

Sandy Recovery Strategic Planning Report

A Strategic Plan for Resilience



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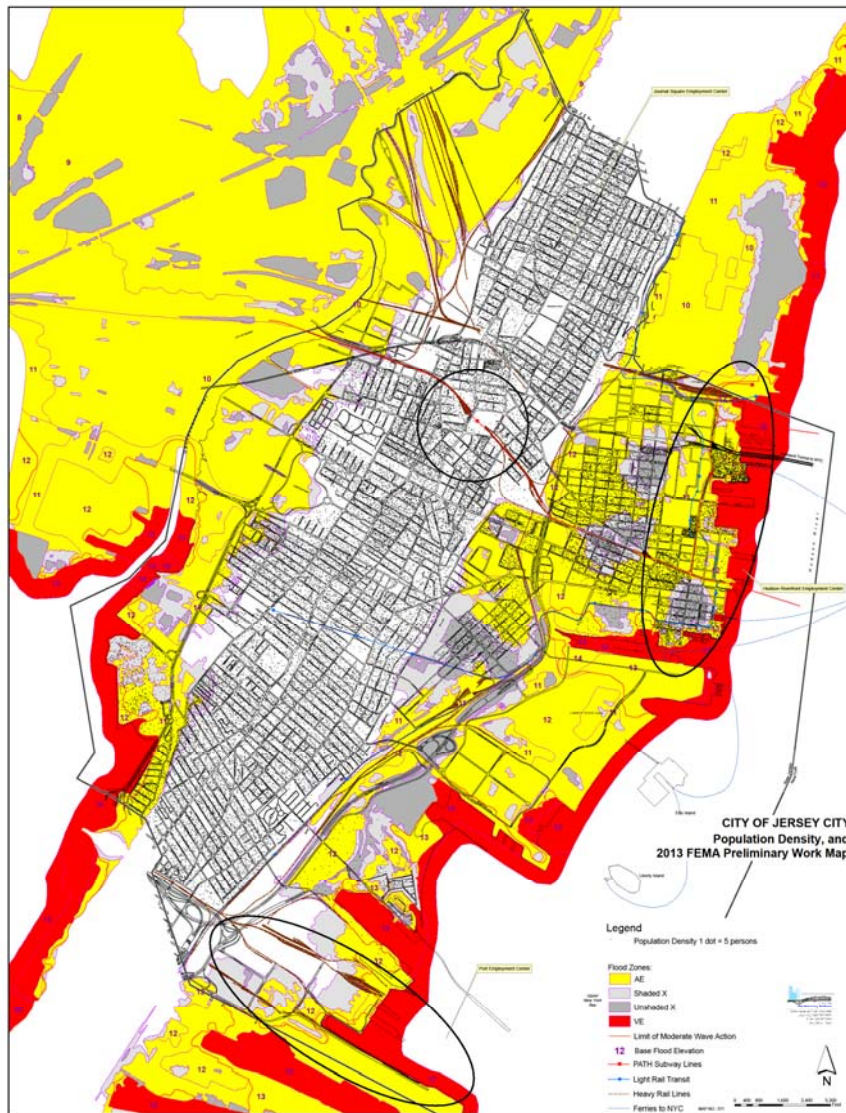
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Introduction, Purpose and Desired Outcomes



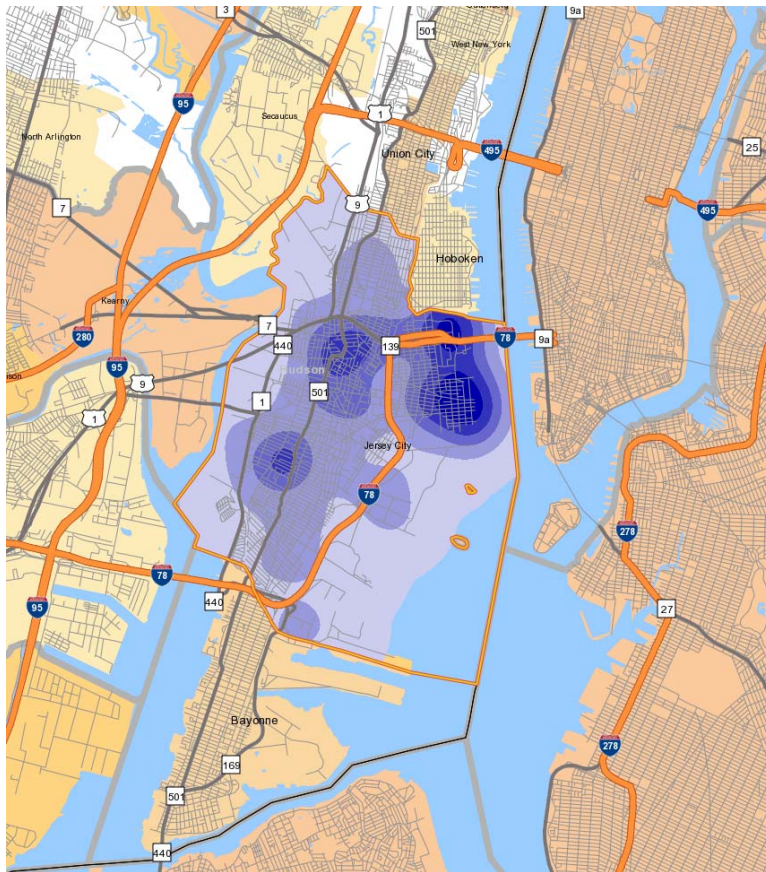
Jersey City is a dense, mid-sized city of about 254,411 people contained in 14.79 square miles, located directly across the Hudson River from lower Manhattan in New York City. It is New Jersey's second most populous city. Jersey City was inundated by Hurricane Sandy all along its 30.7 miles of waterfront of rivers and bays. Flood waters came in from the Hackensack River and Newark Bay to the west and from the Hudson River and Upper New York Bay to the east.

There are 94,599 occupied households in Jersey City – 68.2% of which are renters, and 83.9% in multi-unit structures, according to the U. S. Census Bureau, American Community Survey, 5-Year Estimates for 2007-2011. The median value of owner-occupied housing units is \$353,000. Median household

income is \$57,520. The poverty rate is 16.4%. It is a gateway to America, with 38% of its residents foreign born and many more with recent immigrant ancestry. 52.2% of the population age five and over do not speak English at home.

Jersey City is home to a waterfront regional employment center known as "Wall Street West," with 13.3 million square feet of Class A office space located in flood zones. It also has a major shipping port, and sizable manufacturing, wholesale, retail and service sectors. It is an economic engine for the state, and its daytime population swells with visitors and jobs. According the U.S. Census Bureau, there were 108,914 public and private sector jobs in Jersey City at the beginning of the second quarter in 2011. Jersey City's regional rail and highway links for the movement of people and goods include the National Docks Secondary freight rail line, the Newark Bay Extension of the New Jersey Turnpike (I-78), the two

western portals to the Holland Tunnel, New Jersey highway routes 440, 1&9 Truck, and 139, four PATH train stations, 13 Hudson-Bergen Light Rail stations, and ferry docks. According to the U.S. Bureau of the Census, 2007 Economic Census: Survey of Business Owners, there were 20,193 firms in Jersey City, \$2.2 billion in retail sales and \$3.3 billion in wholesale sales from Jersey City establishments, and \$745.3 million in shipments from Jersey City manufacturers. According to the New Jersey Department of Community Affairs, Jersey City authorized \$391 million in construction in 2012, which was the most that year for any municipality in the state of New Jersey.



Jersey City Employment Density, 2011

- 5 - 1,971 Jobs/Sq.Mile
- 1,972 - 7,871 Jobs/Sq.Mile
- 7,872 - 17,704 Jobs/Sq.Mile
- 17,705 - 31,470 Jobs/Sq.Mile
- 31,471 - 49,170 Jobs/Sq.Mile

Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2011).

As a coastal city it is at risk of coastal flooding and storm surge. It was severely impacted by Superstorm Sandy with extensive flood and wind damage. When it comes to coastal flooding, urban coastlines have a unique set of vulnerabilities, constraints and opportunities. Densely populated low lying lands, historic and substandard building stock and infrastructure, and economic constraints create vulnerabilities. Historic patterns of high density development and investment in property and infrastructure do not leave land reserved for setbacks from the coast line.

