WHAT’S IN STORE FOR THE FUTURE INTERSTATE SYSTEM:
WORKING TODAY FOR A MORE RESILIENT STATE & NATIONAL NETWORK

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Future Interstate Highway System Study Committee
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Via webinar
Key issues from WSDOT
Environmental perspective

• **Climate Readiness**
  - Assess vulnerabilities and use results in decision making for future investments
  - Avoid mal-adaptation
  - Protect assets
  - Be nimble and inclusive

• **Emerging Policy Issues**

Drilled shafts on Interstate 90 in the Cascade Mountains
Federal Highways Climate Pilot Projects
1. DEFINE SCOPE

- Identify Key Climate Variables
  - Climate impacts of concern
  - Sensitive assets & thresholds for impacts

- Articulate Objectives
  - Actions motivated by assessment
  - Target audience
  - Products needed
  - Level of detail required

- Select & Characterize Relevant Assets
  - Asset type
  - Existing vs. planned
  - Data availability
  - Further delineate

2. ASSESS VULNERABILITY

- Collect & Integrate Data on Assets
- Develop Climate Inputs
- Develop Information on Asset Sensitivity to Climate
- Identify & Rate Vulnerabilities
- Incorporate Likelihood & Risk (Optional)
- Assess Asset Criticality (Optional)

3. INTEGRATE INTO DECISION MAKING

- Incorporate into Asset Management
- Integrate into Emergency & Risk Management
- Contribute to Long Range Transportation Plan
- Assist in Project Prioritization
- Identify Opportunities for Improving Data Collection, Operations or Designs
- Build Public Support for Adaptation Investment
- Educate & Engage Staff & Decision Makers

FHWA’s Framework
Statewide Results
(map shows results with 2 foot sea-rise & all other threats)
What did we find?

- Climate change will intensify known threats
- Reinforces value of our current maintenance and retrofit programs
- Unique way to capture knowledge of field staff
- New awareness of combinations of climate risks / extreme events
Co-Benefits: Highlighting current practices that are effective adaptation strategies

*Before:* old culverts obstruct fish passage

*After:* WSDOT project removes barrier and restores access to fish and wildlife habitat

Also: Slope Stabilization, Stormwater Flow Control, Roadside Vegetation Management
Asset Management: Incorporating the results into WSDOT’s work

<table>
<thead>
<tr>
<th>Planning</th>
<th>Major emphasis in our strategic plan: <strong>Consider climate change and propose ways to improve resilience</strong> (corridor studies and plans)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design &amp; Environmental Review</td>
<td>Evaluate potential risks during the environmental and design phase. Project teams follow WSDOT’s NEPA /SEPA guidance (2008 to present) <a href="http://www.wsdot.wa.gov/SustainableTransportation/adapting.htm">http://www.wsdot.wa.gov/SustainableTransportation/adapting.htm</a></td>
</tr>
<tr>
<td>Construction</td>
<td>Look at potential for new issues: Salt water corrosion, heat or precipitation changes for long-term impacts on materials</td>
</tr>
<tr>
<td>Maintenance &amp; Operations</td>
<td>Multi-hazard risk reduction, awareness of maintenance activities that may be affected by heat or extreme weather events</td>
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Our first environmental document to consider climate (NEPA 2008)

Includes project elements that add resilience for future flooding
SR 522/US 2 Completed December 2015
Mukilteo Multimodal Ferry Terminal

Final EIS (2013)
- Sea-level rise
- Stormwater

2016 @ 60% Design
2019 opening

Consider climate risk in Project Planning and Design
SR 167 Completion Project: Connects Port to I-5 and regional highway network

<table>
<thead>
<tr>
<th>Year</th>
<th>Preliminary Engineering</th>
<th>Right of Way</th>
<th>Construction</th>
</tr>
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<tr>
<td>2015</td>
<td>$29 m</td>
<td>$180 m</td>
<td>$724 m</td>
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SR 167 Completion Project – Constraints & Opportunities

• Topography
  – low point of the valley
  – located in the floodplain
  – shallow groundwater

• Aquatic Habitat
  – salmon bearing streams
  – wetlands

✓ Surrounding land use

✓ Riparian Restoration & public support for habitat projects
New Alignment with Riparian Restoration & Flood Storage (considers SLR & Precip)
WSDOT Climate Impacts Vulnerability Assessment Results in Skagit Basin
Skagit Basin Pilot: Used flood studies to inform transportation asset management

Recommendation:
Integrate flood hazard, land use & transportation plans
Early Lessons from WSDOT

- Climate consideration is responsible asset management

- Collaboration & Communication are Essential
  - Achieve co-benefits & avoid mal-adaptation
  - Skagit Basin Flood Risk Management & Transportation Asset Management
  - Multisector planning like HUD’s National Disaster Resiliency Competition (lessons of our unsuccessful bid)

- It’s all local – that’s where impacts are felt, and where climate readiness & hazard risk reduction happens
Understand how others are adapting & improving resilience

• Identify critical natural and built environments
• Restore shorelines & floodplains
  – limit armoring, remove dikes, connect wetlands
  – Protect key geomorphologic processes (sediment supply)

“When engineering is inevitable, be imaginative”
Emerging Issues

- Environmental Mitigation
- Endangered Species & Habitats
- Climate Refugees
- Healthy, Sustainable Communities

Fatal temperatures for salmon (UW CIG 2009)
BUILDING A CLIMATE-READY TRANSPORTATION SYSTEM

Essential elements:

• Understand the climate forecast
• Assess our risks
• Integrate into planning and design
• Look for co-benefits
• Partner with others

For more information:

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