreement process, the City could require that resiliency measures be incorporated into individual projects.

The City should pursue funding to amend the Northeast Ventnor Redevelopment Plan to require resiliency measures in land use and building controls, and for the preparation of resiliency-compliant Redevelopment Plans under the Citywide Rehabilitation designation that would, in particular, address sections of the City impacted by Sandy.

3. Zoning & Related Codes, Ordinances & Regulations (\$25,000)

Whether or not the Master Plan is updated as recommended, the City's Zoning Ordinance should be analyzed from the perspective of refinements to the area and bulk standards which would potentially serve to mitigate damage from major storm events. As part of such an initiative, modifications to setbacks relative to height and the establishment of floor Area Ratio ("FAR") requirements as a mechanism to balance structural size relative to lot area, might be considered.

Refinements to the Ordinance should include a Flood Resilience amendment to enable new and existing buildings throughout designated flood zones to meet the latest standards for flood-resistant construction. Such an amendment will serve to remove a range of impediments to flood-resistant construction and incorporate measures to mitigate potential negative effects of flood-resistant construction on the streetscape and public realm, to further reduce risks associated with natural hazards and minimize disruption to residents and businesses. Aspects which may be included in the amendment are:

- a. Measure building height with respect to the latest FEMA flood elevations;
- b. Accommodate building access from grade;
- c. Increase setbacks;
- d. Increase elevations of structures and bulkheads;
- e. Focus efforts to protect natural resources and environmentally sensitive areas and guide development away from hazard-prone areas;
- f. Improve building and zoning codes to minimize structural vulnerability to natural disasters;
- g. Locate mechanical systems above flood levels;
- h. Accommodate flood zone restrictions on ground floor use;
- i. Strengthen landscaping standards and streetscape requirements.
- j. A Post-Disaster Recovery Ordinance as detailed below.

Figure 18. Example of raising a home to a higher elevation.



4. Post-Disaster Recovery Ordinance

Before the next natural disaster occurs, the City should consider the preparation of a Recovery Ordinance, the purpose of which would be to establish and authorize a Local Recovery Management Organization ("LRMO") that would work hand-in-hand with the local emergency management organization.

The LRMO would help guide short- and long-term recovery plans and identify methods for local government to undertake cooperative efforts with other agencies. The Recovery Ordinance would outline anticipated means of assisting residents, businesses and stakeholders, and would establish emergency powers to protect public health, safety and welfare.



5. Additional Planning Initiatives

a. Capital Improvement Plan (\$10,000)

Preparation of a 5-Year Capital Improvement Plan as a means to achieve the resiliency improvements identified in this Report as well as those that may be recommended as a result of the future analyses recommended herein. Given the costs likely to be involved in such projects, a multi-year spending plan will assist in guiding the City in planning and financing these initiatives in a manner that will minimize impacts to the taxpayer.

b. Shared Services Plan (Costs Unknown at this time)

A Shared Services Plan designed to identify and operationalize the combining of services between the municipalities (and Boards of Education) that share Absecon Island is recommended in order to eliminate duplicative services, increase efficiency and take advantage of economies of scale. While of value in-and-of-itself, such an effort would help to stabilize tax rates in the face of the capital financing required for the projects as proposed.

c. Design Standards (\$20,000)

In addition to amendments to Zoning-related Codes, Ordinances & Regulations addressed under section 3, preparation of new design standards are recommended to assure resiliency as a central component of new development, whether it be commercial, residential, mixed-use, or a public improvement.

C. Sustainability and Stormwater Management

1. Sustainability

Sustainability, as generally considered, relates to the use of natural resources in such a manner as to meet current need without impinging upon the use of same by future generations. From an overarching perspective, aspects of sustainability include:

- (a) measures to reduce utilization of fossil fuels;
- (b) measures to reduce environmental impacts of development; and
- (c) creative stormwater management.

To reduce dependency on fossil fuels, the city should employ the use of renewable energy systems at municipal facilities and, in particular, the use of solar array and wind-driven systems. Such systems, whether ground or roof mounted, are by design less susceptible to flood damage as the arrays are elevated.

To reduce environmental impacts of development, the City should, as part of the development / redevelopment approval process, look for opportunities to reduce impervious surface coverage. Where appropriate, consideration should be given to the use of permeable pavement or pavers set in sand.