The City recognizes that it must prepare for future storm events, and resiliency is key. Resilience is the ability to withstand shocks while maintaining essential functions, and to recover quickly and effectively. In order to be resilient Jersey City needs:

- A. To ensure that all of its governmental units are working in collaboration toward a common purpose, with programs and personnel sharing information to cross fertilize ideas and overcome silos between departments and agencies.
- B. To engage the whole community of stakeholders to build resilience-supporting collaborations across public and private sectors, in advance of both anticipated and unpredictable events.
- C. To ensure that there is an ongoing discussion on disaster preparedness, even as the memory of the last disaster begins to fade over time or the focus becomes diverted by other priorities.
- D. Flood mitigation infrastructure and policies to reduce flood risk from storm water runoff and coastal flooding to critical facilities, buildings, neighborhoods and new development.
- E. Energy security with system redundancy and flood proofing of portions of the electrical grid. Backup power generation for critical facilities.
- F. To address the risk mitigation and disaster preparedness needs of vulnerable populations, including the elderly, disabled, economically vulnerable, and linguistically isolated.
- G. Financial resources and mechanisms to build resilience.

This report will place emphasis on increasing resilience against future disasters. The purpose is to provide a strategic framework for the City of Jersey City to build resilience, and to lay the groundwork for eligibility for CDBG-DR and other grant funds for resilience building activities.

Background

In January 2013, the U.S. Congress approved and the President signed a \$50.5 billion Hurricane Sandy Supplemental aid package, which included \$17 billion for immediate needs and \$33.5 billion for long-term reconstruction. Funds are distributed to a variety of federal agencies, including U.S. Department of Housing and Urban Development (US HUD), Federal Emergency Management Administration, US Department of Transportation, US Department of Health and Social Services, U.S. Small Business Administration, U.S. Army Corps of Engineers (US ACE), U.S. Department of Defense, and the Veterans Administration.

US HUD is disseminating funds to impacted states in three tranches. Funds were allocated under the first tranche to the State of New Jersey to be spent in accordance with a Community Development Block Grant Disaster Recovery (CDBG DR) Action Plan that the New Jersey Department of Community Affairs submitted to US HUD, with the state responsible for allocation of funds to county and local governments. US HUD did not allocate funds directly to county or local governments in the first tranche.

This Strategic Recovery Planning Report is being preparing in accordance with NJ DCA CDBG DR Action Plan and the NJ DCA Post Sandy Planning Assistance Grant Program Description and Guidelines. The program engages licensed professional planners to evaluate the impacts of the disaster on relevant community features. The evaluation can be broad or narrow but should focus on planning goals, strategies, and priorities leading to actions that are most urgently needed for public safety and economic recovery. The Strategic Recovery Planning Report should serve as a guide for actions taken henceforth not only to recover from the effects of Superstorm Sandy but also to reduce vulnerabilities

to future disasters. All reports must contain detailed descriptions of the projects proposed, planned implementation dates, and proposed funding sources for such projects.

Impact of Superstorm Sandy on Jersey City

All of Jersey City was impacted by wind or flood damage from Superstorm Sandy on October 29, 2012. The storm surge inundated the coast lines on both the eastern and western waterfronts of Jersey City.

Sandy inundation mapping in GIS was produced by the U.S. Geological Survey (USGS). Although not precise, the maps are the best available data for Jersey City at this time. The maps show that flood waters inundated approximately 3,688 acres, or approximately 39% of Jersey City's land area. Country Village was excluded from the USGS inundation map, despite severe flooding and damage, for reasons unknown to this office.

GIS analysis by Jersey City staff of the USGS data found that roughly 6,515 land parcels in Jersey City experienced some level of storm surge inundation. Based on eyewitness accounts, a significant portion of residential properties in the Country Village neighborhood, not accounted for by the USGS data, were flooded, which caused extensive damage to homes, possessions, and vehicles. Residential, commercial, industrial, public and private school, church, and cemetery properties were flooded.

On the east side of Jersey City, the USGS measured high water marks at the Exchange Place PATH station at elevation 10.4 feet and 4.1 feet above ground, and at elevation 11.9 feet in Liberty State Park. These are consistent with the high water marks at nearby Battery Park in lower Manhattan in New York City. On the west side, a high water mark was measured at elevation 11 feet in Lincoln Park. The U.S.G.S did not measure high water marks in the Country Village residential neighborhood, although the Sandy inundation impacts were severe.

As of June 26, 2013, FEMA inspectors had approved damage claims by housing owners for 1,567 properties, and damage to tenant contents in 793 rental apartments, and approved \$11,546,768.99 in housing related claims. The vast majority of damage was found in the 07302, 07304 and 07305 zip codes. Most owners' damage was found in 07305 in the southern part of Jersey City that includes the Country Village and Port Liberte neighborhoods. Most renters' damage was found in 07302, which is mainly comprised of historic neighborhoods along the Hudson River waterfront. 07304 encompasses the Lafayette neighborhood on the east side of Jersey City, as well as a large portion of the West Side.

The emergency room at the Jersey City Medical Center was inundated. City Hall was flooded.

There was a loss of \$12,337,900 in tax ratable properties due to Sandy related damage.

Jersey City Housing Authority facilities were hit hard. All of the basements at Booker T. Washington Apartments were flooded, and the central heating plant for the complex that is located in one of the basements was inundated. The basement of the corner building at Gloria Robinson homes was flooded, which shorted out electric panels. The Lafayette Senior Residential building at 463 Pacific had its first floor flooded, as did all of the Hope VI townhouses along Woodward Street.

The Reverend Dr. Ercel F. Webb School (Public School 22) in the Lafayette neighborhood had approximately four feet of water in its two gyms, and 18 inches of water in its boiler room. There was electrical system damage to public schools throughout the city due to power outages that followed Sandy. Cleanup was needed at schools throughout the district.

There was a Norovirus outbreak at one of the city's emergency housing shelters that was likely spread by person to person contact. According to the City's Department of Health and Human Services, 25 cases were identified, affecting both residents at the Jersey City Armory and soldiers who were working at the shelter, despite having separate food sources.

There was flood damage to three PSE&G substations in Jersey City, at 63rd Street, Marion, and Grand Street. Power failure affected residents, businesses and government. According to press accounts, about 75% of Jersey City's population lost power, which was not restored for many residents for more than a week. It took particularly long to restore power to Ward F, which has the oldest power grid in Jersey City. In the week following Sandy, temperatures dropped and residents without power were without heat. The power failure also disabled traffic signals and necessitated an emergency driving ban for public safety reasons. Additionally, there was flood damage to municipal traffic signal controllers at 32 street intersections, predominantly in the downtown area on the east side, which further disabled traffic signals. According to *The Jersey Journal*, 15,000 tons of debris was removed from Jersey City streets by the Jersey City Incinerator Authority.

The storm surge overtopped tide gates that protect the City's combined sanitary and storm sewer outfalls from infiltration at high tide. Flood water entered the combined sewer system through catch basins in city streets, which provided entree to any low lying buildings with insufficient backflow protection. The surge also eroded soil from around the tide gates.

There was damage to NJ Transit's Hudson-Bergen Light Rail (HBLR) system in Jersey City from wind and flooding, including catenary impacts, damage to all electrical substations, signals, and other systems. The HBLR in Jersey City provides a critical north-south link within Jersey City and to other cities in Hudson County, with over 25,000 boardings at 13 Jersey City stations on a typical day, and typically over 26,000 daily alightings in Jersey City.

Additionally, the PATH passenger train system that connects Jersey City with Manhattan, Newark, and Hoboken was swamped. The partially underground system with tunnels under the Hudson River operates on a 24 hour basis, and according to the Port Authority of New York and New Jersey, carries on average 241,725 passenger trips on weekdays. In addition to local transit connections, PATH also links Jersey City to the larger region via transfers to regional rail such as Amtrak and NJ TRANSIT commuter rail at Newark Penn Station. The entire PATH system was out of service for two weeks after Sandy. A link to the World Trade Center was out for four weeks, and service to Hoboken was not restored until three months later.

Emergency Response

Jersey City's official emergency response to Superstorm Sandy was coordinated by its Office of Emergency Management (OEM), and supplemented enormously by the independent efforts of Jersey City Sandy Recovery (JCSR). JCSR was formed spontaneously in the aftermath of Superstorm Sandy. The storm's catastrophic impact galvanized 750 volunteers, primarily residents, to come together and form the organization. The group collected and distributed huge quantities of food and supplies, sent volunteers door to door throughout the city to assess needs, and helped clear streets of debris.

Since Sandy, JCSR has evolved into a non-profit organization with a Board of Directors and remains engaged in Sandy recovery issues such as conducting surveys to assess remaining needs and working with the Hudson County Long Term Recovery Committee to distribute its remaining funds to those still in need. JCSR has partnered with other organizations including American Red Cross, United Way, Garden State Episcopal Community Development Corporation, and Habitat for Humanity to assist those impacted by Sandy. Additionally, JCSR are preparing a strategic disaster response plan that incorporates their volunteer base for future disaster events.

In addition to the efforts of JCSR, various members of the community offered assistance following Sandy, including United Way and Goya, who set up food distribution sites and soup kitchens.

