Performance of Three Popular Rehabilitation Strategies for HMA Pavements

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Project Selection Criteria

• 10-year design life,
• ½ mile minimum length
• Constructed 1997 to 2001.

The following 175 projects met this criteria.
### Projects Studied

<table>
<thead>
<tr>
<th>Type of Treatment</th>
<th>Number of Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two to Four Inch Overlay</td>
<td>73</td>
</tr>
<tr>
<td>Cold planing and overlay</td>
<td>57</td>
</tr>
<tr>
<td>Heater Scarification and Overlay</td>
<td>19</td>
</tr>
<tr>
<td>Full depth reclamation and overlay</td>
<td>6</td>
</tr>
<tr>
<td>Heater remix and overlay</td>
<td>6</td>
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<tr>
<td>Stone matrix asphalt overlay</td>
<td>5</td>
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<tr>
<td>Cold recycle and overlay</td>
<td>5</td>
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<tr>
<td>Heater repaving and overlay</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>175</strong></td>
</tr>
</tbody>
</table>
Performance Based on:

Smoothness (IRI)
Rutting
Cracking

As a function of:

- Asphalt binder
- Traffic
- NHS
- Gradation
- CDOT Region
- Environment
Data Analysis Criteria

- Distress increases with time
- Correlation Coefficient $> 0.50$
- Three projects.
Summary
Smoothness

Years after Rehabilitation

- Cold Planing
- Overlay
- Heater Scarification
- Average
Rutting

Years After Rehabilitation

- Cold Planing
- Overlay
- Heater Scarification
- Average
Fatigue

Years After Rehabilitation

- Cold Planing
- Overlay
- Heater Scarification
- Average
Longitudinal Cracking

Years after Rehabilitation

- Cold Planing
- Overlay
- Heater Scarification
- Average
Conclusions

- Cold planing with an overlay outperforms the simple overlay.
- Cold planing with an overlay and the simple overlay tend to outperform heater scarification.
- Pavement condition where heater scarification and overlay was the rehabilitation method tended to be poorer than the other two rehabilitation methods.
- A greater positive effect on performance occurred when polymer modified asphalt was used with heater scarification compared with cold planing.
- Pavement condition tended to be below the Zero Remaining Service Life Threshold (ZRSL) for all performance indicators except fatigue cracking. The condition of the pavements where cold planing and heater scarification were utilized exceeded the ZRSL threshold.
Conclusions, continued

- Rehabilitation would have been warranted earlier in the life of the pavements which reached ZRSL at the time of rehabilitation. As a result, the expected life of the rehabilitation strategies utilized on these pavements may have been shorter than could be expected had rehabilitation been done before distress reached this high level.

- Although a linear regression was used to compare the rates of change of distress through time for the first six years’ service for this research, it is likely a non-linear model would be needed to predict performance beyond this time.