Additionally:

The City should consider a Sustainable Jersey Certification. This program, which provides access to grants and identifies funding opportunities for sustainable projects, is an initiative of the New Jersey League of Municipalities' Mayors' Committee for a Green Future, the Municipal Land Use Center at the College of New Jersey, the New Jersey Department of Environmental Protection, the New Jersey Board of Public Utilities, and a coalition of non-profits and other state agencies.

There are a number of green initiatives that can be easily accomplished, such as street tree planting and landscaping of yards and parking lots, measures to promote alternatives to automobile use such as bicycling and car sharing services and innovative zoning changes to foster more efficient buildings and green roofs.

2. Stormwater Management

a. Ventnor Heights Stormwater Management Study

As detailed herein, the Ventnor Heights section of the City was significantly impacted by Sandy and, in fact, is particularly vulnerable to tidal and storm related flooding and other weather events.

Figure 19.
Wellington Avenue
Shopping Center
(Ventnor Heights)
Post-Sandy



Source: floodlist.com/insurance/us/flood-insurance-ventnor-new-jersey

In addition to other recommendations in this Report which might be applicable to Ventnor Heights, a specific Stormwater Management Study, evaluating the entirety of the storm-related infrastructure in this section of the City is recommended.

b. Green Infrastructure

Traditionally, modern America has relied on Gray Infrastructure (traditional practices for stormwater management and wastewater treatment such as pipes and sewers) to solve its stormwater problems. However, Gray Infrastructure is expensive.

Alternatively, Green Infrastructure can use landscaping and soil to help improve water quality in addition to managing stormwater runoff. Flooding impacts can be mitigated by using such Green Infrastructure elements as green roofs, rain harvesting systems, stormwater planter boxes, bioswales and rain gardens, and by increased tree canopy.

The City's zoning ordinance should be refined to include Green Infrastructure requirements for new construction and sizable renovations. Potential requirements could include street trees, rainwater harvesting and rain gardens.

Figure 20. Example of stormwater infiltration tree pits that function as an attractive streetscape.



c. Reduction of Impervious Surfaces

One of the easiest ways to reduce flooding impacts is to capture rainwater before it hits the streets and becomes a problem. By allowing the soil to absorb the rainwater directly, there is substantially less sheet flow and, consequently, improved water quality. While this methodology will not address tidal flooding, it can be included as a component of the City's flood mitigation program.

The zoning ordinance could be amended to include the following methods to achieve this strategy:

- Reduce the amount of permitted impervious surfaces, especially for zones commonly inundated with flood waters.
- Prohibit concrete patios and driveways for new construction. Instead of relying on pervious surfaces such as stone, permeable pavement or pavers set in sand are recommended. Permeable pavement should be utilized to the greatest extent practicable as development and redevelopment takes place.

Figure 21. Pervious pavers.



D. Infrastructure

1. Bulkhead Repair and Installation (\$999,740)

Ventnor's Office of Emergency Management considers the condition of the back bay bulkheads to be the City's most pressing storm-related vulnerability.

NJDCA Post Sandy Planning Grants should be secured to fund a planning initiative to inventory back bay bulkheads to determine which need to be repaired, which elevated and/or which replaced. New bulkheads should be installed where no bulkhead currently exists. A similar analysis is recommended for the Beachfront.

The bulkheads at Lily Park (Winchester Avenue between Little Rock and Victoria Avenues); on Winchester Avenue between Marion and Austin

Avenues; at Ventnor Gardens Plaza (Wissahickon Avenue), at the Sacramento Avenue street-end (at Monmouth Avenue); and at the Derby Avenue street-end (at Winchester Avenue) are in poor condition and should be replaced.

Ordinance No. 2014-44 has been introduced to establish a minimum height of elevation 10.5' (NAVD88) for oceanfront bulkheads and seawalls, and a minimum height of elevation 8.0' (NAVD88) and maximum height of elevation 9.0' (NAVD88) for bayfront bulkheads.

2. Ventnor Gardens Stormwater Station (\$2,875,720)

Required *repairs* include a new concrete wetwell, emergency generator set, a new pump station building and repairs to the bulkhead system. As such, *complete reconstruction* ~ as opposed to repair ~ is recommended.

