



U.S. Department of Transportation
Federal Highway Administration



FHWA Resource Center Climate Resilience Interdisciplinary Team

**Texas MPOs Resilience Working Group
October 19, 2021**



Call for Service
FHWA Resource Center

FHWA Order 5520

FHWA's Six Goal Areas:

- Safety
- Economic Strength and Modernization
- Equity
- **Climate Change & Sustainability**
- Transformation
- Organizational Excellence

FHWA Order 5520:

Preparedness and Resilience to Climate Change and Extreme Weather Events *(12/15/2014)*

EO 13990 – Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, January 20, 2021

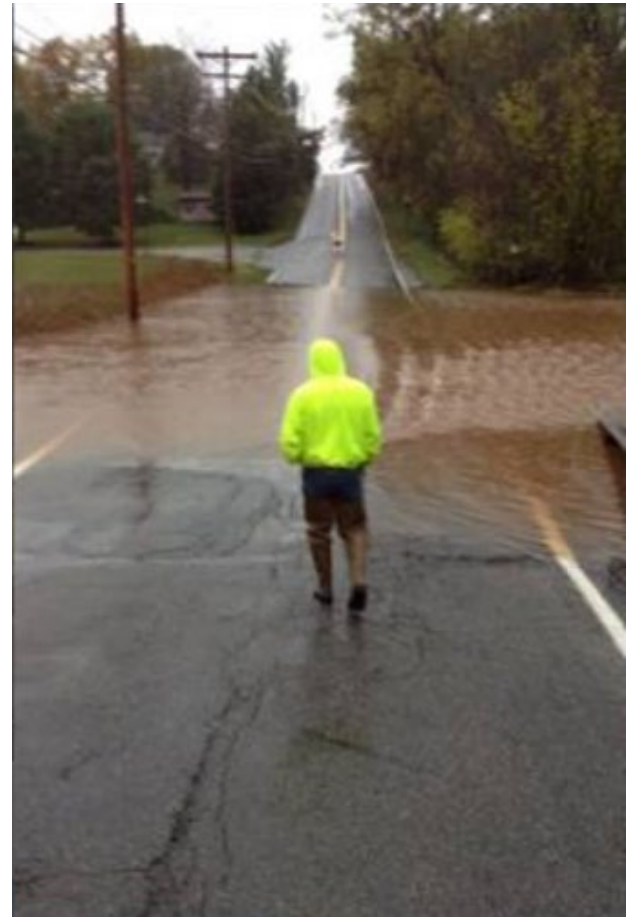
EO 14008 – Tackling the Climate Crisis at Home and Abroad, January 27, 2021



What is Resilience?

Resilience: The ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.

For more information and resources about resilience, visit:
<https://www.fhwa.dot.gov/environment/sustainability/resilience/>



Climate Resilience Interdisciplinary Team (CRIT)

Our goal is to:

