Innovations in Pavement Repair

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PRESENTATION OVERVIEW

- IDENTIFY ASPHALT CONCRETE & PCC PAVEMENT DISTRESSES
  - Common and Unique

- DISCUSS CONVENTIONAL REPAIR METHODS
  - Distress repair objectives
  - Common patching techniques & materials
  - Signs and causes of patch failure
  - Cost-Effectiveness and Likelihood of Success

- DISCUSS INNOVATE REPAIR APPROACHES
  - Mastic’s capabilities & characteristics
  - Application’s
  - Success stories
Asphalt concrete distresses

- Raised manhole covers
- Potholes
- Alligator cracking
- Wide transverse cracks
DEPRESSED THERMAL CRACKING
FAILED PAVING JOINTS
COMMON PCCP DISTESSES

- Slab Cracking
- Joint Spalling
- Corner Breaks
Sunken bridge approach & Railroad crossing
Uncommon Distress’s

- Horse ruts
- RPM popouts
- Raised manhole covers
Objectives of AC & PCCP Repairs

- Safety
- Ride quality-IRI
- Pavement life extension
Conventional repair methods

AC Pavement Repair
- Remove & Replace
- Spray patching
- “Throw & Go”
- “Throw and roll”

PCC Pavement Repair
- Class D concrete out of truck
- 701-04, Portland Cement based concrete repair material
- 701-09, Rapid Hardening Concrete Repair Material
Remove & Replace (Semi-permanent)
Spray Patching
Emulsions
(Temporary/semi-permanent)
THROW & GO
HMA & COLD PATCH
(Temporary)
THROW & ROLL
HMA & COLD PATCH
(TEMPORARY)
PCCP repair timeframe

3+ Day’s

24 hours

20-45 minutes
Repair costs & cost effectiveness
Labor costs
EQUIPMENT COSTS

- Depreciation
- Rental
- Maintenance
- Fuel
MATERIAL COSTS
USER DELAY COSTS
Repair costs

- Labor
- Equipment
- Material
- User

Productivity
- Expected service life

Cost Effectiveness
Signs of Failures

- Adhesive/Cohesive failure
- Reflective Cracking
- Delamination
- Dishing & Shoving
- Reflective Cracking
Causes of repair failures

<table>
<thead>
<tr>
<th>Repair Materials</th>
<th>Installation Methods</th>
<th>Climatic Conditions</th>
<th>Repair Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack adhesion</td>
<td>Lack compaction</td>
<td>Moisture</td>
<td>Emergency</td>
</tr>
<tr>
<td>Lack flexibility</td>
<td>Poor preparation</td>
<td>Cold/Heat</td>
<td>Routine maintenance</td>
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<tr>
<td>Voids</td>
<td>Wrong equipment</td>
<td>Freeze/thaw</td>
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LIKELIHOOD OF SUCCESS

• “The two main elements of quality pothole patching are material selection and repair procedures. For every combination of these two factors, the cost-effectiveness of the overall patching operation will be affected by material, labor, and equipment costs.”

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Materials and Procedures for Repair of Potholes in Asphalt-Surfaced Pavements
LIKELIHOOD OF SUCCESS

• Maintain an aggressive pothole repair program that uses the **best patching material available**

Source: TRIP 2013 report-Bumpy Roads Ahead: America’s Roughest Rides and Strategies to Make our Roads Smoother
Innovative permanent repair

MASTIC’S
Mastic capabilities

- Increase safety
- Restore ride quality
- Extend pavement life
Mastic characteristics

• Highly adhesive
• Waterproof & impermeable
• Flexible
• No compaction
• Stable polymer/resin binder
• Aggregate filled
Preparation

**Patcher II**
- 200 Gallon capacity
- Diesel fired
- Thermostatically controlled
- Multi material use
- Easy clean out
Preparation
Heating & Agitation
Installation
No compaction
Corner break repair's
MDOT Spalled Joint Repair
PAVING JOINT REPAIR
INDOT Lloyds Expressway Partial Depth Joint Repair
Depressed thermal crack repair
INDOT 170 Richmond, Indiana
Placed in 2002
Pothole repair
Bridge deck patching
Indianapolis & Ft. Wayne International Airports
IN G.A. AIRPORTS
TRANSVERSE CRACK REPAIR
Alligatored crack repair
Spalled pccp joint repair
Wide Crack Repair
Slab crack repair
Level bridge approach
Unique repairs
Reflective crack control
Rumble strip repair
Railroad Crossing repair
Thank You!

“May the road rise up to meet you”

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