Asphalt Paving Systems

Who is Asphalt Paving Systems?

6 Locations:

• Hammonton, New Jersey
• Lehighton, Pennsylvania
• Middle Island, New York
• Tampa, Florida
• Cocoa Beach, Florida
• Savannah, Georgia
Emulsion Mills

Hammonton, NJ

Tampa, FL
Definition of Pavement Preservation

Is a planned strategy that extends the life of the pavement while it is still in good condition. This provides a cost effective solution for pavement management.
Where to start

- The objective is to maintain pavement condition such that corrective rehabilitation isn’t needed.
- Evaluate your overall road network and condition of the individual roads.
- Determine which treatment would be correct for the road condition.
When Should Preservation Techniques be applied to Pavements?

Preservation Techniques should be applied when:

- Need waterproofing (cracks)
- Surface oxidation
- Loss of surface friction
- Minor rutting
- Loss of ride quality
## Life cycle extension based on preservation techniques

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Life extension</th>
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</thead>
<tbody>
<tr>
<td><strong>Preventative</strong></td>
<td></td>
</tr>
<tr>
<td>Slurry Seal</td>
<td>3 - 5 years</td>
</tr>
<tr>
<td>Chip Seal</td>
<td>3 - 6 years</td>
</tr>
<tr>
<td>High Performance Chip Seal</td>
<td>5 - 8 years</td>
</tr>
<tr>
<td><strong>Micro Surfacing – Single Application</strong></td>
<td>5 - 8 years</td>
</tr>
<tr>
<td><strong>Double Application</strong></td>
<td>6 - 10 years</td>
</tr>
<tr>
<td>Cape Seal</td>
<td>6 - 10 years</td>
</tr>
</tbody>
</table>
What is the proper time of year to Apply Preservation Techniques to Pavements?

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slurry Seal</td>
<td>May 1 to October 1</td>
</tr>
<tr>
<td>Chip Seal</td>
<td>May 15 to September 15</td>
</tr>
<tr>
<td>High Performance Chip Seal</td>
<td>May 15 to October 1</td>
</tr>
<tr>
<td>Micro Surfacing (Applied Nighttime)</td>
<td>June 1 to September 15</td>
</tr>
<tr>
<td>Micro Surfacing (Applied Daytime )</td>
<td>May 1 to October 15</td>
</tr>
<tr>
<td>Cape Seal</td>
<td>May 15 to October 15</td>
</tr>
</tbody>
</table>
Preventative Maintenance: Chip Seal
Preventative Maintenance: Chip Seal

This technique is to seal the pavement with an impermeable and skid resistant layer wearing course

- Application of asphalt emulsion followed by a uniformly graded aggregate
- Corrects flushing/bleeding

**Application**

- Single, double and seal combination. Various aggregate sizes are used based on project requirements.
- Can use polymer modified emulsions to increase performance and service life (CRS-2PM)

**Performance**

- Medium term (3-6 years) dependant on traffic and weather
- Wearing course for medium to low traffic levels.
Preventative Maintenance: Chip Seal
Preventative Maintenance: Chip Seal

- Single Chip Seal
- Double Chip Seal
- Cape Seal

The Cape Seal process is when a Microsurfacing or Slurry seal application is placed over the Chip Seal.
High Performance Chip Seal
High Performance Chip Seal

Process:

Application of Asphalt Rubber Binder followed by a uniformly graded precoated aggregate.

3/8 cubular aggregate is precoated with PG 64-22 Asphalt Binder at an approved asphalt facility and delivered to jobsite.