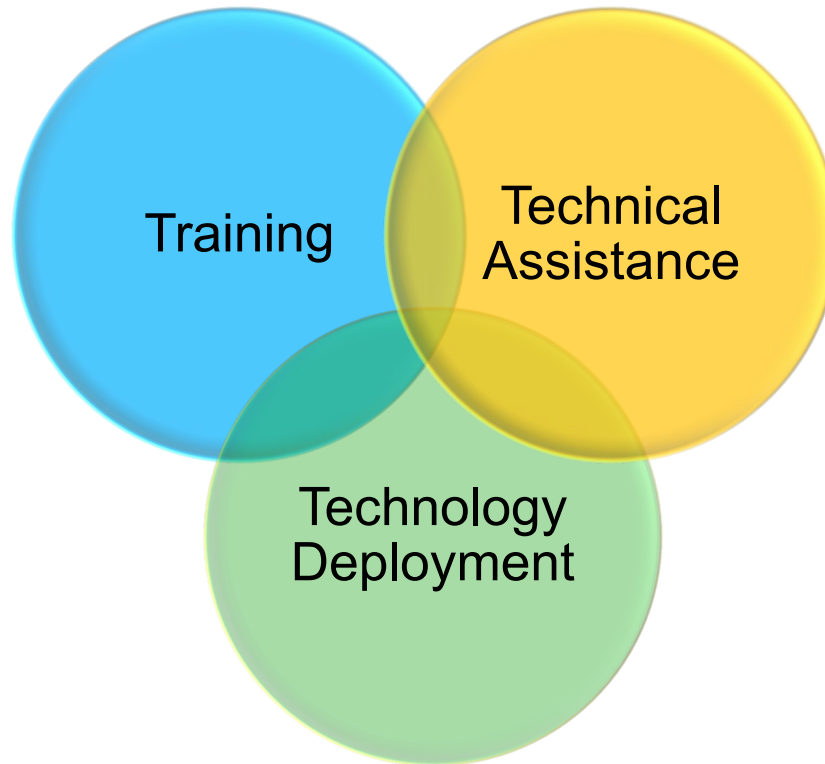
- Understand climate risks and costs
- Develop climate resilience and mitigation solutions
- Respond to the needs of our State, Division, and Metropolitan Planning Organization clients

The **interdisciplinary approach** to building and maintaining a transportation system:

1. Climate science, risk/vulnerability analysis, and lifecycle analysis
2. Planning, engineering, construction, materials, etc.
3. Resolving State's unique situations using the Three T's approach



The Three T's



CRIT Team is the Resilience Resource

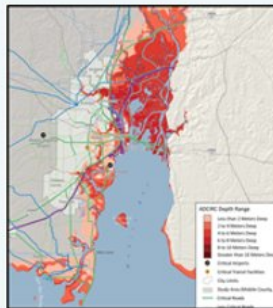
Resilience experts are available to assist on project requests on how to implement resilience practices in all areas of transportation

- David D'Onofrio, **Air Quality/GHG Emissions**
- Laura Girard, **Hydraulics**
- Jeffery Ger, **Structures**
- Jocelyn Jones, **Transportation Asset Management**
- Tom Kearney, **Freight**
- Monica Jurado, **Pavements & Materials**
- Jennifer Albert, **Pavements & Materials**
- Ray Murphy, **Operations**
- Deborah Suciu-Smith, **Environment**
- Megan Hall, **Construction & Project Management**
- Mohamed Dumbuya, **Civil Rights**



FHWA Resources

Gulf Coast 2 Study



Resilience Pilots with State DOTs & MPOs



Hurricane Sandy Project



Engineering Assessments Study



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

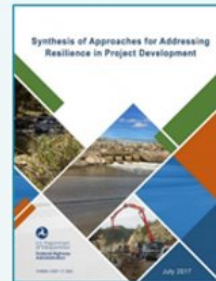
Vulnerability & Adaptation Framework



Engineering Guidance (HEC-25 & 17)



