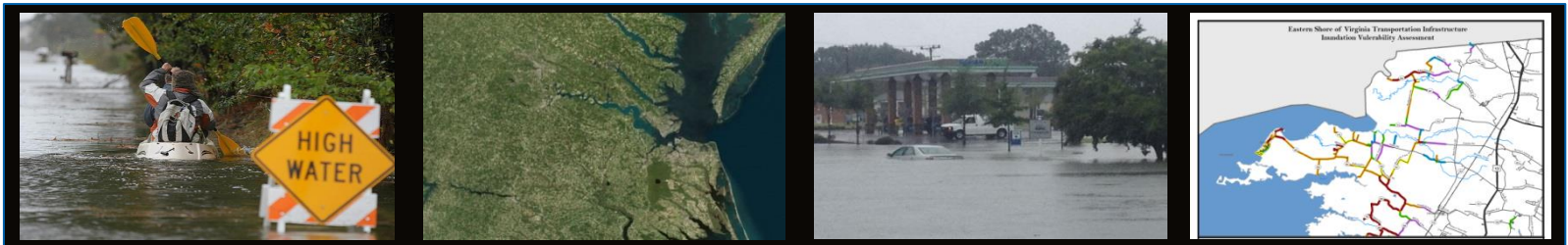




# Joint Subcommittee on Recurrent Flooding Transportation Presentation



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**VDOT Hampton Roads District**  
**September 14, 2016**

## Subcommittee Items of Interest

### Status of 2008 VDEM Hurricane Evacuation Study

Newly approved projects impact on reducing hurricane evacuation time or addressing storm surge impacts

How does safety (storm surge/recurrent flooding) play into SmartScale metrics?

There is a resiliency component to FastAct. Could the Commonwealth utilize FastAct funding to address resiliency issues?

Storm surge - potential submergence of roadway reduction with newly approved projects.

VDOT Drainage map

# Hurricane Evacuation

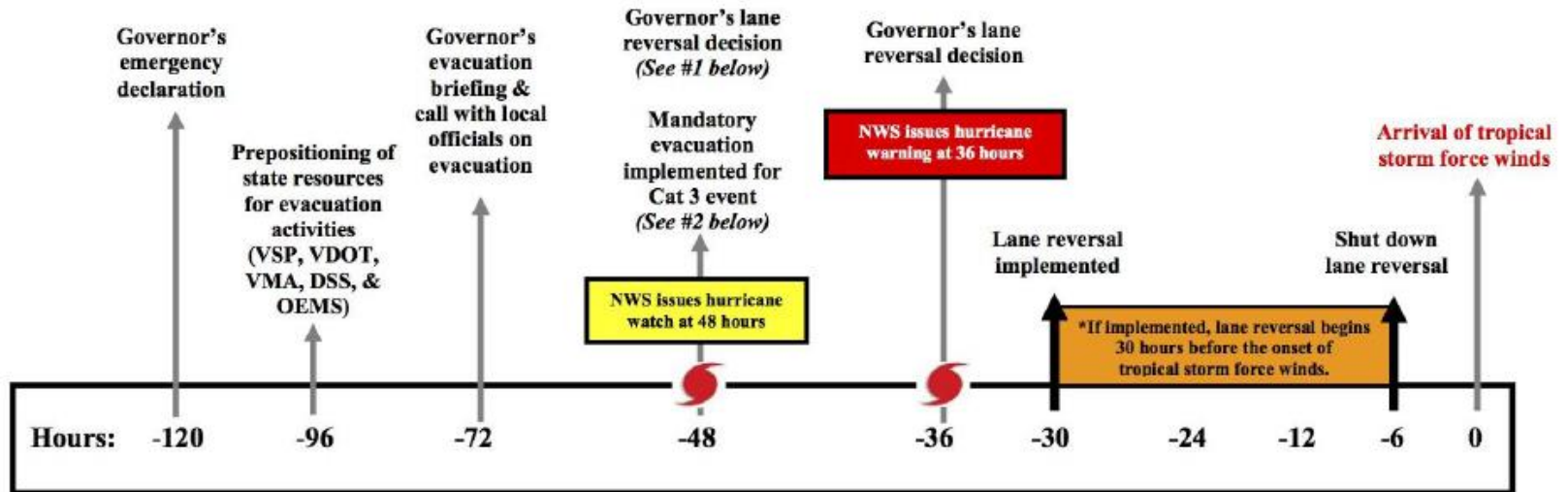
- **Hurricane Evacuation Model has not been adjusted to account for new capacity improvements yet...**
- **VDEM 2008 Study showed:**
  - **I-64 to I-295 Evacuation Commute Time for CAT 3**
    - 15 hours 30 min with lane reversal
    - 27 hours 45 min without lane reversal
- **Significant work being completed by USACOE, VDEM, HRTPO and others that will provide inputs for updating model next spring**
  - **Better defined evacuation zones and participation rates (model inputs)**
  - **Geometric changes will be made to model (base model configuration)**
  - **New modeling runs will start next spring**
- **2014 Governor initiated Hurricane In-Season Review**
  - **Adjusted Hurricane Evacuation Decision-Making Timeline**
    - May provide up to additional 12 hours for deciding on evacuation
  - **De-emphasized I-64 Lane Reversal / Emphasized Evacuation of Vulnerable Areas**
  - **VDEM leading evacuation sheltering planning & improvements**