Vulnerabilities

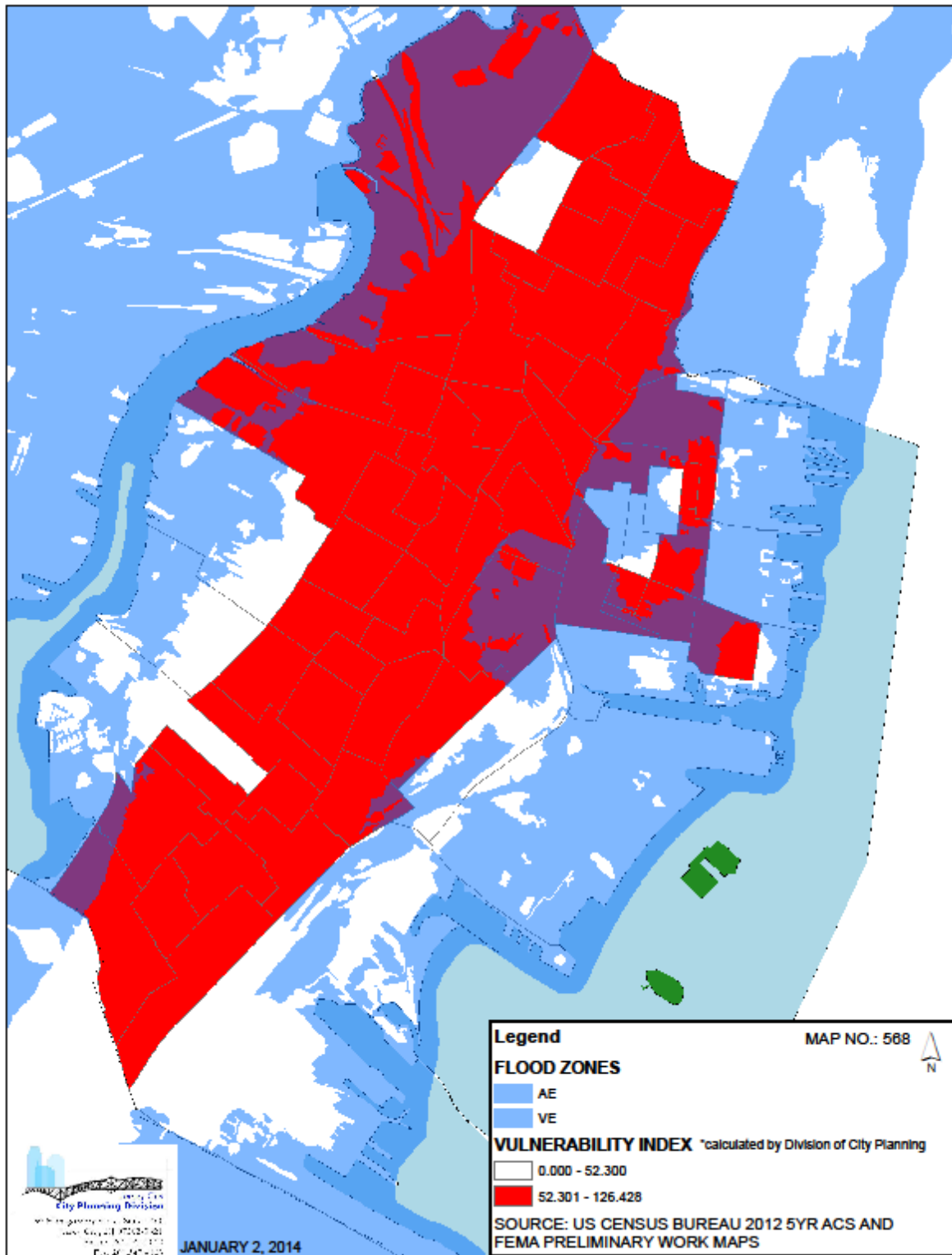
Seventy-seven percent, or 30.7 miles, of Jersey City's border is riverine or bay waterfront. Along the western border are the Hackensack River and Newark Bay. Along the eastern border are the Hudson River and Upper New York Bay. Forty percent (40%) of Jersey City's land area, or 3,782 acres, is within the proposed FEMA Special Flood Hazard Area [SFHA]. The SFHA encompasses high, medium and low density residential areas, public housing, high rise office buildings, medium density buildings with ground floor retail, and single story retail establishments, port and industrial areas, and numerous municipal facilities.

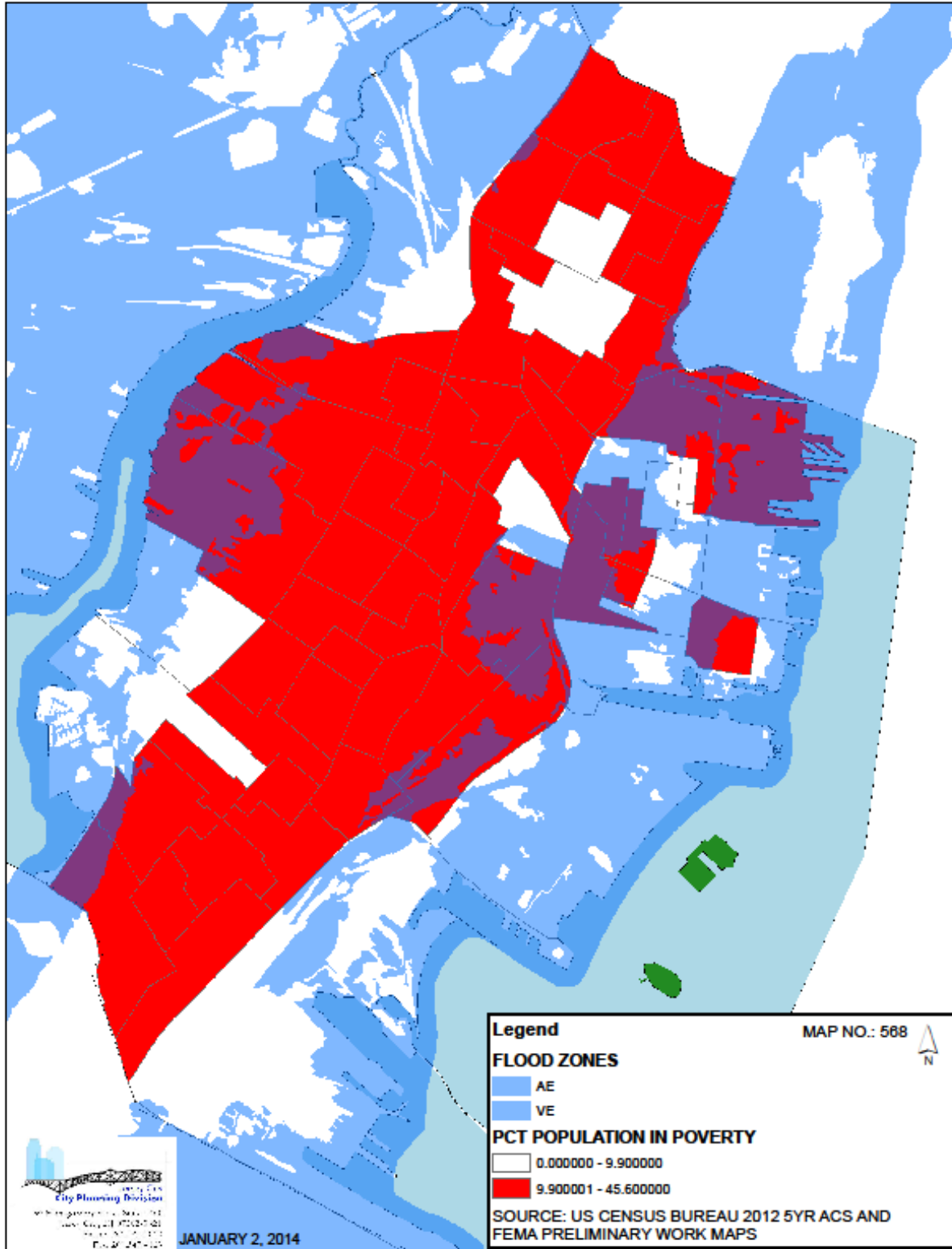
Within the FEMA preliminary work map AE and VE zones¹, there are 364 traffic signal poles, and 4,631 street light poles with potential bottom of pole wiring vulnerabilities. Additionally, there are 728 fire hydrants, with access vulnerability, and 3,318 stormwater catch basins that provide a risk pathway through drain pipes into basements of buildings, and around inland flood protection barriers.

