Town of **Huntington**

Hurricane Review Taskforce
After Action Review for DR 4085
"Hurricane Sandy" 2012

Office of the Town Supervisor
Town Emergency Operations Center

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After Action Review for DR 4085
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Frank P. Petrone - Town Supervisor

Town Council

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Mark Mayoka	Councilman
Eugene Cook	Councilman

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Summary

The disaster caused by Hurricane Sandy 2012 presented significant challenges to communities throughout the greater New York City Metropolitan area. Nearly $88 Billion in costs of recovery efforts are associated with this storm, which is ranked second only to Hurricane Katrina 2005. Although many communities located on the south shore of Long Island, sustained the most severe devastation, the Town of Huntington was not spared from Hurricane Sandy's destructive forces.

During preparation for, response to, and recovery and restoration from the storm, Town personnel worked tirelessly to mitigate and overcome the storm's impacts. Town agencies, with the full support of the Town Board, worked to assist residents with their own recovery needs. On many occasions during the recovery effort, Town personnel were presented with unprecedented challenges in extreme environments.

In the aftermath of Hurricane Sandy, the Town Supervisor, with the support of the Town Board, initiated a comprehensive review of how the Town responded to the disaster. To lead this initiative, a committee of Town personnel and community members with prior emergency management experience was selected to review the procedures followed by the Town during the storm and to make recommendations for improving those processes.

As part of its review, the committee examined issues related to Town-wide preparedness measures, sheltering procedures, storm surge, mitigation measures for prolonged electrical outages, and communications. The committee submits the following report and findings to the Huntington Town Board.

Hurricane Sandy Timeline

Wednesday, October 22
A tropical depression forms in the southern Caribbean Sea off the coast of Nicaragua. The depression
strengthens and becomes Tropical Storm Sandy with maximum winds of about 40 mph.

Thursday, October 24
Sandy moves north across the Caribbean and hits Jamaica as a Category I hurricane, with 80 mph winds. Sandy dumps more than 20 inches of rain on the Dominican Republic and Haiti to its east.

Friday, October 26
Sandy moves from Jamaica to Cuba, striking Santiago de Cuba with winds of 10 mph, a strong Category II hurricane. It crosses the Bahamas and makes a turn to the north-northwest.

Saturday, October 27
Approaching Florida, Sandy moves away from the coast and turns northeast, weakening briefly to a tropical depression but regaining its strength quickly to a Category I hurricane.

Sunday, October 28
Sandy moves northeast along a track that parallels Georgia, South Carolina and North Carolina. The hurricane's eye remains offshore, but the storm punishes the coastline and North Carolina's Outer Banks, washing out highways in places. Meteorologists warn that the storm will converge with other weather masses, causing a hybrid "super storm." A high pressure cold front to the north will block the storm's northward path, causing it to turn northwest into the Mid-Atlantic States. Baltimore, Washington, Philadelphia and New York will be impacted. A corresponding full moon and high tide will exacerbate the storm surge as it makes land fall. The storm is huge, with winds covering an area of 1,000 miles. The storm is forecast to dump heavy snow in the mountains of Virginia, West Virginia and North Carolina.

Monday, October 29
Noon:
Sandy turns toward the northwest, heading for the Jersey Shore.
The storm begins combining with the other weather systems and gains momentum. Sandy will travel 300 miles over open water before landfall, allowing it to build up a huge storm surge that will become even bigger due to the full moon.

Afternoon:
Sandy delivers high winds and drenching rains from Washington, D.C. northward. It downs trees,
power lines and halts air and ground traffic.

8 p.m.:
Sandy makes landfall near Atlantic City, New Jersey. The storm is now classified as a post-tropical
cyclone. As a cyclone, Sandy's strongest winds and highest storm surge are to the front and right of its circulation as it moves forward. New York Harbor and Long Island sit in this region, relative to Sandy's path.

The full moon and high tide added to the storm surge. According to the National Weather Service office in New York, the surge is close to 14 feet on the south shore, which is a new record for a storm surge. The Long Island Sound experienced storm surge and tidal rise during Hurricane Sandy.

Source: National Oceanic and Atmospheric Administration (NOAA); National Weather Service (NWS)

Nov. 1, 2012
Town of Huntington Departments begins to assess damages.

Nov 2, 2012
Nearly 90% of Long Island is without power.
Town of Huntington initiates tree debris removal procedures.

Nov. 3, 2012
The Town of Huntington begins to assess damages to private property.

Nov 6, 2012

7:15PM
The National Weather service issues a coastal flood warning Tuesday afternoon as a northeaster advances toward the East Coast, predicting moderate flooding Wednesday in most of coastal New York and New Jersey, but possible localized major flooding on the south shore of Long Island.
–New York Times

Nov. 7, 2012
With the northeaster closing in on the city, Mayor Michael R. Bloomberg advised residents of some low-lying neighborhoods in Brooklyn and Queens to “consider taking shelter with family or friends, or at a city-run shelter,” based on “analysis of the erosion caused by Hurricane Sandy.” –New York Times

9:20PM
Storm Blankets New York Region in Snow

Nov. 8, 2012
Federal officials said on Thursday that they had started moving temporary housing toward the New York region, where tens of thousands of people are in need of housing in the aftermath of Hurricane Sandy.
–New York Times

3:36PM
Nassau and Suffolk Counties on Long Island are imposing an odd-even gas rationing system tomorrow morning at 5 a.m., similar to the system going into effect in New York City, Gov. Andrew M. Cuomo said Thursday. –New York Times

Nov. 9, 2012
LIPA reported 163,029 customers in Nassau and Suffolk Counties and the Rockaway Peninsula were still without power. That figure includes thousands who had lost power. Many families, the elderly and the disabled have no heat or electricity.
– CBS News

Sandy impact analysis by FEMA

- Ten percent of the 948,540 households in the two counties experienced some flooding or storm damage, FEMA said.
- Total number of flooded, damaged or destroyed structures:
  Nassau: 74,736; Suffolk: 20,798
- Structures that experienced only storm water inundation: Nassau: 17,405; Suffolk: 5,942
- Structures with damage totaling less than 50 percent of their value:
  Nassau: 27,178; Suffolk: 6,638
- Structures with damage totaling more than 50 percent of their value:
  Nassau: 30,036; Suffolk: 8,153
- Destroyed structures: Nassau: 117; Suffolk: 65
- Total debris (cubic yards): Nassau: 3,312,311.22; Suffolk: 1,166,067.35
- Estimated structural debris (cubic yards): Nassau: 3,139,330.31; Suffolk: 828,521.34
- Estimated tree debris (cubic yards): Nassau: 172,980.91; Suffolk: 337,546.01

Source: FEMA / Newsday 2013

Recommendations

1. NIMS must be part of the Town staff culture. As such, annual training should occur each year, to refresh staff understanding, and incorporate organization-wide collaboration. Through this training, the Town can disseminate information on current practices and procedures.

2. The Town shall issue identification cards to staff that are part of the NIMS program. This allows acknowledges that selected staff is "credentialed" and grants them access to sensitive operating sites such as the Town and County EOC.
    a. These cards also allow subordinate and management staff to quickly identify Town incident commanders.

    b. A continual problem during Hurricane Sand involved Chain of Command issues between relief staff at Town Hall and the Emergency Staff at the EOC. For Incident Commanders, ID cards should be red. For support staff, ID cards should be blue. This can eliminate confusion by staff in the office and the field.

3. The Town should create a separate time sheet for EOC Operations. This time sheet should follow the Federal Emergency Management Agency guidelines for reimbursing time for staff resources.

    a. During Hurricane Sandy, Town staff experienced difficulty in identifying the work hours relating to emergency operations, and time spent for regular Town business. Town managers were hesitant to sign for time they may not have directly supervised, and finance department staff needed to know which accounts to bill for work performed. By having a special emergency operations time sheet, the Town can maintain and track total hours spent on operations, and use that data for FEMA reimbursements.

4. The Town should maintain a reserve account for future EOC operations. This account can be referenced on time sheets for overtime hours and provisions associated with an incident.

    a. The Department of Finance needs to create additional codes for time accounting, within the Town financial management system, to address the modified schedules, accruals and overtime that accumulated over the course of the event. By having a specific reserve account for the EOC, these issues may be reduced. Staff accounting can be associated with a specific incident; budgetary reconciliation can be performed between departments with reimbursements made by the federal government.

5. Information Technology Assessment and Implementation of an IT Management Plan. - The current deployment of computers at the EOC posed significant challenges to EOC Staff. Many of the machines maintained at the facility are beyond their maintenance life. Every machine is behind on its software maintenance and current operating systems are older than the last two previous generations.
    a. These antiquated systems create a challenge for EOC staff, which are required to submit requests for assistance, report data and perform analysis, using Federal and State web-based utilities.

b. As a result of experiences from Hurricane Irene (2011), an IT Assessment was scheduled for 2013. The Department of Information Technology is currently in the process of deploying new computers throughout the Town as part of a Town-wide computer modernization plan. The EOC has been scheduled for a comprehensive review.

6. Network Peripherals - The EOC has seven liquid crystal display screens. Only one of these screens is connected to the network. The other six screens are connected to cable television boxes. By connecting these other screens to the network, EOC staff will be able to display other information such as weather and GIS maps.

    a. The Town EOC has a single printer / copier, which is not connected to the network. In addition, the facility has a fax machine, which is used to receive hourly teletype updates from Suffolk County Fire Rescue and Emergency Services (FRES). A centralized printer / scanner / fax / copier should be acquired for the Town EOC. This machine should be incorporated onto the network.

    b. The large format plotter assigned to the EOC was not properly maintained. This needs to be fully stocked with paper and ink to be able to print large maps on request.

7. Telephone Call Center - Throughout Hurricane Sandy and the following recovery operations, the Town EOC transformed into a call center. This was a new role for the facility. The facility should be assessed for reconfiguring as a call center in emergencies.

8. A permanent Wi-Fi installation should be installed to support wireless devices, laptops and GPS systems.

9. The Town should create a separate funding line for emergency overtime. This will provide a single budget line for funding emergency operations and overtime can be billed to this budget line, for work hours provided to an emergency operation.

10. Town Hall staff should be provided bi-annual training for emergency preparedness. This will reinforce the role every employee has during a disaster event.

11. An emergency space plan for displaced employees should be prepared. The Town should anticipate two scenarios, which include moving employees around Town Hall and evacuating Town Hall employees to a second location.

12. The Town needs to review its internal continuity of government plan. This plan should incorporate a disaster recovery strategy for information technology and services.

13. During the recovery effort, the Town was asked to assist other municipalities in disaster recovery operations. The Town should work with these municipalities to for agreements for inter-municipal cooperation during future disasters.

14. Staff from each department should be trained in the use of global positioning devises (GPS) devices for post-disaster assessment.

15. The Town of Huntington should form a working group with debris management staff at the Long Island Power Authority. This inter-municipal group should study how joint Town / LIPA debris management initiatives could be made more efficient through access to Town resources and data.

16. The Information Technology (IT) Disaster Recovery (DR) site at Village Green should be reviewed for further hardening of infrastructure and systems. The Town is currently evaluating the possibility of re-locating this site to the Town EOC.

17. Mobile devices should be based at the EOC and should incorporate standard e-mail. This will make it easier to for documentation months after the storm.

18. Separate e-mail accounts should be set up for EOC related activities. Business cards should be issued to staff members with EOC phone and e-mail. This will eliminate confusion during the recovery process when networking between agencies is crucial.

19. Town staff from each department should be trained in the use of the Town GPS inventory. In the aftermath of a disaster, 10 of these staff can be deployed to evaluate and assess damaged infrastructure and properties using the data on these devices. This data can then be returned to the EOC for incorporation into the Town-wide GIS. This will greatly improve the assessment, mission planning and documentation capabilities of the Town EOC.

20. When making announcements through Code Red, emergency manager must remember to include a disclaimer, which advises village residents to inquire with their local villages about debris clearing.

21. The Town should deploy radios to shelters for use by shelter supervisors. These radios can be used to request assistance from the Town as part of any future sheltering initiatives.

22. Vehicle tracking information should be available through the Town GIS for mission planning, analysis and documentation. This information can be used for storm assessment, debris management and snow plowing and will provide Town EOC staff with a common operating picture with their Highway counterparts.

23. Town Staff should be selected for call center operations. These staff can be trained as part of the Town EOC team and can serve to collect and disseminate the data and information that is essential to any successful recover effort.

24. The Town should establish an ArcGIS Online “For Organizations” account for maintaining emergency GIS applications across the web.

25. The Town should identify the special needs residents, including the elderly and children, who may require special evacuation procedures and continual assistance during sheltering. The locations of these groups should be mapped in the Town-wide GIS, so that Town programs and potential evacuations include these addresses.

26. The Town should contract with a local pharmacy for emergency drug services. If an event lasted longer than two weeks, where power was not restored and vegetative debris continued to block roads, it may be necessary to bring medications to residents directly as prescriptions run out.
    a. There may also be a need to provide medications to homeless members in shelters as part of a monitoring program.

27. The Town should contract with a local Doctor or Nurse Practitioner to be on call for an emergency event. This individual would have access to Town facilities and could be made available to first responders.

28. Town public safety staff should be selected for sheltering support responsibilities. These public safety officers should be trained as part of the CERT program and should be able to provide assistance with the intake and monitoring of residents at Town shelters.

29. The Town should discuss future sheltering plans with the Suffolk County Department of Social Services, in regards to the placement of individuals by the county in Town shelters.

30. An online map for shelters, warming centers and other resources should be made available to the public.

31. The Town should acquire temporary traffic control devices for placement in pivotal intersections throughout the Town. These locations have been identified in the Town geographic information system.

    a. The Town should also make temporary stop signs for tertiary roads that may be hazardous during prolonged power outages. In addition, the Town could acquire collapsible temporary “No Exit” signs to place on roads with significant tree debris. This will alert motorists about areas that are completely blocked.

    b. These devices can be deployed by the Division of Street Lighting and Department of Highways during the initial disaster assessment and can be collected once debris has been cleared or power has been restored.

32. The Town should calculate the Hazard Scoring for all municipal beaches, parks and capital projects.

33. The Town should form a taskforce, which facilitates dialog between emergency services agencies, to identify practices for mitigating future fuel shortages.

National Incident Management System

Hurricane Sandy 2012

Town Departments

Long Island Power Authority

Information Management & Communications

Debris Management

Sheltering

Storm Surge

Recovery Efforts

Understanding "NIMS"

The National Incident Management System (NIMS) identifies concepts and principles that answer how to manage emergencies from preparedness to recovery regardless of their cause, size, location or complexity. NIMS provides a consistent, nationwide approach and vocabulary for multiple agencies or jurisdictions to work together to build, sustain and deliver the core capabilities needed to achieve a secure and resilient nation.[1]

Consistent implementation of NIMS provides a solid foundation across jurisdictions and disciplines to ensure effective and integrated preparedness, planning and response. NIMS empowers the components of the National Preparedness System, a requirement of Presidential Policy Directive (PPD)-8, to guide activities within the public and private sector and describes the planning, organizing, equipping, training and exercising needed to build and sustain the core capabilities in support of National Preparedness Goals.[2]

Credentialing

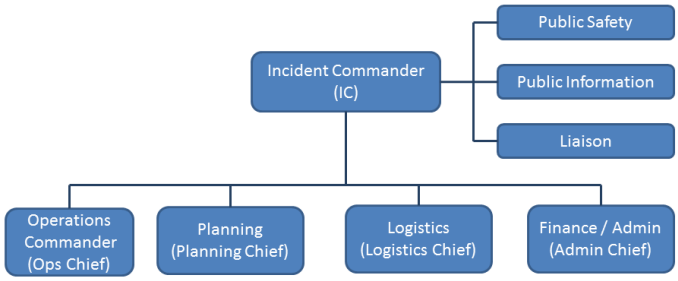
The credentialing process entails the objective evaluation and documentation of an individual's current certification, license or degree; training and experience and competence or proficiency to meet nationally accepted standards, provide particular services and/or functions or perform specific tasks under specific conditions during an incident.[3]

For the purpose of NIMS, credentialing is the administrative process for validating personnel qualifications and providing authorization to perform specific functions and to have specific access to an incident involving mutual aid.

The National Integration Center (NIC) developed the NIMS Guideline for the Credentialing of Personnel, which describes national credentialing standards and provides written guidance regarding the use of those standards. The National Emergency Responder Credentialing System documents minimum professional qualifications, certifications, training and education requirements that define the standards required for specific emergency response positions.[4]

The NIC uses working groups to identify job titles to be credentialed and the qualifications and training required. These working groups focus on the following: Incident Management, Emergency Medical Services, Fires, Hazardous Materials, Law Enforcement, Medical and Public Health, Public Works and Search and Rescue.

Under the National Incident Management System, Incident Command is divided among administrators or "Chiefs". The Incident Commander or "IC" serves as the supreme authority within a command structure for a jurisdiction. It is important to understand that this title is defined as a role, and not a specific individual, and that several credentialed and trained individuals will rotate in and out of this role throughout a pre-determined schedule of shifts, during an incident. This reduces stress and fatigue that would normally affect a single individual, while maintaining continuity under the NIMS structure.



