



REPORT TO GOVERNOR TERENCE R. MCAULIFFE

IN-SEASON REVIEW OF HURRICANE PREPAREDNESS FOR HAMPTON ROADS

August 2014



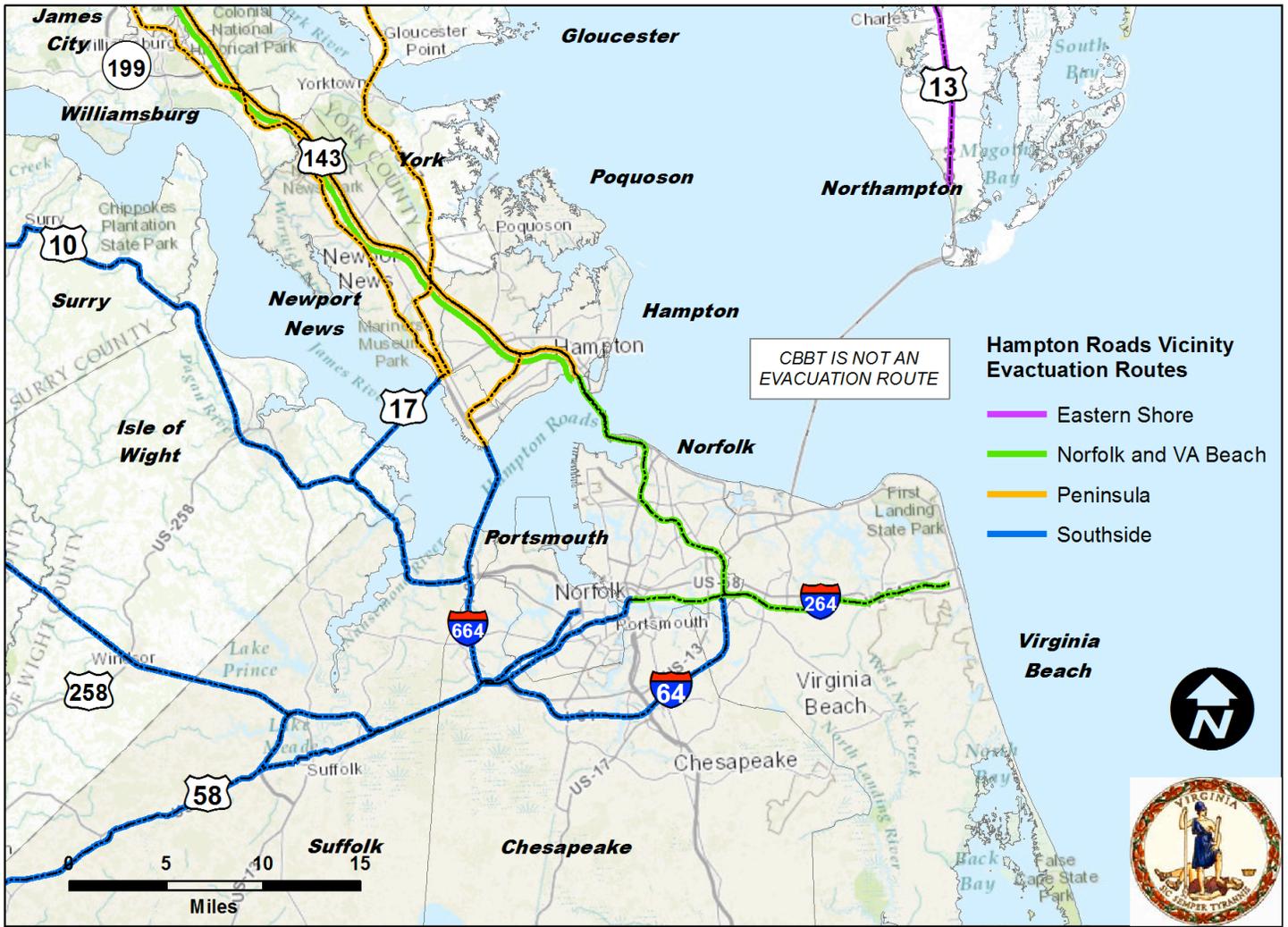
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2014 In-Season Review of Hurricane Preparedness for Hampton Roads

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August 2014



GOVERNOR'S CONFIDENTIAL WORKING PAPERS

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MEMORANDUM
August 15, 2014

TO: The Honorable Terence R. McAuliffe, Governor
The Honorable Brian J. Moran, Secretary of Public Safety and Homeland Security
The Honorable Aubrey L. Layne, Jr., Secretary of Transportation

FROM: Jeffrey D. Stern, State Coordinator

Per your request, the Virginia Department of Emergency Management (VDEM) has completed a review of hurricane preparedness in the Hampton Roads region. This effort was supported by the Virginia Department of Transportation (VDOT), the Virginia State Police (VSP), the Department of Social Services (DSS), and many local governments. FEMA, the U.S. Department of Homeland Security, and private sector subject matter experts also provided input. This report was initiated when concerns about our Commonwealth's ability to effectively evacuate the Hampton Roads region became apparent during a VDEM-led exercise with your Cabinet, prior to this hurricane season.

Virginia is vulnerable to hurricanes and tropical weather systems. Preparing and responding to these hazards requires action at the local, state, and federal level. It also requires private businesses, non-governmental organizations, and individual citizens to take appropriate protective measures before, during, and after a storm. Sometimes these actions go beyond simply evacuating, to include sheltering those who cannot evacuate, providing help to citizens that need assistance, and coordinating response with many different government and private sector entities. Therefore, this review sought to look strategically, broadly, and holistically at the challenges of hurricane preparedness and response, beyond just the challenge of evacuation.

Since this review started at the beginning of hurricane season, it is an "in-season" review in more than name: its focus has been to identify enhancements that can be immediately made to improve hurricane preparedness and response in this 2014 hurricane season, and to catalogue strategic challenges that require long-term solutions by many different levels of government or the private sector. Some of the challenges this report identifies have developed over many decades, and they will take many years to address. The appendix of this report contains an implementation plan that details many of the specific efforts that must go forward to achieve a more resilient Virginia and a robust preparedness and response plan for the Hampton Roads region in the event of a catastrophic hurricane.

"Working to Protect People, Property and Our Communities"

Background and Key Issues

On May 12, 2014, Governor Terry McAuliffe requested a review of the hurricane preparedness plan for the Hampton Roads region, following a cabinet exercise with a hurricane scenario. The exercise revealed challenges in the Commonwealth's and local governments' capacity to evacuate a large number of citizens and visitors in the event of a catastrophic hurricane.

Governor McAuliffe directed cabinet secretaries and state agencies responsible for carrying out a hurricane evacuation to work with their local and federal partners to identify potential enhancements to existing plans. He also charged them with identifying strategic challenges that require long-term solutions. Those tasks fell to Secretary of Public Safety and Homeland Security Brian Moran and Secretary of Transportation Aubrey Layne. The Virginia Department of Emergency Management (VDEM) was tasked with leading this review, supported by the Virginia Department of Transportation (VDOT).

