

RANGE OF ALTERNATIVE MITIGATION ACTIONS CONSIDERED

The following table represents a full range of types of mitigation actions to address each of the hazards identified in this plan. At a working session of the Planning Group on June 6, 2006, Planning Group members considered this range of actions and identified a mitigation strategy for their jurisdiction. Mitigation actions were identified and analyzed for a comprehensive range of mitigation actions and projects for each hazard, and address reducing the effects of hazards on both new and existing buildings and infrastructure.

Note to reviewer: The next section of this plan, entitled, “Action Item Evaluation and Prioritization” explains the criteria used by Planning Group members to evaluate and prioritize this range of actions.

**Table 47
Types of Actions Considered to Achieve Mitigation Goals**

Goals		Actions	
Goal Number	Description	Action Number	Description
1	Promote disaster-resistant development.	1.A	Join the National Flood Insurance Program (for non-participating communities).
		1.B	Ensure that local comprehensive plans incorporate natural disaster mitigation techniques by requiring a courtesy- review of draft plans by the County Emergency Management Agency.
		1.C	Explore the need for hazard zoning and high-risk hazard land use ordinances.
		1.D	Organize an annual event / fair for homeowners, builders and county and local jurisdictions that includes sale of NOAA weather radios, dissemination of information brochures about disasters and building retrofits, demonstration of “defensible-space” concept and fire resistant construction materials (for roofs/exterior finishes and inflammable coverings for openings like chimneys and attics) etc.
		1.E	Develop a stormwater management plan that includes subdivision regulations to control run-off; both for flood reduction and to minimize saturated soils on steep slopes that can cause landslides.
2	Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters.	2.A	Expand and disseminate GIS and other hazard information on the internet.
		2.B	Create a mitigation outreach program that helps residents prepare for disasters.
		2.C	Develop a plan and seek funding for backup electric and telecommunications systems in local government-owned critical facilities.
		2.D	Support and fund Community Emergency Response Team (CERT) programs that also include a mitigation component.
		2.E	Create a virtual and physical library that contains all technical studies, particularly natural resources.
		2.F	Expand GIS to collect and develop more sophisticated hazard mapping. Use information to update plan. Ensure information will be available to the public and to relevant communities and agencies.
		2.G	Provide training for inspection and enforcement of adopted codes and ordinances.

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3	Reduce the possibility of damage and losses due to drought.	3.A	Encourage citizens to implement water conservation measures by distributing water saving kits which include replacement shower heads, flow restrictors, and educational pamphlets which describe water saving techniques. Also encourage conservation by offering rebates for ultra-low-flow toilets.
		3.B	Modify rate structure to influence consumer water use including: increasing rates during summer months and imposing excess use charges during times of water shortage.
		3.C	Reduce water use for landscaping by imposing mandatory water-use restrictions during times of water shortage. Also, develop a demonstration garden to exhibit water conservation techniques.
		3.D	Publish and distribute pamphlets on water conservation techniques and drought management strategies.
		3.E	Develop and adopt an emergency water allocation strategy to be implemented during severe drought.
		3.F	Implement water metering and leak detection programs followed by water main repair/replacement to reduce losses.
4	Reduce the possibility of damage and losses due to flooding caused by floods and hurricanes.	4.A	Join the National Flood Insurance Program. As a participant, floodplains within the participating community will be identified and mapped. In return, the participating community will become eligible for flood insurance as long as the local governing body adopts and enforces a floodplain ordinance.
		4.B	Limit uses in floodways to those tolerant of occasional flooding, including but not limited to agriculture, outdoor recreation, and natural resource areas.
		4.C	Develop a Countywide gauging and warning system for flash and riverine flooding.
		4.D	Continue to implement best management practices for floodplain areas.
		4.E	Identify and document repetitively flooded properties. Explore mitigation opportunities for repetitively flooded properties, and if necessary, carry out acquisition, relocation, elevation, and flood-proofing measures to protect these properties.
		4.F	Participate in the New York State Routine Stream Maintenance Program (for currently non-participating communities).
		4.G	Develop specific mitigation solutions for flood-prone roadways and intersections under the leadership of NYDOT. Develop a work plan for when sites will be surveyed and what role can the local government play in selection and implementation of mitigation activities (e.g. any monetary or contextual support through the local capital improvement plan).

