

# Resiliency Enhancements

## HRTPO Project Prioritization

RESILIENCY ENHANCEMENTS APPROVED JULY 2025

FOR QUESTIONS, CONTACT:  
DALE M. STITH, AICP, GISP  
HRTPO PRINCIPAL TRANSPORTATION PLANNER



# HRTPO LRTP Approach



## EXPLORATORY SCENARIO PLANNING

- Prepare for future uncertainty
- Candidate projects evaluated across all scenarios to identify most robust projects



## PROJECT PRIORITIZATION TOOL

- Objective, data driven methodology
- Performance-based approach
- Used to select projects for LRTP and TIP



## RESILIENCY AND VULNERABILITY PLANNING

- Evaluate potential impacts of multiple Sea Level Rise and storm surge flooding scenarios



## EQUITY AND ACCESSIBILITY

- Enhance Equity and Accessibility measures

# 2050 LRTP Scenario Narratives



## Greater Urban Growth



## Greater Suburban Growth



## Greater Inland/Westward Growth



### WHAT THESE HELP US TEST

Test more urban and multimodal travel patterns.

Test more overall regional travel.

Test major impacts from climate change and alternate commuting patterns.

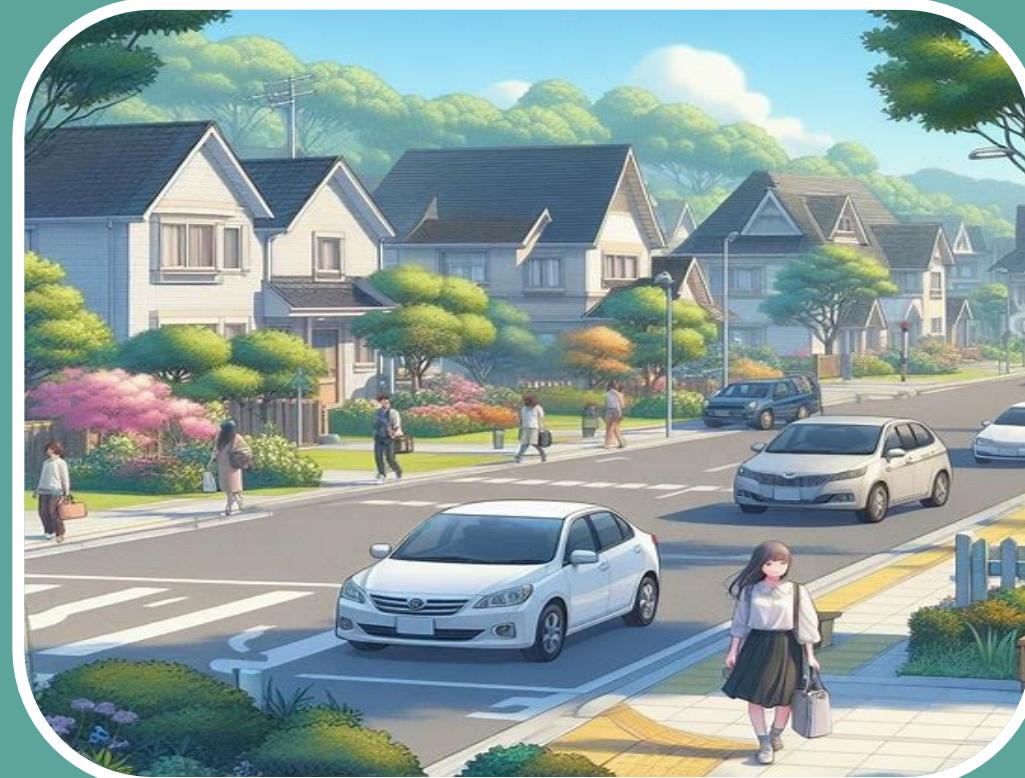
# 2050 LRTP Scenario Narratives



## Greater Urban Growth



## Greater Suburban Growth



## Greater Inland/Westward Growth



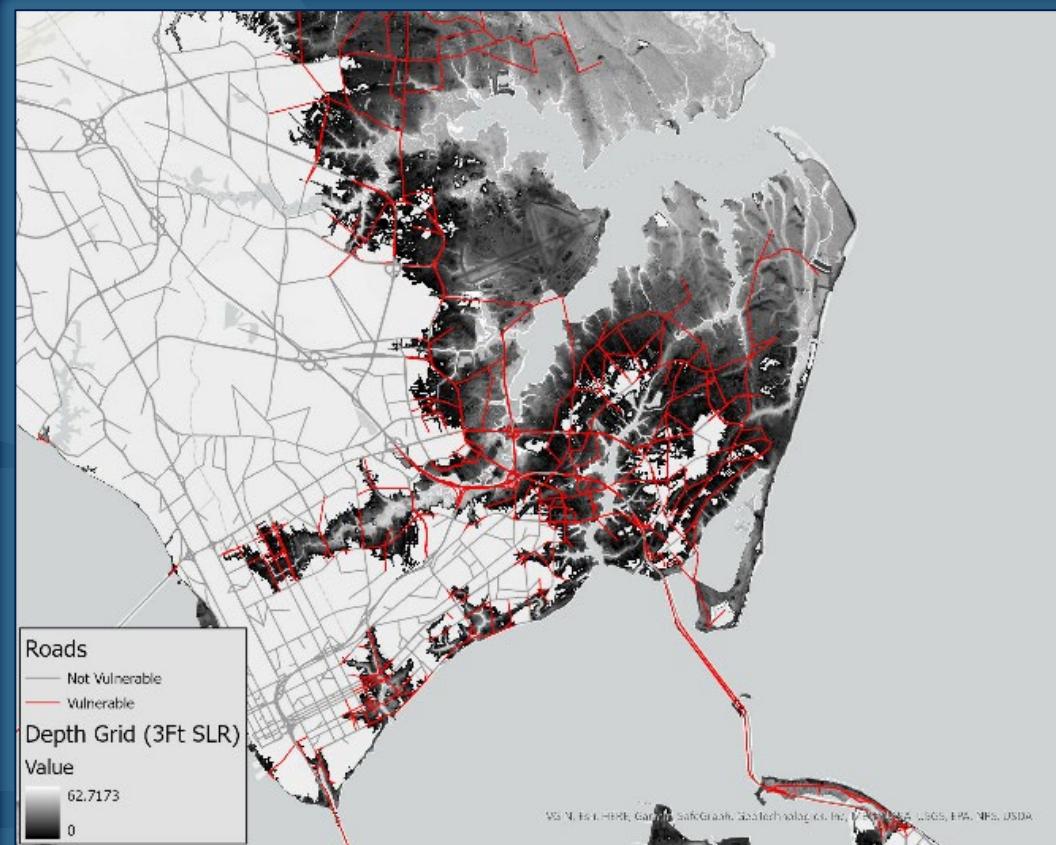
## SEA LEVEL RISE/STORM SURGE ASSUMPTIONS

3-feet Sea Level Rise  
10-year Storm Surge

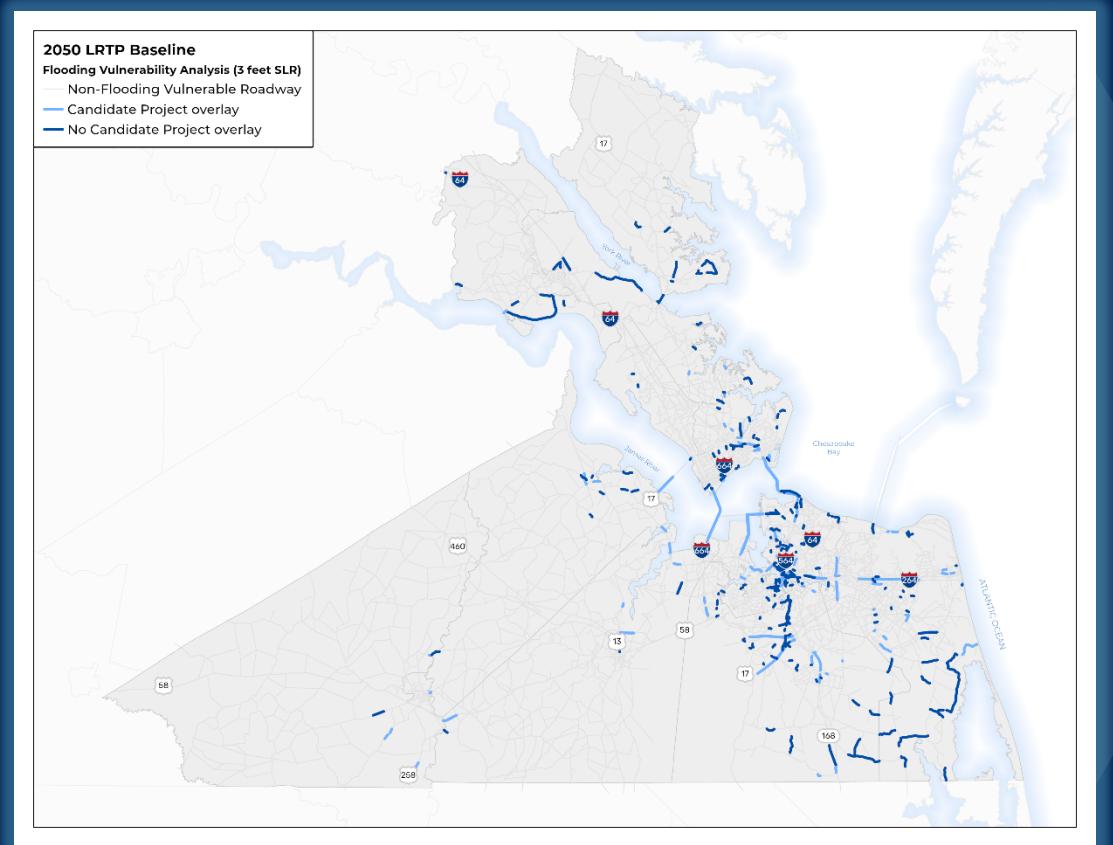
3-feet Sea Level Rise  
100-year Storm Surge