In order to take a strategic and comprehensive look in a short amount of time, this review identified five key areas on which to focus. Those areas included:

- Situational Awareness and State-Local Coordination;
- Evacuation (to include Lane Reversal on I-64);
- Sheltering;
- Citizens Needing Assistance; and
- Public Information.

The approach for this review was multi-fold, consisting of numerous meetings with local governments, engagement through several existing inter-governmental and inter-agency work groups at the regional and state level, in-depth stakeholder engagement, and federal assistance from Federal Emergency Management Agency (FEMA) and the Department of Homeland Security's (DHS) National Protection and Programs Directorate (NPPD). Additionally, Witt O'Brien's, a private company with experience in hurricane preparedness and response, was contracted to provide an independent look at the review process, to research best practices in other states, and to validate (or invalidate) proposed enhancements and strategic initiatives through an exercise with local stakeholders.

Governor McAuliffe participated directly in this review process, hosting a roundtable along with Secretaries Moran, Layne, and Molly Ward, Secretary of Natural Resources and the former Mayor of Hampton. This meeting took place on July 1, 2014, at Camp Pendleton in Virginia Beach with representatives from local governments and state agencies.

Numerous events were held during the past three months with local government partners to discuss these issues. They included:

- Lane Reversal planning meetings on May 14 and June 9.
- Hurricane Decision Making Tabletop Exercise on May 21.
- Annual Federal Emergency Management Agency (FEMA) Hurricane Season Video Teleconference on May 28.
- Locality and Military Emergency Managers Coordination Meeting on June 10.
- Hurricane Evacuation Steering Committee Meeting on June 10.
- Hampton Roads Hurricane Public Information Officer Workshop on June 12.
- In-Season Review Briefing with state agencies on June 18.
- In-Season Review Briefing with localities on June 24.
- Virginia Emergency Response Team Exercise (VERTEX) (hurricane scenario) on June 25-26.
- Hurricane Multi-Agency Coordination Center Field Exercise (Region 5 Southside and Peninsula) on June 25-26.
- Governor's Roundtable & Stakeholders' Workshop on July 1.
- Hurricane Evacuation (HURREVAC) and Sea, Lake and Overland Surges from Hurricanes (SLOSH) software training for state and local emergency managers and Geographic Information System (GIS) personnel on July 15.
- Various hurricane review subgroup meetings and conference calls held between July 15 and August 15.
- Weekly in-house meetings to coordinate in-season review activities between July 15 and August 11.
- Hampton Roads Transportation Planning Organization Board Meeting on July 17.
- Regional Emergency Management Advisory Committee (REMTAC) Meeting on July 22.

- Presentation of final draft of Storm Surge Mapping Application to Hurricane Evacuation Coordination Workgroup on July 23.
- Ready Hampton Roads Subcommittee Meeting on July 24.
- Witt O'Brien's third party interviews on July 28-31.
- Richmond area emergency manager focus group on July 30.
- In-Season Review Briefing with the Virginia Emergency Management Association (VEMA) on August 4.
- In-Season Review Validation Exercise on August 5.

Overarching key findings associated with each of these focus areas are:

- **Situational Awareness and State-Local Coordination:** State and local coordination has occurred in inconsistent fashion during the past decade and can be improved through standardization of conference calls, use of new web tools for information exchange, deployment of liaison officers in local emergency operations centers, and the development of a more regional approach to disasters in Hampton Roads. Local and state governments need to think regionally, even as Virginia deals with individual challenges within each local jurisdiction.
- **Evacuation:** Hampton Roads cannot evacuate everyone out of its region, nor should it try to do so. Critical areas will need to be evacuated, and Virginia must prioritize those areas. The Commonwealth has built plans emphasizing lane reversal, a tool of last resort for the most catastrophic storms. Lane reversal should remain a tool of last resort, but renewed emphasis should be placed on developing focused evacuation areas for the most vulnerable citizens, increasing regional shelter capability, and communicating preparedness to the public. Future road networks should include considerations for improving the capacity and options for evacuating citizens from the area.
- **Sheltering:** Inadequate sheltering exists at the local and state level for citizens seeking refuge. Commonwealth plans for the past decade have focused on state-managed sheltering at remote sites far away from the Hampton Roads region. Renewed emphasis must be placed on building shelter capacity within the region and ensuring that those shelters are adequate to withstand storm winds. Only eight local shelters in the Hampton Roads region are known to be capable of withstanding Category 2 (CAT-2) storms. Building codes have not addressed the requirements for storm wind protection adequately.
- **Citizens Needing Assistance:** Plans are in place to contract with bus services to evacuate citizens without transportation and to provide services for citizens with access or functional needs, but those efforts are fragmented between different jurisdictions and levels of government.

- **Public Information:** Risk and crisis communications with the public are still challenging. Progress has been made with the development of the Ready Hampton Roads (RHR) program, but a more robust public messaging effort will be needed as changes are made in evacuation planning, sheltering, and also for communicating with tourists visiting the area during the summer months.

This in-season review has resulted in many short-term enhancements that will be initiated or implemented in this hurricane season. These short-term enhancements include improving situational awareness capabilities, adjusting the current decision-making timelines for evacuation and lane reversal, enhancing sheltering planning, planning for citizens needing assistance, and developing new tools for unified public information messages. Long-term recommendations also were identified within the five main topic areas. These issues will require a long-term commitment through revised inter-governmental structures and local champions to achieve. The first steps begin here.

