The Oregon Resilience Plan

Oregon Transportation Commission Workshop
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Presented by:
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The Oregon Resilience Plan

Required by the legislature, supported by Governor

Comprehensive plan, developing a strategic approach

Transportation is critical
Concepts

Retrofit increases resiliency if done incrementally & strategically.

Secondary loss of life and long term economic losses can be significantly reduced.

Strategic planning is critical to success and will require widespread consensus.
The solution

RETROFIT

For life safety to prevent collapse

For serviceability to keep the bridge functional
Seismic Retrofit Methods

Older overpasses are vulnerable at their joints and columns, they need to be retrofitted to help them stand up to a quake.

Older concrete columns are fitted with a steel casing. A thin layer of concrete grout fills in gaps.

Old columns have vertical rods and ½” steel hoops on 12” centers. During a quake the columns collapse under lateral motion.

Footings are enlarged and pilings driven deep into ground for structures built in soft soil.

New columns have continuous ¾” steel spirals on 3” centers to support vertical rods.

Cable supports keep road beds from separating at joints and hold bridge decks to columns.
Collapse

Astoria-Megler Bridge
## Retrofitting progress

First 16 years since vulnerability was identified

<table>
<thead>
<tr>
<th>Years</th>
<th>Actions</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994/1997</td>
<td>Prioritized total bridge needs</td>
<td>1155</td>
</tr>
<tr>
<td>1985-2012</td>
<td>Phase 1 retrofit added to projects (STIP &amp; OTIA III program) bridges addressed</td>
<td>355</td>
</tr>
<tr>
<td>Future</td>
<td>Bridges still needing retrofitting (About 200 years at current funding)</td>
<td>800</td>
</tr>
</tbody>
</table>
Findings on transportation in the Oregon Resilience Plan

- Develop mitigation policy and retrofit plan
- Complete statewide transportation resilience assessment & gap analysis
- Identify key transportation links
$350 Billion Loss
• Minimize long term economic damage
• Address overall bridge condition
• Identify strategic lifeline routes
## Route selection

<table>
<thead>
<tr>
<th>Category</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survivability</strong></td>
<td>• Emergency responders</td>
</tr>
<tr>
<td></td>
<td>• Critical care facilities</td>
</tr>
<tr>
<td><strong>Life Support</strong></td>
<td>• Critical care facilities</td>
</tr>
<tr>
<td></td>
<td>• Life support resources</td>
</tr>
<tr>
<td></td>
<td>• Evacuation routes</td>
</tr>
<tr>
<td><strong>Economic Recovery</strong></td>
<td>• Critical freight corridors</td>
</tr>
<tr>
<td></td>
<td>• Mobility into and out of the region</td>
</tr>
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<td></td>
<td>• Routes between large metro areas</td>
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</table>
Recommended lifeline routes
## Total Seismic PLUS Program Cost

<table>
<thead>
<tr>
<th>Program Phases</th>
<th>Total Bridge Cost</th>
<th>Landslides/Rockfalls Cost</th>
<th>Total Seismic PLUS Program Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$738 Million</td>
<td>$197 Million</td>
<td>$935 Million</td>
</tr>
<tr>
<td>2</td>
<td>$632 Million</td>
<td>$272 Million</td>
<td>$904 Million</td>
</tr>
<tr>
<td>3</td>
<td>$612 Million</td>
<td>$483 Million</td>
<td>$1,095 Million</td>
</tr>
<tr>
<td>4</td>
<td>$640 Million</td>
<td>$126 Million</td>
<td>$766 Million</td>
</tr>
<tr>
<td>5</td>
<td>$1,432 Million</td>
<td>$0</td>
<td>$1,432 Million</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$4.1 Billion</strong></td>
<td><strong>$1.0 Billion</strong></td>
<td><strong>$5.1 Billion</strong></td>
</tr>
</tbody>
</table>
Major Seismic Event: Isolated Areas

Total economic loss: $350 B
Isolated Zones: Phase 1 & 2 Scenario

Reduce economic loss by:
$35\text{ B}$
Isolated Zones: Full Seismic Program

Reduce economic loss by:
$84 B
Cost = $5.1 Billion
Economic Loss Avoided = $250 Billion

50:1
We need to start NOW
Transportation is key to the overall response

Seismic Retrofit by State

5147 Bridges
$13 Billion

416 Bridges
$177 Million

143 Bridges
$44 Million
Oregon Resilience Plan Recommendations

Begin immediately to prepare critical state highway bridges and the transportation system to withstand a major earthquake.

- Additional revenue be identified to complete the most critical routes.
- Funding source should be “pay as you go.”
- Research to ensure the most current technology and efficient methods are applied.
- Conduct a thorough inventory and assessment of transit, port and rail assets.