Provides Quicker Stronger aggregate chip adhesion
High Performance Chip Seal

Application:
- Apply Asphalt Rubber Binder to road surface at a temperature between 350-400 degrees Fahrenheit at a rate of .5 to .65 gallons per square yard.
- Apply hot precoated aggregate immediately following Asphalt Rubber Binder at a rate of 30 to 40 pounds per square yard.
- Immediately roll with two pneumatic rollers in tandem
- Sweep excess aggregates after material has cooled

Performance:
- Medium term (5-8 years) dependent on traffic and weather
- Wearing course for medium to high traffic levels.
High Performance Chip Seal
High Performance Chip Seal
High Friction Surface Treatment
Preventative Maintenance: Microsurfacing/Slurry Seal
Preventative Maintenance: Microsurfacing/ Slurry Seal

Microsurfacing/Slurry Seal is a calibrated mixture of:

- Polymer-modified asphalt emulsion
- Type II & III gradations crushed aggregates
- Mineral filler, (Portland cement or hydrated lime)
- Water
- Other chemical additives

These materials are then mixed and spread on the pavement surface by a specially designed paving machine.
Preventative Maintenance: Microsurfacing/Slurry Seal

Mixture Design

- Predictive model for successful application of the microsurfacing mixture in the field
- Allows for anticipation of mixture performance characteristics as weather conditions fluctuate
NJDOT Specifications:

- Microsurfacing – 18 to 22 lbs./SY
- Slurry – 16 to 20 lbs./SY

*Projects Specified as Slurry Seal are not required to conform to ADA upgrades.*
Preventative Maintenance: Microsurfacing/Slurry Seal
Preventative Maintenance: DOT Nighttime application
Preventative Maintenance:
County Route Microsurfacing
Preventative Maintenance: Residential Microsurfacing
Microsurface/Slurry Seal
What roads may be candidates for Preventative Maintenance Treatments?

- Low – medium severity distresses
- Proper structural capacity
- Highways & Interstates
- Streets and Roadways
- State and Metro Parks
- Airport Runways and Taxiways
- Large Commercial and Industrial Lots
- Performance of 5-10 years
- Intermediate Course for Leveling/Binding
Preventative Maintenance

Benefits using Microsurfacing and Chip Seals:

- Quick traffic, 1 hour or less
- Minimizes traffic disruptions/user delay
- No utility adjustments
- Cost effective
- Day or Night time placement
- Improved Ride
Preventative Maintenance

Industry enhancements in the last 15 years

- Materials Technology Innovations
- Emulsifier Technology
- Engineered for adhesion, controlled break performance
- Polymer Technology
- Advanced Equipment Technology
Importance of Tack Coats

Good Tack Coat practices are imperative to achieve good pavement performance

- Selecting the appropriate material
- Calibrating distributor to achieve proper application rate
- Proper Sampling
- Surface must be clean and dry
- Must be applied in a uniform and consistent spray
- Must be sprayed at specified temperatures
## Importance of Tack Coats

<table>
<thead>
<tr>
<th>Material</th>
<th>Application Rate Gal/Per SY</th>
<th>Application Temperature (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polymer Modified Tack Coat (Spray Jet Paver)</td>
<td>0.05 – 0.15</td>
<td>140 – 175</td>
</tr>
<tr>
<td>CSS-1, CSS-1H</td>
<td>0.05 – 0.15</td>
<td>70 – 140</td>
</tr>
<tr>
<td>RS-1, RS-1H (NJDOT)</td>
<td>0.05 – 0.15</td>
<td>125 – 185</td>
</tr>
<tr>
<td>High Performance Trackless</td>
<td>0.05 – 0.15</td>
<td>140 – 160</td>
</tr>
<tr>
<td>CRS-1, CRS-1H (NJDOT)</td>
<td>0.05 – 0.15</td>
<td>125 – 185</td>
</tr>
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</table>
VOGELE Spray Jet Paver
VOGELE Spray Jet Paver

Heated Asphalt emulsion storage tank

Emulsion Spray nozzles

Emulsion ➔ Spray nozzles
VOGELE Spray Jet Paver

Polymer modified emulsion

High Performance Thin Overlay (HPTO)
Conclusion

- One of the toughest parts of pavement preservation is to get the public understanding that roads in generally good condition need treatment – Need to Break “Worst First Mentality”, approach to managing network

- If implemented correctly, surface treatments can provide better quality roads for longer, at reduced life cycle costs

- All of the pavement preservation techniques are considered a green construction method due to the limited amount of fuel and waste generated throughout construction
Asphalt Paving Systems
Pavement Preservation

Questions?