Integrating Resilience into Transportation Planning

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Sixteen Billion-Dollar Disasters in 2017

This map denotes the approximate location for each of the 16 billion-dollar weather and climate disasters that impacted the United States during 2017.
Resilience: the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.
Integrating Resilience

Goal: Integrate consideration of resilience in transportation decision making
- In support of 23 U.S.C. § 503(b)(3)(B)(viii), which directs the U.S. Department of Transportation “to carry out research and development activities … to study vulnerabilities of the transportation system to … extreme events and methods to reduce those vulnerabilities.”
• USDOT FY 2018-22 Strategic Plan: “DOT will increase its effectiveness in ensuring that infrastructure is resilient enough to withstand extreme weather”

• FHWA Order 5520 commits FHWA to integrating extreme weather risk consideration into programs

• Extreme weather resilience eligible for FHWA funds

• Emergency relief program guidance encourages cost-effective resilience strategies
Extreme Weather Resilience Related Regulations

- Risk-based asset management plans must address risks associated with current and future environmental conditions (23 CFR 515)
- Assets requiring repeated repair require analysis of alternatives (23 CFR 667)
- State and metropolitan transportation planning should now include resilience as a planning factor (23 USC 134, 23 CFR 450)
- Metropolitan transportation plans shall include an assessment of capital investment and other strategies to... reduce the vulnerability of the existing transportation infrastructure to natural disasters (23 CFR 450.324(f)(7))
Integrating Resilience in Transportation Planning

FHWA Initiative: Integrating Resilience into the Transportation Planning Process

https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/planning/

- Workshops and Peer Exchanges
- White Paper
- Q&A Document (October 2018)
- Case Studies (November 2018)
- Handbook (December 2018)
Approaches to Incorporating Resilience in Planning

- Include resilience in transportation plan goals and objectives
- Identify, evaluate, and adopt strategies to address identified vulnerabilities
- Screen projects during planning to avoid making investments in particularly vulnerable areas
- Include resilience in the criteria for evaluating projects for funding
- Consider future environmental conditions in corridor planning studies
FHWA Resilience Resources

Gulf Coast 2 Study

Resilience Pilots - State DOTs, MPOs, FLMAs

Hurricane Sandy Project

Tools

https://www.fhwa.dot.gov/environment/sustainability/resilience/

Vulnerability & Adaptation Framework

Engineering Guidance (HEC-25 & 17)

Project Development

Operations & Maintenance

Guidebooks under development on integrating resilience in:

- Asset Management
- Transportation Planning
- Nature-based solutions
• Provides an in-depth and structured **process** for conducting a vulnerability assessment.

• Features **examples** from assessments conducted nationwide.

• Incorporates information from recent FHWA and other U.S. **partner projects**.

• Includes links to **resources and tools**.
Resilience Pilots 2010 – 2018

Lead Agency:
- MPO
- DOT
- NAVFAC
- USACE

Pilot Year:
- 2010-2011 Vulnerability Assessments
- 2013-2015 Vulnerability and Adaptation
- 2016-2017 Nature-Based Resilience
- 2018-2019 Asset Management
- 2018-2020/2024 Extreme Weather
2018 Resilience Pilots

Map showing locations of resilience pilots in the United States, including:
- Utah DOT
- Bi-State Regional Commission
- MARC
- H-GAC
- Corpus Christi MPO
- Tampa Bay TMA

Lead Agency:
- MPO
- DOT
- NAVFAC

Type of Project:
- Integrating resilience and durability into agency practices.
- Using available tools and resources to assess the vulnerability and risk of transportation projects or systems.
- Deploying a resilience solution and monitoring performance.
THANK YOU!

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• **Project:** Integrate threats of extreme weather on transportation assets and users into the planning and engineering process using ARC’s vulnerability assessment framework

• **Outcome:** Resilience integration within transportation plans, criticality and vulnerability assessments of transportation assets
Bi-State Regional Commission

- **Project:** Conduct a vulnerability assessment and determine strategies to mitigate near-term and long-term effects of extreme weather events in the Quad Cities, Iowa/Illinois metropolitan planning area multimodal transportation system

- **Outcome:** Apply understanding of extreme weather threats to future projects and to 2050 Quad Cities Long Range Transportation Plan
• **Project:** Design and deploy a nature-based shoreline protection buffer to enhance the resilience to extreme weather of Laguna Shores Road

• **Outcome:** Construction of shoreline protection project and monitoring of project effectiveness