WSDOT Pavement Management Practices for Concrete Pavement Preservation

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WSDOT Highway System

Statewide Lane Miles

- Chip Seal: 6,580 (36%)
- Asphalt: 9,660 (52%)
- Concrete: 2,250 (12%)

Statewide VMT

- Chip Seal: 6% (6,580)
- Concrete: 28% (9,660)
- Asphalt: 66% (18,500)

- 18,500 lane-miles

Washington State Department of Transportation
Cost-Effectiveness

“...the most efficient investment...”

- Annual Cost ($ / lane-mile / year of life)

- Historical Cost of Acceptable Pavement Performance
  - Actual historical cost ($/LMY)

- Expected Cost of Future Pavement Rehab
  - Projected LCCA ($ /LMY)
LLCC: Concrete

Risk of Catastrophic Failure:
- Very Low
- Low
- Med.
- High

Strategy:
- Grind
- Grind and/or DBR and Selective Reconst.
- Wait for Total Reconst. (Triage)

Condition Indexes

- Cannot do grind or DBR after this point
- MUST do reconstruction after this point

Total Reconst. (index < 25)
Replacement (Strategy) Analysis

• Decision Analysis to consider:
  – Do Nothing (no replacement)
  – Maintenance
  – Rehabilitation
  – Reconstruction

• If proposed alternative results in lower annual cost, then make decision for (strategy) replacement
## Cost Effectiveness Evaluation

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Agency Cost ($/LM)</th>
<th>Life Extension (years)</th>
<th>EUAC(_0%) ($/LMY)</th>
<th>EUAC(_4%) ($/LMY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grinding &amp; slab replacement</td>
<td>$400,000</td>
<td>15</td>
<td>$26,667</td>
<td>$35,976</td>
</tr>
<tr>
<td>CSOL + resurfacing in year 20 and 35</td>
<td>$900,000 + $225,000 each</td>
<td>50</td>
<td>$27,000</td>
<td>$49,330</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>$2,500,000</td>
<td>50</td>
<td>$50,000</td>
<td>$116,376</td>
</tr>
</tbody>
</table>
Distribution of PCCP Miles by Rehabilitation Method

- **Untouched**: 1130 (55%)
- **Built After 2000**: 179 (9%)
- **DBR**: 343 (17%)
- **Grind**: 222 (11%)
- **Panel Replacement**: 168 (8%)

**Pavement Age (years):**
- 0-4
- 5-9
- 10-14
- 15-19
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79

- 25% in each age group.
### 30-Year Concrete Rehabilitation Needs

<table>
<thead>
<tr>
<th></th>
<th>Triage (lane-miles)</th>
<th>Reconstruction* (lane-miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-25</td>
<td>366</td>
<td>515</td>
</tr>
<tr>
<td>2026-35</td>
<td>567</td>
<td>474</td>
</tr>
<tr>
<td>2036-45</td>
<td>417</td>
<td>504</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,350</strong></td>
<td><strong>1,493</strong></td>
</tr>
<tr>
<td><strong>Annual Average</strong></td>
<td><strong>45</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>
Note: Chart includes funding provided from the Legislature. Over programming not included for 2017, 2018 and 2019.