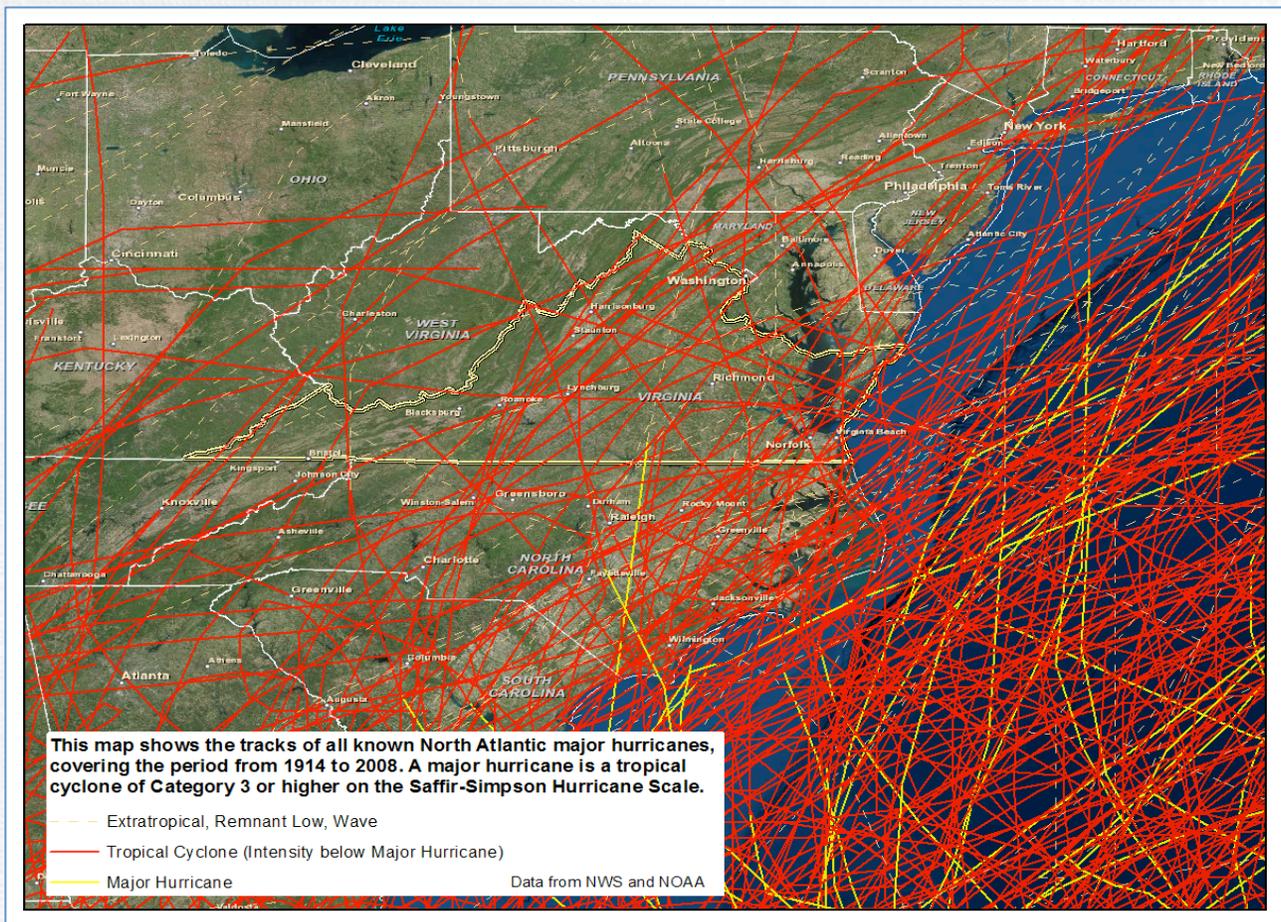


Figure 1. Storm Tracks Since 1914

Situational Awareness and State-Local Coordination

Put simply, situational awareness is the recognition of an unfolding incident and an understanding of its impact. Coordination between state and local governments is essential, both to develop a common understanding of the problem and a coordinated response.

The commonwealth uses three main methods to maintain situational awareness and conduct state-local coordination. These methods include internet-based programs for information sharing and exchange, conference calls between jurisdictions, and placement of liaisons in local emergency operations centers.

Short-Term Enhancements

Enhance Conference Call Procedures - Conference call procedures for situational awareness will be improved to ensure the timing is standardized, they occur in an expedited manner, and accurate information is relayed through a standardized template.

Long-Term Strategic Recommendations

Use a Multi-Agency Coordination Center (MACC) to improve regional situational awareness and state-local coordination - A MACC is a component of the National Incident Management System (NIMS). It is a location where multiple agencies gather to share information and is used widely for large incidents and special events. A regional MACC would facilitate information sharing between local governments and help streamline regional needs to the Virginia Emergency Operations Center (VEOC) during storm response.

Expand and Train on New Technologies for Situational Awareness -- State and local governments should continue to work to link various situational awareness tools to enable users to seamlessly share information, ranging from traffic cameras to web-based products. Some of these products include new GIS data layers with storm-surge maps, new storm inundation maps from the National Hurricane Center, and various data sharing and exchange tools that are in development or should be identified to facilitate information sharing between local and state agencies.

Evacuation

Evacuation is the movement of people out of a hazardous area. It is not always necessary for everyone to evacuate, but it means moving citizens or visitors away from vulnerable low-lying areas in danger of flooding from storm surge. More than 90 percent of fatalities during hurricanes result from flooding due to storm surges.

For evacuation, Virginia primarily has focused on a catastrophic hurricane impacting the Hampton Roads region. Hurricane damage can differ widely based on the track and strength of the storm. A Category 2 storm (CAT-2) could cause severe and widespread damage, and a Category 3 (CAT-3) and above for Virginia could be catastrophic (Hurricane Katrina made landfall in New Orleans as a CAT-3 storm). The current evacuation plan utilizes an evacuation decision-making timeline meant to aid Commonwealth agencies in recommending action to the governor as a hurricane approaches. Included within this timeline are recommended decision points regarding the lane reversal plan for Interstate 64. Developed following Hurricane Floyd in 1999, this plan calls for a lane reversal (sometimes referred to as “contraflow”) of the eastbound lanes of I-64, turning all traffic westward to increase evacuation capacity. This lane reversal plan was designed to support evacuating a specific geographic area of Hampton Roads in Virginia Beach and Norfolk. It has received heavy emphasis in plans and preparedness activities, but has never been used, and is considered a last-resort tool for a catastrophic storm.

Short-Term Enhancements

Adjusting Hurricane Evacuation Decision-Making Timeline: The hurricane evacuation timeline should be adjusted to allow for more time to make decisions and implement plans prior to the arrival of tropical storm force winds (see Appendix G). Nevertheless, while this change may provide up to an additional 12 hours for deciding evacuation issues, it depends on a clearly defined storm track and intensity analysis several days before landfall. During this review, Hurricane Arthur increased from a tropical storm to a CAT-2 hurricane only 14 hours prior to landfall.

Long-Term Strategic Recommendations

De-emphasize I-64 Lane Reversal and Re-Emphasize Evacuation of Citizens from Highly Vulnerable Areas: Virginia and the Hampton Roads region should emphasize focused evacuation. New information technology such as GIS storm surge maps will enable better planning for the most critical areas. Long-term decisions will need to be made as to whether to maintain jurisdictional evacuation, establish tiered evacuation zones, or use address-specific evacuation models. Each has its advantages. Virginia should pilot the use of evacuation zones with localities in the Hampton Roads area.

Traffic Management Plans: Virginia should develop, enhance, and exercise regional traffic management plans at the state and local levels to improve coordination, traffic flow, and clearance times.

Gas Station Resiliency: Fuel stations are a critical component for evacuation, response, and recovery. Lessons from many prior hurricanes show that often gas stations lose the ability to pump gas if power is cut off, which commonly occurs after a hurricane. Resiliency can be built if gas stations are incentivized to add generators to their facilities. Additionally, government should partner with fuel suppliers to ensure all gas station tanks are “topped off” prior to a storm. Virginia should embark upon these best practices to increase gas station resiliency within the energy sector.

Improve Evacuation Routes: Future road networks should include considerations for improving the capacity and options for evacuating citizens from the area. As funding is available and fiscally responsible assessments conducted, improvements should be made to critical nodes in the current network, such as the Bower’s Hill area.