Town Incident Command Structure

In the Town of Huntington, the Incident Commander is primarily the Town Supervisor; however, in the absence of the Town Supervisor, this role reverts to the Operations Chief, who exercises this role with the full authorities of the Town Supervisor and with fiduciary responsibilities to the residents of the Town of Huntington.[5]

Under NIMS, powers from the Incident Commander can also delegated to a maximum of four Assistant Commanders, who serve in supporting roles to assist the IC. The number of positions allowed under NIMS is part of the principle of "appropriate span of control", which describes how control can be lost as more "Chiefs" are added. By limiting the number of Chiefs, the command structure remains clearly defined and understood by supporting personnel.[6]

As prescribed under the FEMA NIMS protocols, these "Assistant Chiefs" are responsible for coordination and administration incidents through the following rolls:

- **Operations Chief (OC)** – The Operations Chief, Commonly referred to as the "Ops Chief" is responsible for directing emergency operations and commonly serves as the Incident Commander. The Operations Chief may negotiate with other agencies for resources. Additionally this Commander may direct Town resources and personnel, regardless of job title classification, in order to facilitate a timely response to an emergency, for the protection of human life and property. During past practices in the Town of Huntington this role has been exercised by the Chief Fire Marshal at the direction of the Town Supervisor.[7]

- **Planning Chief (PC)** – The Planning Chief supports the Incident Commander by providing a robust understanding of the duties, responsibilities, and capabilities of agencies and resources. The Planning Chief responsibilities fall into two categories: 1) managing the planning cycle, and 2) tracking resources and incident status.[8]

- **Logistics Chief** - The Logistics Section Chief is tasked with providing all resources, services, and support personnel required by the incident. At the Direction of the Town Supervisor, the Director of General Services has been directed to serve in this role.[9]

- **Finance/Administration Section Chief** - The Finance/Admin. Section Chief is tasked with tracking incident related costs, personnel records, requisitions, and administrating procurement contracts required by Logistics.[10]

Command Transfer

A role of responsibility can be transferred during an incident for several reasons: As the incident grows a more qualified person is required to take over as Incident Commander to handle the ever-growing needs of the incident, or in reverse where as an incident reduces in size command can be passed down to a less qualified person (but still qualified to run the now-smaller incident) to free up highly qualified resources for other tasks or incidents. Other reasons to transfer command include jurisdictional change if the incident moves locations or area of responsibility, or normal turnover of personnel due to extended incidents. The transfer of command process always includes a transfer of command briefing, which may be oral, written, or a combination of both.[11]

Executive Authority

In New York State the authorities of municipal chief executives during an emergency are identified in what is commonly known as "Article 2B". This is in reference to Executive Law, Article 2-B, which states as follows:

1. It shall be the policy of the state that:

a. local government and emergency service organizations continue their essential role as the first line of defense in times of disaster, and that the state provide appropriate supportive services to the extent necessary;

b. local chief executives take an active and personal role in the development and implementation of disaster preparedness programs and be vested with authority and responsibility in order to insure the success of such programs;

c. state and local natural disaster and emergency response functions be coordinated using recognized practices in incident management in order to bring the fullest protection and benefit to the people;

d. state resources be organized and prepared for immediate effective response to disasters which are beyond the capability of local governments and emergency service organizations; and

e. State and local plans, organizational arrangements, and response capability required to execute the provisions of this article shall at all times be the most effective that current circumstances and existing resources allow.

As part of the Executive Powers of the Office of the Town Supervisor, the Town Supervisor may exercise broad powers in order to effectively facilitate the timely response by Town agencies to a disaster, for protecting human life and property. These powers are exercised after there has been a local "Declaration of a State of Emergency" pursuant to section 24 of the NYS Executive Law.[12]

Local Declaration of a State of Emergency

In compliance with Section 24 of New York State Law, only the local chief executive (County Executive, Town Supervisor, Village or City Mayor) can declare a local state of emergency covering all or any part of their jurisdiction. A declared can be in response to, or anticipation of, a threat to public safety, and should be in writing.

A local state of emergency must be declared before emergency orders can be issued, and local state of emergency should

be formally rescinded when the declaration is no longer needed.

In order to maintain legal continuity, only the local chief executive, or person authorized to act for the local chief executive, may rescind a local state of emergency.
The powers, which are granted through an official declaration, provide the local chief executive with additional powers in order to respond adequately to a disaster. These powers may include, but are not limited to:

- Establishing curfews;
- Implementing public protective measures;
- Establishing shelters, medical shelters, or alternate care sites;
- Suspending local laws; and
- Requesting supplemental assistance from other Federal, State and Local agencies.

Findings

For several years, the Town has made it a priority to incorporate NIMS as part of regular personnel training. However the Town must continue to cultivate this system into its wider staff culture. Town staff needs a better understanding of their personal roles in an incident, and how those roles support the larger operational picture.[13]

Essentially, the Town maintains a bifurcated staff system where some members are fully integrated into the NIMS systems, while other staffs remain incognizant to the NIMS structure and concepts. This self-identification as being part of the "everybody else" cohort, can lead to break downs in the NIMS system. These are the following recommendations to strengthening the Town-wide emergency management structure:

1. NIMS must be part of the Town staff culture. As such, annual training should occur each year, to refresh staff understanding, and incorporate organization-wide collaboration. Through this training, the Town can disseminate information on current practices and procedures.

2. The Town should issue identification cards to staff that are part of the NIMS program. This acknowledges that selected staffs are "credentialed" and grants them access to sensitive operating sites such as the Town and County EOC. These cards also allow subordinate and management staff to quickly identify Town incident commanders.

   A continual problem during "Hurricane Sandy", was that relief staff at Town Hall and the Town EOC, needed to identify "who's in charge". For Incident Commanders, ID cards should be clearly marked. For support staff, ID cards should also be clearly marked. This common practice of differentiation will eliminate confusion by staff in the office and the field.

3. The Town should create a separate time sheet for EOC Operations. This sheet should follow the Federal Emergency Management Agency guidelines for reimbursing time for staff resources.

   During Hurricane Sandy, Town staff experienced difficulty in identifying

the work hours relating to emergency operations, and time spent for regular Town business.

Town mangers were hesitant in signing for time they may not have directly supervised, and finance department staff needed to know which accounts to bill for work performed. By having a special emergency operations time sheet, the Town can maintain and track total hours spent on operations, and use that data for FEMA reimbursements.

4. The Town should maintain a reserve account for future EOC operations. This account can be referenced on time sheets for overtime hours and provisions associated with an incident.

   During Hurricane Sandy, some department managers were reluctant to approve overtime for their department staffs, who were involved in Sandy recovery operations. This was resolved after the Director of Finance approved overtime requests directly.

   Under the federal reimbursement formula, the Town may apply for reimbursable overtime expenses. Unfortunately the federal formulas do not provide reimbursement for regular time worked.

   In addition, the Department of Finance needed to create additional codes for time accounting, within the Town financial management system, to address the modified schedules, accruals and overtime that accumulated over the course of the event.

   By having a specific reserve account for the EOC, these issues could be greatly reduced. Staff accounting can be associated with a specific incident, budgetary reconciliation can be performed between departments and reimbursements can be made to the federal government.

Hurricane Sandy 2012

On Wednesday October 24th the Town Emergency Operations Staff reported to the Town Supervisors Conference Room to discuss hurricane preparedness measures. During this initial meeting, staffs were provided the Daily Weather Release from Gary Conte, National Weather Service Meteorologist, which stated that there was a "potential for a high impact coastal storm.[14]

Between October 24th and 27th, Town of Huntington EOC Staff participated in multiple daily meetings and conference calls between Suffolk County Fire, Rescue and Emergency Services, the Long Island Power Authority, and various State and Federal agencies. During these meetings, coordination rules were established between the stakeholders.[15]

The Town had been in continual communication with LIPA for nearly nine months prior to Hurricane Sandy as part of an effort to develop coordinated procedures for debris removal. During the course of these discussions in the summer of 2012, it was suggested by the Town, that new procedures be developed for coordinating LIPA and Town crews during recovery efforts. These suggestions were made after the Town completed an after review, which identified issues relating to Tropical Storm Irene.[16]

In addition to the activities, Town departments began to prepare and assess their facilities and inventories. Surveys of the Town beaches were completed days before the storm. The Planning Department began to examine pre-disaster mitigation planning issues and identified several areas of concern. These included potential flooding areas and section of the Town that were prone to wind borne debris.

Town "EOC" Operations

On Sunday, October 27th, the Town Supervisor opened the Town Emergency Operations Center to monitor Hurricane Sandy as it approached. During this initial "kick off" meeting the EOC staff discussed reported storm scenarios, known hazards and mitigation measures and the past experience of Hurricane Irene.[17]

During this discussion it was decided that the EOC staff would create an ad hoc call center activity within the EOC, to manage the anticipated call volumes. The Department of Public Safety was tasked with providing additional support staff for this effort.[18]

This initiative became a critical component to EOC operations during the storm event and subsequent recovery operations. Thousands of calls were received by the EOC during this period. These calls included resident requests for information, reporting and public agency request for assistance.

This information was then reported to the Planning Chief, where it was then entered into the Town-wide geographic information system. This process created a complete common operating picture across Town departments and allowed EOC staff to deploy resources more efficiently.

As the storm passed over Huntington, Town staff, emergency service agencies and local police departments engaged in a significantly increased operational tempo. The EOC provided additional support to local fire and police services by responding to heavy equipment requests. Several

requests were placed to assist first responders in reaching residents in need.

It should be noted that over this 12 hour operational period, Town-wide emergency services and police departments, engaged in what can best be described as heroic actions. Multiple automobile accidents, tree falls and fire emergencies were addressed concurrently. In one incident that resulted in an unfortunate fatality, fire rescue and Town crews spend nearly three hours trying to cut their way through massive amounts of vegetative debris, in order to arrive at the scene.[19]

While Huntington was engaged in multiple emergency incidents, the EOC was also monitoring radio frequencies from jurisdictions around the county. By midnight, radio reports were indicating that there were over 100 working fires being fought by local departments throughout Suffolk County.[20]

Throughout the night, EOC staff monitored reports from around the Town. At approximately 2 A.M., the center lost its cable connection. This left the EOC without direct internet connectivity, or cable news and weather feeds. EOC staff activated portable Wi-Fi hot spots, which they purchased a day prior to the storm arrival. This provided limited connectivity to report incident requests to the County EOC and receive news reports.[21]

In addition, EOC incident management and support staff maintained a continual mobilization for an operation period of eleven days. This operational posture provided other agencies and jurisdictions with a 24 hour contact point in the Town of Huntington.

Within a few days after the storm, the Town was faced with a variety of critical un-anticipated issues which compounded the recovery effort. This included nearly 90% power outages through-out the Town, a collapse of the region's fuel supply system, and a dangerous drop in temperature.[22]

This situation created a convergence of un-anticipated challenges to local emergency resources. Within a few days, many homes would be at near freezing temperatures without heating oil or electric. As the temperature dropped, fire departments opened their fire houses up to the public as warming centers. The Town opened additional warming centers and charging stations.[23]

Throughout this period, EOC staff continued to receive calls from the public, and began to relay vital information regarding warming center placements and Town-wide recovery programs. EOC staff also began to analyze various data to assess community needs and losses.

As the Town entered its recovery operations, the EOC became the central administrative offices for this effort. A regular schedule of meetings was conducted each day between EOC staff and Town administrative officials. The EOC coordinated the deployment of resources and served as a central point for collecting reporting data related to the recovery effort. This information was then passed along to federal, state and county agencies.[24]

As recovery efforts gained momentum throughout the Town, it became clear that the EOC was the central venue for collecting, coordinating, and disseminating information. The EOC is not merely an office for emergency manager to gather, but

a pivotal component to the information management and communications plan for the Town of Huntington.

Recommendations

While the Town Emergency Operation Center has been identified as an exemplary facility for coordinating localized emergency management, there are areas where furthered improvements can be made.

It should be noted that while the committee has made recommendations as part of this report, many of those recommendations were in the process of being addressed as a result of after action reporting for Hurricane Irene. When applicable, this report will indicate prior-scheduled improvements that may affect recommendations.

The following recommendations for advancing the mission of the EOC include:

1. Information Technology Assessment and Implementation of an IT Management Plan. - The current deployment of computers at the EOC posed significant challenges to EOC Staff.

- Many of the machines maintained at the facility are beyond their maintenance life;

- every machine is behind on its software maintenance;

- Current operating systems are older than the last two previous generations.

  These antiquated systems create a challenge for EOC staffs, which are required to submit requests for assistance, reporting data and perform analysis, using Federal and State web-based utilities.

As a result of experiences from Hurricane Irene, an IT Assessment was scheduled for 2013. The Department of Information Technology is currently in the process of deploying new computers throughout the Town as part of a Town-wide computer modernization plan. The EOC has been scheduled for a comprehensive review.

As part of this effort, the EOC staff and the Department of Information Technology are reviewing the possibility of deploying laptops to EOC staff. This would reduce the number of fixed terminal computers in the center, while providing more powerful lap-tops which can be continually updated during the course of regular business. This also gives manager the ability be mobile.

Laptops were utilized during Hurricane Sandy due to inadequacies of EOC desktop computers. The Operations Chief and Planning Chief worked exclusively from laptops. In addition, an ad hoc data entry initiative was set up with four laptops, where public safety officer entered reports into the Town-wide GIS.

Under normal operating conditions, the Town EOC network is not connected to the Town network. This creates an operational situation, where it is impossible to efficiently retrieve data, run reports and access resources from Town Hall. This situation also exists between the Town EOC and the Department of Highways.

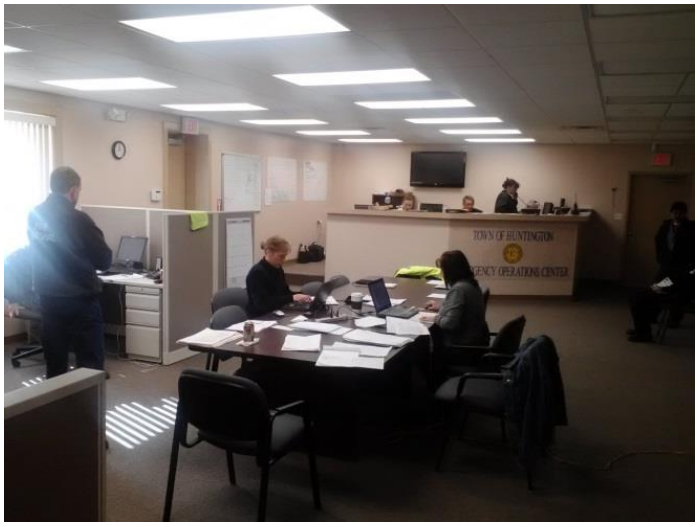
It is therefore recommended that the network infrastructure at the Town EOC and the Department of Highways should be integrated with the Town network.

2. Network Peripherals - The EOC has seven liquid crystal display screens. Only one of these screens is connected to the network. The other six screens are connected to cable television boxes. By connecting these other screens to the network, EOC staff will be able to display other information such as weather and GIS maps.

   The Town EOC has a single printer / copier, which is not connected to the network. In addition, the facility has a fax machine, which is used to receive hourly teletype updates from Suffolk County Fire Serves. A centralized printer / scanner / fax / copier should be acquired for the Town EOC. This machine should be incorporated onto the network.

   The large format plotter was not properly maintained. This needs to be fully stocked with paper and ink to be able to print large maps on request.

3. Telephone Call Center - Throughout Hurricane Sandy and the following recovery operations, the Town EOC transformed into a call center. This was a new role for the facility. The facility should be assessed for reconfiguring as a call center in emergencies.
4. A permanent Wi-Fi installation should be installed to support wireless devices, laptops and GPS systems.



Town of Huntington Staff received calls at the EOC during the recovery effort.

By the Numbers

- **$9 million in category "A" funding for debris clean up.**
- **$1 million Category "B" emergency funding.**
- **$1.5 million Category "C" for sidewalk and street lighting repairs.**
- **$2 million Category "E" facilities repairs.**
- **90% Federal reimbursement.**

*These figure reflect Federal reimbursements as of July 2013.

Assessor's Office

The Assessor's Office does not actively participate in storm mitigation or recovery efforts. However, this office does have a significant role in maintaining the Town-wide assessment role. In the aftermath of Hurricane Sandy, many residents approached this office for assistance with their property appraisal requirements.

In the weeks after Hurricane Sandy, FEMA Individual Assistance (IA) mobile centers, were placed at Town Hall. During this visit, residents could bring their claims to FEMA and insurance representatives. The Assessor's Office was able to assist in the retrieval of documentation and appraisal history.[25]

Building & Engineering Services

The Dix Hills Water District was able to utilize emergency generators at key pumping sites. Water service to the residents and firefighting capabilities was never interrupted.

The Building Department established an Emergency Permit process to expedite needed repairs to residents affected by the storm. Home owners were able to come to the Building Department and leave the same day with a permit. Permit fees were waived.

Building Inspectors were utilized to assess damaged homes and the safety of Town structures. The Engineering staff was utilized to assess damaged Town facilities and provide construction cost repair estimates for FEMA reimbursement and future budgeting. The Building Department extended the operating hours over the course of two evenings to aid the public with home repairs and marine conservation concerns.[26]

Town Attorney's Office

In preparation for the storm Town Attorney representatives assigned to the Town of Huntington emergency preparedness committee attended all requested emergency meetings. As such, the Town Attorney's office staff had an understanding of federal, state and emergency protocols, and were qualified to render competent legal advice to Town emergency management staff.

An Assistant Town Attorney attended daily briefing meetings at the Town EOC and at Town Hall offering advice and research on legal issues as required by Town Emergency Staff. This included issues relating to the preparation of Emergency Declarations, and with NYS Executive Law Article 2b.

When fuel supplies throughout Long Island began to experience substantial market

interruptions, new sources of fuel were needed for emergency vehicles. Assistant Town Attorneys worked to identify answers to questions Town EOC staff as to the ability of the Town to sell fuel to fire departments at cost.

Due to the unprecedented amount of vegetation debris, vendors had to be secured without the benefit of bidding and review. A legal opinion had to be rendered for these issues. Finally, with input from various departments, resolutions for approvals had to be drafted and coordinated for services.[27]

Maritime Services

In accordance with the procedures identified in the Town-wide Emergency Preparedness Plan, the Department of Maritime Services initiated pre-disaster procedures. As prescribed by these procedures, department staff acquired fuel for all department vehicles, portable fuel cans, and generators.

Department staff then moved all essential equipment to "higher ground" and safe locations identified through previous

Wash over at Hobart Beach during Hurricane Sandy

pre-mitigation planning efforts. The staff then secured power systems and removed sanitary waste from all pump-out tanks and secured pump out equipment. Safety lines were then installed on gangways leading to docks. In a final procedure, department staff was deployed to document and photograph Town beaches and marinas.

In addition to these efforts, staff secured the marina workboat and Gold Star launch dinghy. Final inspections were then made on all Maritime Services facilities. All department personnel with official vehicles were then directed to report to Halesite Office.

Upon notification from the Town EOC that recovery procedures had commenced, the department immediately initiated post storm disaster procedures. As part of these protocols, department staff deployed to Town beaches and marinas to survey damages, document and photograph impacts to Town facilities. Department staff used a tractor to clear access ways to beaches. Upon the preliminary damage assessments, immediate safety issues at marinas or beaches were identified, and when necessary stabilization repairs were made to secure a limited degree of structural safety.

In addition to this effort, nearly half of the department's staff was engaged in providing augmentation assistance to other departments. Maritime staff were re-assigned to assist Highway department for recovery efforts, while the remaining staff worked on shorefront facilities (clearing sand from beach parking lots, etc.). Additional part-time staff was activated, and Town Bay Constables were assigned to provide additional security to Town facilities, and relieve staff at the Town EOC.[28]

Parks & Recreation

In preparation for the arrival of Hurricane Sandy, equipment at the golf courses was secured and stored. All programs and activities were cancelled. Department Staff

were directed to be on call in the event assistance was needed at Town shelters.

During the recovery operations, Department Staff assisted in performing damage assessments to Town facilities. Fortunately, our recreational facilities did not suffer major damage. In coordination with Maritime Services, assessments were completed at all Town beach facilities.

