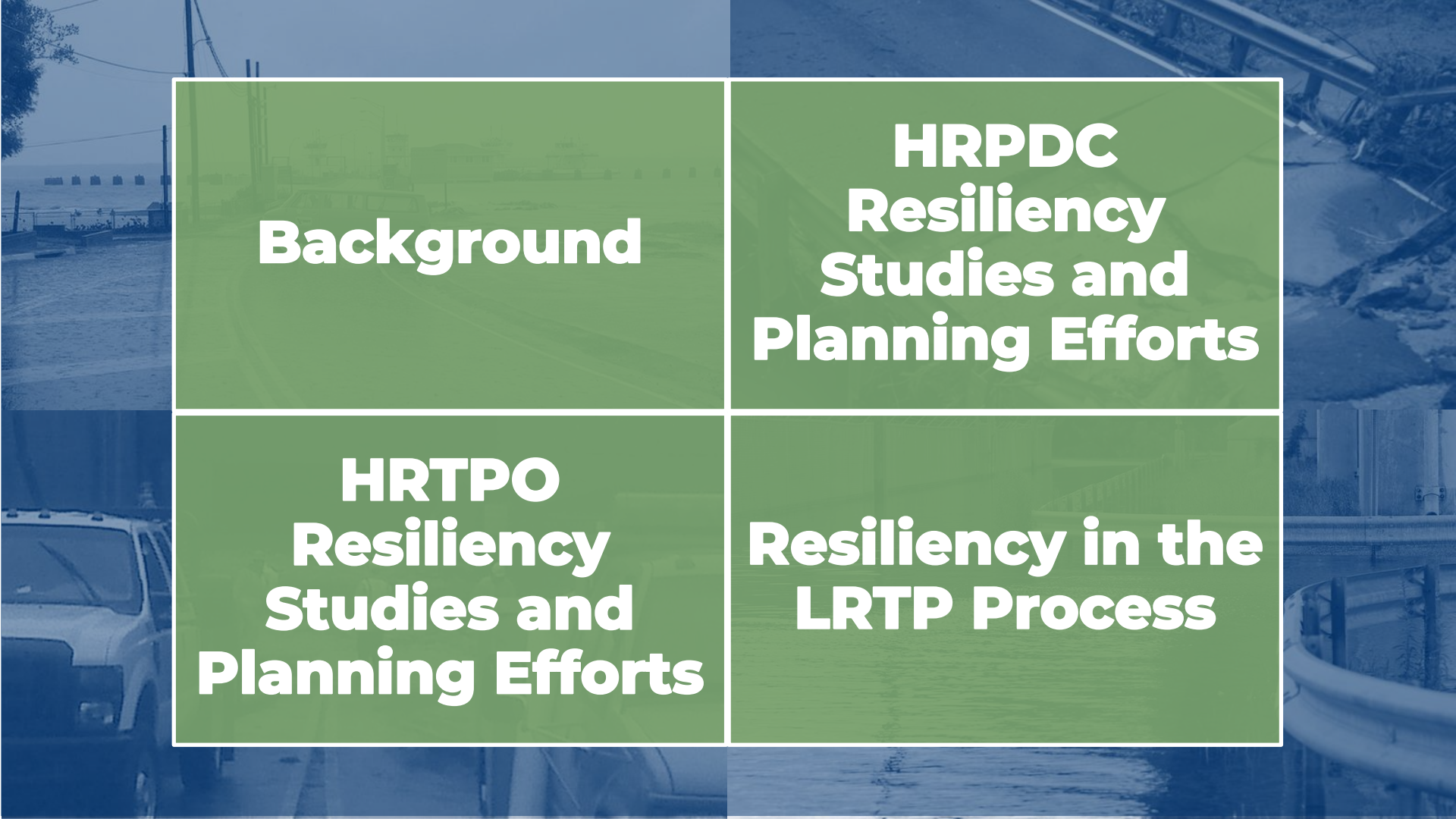