4.5-feet Sea Level Rise  
100-year Storm Surge

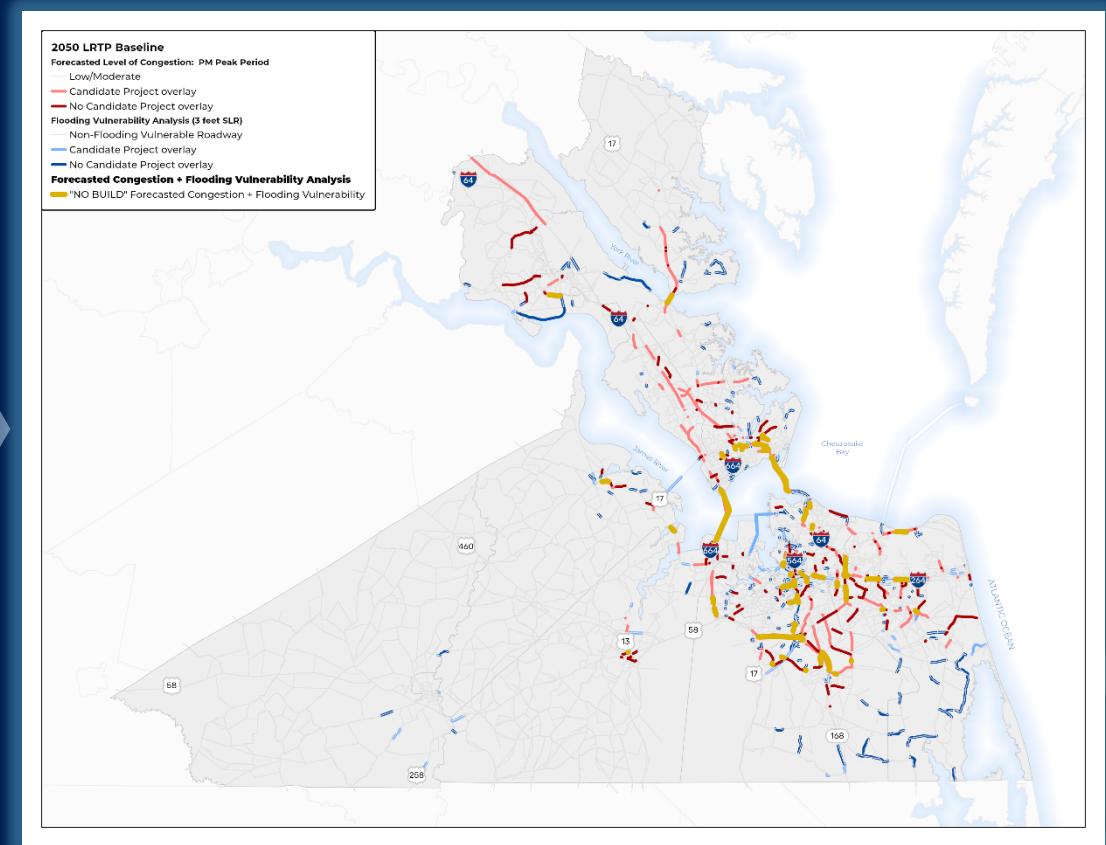
# Identifying Network Vulnerabilities



# Where are there vulnerabilities?



# How does this line up with candidate projects already identified?



# Which vulnerable segments are heavily traveled?

# HRTP Project Prioritization Tool



Ability to solve a transportation problem

Potential for economic gain

Project readiness and compatibility

# Criticality Measures

## Examples of Regional Significance (Criticality) Prioritization

### Measures:

- Usage (Volumes/Ridership)
- Degree of Regional Impact
- Regional Travel Time
- Travel Time Reliability
- Diversion Impacts
- Impact to Freight Movement
- Incident Management/Evacuation Routes
- Defense, Port, Tourism Access
- Labor Market Access (Access to High Density Employment/Major Employment Centers)
- Access to Areas with High Unemployment and Low-Income Areas