Sheltering

Sheltering includes the provision of a location in an emergency for citizens to wait out a storm, and to feed, house, and care for them if their homes are destroyed or inaccessible in the aftermath of a storm. Many kinds of shelters exist, from full-service staffed shelters that can accommodate citizens needing assistance, whether medical, functional, or access needs, to shelters capable of receiving family pets, to austere and unstaffed buildings designated simply to provide a lifesaving refuge.

Coordinating sheltering is a shared responsibility. Local jurisdictions are responsible for establishing and staffing shelters. Local governments are supported by state agencies, and a state-managed shelter (SMS) system is managed by the Department of Social Services (DSS). DSS currently can staff up to six shelters simultaneously within the system. While each local government maintains its own list of shelters, local emergency managers generally do not provide a list of shelters until an emergency is declared, as a building is not considered a shelter until it is staffed, supported, and officially open, and shelter locations can change based upon the requirements of a specific incident. But a lesson learned from Hurricane Sandy is the need for government to provide timely notification of specific shelter information and educate the public on the location and capabilities of a shelter prior to an emergency.

Short-Term Enhancements

Sheltering Coordinator: VDEM is commencing with the hiring process for a shelter coordinator position, as called for in a recent Joint Legislative Audit & Review Commission (JLARC) study and funded by the state legislature. This position should be brought aboard to begin the task of addressing shelter issues.

Re-open State Homeland Security Grant Program (SHSGP) Funds to Support Shelter Projects: The 2014 SHSGP program grant period was re-opened to allow for additional sheltering projects to be proposed by localities.

Long-Term Strategic Recommendations

Shelter Identification and Assessment: Currently different working lists of shelters exist in each locality. The new shelter coordinator should address the verification and update of these lists with local governments. Additionally, key shelters should be assessed for the structural integrity and ability to withstand winds from storms. It may be necessary to partner with the Virginia National Guard or a private contractor to conduct this assessment.

Shelter Facility Enhancements: Local governments should seek funds or consider incentives to strengthen shelters and add to the number of local shelters that can withstand serious storms. The Commonwealth should consider developing incentives for local governments to enhance or retrofit shelter facilities to higher wind/storm ratings, or design higher levels of protection in new buildings.

Increase Shelter Capacity and Staffing: The Commonwealth should enhance the coordination of SMS implementation procedures with local governments and with the university emergency managers or the state colleges that may serve as SMS hosts. Each local government should review its ability to staff shelters. Shelters should be identified by the type of hazard for which they are viable (i.e., not just for hurricanes).

Citizens Needing Assistance

Citizens who need assistance is intended to capture the people who need help in an emergency, to include those individuals with access or functional needs, those without personal transportation, those requiring medical care, and those with limited economic capabilities.

These Virginians currently are served by a variety of programs. For example, VDEM maintains a state bus contract with private bus companies, which includes para-transit buses. This contract could be employed to help move or evacuate citizens needing assistance. However, the plan lacks detailed linkages with local government plans. The Hampton Roads Metropolitan Medical Response System Strike Team maintains a series of support units and trained staff to support citizens requiring specialty medical care in shelters. These are only two of many programs.

Short-Term Enhancements

FEMA Technical Assistance for Transportation: FEMA has offered to provide technical assistance in developing a pilot project for transportation-dependent citizens with at least one Hampton Roads locality. This should be conducted after the 2014 hurricane season and put in place for 2015.

Long-Term Strategic Recommendations

Technology and Communication: Virginia should capitalize on existing and emergent technology to enhance support of individuals with access and functional needs. Methods of communicating to citizens needing assistance regarding the evacuation plan and options for support should be established.

Engage Stakeholders via Advisory Boards: Virginia should develop an Access and Functional Needs Advisory Panel to identify the emergency preparedness, response and recovery needs of individuals with access and functional needs, to enhance guidance for inclusive planning, and to afford all individuals within the Commonwealth with equal access to programs, services, and activities related to emergencies and disasters. The Governor's Children's Cabinet and the Commonwealth Council on Childhood Success may also provide avenues to address the specific needs of children in a disaster.

Public Information

Public information includes the communication of important and urgent lifesaving information, preparedness messaging, risk communication strategies, and crisis communications.

The Hampton Roads community is a diverse, interconnected region with people crossing jurisdictional boundaries. The region includes a large number of visitors, short-term residents, military, individuals with limited English proficiency, and individuals with disabilities or access and functional needs. Residents often depend on their local officials to keep them informed throughout an emergency. Due to the vast differences in audiences, any communication with this community prior to or during an emergency should also be regional and inclusive.

The need for a regional focus presents a complex task for local, state, and voluntary agency public information officers (PIOs) charged with crisis and emergency risk communication. While great strides have been made in preparedness efforts with the Ready Virginia and Ready Hampton Roads (RHR) campaigns, synchronizing messages during a crisis is difficult. Currently, no regional structure exists to collaborate and coordinate regional messaging in an emergency. As a result, the public potentially could receive conflicting information from these entities regarding emergency preparedness, evacuation, sheltering, or other critical details pertaining to life safety and protection of property and will struggle to locate all of the information they need to make decisions before, during, and after an event.

Short-Term Enhancements

Ready Hampton Roads and Virtual Joint Information Center: The redesign of the Ready Hampton Roads (RHR) website should be completed, finalizing the RHR emergency communications framework, and beginning the virtual Joint Information Center (vJIC) training for public information officers. Virginia and localities should coordinate state and local public messaging and upcoming actions (e.g. news conferences) via conference calls and/or the regional vJIC.

Long-Term Strategic Recommendations

Outreach Campaign, Disability Information & Alert Network, Training and Exercise: RHR should implement a regional emergency preparedness outreach campaign that addresses evacuations, sheltering, and risk awareness for citizens and businesses. RHR should develop the Disability Information & Alert Network (DIAN) program. RHR should conduct a functional exercise for the vJIC that includes activation of the DIAN program.

Social Media: Social media is driving a change in disaster information, making every local emergency an incident with potential global reach. State and local emergency managers must embrace this change in both disaster public communications and in disaster operations.

Appendices

Implementation Guides and Tools

Appendix A: Situational Awareness and State-Local Coordination

Current Tools

WebEOC is the Commonwealth's primary information sharing and situational awareness tool and the official record of the response and recovery. Localities have access to this web-based program and are asked to submit regular situation reports in order to keep the VEOC updated during an event. Additionally, localities use WebEOC to make requests for assistance and resources. WebEOC is monitored in the Watch Center on a 24-hour basis. WebEOC includes boards related to local situation reports, daily operations logs, local shelter status, state shelter status, and traffic cameras. Additionally, WebEOC contains links to VDEM WebFUSION boards, National Capital Region (NCR) boards, power outage information, transportation information, media releases, talking points and weather information

Additionally, VDEM hosts a robust and active Geographic Information Systems (GIS), which provides mapping and geospatial analysis capabilities for routine activities as well as during disaster response and recovery operations. This system, which operates on ESRI's ArcGIS platform, feeds and interacts with WebEOC primarily via the Mapper application. VDEM's GIS system ingests data from other sources, processes it, and makes it available for analysis on a number of viewer platforms, including Mapper, VIPER, and on-demand maps created by VDEM's GIS staff. Together, WebEOC and VDEM's GIS system provide a strong platform for information sharing and situational awareness.

