

FHWA Strategy for Adaptation to Climate Change Effects

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FHWA Adaptation Working Group



- **Formed in 2008**
- **Office Representation**
 - Environment, Planning, and Realty
 - Infrastructure (Asset Management, Bridge, Design, ER)
 - Operations
 - Safety
 - Federal Lands Highway
- **Primary activity to date: Adaptation Strategy**

FHWA Adaptation Strategy



Purpose

- Establishes FHWA policy on adaptation
- Provides strategic foundation for future activities
- States FHWA objectives in short, medium and long-term

Status

- Internal draft currently under review

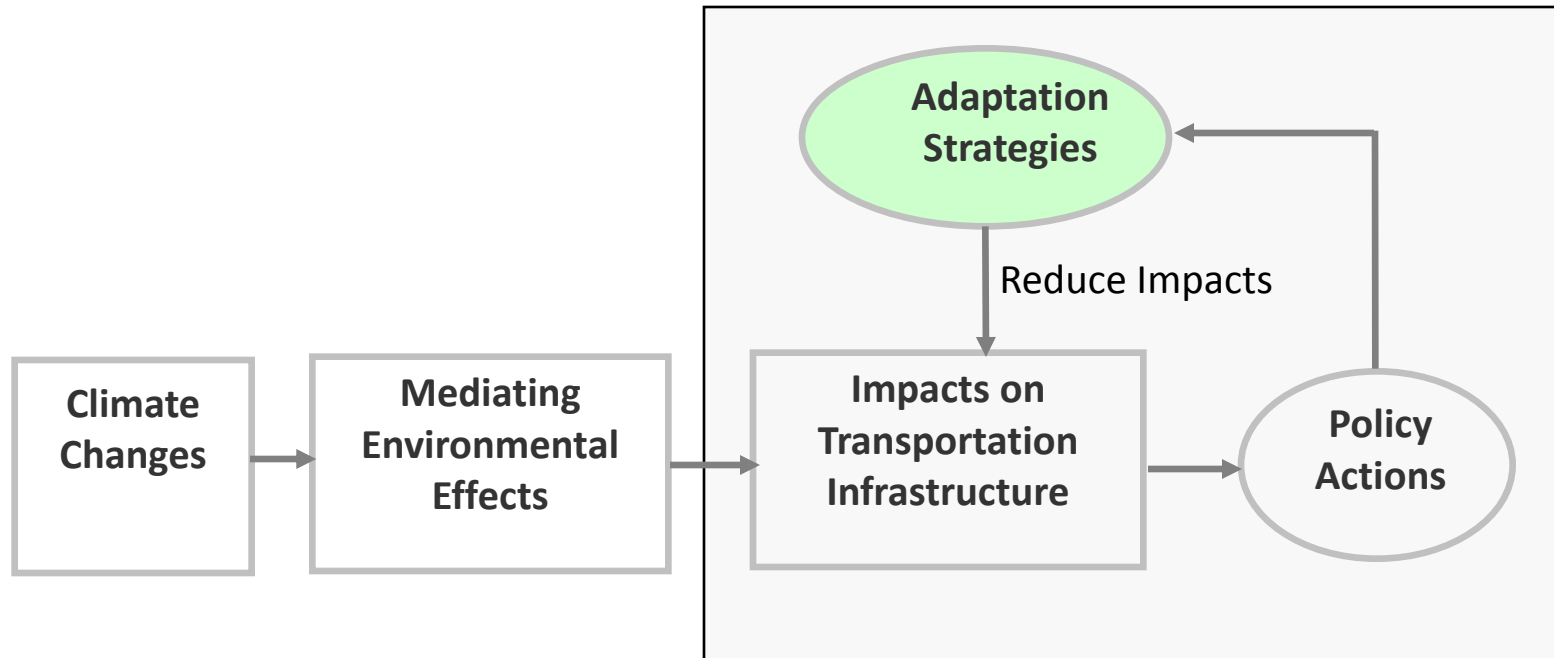
FHWA Adaptation Strategy



- Foundation and plan for addressing climate change adaptation at FHWA
- Purpose of strategy:
 - identify issues of concern for FHWA
 - focus attention on what FHWA needs to do to address the issue
- Will include multi-office adaptation activities
- Primary consideration: address adaptation across all steps of the delivery highway projects

Status: Internal draft currently under review

Focus of FWHA Adaptation Strategy



Climate Change Effects, Impacts, and Adaptation



Climate change effects

- Outcomes of long-term variation in the climate.

Climate change impacts

- Consequences that climate change effects may have on infrastructure

Adaptation

- Changes in the way surface transportation infrastructure is planned, designed, constructed, operated, and maintained

Strategy Structure



- **Overview of Climate Change Effects**
- **Impacts to Highway Infrastructure**
- **Potential Adaptation Responses**
- **FHWA actions and objectives for each program area**

Climate Change Effects Vary by Region



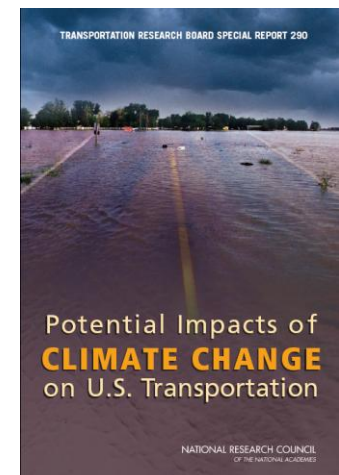
- Changes in sea levels due to sea level rise, subsidence
- Increased storm surge
- Changes in temperature
- Changes in precipitation



Impacts on U.S. Transportation



- **Permanent and temporary flooding of coastal roads, tunnels, rails, and runways**
- **Pavement and track damage from extreme heat; reduced snow and ice removal costs**
- **Slope failures, wildfires, damaged infrastructure in Alaska from permafrost thaw**
- **Improved ocean transport from reduced sea ice**



Why be Concerned about Climate Change Impacts?