Furthermore, the department provided additional community outreach and support, by offering free skating sessions at the Dix Hills Ice Rink. These sessions were heavily attended and strongly appreciated by our residents. This effort was also supported by D & J Refreshments, a local vendor doing business with the Town. Hot chocolate and coffee was provided for residents, while the ice rink also served as a charging station for re-charging electronic devices.

In addition to these efforts, department staff also assisted in staffing the re-charging site at Town Hall. This provided comfort to residents, by assisting them with their daily needs, allowing them to interact, become informed of current news, and recharge their cell phones.[29]

Planning & Environment

Within days of the approach of Hurricane Sandy, the staff of the Department of Planning & Environment began to review preliminary weather and storm surge data related to the storm. The department staff includes local shoreline experts and technical staff. In addition, this Department includes the Town Geographic Information Systems (GIS) staff. The Planning staff was responsible for developing predictive analysis for Town managers. This included advanced storm surge modeling to predict shoreline inundation areas, and post disaster recovery planning. This work is critically important both before and after the storm, because Federal, State and County emergency management agencies require a constant supply of statistical data and incident intelligence from local municipalities, for planning and response needs.

Waste Management

In anticipation of Hurricane Sandy, the Department of Waste Management initiated pre-disaster mitigation measures. Prior to the storm, all department staff was put “on shift”. Pump station generators were checked to be fully fueled, and operational. In addition, staff maintenance mechanics were directed to report to the waste management site, so there would be emergency personnel available in the event of mechanical breakdown.[30]

The department is responsible for managing the waste water treatment facility at Creek Road. This facility is the oldest and largest treatment facility in Suffolk County, with a processing capacity of over 500,000 gallons of waste water.[31]

This facility provides treatment services to the Huntington Sewer District, which has a geographic boundary that stretches from the downtown “Huntington Village” business district, to the marinas and wetlands of Huntington Bay. Failures at this facility could result in systemic disruptions in localized economic activity, while creating significant health threats to local residents and the surrounding environment.

Bevin Drive

Subsequent to the storm event, this facility lost all power from LIPA. Thanks to pre-disaster mitigation measures, and extraordinary efforts by department employees, this facility was sustained on generator power for ten days and the outlying pump stations were on generators for six days. Emergency measures taken by Department of Waste Management staff, most certainly prevented possible failures at this facility.

The Department also played an important role in providing multi-jurisdictional assistance to other communities in need. The department supported the Town Department of Highways when requested, and personnel and trucks were dispatched to assist in the pick-up of tree debris. Prior to the storm both roll -off trucks were fueled and empty 40 -yard containers were placed on each truck in preparation for clean -up. Once called on by Highway, both trucks with drivers were assigned to Highway for approximately two months assisting the removal of tree debris.[32]

At the direction of the Town Supervisor, staff from the department was dispatched to the City of Long Beach for two days to assist with the collection of garbage and construction debris. The department also assisted the Village of Amityville, which had also placed request for mutual-aid assistance through the Suffolk County EOC, for the collection of garbage and construction debris.[33]

Town Hall

During Hurricane Sandy, all power was lost at Huntington Town Hall. With this loss of power, all Town-wide critical operating systems were inoperable. In order to facilitate a comprehensive recovery effort, the Town emergency manager needed access to many of these systems.

The Friday evening prior to the arrival of Hurricane Sandy, the Department of General Services deployed a mobile generator to Town Hall with enough capacity to sustain the Town Data Center. Two Town electricians were authorized for overtime that evening to connect the generator to the data center. However a late decision was made not to connect this generator to the data center. During these discussions, staff had logistical and safety concerns about leaving employees at town hall for the duration of the storm event, in order to properly maintain the generator.[34]

Fortunately, within 24 hours of the storm, the Town had access to a larger mobile generating unit, which was provided by the disaster recovery organization, First Response Team of America.[35] First Response is an internationally recognized disaster specialist provider with experience during Hurricane Katrina. This organization also has part of its base of operations located in Huntington. First Response donated the use of its mobile generator to assist in recovery operations at Town Hall.[36]

The First Response Generator at Town Hall

With temporary power restored to Town Hall the Department of Information Technology began to restore Town-wide information systems, such as e-mail and audit and control systems. In addition to this effort, Information Technology staff set up a charging station in Room 114, for use by Town residents in need of charging their mobile devices.[37]

Power was restored to Town Hall by LIPA on November 6.[38]

Highways

The Department of Highways set up an ArcGIS Online account on October 27, 2012. Through this account, the department was able to share GIS data and resident notifications with the Town EOC. Throughout the event, this information was used to assess debris location, hazardous areas and to develop daily storm debris clearing maps.[39]

On October 29, President Obama declared a state of emergency (DR 4085). In response to federal, state and Town disaster declarations, the department activated its emergency plans.[40]

During recovery operations nearly 19,000 truckloads of debris was cleared and removed from Town rights-of-way. This equates to approximately 550,000 cubic yards of vegetative debris material. In addition, department staff documented every aspect of their responsible operations. Nearly 250 gigabytes of data, including approximately 60,000 pictures, and video was captured in support of FEMA reimbursement.[41]

Four Town parks were used for transfer stations for vegetative debris. These included Dix Hills Park, Half Hollow Hills Park, Peter Nelson Park, and Mill Dam Park. Emergency DEC permits were obtained for each site.[42]

A neighborhood cleared by the Highway Department.

On February 28, 2013 New York State granted a six month extension for the completion of eligible Category A and B work relating to DR 4085 (Super-storm Sandy), including projects which have not yet been obligated. The new deadline for completion of these projects is October 30, 2013.[43]

General Services

While the Department of Highways serves as the “backbone” of Town of Huntington

recovery efforts, the Department of General Services (GS) serves as a Town-wide "quick reaction force", which constantly pivots to address issues as they arise.

Prior to the arrival of Hurricane Sandy, department staff pre-positioned equipment around the Town for use in the recovery effort. This included an evacuation vehicle for use by Eaton's Neck Fire Department and mobile generator systems at various Town sites.

During the night of the storm, the Department deployed a pay loader and an Arborist to assist the Lloyd Harbor Fire Department with an emergency request for assistance. Over a period of nearly four hours, under strenuous conditions created by the confluence of extreme weather and vegetative debris, the team from General Services, fire service members, cut their way through blocked roads to respond to an emergency call for help. Although this emergency resulted in a fatality of a resident, this effort displayed by these first responders should be noted.

As part of the Town-wide emergency operation plan, the Department of General Services addresses its own multi stage recovery operation plan in the following order:

- Commuter and Municipal Parking lots are cleared of any debris and are accessible.
- Town facilities and shelters are assessed for damage and cleared of debris. This includes the Flanagan Center and Town Hall.
- Assess Town parks for damage to facilities and clear debris.

In addition to these responsibilities, the department staff augmented other departments in their recover efforts. Approximately 75% of the staff was deployed to assist the Department of Highways with coordinated recovery initiatives.[44]

General Service's vehicles, Asharoken Avenue

Street Lighting

The Town Division of Street Lighting performed approximately 600 repairs at a cost of nearly $200,000 to the Town street lighting network. This included replacing approximately 300 overhead lighting fixtures and 84 decorative lighting fixtures. In addition approximately 100 overhead wiring repairs were made.[45]

The Town recently acquired a street light inventory application which incorporated a global positioning system (GPS) and incorporates the Town-wide geographic information system (GIS). This system was not deployed to assess damage.[46]

Recommendations

1. The Town should create a separate funding line for emergency overtime. This will provide a single budget line for funding emergency operations and overtime can be billed to this budget line, for work hours provided to an emergency operation.

2. Town department heads should be proficient in NIMS. Town Hall staff should be provided bi-annual training for emergency preparedness by their supervisors. This will reinforce the roll every employee has during a disaster event.

3. An emergency space plan for displaced employees should be prepared. The Town should anticipate two scenarios, which include moving employees around Town Hall and evacuating Town hall employees to a second location.

4. The Town needs to review its internal continuity of government plan. This plan should incorporate a disaster recover strategy for information technology and services.

5. During the recovery effort, the Town was asked to assist other municipalities in disaster recovery operations. The Town should work with these municipalities to for agreements for inter-municipal cooperation during future disasters.

6. Staff from each department should be trained in the use of Town global positioning devises (GPS) for post-disaster assessment.

Long Island Power Authority

The committee examined issues related to prolonged power outages throughout Long Island communities in order to find solutions for mitigating the hardships associated with such experiences. Over the past two decades, there has existed a misconception among regional emergency planners that, Long Island survived Hurricane Gloria (1985); therefor it will survive the next storm.

However there is a significant flaw in this thinking, which was exposed during Hurricane Sandy. A statistical review by the Department of Planning & Environment, identified differences in conditions between Hurricanes Gloria (1985) and Sandy (2012).

While the population for the Town of Huntington in 1980 was constant with the population of 2010, there was an increase in additional housing units by approximately 10%. A further analysis of utility pole data available for review in the town-wide geographic information system showed that in 1985, there was an approximate total number of 7,000 utility poles in the Town of Huntington. Today there are nearly 28,000 utility poles.

The committee also found that in general, there is a limit to the amount of time a resident is willing to be without power. There are also many misconceptions to what is technologically feasible in restoring power. Electrical consumers are not used to energy constraints, and are not willing to except the delays due to technological issues. In the absence of reliable public information in the days following Hurricane Sandy, the public became frustrated with the recovery response by LIPA. This frustration was reflected in calls to the Town EOC and by resident visits to local shelters.

LIPA Electrical Inspection Program

On the evening of October 29th, a fire broke out in the barrier island community of Breezy Point, which is located a short distance from Kennedy Airport. The blaze was fought by City and local fire departments for nearly 45 hours and would eventually destroy 126 homes.[47]

The electrical service to this particular section of the Rockaway peninsula is provided by the Long Island Power Authority. Within a few days of the fire, the cause of the blaze was discovered to originate at a point where salt water from flooding reached the electrical box of each residence. This revelation set into motion a series of management reactions and missteps, which would adversely affect the residents of the Town of Huntington.

On the evening of November 4th, the Director of Buildings and the EOC Planning Chief attended a meeting of representatives from the County Executive's office, and representatives from local Towns and LIPA. At that meeting the Huntington representatives were informed that LIPA would not be energizing residential structures until inspections of electrical panels in flood prone areas were performed.[48]

The LIPA representatives indicated that a decision was made at LIPA headquarters, and that LIPA staff had toured areas throughout Long Island to assess flooding conditions. As part of this assessment, paper maps were issued to perform the survey. On these maps, lines of demarcation were drawn to determine which neighborhoods would be energized.[49]

When asked by Town representatives how the flood plains were determined by LIPA, the representative explained that the flood plains are located south of County Road 27 and north of State Road 25A, and that LIPA

substations had been ordered to refrain from energizing structures within these areas.[50]

This revelation became an issue of contention for the local Town representatives which were present at the meeting. Of the Town representatives present at this meeting, all possessed significant planning and building inspection experience. It became clear that the staff from LIPA had little understanding of what the flood plain was or where flood inundation actually occurs.

Furthermore, the LIPA representatives acknowledged that there were not enough qualified personnel available to perform the inspections needed. This prompted the County Executive's Office to formulate a strategy for performing the required inspections on nearly 240,000 homes. As part of this strategy, Suffolk County would employ local electricians and assume the liability for inspections.[51]

After the County presented its strategy to the Towns, a Town Commissioner of Planning present at the meeting suggested that the proposed number of inspections may be in fact much larger than needed.
The FEMA GIS Modeling Taskforce had provided the Town GIS staff with storm surge data. This data included "actual" flood inundation along the south and north shore of Long Island. While many areas sustained extreme damage to the coastline, other areas may not have experienced any flooding at all.[52]

The representatives from Huntington agreed with the Commissioner. Geographical information systems data provided by FEMA had allowed the Town EOC to perform storm surge modeling with a high degree of accuracy. These models indicated only a few select areas within the Town had experienced flooding. The Director of Building indicated that the Town was aware of approximately 20 homes, which had been affected by flooding and that those properties were actively being inspected. However LIPA insisted in refraining from energizing approximately 5,000 homes in the Centerport and Northport areas.

Eventually it was suggested that by combining LIPA and County geographical information systems data, local Town building departments could quickly identify properties which had been flooded. This simple analysis would require the address data for houses that were de-enrgized.[53]

Town representatives requested this information from the LIPA representative in attendance. However, the LIPA representative was not confident that LIPA could provide this information. Most of the surveys were conducted using paper maps and relatively little information was available in a digital format.[54]

It became clear to the Town representatives present at this meeting that:

- LIPA had limited understanding of the geography and topography affected by flooding.
- That the absence of accurate data at LIPA created a situation where it was possible that thousands of residents were being kept without power.
- While the Towns and County possessed the technical and technological means for addressing this problem, antiquated technology and a general lack of procedures, prevented LIPA from collaborating effectively with local Town inspectors.

SANDY

HELP TO SPEED UP EVALS

Government joins electrical effort

BY PAUL LAROCCO AND MARK HARRINGTON

Long Island's two county executives announced yesterday that the Long Island Power Authority will scrap its policy that required tens of thousands of South Shore homeowners affected by superstorm Sandy to obtain new electrical evaluations before they can get power turned on.

Flanked by town supervisors and village mayors representing communities hardest hit by the storm, Suffolk County Executive Steve Bellone said LIPA's plan would have meant many residents in homes that were not flood-damaged could remain without electricity "into the next ...mer," as they wait for everyone ...und them, including the ...impacted homes, to re... certificates of inspection.

...announcement by Bel... Nassau County Execu... ...rd Mangano came on ... LIPA continued to ...blistering criticism ...nce Sandy struck ...days ago. ...to 250,000 cus... ...ut power late ...on, LIPA ...ight of the ...rkforce it ...culty in ...public

...achael ...perating of... ...folk's approach ...large areas was ap... He advised Suffolk resi... ...s who have experienced flood damage to their homes to make sure circuits are turned off before power is resumed. He said Nassau's approach to evaluations by electricians followed LIPA's own model.

Both county executives — and Gov. Andrew Cuomo at a separate news conference yesterday — were blunt in their criticism.

"Our message to LIPA is to 'Turn. Back. The. Power,'" Bellone said to applause at Babylon Town Hall. "Get the power back. People are suffering right now and this cannot go on."

Mangano said LIPA had been ineffective managing its policy and change was demanded.

"From the pole to the light switch, they should be leading the charge to get the lights on," he said. Mangano even called on the U.S. military to take over the "managerial structure" of LIPA.

Even as criticism of the utility was ratcheted up, LIPA acknowledged it would again not hit its goal of restoring 90 percent of customers in the dark who were capable of receiving power back onto the grid. And yesterday morning, the number of outages spiked sharply after LIPA added 40,000 customers from the Rockaways and Long Beach to its outage map.

Those customers came stop new outages from Wednesday's nor'easter that added at least 123,000 new ones, even as LIPA worked to restore the tens of ...

...homes with barbecue grills, kerosene devices and generators.

"What we are facing is a public safety crisis," Bellone said.

Babylon Town Supervisor Richard Schaffer said LIPA's policy had caused "mass chaos."

"It's unacceptable for us to have to stand here and tell members of the public that you literally could die in your home before an inspector is able to get there, when legitimately the power can be turned back on," he said.

At yesterday's news conference, Schaffer and Bellone blasted the utility's leadership, with Schaffer saying "my anger has reached the 'boiling point," and Bellone noting that it appeared LIPA "did not have a plan" to deal with Sandy's damage.

Islip Supervisor Tom Croci said his town had handled 8,500 electrical assessments, per LIPA's policy, and forwarded the information to the utility, waiting on its action. He said it was now time for local govern-...

ALSO INSIDE TODAY

SANDY'S COST MAY BE $33B IN NY

STORM from A3

As estimates of financial fallout mounted, weary Island residents bore the brunt of another day marked by lack of power and fuel: electricity for homes and businesses, and gas for ...hicles and generators.

More than 200,000 ...land Power A... ...ers did not ...gerrilla... ...pe...

...Co. ...soun... ...against ...haul of t... "failed the ... "They're ...less bureauc... ...oly that opera... ...incentive or sa... ...said at a news co...

The number of c... ...out electricity, a re... ...of 1.2 million right a... ...struck 10 days ago, wa... ...about 150,000 Wednesda... ...the nor'easter knocke... ...power to at least 60,000 mor...

Outages spilled to 262,384 ...tomers by yesterday afterno... ...although LIPA said the numbe... ...included those previously re... ...moved from the list from the Rockaway Peninsula to Long Beach, where devastation left many homes unable to accept electrical service.

LIPA chief operating officer Michael Hervey has responded to criticism of the utility by saying he is focused on restoring power from the worst outage in Long Island's history, and not on trading barbs with politicians.