# Initial Resiliency Measures

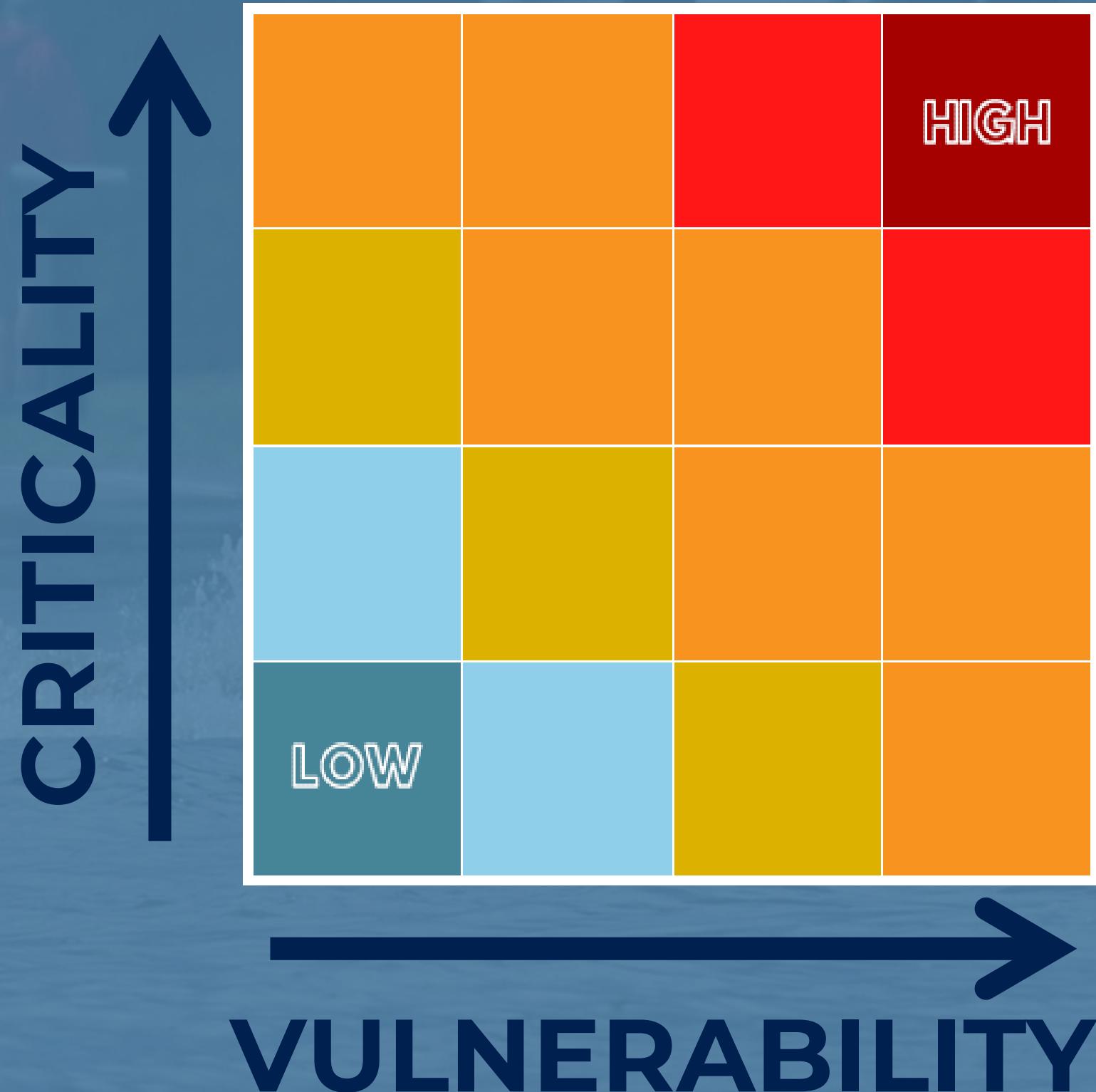
Vulnerability to sea level rise/storm surge/recurrent flooding. (High, Medium, Low)

If Vulnerable, resiliency design features included. (Yes/No)

Level of access provided to critical areas or facilities that projected to be disrupted by flooding. (High, Medium, Low)

(e.g., hospitals, Fire-EMS, emergency shelters, dense employment area, and single entry/exit point for flood prone areas or neighborhoods)

# Why Enhance Resiliency and Criticality Scoring



Improving how we identify the relationship between **CRITICALITY** and **VULNERABILITY** and **ACCESSIBILITY**

# Why Enhance Resiliency and Criticality Scoring

## RESILIENCY

- Encourage robust, future-ready transportation infrastructure – **PREPARE FOR FUTURE UNCERTAINTY**
- Strengthen our response to system vulnerabilities.
- Reflect how well projects maintain access, mobility, and investment value during disruptive events.