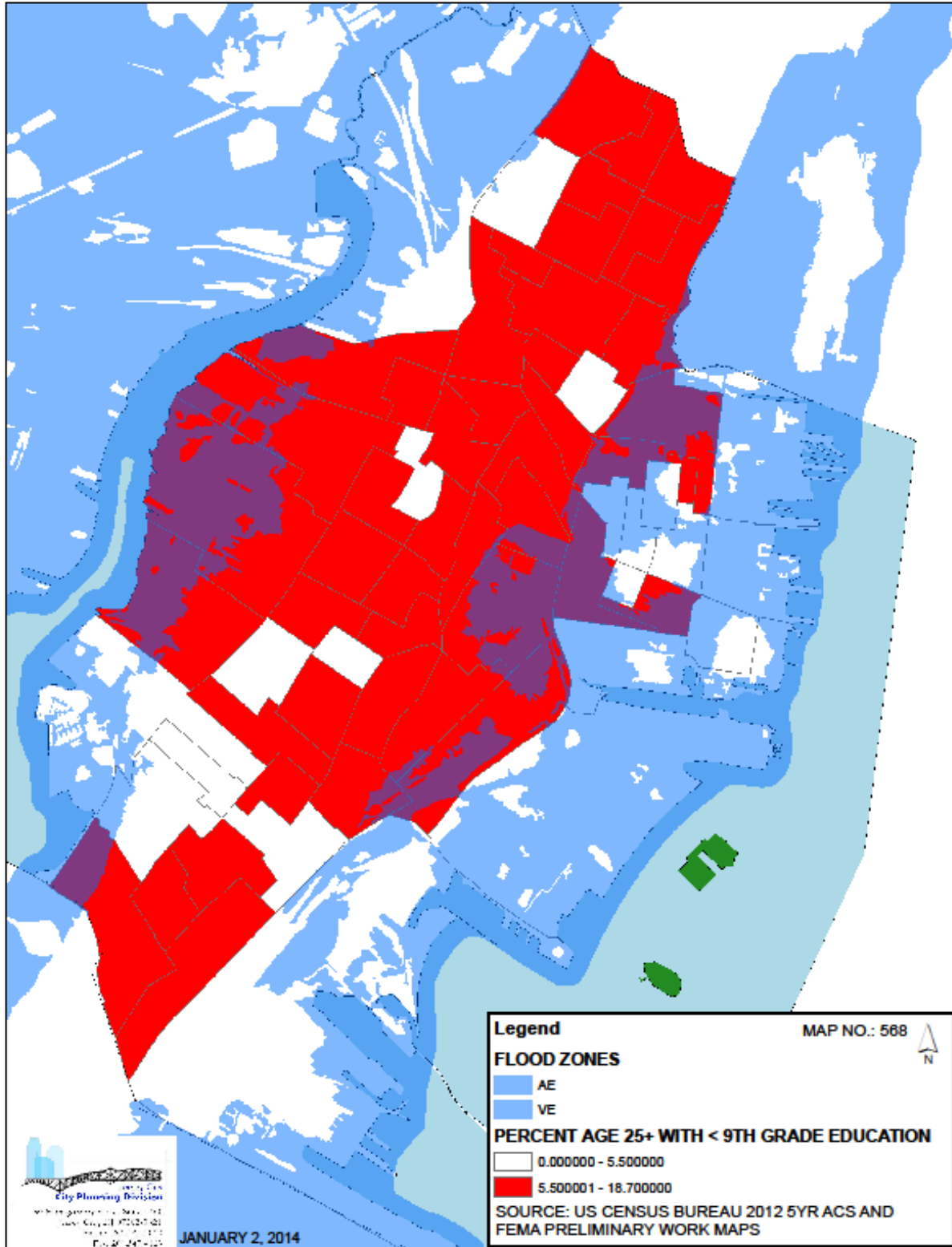
Additionally, within the proposed AE and VE zones there is 13.3 million square feet of Class A office space, the western portals of the Holland Tunnel, entrances to three PATH stations, access roads to four entry points for I-78, 78 centerline miles out of 270 centerline miles of city streets, 10.4 track miles of Hudson-Bergen Light Rail out of 19.4 track miles, and nine out of 13 light rail stations, one of the city's two hospitals, and two out of the city's 15 fire houses.

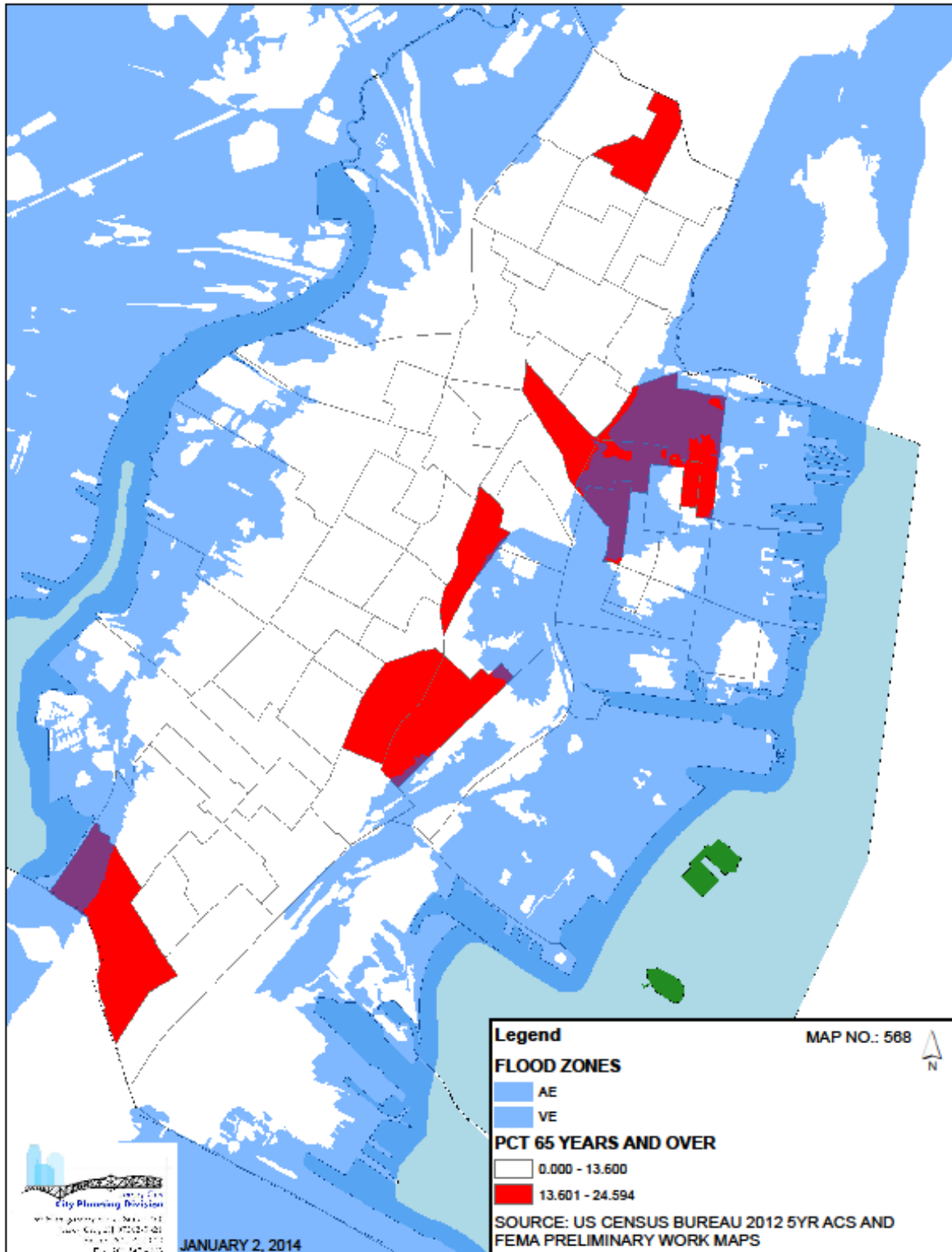
Potentially vulnerable populations are identified at the sub-municipal level by using U.S. Census Bureau 2012 American Community Survey 5 year Estimates to compare census tract population to the state population as a whole for six risk factors of poverty, low educational attainment, elderly, disabled, very young, and lack of English speaking proficiency. Additionally, the six risk factors are aggregated to create a Vulnerability Index. Census tracts that contain a higher rate than that of the State of New Jersey as a whole are denoted in red. Overlay of the red census tracts with FEMA preliminary work map AE and VE zones identifies census tracts with populations that are potentially vulnerable to flood hazard. In addition to the flood hazard faced by the population in low-lying areas, the City's entire population, including those in upland areas, is vulnerable to wind damage.