NEW RED TAPE

LIPA customers upset over evaluation rule

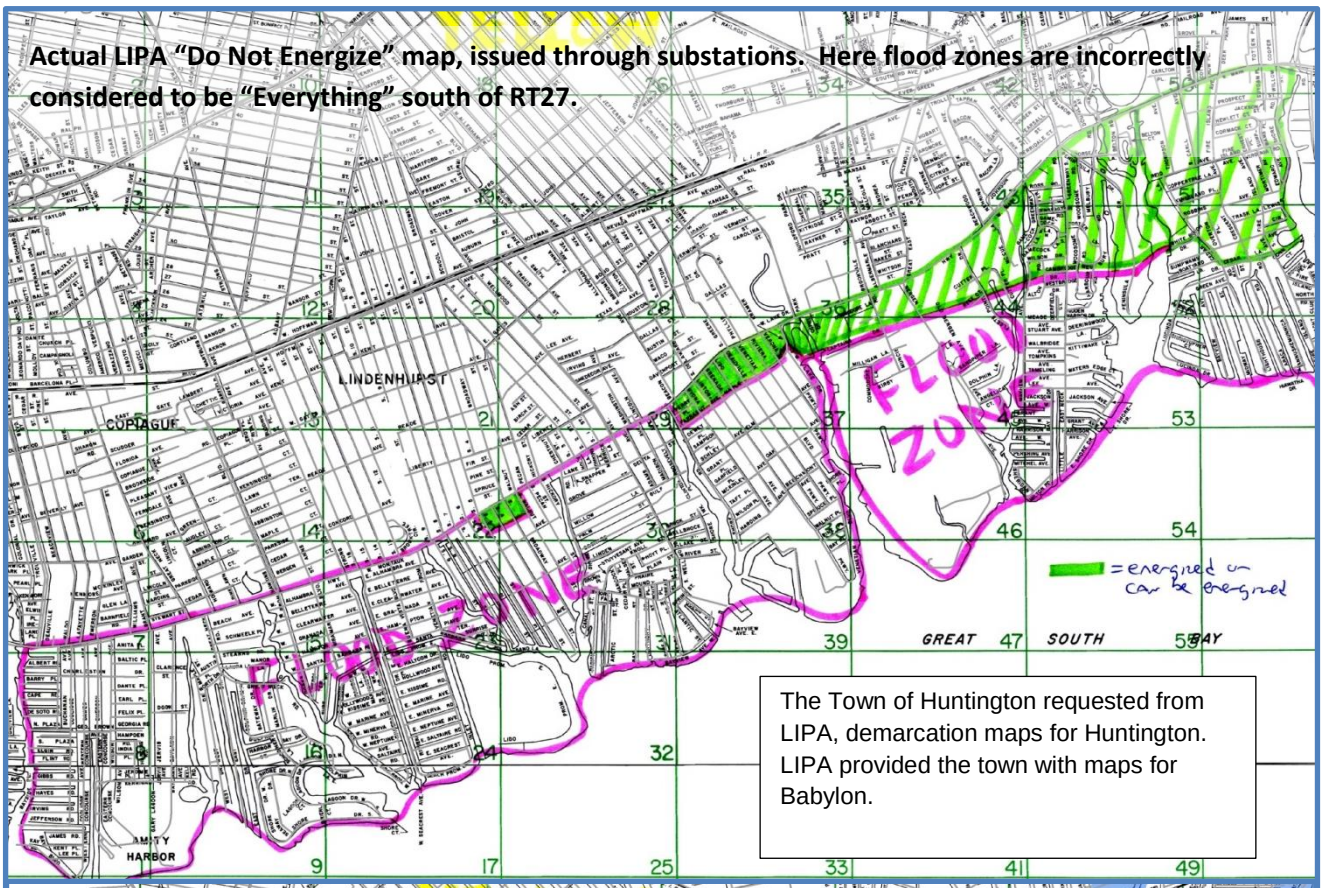
...ORIAL

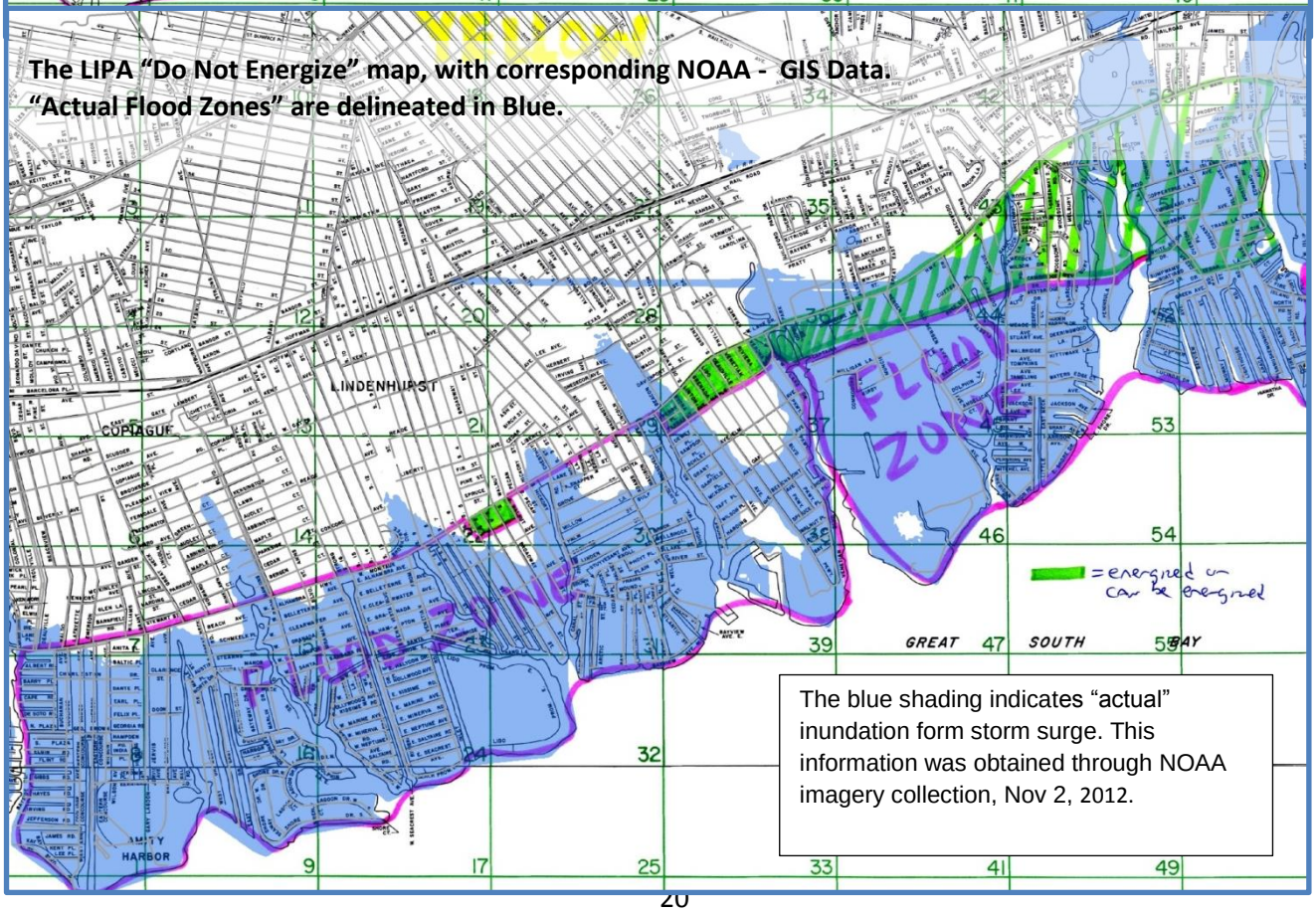
...ederal government must help region get back on its feet

A44

UP TO 40%

Contractors from outside New York State were issued inaccurate paper maps to find their way to inspection location. This lead to inspectors covering areas twice, and missing some areas all together. (Newsday, 2013)


Actual LIPA "Do Not Energize" map, issued through substations. Here flood zones are incorrectly considered to be "Everything" south of RT27.
LINDENHURST
COPIAGUE
AMITY HARBOR
GREAT SOUTH BAY
= energized
can be energized
The Town of Huntington requested from LIPA, demarcation maps for Huntington. LIPA provided the town with maps for Babylon.


The LIPA "Do Not Energize" map, with corresponding NOAA - GIS Data.
"Actual Flood Zones" are delineated in Blue.
LINDENHURST
COPIAGUE
AMITY HARBOR
GREAT SOUTH BAY
= energized
can be energized
The blue shading indicates "actual" inundation form storm surge. This information was obtained through NOAA imagery collection, Nov 2, 2012.

US Energy Information Agency

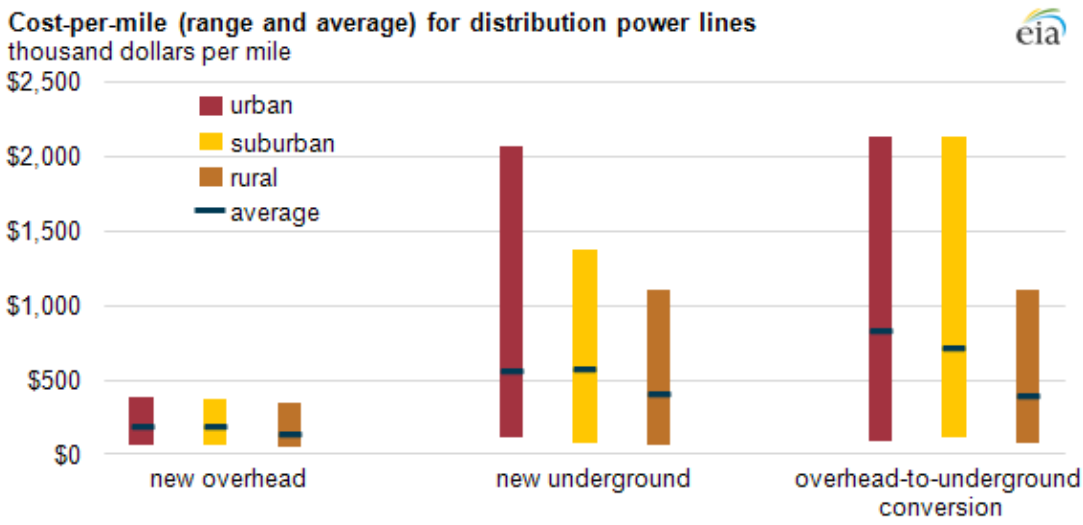
Undergrounding Electric Distribution

The Committee discussed the feasibility of burying power lines throughout the Town of Huntington as a means of mitigating future storms. This was an issue raised by several residents and community leaders throughout Long Island.

There is limited public information available regarding the potential for burying power lines throughout the Town of Huntington. However there is some information from feasibility studies in other municipalities. The U.S. Energy Information Agency (EIA), a bureau of the Department of Energy, has published various research on this issue, and the average costs associated with it.

According to EIA, the average cost for an "Overhead to Underground" conversion is approximately $2.1 million per linear mile. This does not take into account localized cost for specific geographic regions. It does provide a baseline value, which when associated with a linear value of existing overhead power line coverage, can provide a general estimate of overall costs associated with a mitigation initiative.

Using the town-wide geographic information system, the committee staff performed a simple analysis of road segments with known LIPA poles. Through an analysis of roads, which would be candidates for underground conversion, approximately of 776 linear miles were identified. Using a value of $2.1 million per linear mile, it is possible that the potential cost to bury the remaining above ground power lines in the Town of Huntington, could exceed approximately $1.63 Billion.



What about Solar Power?

During this review by the committee, questions were raised by town staff about the use of solar panels to power Town Hall. The Town recently deployed solar photovoltaic cells at the Huntington Station parking garages and Town hall. That town also has plans for future installations.

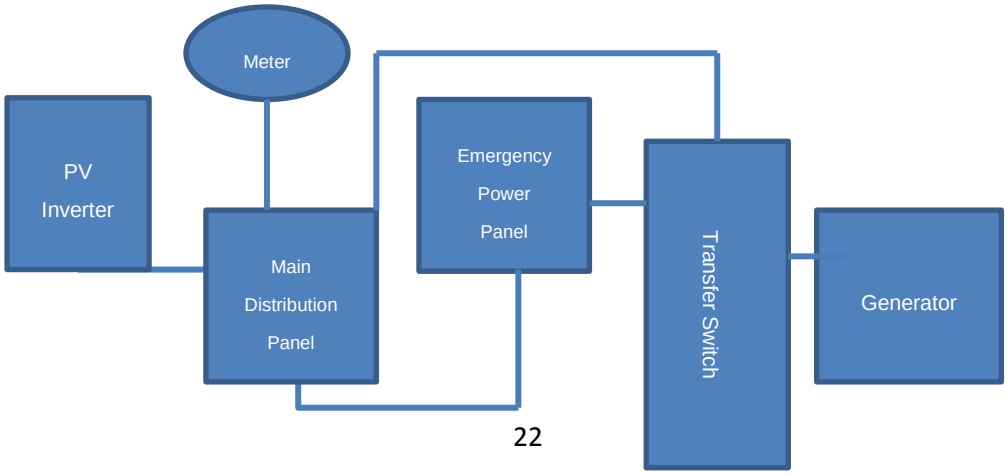
Unfortunately these systems were not operable for use during Hurricane Sandy. In order to prevent future injury or disaster, special safety mechanisms disable these photovoltaic systems when the power is lost to the grid. This prevents power from being loaded back onto the grid.

However these systems can be modified to incorporate power inverters and battery storage systems. These technologies allow for photovoltaic systems to provide power in an emergency to a facility day and night.

In addition, such systems can allow for commercial and residential photovoltaic users to maintain their systems. This concept of "sunny islands" creates locations that are able to sustain opportunity power available from the sun.

However, it is not practical to expect these technologies can support all of the normal electric load demands required by a residence, business or institution. Critical loads need to be identified before sizing these systems.

The question needs to be asked: "What is the minimum I need to wait out this crisis"? Households may require the minimum electrical maintenance of a refrigerator, cellular phone or radio. Businesses may require power for freezer units or computer data centers.



"Solar arrays and a diesel generator at Midtown Community School in Bayonne, N.J., allowed it to operate as an overnight shelter after Hurricane Sandy knocked out power from the grid".

The New York Times

Q. and A.: In a Blackout, Solar Exceptions

By DIANE CARDWELL

As I reported this week in The Times, many homeowners with solar panels on their roofs found themselves without electricity along with their conventionally powered neighbors when Hurricane Sandy knocked out power along the coasts of New Jersey, Queens, Brooklyn and Long Island. But in Bayonne, N.J., a school with an unusual coupling of a solar array and a backup diesel generator found itself chugging along through the storm and its aftermath, allowing more than 50 residents to spend the night that Sandy hit on cots in a heated, dry and well-lighted community room. At the heart of the system, designed and installed by Advanced Solar Products at the Midtown Community School, a designated evacuation center, is a special inverter with software that allows electricity from the panels to stop flowing out into the grid when it goes down.

It's a standard safety mechanism that protects line workers from electrocution during repairs. But in this case, the electricity goes to fuel critical systems in the building. The inverter keeps the emergency generator humming at a much lower level while the sun is shining and brings it back up to the necessary level when it is too cloudy or when night falls.

The set-up has its own vulnerability in that if the generator runs out of diesel, the whole system shuts down, a weakness that the company is addressing with a new design that incorporates batteries as well.

"We already have residential-sized solar systems that can incorporate solar panels, batteries and generators, all in a single inverter, but that has not existed in commercial-sized systems until now," said Lyle Rawlings, chief executive of the company, based in Flemington, N. J. That approach, one of many that various designers and companies are pursuing, is helping to light a path toward a more resilient energy future, one in which relationships between consumers and the grid are more dynamic. My own house, a tiny bungalow built in the 1910s near the ocean in Rockaway Beach, took a beating along with the rest of my neighborhood, where many of us were flooded and are still without power.

But we were lucky on my block to get a solar charging station in the community garden through Solar One, a nonprofit and educational group, and Power Rockaways Resilience, a group that is raising money to bring more mobile solar generation to the area.

I was curious to learn more about how people in the Northeast and elsewhere in the United States might be better prepared for disasters like Sandy — or run-of-the-mill summer blackouts. I asked Mr. Rawlings to explain how new and developing technologies, especially batteries and inverters, are being put to use and how they might help ease growing strains on the grid going forward. Following are excerpts from our conversation, edited for brevity and clarity.

Q. *What kind of solar system might homeowners want to install if they were clobbered by Sandy and are thinking, "I don't ever want that to happen to me again"?*

A. If you're building PV [photovoltaic] for the first time, it's pretty simple: you choose an inverter that's capable of working with batteries and you're putting in the batteries. And you would take your critical loads and put them in a separate panel, an emergency panel. The bad news is that this is fairly costly — anywhere from $7,000 to $12,000, and that's a very rough estimate. That's on top of the cost of a typical PV system, which is probably at this time maybe $22,000 to $30,000. It's quite an add-on.

But, on the other hand, that's going to operate reliably and silently during a storm. People aren't going to have to wait in line to fill up their gas cans and listen to a generator all night, and the cost of an automatic permanently installed generator is probably as much or more than that. It might cost a bit more to do it as a retrofit, but it should be close to the same.

Q. *What are some of the newer technologies that are making this possible?*

A. Battery technology is advancing, and the inverters that can work with those batteries are becoming commercially available. Interestingly enough, the main motivation that's bringing this to market is not emergency power, it's a different issue altogether. We've got to start thinking now of how our electric grid is going to handle higher penetration of renewable resources that are intermittent — sun and wind.

You've got to ask what happens when the clouds roll over or when the winds stop blowing, and part of the answer to that is battery storage so that you don't get sudden changes that overwhelm the capability of controlling the grid and start to get the grid destabilizing and have blackouts or brownouts. Another important thing that the

batteries can do is help control the frequency of the electric power.
So frequency regulation is a service that solar power systems can start to offer to the grid and actually get paid for it by PJM, which is the independent system operator in this region. So that economic incentive is getting people to install these battery-scale inverters.

Q. *What has happened in the world of batteries that's allowing this suddenly to go forward?*

A. It's driven by that perception that solar is coming and wind is coming — they're getting larger and larger — and apart from renewables, the grid needs stabilization. We've seen the fragility of the grid in this storm, in the Northeast ice storm, and in Irene and in the snowstorm of Halloween last year. At the same time, the need for electric cars has been driving battery research, and so all these things have gone together and big companies have been pouring money into it.

Q. *What do you think could be a kind of game changer for a place like New York, to make us a little more resilient?*

A. The incentives that exist in New Jersey for batteries connected to PJM — those kind of frequency-regulating services — those don't exist in N.Y.I.S.O., the grid operator in New York. So that should be instituted as quickly as possible. A smart thing to do would be for New York State to have some incentive for batteries because of this recognition that they're not just helping people with emergency power but they can do a lot of other things.

They'll be vital once we get to the point where the penetration of PV and wind in the grid are higher. The future of energy is going to be more complicated than in the past — it's going to have wind, it's going to have solar, it's going to have demand-side management and energy efficiency, and the people trying to keep the lights on, the grid operators, are going to need to think differently and batteries are going to be a big part of that change.

Q. *New Jersey seems to be pretty far ahead in laying the groundwork for this very complicated energy future that you're talking about.*

A. New Jersey is by a lot of measures the leading state in the nation in developing solar power: it's the fastest-growing solar market, in absolute size it's second only to California, and it's catching up. Just three or four years ago, California was about six to seven times the size of the Jersey market, but last year New Jersey was 60 percent the size of the California market, even though California is four and a half times the size of New Jersey population-wise.

And sometimes it's ahead in making the mistakes that other states can learn from. We're leading the way in terms of lessons learned, and what not to do as well.

Recommendation

1. The Town of Huntington should form a working group with debris management staff at the Long Island Power Authority. This working group should study how joint Town / LIPA debris management initiatives could be made more efficient through access to Town resources and data.

2. The Town should work with LIPA to develop a comprehensive inspection program for residential and commercial buildings during future disasters. By taking the element of surprise, and guesswork, out of the equation, residents will be restored to normal operating power sooner.

3. The Town should assess alternative power systems which may offer a more sustainable means for providing emergency power to town facilities. The Town Sustainability Office should lead this effort to identify a cost effective solution.

Emergency Communications

Throughout the course of this review by the committee, communications was identified as the single most important issue related to the success or failure of any incident. While there were many successes during Hurricane Sandy, there were also many challenges, which ultimately reflected a breakdown in communications.