Resiliency measures ensure LRTP Prioritization Process reflects regional vulnerability to hazards and rewards projects that maintain essential access and mobility.

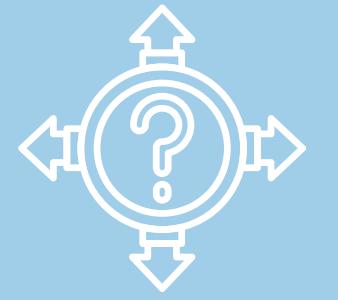
# Why Enhance Resiliency and Criticality Scoring

## CRITICALITY

- **Highlight the projects that matter most to the daily and regional function of the system.**
- **Incorporate objective factors like usage, economic role, emergency relevance, and strategic access.**
- **Complement resilience by ensuring critical corridors receive due attention even outside hazard contexts.**
- **Promote efficient investment in the “backbone” of the transportation network.**

Complements resiliency by identifying system-critical infrastructure in all conditions, not just hazard events.

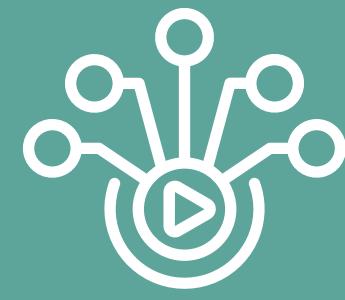
# Challenges in Analyzing Future Hazard Resiliency Investments



**FUTURE HAZARD CONDITIONS ARE HIGHLY UNCERTAIN.**



**OFTEN A RANGE OF RESILIENCE INVESTMENT OPTIONS THAT CAN MITIGATE EFFECTS.**



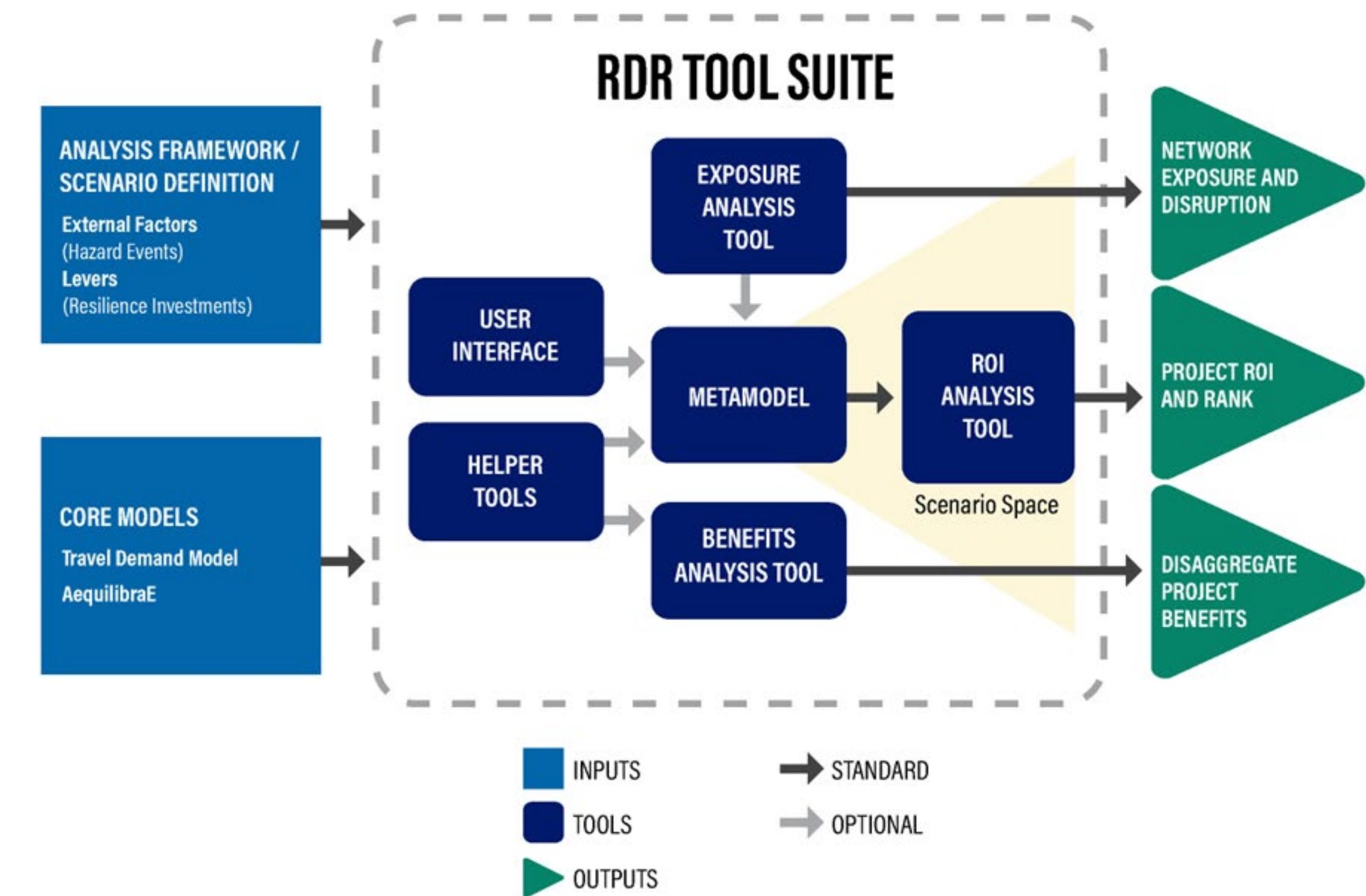
**LEADS TO THOUSANDS OF SCENARIOS TO TEST.**