Additional Tools

Other situational awareness tools are used by state agencies and localities. Examples of these include the Virginia Interoperability Picture for Emergency Response (VIPER) – the first viewer of its kind in the Commonwealth), Mapper – an add-on to WebEOC, Ready Hampton Roads (RHR) Viewer, Real-Time Evacuation Planning Model (RtePM), and the Hurricane Evacuation Encouragement Demonstrator (HEED) mobile application. Additionally, VDH uses an independent viewer called Virginia Health Alert and Status System (VHASS).

A situational awareness viewer was developed by the Office of Veteran's Affairs and Homeland Security as an outgrowth of a study conducted on information sharing within the Commonwealth. This tool was created with the intent of populating information in real time by sources readily available and was distributed during the early part of a pilot stage to several localities. While the pilot project was launched in late 2013, the project faltered with the change of administrations and subsequent changes in staffing at the Office of Veteran's Affairs, among other issues.

While not situational awareness tools *per se*, two data sharing platforms operate within the Commonwealth of Virginia – the Virginia GIS Clearinghouse operated by the Virginia Geographic Information Network (VGIN) and the National Capitol Region Geospatial Data Exchange (NCR GDX). These data repositories allow GIS staff and agencies to share geospatial data and information across the Commonwealth.

Current Approach

As a storm approaches, VDEM conducts a state agency call to devise the steps forward based on the status of the storm. Once the state response is determined, VDEM will coordinate conference calls with the localities impacted by the storm to inform them of the planned state response. These calls are generally started with a briefing by a National Weather Service (NWS) representative and then followed up by a report out from each state agency represented on the call. The local representatives will sometimes be polled to ask questions; however, this roll call is not always conducted. These calls are meant to be informative for the localities and not operational in nature at the local level. Some localities will hold a regional call to discuss operational plans within the region following the state call. One of the concerns from the localities is that VDEM does not have a schedule of calls. Local emergency managers want to know ahead of time when to expect the timing of these calls.

An incident is created in WebEOC for localities and state agencies to log and track information. Mapper is populated with information from participating WebEOC boards as it becomes available. Spot reports and situation reports are distributed through the Plans Section of the VEOC at predetermined times. State and local/regional conference calls are scheduled as needed, pre- and post-event.

Identified Issues and Concerns

With the variety of situational awareness tools available a number of issues have been surfaced by localities as well as state agencies.

A common complaint about WebEOC is that it is difficult and cumbersome because of the number of different WebEOC systems in use throughout the commonwealth. For instance, in the Hampton Roads region, three versions of WebEOC exist – the Commonwealth’s version, a regional version, and a local version. This issue is currently being addressed by implementing a tool known as WebFUSION, which allows communication across multiple versions of WebEOC. At present, connectivity among these various systems has been accomplished with WebFUSION and development of WebFUSION capabilities continues.

Another issue that has been raised is that the sheer volume of GIS data and tools for viewing these data is overwhelming and confusing to both the professional emergency management community and the public alike. Because the technology is advancing very rapidly, this problem is unlikely to be resolved naturally in the near future. Efforts have been made in the Commonwealth to identify both the necessary minimum data standards for situational awareness, as well as the tools which display and report on those data. At this point in time, several sources of GIS data and viewing solutions are still in use at both the state and locality level. Ultimately, a coordinated effort between the Commonwealth and localities needs to identify not only tools but data, which are used to inform emergency managers about a current situation. Legacy systems such as VIPER essentially rely on an 'all in one' approach where every data layer available is included in the tool. Currently, this philosophy is shifting somewhat with the recognition that 'packages' of data can be created for particular situational requirements and this approach is fostered by advances in the underlying technology.

Short-Term Enhancements

The following enhancements can be implemented within this hurricane season.

- Virginia should identify an overall situational awareness strategy for the Commonwealth, including appropriate tools and data resources.
- Virginia should refine conference call procedures for state-local and regional conference calls.

Long-Term Strategic Recommendations

The following long-term strategic recommendations can be implemented in the next 18-24 months.

- Virginia should consider supporting a Multi-Agency Coordination Center (MACC) in VDEM Region 5.
- Virginia should continue to identify GIS data layers to facilitate information sharing between local and state organizations.
- VDEM should continue the work currently in progress on the WebFUSION link to allow the different deployments of the product to work together.
- VDEM should continue with work to link various situational awareness tools and/or versions of those tools to enable users to seamlessly share information.
- Virginia should develop training for localities to help familiarize them with the National Weather Service tools.

- Virginia should investigate the use of additional technology resources such as video monitoring and improve planning among the various jurisdictions along the evacuation routes.
- Hampton Roads should increase the number of participants in Emergency Management Assistance Compact (EMAC) requests to areas affected by hurricanes and other disasters to enhance their experience in disaster coordination and response.

Appendix B: Evacuation

Current Approach

The primary planning focus has been on a catastrophic hurricane (CAT 3+) impacting Southeastern Virginia, as identified by the Commonwealth's Threat and Hazard Identification and Risk Assessment (THIRA). The current evacuation plan utilizes an evacuation decision-making timeline that aids Commonwealth agencies in recommending and taking actions as a hurricane approaches the coastline of Virginia. Included within this timeline are recommended decision points regarding a Lane Reversal Plan as one evacuation option. Developed following Hurricane Floyd (1999), this plan describes a lane reversal of the eastbound lanes of Interstate 64 to increase throughput of traffic from Hampton Roads toward Central Virginia. This Lane Reversal Plan was designed to support evacuating a select geographic area of Hampton Roads, specifically Virginia Beach and Norfolk.

A successful approach to evacuation must avoid developing and investing in reactionary plans, and instead dedicate resources to long-term, system-wide solutions that empower both local emergency managers and the citizens they serve.

Short-Term Enhancements

The following enhancements can be implemented within this hurricane season.

- The hurricane evacuation timeline should be adjusted to allow for more time to make decisions and implement plans prior to the arrival of tropical storm force winds. Virginia should approve the revised evacuation planning tools (e.g., timeline) for use this year (see Appendix G). Evacuation Timeline Recommendations should revert back to the 2012 Evacuation Timeline with the following action guideline points:
 - -96 Hours – Initiate deployment of state resources for evacuation activities.
 - -72 Hours – Recommend first call by governor with chief local elected officials concerning evacuation plans/activities (from the previous -48 Hour mark).
 - -48 Hours – Recommend start of mandatory evacuation for a CAT 3 Hurricane (from the previous -38 Hours mark).

Long-Term Strategic Recommendations

The following long-term strategic recommendations can be implemented in the next 18-24 months.