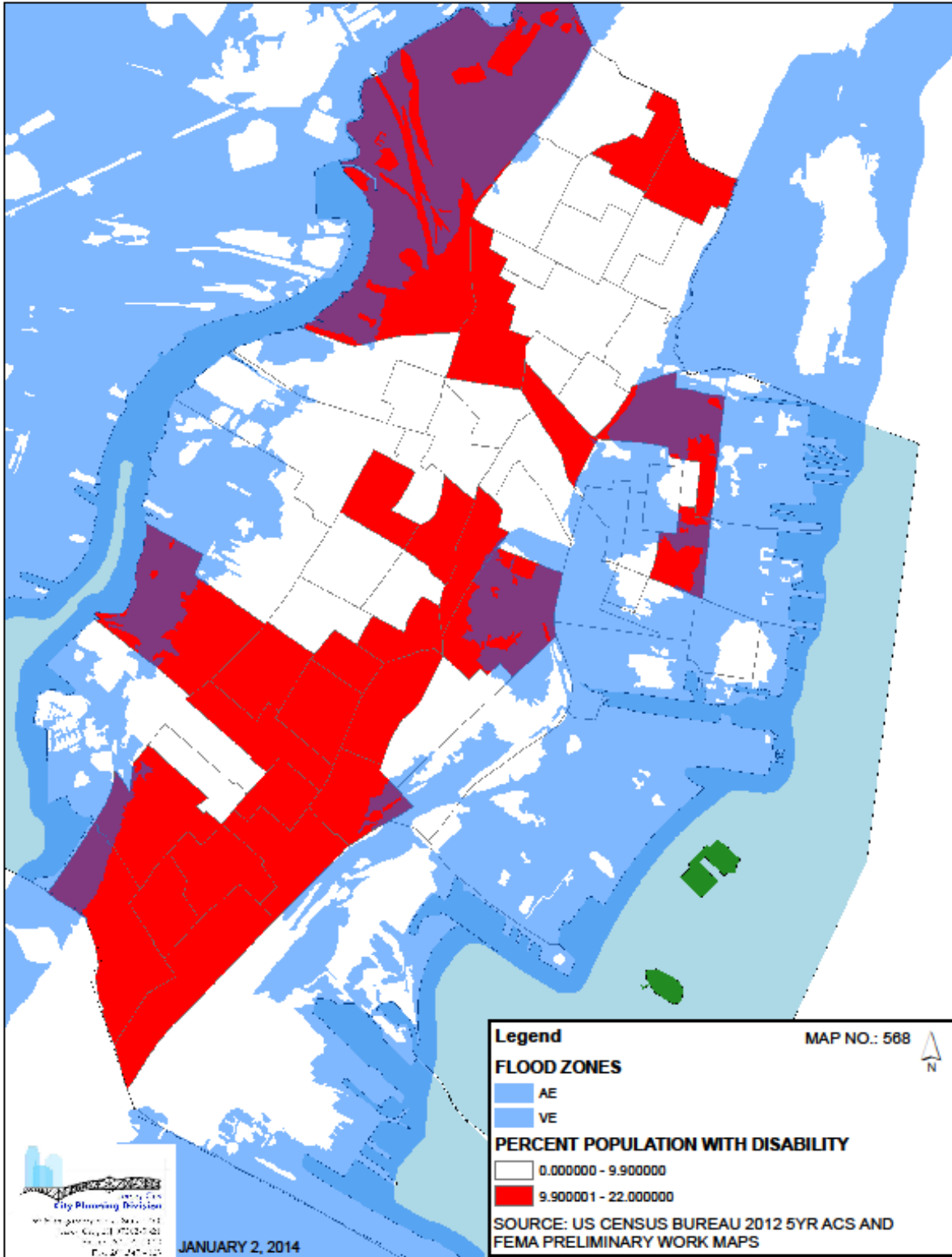
¹ FEMA defines AE zones as "areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods" and VE zones as "areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action".
(<https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=floodZones&title=FEMA%2520Flood%2520Zone%2520Designations>)