Project Development



Operations & Maintenance

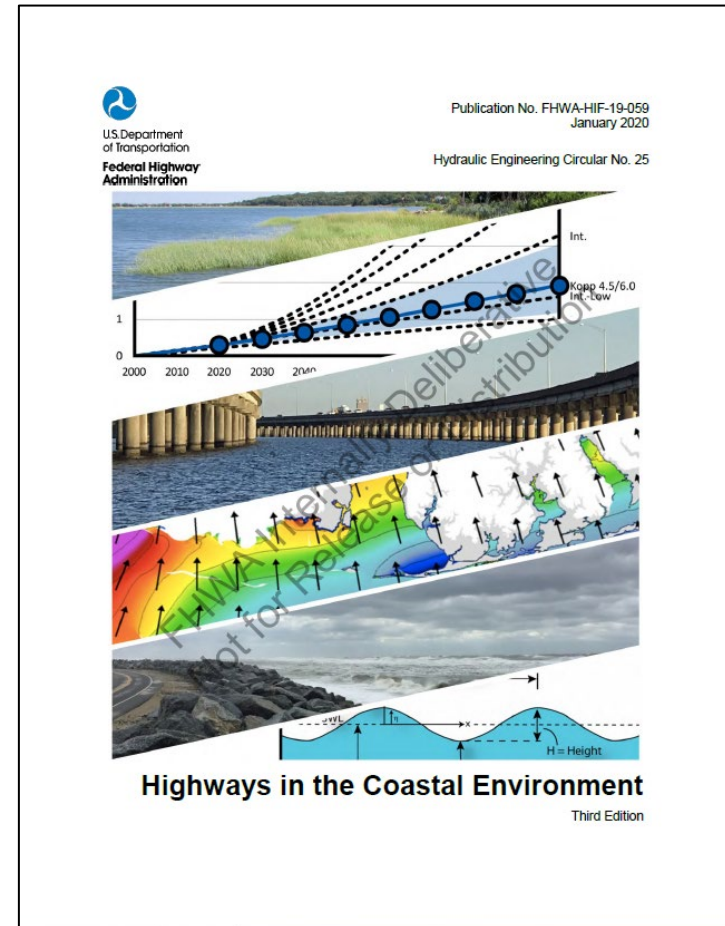


Nature-Based Solutions



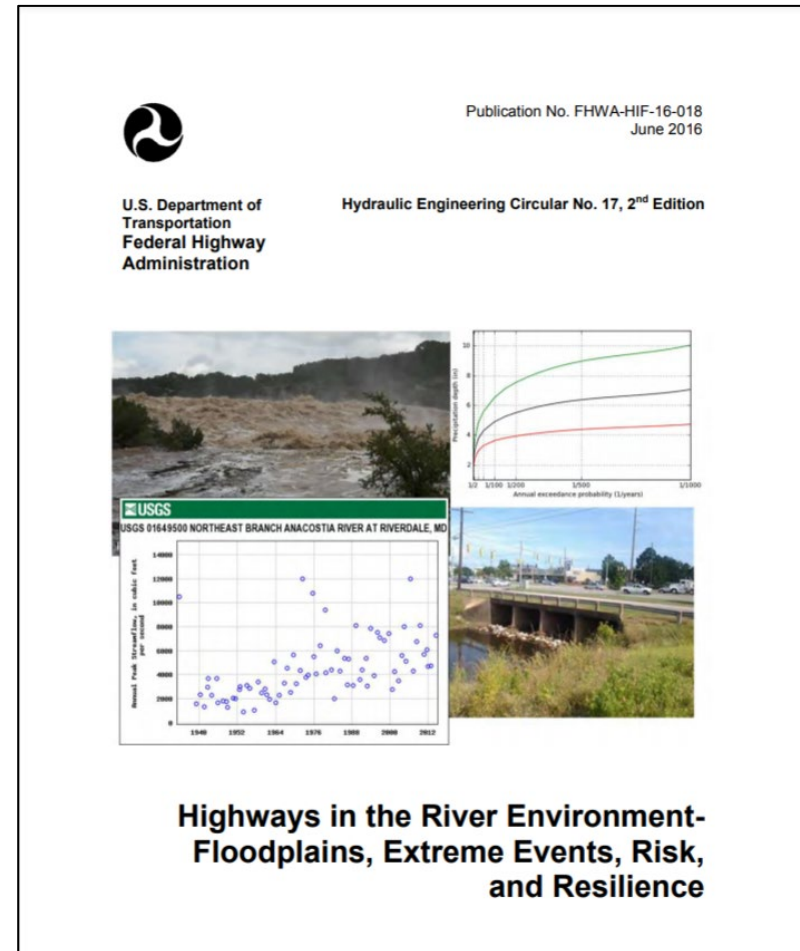
HEC 25, 3rd Edition (2020)