Traditionally communications has been viewed as a single issue that is best resolved through a single solution, such as a type of phone system or computer system. However it is more appropriate to think of communications more comprehensively. This means having multiple means of communications as part of an all-encompassing strategy. This includes telephony, information technology, web-services, radio systems and even social media. All of these should be part of a coordinated emergency communications strategy. Emergency communications can be reduced to three (3) central themes:

1. **Radio Communications.** This included radios and cellular phones. Any type of device that initiates or receives a signal by radio wave.

2. **Information Systems**. This includes e-mail, and all management information systems required for responding to an incident. This includes internal purchasing and payment systems, geographic information systems and peripheral reporting systems, which assist in the collection and analysis of data. This also includes web-based applications and social media services.

3. **Public Information.** This includes all methods, processes and procedures for disseminating information to the general public and other agencies. It is important to communicate with the public about pre-storm and post storm efforts. This helps the public understand the challenges being faced by public agencies, and can often re-assure them during a crisis.

The committee reviewed communications issues related to the storm and identified following areas of strength and weakness:

Cellular Communications

In a 2009 study the National Center for Health Statistics found that 25% of households in in the United States had no landline service and only cell phone service. For certain subgroups in the population, these numbers are considerably higher: 30% of Hispanics are cell-only, as are 49% of adults ages 25-29.[55]

This presents a significant challenge to Town emergency personnel when trying to disseminate information to the public through call centers and automated telephone calls. While residents were advised prior to the storm to charge their phones before a storm arrives, such efforts may only provide 3 or 4 days of additional battery time for the handset. In addition, all cellular towers are required to have back up power supplies; however these supplies are often fueled by gasoline or propane, which may last between 48 – 72 hours.[56] As a disaster event continues, cellular phone users can expect to experience a decline in service over a three day period. Two days after the storm, the Town EOC attempted to

provide gas to the backup generator for the tower at Jayne's Hill. Had this tower failed, agencies would have had difficulty communicating. [57]

Call Center Operations

Prior to the arrival of Hurricane Sandy, the Town Incident Commander organized the Town EOC to act as an *ad hoc* call center operation. With the assistance of several dedicated personnel from the Department of Public Safety and the Bay Constable's Office, the Town EOC became a conduit for receiving valuable intelligence from throughout the community about hazardous conditions, while disseminating a coordinated message to the public.[58]

This operation involved 24 hour shifts for up to five days after the storm. Staff adapted to the situations presented during this shift. In coordination with this activity, additional staff assisted the Planning Chief with documenting each call that was received. This information was then entered into the Town geographic information systems, to allow managers to prioritize and address each request accordingly.[59]

As the incident continued over a week, many of these calls reflected the general frustrations being experienced by the public throughout the region. However in many cases, even the most hostile of calls would soon become civil, as callers came to realize that the Town staffs were experiencing the same difficulties as the public. In general, many callers were happy to have someone to communicate their frustrations with.[60]

As temperatures began to drop, Town staff became a conduit to vital information regarding open shelters and warming centers. During this period the Town EOC coordinated transportation to shelters, and assistance to elderly residents. Many of these requests came in the late hours of the evening, when temperatures began to drop past freezing.[61]

Radio Communications

The Town is currently in the process of upgrading its radio systems as part of a multi-year communication plan initiated by the Federal Communication Commission in 2011. In response to these new FCC requirements, the Town is adding an additional general frequency to be used as a Town-wide "hailing" frequency. This will enable internal and external agencies to communicate with each other, while utilizing their existing equipment with minor adjustments and expense.[62]

In 2012, the Town purchased the next generation of radios to replace the existing inventory. These new replacements are currently being programmed and prepared for deployment in Town vehicles.[63]

Mutual Link

In 2009 the Mutual Link to assist in the coordination of radio traffic between fire service agencies in the Town and county. Mutual Link is an internet protocol (IP) based multimedia overlay network, which is designed to leverage the sharing of existing radio, video, telephone, and IP-based sensory equipment.[64]

Because Mutual Link requires access to the internet to perform operations, any interruption of internet services will render the system inoperable. During Hurricane Sandy the system was not employed.

Had the cable internet connection remained active, Mutual Link could have been used effectively to address compatibility issues

that originated between radios used by LIPA crews and contractors, as well as communications systems used by Town and local fire departments.

Code Red

The Town employs a community notification system for sending mass e-mails, recorded messages and text messages to residents. In an emergency this web-based system can be employed using a mobile phone, and can target messages to specific geographies or groups.[65]

The Code Red platform was used extensively during the days following Hurricane Sandy. Notifications were sent out informing residents about the location of warming stations and shelters.

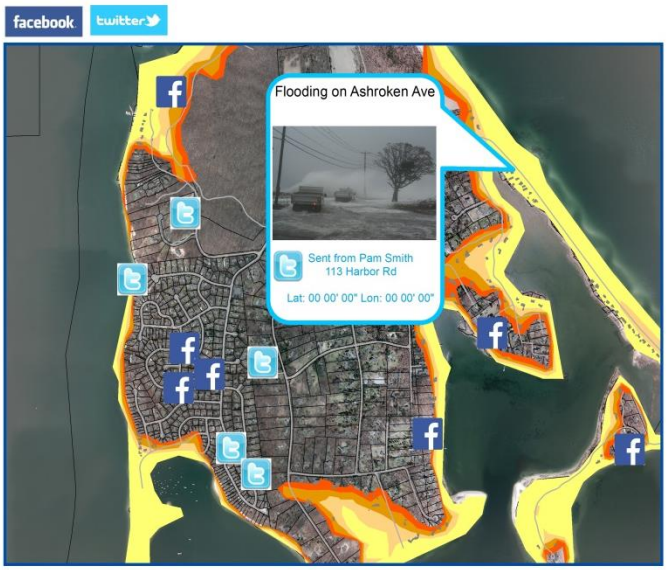
While this system was extremely effective in relaying information to resident mobile devices, it should have been more targeted in its use. There were instances where announcements, such as debris removal instructions, which are intended to include all Town residents, provided conflicting instructions to village residents. In the future these messages should indicate that procedures for debris removal are for "un-incorporated" areas of the Town, unless instructed otherwise.[66]

Social Media

Social media is a new technology that not only allows for another channel of broadcasting messages to the public, but also allows for two way communication between emergency managers and major stakeholder groups. Increasingly the public is turning to social media technologies to obtain up to date information during emergencies and to share data about the disaster in the form of geo data, text, pictures, video, or a combination of these media. Social media also can allow for greater situational awareness for emergency responders. While social media allows for many opportunities to engage in an effective conversation with stakeholders, it also holds many challenges for emergency managers.[67]

While Town staff at the EOC was engaged in call center operations, additional reporting was made through the Town Facebook account. This account was monitored by the Town public information officer and members of the Town council support staff. This effort provided greatly to the success of greater Town-wide efforts to communicate with the public.

As a result of the successes realized through social media use during Hurricane Sandy, Town EOC staff is now recommending that the Town implement Social Media functionality with the Town-wide geographic information system.[68]



Example of Social Media / GIS Application.

With the integration of social media systems into the Town geographic information system, Town EOC staff will be able to

quickly collect, analyze and disseminate information. Key words could be searched, photos examined and locations could be tracked through the global positioning data tags from each post. This means that as the public geo-tags photos and posts, this data can be instantly mapped in the Town GIS.[69]

The Town could issue press releases prior to an event, which would instruct residents about sharing procedures with the Town. During the storm event, residents can simply take a picture, tweet a keyword or post a comment, and it is instantly seen in the Town EOC. This service would provide increased situational awareness for first responders, while creating enhanced documentation for the incident.[70]

E-Mail

During any emergency incident email is a vital communication medium for Town Emergency Personnel. It is used to submit requests for aide receive inter-agency communications and document the incident for historical record.

In past storm events, the Town email system has experienced significant interruptions of service, which has caused Town staff to rely on alternative methods for communication. When email communications are spread around various email services and domains, it makes it difficult to establish proper documentation for an event.[71]

In the spring of 2013 the Department of Information Technology transitioned the Town email service to Microsoft Office 365. This will allow for greater communications continuity of government in future emergencies, by allowing web access and uninterrupted e-mail service.[72]

The Town Message

Throughout an emergency it is vitally important that correct information is relayed to the public. An uninformed public can become frustrated and hostile to government recovery initiatives.

During Hurricane Sandy the Town of Huntington made every effort to provide accurate and timely information to residents. Although this effort was made difficult by conflicting information provided by both official and non-official sources, and by the total collapse of the public information process at LIPA, the Town did manage to provide a consistent message to the public.[73]

It is vitally important that all Town staff understand the concept of the "Town Message". All communication to the public should be controlled. Information must be direct, coordinated with the planning of other agencies and approved by the Incident Commander or their appropriate designee before release.[74]

The municipal Chief Executive or Incident Commander should drive the message. The Public Information Chief (PI) should assist and when necessary voice that message. Outside of the FEMA Incident Command structure, no other staff member or Town official should make public comments regarding emergency plans or operations. Non-official comments can inadvertently provide conflicting information that could have negative and even dangerous effects on recovery efforts.[75]

Information Technology

Since the fall of 2010 the Town of Huntington has been focused on the modernization of Town-wide information

technology (IT) infrastructure. This represents the most significant IT investment by the Town in over a decade.[76]

Through this initiative, the Department of Information Technology has sought to advance both the technological resources available to Town staff, as well as the organizational culture.

This modernization effort has continued to follow a Town-wide strategic plan, which includes:

- Town-wide centralized databases. For the past two years Town IT staffs have been working with Town departments to consolidate and centralize legacy databases.
- Deployment of enterprise software environment;
- Standardization of desktop and peripheral hardware;
- Advancement of a centralized, enterprise geographic information system;
- Major update of the Town website and associated web services;
- Centralized virtualization and deployment of a Town-wide server farm and disaster recovery capability.
- Deployment of a wide area network based on fiber-optic connectivity.

During Hurricane Sandy the Department of Information Technology faced a multitude of challenges, including power outages at 90% of the facilities supported by the department, as well as communications issues with service providers and vendors.[77]

Without power at Town Hall, IT functions would normally transfer to the disaster recovery site (DR). However a confluence of storm issues involving power support, connectivity and communications prevented this site from functioning properly.[78]

Within hours of the passing of Hurricane Sandy, IT staff and GS Electricians had established limited power to the primary data center at Town hall. These employees worked around the clock to bring critical systems online.[79]

Through these efforts, nearly all of the staff was able to return to their duty stations at Town Hall within 48 hours. In addition, critical systems such as e-mail, financial systems and land management systems were able to provide data needed for producing purchase orders, payroll and reviewing emergency permits.[80]

IT infrastructure is often looked as important in the disaster recovery process. It is often said that in its absence, the Town could simply revert to “pen and paper” to manage the affairs of local government. However in the age of information, this is an overly simplistic idea. In reality it would be nearly impossible to competently manage the capital resources and documentation needed to facilitate a successful recovery effort, without the use of information technology.[81]

Use of Geographic Information Systems in Emergency Management

During Hurricane Sandy 2012, local municipalities throughout Long Island were encouraged to employ geographical information systems as part of operations, analysis and post disaster recovery efforts. Although many of these efforts were not coordinated, or lacked the technical understanding of the issues facing local communities, some initiatives did have extraordinary success.[82]

In recent federal and state reviews of local responses to Hurricane Sandy, it has been proven that municipalities, which utilized geospatial technologies before, during and directly after a significant disaster event, possessed better situational awareness, and improved disaster response, when compared to organizations which lacked geospatial skills. Municipalities became dependent on GIS and GPS to collect field data, perform damage assessments, and manage post disaster response.[83]

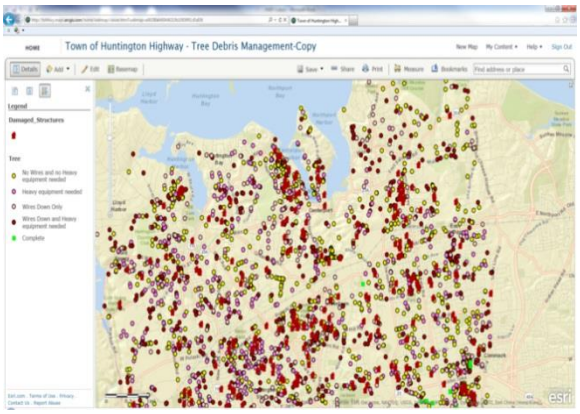
Furthermore, in the wake of the disaster, some communities were devastated and needed to reach out to neighboring municipalities for assistance. Increasingly this assistance required analysis, documentation and accounting for processing inter-municipal requests, performing recovery work and submitting for inter-municipal reimbursements.

During Hurricane Sandy it was also discovered, that emergency personnel may come from a variety of disciplines throughout an organization, and therefor may not be familiar to the advantages and practices in using GIS or GPS to address problems.

ArcGIS Online

ArcGIS Online is a web based application that allows for the expedited deployment of an Incident Management System. The application is simple to use by operators and secure. Because ArcGIS Online is hosted remotely by ESRI, Inc., there is limited risk for the application to fail during power outages and other unforeseen circumstances. All that is required is access to the internet, either by land line or wireless device.[84]

During Hurricane Sandy 2012, the Town of Huntington Department of Highways deployed a GIS application for recording reports submitted to Town staff by residents. After Town Hall experienced interruption of regular IT services, this web-based application became the primary management tool during storm operations. The application also allowed for greater accountability and documentation during recovery operations, because it allowed Town staff to plan clean-up and recover operations, create reports, and respond to media inquiries.[85]



Town of Huntington GIS – Tree Debris Management

This portal eliminated duplication from reports made to both the EOC and Highway Department.[86] Once a call request was

entered into the central GIS, Town-wide agencies could see if the request was responded to. This data became invaluable to Town Emergency Manager, as the Town entered the recovery phase of Hurricane Sandy. As a result of the success of this program, other agencies and villages expressed their desire to participate in the GIS process during future events.[87]

GIS Data Sharing

GIS data has become the single most important information for responding to a storm event. As information is collected and managed within the GIS, it can be instantly disseminated to other agencies and organizations. This presents a common operating picture for every participant in the recovery effort.

In the days prior to Hurricane Sandy, federal state and local agencies used GIS data to map, analyze and plan for potential storm scenarios. At the conclusion of the storm event, GIS data sharing became important for providing federal agencies with disaster assessments, and recover operations progress.

To assist local governments in their GIS efforts, FEMA, New York State, the Department of Defense and even the American Red Cross, set up data sharing processes. In addition, the Civil Air Patrol (CAP) of the United States captured thousands of geo-tagged photographs from the air following the hurricane, using digital SLR cameras with GPS attachments. This allowed the Town Emergency Manager access to the latest area data for planning Huntington's disaster response.[88]

Global Positioning System (GPS) For Disaster Assessment

The Town of Huntington maintains a variety of devices, which operate as part of the global positioning system (GPS). There are two types of GPS devices currently maintained by the Town:

- Navigational GPS – These devices include the Town vehicle tracking systems, which monitors Town vehicles and;

- Mapping GPS – These devices are used for mapping, fixed asset inspection and data collection.

The Town currently owns the GPS receivers mounted within Town trucks. These receivers provide location information for the municipal vehicle fleet. A private vendor maintains the application for processing this data; however, advancements in technology now make it easier to incorporate this information into the Town-wide GIS. GPS/GIS integration is useful in collecting data from the field in real time and planning for which assets to deploy as part of the recovery effort.[89]

The mapping grade GPS devices currently used by the Town Planning, Highway and Street Lighting are highly accurate and can be used to collect damage assessments of Town sites. This information can then be processed in the Town-wide GIS to prepare reports and documentation.

Recommendations

1. The Disaster Recovery site should be reviewed for further hardening of infrastructure and systems. The Town is currently evaluating the possibility of re-locating this site to the Town EOC.

2. Mobile devices should be based at the EOC and should incorporate standard e-mail. This will make it easier to for documentation months after the storm.

3. Separate e-mail accounts should be set up for EOC related activities. Business cards should be issued to staff members with EOC phone and e-mail. This will eliminate confusion during the recovery process when networking between agencies is crucial.

4. Town staff from each department should be trained in the use of the Town GPS inventory. In the aftermath of a disaster, 10 of these staff can be deployed to evaluate and assess damaged infrastructure and properties using the data on these devices. This data can then be returned to the EOC for incorporation into the Town-wide GIS. This will greatly improve the assessment, mission planning and documentation capabilities of the Town EOC.

5. When making announcements through Code Red, the Public Information Officer must remember to include a disclaimer, which advises village residents to inquire with their local villages about debris clearing.

6. The Town should deploy radios to shelters for use by shelter supervisors. These radios can be used to request assistance from the Town as part of any future sheltering initiatives.

7. Vehicle tracking information should be available through the Town GIS for mission planning, analysis and documentation. This information can be used for storm assessment, debris management and snow plowing and will provide Town EOC staff with a common operating picture with their Highway counterparts.

8. Town Staff should be selected for call center operations. These staff can be trained as part of the Town EOC team and can serve to collect and disseminate the data and information that is essential to any successful recover effort.

9. The Town should establish an ArcGIS Online “For Organizations” account for maintaining emergency GIS applications across the web.

By the Numbers

- **550,000 cubic yards of debris removed.**
- **19,000 truckloads of debris.**
- **80,000 documents including 60,000 photos and load tickets prepared.**
- **New York State has granted a six month extension for the completion of eligible Category A and B work relating to DR 4085**

Debris Removal

Hurricane Sandy created more debris in communities on Long Island, than any previously recorded storm.[90] A total of 550,000 cubic yards of vegetative debris was cleared by Town of Huntington Department of Highways and Department of General Services. This massive quantity of nearly 19,000 truckloads required collection, transport and processing on a scale that was far greater than previously experienced by the Town of Huntington.[90]

In addition to this collection effort, the Town was required to document each and every truckload as prescribed by FEMA requirement. Failure to correctly document the collection, handling and disposal of debris can place in jeopardy any chances for future federal reimbursements.

Under regular storm conditions, the Department of Highways has processes in place for handling and post storm recovery. However this storm required additional measures.

Town / LIPA Coordination

On the morning of November 2, 2012 the Town of Huntington was fully engaged in disaster recovery operations. Information collected through the Town EOC and processed in the Town GIS indicated an approximately 750 large trees were felled, and nearly 90% of residents were without electrical power.[91]

Town emergency personnel in the field and the Town EOC had relayed this information to LIPA. These trees presented a challenge to Town tree debris crews who needed assurances in the field as to the safety of any wires found around the debris areas. The Town Supervisor expressed his own frustration to LIPA managers about the delays in obtaining this information.

