Helping agencies make informed decisions about future infrastructure investments.

U.S. Department of Transportation

Resilience and Disaster Recovery (RDR) Tool Suite

Sponsored by the U.S. Dept. of Transportation Office of the Secretary of Transportation – Research (OST-R) and the Federal Highway Administration (FHWA) | Executed by the Volpe National Transportation Systems Center (Volpe Center)

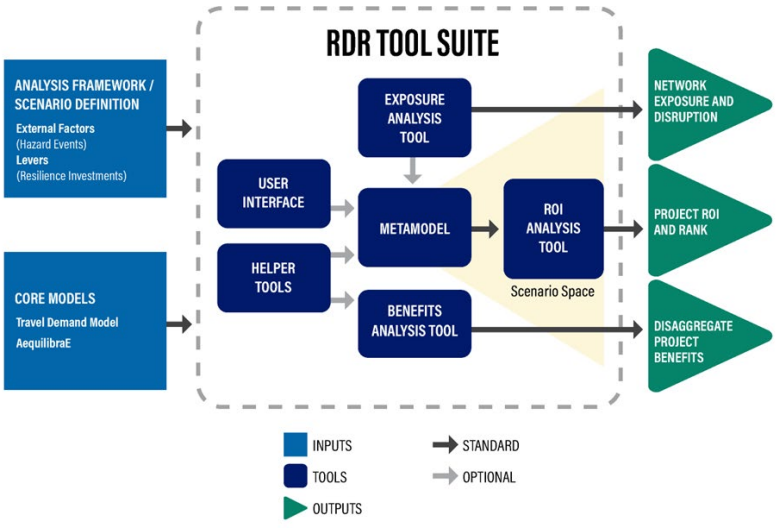
Rationale

To select and prioritize infrastructure construction and roadway improvement projects, Federal, State and local governments, as well as private industry, need reliable cost and performance metrics. Such metrics can change rapidly under hazard conditions such as flooding, storms, earthquake, and others; what's more, these hazards are highly uncertain. To accurately assess the value of an investment, it is important to understand how that investment will affect cost and performance not only in ordinary circumstances, but also under a range of potential hazard conditions. Therefore, agencies need to incorporate the cost and benefits of resilience into the transportation planning decision-making process to make informed decisions about future infrastructure investments.

The Resilience and Disaster Recovery (RDR) Tool Suite was developed to help transportation agencies estimate the return on investment (ROI) of resilient road and transit infrastructure across a range of uncertain future hazards (such as flooding, earthquake, etc.) for long-range transportation planning. The RDR Tool Suite:

- Uses established Robust Decision-Making concepts to address future scenarios that are highly uncertain.
- Ranks projects based on economic return on investment using Benefit-Cost Analysis (BCA), BCA under Uncertainty/Regret Analysis, or Breakeven Analysis, depending on user data.
- Includes benefits of reduced repair cost, faster recovery time, and improved roadway network connectivity.
- Allows for use of default values or customized benefit and cost calculations based on agency data and knowledge.
- Enables analysis of benefits accrued to different transportation analysis zones based on metrics of interest (e.g., urban/rural, disadvantaged/baseline).

RDR Tool Suite project rankings can contribute to transportation infrastructure project prioritization in combination with other factors such as congestion reduction, safety, engineering, and budgets.



For more information contact:
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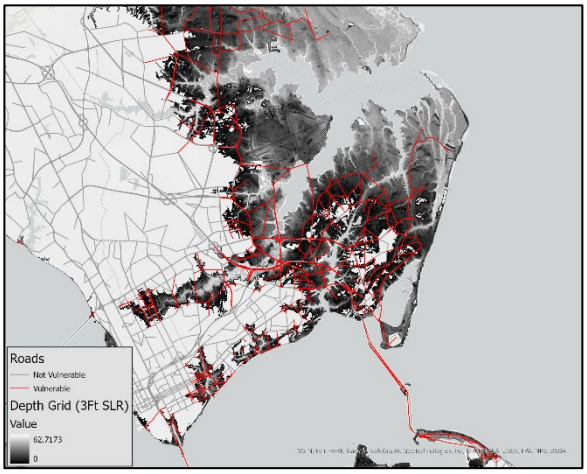
Resilience and Disaster Recovery (RDR) Tool Suite

The RDR Tool Suite can help transportation agencies answer critical questions.

RDR Exposure Analysis Tool

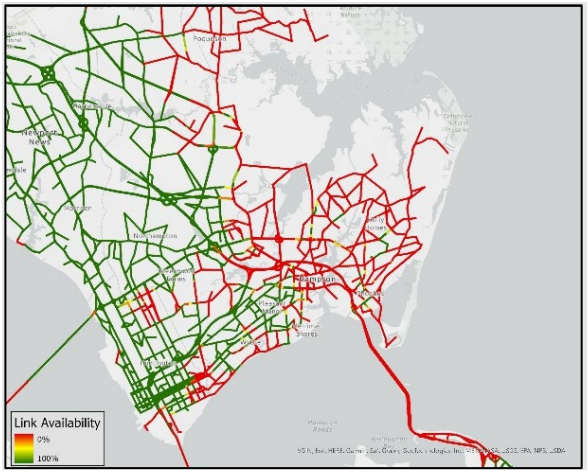
Which of my network assets are vulnerable under a given hazard condition?



Maximum network exposure on each link

RDR Link Capacity Loss Calculation

What will link level capacity loss be under a given hazard condition?



Capacity reduction on each link

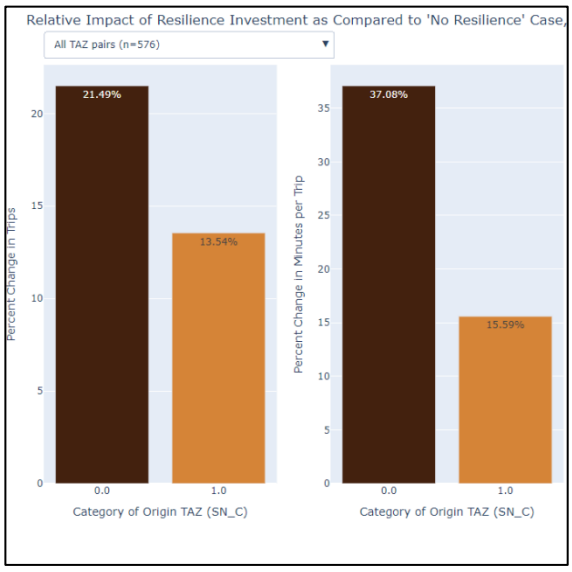
Project Ranking by ROI

Which resilience-focused projects give the most benefit across the range of hazards of concern?

RDR Tableau dashboard of project performance

Benefits by Community Type

How are the benefits of a project distributed among different transportation analysis zones (e.g., rural/urban, disadvantaged/baseline)?



Benefits by TAZ types