- Coastal engineering reference manual
- Coastal science as it relates to highway infrastructure
- Future sea level rise scenarios, recommendations
- Example project analyses
- Updating Coastal NHI course



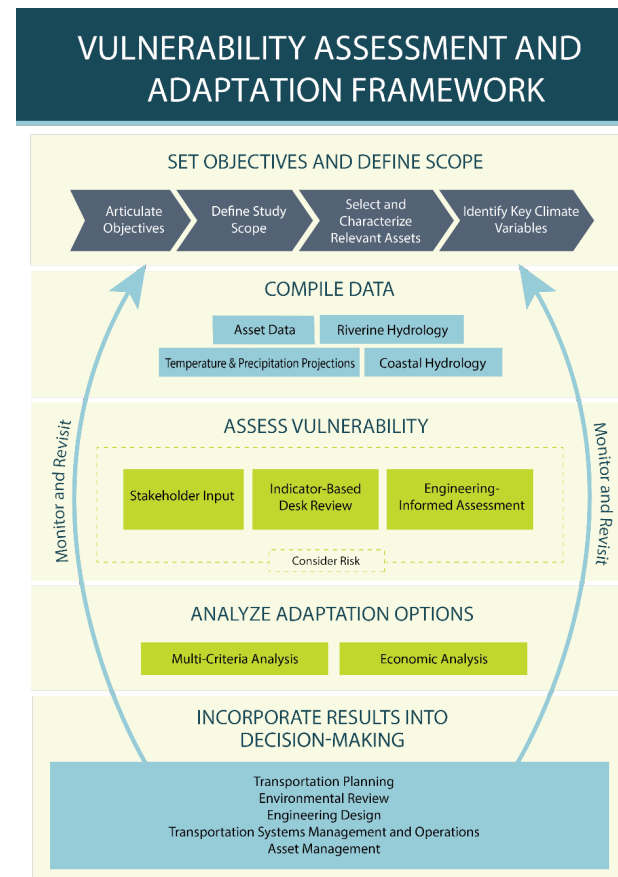
HEC 17, Highways in the River Environment Floodplains, Extreme Events, Risk, and Resilience

- Floods, floodplain policies, extreme events, climate change, risks, and resilience
- Climate change and other sources of nonstationarity
- Example project analyses





Vulnerability Assessment and Adaptation Framework, 3rd Edition

- Provides an in-depth and structured **process** for conducting a vulnerability assessment.
- Features **examples** from assessments conducted nationwide.
- Includes links and references to related **resources and tools**.
- Tentatively plan to begin update in 2022



CMIP Tool – Climate Projections






CMIP

Climate Data Processing Tool 2.0

Your job has been successfully submitted. You will receive an email notification once your job has been processed.



USING FHWA RESOURCES TO BUILD RESILIENCE

Extreme weather, sea level change, and changes in environmental conditions threaten the considerable federal

