FHWA Strategy for Adaptation to Climate Change Effects

FHWA/AASHTO Climate Change Symposium
August 6, 2010

Butch Wlaschin
Office of Asset Management
Federal Highway Administration
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
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 Changes
- Mediating Environmental Effects
- Impacts on Transportation Infrastructure
- Adaptation Strategies
- Policy Actions
- Reduce Impacts
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

Photo by www.asphaltwa.com
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**

Sources: WSDOT and Caltrans
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
Maintenance cycle (without climate change)

Maintenance cycle (with climate change)

Intervention threshold (without climate change)
Thank you