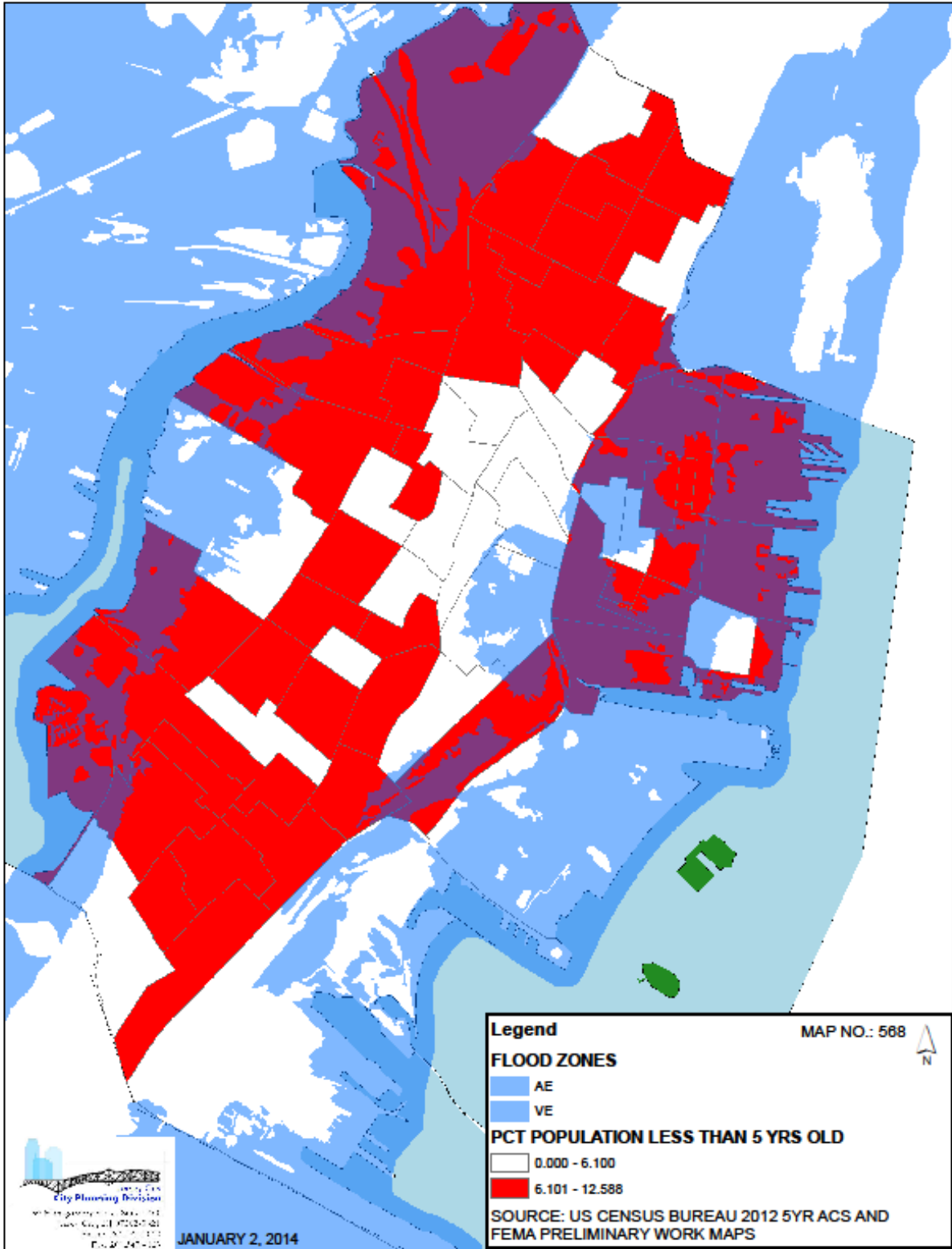


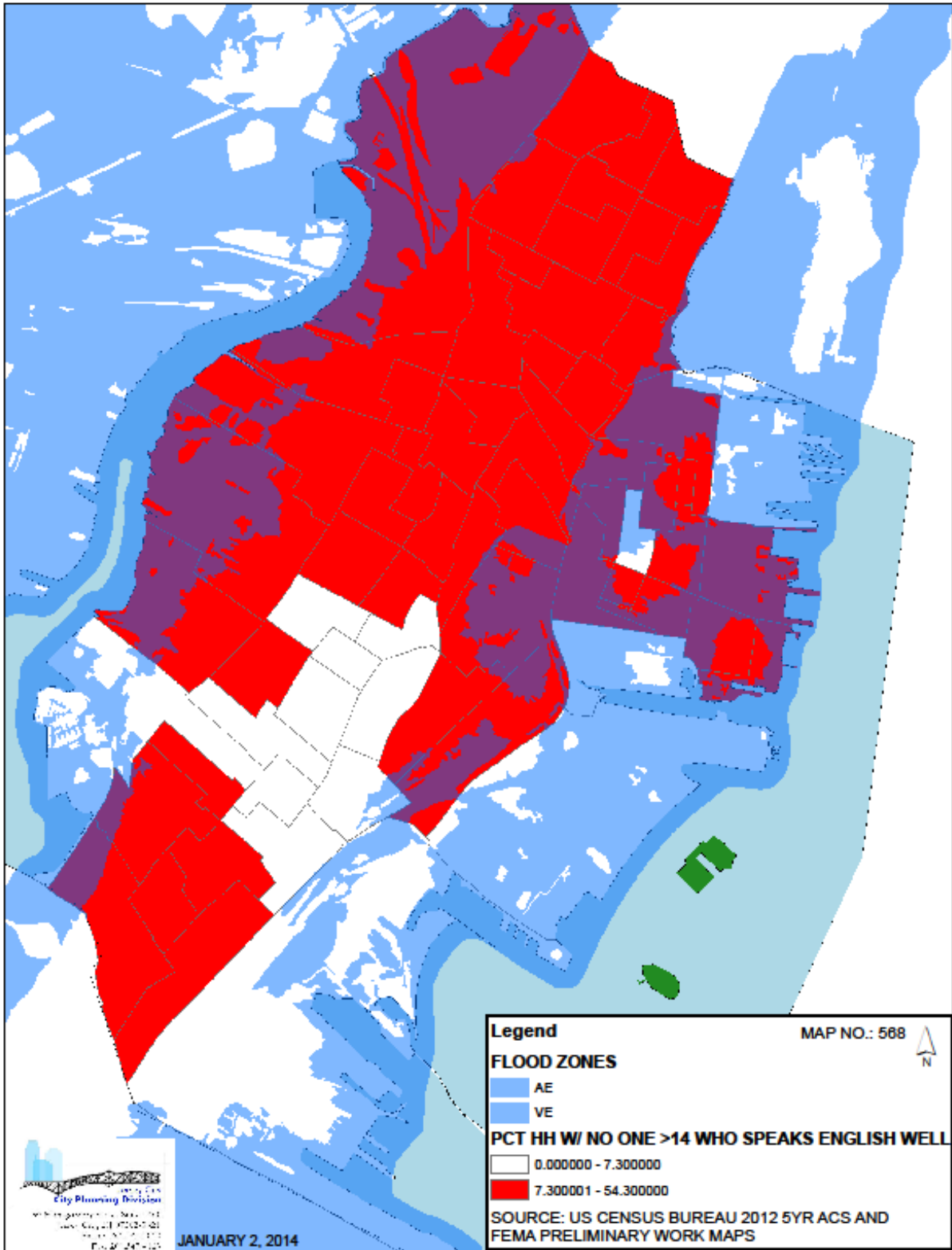












Resilience Strategic Action Plan

The Resilience Strategic Action Plan provides a framework with discussion of challenges, opportunities and next steps for proposed projects specifically related to an application for NJ DCA Post Sandy Planning Assistance Grants, and other resources.

1.1. Institutional

1.1.1. Chief Resilience Officer

There is need to designate a Chief Resilience Officer. The Chief Resilience Officer should serve as a central coordinator of all resilience building activities for the City, across departments and agencies, and in coordination with Jersey City Sandy Recovery, the non-profit emergency providers, and other stakeholders. Resilience building should encompass planning and implementation of physical, regulatory, and programmatic measures.

1.1.2. Budget

There is need to establish operating and capital budgets for resilience planning and implementation, based on the activities that are identified in this strategic plan.

1.1.3. Dashboard Program

The City is in the process of installing a Dashboard Program that will bring about transformative changes in the city government's ability to record and analyze Big Data in order to address operational inefficiencies, improve communication and transparency, formulate and implement a comprehensive data-driven management strategy, and significantly improve the quality of services provided. The City has already begun the process of collecting data across city departments in order to affect a deeper understanding of department functions and capacities, and will continue to aggressively roll out to the program.

1.1.4. Master Resilience Plan

There is need to develop a Master Resilience Plan that builds upon this strategic plan and provides greater detail for addressing the institutional, adaptation, preparedness and recovery strategies that are described in this report.

Action: Apply for NJ DCA Sandy Recovery Planning Grant to develop a detailed Resilience Master Plan.

1.2. Adaptation

The Jersey City strategy is to pursue a multi-faceted, layered approach to coastal flood protection. Measures can be implemented at the level of region, city shoreline, neighborhood and building structure. Additional measures can address flooding from stormwater runoff. Flood insurance provides a final backstop.

Detailed below are ongoing initiatives by the City, The Stevens Institute of Technology, the New Jersey Sea Grant Consortium, and Together North Jersey to identify coastal flood risk pathways and area wide adaptation options to block flood waters, and benefits and tradeoffs of implementation.

Additionally, there is need for Jersey City to amend its codes to increase the resilience of individual buildings, and to prepare a capital improvement plan and seek grants to increase resiliency of municipal buildings.

1.2.1. Collaborative Climate Adaptation Planning for Urban Coastal Flooding

The Stevens Institute of Technology and the NJ Sea Grant Consortium have been selected by the National Oceanic Atmospheric Association (NOAA) to receive a \$100,000 grant to fund a groundbreaking project that will identify flood-risk pathways into Jersey City as well as potential mitigation strategies called “Collaborative Climate Adaptation Planning for Urban Coastal Flooding.” The Consortium will work in collaboration with the City of Jersey City.

The overall goal of the project is to improve Jersey City’s capacity to adapt to coastal flooding from storms and climate change. The diverse and experienced project team assembled to carry out this set of objectives includes physical oceanographers, coastal flooding specialists, city planners, a sustainability expert, and scientists with broad experience in communicating flood risks to the general public. Preliminary findings from the study are expected to be released in July 2014.

The primary scientific objectives include the following:

- To provide basic information on flooding for Jersey City planners – flood zone maps for the 2050s decade with climate change and map animations showing flood water pathways
- Work with a team of City of Jersey City staff partners to develop a set of realistic coastal adaptation options that prevent or reduce future flooding from storm surges and sea level rise
- Utilize storm surge modeling to evaluate each coastal adaptation option, as well as how sea level rise and climate change will affect performance
- Transfer our knowledge more broadly around our region – write a report, publish the research in a peer-reviewed journal, and have a regional stakeholder meeting

Additionally, a Jersey City Resiliency Task Force comprised of various representatives from municipal departments and agencies will be trained by U.S. Green Building Council-New Jersey Chapter to be able to assist in this process. The Jersey City Resiliency Task Force will work with Dr. Philip Orton, research scientist at The Stevens Institute of Technology, who will lead the modeling effort which will generate flood zone maps that account for future sea level rise and storm climatology changes including map animations of how floodwaters enter Jersey City to help understand how the pathways can be blocked, as well as a set of coastal adaptation options and assessment of their performance with future climate change.

1.2.2. Jersey City Visualizations of Adaptation Scenarios and Next Steps White Paper

Together North Jersey has awarded the City of Jersey City a \$110,000 Local Government Capacity Program grant to create visualizations that show adaptation options identified by the Collaborative Climate Adaptation Planning for Urban Coastal Flooding effort in the intended Jersey City context from multiple perspectives, and to prepare a white paper that discusses and quantifies some of the potential benefit and trade-offs for each adaptation option. The white paper will address at a minimum, local and regional social, economic, financial, public safety, public health, disaster preparedness, and property value factors. It will also lay out next steps. The visualizations and white paper are scheduled for completion in Fall 2014.

1.2.3. Rebuild by Design

Rebuild by Design is a US Department of Housing and Urban Development (HUD) and Presidential Hurricane Sandy Rebuilding Task Force initiative to develop innovative designs to address coastal flooding in the Sandy affected region. It is a design competition-based format, and the City of Jersey City worked with Rebuild by Design teams during the competition process. The Rebuild by Design process and its associated substantial funding represents a potential funding source for implementation of adaptation measures. Two of the six winning design “opportunities” impact Jersey City, including New Meadowlands: Productive City + Regional Park by MIT CAU + ZUS + URBANISTEN in The Meadowlands, which are partially located in Jersey City, and Resist, Delay, Store, Discharge: A Comprehensive Strategy for Hoboken by OMA.

The MIT CAU + ZUS + URBANISTEN project was awarded \$150 million and articulates a plan for development of Meadowpark, a natural reserve made up of berms and marshes that provide flood mitigation, and Meadowband, a protective corridor that rings Meadowpark and provides opportunities for access and recreation. The New Meadowlands project envisions increased intensity of land use in areas where there is already development. One of the three proposed pilot locations includes the western waterfront in Jersey City.

The OMA project was awarded \$230 million and articulates a plan to resist, delay, store, and discharge floodwater, caused by both rain events and storm surge, primarily with the implementation of new infrastructure that includes the filling of the Long Slip Canal; green

infrastructure such as wetlands at Weehawken Cove, a greenbelt along the Palisade Cliffs, and bioswales along Washington Street; and pumping stations. As Hoboken and Jersey City share a border, these recommendations have the potential to impact and benefit both municipalities.