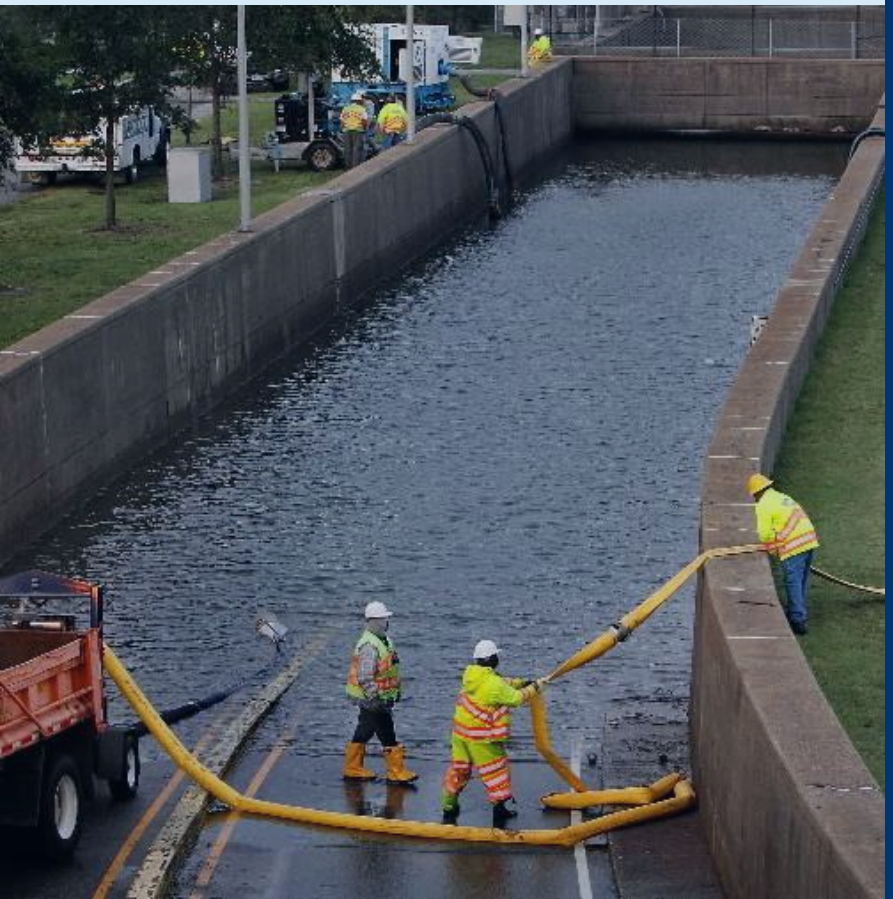
RESILIENCY CONSIDERATIONS IN PLANNING