The frustration experienced by the Town officials and the EOC staff originated from a series of previous discussions with LIPA after Hurricane Irene in 2011. That incident involved nearly the cleanup of nearly 70,000 cubic yards of vegetative debris.[92] The

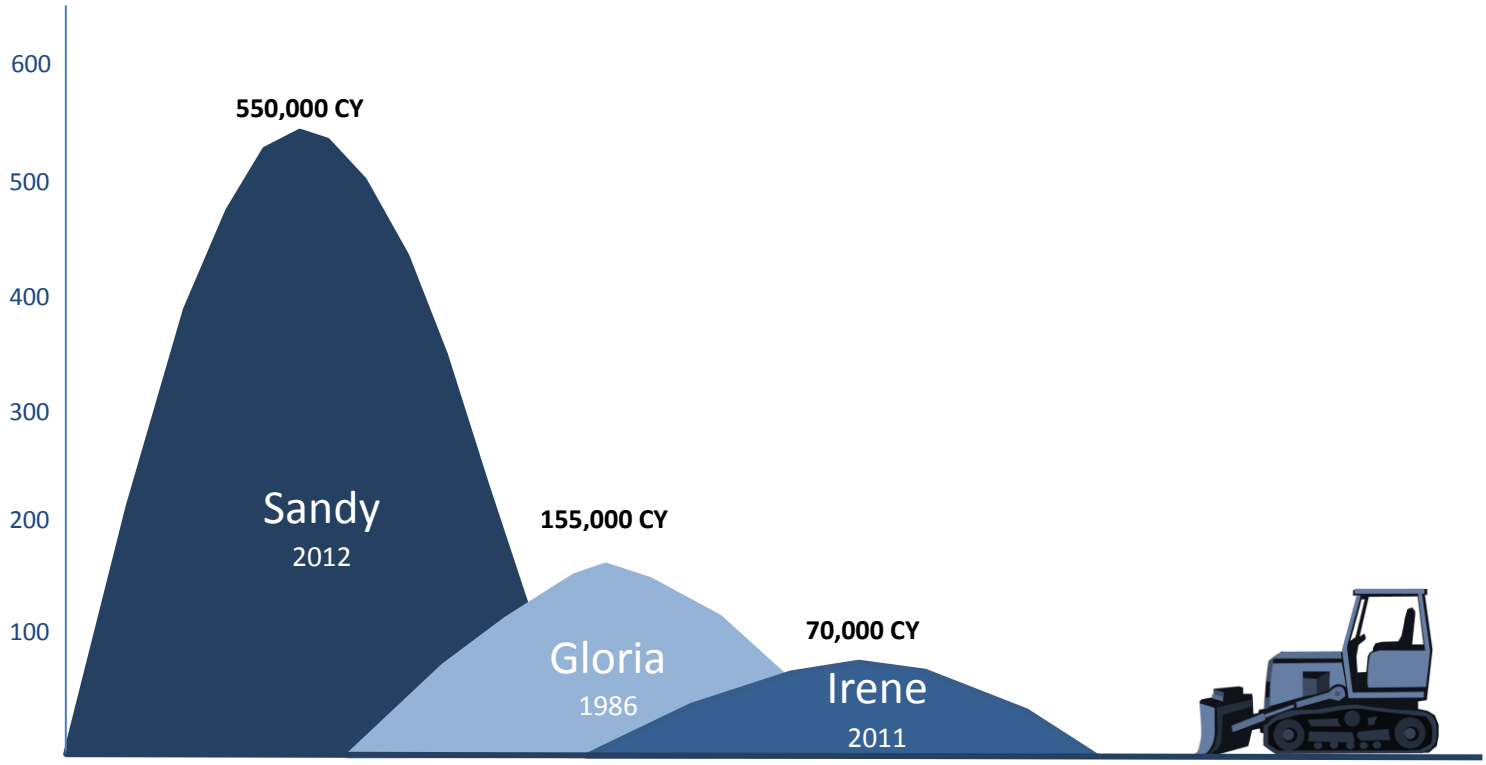
cleanup effort was hampered by safety issues related to downed power lines.

After performing after action reviews for Hurricane Irene, the Town decided to be pro-active in its future approaches to debris management. As part of this effort, Town staff from the departments of Highway, General Services and Planning & Environment met with LIPA disaster mitigation staff. Over the course of several meetings in the spring of 2012, various strategies began to be formulated as to how the Town Highway Department and LIPA crews could engage in a coordinated debris removal effort.[93]

Within 48 hours of Hurricane Sandy making land, the Town of Huntington had an exceptional understanding of its needs and a common operating picture among its departments.

The Town identified which areas were hit the hardest and the Highway Department already was fully engaged in debris management. As the Town EOC processed data and requests for assistance, this information was passed on to LIPA.

However in the aftermath of Hurricane Sandy, it became apparent to Town staff that the collaboration they had discussed with LIPA in the previous months would not materialize. LIPA became overwhelmed by the scope of the disaster. LIPA managers had difficulty understanding Town requests and LIPA crews did not coordinate with Town Highway and General Service's crews.[94]



Dix Hills Park

Dix Hills Park served as a primary location for staging and processing vegetative debris. This site was chosen because of its location within a short distance of major Town roads and the Long Island Expressway. As part of the selection process, emergency permits were issued by the New York State Department of Environmental Conservation (DEC).

Three additional Town parks were used as transfer stations for debris material. These included Half Hollow Park, Peter Nelson Park and Mill Dam Park. Town staff maintained security at these facilities on 24 hour shifts throughout the recovery period.

Crews from the Department of Highway process vegetative debris material at Dix Hills Park.

Recommendations

1. The Department of Finance should implement a review of cost codes currently available in the town MUNIS accounting system. FEMA Project Codes should be identified and incorporated into MUNIS. During Hurricane Sandy, it was necessary to create special codes within MUNIS to allow for the accounting of special purchasing and payroll issues, which were unique to the
   disaster event.

2. FEMA Incident Specific Timesheets should be created for use by personnel assigned to the EOC. Hurricane Sandy commenced over an 11 day operational period. During that time, the EOC maintained 24 hour operations, and many staff from various departments were deployed to support EOC operations.

   A typical FEMA operation period includes a 12 hour rotational shift. Do to the nature of disaster recovery work, it can be expected that large portions of staff assignments will be performed outside of normal town operating hours. Using a FEMA specific timesheet will assist emergency management employees and town audit and control, to identify regular hours worked as part of regular duties, and hours work as part of recovery operations, which may be reimbursable under FEMA guidelines.

The American Red Cross

The Suffolk County Chapter of the American Red Cross (Red Cross) serves as the main resource for sheltering in Suffolk County. As part of its county-wide sheltering responsibilities, the Red Cross coordinates the operation of emergency shelters in the Town of Huntington. When the need arises, the Town EOC will contact Suffolk County Fire Rescue and Emergency Services (SCFRES) to request activation of Red Cross public shelters.

As part of its Congressional charter, the American Red Cross initiates its own damage assessment process following a major storm to determine what level of Red Cross assistance is needed within a jurisdiction. This is usually performed in two phases:

- An immediate assessment, performed within 24 hours of storm impact (if at all possible) to get a general sense of devastation;
- and a more extensive survey, conducted 24-72 hours after impact, that includes virtually every street in a stricken community.

Suffolk County Red Cross representatives share their survey results with Town officials and work with the Town to prioritize areas requiring the most immediate assistance.[95]

Local Hospitals

The two primary hospitals within the Town of Huntington are Huntington Hospital and the VA Hospital at Northport.

The Department of Veterans Affairs maintains the Northport VA Hospital Facility. This facility is self-sufficient and accepts members and former members of the Armed Forces. Although this facility is equipped with emergency facilities, the general population of Huntington would not be admitted during an emergency.[96]

Huntington Hospital is part of the North Shore – LIJ Health System and was established in 1916. This hospital has 408 beds and an emergency intake capacity.

Huntington hospital is required to practice emergency preparedness measures annually. As part of these measures, the hospital participates in a 96 hour disaster drill. During these drills the facility switches to its emergency power and every aspect of the facility continuity of operations plan is reviewed. During Hurricane Sandy this facility was sustained on reserve power.

Huntington Hospital will not turn away a resident seeking help. Throughout Hurricane Sandy this facility hosted perhaps 50+ residents seeking shelter. Many of these residents entered the hospital for medical needs and continued to remain at the facility long after they would normally have been released.

Huntington Hospital established its own warming center and sheltering area for individuals who did not want to leave. Some of these individuals had specific needs such as medication monitoring requirements.[97]

Warming Stations

As part of the Town-wide emergency plan, warming stations were opened throughout the Town. These warming stations allowed residents to charge their mobile devices and warm themselves. These stations were placed in municipal buildings such as Town-Hall, local religious institutions, non-profit organizations and local fire departments.

These facilities provide residents with a sense of security and allow the most vulnerable elements of the community, children and seniors, a place to connect with each other, receive the news and maintain their health in extreme weather conditions.[98]

Town Sheltering

On the evening of November 6th, the Town Supervisor participated in a conference call between the Town EOC and Suffolk County EOC. It was during this call that County authorities notified Town Supervisors and their Emergency Operations Staffs, that the Red Cross was "moving all sheltering capacity" to a larger site in Patchogue, NY.

In adapting to this strategy, the Suffolk County EOC requested each Town to provide a transportation plan for residents who desired to be sheltered in Patchogue. When the Chief of Police for an east-end Town asked how residents were to get to Patchogue, he was told by a Senior County Emergency Manager "put them [residents] on a bus, it's only a 20 minute ride from East Hampton to Patchogue".[99]

After consulting with Emergency Personnel and the Town Directors of Human Services and Public Safety, the Town of Huntington Supervisor made several suggestions to Suffolk County Emergency Managers.

a. Suffolk County could open the Suffolk County Community College campus in Brentwood and Riverhead. This would provide better geographic accessibility to residents from western and eastern Towns. This also gave the county sites which could be controlled and protected by county security.

b. Suffolk County could provide additional security to existing shelters, where Town staff could take over for Red Cross staff.

Both recommendations were dismissed by Suffolk County Emergency Personnel as "not feasible, given the constraints of county resources". At the conclusion of the conference call, the Town Supervisor and Emergency Managers began to discuss the issues related to transporting Town residents to the Patchogue shelter.[100]

After discussing a variety of options with his staff, the Town Supervisor issued the following verbal executive orders:

- That the Town of Huntington will not send residents to Patchogue;
- The staff at the Town EOC would coordinate with the Huntington YMCA and the Town Senior Center in opening a shelter for Town residents.

Walt Whitman High School

Walt Whitman High School served as a primary sheltering location for the Town of Huntington. During Hurricane Sandy, the school lost part of its roof from high winds. This created hazards for maintaining the location as a safe shelter. The staff adapted to this challenge and residents were able to be sheltered there during the day. Although the Town did provide security to this site, in a future disaster, the Town EOC should provide this site with a radio for continued communications.[101]

Future Sheltering Initiative

After reviewing the sheltering efforts for Hurricane Sandy, the committee developed recommendations for future sheltering initiatives. These initiatives are based on the main principle that the Town must be prepared for a potential need to "shelter in Town".

As part of this concept, the Town should be prepared to coordinate sheltering among local agencies around the Town and separate from federal, state and county-wide sheltering efforts. Although this concept may be criticized as a "go your own way" scenario, it should be understood that the greater Huntington community needs to plan for a scenario where county and state support may be delayed. In this scenario, Huntington's neighbors will need to assist each other. This neighborhood centered concept should be coordinated among the local fire departments and school districts.

Recommendations

The following recommendations for future sheltering are:

1. The Town should identify the special needs residents, including the elderly and children, who may require special evacuation procedures and continual assistance during sheltering. The locations of these groups should be mapped in the Town-wide GIS, so that Town programs and potential evacuations include these addresses.

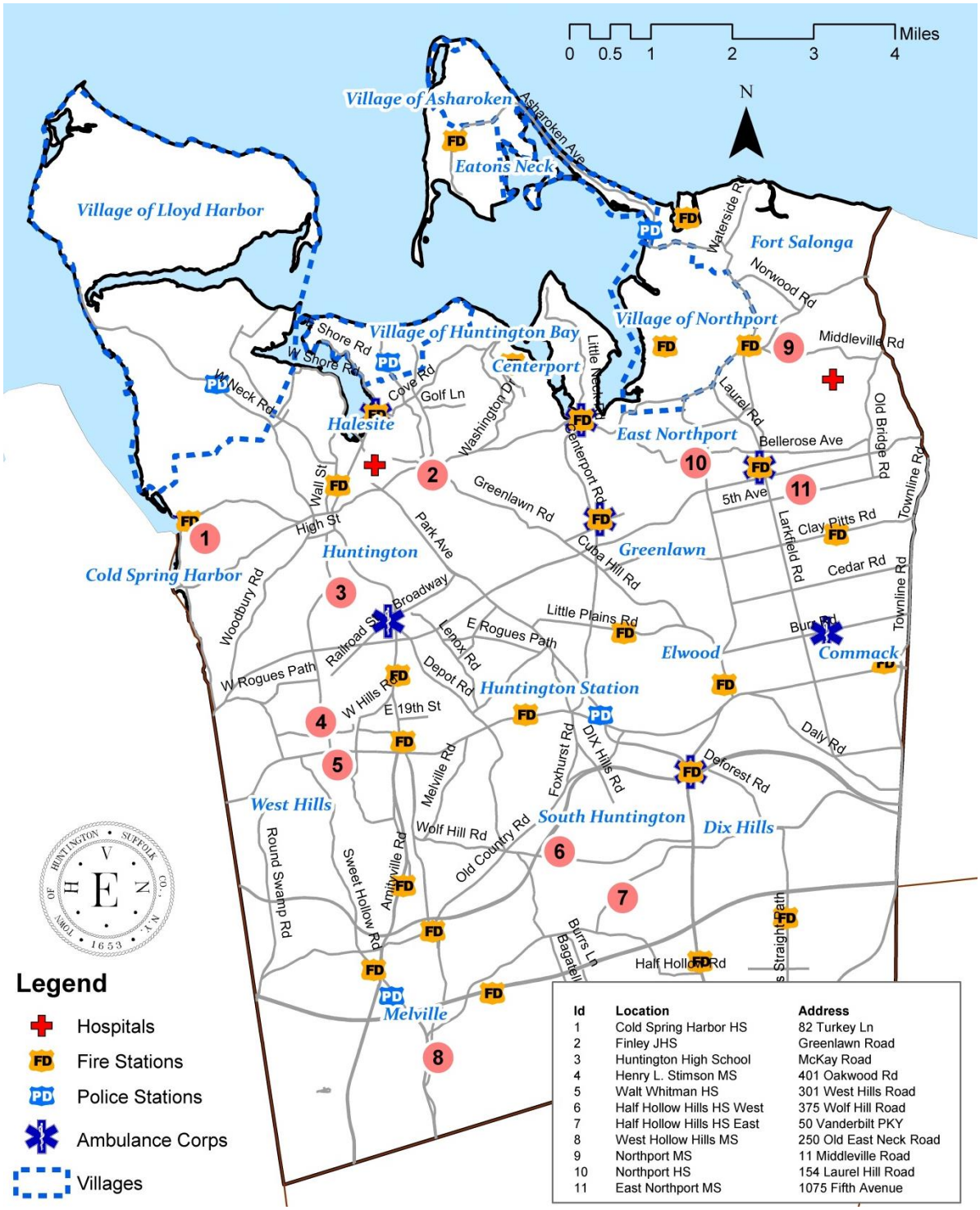
2. The Town should contract with a local pharmacy for emergency drug services. If an event lasted longer than two weeks, where power was not restored and vegetative debris continued to block roads, it may be necessary to bring medications to residents directly as prescriptions run out. There may also be a need to provide medications to homeless members in shelters as part of a monitoring program.

3. The Town should contract with a local Doctor or Nurse Practitioner to be on call for an emergency event. This individual would have access to Town facilities and could be made available to first responders.

4. Town public safety staff should be selected for sheltering support responsibilities. These public safety officers should be trained as part of the CERT program and should be able to provide assistance with the intake and monitoring of residents at Town shelters.

5. The Town should discuss future sheltering plans with the Suffolk County Department of Social Services, in regards to the placement of individuals by the county in Town shelters.

6. An online map for shelters, warming centers and other resources should be made available to the public.



Id	Location	Address
1	Cold Spring Harbor HS	82 Turkey Ln
2	Finley JHS	Greenlawn Road
3	Huntington High School	McKay Road
4	Henry L. Stimson MS	401 Oakwood Rd
5	Walt Whitman HS	301 West Hills Road
6	Half Hollow Hills HS West	375 Wolf Hill Road
7	Half Hollow Hills HS East	50 Vanderbilt PKY
8	West Hollow Hills MS	250 Old East Neck Road
9	Northport MS	11 Middleville Road
10	Northport HS	154 Laurel Hill Road
11	East Northport MS	1075 Fifth Avenue

Storm Surge

Storm surge is one of the most misunderstood issues relating to hurricane preparedness and recovery. The issue is often difficult to explain, and similarly difficult to understand. In the wake of Hurricane Sandy public officials and private property owners began to assess the needs of mitigating the effects of storm surge and sea level rise.

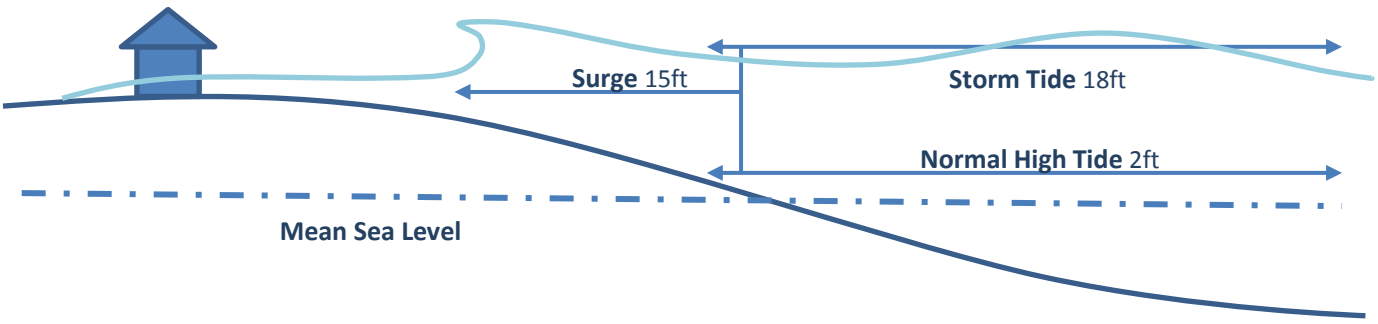
During the recovery effort, conflicting statements released to the public by state and county officials created a sense of confusion among property owners about how to prepare for, or mitigate, the effects of future storm surge.