3. Emergency Generators (\$300,000)

An alternative source of electricity insures that critical facilities, wells and sanitation pumps continue to function in the event of power failure. Appropriately sized emergency generators should be installed, at a minimum, at the City's stormwater, water and sewer pumping stations.

4. Pipe Evaluation (\$150,000)

The City's stormwater piping should be video-inspected to locate blockages and areas of deterioration. Based on the inspection results, an improvement plan and timeline should be prepared for repair or replacement.

5. Inspection of City Owned Facilities (\$25,000)

An analysis of City-owned facilities should be undertaken to determine hardening measures to mitigate the damage from future storm events.

6. Speaker System (\$100,000)

The installation of a Citywide warning system would be beneficial for emergency notifications and public warning signals. The priority for this project is low and pending available funding.

E. Other

1. Blue Acres / Buyouts

The City may wish to consider acquiring abandoned and/or severe repetitive loss properties where it can be demonstrated that acquisition is necessary to mitigate damage from future storm events. This approach allows for the demolition of improvements and creation of open space, affording conservation and restoration opportunities.

Figure 21. Transformation of flood-prone areas



2. Community Rating System ("CRS")^d

The CRS is a voluntary program designed to provide communities with the impetus to increase public safety, reduce damage to private property and public infrastructure, minimize economic disruption and loss and protect the environment. To incent these activities, communities that participate in the CRS program are entitled to reduced flood insurance premiums.

Additionally, participation in certain CRS activities may contribute to project eligibility for certain other federal assistance.

For CRS participating communities, flood insurance premium rates are discounted in increments of 5%. As such, a Class 1 community would receive a 45% premium discount while a Class 9 community would receive a 5% discount. Classes for local communities are based on 18 creditable activities organized under four categories:

CRS Creditable Activities			
Public Information	Mapping and Regulations	Flood Damage Reduction	Flood Preparedness
<ul style="list-style-type: none"> ▪ Elevation Certificates ▪ Map Information ▪ Outreach Projects ▪ Hazard Disclosure ▪ Flood Protection Information ▪ Flood Protection Assistance 	<ul style="list-style-type: none"> ▪ Additional Flood Data ▪ Higher Regulator Standards ▪ Land Development Criteria ▪ Flood Data Maintenance ▪ Stormwater Management 	<ul style="list-style-type: none"> ▪ Repetitive Loss Requirements ▪ Floodplain Management Planning ▪ Acquisition and Relocation ▪ Flood Protection ▪ Drainage System Management 	<ul style="list-style-type: none"> • Flood Warning Program • Levee Safety • Dam Safety

Ventnor is currently in CRS Class 7, resulting in a 15% discount in flood insurance premiums for properties located in the Special Flood Hazard Area and a 5% discount for properties not located in such areas.

The City should continue its CRS efforts in order to maximize resiliency and minimize flood insurance premiums.

3. Best Practices

Consideration should be given to the preparation of Best Practices to reduce likelihood of utility service interruptions during major natural or man-made

^d Source: ready.nj.gov/programs/pdf/irene_mitigation/092311_dr4021_012.pdf

events. Best Practice measures would supplement existing building code requirements and would address issues such as back-up power generation; the limiting of heating and cooling losses through windows, walls and roofs; and common access to potable water in multi-family structures.

4. Economic Development Plan for Business Districts

As coastal New Jersey continues to recover from Sandy, a second ~ man made event ~ has hit the area. Closing of four casino resorts in 2014^e has / will cost the region an estimated 7,143 direct jobs and an untallied number of indirect jobs as the reduction in casino purchasing and unemployment ripples through the economy.

Job Loss Impact

(Does Not Include Atlantic Club)

Municipality	Casino Employees	Jobs at Risk	% Casino Job Loss
Atlantic City	6,237	1,334	21.4%
Egg Harbor Township	4,783	830	17.4%
Galloway Township	3,641	696	19.1%
Pleasantville	2,911	530	18.2%
Hamilton Township	2,222	432	19.4%
Absecon	1,400	250	17.9%
Ventnor	1,347	247	18.3%
Brigantine	1,151	196	17.0%
Egg Harbor City	740	151	20.4%
Somers Point	673	138	20.5%
Northfield	755	133	17.6%
Hammonton	409	94	23.0%
Linwood	333	84	25.2%
Tuckerton	419	81	19.3%
Vineland	347	75	21.6%
Sicklerville	288	69	24.0%
Margate	311	65	20.9%
Williamstown	247	53	21.5%
Ocean City	181	53	29.3%
Manahawkin	123	32	26.0%

Source: New Jersey Casino Control Commission (as of July 1, 2014)
via Press of Atlantic City (September 5, 2014)

Without employment, families will be forced to leave the area and seek opportunity elsewhere.