1.2.4. North Atlantic Coast Comprehensive Study

The U.S. Army Corps of Engineers has undertaken a North Atlantic Coast Comprehensive Study that will comprehensively evaluate the existing and planned measures for coastal areas from North Carolina to New Hampshire to reduce the flooding risk from tidally-influenced storm surges as well as other alternatives for areas at risk to future storm damages. The U.S. Army Corps of Engineers goals are to (1) provide risk reduction strategies to reduce risk to which vulnerable coastal populations are subject, and (2) promote coastal resilient communities to ensure a sustainable and robust coastal landscape system, considering future sea level rise and climate change scenarios, to reduce risk to vulnerable population, property, ecosystems, and infrastructure. Jersey City officials met with the project team and provided information about damage from Hurricane Sandy to Jersey City as well as potential coastal flood protection concepts for consideration.

1.2.5. Adaptation Master Plan

To work toward comprehensiveness and redundancy, the City will work toward implementation of shoreline protective measures, make changes to the regulatory requirements for new buildings, and implement programs to facilitate flood proofing of existing public and private structures and facilities. The Adaptation Master Plan will describe existing conditions, the nature and extent of adaptation measures, and identify funding sources, implementation agencies, and time frames. Additionally, the Adaptation Master Plan will address how adaptation impacts the land use element of the municipal Master Plan, as well as changes that may be needed to zoning and redevelopment codes.

1.2.5.1. Area Wide Measures

There is need to build upon the adaption work described above and identify the specific shoreline protective measures to implement, and delineate the impact of those measures to the city's spatial pattern, transportation and street infrastructure, and utility infrastructure. Engineering feasibility studies will be needed for certain potential adaptation measures. Potential measures to block or increase resilience against flood risk pathways might include rises in landmass or streets in strategic locations, coastal barriers, water detention areas, absorption areas, stormwater pumps, or other measures.

Action: Identify and pursue funding for engineering feasibility studies for adaptation measures.

1.2.5.2. Building Requirements

There is need for Jersey City to develop and codify through zoning and flood damage protection ordinances approaches to building rehabilitation and new construction that are more resistant to damage from future storm events and that are context sensitive and maintain the character of Jersey City's existing neighborhoods.

The City of Jersey City is a dense urban landscape with many mid rise and high rise residential and commercial office buildings. Within the Special Flood Hazard Area there lies several neighborhoods that are National Register and municipal historic districts and primarily contain rows of attached historic residential structures. Ground level retail establishments in multi story buildings abound, and create a vibrant urban streetscape. It is generally not feasible, desirable nor architecturally appropriate for building owners to raise the elevation of these structures.

FEMA National Flood Insurance Program requirements as adopted by Jersey City dictate that for residential uses all new construction and substantial improvements within Zones A1-30, AE and AH zones have the lowest floor, including any basement that is usable for living area, elevated to or above the base flood elevation. New or substantially improved non-residential structures must be elevated or dry floodproofed. Flood insurance rate discounts can be achieved by adding distance, or freeboard, between the lowest floor and base flood elevation, or by dry flood proofing above the base flood elevation.

However, compliance with these flood management requirements can result in unoccupied "dead" space at street level, which is contrary to a vibrant, safe, urban community. Therefore, Jersey City will seek to amend and reconcile its zoning and redevelopment codes with design standards to accommodate building designs that allow for floodplain management compliance while at the same time maintaining the desired active urban streetscape environment.

Jersey City's new codes will meet or exceed FEMA base flood elevation requirements, which do not account for sea level rise, and will take into account prospective base flood elevations that will be determined by The Stevens Institute of Technology through modeling it will conduct for Jersey City as part of the Collaborative Climate Adaptation Planning for Urban Coastal Flooding initiative described above.

Action: Apply to NJ DCA Sandy Recovery Grant program for funding for development of design standards and revisions to the master plan, and zoning and redevelopment codes.

Additionally, a high market value for real estate in Jersey City creates a loophole in National Flood Insurance Program requirements because it raises the threshold by which a rehabilitation project is considered to be “substantial improvement.” The effect is that new basement apartments or condominiums can be more easily created in pre-FIRM buildings when a building is rehabilitated because it is easier to meet the substantial improvement test due to the high market value of the property.

Action: Amend the Land Development Ordinance to prohibit the creation of new apartments and condominiums in basements in FEMA delineated Special Flood Hazard Areas. Additionally, where pre-existing habitable space within a structure is located below base flood elevation in the Special Flood Hazard Area, the establishment of a freeboard requirement for new kitchens and bathrooms should deter the illicit conversion of any portion of a building that is below the base flood elevation to an illegal apartment, and reduce the risk of flood hazard to residents.

1.2.5.3. Programmatic Approach

Owners of private buildings can dry or wet flood proof existing buildings in flood hazard areas to reduce risk of flooding and to reduce insurance premiums. FEMA provides Flood Mitigation Assistance (FMA) grants and Pre-Disaster Mitigation (PDM) grants that may be used for Dry Flood Proofing of Historic Residential Structures and Dry Flood Proofing of Non-Residential Structures through the New Jersey Office of Emergency Management. It is a reimbursement program that requires 25% non-federal match, and municipal resources would be needed to manage and administer the program. The program could be structured such that property owners provide the 25% match, plus an administrative fee to cover municipal expenses.

Action: Survey property owners in flood hazard area to determine interest and submit application to New Jersey Office of Emergency Management.

Additionally, pre-existing public buildings, critical facilities, and non-historic residential buildings will also benefit from flood proofing.

Action: Identify additional flood mitigation measures and funding mechanisms for buildings through development of a comprehensive Resiliency Plan.

1.2.5.4. Public Housing

The Jersey City Housing Authority (JCHA) is implementing various improvements to its housing communities to mitigate impacts of future storms. At Booker T. Washington, a housing community flooded during Sandy, the boiler room will be decentralized by installing

boiler plants on higher floors in all nine buildings of the complex. Also at Booker T. Washington, electrical equipment will be relocated to higher floors. Resiliency projects at the Thomas J. Stewart senior building, which sustained damaged during Sandy, include the replacement of the roof and the addition of a natural-gas burning generator to provide emergency power. The JCHA was awarded \$7.2 million in CDBG-DR funds for improvements at Booker T. Washington and Thomas J. Stewart. The JCHA also plans to decentralize the boiler facilities at the Marion Gardens housing community, replace the curtain wall at the senior building at Berry Gardens, and repair the roofs of other facilities. The Enterprise Foundation, through its Learning Collaborative for Resilience program, will provide the JCHA with technical assistance.

1.2.5.5. Storm Water Management

The Jersey City Municipal Utilities Authority (JC MUA) has undertaken a five year capital plan to install pumps at outfalls to push water out of the sewer system during high tide and storm surge events, as well as to extend the Sixth Street outfall to deeper water in the Hudson River, and the 18th Street outfall into the Long Slip Canal.

There are 3,318 stormwater catch basins within flood zones that provide flood risk pathways through drain pipes into buildings and around any inland barriers against flooding that the city may erect. Potential flood risk adaptation measures should address the risk pathways generated by the sewer system.

Additionally, the Jersey City Redevelopment Agency (JCRA) is advancing the Canal Crossing project to redevelop an underutilized and contaminated industrial area into a new neighborhood. The existing condition is a combined sanitary and stormwater system that is part of the existing municipal sewer system. The JCRA plan for redevelopment includes separation of the stormwater from sanitary systems, and use of green infrastructure for stormwater management. The result will be a reduction in stormwater volume entering the municipal sewer system.

1.2.5.6. Electric Utilities

Overhead electric wires are subject to damage from wind, and falling trees or limbs. During Hurricane Sandy, underground waterproof transformers in the Newport section of Jersey City were immune to damage from wind and flooding. Micro grid and smart grid technology can enable greater local distribution of locally generated power from sources such as wind, solar and backup generators. Additionally, these technologies can improve reliability of the distribution system for critical facilities during disaster events.

Action: Seek to relocate at least a portion of electric utilities underground to provide continuous service despite damage from wind and falling limbs and trees. Provide waterproofing for underground electric utilities within low lying areas in sufficient strategic locations to ensure continuous electric supply during times of wind and flood hazard.

Action: Initiate discussion with PSE&G and New Jersey Board of Public Utilities to develop a strategy to implement micro grid and smart grid technologies.

1.2.6. Urban Community Resilience Decision Model

The City of Jersey City supports the Center for Urban Environmental Sustainability (CUES) proposal to the National Fish and Wildlife Foundation for the development of an Urban Communities Resilience Decision Model, which will aid in the modeling of urban coastal vulnerability in communities within the Hudson-Raritan Estuary. In addition to creating an urban assessment tool, this effort also seeks to improve communication between jurisdictions so that mitigation strategies are identified and implemented in a coordinated fashion. To support this effort, the City will provide information and documents related to zoning, planning, and current land use and environmental policies to the CUES project team; participate in the regional Urban Resiliency Task Force meetings organized by CUES; and sponsor public meetings to share the results of the Urban Communities Resilience Decision Model with Jersey City residents and stakeholders.