Questions began to be asked about what should be done. Should a particular structure be raised? How high should it be raised? Who pays for it? Residents and business owners turn to the local building and planning departments for those answers.

The issue of storm surge has been at the forefront of emergency planning by the Town of Huntington. As part of the Town-wide hazardous mitigation analysis, the Department of Planning and Environment routinely performs GIS modeling and analysis of proposed capital projects and hazards which are situated within the Sea, Lake and Overland Surges from Hurricanes (SLOSH) zones. These zones are based on hurricane storm categories.[102]

SLOSH

The SLOSH model is a computerized numerical model developed by the National Weather Service (NWS) to estimate storm surge heights resulting from historical, hypothetical, or predicted hurricanes by taking into account the atmospheric pressure, size, forward speed, and track data. These parameters are used to create a model of the wind field which drives the storm surge. The SLOSH model consists of a set of physics equations which are applied to a specific locale's shoreline, incorporating the unique bay and river configurations, water depths, bridges, roads, levees and other physical features.[103]



Town of Huntington Department of Planning & Environment / National Oceanographic and Atmospheric Administration

What causes Storm Surge?

Storm surge is the result of a combination of strong winds and coastal tides. However, it should be understood that storm surge contributes to water level rise during a hurricane or tropical storm. It is not the direct cause. Storm surge occurs as a result of these combined conditions:

Storm Tides- Tides also contribute to water level rise. Local tides combined with storm surge, is called a storm tide. Since it is difficult to accurately time the arrival of a storm with the arrival of a given tide, when making decisions emergency planners make a conservative assumption that a storm will arrive during part of the "high tide" cycle.

Wave Action - As a hurricane approaches, the waves become larger and more water is pushed onshore. When combined with storm surge and increased winds from a hurricane or tropical storm, waves gain increased strength. These more powerful waves can cause exceptional damage to infrastructure and private property in a short span of time.

Precipitation - Heavy rainfall ahead of a hurricane can cause river levels to rise well inland from the coast. Once all this water flows downriver and reaches the coast, local water levels especially near deltas and in bays will rise.

Storm surge is also affected by the slope of the water basin bottom, and the central pressure and forward speed of the storm. The Town of Huntington sits within the Long Island Sound basin. Within this basin are located several monitoring stations for identifying real time tidal change.[106]

By the Numbers

- **6 % Population density increases in Huntington from 1990 to 2010**
- **5% of roads within Huntington are located in the SLOSH zones, or are within the flood plains.**
- **4,024 structures are situated within the SLOSH zones for the town of Huntington.**
- **50 Miles of Shoreline for the Town of Huntington and adjoining Villages.**

Town Emergency Personnel use the reporting data from the sensor station at Kings Point Merchant Marine Academy, when performing preliminary analysis prior to the storm arrival. Historically, a 6 foot rise in water at Kings Point combined with a local high tide, created conditions where water would wash over Asharoken Avenue. In 2012 the US Army Corps of Engineers completed mitigation measures to reduce this threat at Asharoken, however, other areas of the Town remain vulnerable. Accurate tidal data can assist Town personnel in predicting problem areas, prior to the arrival of a storm system.[104]

There are four critical areas that are vulnerable to storm surge and flooding conditions during storm events. These include the following locations:

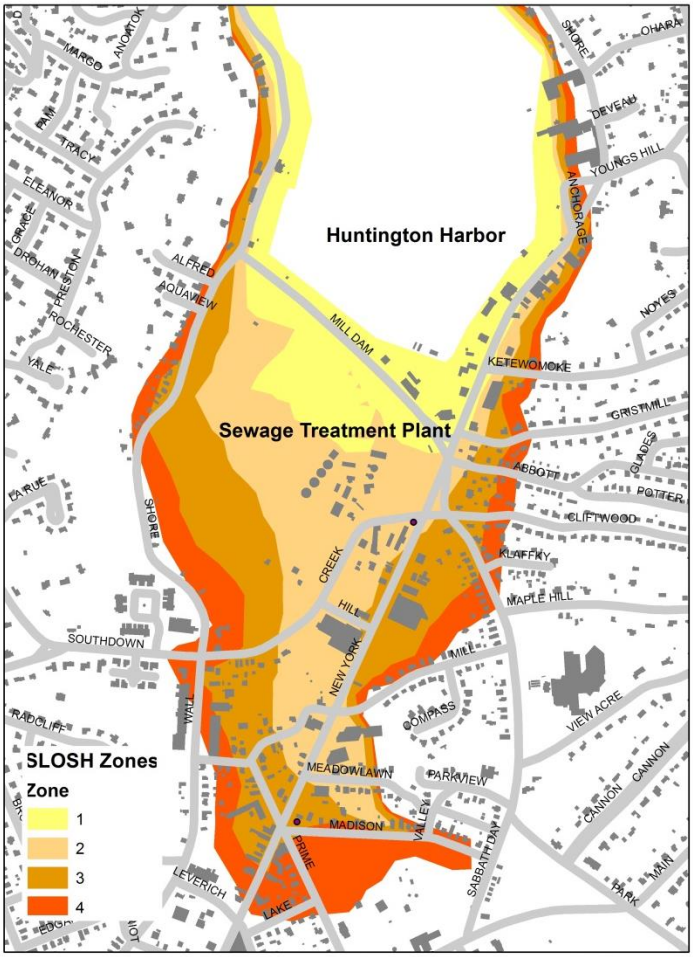
Huntington Sewage Treatment Plant

The waste water treatment facility at Mill Dam Road is the oldest and largest treatment facility in Suffolk County, with a processing capacity of over 500,000 gallons of waste water per day.[105]

This plant was constructed within the flood zones in 1915. While the facility maintains an exceptional record for environmental compliance and emergency preparedness, the site is vulnerable to storm surge. The plant sits at 6ft elevation above mean sea level.[106]

This facility provides treatment services to the Huntington Sewer District, which has a geographic boundary that stretches from the down-town "Huntington Village" business district, to the marinas and wetlands of Huntington Bay. Failures at this facility could result in systemic disruptions in localized economic activity, while creating significant health threats to local residents and the surrounding environment.

During Hurricane Sandy this facility was sustained on generator power for a period of ten days and the outlying pump stations were on generators for six days. In addition, this site experienced nearly 4 feet of flooding. Department staff engaged in pre-disaster mitigation procedures to prevent the wash over of critical systems.[107]



Town of Huntington, Department of Planning & Environment - GIS

Sewage Plant Recommendations

1. The Town should investigate potential flood control measures for this facility. During preliminary discussions with the Federal Emergency Management Agency it was suggested that the Town include permitting of temporary barriers around critical systems on the site.
2. One of the facility's back-up generators should be raised above any potential flood level. Of the two generators at the site, one is raised on a platform.

Asharoken Avenue

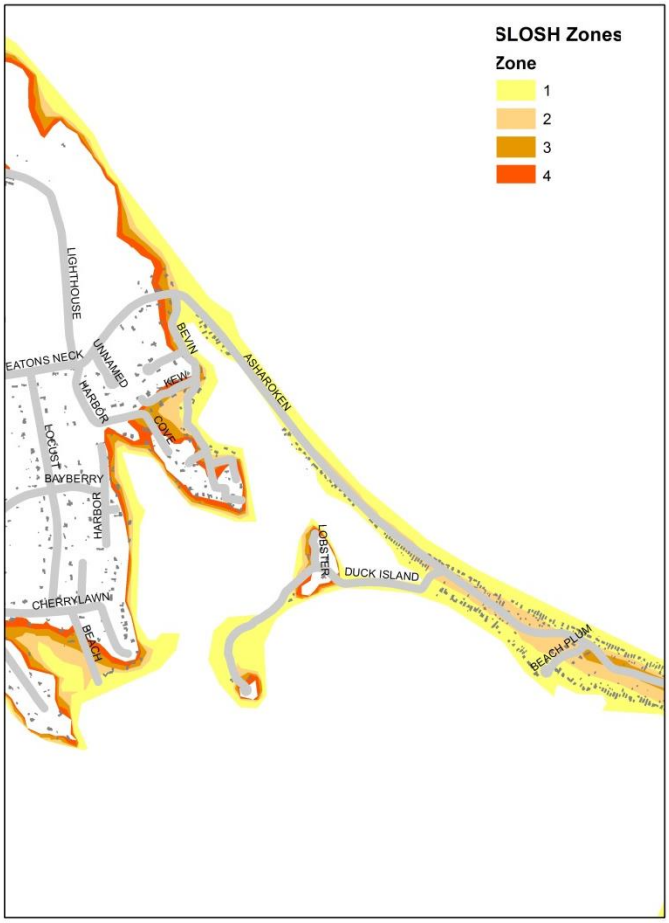
Over the past decade, Asharoken Avenue has been subjected to multiple storm events.[108]

In 2010 the eastern sea wall was breached during a March Nor' Easter. This prompted the Town Department of General Services and the Town Highway Department to engage in emergency stabilization measures. The Town placed nearly $60,000 worth of sand into the breach area to stabilize the road.[109]

Although this roadway is technically the jurisdiction of the Village of Asharoken, it is also the only egress from Eaton's Neck (Town of Huntington Jurisdiction). The Town has a responsibility to the nearly 2,000 residents of Eaton's Neck to maintain an adequate egress in times of emergency.

The US Army Corps of Engineers recently completed a significant mitigation and stabilization project on the causeway. The Town remains ready to respond to any potential incident. During Hurricane Sandy, the Town pre-positioned equipment near this causeway, in case it was needed for recovery efforts.

The Village Police Station and Village Hall were flooded during Hurricane Sandy. As a result, special arrangements were required to maintain a continuity of village government.[110]



Town of Huntington, Department of Planning & Environment - GIS

Asharoken Avenue Recommendations

1. The Town should continue to plan for equipment staging, with the anticipation of responding to issues on Asharoken Avenue.
2. The Town could provide the Village with access to the Town incident reporting tools during a storm event. This will give the Town and village a common operating picture for coordinating stabilization and or recovery operations on Asharoken Avenue.

   It should be noted, that Asharoken Avenue is a Federal Highway Administration (FHWA) roadway.

Sea Level Rise

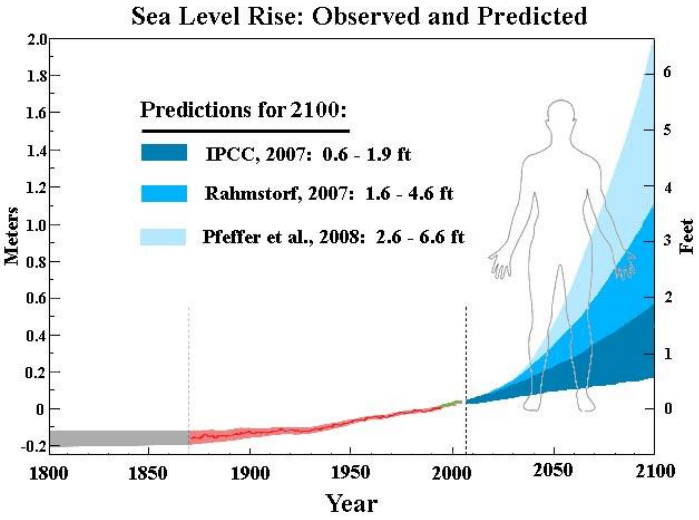
According to reports from the State of New York Department of Environmental Conservation and the City of New York, global mean sea level has been generally rising since the end of the last ice age. In the 18th and 19th centuries the rise was small, but during the 20th century the seas rose faster, primarily because ocean waters have warmed and expanded, and larger volumes of melt-water from mountain glaciers are now reaching the sea.[111]

Conservative projections predict that seas will rise by 7 to 23 inches by 2100, but do not account for rapid melt of land-based ice. The latest studies take into account rapid ice melt to project a rise in global mean sea level of three feet or more.

Rising sea levels pose serious threats to coastal communities and natural resources, both worldwide and in New York. To ensure the future usability and security of facilities, transportation and critical resources (such as drinking water), government officials and private sector planners need the best available sea level rise projections.

Sea Level Rise for Long Island

Tide-gauge observations indicate that rates of relative sea level rise in New York State were greater than the global mean, ranging from 2.41 to 2.77 millimeters per year (0.9 to 1.1 inches per decade) over the last century.



Penn State University Department of Geography

The *State Sea Level Rise Task Force*, charged by the Legislature with developing recommendations for adapting to sea level rise, adopted the sea level rise projections in the table below for two regions of New York State. Although these projections have not been officially adopted by the Legislature or any New York State agency for regulatory purposes, the DEC considers them the best available projections for planning purposes.[112]

Lower Hudson Valley & Long Island	2020s	2050s	2080s
Sea level rise	2 to 5 in	7 to 12 in	12 to 23 in
Sea level rise with rapid ice-melt scenario	5 to 10 in	19 - 29 in	41 to 55 in

Wetlands

Coastal wetlands serve as a buffer and retention area for storm surge, serving as part of the hurricane protection system. Hurricanes become weaker as they travel over land, therefore the more land these storms have to cover the better. Unfortunately this also means that wetland and coastal buffer zones take most of the force and can therefore be worn away at a faster rate. Sustaining these natural buffer zones is one of the best mitigation measures Town of Huntington can do to protect against future storm surge, while fostering a healthy ecosystem.

High Water Vehicles

Storm related accumulations of debris often render vital roadways impassable for fire and rescue personnel. During coastal storm events tidal surge flood inundation and the corrosive nature of saltwater has a disastrous effect upon fire and rescue equipment.

In an effort to provide assistance to our emergency response partners the Town acquired two surplus 2 ½ ton military cargo vehicles for use in the evacuation of low lying coastal areas. The vehicles would be provided to emergency response personnel for use during these events. The design features of these heavy duty trucks include four wheel drive capability, high axle clearances, and elevated exhaust stacks. These features make these vehicles ideally suited for use during flood events.

Subsequent to the acquisition of these vehicles they have been deployed throughout the Town for a number of weather events with a varying degree of success. Roughly three years ago one of the vehicles was rendered inoperable due to mechanical failure of the motor. The remaining vehicle is still in service and is available for deployment as the need arises.

Vehicle Usage

Huntington Fire Department - The department provides fire services to a portion of the Village of Lloyd Harbor including the entirety of Lloyd Neck and the connecting causeway. Since the causeway is prone to over wash, one of the high water vehicles was often pre-positioned to allow for emergency medical evacuation purposes for the population of this area. The Fire District recognized the need to purchase a high water vehicle for use within the district and obtained one approximately two years ago.

Northport Fire Department - The department provides fire and rescue services under contract with the Town for Huntington Fire Protection District #1. This is an area encompassing the unincorporated hamlets of Fort Salonga, Crab Meadow, and Makamah Beach. In addition contract services are provided to the Incorporated Village of Asharoken. During a previous storm event in 1991, later named the “The Perfect Storm”, the Department was tasked to respond to effect evacuations of Makamah Beach and portions of Asharoken Village during multiple high tide cycles. The department also responded to a major structure fire on Makamah Beach that involved three private residences that resulted from saltwater tidal inundation. Damage to the emergency vehicles subject to saltwater immersion was extensive and resulted in substantial cost to repair the damaged equipment.

With the approach of Tropical Storm Irene the Chief of Department requested use of the remaining operable vehicle for emergency evacuation purposes. During the operational period of the storm emergency responders utilized the high water vehicle to evacuate 23 residents from flooded or flood isolated houses. The Chief Officer indicated that the vehicle operated flawlessly during the event and the only difficulty arose from the fact that the Eaton's Neck Fire Department requested use of the vehicle as well. Similar to Huntington Fire District the Village of Northport recognized the need for specialized equipment for high water evacuation purposes and obtained a vehicle prior to the arrival of Super-storm Sandy.

Eaton's Neck Fire Department - The department provides fire and rescue services to the unincorporated hamlet of Eaton's Neck and a portion of the Village of Asharoken. The area in question is an isthmus with a single roadway connection to the mainland which is prone to over wash. On many previous occasions the fire department had requested a high water vehicle be pre-positioned to allow for emergency medical evacuation purposes for the population of this area. During Super-storm Sandy the Town provided alternate equipment since the single remaining high water vehicle had already been tasked to the Northport Fire Department. Since Eaton's Neck and Northport share dispatch services the chief officers in Northport agreed to support the Eaton's Neck personnel with the high water vehicle should the need for medical evacuation arise. A request was also sent from the Town EOC to Suffolk County Fire Rescue & Emergency Services for a suitable high water vehicle. The request revealed that all high water vehicle assets within the County were already utilized on the South Shore and equipment only became available when the State deployed National Guard units from upstate New York to the region. When these vehicles arrived equipment was tasked to assist the Eaton's Neck, Northport, and Centerport fire departments respectively. As the storm event evolved, portions of upstate New York were significantly impacted by widespread flooding due to the heavy rain associated with the storm. This resulted in the National Guard equipment being recalled from the island and re-tasked to these areas.

Events such as this clearly reveal the need for local equipment to be ready and available for prompt use.

During the Super-storm Sandy event the remaining high water vehicle was tasked to Eaton's Neck where fire department personnel utilized the equipment to perform various operations including assisting in the removal of vegetative debris from area roadways. The vehicle remained in operation throughout the storm event and operated without incident.

Recommendations

High water vehicles are used for brief operational periods during storm events that occur without benefit of any regular frequency. From an operational standpoint this equipment should be exercised and serviced on a scheduled basis rather than just prior to an impending event. It is recommended that a maintenance schedule be drafted and implemented to ensure maximum equipment operability during emergency events.

After gaining operational experience our response partners have suggested various improvements to increase the functionality of the equipment. These suggestions include:

1. Improve ingress / egress for the rear area;

2. Repair / replace rear wooden siding and benches;

3. Provide rear cover to protect evacuees from the elements;

4. Review and implement design elements currently incorporated in Village of Lindenhurst vehicle;

5. Obtain indoor storage area or protect rear area from elements during periods of storage.

It has been reported that one of the vehicles is no longer operable; although two fire departments have purchased high water vehicles, the ability for the Town to have a second vehicle is an operational concern. There are multiple low lying areas prone to flooding within the Town and these areas are remotely located from one another. It is recommended that a mechanical review be performed on the broken vehicle to determine if the equipment can be repaired and returned to duty or should be replaced.

Consideration should be given to incorporating maintenance and upgrade costs for this equipment into a line item of an overall emergency management budget. Since the operation of the equipment is in association with our emergency response partners, funding should be secured from the Fire Trust and Agency account.