## Sheltering Planning & Improvements

- **VDEM hired full time, statewide sheltering coordinator to focus solely on sheltering planning & improvements**
- **Established 10 working groups that came out of in season review dealing with:**
  - **Funding**
  - **Capability**
  - **Capacity**
  - **Staffing**
  - **Facility Resilience**
  - **and Additional Resource Needs**
- **VDEM appropriate agency to provide specific updates**

# Hurricane Evacuation/Lane Reversal 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*)

## Smart Scale

- **Smart Scale metrics do not specifically address sea level rise or evacuation routes**
  - Points are not given for mitigation of future potential sea level impacts
  - Points are not given for a specific route designation of an evacuation route
- **The reliability measure under the Economic Development Factor does give credit for projects that improve the reliability of a facility**
  - The definition of reliability would include weather related impacts such as recurrent flooding or snow
- **The CTB is required to follow the Smart Scale screening and scoring process but can consider other factors in project selection**
- **The report “Sea Level Rise and Storm Surge Impacts to Roadways in Hampton Roads,” published by the Hampton Roads Transportation Planning Organization (HRTPO), includes the recommendation to review the HRTPO prioritization tool and incorporate sea level rise and vulnerability.**

## Projects

- **New capacity improvement projects utilize existing roadway profiles and do not account for sea level rise (I-64 Widening on Peninsula and South Side)**
- **On I-264/Witchduck project, all roads are above elevation 11, which complies with the “sea level rise” Executive Order. Per the FEMA maps, the Base Flood Elevation (BFE) of the lake is 8.0.**
  - Per the Federal Flood Risk Management Standard (Amendments to Executive Order 11988) developed to increase resilience against flooding such as potential sea level rise, new federal roads must be built above the adjusted floodplain which is calculated “by adding an additional 2 feet to the base flood elevation for non-critical actions and by adding an additional 3 feet to the base flood elevation for critical actions”.

## I-64 Widening & High Rise Bridge

- Since we are not reconstructing the existing pavements, our profile grade lines are generally “spline grades” – they match the existing roadway grades.
- The only new roadway construction that we have is at the approaches to the new HRB, where the profile grade lines were designed to meet minimum interstate construction design criteria – no flooding of the roadway during a 25-year storm event.
- The vertical clearance of the HRB was determined to be 100ft. The clearance is based on the mariners need of 95ft + 2.5ft for sea level rise + 2.5ft of extra clearance to round up to 100ft.



## Midtown Tunnel/MLK Expressway

- **Preliminary Hydrologic and Hydraulic Design Report**
  - **Constructed 10' wide berm behind crash house to prevent overland flow encroaching onto the roadway**
  - **Upgraded existing pump station (to south portal) to address additional flow from re-directed storm drains**
  - **Raised profile of Ramp B**
  - **Constructed 10' wide berm between Ramp B and Brambleton Avenue**
  - **Raised Bicycle path near portal, to prevent tidal waters from entering the portal from the north**
  - **Constructed 10' wide berm behind pump station to prevent overland flow from the south.**
  - **Overall “2 additional feet of flood protection”**

## FAST Act

- **Achieving resilient transportation system by addressing:**
  - Existing Infrastructure Resilience
  - New Infrastructure Resilience
  - System Resilience
- **DOT will focus on:**
  - Engaged and strong partnerships and information sharing at all levels of government;
  - Risk-informed decision-making and the tools to facilitate it;
  - Adaptive learning, in which experiences serve as opportunities to inform and adjust future actions; and
  - Preparedness planning for both its own operations as well as its mission programs.

## Inundation Impacts

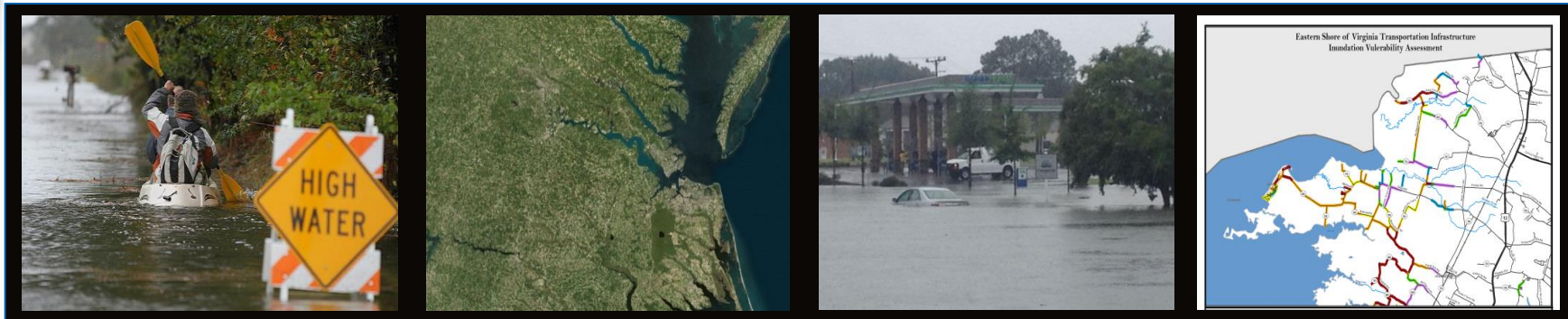
- **ANPDC and HRTPO have recently completed studies to map inundation impacts on transportation infrastructure**
- **HRTPO Study recommends considering relative sea level rise when selecting future projects**

## Summary

- **There are multiple efforts identifying impact areas**
- **Yet there is no policy requirements or guidance to incorporate solutions in roadway development outside of our current hydraulic analysis, where the hydraulic analysis is normal project development**



## Questions?



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