1.2.7. Green Infrastructure Study

The City of Jersey City is preparing a Green Infrastructure Study that will identify and inventory the City's green infrastructure (e.g., tree pits, green roofs, rain gardens). Key products will include the inventory in database and map forms, assessments of land cover and tree canopy, and a land use model that will be a digital tool to assess natural resources. The final deliverables of the Green Infrastructure Study will inform a long-term environmental resources management plan.

1.2.8. Urban Coastal Defense and Storm Water Mitigation System

In response to the increased flood risk identified as a result of Superstorm Sandy, and the prospect of sea level rise, JC MUA in conjunction with the City of Jersey City is developing a plan for an urban coastal defense system that will protect the City from flooding and storm surge. It is envisioned that the plan will include the construction of a seawall and an earth-filled levy that can be provide land for new development. Incorporated into the coastal defense system will be storm surge sector gates to allow vessel traffic into existing marinas that will be closed during storm conditions. It is anticipated that a feasibility study of the urban coastal defense system will begin by Fall 2014.

1.3. Preparedness and Recovery

1.3.1. Hurricane Preparedness Group

A Hurricane Preparedness Group (HPG) that consists of various City departments including the Office of Emergency Management, the Resident Response Center, and the Division of City Planning has been convened. The HPG has been tasked with improving communication between City agencies and Jersey City residents in the event of future storms. HPG priorities include:

- Revisiting disaster preparation planning processes.
- Developing a framework for quarterly disaster preparation self examination among municipal officials and community stakeholders. CERT team members will be called on to assist as needed. A subtask will be the development of a disaster preparation plan that utilizes a community volunteer base.
- Enhancing communications capabilities, especially for when power outages occur and normal communications technologies are not available. This may include expanding the use of social media and the municipal alert system, as well as the establishment of satellite information centers for distribution of information and intake of citizen complaints.
- Updating the registry of residents who have special needs.

1.3.2. Federal Hazard Mitigation Grant Program – Energy Allocation Initiative

In October 2013, the Jersey City Office of Emergency Management was awarded a \$159,840 Hazard Mitigation Program grant for portable generators and transfer switches at police and fire facilities. Additionally, the Jersey City Municipal Utilities Authority was awarded a \$159,840 grant to upgrade pumping systems.

1.3.3. Hudson County All Hazard Mitigation Plan

The City of Jersey City is participating in the update of the Hudson County All Hazard Mitigation Plan (HMP) adopted in 2008. The HMP supports the preparation for and reduction of the potential impacts of natural hazards. Hudson County's HMP also includes a section on manmade hazards. The development and update of the HMP involves collaboration with the municipalities in the County, including Jersey City, to ensure coordination amongst plans and resources. Key sections of the HMP include a profile of the County with detailed demographic data, a risk assessment, and mitigation strategies. A jurisdictional annex for Jersey City is incorporated into the HMP that focuses specifically on the natural hazards facing the City and the proposed mitigation actions to reduce exposure and losses to these hazards. It is anticipated that the update of the HMP will be complete in 2014.

1.3.4. Regional Catastrophic Preparedness Grant Program (RCPGP) – Participatory Urban Planning (PUP)

As a major metropolitan area, the City of Jersey City is participating in the Regional Catastrophic Preparedness Grant Program (RCPGP), a Department of Homeland Security initiative that encourages collaborative emergency planning in America's largest urban regions. RCPGP goals are to correct deficiencies in existing plans, build regional planning communities, and link operational and capabilities-based resource planning. The City is also taking advantage of Participatory Urban Planning (PUP), a resource for coordinating emergency management response and recovery efforts with both non-profit organizations and the private sector.

1.3.5. Blending Technology, People and Places to Mitigate Impacts of Pending Weather Disasters and Other Emergency Events

The City of Jersey City has applied for a FY 2013 Disaster Relief Appropriations Act for Coastal Resilience Networks grant from the National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), and U.S. Department of Commerce. The City of Jersey City, along with key support staff from Rutgers University, is seeking funding to implement more thorough emergency response strategies for the City of Jersey City. If funded, the strategies will build upon the data collected through the Collaborative Climate Change Adaptation project described above, and will develop an emergency response strategy that addresses the needs of the most at risk populations, both geographically and economically. Strategies will also address how first responders, educators, key local officials and other community members can bring together resident support systems that will make communication Jersey City's number one safety priority, as well as develop "action steps" that are easy to comprehend and execute during emergency situations.

1.3.6. Individual Preparedness

1.3.6.1 Special Needs Registration

The City is developing a registration system for residents who need assistance in the event of an emergency evacuation. This database will document conditions that could make safe and timely evacuation difficult or impossible, including mental impairment, physical impairment, lack of access to a vehicle, and lack of means of information and/or communication (e.g., no telephone, no television, no internet). The Special Needs Registration will help the City identify and assist the most vulnerable during an emergency evacuation.

1.3.6.2 Community Emergency Response Team (CERT)

CERT is comprised of trained residents who have volunteered to respond to emergencies, both manmade and natural disasters. The City's OEM provides free CERT training. A key component of the program is to train volunteers to prepare themselves for emergencies.

CERT members assist first responders as well as provide direct assistance, such as fire suppression, assessment and treatment of injuries, and light search and rescue, to those in need during an emergency. In the past, CERT members have been mobilized to assist with setting up temporary shelters and distributing supplies at emergency scenes, amongst other tasks.

1.3.7. Community Education

Ongoing community education is needed to ensure that there is an ongoing awareness about need for disaster preparedness by individuals and families, even as the memory of the last disaster begins to fade over time or the focus becomes diverted by other priorities. Collaboration with the Jersey City Board of Education to develop a school curriculum template that can be used regularly in public and private schools can help address this need.

Business awareness about the need for disaster preparedness can be accomplished through implementation of a point based competition among firms and businesses to prepare and reduce risk. The competition can be implemented as part of a broader point based initiative to increase awareness about sustainable practices by businesses, and to create incentives to increase sustainability. The city can explore whether such a program can be financially self sufficient through annual registration fees and sponsorships.

1.3.8. Flood Insurance

It is important that property owners and renters in flood hazard areas maintain flood insurance in order to be financially resilient against flooding. However, flood insurance increases the cost of housing, and is particularly burdensome to low and moderate income residents. Additionally, FEMA is in the process of updating the flood insurance rate maps for Jersey City. Upon adoption, the special flood hazard area (AE and VE zones) will be greater and encompass many more properties than previously. At the same time, the Biggert-Waters Flood Insurance Reform Act of 2012 will cause an increase in flood insurance rates in Jersey City when the new maps are adopted. The impact is twofold – flood insurance rates will increase, and more properties will be subject to flood insurance requirements by lenders.

Owners of existing buildings can reduce risk, and thereby reduce premiums, by wet or dry proofing the buildings, and by raising the elevation of mechanicals within the building above the base flood elevation. New basement dwelling units are prohibited in special flood hazard areas; however, there are many pre-existing basement apartments and condominiums in Jersey City. Basement unit coverage in special flood hazard areas by flood insurance is limited.

1.4. Recovery

Lead Hazard

The State of New Jersey awarded the City of Jersey City a \$989,000 grant to conduct blood lead testing, case management for affected families, and environmental investigations such as soil testing and home inspections. This grant addresses concern that grew following Hurricane Sandy that children could be at increased risk of exposure to lead due to damage in older homes and neighborhoods. Most of Jersey City’s housing stock is older and contains lead based paint.

Table 1: Anticipated Post Sandy Planning Assistance Grant Activities and Funding Requests

It is anticipated that all activities will be completed 12 months after receipt of grant funding.

Activity	Purpose	Anticipated Funding Request
Resilience Master Plan	Provide greater detail for addressing the institutional, adaptation, preparedness and recovery strategies described in Jersey City’s Strategic Planning Report	\$50,000
Adaptation Master Plan	Describe existing conditions, the nature and extent of adaptation measures, and identify funding sources, implementation agencies, and time frames	\$50,000
Design Standards	Ensure that building designs that allow for floodplain management compliance also maintain the desired streetscape environment	\$50,000
Capital Improvement Plan	Describe projects, budget, funding sources for capital investments that improve resiliency	\$30,000
Urban Environmental Design Plan	To prepare environmental plans regarding storm impact and building community resiliency, in particular a study to advance findings/recommendations of the <i>Collaborative Climate Adaptation Planning for Urban Coastal Flooding</i> study.	\$50,000
Zoning and Redevelopment Code	Develop and codify zoning and flood damage protection ordinances that describe approaches to building rehabilitation and new construction that are more resistant to damage from future storm events and that are context sensitive and maintain the character of Jersey City’s existing neighborhoods	\$40,000