

**Conceptual Model for Conducting Climate Change Vulnerability and
Risk Assessments of Transportation Infrastructure
*Hampton Roads, Virginia Implementation Pilot***

Virginia Department of Transportation

Hampton Roads Planning District Commission

University of Virginia Center for Transportation Studies

University of Virginia Center for Risk Management of Engineering Systems

Hampton Roads Transportation Planning Organization

Description of the Proposed Effort

The Hampton Roads region is a heavily populated, coastal area in southeastern Virginia (for a map of the region, please see Figure 1 on page 2). With its ports, military installations, recreational and historical resources, and industry, Hampton Roads plays a key role in the economy and security of Virginia and the nation. To illustrate this, consider that a recent study has shown that Hampton Roads' Port of Virginia, one of the nation's most active, has a role in 1 in 9 jobs in Virginia. The provision of transportation services in the region is particularly challenging due to the large number of major bodies of water, as well as the fact that large populations live in areas already subject to flooding during storm events. This challenge will become more significant due to the impact of climate change. In a United States Geological Survey (USGS) study, Hampton Roads area is considered to be second only to New Orleans in terms of overall risk from the increased occurrence and intensity of coastal storms that are predicted to occur as a result of climate change.

Given Hampton Roads' importance, coastal location, and complex transportation system, state and local agencies have been working to prepare for the impact of climate change. The opportunity to conduct a pilot implementation of FHWA's conceptual model for assessing vulnerability and risk and climate change effects on transportation infrastructure is a critical opportunity to further the on-going work in the region, and to prepare to move towards adaptation activities.

VDOT, through its Virginia Transportation Research Council (VTRC), will serve as the lead agency for this project. It will partner with the Hampton Roads Planning District Commission (HRPDC) and the region's MPO, the Hampton Roads Transportation Planning Organization (HRTPO). Finally, the team will include two research centers at the University of Virginia (UVA), the Center for Transportation Studies and the Center for Risk Management of Engineering Systems. UVA will bring to the team expertise in transportation infrastructure and operations, climate change, and risk analysis. This broad and highly capable team, which will be described in more detail in the following section, will allow this project to meet the following objectives:

1. To identify, analyze, and prioritize a comprehensive set of transportation assets in Hampton Roads that have the highest exposure to climate change threats, and have the highest potential for significant impacts due to climate change. This will serve as the foundation for future work focused on identifying and implementing specific adaptation items.
2. To incorporate the consideration of vulnerabilities due to climate change into ongoing work addressing infrastructure protection from a security perspective.
3. To document lessons learned in applying FHWA's Risk Assessment Model, and to develop specific recommendations for the FHWA to consider in revising the model.

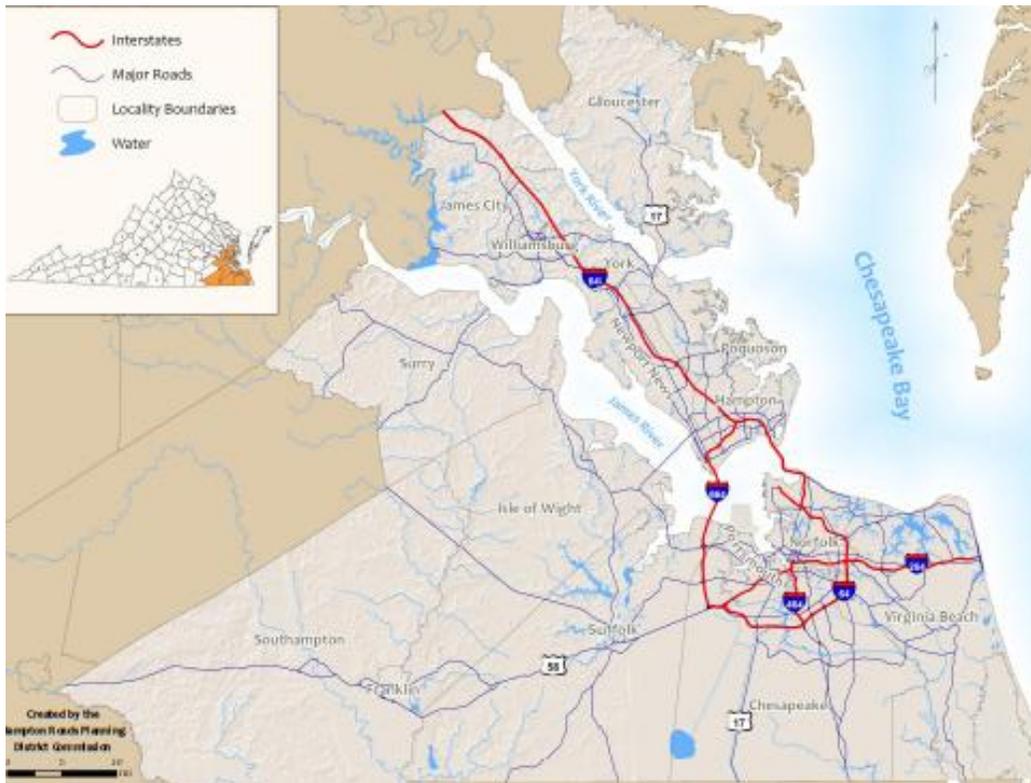


Figure 1. Hampton Roads Region