RESOURCES

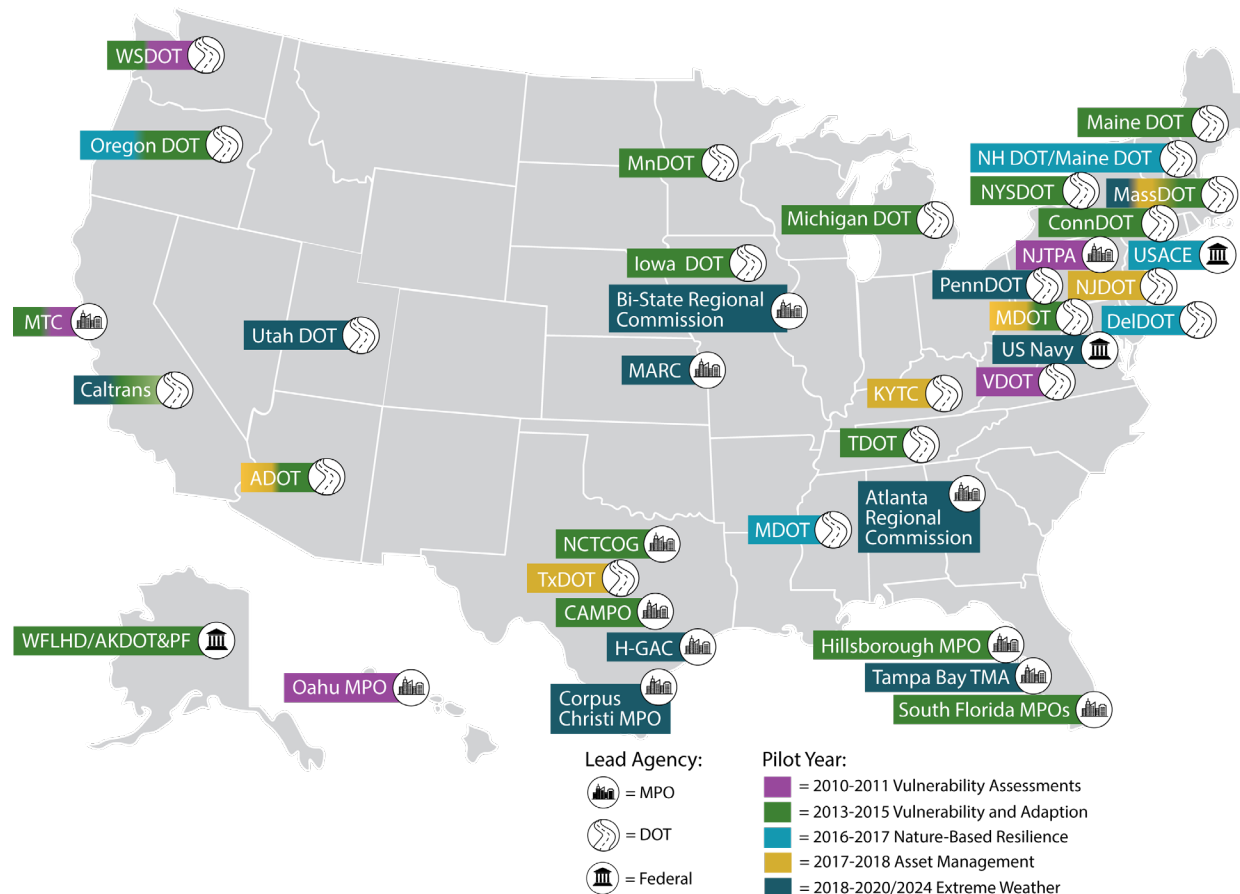
- Downscaled CMIP5 Climate and Hydrology Projections (DCHP)
- FHWA Hydraulic Engineering
- FHWA Resilience