**EXISTING TRAVEL MODELS ARE TOO SLOW TO ANALYZE MANY SCENARIOS AND CANNOT COMBINE PERFORMANCE BENEFITS ACROSS HAZARD CONDITIONS.**

# Solution: US DOT Volpe RDR Tool

A robust tool suite to help transportation practitioners evaluate resilience return on investment (ROI) for long-range planning across a range of uncertain scenarios.



# RDR Tool – Notable Metrics

## Trip Loss and Critical Access

Evaluates how well projects maintain mobility to critical services and vulnerable communities during disruptive events.

## Return on Investment (ROI)

Looks at how much benefit a project offers per dollar spent, under a range of plausible futures (delay and repair costs).

## “Regret” Across Scenarios

How much might the region regret not investing in the project under future scenarios.

**Straight forward to incorporate in  
Prioritization Tool**

# Key Proposed Metrics

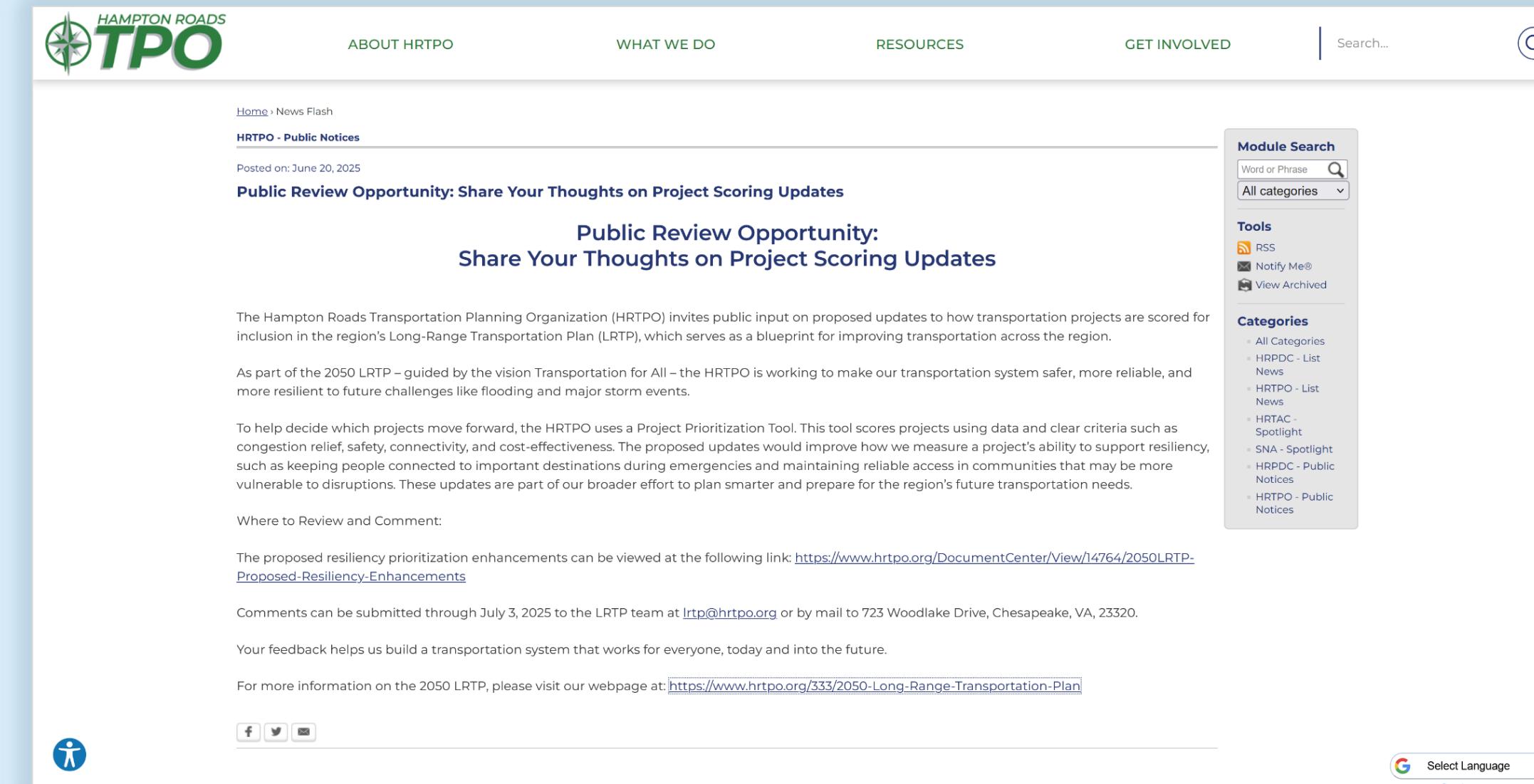
PROPOSED RESILIENCY PRIORITIZATION ENHANCEMENTS					
Scoring Location		Draft Measure Name	Draft Scoring Language	Draft Scoring Tiers	Source
Project Utility	System Continuity / Resiliency - <u>new</u> measure	Minimize Trip-Loss During Disruptive Events	Project minimizes loss of trip-making under disruptive conditions (indicates project's importance for maintaining mobility/accessibility during disruptions).	High: ≥90% trips retained Medium: 75–89% Low: 50–74% No Points: <50% retained	Change in Trips (RDR Benefits Analysis Tool)
Project Utility	System Connectivity / Resiliency - <u>refine</u> , current level of access to critical areas/facilities	Maintains Access to Critical Areas/Facilities During Disruptive Events	Project preserves access to essential services or facilities during hazard conditions.	High, Medium, Low, No Access Multiplier for retained access during disruptive events	Critical Areas/Facilities data (GIS overlay) + Trip Retention (RDR)