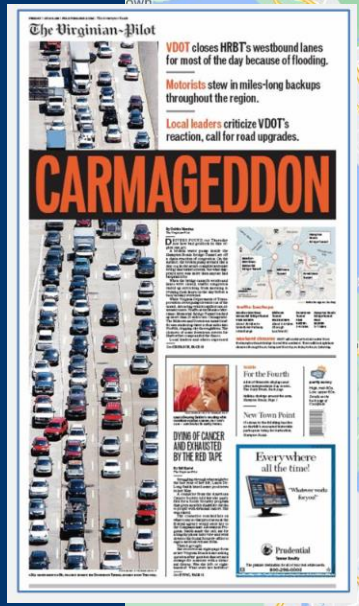

Background
HRPDC Resiliency Studies and Planning Efforts
HRTPO Resiliency Studies and Planning Efforts
Resiliency in the LRTP Process

Flooding of the Midtown Tunnel



RESILIENCY CONTEXT

- Several events have shut down critical infrastructure in the region


The Virginian-Pilot

VDOT closes HRBT's westbound lanes for most of the day because of flooding.

Motorists stew in miles-long backups throughout the region.

Local leaders criticize VDOT's reaction, call for road upgrades.

CARMAGEDDON

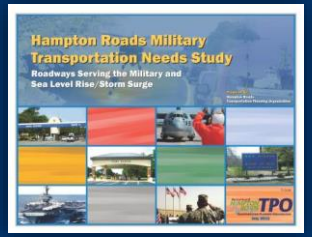
DYING OF CANCER AND EXHAUSTED BY THE RED TAPE

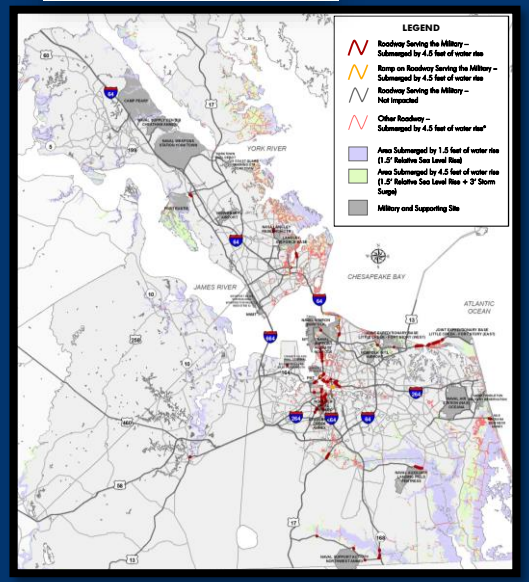
Everywhere all the time!

Prudential

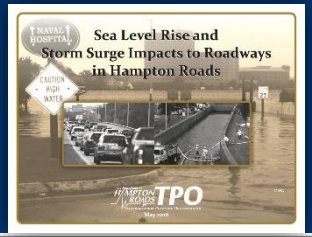
HRTPO STUDIES – VULNERABILITY ANALYSES

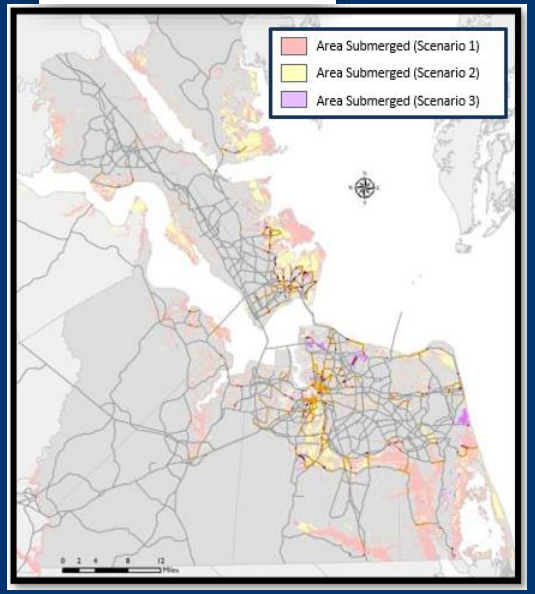
2013





2016





Identify Vulnerabilities and Develop Adaptation Strategies

- Identify roadway segments vulnerable to flooding to develop adaptation strategies
- Raise awareness of potential flood locations to consider during design

Project Evaluation and Prioritization

- Use study results to add a "flooding vulnerability" component within the Project Prioritization Tool

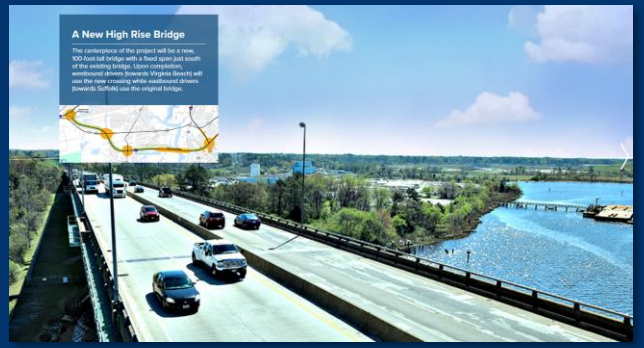
STUDIES THAT HAVE INCORPORATED 2016 SLR/SS STUDY