- Virginia should emphasize evacuation planning as a whole in the Commonwealth of Virginia Emergency Operations Plan (COVEOP) and in planning guidance by outlining all of the tools and strategies (not solely lane reversal) currently utilized by state agencies.
- Virginia should develop, enhance, and exercise regional traffic management plans at the state and local levels to improve coordination, traffic flow, and clearance times in an evacuation and provide a flexible evacuation plan.
- Virginia should enhance planning efforts along all evacuation routes to include consideration for needs such as fueling, towing, and law enforcement.
- Virginia should pilot the use of Evacuation Zones (See Appendix H) with localities in the Hampton Roads area.
- Virginia should continue to coordinate evacuation plans with North Carolina.
- Virginia should consider funding for the development, implementation, and retrofits of critical evacuation routes to increase throughput and evacuation clearance times.
- Virginia should consider reviewing evacuation terminology (i.e. voluntary, mandatory) to ensure the appropriate message is being communicated.
- Virginia should consider implementing a program to increase gas station resiliency.

Appendix C: Sheltering

Current Approach

Local jurisdictions are responsible for evacuation and sheltering. The Commonwealth is responsible for supporting the localities throughout all phases of emergency management. The individual jurisdictions do the bulk of planning and preparedness separately with guidance from both the state and federal governments. Any remaining gaps across plans are worked out through several groups such as Hampton Roads Emergency Management Committee (HREMC), Regional Emergency Management Advisory Committee (REMTAC), Regional Catastrophic Planning Team (RCPT), and the Hurricane Evacuation Coordination Workgroup.

Options have been developed to support statewide response to emergencies, such as state-managed shelters (SMS). However, even large-scale solutions and tools have limitations. Currently, Virginia continues these best practices knowing leaders will need to make tough decisions to implement feasible solutions, particularly inland host shelters, which offer the flexibility, feasibility, and cost effectiveness required to adequately close identified gaps in capacity.

The Commonwealth is endeavoring to assist localities in tackling big regional problems. Virginia would like to assist individual localities with solving local problems through pilot projects with the intent that solutions will be shared and modeled for all the localities in the Commonwealth.

Short-Term Enhancements

The following enhancements can be implemented within this hurricane season.

- Per Senate Bill 310, VDEM will conduct a thorough nationwide search to identify an innovative leader to assume the position of Sheltering Coordinator to improve and coordinate with the Department of Social Services (DSS) and the Department of Health (VDH) on the Commonwealth's sheltering preparedness and capabilities in the event of evacuations due to natural or man-made disasters by reviewing, evaluating, and developing a state-wide master plan for the implementation and operation of state and local emergency shelters in the Commonwealth.
- State and local shelter locations should be identified to include shelters that can meet the needs of individuals with access and functional needs. A recent federal court ruling indicates that prior knowledge of shelter locations allows for more complete personal preparedness planning.

Long-Term Strategic Recommendations

The following long-term strategic recommendations can be implemented in the next 18-24 months.

- Localities should apply to use the State Homeland Security Grant Program funds for upgrading shelter resiliency.
- Virginia should reevaluate and/or enhance state-managed shelter (SMS) procedures with input from local governments.
- Virginia should encourage each locality to increase its shelter capacity and capability.
- Virginia and localities should consider alternatives to alleviate staffing limitations.
- Virginia should encourage congregate care facilities to have robust emergency action plans.
- Localities should share local shelters and related information with the state. Shelters should be identified by hazard/risk levels for which they are viable (not just hurricanes).
- Virginia should consider conducting a constructive engineer assessment of currently identified shelter buildings.
- Virginia should provide incentives or enhancements to localities to retrofit shelter facilities to higher wind/storm ratings.
- Virginia should identify building codes guidelines to increase shelter resiliency.
- Virginia should create a list of anticipated resources needed for state and local shelters.

Appendix D: Citizens Needing Assistance

Current Approach

Since Hurricane Katrina, a significant focus on planning for response to special needs populations has evolved. Virginia developed a Special Needs Annex for its existing Local Emergency Operations Plan Template (LEOPT). Subsequently, a workshop was conducted in each of VDEM's regions on the use of the Special Needs Annex in partnership with stakeholders of these populations. With several of the agencies involved in the planning and workshop effort, VDEM formed a Special Needs Cadre within Emergency Support Function (ESF) 6 (Mass Care) to assist localities in addressing related issues that might arise during a response. More recently, consideration has been given to the creation of an Access and Functional Needs Advisory Panel at the state level, mirroring a similar entity created in Hampton Roads.

In an effort to support local evacuation planning efforts for its identified transportation-dependent population, the Commonwealth obtained a contract for evacuation bus operations that includes 1140 buses/motorcoaches, 60 paratransit vehicles, and 100 minibuses for stranded motorist clearance.

At the request of the locality, evacuation resources are staged at a pre-designated locality pick-up point (LPUP) where residents who are transportation dependent and/or have other mobility challenges can be picked up to be evacuated. The locality is responsible for developing mechanisms and routing for picking up its residents and delivering them to the LPUP. However, locality-based routing plans to the LPUPs may not have been developed. These routing plans should outline how local buses will route, designate where they will pick up citizens, and identify the populations that will need assistance and the specifics of that assistance.

As this in-season review was being initiated, FEMA Region 3 offered technical assistance to the Commonwealth to assist localities in developing planning for transportation-dependent citizens (see Appendix F).

In an effort to identify the vulnerable population, VDEM partnered with the University of Richmond to conduct data mining of sources tracking various populations with disabilities or access and functional needs. This information is now available to localities and FEMA.

Additionally, Norfolk has developed a partnership with the Virginia Modeling, Analysis and Simulation Center (VMASC) at Old Dominion University, which appears to have identified individuals with disabilities or access and functional needs to a level below the city-wide view. Furthermore, the two academic institutions are now aware of the other's efforts.

Short-Term Recommendation

The following enhancements can be implemented within this hurricane season.

- Virginia should partner with FEMA to conduct a pilot to develop planning for transportation-dependent citizens with at least one Hampton Roads locality.

Long-Term Strategic Recommendations

The following long-term strategic recommendations can be implemented in the next 18-24 months.

- Virginia should develop an Access and Functional Needs Advisory Panel.
- Virginia should utilize technology to enhance support of individuals with access and functional needs.
- Localities should use funding from the State Homeland Security Grant Program to support evacuation planning for citizens needing assistance.
- Virginia should enhance existing mechanisms to relocate vulnerable populations in the Hampton Roads region.
- Virginia should revisit the bus contract to determine if it is sufficient.
- A routine method of communicating to citizens needing assistance in the evacuation plan on the local level should be established.