By the Numbers

- **$15 Million in storm related expenditures.**
- **$6.8 Million worth of approved Federal reimbursable expenses.**
- **$6.6 Million of additional anticipated reimbursements.**
- **$500,000 in insurance reimbursements.**
- **350 structures inspected for storm related damages.**

Residential Recovery

Approximately 350 residential structures within the Town of Huntington sustained damage during Hurricane Sandy. A total of 5 structures sustained significant damage, which rendered these homes uninhabitable. Within the first 24 hours after the end of the storm, Town inspectors from the Department of Engineering Services were deployed to perform preliminary assessments of these structures.

This effort was coordinated through the Town EOC by using information reported to the GIS from the call center initiative. This information was then merged with existing land management records to create survey sheets, which were distributed to the inspection team. At the end of each inspection day, these surveys were returned to the Town EOC and the information collected on the survey was entered into the Town geographic information system.[113]

Placards

The Town inspection team implemented damage assessment practices that are prescribed as part of the FEMA Safety Assessment Program (SAP). These procedures establish a standardized system of colored placards to indicate the condition of a structure for continued occupancy.

The Safety Assessment Program identifies structural conditions by the following colors:

- **Blue** A blue placard means that the assessment indicated that the building was not affected by the flood.
- **Green** A green placard means that the inspector assessing the building observed that there are some minor repairs required but that the building is safe. If there was water in the basement, it was less than one foot.
- **Yellow** A yellow placard means that damage observed by the inspector assessing the building needs to be repaired to make the building fully safe. If there was more than one or up to 8 feet of water in the basement, moderate structural damage, damaged utility lines, moderate damage to life safety provisions like power, water, HVAC, obstructions to exiting or other moderate damage effecting the safety of the building, a yellow placard is used. If electrical components or systems were submerged a yellow placard is used because this is a fire hazard.
- **Orange** An orange placard means the building has been severely damaged and the building is unsafe for occupancy until repairs have been made. Occupants should not remain in the building. Extreme caution must be taken by those doing repairs or clean up.
- **Red** The building is permanently uninhabitable and dangerous.

FEMA Mitigation Standards

Several steps can be taken to calculate a FEMA Hazard score for the risk estimates of municipal projects. The following formula is used by FEMA and New York State to calculate the Hazard Score of a particular project.[114]

Risk = Hazard x Exposure x Vulnerability

The Hazard score is based on the likelihood an event will occur *and* the magnitude (destructive capacity) of the event. Likelihood is derived from the storm recurrence interval within the selected planning time frame. The return period is the long-term average amount of time between recurrences of an event of a given magnitude. For example, the "100-year storm" is the maximum storm that occurs once in 100 years on average. Similarly the 1-year return period event is the maximum event that occurs once a year, averaged over a long period of time.

For the purpose of preparing a Coastal Reconstruction Zone (CRZ) Plan the recommended storm event is a 100 year storm (1% annual chance). Because the *magnitude* of storm events increases as the likelihood decreases (100 year storms have higher magnitude than 10 year storms), the Hazard score increases as the likelihood goes down. The following steps explain how Hazard scores are calculated. [115]

This equation is useful to see how the likelihood of a hazard event increases or decreases based on the magnitude of the storm and the planning time frame. For example, a 100 year flood has a 63.4% chance of occurring within 100 years. A 10 year flood has a 99% chance of occurring within 100 years.

This scoring process is for relatively long planning time frames. It is not applicable to long return period storms with short planning time frames (100 year storm in 10 year time frame, or similar.)

Recommendation

1. The Town should calculate the Hazard Scoring for all municipal beaches, parks and capital projects.

Hazard Scores

Hazard Score	Description	Probability of occurrence within planning timeframe
5	Highly unlikely, but conceivable. Extreme intensity event.	1-10% probability of occurring
4	Unlikely to occur. Very high intensity event.	10-33%
3	About as likely as not (possible). High intensity event.	33-66%
2	Likely to occur. Moderate intensity event.	66-90%
1	Very likely or expected to occur. Low intensity event.	>90%

Fuel Shortages

The committee reviewed the issues surrounding the fuel shortages caused by prolonged power outages to gas stations. This shortage in fuel supplies caused significant aggravation and apprehension among residents and further complicated the recovery effort.

The Town of Huntington was fully provisioned with enough fuel to last the operational period. Under normal operational conditions, the Town typically receives a weekly fuel delivery at each location with a fuel pump. As part of the Town emergency procedures, the Departments of General Services and Highways received fuel deliveries prior to the arrival of the storm.[116]

On October 31, the Town gas tanks at the Pulaski Road facility were "topped off" with 7,400 gallons of gas and 8,400 gallons of diesel fuel. By November 2, this facility retained a total of 2,200 gallons of gasoline. The facility at Boxer Court reflected a use of approximately 1,500 gallons per day, immediately following the storm.[117]

The Town also provided fuel to local fire departments, the Huntington Community First Aid ambulances and the US Postal Service. This extended emergency services to Town residents, which may have otherwise been restricted by diminished fuel supplies.

In the wake of Hurricane Sandy, local governments have called for mandatory generators to be placed at local gas stations in order to maintain a steady fuel supply during power outages.

While this initiative is well intentioned, it may not be a solution to future fuel shortage problems. While powering the pumps by generators will allow additional fuel dispersals, this will extend the fuel capacity for a local community for approximately 48 hours of additional supply. This does not address the greater problem of supply to the station. This involves tanker truck deliveries.

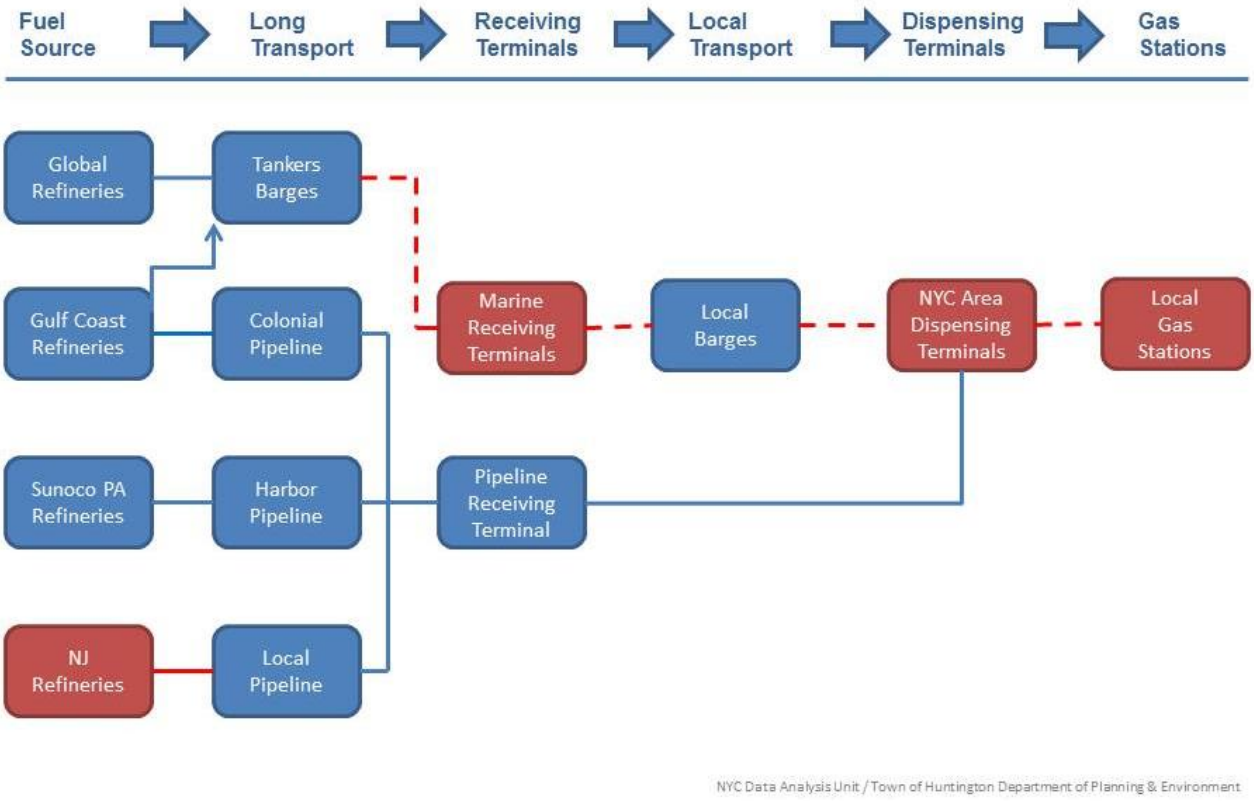
Under a future storm scenario that includes generators, communities that had severely restricted access to fuel during Hurricane Sandy may see an extension of 2 days in their own localized fuel capacity. Communities, which had accesses to fuel, may see those supplies last marginally longer. Ultimately these stations will require a replenishment of fuel supplies.

The larger capacity constraint within this scenario is that a failure in regional refineries and distribution terminals will translate to failures in the entire fuel distribution system for the region.

Recommendations

1. The Town could form a working group between emergency services agencies, to identify practices for mitigating future fuel shortages.

Supply Chain for Gasoline Delivery



Roads

Two days after Hurricane Sandy residents began to leave their homes in significant numbers. Even while emergency orders to stay off the roads had been in effect, local motorists began to explore the community. As fuel and food supplies began to diminish, residents looked for provisions to wait out the potential for long power outages.

As more cars were added to local roads, traffic began to build up as motorist began to navigate intersection without traffic lights and other control devices, which had been disabled from power outages.

This poses a significant public safety problem. In the absence of traffic control devices, public safety and police officer need to be deployed to the most dangerous intersections.

Recommendations

1. The Town should acquire temporary traffic control devices for placement in pivotal intersections throughout the Town. These locations have been identified in the Town geographic information system.

2. The Town should also make temporary stop signs for tertiary roads that may be hazardous during prolonged power outages. In addition, the Town could acquire collapsible temporary “No Exit” signs to place on roads with significant tree debris. This will alert motorists about areas that are completely blocked.

These devices can be deployed by the Departments of Street Lighting and Highways during the initial disaster assessment and can be collected once debris has been cleared or power has been restored.

Temporary solar powered control devices can be placed at intersections.

Town of Huntington Federal Assistance Progress			
Category	**Status**	**Amount**	
A - Version	In Progess	$10,631,474.00	(Estimated)
A - Sand	Complete	$68,684.00	
B - Emergency	Complete	$1,060,408.00	
C - Street Lighting	Complete	$509,602.00	
E - Mill Dam Marina	Complete	$275,745.00	
E - Centerport Marina	In Progess	$122,506.00	(Estimated)
E - Crab Meadow	Pending	$705,250.00	(Estimated)
E - Gold Star	Pending	$165,000.00	(Estimated)
E - Walsh Park	Pending	$5,000.00	(Estimated)

Department of Highways Federal Assistance Progress			
Category	**Status**	**Amount**	
C - Sidewalks & Curbs	In Progress	$1,000,000.00	(Estimated)
G - Fences	Pending	Pending	

**As of July 1, 2013*

Reimbursements

In 2012, the Department of Finance began a comprehensive review of the insurance of Town-wide capital assets. As part of this review, an asset inventory was performed and databases were created within the Town-wide geographic information system for analyzing storm related risks to these assets.

Town-wide insurance policies were analyzed for storm damage and flooding and adjustments were made to Town policy, where necessary. As part of the current Town policy, the Town maintains $5 million of coverage for damages sustained through flooding.

The data collected through the inventory initiative would assist the Town in quickly assessing municipal facilities for damages related to the storm. The Town filed approximately $1million in claims for storm related damages and has received nearly $450,000 in payments from the Town policy, as of the writing of this report.

Insurance is critical to the restoration efforts for municipalities throughout Long Island. The Federal Emergency Management Agency encourages both public and private organizations to pursue insurance as a vehicle for recovery. The Town of Huntington has been fortunate, in that the Town is able document facilities for structural conditions before and after Hurricane Sandy, which has assisted in a timely recovery effort.

In addition, the Town has also submitted approximately $15 million in claims to the Federal Emergency Management Agency For reimbursement, for costs associated with Hurricane Sandy.

2013-64

RESOLUTION TO ESTABLISH THE HURRICANE SANDY EMERGENCY REVIEW TASK FORCE

Resolution for Town Board Meeting dated: February 5, 2013

The following resolution was offered by: Supervisor Petrone
Councilman Cuthbertson
Councilman Mayoka
Councilman Cook

And seconded by: **COUNCILWOMAN BERLAND**

WHEREAS, Hurricane Sandy wreaked havoc and devastated portions of the northeast, including Long Island, early on October 29, 2012. The storm came ashore as a post-tropical cyclone with hurricane-force winds. The storm became the largest Atlantic hurricane on record; and

WHEREAS, in anticipation of the storm, Supervisor Petrone ordered the immediate implementation and coordination of Towns' emergency preparedness procedures (Towns' All Hazard Emergency Operation Plan), opened the Emergency Operations Center and declared a State of Emergency for the Town of Huntington commencing October 27, 2012; and

WHEREAS, Supervisor Petrone, as the Town's Chief Coordinating Officer and Incident Commander established communications with our partners: local (villages), county (FRES), state, (Office of Emergency Management) and federal (FEMA) as well as our emergency response partners: all Town Fire Departments, Emergency Services and Police; and

WHEREAS, Supervisor Petrone is desirous to establish a Task Force to be charged with the review and critique of emergency operations, response and recovery operations by the Town in response to Hurricane Sandy; and

WHEREAS, amending the 2013 Budget is not an action pursuant to SEQRA as defined by 6 N.Y.C.R.R. § 617.5(c)(20) and therefore no further SEQRA review is required.

NOW, THEREFORE, BE IT RESOLVED, that the Town Board HEREBY AUTHORIZES the creation of the Hurricane Sandy Emergency Review Task Force, chaired by the Towns' Planning Department and comprised as follows: Each Town Board member shall designate a not-for-profit entity involved in emergency response operations and procedures. The Supervisor shall appoint the following positions to serve on the Task Force: Towns' Chief Fire Marshal, Emergency Preparedness Coordinators, Special Assistant to the Supervisor/Emergency Manager, Senior Harbor Master, Director of Public Safety, Director of General Services, Director of Human Services, a representative of the Towns' Highway Department, Superintendent of the South Huntington School District, representative from the Family Service League,

2013-64

representative from the YMCA. The Task Force shall report back to Supervisor Petrone by May 1, 2013 with its findings.

VOTE: AYES: 5 NOES: 0 ABSTENTIONS: 0

Supervisor Frank P. Petrone	AYE
Councilman Mark A. Cuthbertson	AYE
Councilwoman Susan A. Berland	AYE
Councilman Mark Mayoka	AYE
Councilman Eugene Cook	AYE

THE RESOLUTION WAS THEREUPON DECLARED DULY ADOPTED

2013-117

RESOLUTION DIRECTING THE DEPARTMENTS OF INFORMATION TECHNOLOGY, PLANNING AND ENVIRONMENT, GENERAL SERVICES AND THE HUNTINGTON HIGHWAY DEPARTMENT TO DEVELOP A PLAN FOR USE AND DEPLOYMENT OF 21ST CENTURY COMMUNICATIONS TECHNOLOGIES AND PROCEDURES THAT MAXIMIZE THE CAPABILITY OF THE TOWN TO COMMUNICATE WITH RESIDENTS AND FOR TWO-WAY COMMUNICATIONS BETWEEN RESIDENTS AND THE TOWN

Resolution for Town Board Meeting Dated: March 5, 2013

The following resolution was offered by: Councilman Cuthbertson

and seconded by: **SUPERVISOR PETRONE**

WHEREAS, events in recent months like Hurricane Sandy and the February blizzard demonstrated the need to improve communication systems between the Town and its residents, particularly in the lead up to, during and after storms and other emergencies when the need for current and accurateinformation is at its highest; and

WHEREAS, 21st Century technology is in use on an internal basis to manage data and promote efficient communication, in many cases resident out-reach still depends on 20th Century solutions, the most notable example being Highway Department'stelephone Hotline to which it direct residents to initiate service and information requests and which became overwhelmed during the recent storm; and

WHEREAS, as the Town of Huntington has in place several systems to gather, store and communicate information, including geographic information systems (GIS), global positioning systems (GPS) that can be leveraged to easily deliver information to residents through smart phones, tablets and personal computers via Internet, e-mail and/or social media; and

WHEREAS,the systems described above are currently operated and maintained by several Town departments, principally Information Technology, Planning and Environment, General Services and the Highway Department; and

WHEREAS, it is the Town Board's determination that a plan for the consolidation of design, procurement, maintenance and upgrade of systems above described will provide the most efficient and most cost effective means of upgrading communications between the Town and its residents; and

WHEREAS, in addition to organizing and managing information, technologies like GIS and GPS allow departments with heavy equipment, like Highway, to map the progress of its equipment in "real-time" so not only can supervisory personnel track the progress of its snowplows, but the public can track the progress on the Department's webpage, which technology further can be required to be installed in the equipment of any outside contractors who may be employed during a snow storm or other cleanup giving residents a complete view of clearing operations in real-time; and

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WHEREAS, in addition to allowing residents to follow the progress of Town operations in real-time, modern technology provides capacity for two-way communications by which residents can provide feedback that Town departments can use to adjust and improve operations as they are being carried out, which can be done in the form of a well-publicized e-mail address where residents can reach major departments like the Highway department, twenty-four hours a day, seven days a week; and

WHEREAS, the Town Board believes that cooperative planning effort that directly engages the Director of Information Technology, the Director of Planning and Environment, the Director of General Services and the Superintendent of Highways is the bestway though not the only way to achieve these goals, it should be employed in the first instance; and

WHEREAS, directing Department Directors and the Highway Superintendent to develop a plan for the use and deployment of modern communications technologies is a Type II action pursuant to 6 N.Y.C.R.R. §617.2(b)and therefore no further SEQRA review is required.

NOW, THEREFORE, THE TOWN BOARD

HEREBY DIRECTS the Departments of Information Technology, Planning and Environment, General Services and the Huntington Highway Department to develop a plan for use and deployment of 21st century communications technologies and procedures that maximize the capability of the Town to communicate with residents and for two-way communications between residents and the Town.

VOTE: AYES: 5 NOES: 0 ABSTENTIONS: 0

Supervisor Frank P. Petrone	**AYE**
Councilwoman Susan A. Berland	**AYE**
Councilman Mark A. Cuthbertson	**AYE**
Councilman Mark Mayoka	**AYE**
Councilman Eugene Cook	**AYE**

THE RESOLUTION WAS THEREUPON DECLARED DULY ADOPTED.

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2. http://www.fema.gov/nims-components
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8. Town of Huntington, All Hazard Emergency Operations Plan, pg. 120
9. Town of Huntington, All Hazard Emergency Operations Plan, pg. 33
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55. New York State Senate Bi-Partisan Task Force Report
56. Personnel Notes
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97. Town Emergency Operations Plan
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