CONCRETE PAVEMENT PRESERVATION IN GEORGIA

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Pavement Preservation

Pavement preservation is a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations.
Pavement Preservation

The sum of all activities undertaken to provide and maintain serviceable roadways. This includes preventive maintenance and some forms of reactive maintenance, as well as minor rehabilitation projects. It excludes new or reconstructed pavements and pavements requiring major rehabilitation or reconstruction.
Concrete Pavement Preservation

Manage the rate of deterioration
HISTORICAL TIMELINE

- 1971  First Comprehensive Interstate Condition Survey
- 1974  Research on CPR Procedures
- 1976  CPR Workshop in Augusta
- 1976  Started Letting CPR Contracts
PCC CONDITION SURVEYS

- STARTED IN 1971
- FAULTING 12.5 % SAMPLE
- BROKEN SLABS
- REPLACED SLABS
- JOINT SEAL CONDITION
- SMOOTHNES
- FRICTION
PROBLEMS WITH PCC PAVEMENTS

• Erodible Bases
• Undoweled Joints
• Poor Joint Seal Performance
• Asphalt Shoulders
• Heavy Truck Traffic
Concrete Pavement Restoration

- Two things are required for restoration to be cost effective & have desired performance:
  - A feasible repair method that addresses the distress
  - Applied at the appropriate time.
Concrete Pavement Preservation Strategies

• Determine type and extent of distress
• Review historical performance data
• Look at more than one technique
• Address the causes of existing deterioration
• Provide a reasonable improvement over existing pavement
Restoration Techniques

Concrete Pavements

- Full-depth repair
- Partial-depth repair
- Diamond grinding
- Joint & crack resealing
- Slab stabilization
- Retrofitting dowels
- Retrofitting concrete shoulders
- Cross-stitching long cracks/joints
- Retrofit Edge Drains
When to Do CPR
CPR “Window of Opportunity”

Original Pavement

Concrete Overlay

Trigger Value

Limit Value
## Windows of Opportunities

### Structural Trigger and Limit Values for JPCP

<table>
<thead>
<tr>
<th>Traffic Volumes</th>
<th>Trigger / Limit Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High ADT&gt;10,000</td>
</tr>
<tr>
<td>Fatigue Cracking (% slabs)</td>
<td>1.5 / 5.0</td>
</tr>
<tr>
<td>Deteriorated Joints (% joints)</td>
<td>1.5 / 15.0</td>
</tr>
<tr>
<td>Corner Breaks (% joints)</td>
<td>1.0 / 8.0</td>
</tr>
<tr>
<td>Faulting (avg. - mm)</td>
<td>2.0 / 12.0</td>
</tr>
<tr>
<td>D-Cracking (severity)</td>
<td></td>
</tr>
<tr>
<td>Joint Seal Damage (% joints)</td>
<td></td>
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<tr>
<td>Load Transfer (%)</td>
<td></td>
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<tr>
<td>Skid Resistance</td>
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</tbody>
</table>
## Windows of Opportunities

### Functional Trigger and Limit Values for JPCP

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<tbody>
<tr>
<td></td>
<td>High ADT&gt;10,000</td>
</tr>
<tr>
<td>IRI (m/km)</td>
<td>1.0 / 2.5</td>
</tr>
<tr>
<td>PSR</td>
<td>3.8 / 3.0</td>
</tr>
<tr>
<td>California Profilograph</td>
<td>12 / 60</td>
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</tbody>
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CPR GUIDELINES
GEORGIA

• FAULTING: 3/32” TO 1/8 “
• RIDE
  • GROUND: SI 1400 (IRI 106 in/mi)
  • ORIGINAL: SI 1650 (IRI 125 in/mi)

• CRACKED SLABS
  • NO MAX PERCENTAGE
Performance
I-475

- OPENED TO TRAFFIC 1966/1967
- 9 INCH THICK PCC
- NO DOWELS, 30 FT JOINT SPACING
- SOIL/ BIT STAB. BASE
- DESIGNED FOR 5 MILLION ESAL’S
- CARRIED 50 + MILLION
Equivalent Loading History

\[
\sum \text{ESALs}
\]

Year


14.23 15.08 16.31
I-285
From I-20 to Chamblee-Tucker Road

- Opened to Traffic 1967/1968
- 10 inches Thickness
- No dowels. 30 ft joint spacing
- Inside lane added 1981
- Design Loads 5 to 6 million ESAL’s
- 2002 Traffic 160,000 to 225,000
  15% trucks
- CPR in 1981 at 23 million ESAL’s
- Current est. ESAL’s 125 million
Smoothness History

I - 285 (MP 35 - 45)

Year


Smoothness

0 20 40 60 80 100 120
Restoration Performance

• Provides 7 to 10 or more years of service.
• Preliminary engineering & timing are critical.
• Overall effectiveness is highly dependent on design adequacy, construction quality, and other restoration activities.
• Future Maintenance
Concrete Pavement Preservation WILL

- Manage rate of deterioration
- Extend pavement life
- Maintain high level of serviceability
- Provide cost-effective alternative
- Allow for rapid repair under traffic
- Fit with traffic management strategies
Concrete Pavement Preservation WILL NOT

• Correct design deficiencies
• Stop aging of the pavement
• Prevent future deterioration
• Make pavement “zero maintenance”
Left to themselves, things always go from bad to worse.