Current Single machine process

History
Right treatment on right road
Six Step Process
Joint density
Innovations

Single Machine Repaving (SMR) Process
History

- 1965 – Founded by Earl Cutler
- 1989 – Acquired by new ownership
- Nine contract repaving spreads in U.S.
- Sold 41 Repavers internationally
Over 220 million square yards completed
Current United States Contracting Market

Pioneers in Pavement Preservation
Pavement Preservation

The “right” treatment
On the “right” road
At the “right” time
The Cost of Timely Maintenance

Pavement Condition

1st 40% drop in quality
Cost: $1.00

2nd 40% drop in quality
Cost: $4.00 - $5.00

Years (Time Varies for Each Road Section)

CUTLER Repaving, Inc.

Pavement Preservation Economics
Project Considerations

- Uniformity
- Depth of existing HMA
- Presence of Chip Seals
- Asphalt content (bleeding)
- Asphalt properties
- Traffic
- Types of pavement distress
- Environment
Urban Applications

• Curb line milling may be necessary
• Traffic easily controlled in work zone
• Environmental considerations
5.16.8 Selecting the Appropriate Hot In-Place Recycling Process

Table 5.5 below provides a general guideline for the preliminary selection of candidate recycling or reclamation methods for the rehabilitation of asphalt pavements.

<table>
<thead>
<tr>
<th>Pavement Distress Mode</th>
<th>Candidate HIR Process</th>
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<tbody>
<tr>
<td></td>
<td>Surface Recycling</td>
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<td></td>
<td>Remixing</td>
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<td>Repaving</td>
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<tr>
<td>Raveling</td>
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<td>Potholes</td>
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<td>Bleeding</td>
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<td>Skid Resistance</td>
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<td>Rutting</td>
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<td>Corrugations</td>
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<td>Shoving</td>
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<td>Fatigue Cracking</td>
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<td>Edge Cracking</td>
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<tr>
<td>Slippage Cracking</td>
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<tr>
<td>Block Cracking</td>
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<tr>
<td>Long./Trans./Reflect. Cracking</td>
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<tr>
<td>Swells, Bumps, Sags, Depressions</td>
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<tr>
<td>Marginal Existing Pavement Strength</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Non-Distress-Related Considerations</th>
<th>More Appropriate</th>
<th>Less Appropriate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Cost</td>
<td>$1.00 - $2.00 SY</td>
<td>$3.75 - $4.75 SY</td>
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<tr>
<td>User Costs</td>
<td>See PDM, C.4.3.1</td>
<td>See PDM, C.4.3.1</td>
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<td>Min. turning radius greater than 500'</td>
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<td></td>
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<tr>
<td>Min. turning radius less than 500'</td>
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</table>

1 The initial cost does not include the cost of any succeeding pavement layer that will be required to complete the work. The cost of any additional pavement overlay to be installed after each hot in-place recycling process should be considered in the cost evaluation step.
SINGLE MACHINE REPAVING (SMR) PROCESS
FIRST STEP:

Heat the Pavement
Virgin Hot Mix Delivered

Receiving Hopper and Drag Slat Conveyor

Single Machine Repaving (SMR) Process
Types of HMAC laid

Warm mix, both chemical and foamed
Asphalt rubber, wet and terminal blend
Stone Mastic
All types of SuperPave
Cutler R-2000 Pre-heater

First Step: Heat the Pavement
Main Heating Unit of Repaver

First Step: Heat the Pavement
Underside of Heating Hood

First Step: Heat the Pavement
Using Multiple Pre-heaters

First Step: Heat the Pavement
SECOND STEP:
Scarify the Pavement
Second Step: Scarify the Pavement

Scarifier System
Second Step: Scarify the Pavement
THIRD STEP:

Apply & Mix Emulsified Recycling Agent
Third Step: Apply & Mix Emulsified Recycling Agent
Recycling Agent Applied

Third Step: Apply & Mix Emulsified Recycling Agent
Moldboard Gathers Recycled Material Into Recycled Windrow

Rotary Auger distributes recycled material into windrow

Third Step: Apply & Mix Emulsified Recycling Agent
Moldboard

Third Step: Apply & Mix Emulsified Recycling Agent
Recycled Windrow

Third Step: Apply & Mix Emulsified Recycling Agent

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Steps 1-3 Review

Virgin hot mix delivered
Existing pavement heated
New hot wearing course laid

Existing pavement heated
Recycled windrow
Recycled mix laid
4-section recycling screed

Pavement scarified
Recycling agent applied and mixed
4-section paving screed

Recycling agent applied and mixed
4-section recycling screed

Single Machine Process
Fourth Step: Lay Recycled Material With Recycling Screed
Recycled Material Distributed

Fourth Step: Lay Recycled Material With Recycling Screed
Recycled Material Laid

Fourth Step: Lay Recycled Material With Recycling Screed
FIFTH STEP:
Lay Virgin Hot Mix Over Recycled Material
Virgin Hot Mix Dispensed

Drag Slat Conveyor at Paving Screed

Fifth Step: Lay Virgin Hot Mix Over Recycled Material
Paving Screed

Fifth Step: Lay Virgin Hot Mix Over Recycled Material
Fifth Step: Lay Virgin Hot Mix Over Recycled Material
Paving 17 Feet Wide

Fifth Step: Lay Virgin Hot Mix Over Recycled Material
SIXTH STEP: Final Compaction
Final Compaction

Sixth Step: Final Compaction
Sixth Step: Final Compaction
Heating edge insures joint density
Adjoining Lane Repaving Pass
Adjoining Lane Repaving Pass
Recent Innovations

Forced hot air heating system
Cutler Hot Air heating system
Cutler Hot Air heating system
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Recent Cutler FDOT History

2012
U.S. 41 (Tamiami Trail) SR 90 fr. Collier Co. line West 1 inch recycle depth

2015
SR 80 Palm Beach County 1-1/2 inch recycle depth
U.S. 41 Tamiami Trail
U.S. 41 Tamiami Trail
SR 80 Palm Beach Co.
Questions to think about on the way forward

• Are selection guidelines for HIR necessary for future use?
• How does HIR fit into FDOT preservation parameters?
• Many Districts see need but seem unsure of next steps
• How can we assist in educating Districts?
• Other questions