- JBLE Fort Eustis JLUS – Jan 2018
- Hampton Roads Military Transportation Needs Study – 2018 Update – Jul 2018
- Isle of Wight County Transportation Study – Jul 2019
- Norfolk and Virginia Beach JLUS – Aug 2019
- Hampton-Langley Air Force Base JLUS Study Addendum: Resiliency and Adaptation – Aug 2019
- Historic Triangle Comprehensive Transportation Study – Jul 2020
- 2045 LRTP - 2021
- Portsmouth and Chesapeake JLUS – Apr 2021
- Gloucester County Transportation Study – Oct 2021
- JBLE Langley Transportation Management Plan (TMP) – Oct 2023
- Chesapeake Industrial Waterfront Study – Aug 2023
- Hampton Roads Freight Facilities Interactive Map – Aug 2023
- City of Hampton Comprehensive Transportation Study
- City of Chesapeake Comprehensive Plan – Feb 2024
- City of Portsmouth Local Studies (Safe Streets and Roads for All & OLDCC Grant) – Mar 2024

INTEGRATING ADAPTION STRATEGIES

- Adaptation strategies reduce potential impacts to ensure transportation system reliability and resiliency

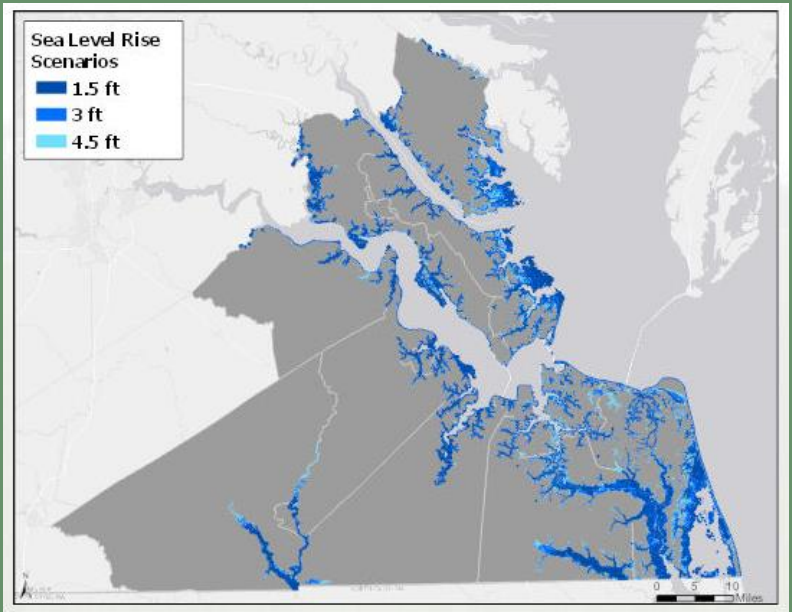
- **Wythe Creek Road widening project**
  - Coordination between Poquoson, Hampton, and NASA
  - Used inundation mapping tool and modeling to make design modifications



- **I-64 Southside High Rise Bridge project**
  - As a result of sea level rise planning efforts, VDOT increased bridge design height by 5-feet to account for future sea level rise

ENHANCING RESILIENCY CONSIDERATIONS IN THE LRTP

Sea Level Rise Scenarios



- **Scenario Planning**
- **Project Prioritization Measures**
- **Data-driven, Objective, Comprehensive Inputs**
- **Resiliency Pilots with Volpe and Fernleaf**

2050 LRTP Draft Scenario Narratives

Greater Urban Growth

Greater Suburban Growth

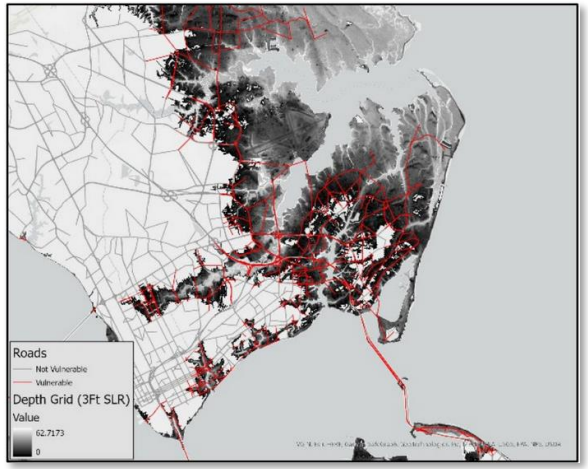
Greater Inland/ Westward Growth

Sea Level Rise/Storm Surge Assumptions (based on Regional SLR Policy)