Economic Vitality	Modify current Economic Distress Factors, adding <u>new</u> submeasure	Maintains Access to Transportation-Vulnerable Communities During Disruptive Events	Project preserves access for vulnerable communities during disruptive events (supports equitable mobility and recovery).	High: ≥75% of distressed TAZs retain ≥90% trips Medium: 50–74% Low: 25–49% No Points: <25%	TAZ-Level Metrics (RDR Benefits Tool + Transportation-Vulnerable Communities data)
Project Viability	Modify Cost Effectiveness measure, adding <u>new</u> submeasure	Return on Investment (ROI)	Return on Investment (ROI) across scenarios (includes delay and repair costs savings).	High: ROI ≥ 2.0 Medium: 1.5–1.99 Low: 1.0–1.49 No Points: <1.0	ROI Analysis Tool (RDR: NPV / Cost)
Project Viability	<u>New</u> category: System Importance - <u>new</u> measure	Regret Score	Reflects the potential for regret if a project is not implemented under future hazard conditions. Higher scores indicate greater importance under robust decision-making scenarios.	High: Top 25% of scores Medium: Middle 50% of scores Low: Bottom 25% of scores No Points: Score=0	ROI Analysis Tool (RDR Regret Ranking)
Project Viability	<u>New</u> category: System Importance - <u>new</u> measure	Infrastructure Criticality	Importance of project to maintaining critical regional functions.	High Criticality Medium Criticality Low Criticality No Points	See Criticality matrix (informed by other prioritization measures)

