MICRO-MILLING

What is Micro-Milling?
Micro-milling provides an innovative way to rehabilitate asphalt pavements. Micro-milling uses a milling drum with more teeth and a tighter lacing pattern to create a smoother surface than the traditional milling process (about 3 times the teeth than regular milling heads). The smoother surface provides a better surface for thin overlays, ultra-thin bonded wearing course (UTBWC), chip seals, and microsurfacing.

Benefits of Micro-Milling
Micro-Milling is used to help restore ride on pavements that are in otherwise sound structural condition. In the past a traditional mill and overlay have been used. By using micro-mill, “bumps” are milled off the roadway creating a smoother ride. Below is a chart depicting TH89 in District 2 with before micro-mill and after micro-mill ride data.

MnDOT’s Experience
Specifications were developed using specifications from Georgia and Virginia DOT’s. Using this specification, two (2) projects were partially funded by Destination Innovation Monies. The Destination Innovation program establishes and delivers innovative technologies and practices that illustrate significant improvements in quality and cost efficiency.
TH89 District 2

This project was located south of Grygla, MN. It consisted of 16 miles (32 lane miles) of pavement micro-milled and chip sealed.

<table>
<thead>
<tr>
<th></th>
<th>Before IRI (in/mi)</th>
<th>After IRI (in/mi)</th>
<th>After Chip Seal IRI (in/mi)</th>
<th>Percent Improvement after Micro Mill</th>
<th>Percent Improvement after Chip Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Both Wheel Path</td>
<td>81.1</td>
<td>64.3</td>
<td>67.3</td>
<td>21%</td>
<td>16%</td>
</tr>
<tr>
<td>Average Left Wheel Path</td>
<td>79.3</td>
<td>73.9</td>
<td>79.3</td>
<td>7%</td>
<td>0%</td>
</tr>
<tr>
<td>Average Right Wheel Path</td>
<td>80.6</td>
<td>55.2</td>
<td>55.3</td>
<td>32%</td>
<td>31%</td>
</tr>
</tbody>
</table>

TH89 Metro District

This project was located in Lake Elmo, MN. It consisted of 3 miles of road micro-milled and then an Ultra-Thin Bonded Wear Course (UTBWC).

<table>
<thead>
<tr>
<th></th>
<th>Before IRI (in/mi)</th>
<th>After IRI (in/mi)</th>
<th>After UTBWC IRI (in/mi)</th>
<th>Percent Improvement after Micro Mill</th>
<th>Percent Improvement after UTBWC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Both Wheel Path</td>
<td>111.7</td>
<td>97.3</td>
<td>48.1</td>
<td>13%</td>
<td>57%</td>
</tr>
<tr>
<td>Average Left Wheel Path</td>
<td>124.1</td>
<td>100.0</td>
<td>49.8</td>
<td>19%</td>
<td>60%</td>
</tr>
<tr>
<td>Average Right Wheel Path</td>
<td>99.2</td>
<td>94.52</td>
<td>46.33</td>
<td>5%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Next Steps

Evaluations of the above mentioned projects will continue. More projects using micro-milling are scheduled to be constructed in the 2014 construction season in District 3.

One project will be a micro-mill with an UTBWC on TH10 and another project in development will use micro-mill with microsurfacing.

For More Information and for Additional Resources:

Melissa Cole  
Pavement Preservation Engineer  
Assistant Grading & Base Engineer  
melissa.cole@state.mn.us  
Ph: (651) 366 – 5432

Jerry Geib  
Asphalt Research  
jerry.geib@state.mn.us  
Ph: (651) 366 - 5496