^e Atlantic Club, Showboat, Revel & Trump Plaza.

These numbers are underscored by employment figures released by the U.S. Bureau of Labor Statistics,^f which indicate 3,600 fewer jobs in the Atlantic County Metropolitan Area in July 2013 as compared to July 2012. This 2.6% reduction places the County last among 372 metropolitan areas in job gains / losses.

An Economic Development Plan for Ventnor and Atlantic Avenues on the Island and Dorsett and Wellington Avenues in Ventnor Heights, and other sections of the City as appropriate is recommended to support the existing commercial operations in these areas as well as to attract new businesses to the City. In addition to traditional economic analyses, design standards are recommended to increase resiliency while enhancing the aesthetics of these business districts.

5. Funding Opportunities

While the following is offered as examples of the types of funding available to the City and its property owners to address the needs of the community, it should by no means be considered an exhaustive inventory of such funding. Additional programs may exist from a variety of sources. Additionally, over the course of time, new programs may be offered and existing programs eliminated or modified.

- Additional opportunities through the NJDCA Post Sandy Planning Grant program.
- Hazard Mitigation Grants ("HMG") – offers homeowners up to \$30,000 to raise their homes (offered only for a Presidential-declared disaster).
- NFIP Increased Cost of Compliance ("ICC") Coverage – grants available to eligible properties^g for owners who carry new and renewed standard flood insurance policies as a means to assist homeowners meet the costs of repairing or rebuilding properties in compliance with new, post-Sandy building requirements and thereby reduce future flood damage. Such funding is available for the elevation of a home above the flood elevation level adopted by the City, the relocation of a home out of harm's way and the demolition and removal of a damaged home.
- Flood Mitigation Assistance ("FMA") – offered annually from FEMA.
- Pre-Disaster Mitigation ("PDM") Grants – offered annually from FEMA for hazard-mitigation planning and the implementation of mitigation projects prior to a disaster.
- Severe Repetitive Loss ("SRL") Grants – provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss structures insured under the National Flood Insurance Program.

^f Press of Atlantic City (August 28, 2014)

^g Property must be located in a flood plain and have suffered repeated / substantial damage from a flood

- Repetitive Flood Claims ("RFC") Grants – provide funding to reduce or eliminate the long-term risk of flood damage to structures insured under the National Flood Insurance Program that have had one or more claim payments for flood damages.
- Blue Acres, NJDEP – provides funding to purchase properties (including structures) that have been damaged by, or may be prone to incurring damage caused by, storms or storm-related flooding, or that may buffer or protect other lands from such damage.
- U.S. Army Corps of Engineers – provides funding and engineering support for beach renourishment as well coastal protection elements such as bulkheads, stormwater management systems and certain mitigation projects.

6. Partnerships

Certain grant funding is awarded to non-profits, state government and colleges. The City should consider networking with the following organizations, among others, for potential future collaboration:

- NJDEP, Office of Natural Resource Restoration
- Rutgers University
- The Richard Stockton College of New Jersey
- Atlantic Cape Community College
- New Jersey Audubon Society
- New Jersey Conservation Foundation
- The American Littoral Society

Appendices

Appendix 1.

Table of Flood and Storm Surge on Historic and Cultural Resources

List of Ventnor City's Historic and Cultural Resources

Location	Flood		Storm Surge			
	1% Annual Chance of Flood	0.2% Annual Chance of Flood	Category			
			1	2	3	4
Raphael-Gordon House		X		X	X	X
Ventnor City Hall		X		X	X	X
Marven Gardens Historic District	X		X	X	X	X
Saint Leonard's Tract Historic District	X	X	X	X	X	X
John Stafford Historic District	X	X	X	X	X	X

Source: Atlantic County 2010 Natural Hazard Mitigation Plan

Appendix 2.