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5	Reduce the possibility of damage and losses due to earthquakes.	5.A	Retrofit old/dilapidated critical facilities.
		5.B	Public awareness through video/brochures about simple steps homeowners can take to mitigate damage.
6	Reduce the possibility of damage and losses due to landslides.	6.A	Create comprehensive geological mapping to areas prone to landslides and rockslides.
		6.B	Identify high landslide hazard areas and limit future development.
		6.C	Develop a public outreach program that addresses the economic impacts of landslides on personal property.
		6.D	Develop a vegetation management plan. Proper vegetation can supply slope-stabilizing root strength, and facilitate in intercepting precipitation. Establishing and maintaining appropriate vegetation of areas above the bluff slope may be the single most important and cost-effective mitigation measure available.
7	Reduce the possibility of damage and losses due to coastal erosion	7.A	Establish an erosion setback line which is located landward of the first stable natural vegetation at a specified distance based on long-term rate of erosion.
		7.B	Implement V Zone construction requirements for new development located in Coastal A Zones (for communities not currently implementing these requirements).
		7.C	
8	Reduce the possibility of damage and losses due to winter storms.	8.A	Promote (or purchase, for critical facilities) NOAA weather radios.
		8.B	Educate residents about driving in winter storms and handling winter-related health effects
		8.C	Ice and windstorm-resistant trees and landscaping practices to reduce tree-related hazards
		8.D	Bury utility lines to avoid power outage due to winter storms (if risk is very high then only this action might be cost-effective)
9	Reduce the possibility of damage and losses due to tornadoes and high winds caused	9.A	Adopt an ordinance to require safe rooms in mobile home parks
		9.B	Provide low interest loans (or other form of financial assistance) for building safe rooms.
		9.C	Provide technical assistance for building safe rooms.
		9.D	Adopt an ordinance to require hurricane clips on new construction.

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	by windstorms and hurricane winds.	9.E	Install hurricane clips and wind shutters on existing development—particularly emergency facilities and shelters built before existing codes were adopted to offer some degree of wind protection.
10	Reduce the possibility of damages to emergency facilities from flooding and wind damage.	10.A	Conduct a study to determine the year-built and level of protection (flood, surge, wind) for each emergency facility.
		10.B	On completion of 10.A, seek funding for mitigation projects for emergency facilities not currently designed for protection from flooding, surge, and high wind.

In addition to these general types of mitigation actions, the Planning Group also considered during their meeting of June 6, 2006, a series of more specific mitigation actions that has been identified throughout the course of the planning process as specific problems and/or problem areas were brought to light. These “Past Discussion Points” are provided in Table 48, and were distributed at the meeting for review.

Table 48 Past Discussion Points and Possible Action Items Considered			
	Past Discussion Points	Possible Action Item Considered	Comments
1	Urban drainage flooding caused due to water backing up through the system when storm drainage system outfalls are submerged. Various locations.	Install backflow valves at outlets.	Mentioned by Town of Hempstead at January 12th meeting.
2	Lido Boulevard in Lido Beach is an evacuation rote that gets flooded frequently due to poor drainage. Also an issue with drainage from under the school. Part of road lower than storm drain system.	Study the area in detail to determine the best mitigation solution.	Mentioned by Town of Hempstead at January 12th meeting.
3	Recharge basins overgrown or undersized; causes flooding. Various locations.	Perform regularly scheduled maintenance/upgrades. <i>*Note—routine maintenance is not an eligible type of “mitigation” project for funding under most FEMA programs.</i>	Mentioned by Town of North Hempstead and NYSDOT at January 12th meeting.
4	NCOEM mentioned that some of LIPA’s substations may need to be mitigated (elevated/floodproofed/ etc.).	LIPA can evaluate substation critical elevations versus flood heights and identify facilities most in need of mitigation. If LIPA requests, NCOEM could support LIPA by applying on their behalf for federal/state mitigation project funding.	Mentioned by NCOEM at January 12th meeting.

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5	Flooding due to storm drains backing up. In some cases due to lack of maintenance. In other cases systems are undersized due to increased development. Various locations.	Perform regularly scheduled maintenance/upgrades. <i>*Note-routine maintenance is not an eligible type of "mitigation" project for funding under most FEMA programs.</i>	Mentioned by Town of Hempstead and NCOEM at January 12th meeting.
6	LIPA poles- will they withstand heavy flooding events?	LIPA could evaluate whether existing poles will likely withstand heavy flooding events, and whether installing poles to a greater depth would mitigate.	Mentioned by NCOEM and Town of Hempstead at January 12th meeting.
7	Flooding in Morgan Island in Glen Cove includes areas where sewage lift stations are located.	Evaluate whether electrical components can be moved to higher ground to mitigate the problem.	Mentioned by Glen Cove at January 12th meeting.
8	East Island in Glen Cove has 6,800 ft of shoreline on the Long Island Sound and 4,000 ft of shoreline on Dosoris Pond; it is vulnerable during severe storm occurrences and has approximately 140 homes. Several streets subject to tidal flooding and storm surges, impacting City services and requiring evacuation.	Study specific problem areas in more detail to determine the cause(s) and best mitigation solution(s) to protect these low-lying areas and the roadway system.	Provided through Glen Cove DPW to NCOEM, June 2006.
9	East Beach Road, Prybil Beach, in Glen Cove . Services City beach and provides emergency access to East Island and Dosoris Island. Serves also as part of emergency route when Danas Island Highway is closed.	Consider raising the road to an elevation sufficient to allow for safe emergency access during a 50-year storm event.	Provided through Glen Cove DPW to NCOEM, June 2006.
10	Southland Drive, East Island, in Glen Cove . Southland Drive is one of two main east-west roads on East Island and is primary emergency route off island if west exit along Danis Island Highways is impassable. Pipe outlets at point of discharge in Long Island Sound from Southland Drive and Eastland Drive are in need of valve control. During storm tides and surges the system becomes clogged with sand and becomes non-functional, causing inland flooding and overflow into Dosoris Pond.	Consider valve control at outlet.	Provided through Glen Cove DPW to NCOEM, June 2006.
11	Southland Drive sanitary sewer pump station on East Island in Glen Cove – lift station services east end of East Island. Extreme high tides and storm surges flood station, disrupting power causing the station to go off line possibly interrupting service to residents and resulting in raw sewage overflow to Dosoris Pond.	Consider retrofitting station for submergible operation as well as emergency power generation.	Provided through Glen Cove DPW to NCOEM, June 2006.
12	Dock Place sanitary sewer pump station on East Island in Glen Cove – lift station services west end of East Island as well as inflow from Southland Drive lift station. Extreme high tides or storm surges flood this station causing the station to go off line which results in raw sewage overflow to the Long Island Sound.	Consider retrofitting facility for submergible operation in addition to emergency power generation for continuous operation during electric power outages.	Provided through Glen Cove DPW to NCOEM, June 2006.

