California Pavement Inventory

Total state network: 353,744 ln-mi

- Counties: 132,775 ln-mi (38%)
- Caltrans: 50,450 ln-mi (14%)
- Cities: 170,518 ln-mi (48%)
CT pavement projects:
last 4 yrs: $4.0 billion /16,500 ln-mi

- Preventive Maint: avg = $104,000/ ln-mi
- Major Rehab: avg = $1 million/ ln-mi

10 yr pavement needs = $2.0 bil / yr
Traffic and Climate
Cracking

- 1st Stage: single longitudinal or transverse
- 3rd Stage: intersecting, 3 or more pieces
Typical Concrete Repair Strategies

**Distress Level**

- **Preventive**
  - Failed joint seal
  - 3rd stage ≤ 10%; spalling

- **Corrective**
  - IRI > 170
  - Faulting > ¼”
  - 3rd stage 10% - 20%

- **Rehabilitation**
  - 3rd stage ≤ 10%

**Strategies**

- Seal joints, slab replacement, spall repair
- Grind, slab replacement, DBR
- Lane replacement, CSOL
Spall Repair
Spall Repair
Dowel Bar Retrofit
Dowel Bar Retrofit
Dowel Bar Retrofit
Dowel Bar Retrofit
Slab Replacement
Slab replacement
Slab Replacement  3rd Stage Crack vs. Age

\[ y = 0.7586x \]

\[ y = 1.5213x \]
Slab Replacement  3rd Stage Crack vs. Age

y = 0.7586x

y = 1.5213x

6.6 Yr

13.2 Yr

Doweled

Not Doweled

Linear (Doweled)

Linear (Not Doweled)
Slab replacement    Study Limitations

• Survivor bias
  • Some failed slabs have been replaced

• Repeat projects at location
  • Difficult to ID old slabs among new slabs
Slab Replacement

2002
2007
2009
2010
<table>
<thead>
<tr>
<th>Strategy/ Issue</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid slab replacement</td>
<td>➢ Rapid strength concrete</td>
</tr>
<tr>
<td></td>
<td>➢ Precast panels (nonstd)</td>
</tr>
<tr>
<td>Spall repair durability</td>
<td>➢ CP Tech Center design-2012</td>
</tr>
<tr>
<td></td>
<td>➢ Polyester concrete</td>
</tr>
<tr>
<td></td>
<td>➢ Future: AML alternatives</td>
</tr>
<tr>
<td>Abrasive wear &amp; rutting</td>
<td>➢ Lithium silicate surface hardeners?</td>
</tr>
<tr>
<td></td>
<td>➢ Polyester concrete inlays?</td>
</tr>
</tbody>
</table>
Questions?

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Thank you!