Appendix E: Public Information

Current Approach

When coordinating public information, public information officers (PIOs) might call each other directly, but only occasionally, to verify facts and rely heavily on state-coordinated public information conference calls. It should be noted, however, that the region's PIOs see these calls as a way to hear other agency and locality messaging rather than as an opportunity to collaborate and coordinate messaging. PIOs might be affiliated with two regional groups – the Hampton Roads Emergency Services Media Council (HRESMC) and the Ready Hampton Roads (RHR) Subcommittee. The HRESMC includes local news media in membership and serves as a networking opportunity for PIOs. The RHR Subcommittee is in the beginning stages of developing a regional public information system and virtual Joint Information Center (vJIC), and membership includes both emergency management and PIOs; no news media.

ReadyHamptonRoads.org initially was established by the City of Chesapeake as a way to recruit volunteers for the Community Emergency Response Team program. In 2012, the Hampton Roads Planning District Commission (HRPDC) took ownership of the website and brand to work together with the Regional Emergency Management Technical Advisory Committee (REMTAC) to create a single brand and location for the public to find preparedness information. The RHR brand is currently used for outreach at regional and local events, social media preparedness campaigns, and as a connection between the public and the local emergency management offices. To date, however, very little promotion and advertising has been done due to lack of funding.

The HRPDC is developing a regional communications platform that will serve as a virtual hub for internal and external emergency public information. The existing RHR website will host this platform, and it will function as an aggregate site for participating localities, emergency management partners, and community non-profits to provide Hampton Roads residents and visitors a one-stop shop for public information and preparedness education. This website will provide a secure structure and process for collaborating on and coordinating regional messages and creates a vJIC for government, private sector, and voluntary agency public information officers to use. This system and website will be provided at no cost to localities and only minimal cost through grant funding.

The first RHR Subcommittee meeting was in July 2014. Meetings will be held monthly until the website is complete, content is created, and standard operating procedures are developed for both the use of the ReadyHamptonRoads.org site and the vJIC. The subcommittee also will develop vJIC training and an annual exercise that focuses on disaster public information.

Short-Term Enhancements

The following enhancements can be implemented within this hurricane season.

- Virginia should assist the HRPDC's REMTAC in the development of the RHR Subcommittee structure. This subcommittee will be responsible for :
 - Completing the redesign of the RHR website,
 - Finalizing the RHR emergency communications framework, and
 - Beginning the virtual Joint Information Center (vJIC) training for public information officers.
- Virginia and localities should coordinate state and local public messaging and upcoming actions (e.g. news conferences) via conference calls and/or the regional vJIC.

Long-Term Strategic Recommendations

The following long-term strategic recommendations can be implemented in the next 18-24 months.

- The RHR Subcommittee should implement a regional emergency preparedness outreach campaign that addresses evacuations, sheltering, and risk awareness for citizens and businesses.
- The RHR Subcommittee should develop the Disability Information & Alert Network (DIAN) program.
- The RHR Subcommittee should continue ongoing vJIC training and development of standard operating procedures.
- Virginia should enhance efforts to monitor and report on discussions related to regional emergencies on social media platforms.
- The RHR Subcommittee should conduct a functional exercise for the vJIC that includes activation of the DIAN program.
- Virginia should consider funding options to continue regional campaigns, website, and communication initiatives.

Appendix F: Additional Capabilities and Tools to Support Hurricane Preparedness and Response

Training Requested

1. FEMA's Hurricane Preparedness for Decision Makers

Virginia is working with the National Hurricane Center to schedule the 3-day L-0320 course, Hurricane Preparedness for Decision-Makers: State Specific to be delivered in Virginia prior to the next hurricane season. The state-specific tailored course is designed to guide and instruct up to 25 participants on essential state-specific meteorological and emergency management information for making hurricane evacuation and related critical decisions.

2. FEMA's Hurricane Preparedness and Response Course

The IEMC/Hurricane: Preparedness and Response course addresses preparedness and response in emergency situations resulting from a hurricane. This exercise-based course places public officials and other key community leaders in a disaster simulation to focus on evacuation issues prior to the simulated hurricane making landfall and response activities after landfall.

3. Hurricane Center One-Day Executive Course

The VDEM state coordinator participated in a one-day executive training course at the National Hurricane Center.

Situational Awareness

Virginia has enhanced the video teleconferencing capabilities in Hampton Roads for utilization by the governor to communicate with mayors and chief administrative officers in the region.

Evacuation

1. Virginia is working with Virginia Modeling, Analysis and Simulation Center (VMASC) to develop a Real-time Evacuation Planning Model (RtePM) to be made available to state agencies and localities for unlimited all-hazards evacuation planning.
2. Virginia is working to pilot the use of Evacuation Zones with localities in the Hampton Roads area.

Citizens Needing Assistance

As this in-season review was being initiated, FEMA Region 3 offered technical assistance to the Commonwealth to assist localities in developing planning for transportation-dependent citizens. Specifically, FEMA headquarters will direct its retained contractor, Transportation Management Services (TMS), to work with a locality and develop a detailed routing plan and locality pick-up point (LPUP) layout model.

Because Norfolk's population can quickly be put at a significant disadvantage when faced with a disaster and to support existing planning efforts that include individuals with disabilities or access and functional needs, it has been identified as the most appropriate locality in which to pilot this effort. The Norfolk emergency manager has agreed to this approach.

A preliminary discussion was held with FEMA staff, TMS, Norfolk's emergency manager, and VDEM staff. The consensus was that the pilot could benefit other Virginia localities once it is determined successful. The parties involved have received a draft of the project's scope in advance of a scoping meeting, which will be held after mid-August. Partners will continue to ensure this effort is part of and coordinated with a larger evacuation effort considerate of all populations with disabilities or access and functional needs.

Coordination and Planning

The Hampton Roads Regional Catastrophic Planning Team (RCPT) will share planning documents and shelter data with Richmond area localities.

Enhanced Capabilities

Virginia is extending the grant proposal period for the 2014 State Homeland Security Grant Program (SHSGP) to enhance capabilities in key topic areas (i.e. sheltering, access and function needs, and multi-jurisdictional planning).