Greater Urban Growth	Greater Suburban Growth	Greater Inland/ Westward Growth
3-feet Sea Level Rise 10-year Storm Surge	3-feet Sea Level Rise 100-year Storm Surge	4.5-feet Sea Level Rise 100-year Storm Surge

VOLPE RDR TOOL OVERVIEW

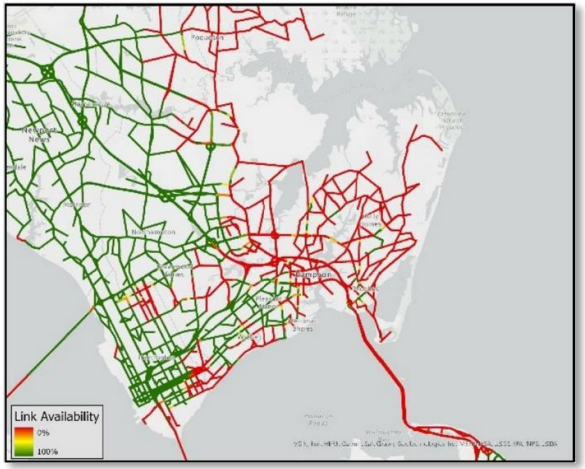
RDR EXPOSURE ANALYSIS TOOL



Maximum network exposure on each link

- Identify network assets vulnerable under given hazard condition

RDR LINK CAPACITY LOSS CALCULATION



Capacity reduction on each link

- Assess lost/reduced capacity under given hazard condition

PROJECT RANKING BY ROI, PERFORMANCE UNDER UNCERTAINTY

- Identify resiliency-focused projects that provide most benefit across range of hazard scenarios

Source: Volpe

VOLPE RDR TOOL: HRTPO PLANNING APPLICATIONS

Scenario Planning

- Multiple flooding scenarios

Candidate Project Identification

- Identification of high disruption assets for project consideration
- Project design/cost refinement incorporating resilience

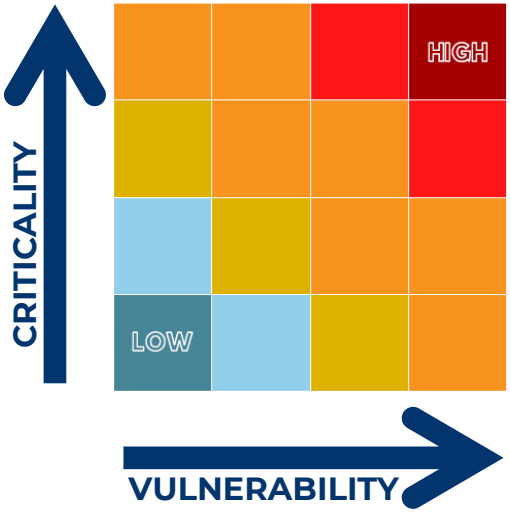
Factors for Project Prioritization

- Vulnerability/exposure across scenarios (added equity and transit)
- Disruption severity/change in network performance
- Refinement of cost effectiveness measures

Fiscal Constraint

- Help identify critical projects to constrain in LRTP

Measuring Criticality and Vulnerability



RESILIENCE/ EQUITY PILOT WITH FERNLEAF

- Extreme weather/climate-induced events have had a disproportionate impact on socially vulnerable populations

- Build off Volpe RDR Tool and JLUS efforts
  - Data-driven objective measures to include in Project Prioritization

- Approach:
  - Screening Level Analysis
  - Combines Social Vulnerability with Roadway Network Analysis

fernleaf

RISE
Resilience Innovations


Thank You!