- **Design life of transportation infrastructure: decades or longer**
- **As climate changes, our infrastructure will need to evolve to handle new conditions**
- **Each region has unique transportation assets, and faces different vulnerabilities and risks**



Flooded roadways in Houston



Hurricane Katrina: Wave-Induced Bridge Damage (2005)



Photo by S. Douglass



Extreme Rutting



Logistics and Operations



What Are Possible Adaptation Responses?



- **Maintain & Manage**
 - Continue maintenance after storms
- **Protect, Strengthen**
 - Sea walls and buffers
 - Design changes when rebuilding
- **Relocate & Avoid**
 - Move key facilities, site new facilities in less vulnerable locations
- **Abandon and Disinvest**
- **Enhance Redundancy**



FHWA Adaptation Objectives



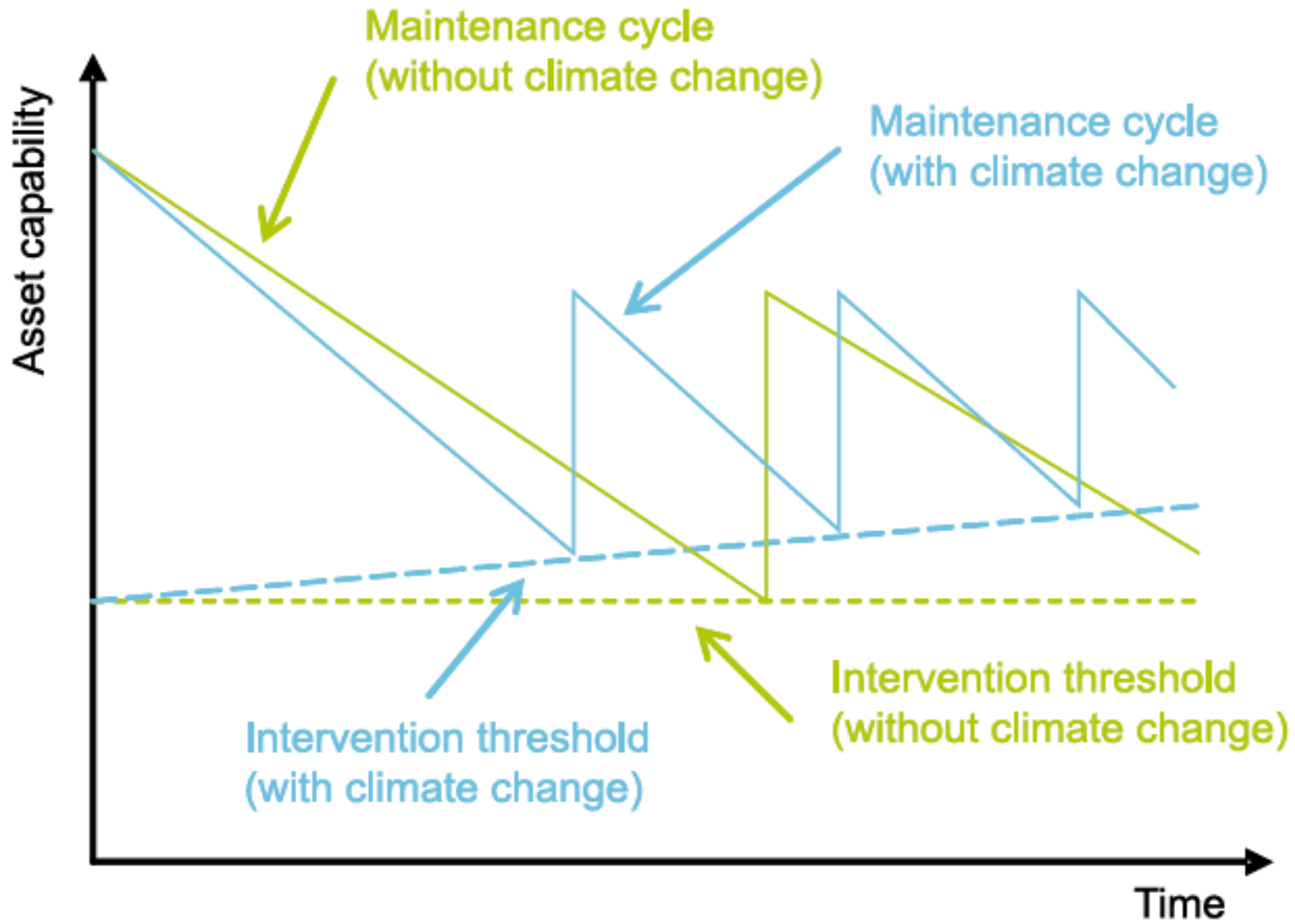
- Cross cutting issues (like climate data)
- Transportation Planning
- Asset Management
- Preliminary Engineering and Project Development
- Project Design and Construction
- Operations
- Safety
- Federal Lands



Strategy – examples of draft FHWA objectives



- **Cross-cutting:** Collect, Synthesize, Disseminate Climate Data Scaled for State & Local Transportation Agency Use
- **Transportation Planning:** Implementation of system-level vulnerability and risk assessment tools to support investment decisions
- **Asset Management:** Maximized performance and minimized life-cycle costs of existing system



Thank you