National Protection and Programs Directorate Study Update

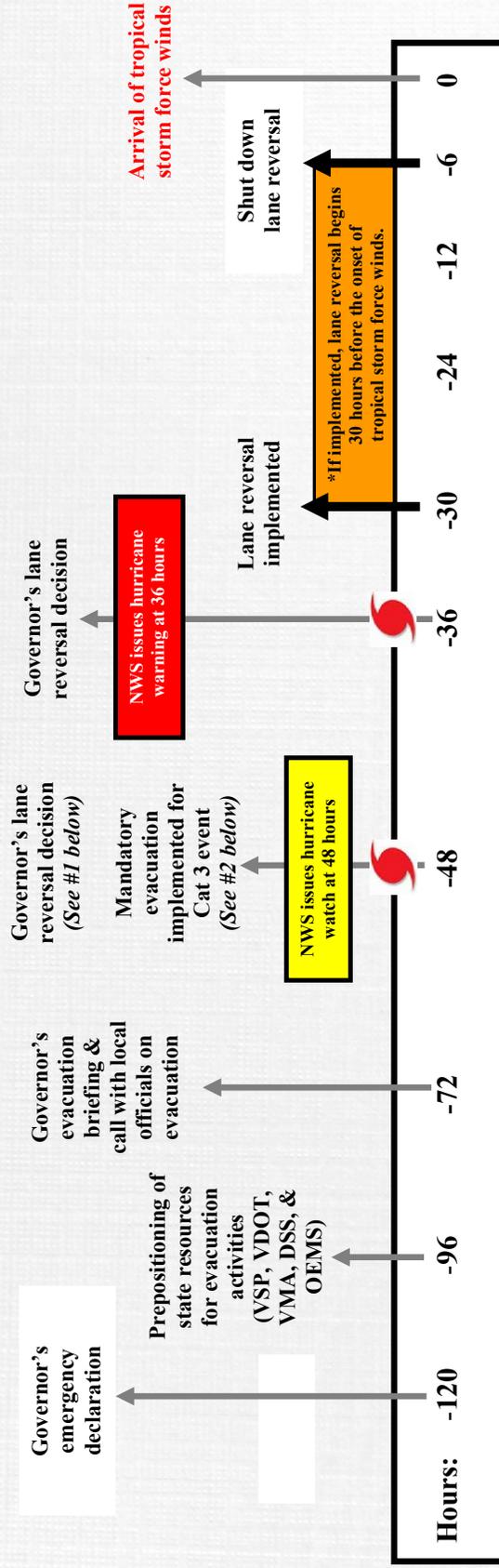
The Department of Homeland Security (DHS) National Protection and Programs Directorate will conduct a study of critical infrastructure impacts based upon a storm-model as selected by Virginia next year (last done in 2008).

Enhanced Focus on Recovery Next Year

The annual Virginia Emergency Response Team Exercise (VERTEX) has traditionally validated the plans for an initial response to a disaster. Using the building block approach to exercises, the local, state, and federal partners have progressed from discussion-based exercises through a full-scale exercise with a consistently organized and effective response to any type of disaster. At this time, the Commonwealth needs to move into the recovery phase of emergency management. Subsequent years for VERTEX will focus on how the same local, state, and federal partners respond after the disaster addressing issues such as intermediate and long-term housing, economic recovery, infrastructure rebuilding, and communications. Using the same building block approach (beginning with discussion-based and moving to full-scale) the 2015 VERTEX is planned to be a recovery workshop followed a functional recovery exercise in 2016.

Appendix G – Proposed Hurricane Evacuation Timeline

Commonwealth of Virginia Hurricane Evacuation/Lane Reversal Timeline



Timeline shows maximum times and trigger points for Category 1-3 hurricanes. The timeline may vary depending on the storm.

#1 – State resources move from pre-staging areas to duty post with lane reversal decision.

#2 – Evacuation implementation point for Southside Hampton Roads, with or without lane reversal decision. (Bowers Hill Evacuation Traffic)

Appendix H– Evacuation Zones

Strategic Enhancements

Evacuation Zones (EZ), which include smaller zones within each storm surge prone locality, were developed during the 2009 Virginia Hurricane Evacuation Re-Study and were the foundation of the transportation and shelter analysis. However, in Virginia, they are not utilized nor referred to by a majority of localities during evacuation decision making process.

EZs are used as a baseline to determine numbers of evacuating people and vehicles and which routes they will use. EZs are also used to estimate shelter demands for each locality. These numbers ultimately translate into the evacuation clearance times and shelter population gaps.

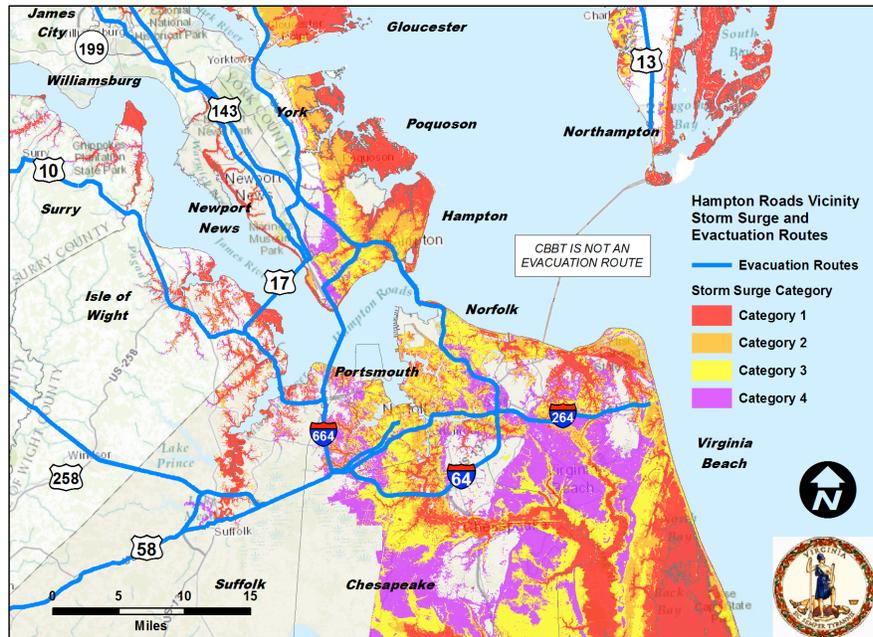
EZs are intended to be a tool that local officials can use to communicate the specific boundaries of areas needing to evacuate their citizens due to storm surge flooding. Localities in Virginia have generally chosen to use the more global designations of Storm Surge Zones, which show the worst case, unrealistic scenario of potential surge inundation by hurricane category rather than using the EZs for specific storm tracks.

Typically, citizens are advised by localities to evacuate “low lying areas” without providing specific area identification. Historically, the storm scenarios in which this guidance has been given have been minimal hurricane/tropical storm scenarios. Such guidance would not be appropriate for a Category 2 or 3 scenario, and would likely cause confusion.

Some of the localities realized the importance of the utilization of the Hurricane Evacuation Zones during the 2014 National Hurricane Conference and have identified EZs as a goal that should be institutionalized at the local level.

Virginia was provided new storm surge data in 2012 for the Norfolk Basin and was provided additional new data in 2014 for the new Chesapeake Bay Basin, which supersedes that provided by the 2009 Virginia Hurricane Evacuation Re-Study. The U.S. Army Corps of Engineers, Norfolk District, is currently analyzing this data at the state’s request to determine if sufficient change warrants an update to existing Evacuation Zones and Storm Surge Zones.

If Virginia decides to transition to Evacuation Zones, Virginia should develop a plan to standardize the marking of the evacuation zones and routes. This plan could be similar to those used in other states (see examples on the next page).



In conjunction with the signage plan, a public education campaign should be launched to bring about the cultural change emphasized in the document. Ideas such as including the information in water bills are excellent ways to reach people. Virginia should develop an evacuation quick reference section in the Ready Virginia and the Ready Hampton Roads websites and produce a quick response (QR) code that links to that information. That QR code could be included in all evacuation information documents to provide an easy link to more specific information.



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