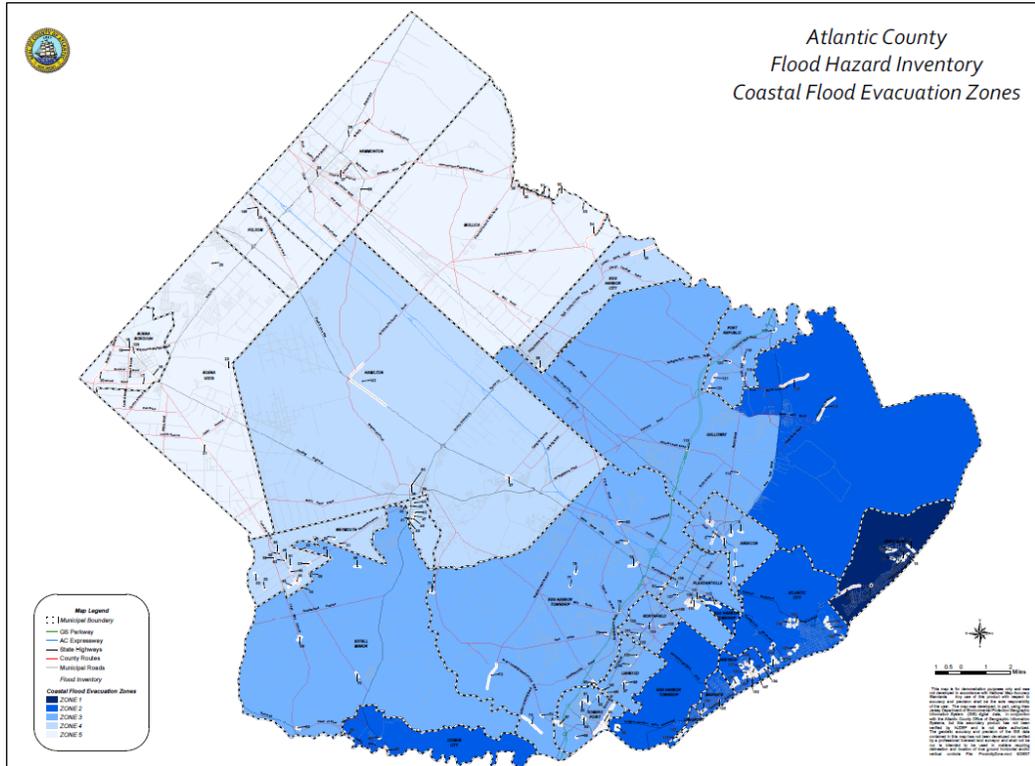
Table of Flood and Storm Surge on Critical Facilities

List of Ventnor City's Critical Facilities

Type of Facility	Flood		Storm Surge			
	1% Annual Chance of Flood	0.2% Annual Chance of Flood	Category			
			1	2	3	4
Fire Station #1, Ventnor City	X			X	X	X
Fire Station #2, Ventnor Heights	X			X	X	X
Police Station		X		X	X	X
Ambulance Station	X			X	X	X
Emergency Operations Center		X		X	X	X

