Choosing the Right Treatment to Meet Your Needs

Western States Regional In-Place Recycling Conference

Better, Faster, Cost Effective

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In-Place Recycling
Selection Considerations

- Pavement condition (distress type, extent and severity)
- Engineering factors
- Economic considerations
Pavement Condition

Types of Distress

- Surface defects
- Deformation
- Cracking
  - Load-related
  - Non load-related
  - Reflective
- Patching
Impact of Pavement Distress on Recycling Methods

<table>
<thead>
<tr>
<th>Technique</th>
<th>Distress Characteristics</th>
<th>Typical Milling Depths</th>
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<tbody>
<tr>
<td>HIR</td>
<td>Minimal deterioration, distress contained in surface, no load distress</td>
<td>2 in.</td>
</tr>
<tr>
<td>CIR</td>
<td>More high-severity, non load distress extending deeper into surface</td>
<td>4 in.</td>
</tr>
<tr>
<td>FDR</td>
<td>Any</td>
<td>6 to 14 in.</td>
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Engineering Factors

• Expected treatment design life
• Suitability of materials for recycling
• Expected traffic growth
• Traffic control
• Construction logistics
• Presence of underground utilities
• Need for geometric corrections or safety enhancements
• Environmental factors
• Drainage improvements
Economic Considerations

- Financial comparisons
- User delay
- Traffic control
- Length of construction period
- Local business impact
- Utilities
5 Case Studies

• Considerations (pavement condition, engineering factors and economic considerations)

• Project Decisions
  – Type of Recycling
  – Depth of Recycling
  – Use of Additives
  – Other Information as Available
Colorado DOT, Region 1
SH-86 near Kiowa

Case Study #1
Before
Colorado DOT, Region 1
SH-86 near Kiowa
Case Study #1
During
Cores are important

- What does the distress look like below the surface?

CIR passed Hamburg wheel-tracking test
Colorado DOT, Region 2
I-25 south of Pueblo
Case Study #2
Before
Colorado DOT, Region 2
I-25 south of Pueblo
Case Study #2
During
Colorado DOT, Region 2  
I-25 south of Pueblo  

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- **Life Cycle Cost Analysis**
  - 6-inch CIR and 4-inch overlay ($24.7M)
  - 4-inch mill and 5.5-inch overlay ($28.9M)

- **“Go Green” Calculations**
  - Save 17,000 tons of aggregate
  - Save 1,200 tons of binder
  - Recycle 85,000 tons of material
Colorado DOT, Region 3
SH-141 through Unaweep Canyon
Case Study #3
Before
Colorado DOT, Region 3
SH-141 through Unaweep Canyon
Case Study #3
During
Colorado DOT, Region 3
SH-141 through Unaweep Canyon

- Pavement smoothness award
- When HIR is selected, CDOT has project selection guidelines for the 3 types of HIR:
  - Surface recycling
  - Heater remixing
  - Heater repaving
Colorado DOT, Region 4
US-385 at Idalia

Case Study #4
Before
Colorado DOT, Region 4
US-385 at Idalia
Case Study #4
During
• “Exposed” FDR
  – Maximum length of 4 miles
  – Maximum time of 3 days
• Trimmer required for grade control prior to paving
Colorado DOT, Region 5
US-160 near the four corners

Case Study #5
Before
Colorado DOT, Region 5
US-160 near the four corners

Case Study #5
During
Colorado DOT, Region 5
US-160 near the four corners

- 3D Modeling
  - Balance delivery of aggregates
  - Blade in front of reclaimer had AMG
  - Blade behind reclaimer had AMG

- Pavement Award

Note
Case Study #6
AADT = 35,000, 5% Trucks
Summary

• Pavement Condition
  – Surface distresses
  – Cores (distress below surface & pavement depth)

• Engineering Factors
  – Design life, constructability, geometrics, drainage, others

• Economic Considerations
  – LCCA, user delay, local businesses, “go green”
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Questions?