POLICIES, RIGHTS, LEGAL

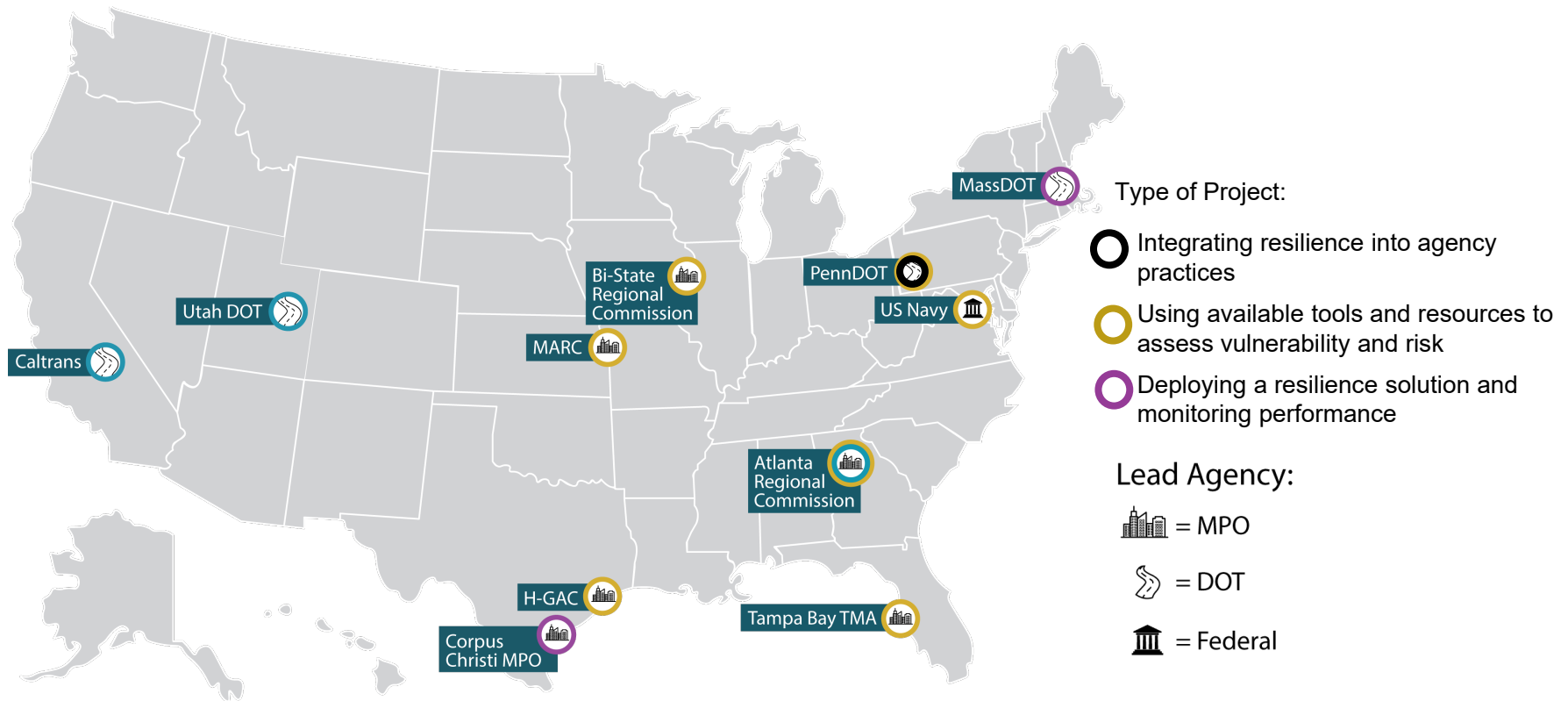
Privacy Policy	Web Policies & Notices	U.S. DOT Home
Freedom of Information Act	No Fear Act	USA.gov
(FOIA)	Report Waste, Fraud	WhiteHouse.gov
		Federal Highway Administration



FHWA Resilience Pilots To-Date



Most Recent Resilience and Durability Pilot Projects



Texas Resilience Pilots (2013-In progress)

Texas DOT

- Assessment of vulnerability of critical assets to extreme weather events in Houston district, inform asset management practices including LCP, deterioration curves

North Central Texas Council of Governments (NCTCOG)

- Assessed the vulnerability of existing and planned transportation infrastructure in the Dallas-Fort Worth region

FHWA

- Temperature and Precipitation Impacts to Pavements on Expansive Soils: Proposed State Highway 170 in North Texas

Capital Area Metropolitan Planning Organization (CAMPO) and the City of Austin

- Data and stakeholder-driven approach to assess risks to nine critical assets from flooding, drought, extreme heat, wildfire, and ice

Houston-Galveston Area Council (H-GAC)

- Reduce flood risk on critical regional and local highways by developing detailed recommendations to improve resiliency of transportation infrastructure

Corpus Christi MPO

- Design a nature-based shoreline protection feature to enhance the resilience of a roadway against inundation and shoreline erosion along the western shore of the Laguna Madre in Corpus Christi, Texas.





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For More on Resilience, contact:

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