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13	Danas Island Highway, Dosoris Island in Glen Cove – connects Dosoris Island and East Island to the mainland. Only road connecting islands to mainland. Subject to tidal flooding and storm surges which isolate both islands from the mainland. City services are impacted and evacuation is necessary.	Consider raising the road for a 50-year storm event.	Provided through Glen Cove DPW to NCOEM, June 2006.
14	Hewlett Harbor – urban flooding (storm drains) during October 2005 heavy rainstorms.	Storm drain board is evaluating capital projects to mitigate similar impacts during future heavy rain events.	Provided by Hewlett Harbor to NCOEM, March 2006.
15	Great Neck School District – Flooding at Cumberland School, 30 Cumberland Ave, Great Neck, due to storm water and lack of adequate drainage.	Study specific problem areas in more detail to better define the cause(s) and best mitigation solution(s).	Provided by Great Neck School District to NCOEM, March 2006.
16	In Lido Beach on Lido Boulevard between Greenway Road and Regent Drive – rainstorms during high tides cause severe flooding, reducing the road to only one lane (for example during the October 2005 heavy rainstorms) and causing roadway closure. Lido and Point Lookout Fire has not been able to determine why this is happening or how to correct the problem.	Study specific problem areas in more detail to better define the cause(s) and best mitigation solution(s).	Provided by Lido and Point Lookout Fire District to NCOEM, December 2005.
17	NYS DOT notes drainage problem areas in Nassau County – see separate handout.	For discussion at June 6, 2006 meeting. Priority should be given to mitigating problem areas located along evacuation routes, particularly in the southern portion of the county where storm surge is an issue and evacuating populations are highest.	Provided by NYS DOT.
18	Shelters - NCOEM currently has a tracking system in place for hurricane sheltering in the County. At this time, shelters have been pre-designated per American Red Cross Publication #ARC-4496. As per the 1993 Hurricane Evacuation Study, the ARC and County have reviewed surge mapping and will only open shelter located outside of any potential hurricane surge flooded area. It was recommended that studies be conducted to determine wind resistant design level for each facility but at this time, only one has been completed.	Seek grant funding to conduct studies of the shelters to determine the winds they each would withstand and then to seek funding for mitigation (hardening, shutters, hurricane clips, etc), possibly for the ones with the greatest capacities first.	Provided by NCOEM.
19	1993 Hurricane Evacuation Study notes first floor elevations for institutions and medical facilities with regard to potential storm surge heights. Some facilities have first floor elevations that could be flooded for Category 1 and higher; many facilities have first floor elevations that could be flooded for Category 2 and higher. Various facilities in Long Beach, Island Park, Inwood, Woodmere, Hewlett, Valley Stream, East Rockaway, Lynbrook, Rockville Centre, Oceanside, Baldwin, Freeport, Bellmore, Seaford, and Massapequa.	Conduct detailed evaluation of the site and specific construction details of the facilities. Identify feasible mitigation alternatives. Fund the most cost-effective alternative (or seek grant funding if needed). Initiate mitigation projects when funding is secured.	Suggested by consultant for consideration at June 6, 2006 meeting.

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20	Some jurisdictions with mapped landslide hazard areas of High Susceptibility –Low Incidence have adopted Steep Slope Ordinances with development standards for these areas; other jurisdictions have not.	Nassau County could hold one informational meeting with jurisdictions who have not adopted steep slope ordinances to describe what they are, and provide samples of steep slope ordinances from other Nassau County communities.	Suggested by consultant for consideration at June 6, 2006 meeting.

All participating jurisdictions who will be adopting this plan have elected to undertake the following high priority public outreach actions at a minimum, by vote of the Planning Group on March 9, 2006:

- Each participating jurisdiction will add a link on their jurisdiction’s web page to the County mitigation planning website, if they have not already done so as part of the plan development process.
- Participating jurisdictions will conduct annual interviews and/or smaller meetings with civic groups, the public and other stakeholders. This will be accomplished through incorporating discussion of the mitigation plan into other regularly attended meetings.
- Participating jurisdictions will consider annual flyers, newsletters, newspaper advertisements, and Radio/TV announcements, and will implement some or all of the above at the discretion of the jurisdiction.