PROPOSED CRITICALITY MEASURE: ROADWAYS			
Measure Name	High Criticality (2 points)	Medium Criticality (1 point)	Low Criticality (0 points)
Future Usage (Volumes/Ridership) (double weight)	Top 25% of volumes/ridership (4 points)	25% to 75% volumes/ridership (2 points)	Bottom 25% volumes/ridership
Travel Time Reliability	Very High, High	Medium High, Medium, Medium Low	Low
Degree of Regional Impact	Regional	Multi-jurisdictional	Local
Incident Management/Evacuation Routes	Designated evacuation or incident mgmt route (or both evac and IM route)	Secondary evacuation support (or either evac or IM route)	No evacuation/incident management function
Labor Market Access	High	Medium	Low
Military Access	High	Medium	Low
STRAHNET	Yes	Military Roads	No
Port/Freight Access (Truck Zones)	High	Medium	Low
Impact to Freight Movement (Improved Delay for Port Facilities)	Very High, High (score >3)	Medium High, Medium (score 2 to 3)	Low, Very Low (score <2)
Tourism Access	High	Medium	Low
Access to High Unemployment/Low-Income Areas	>7	7 to 3	<3
Functional Class	Interstate/Freeway/Expressway/Principal Arterial	Minor Arterial/Major Collector (Secondary)	Minor Collector/Local

- **Minimize Trip Loss** During Disruptive Events
- **Maintain Access to Critical Facilities/Areas** During Hazard Events
- **Maintains Access to Transportation-Vulnerable Communities** During Disruptive Events
- **Return on Investment** across scenarios (based off delay and repair cost savings)
- **Regret-based scoring** across future scenarios (regret if project is not implemented)
- **Infrastructure Criticality**

# Review Opportunities

- **L RTP Subcommittee review:** May 7 – 23, 2025
  - No additional comments received
- **Public Review:** June 20 – July 3, 2025
  - No comments received



The screenshot shows a website for the Hampton Roads Transportation Planning Organization (HRTPO). The header includes the HRTPO logo, navigation links for About HRTPO, What We Do, Resources, and Get Involved, and a search bar. The main content area displays a news flash titled "Public Review Opportunity: Share Your Thoughts on Project Scoring Updates". The text in the article discusses the invitation for public input on proposed updates to project scoring for the LRTP, the goal of making the transportation system safer and more reliable, and the use of a Project Prioritization Tool. It also provides a link to view proposed resiliency enhancements and instructions for submitting comments by July 3, 2025. The sidebar on the right contains a module search, tools for RSS, Notify Me, and View Archived, and a categories section with links to various news and spotlight topics.

**Public Review Opportunity: Share Your Thoughts on Project Scoring Updates**

The Hampton Roads Transportation Planning Organization (HRTPO) invites public input on proposed updates to how transportation projects are scored for inclusion in the region's Long-Range Transportation Plan (LRTP), which serves as a blueprint for improving transportation across the region.

As part of the 2050 LRTP – guided by the vision Transportation for All – the HRTPO is working to make our transportation system safer, more reliable, and more resilient to future challenges like flooding and major storm events.

To help decide which projects move forward, the HRTPO uses a Project Prioritization Tool. This tool scores projects using data and clear criteria such as congestion relief, safety, connectivity, and cost-effectiveness. The proposed updates would improve how we measure a project's ability to support resiliency, such as keeping people connected to important destinations during emergencies and maintaining reliable access in communities that may be more vulnerable to disruptions. These updates are part of our broader effort to plan smarter and prepare for the region's future transportation needs.

Where to Review and Comment:

The proposed resiliency prioritization enhancements can be viewed at the following link: <https://www.hrtpo.org/DocumentCenter/View/14764/2050LRTP-Proposed-Resiliency-Enhancements>

Comments can be submitted through July 3, 2025 to the LRTP team at [lntp@hrtpo.org](mailto:lntp@hrtpo.org) or by mail to 723 Woodlake Drive, Chesapeake, VA, 23320.

Your feedback helps us build a transportation system that works for everyone, today and into the future.

For more information on the 2050 LRTP, please visit our webpage at: <https://www.hrtpo.org/333/2050-Long-Range-Transportation-Plan>

[Facebook](#) [Twitter](#) [Email](#)

Select Language [Google Translate](#)

# Summary of Enhancements

- Uses **data-driven tools** and **aligns with LRTP goals**
- Can **incorporate in existing scoring framework**
- **Balanced**: every major scoring category will reflect resilience:
  - *Utility*: Can the system function during disruptive events?
  - *Vitality*: Can the project support economic resilience and reduce regional vulnerability?
  - *Viability*: Is the project a smart, robust investment under future uncertainty?

# Approval Actions



- TTAC recommended HRTPO Board approval of proposed resiliency enhancements at its July 3, 2025 meeting
- HRTPO Board approved the Project Prioritization resiliency enhancements at its July 17, 2025 meeting

# THANK YOU!

# 2050

## HAMPTON ROADS

### LONG-RANGE TRANSPORTATION PLAN

Dale M. Stith  
Principal Transportation Planner  
[dstith@hrtpo.org](mailto:dstith@hrtpo.org)