Source: Atlantic County 2010 Natural Hazard Mitigation Plan

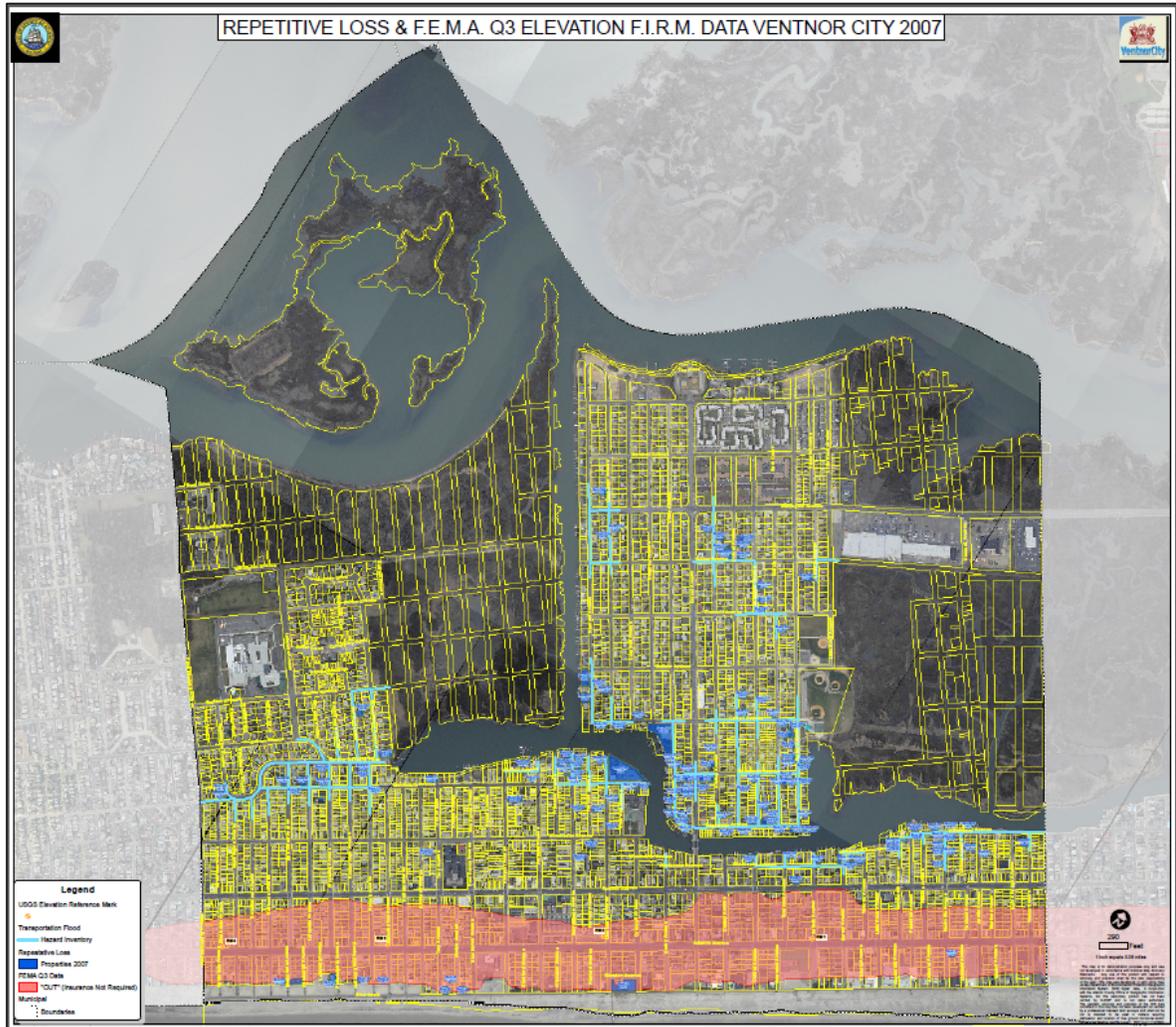
Appendix 3. Evacuation Route Map



Appendix 4. Zoning Map



Appendix 5. Repetitive Loss Map



Works Cited

1. **National Weather Service.** *Hurricane/Post-Tropical Cyclone Sandy*. National Oceanic and Atmospheric Administration. Silver Spring, Maryland: Department of Commerce - United States of America, May 2013. p. 66, Service Assessment.
2. **National Hurricane Center.** *Tropical Cyclone Report - Hurricane Sandy*. s.l.: National Hurricane Center, 12 February 2013. p. 157. (AL182012).
3. **NJ Department of Community Affairs.** Post Sandy Planning Assistance Grant. *www.NJ.gov*. [Online] [Cited: April 20, 2014.] <http://www.nj.gov/dca/services/lps/pspag.html>.
4. **United States Census Bureau.** State and County Quickfacts. *Census.gov*. [Online] US Department of Commerce. [Cited: April 21, 2014.] <http://quickfacts.census.gov/qfd/states/34/3475620.html>.
5. **State of New Jersey Department of Transportation.** *Straight Line Diagrams*. May 2010.
6. **URS.** *Atlantic County Multi-Jurisdictional Natural Hazard Mitigation Plan (hereinafter cited as Mitigation Plan)*. September 2010. p.3a-13.
7. Ibid. p.3a-29.
8. Mitigation Plan. p. 3a-54/55.
9. Mitigation Plan. p. 3a-59.