

# Introduction to Pavement Preservation

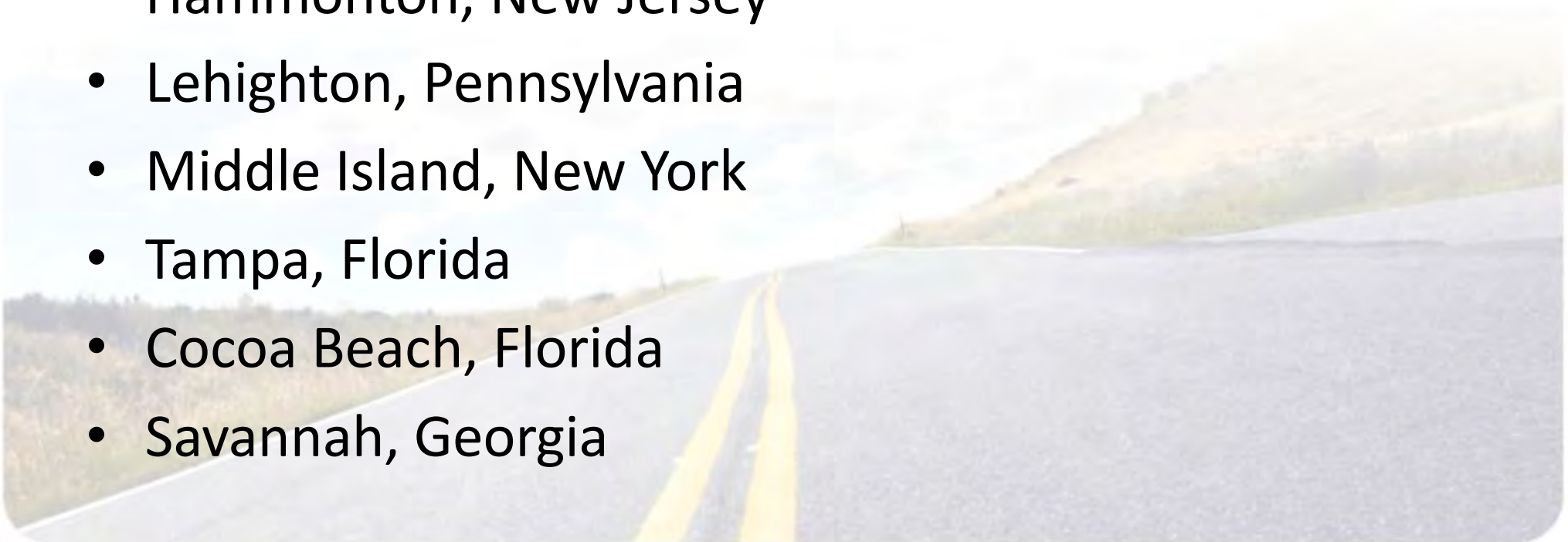


# Asphalt Paving Systems

## 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



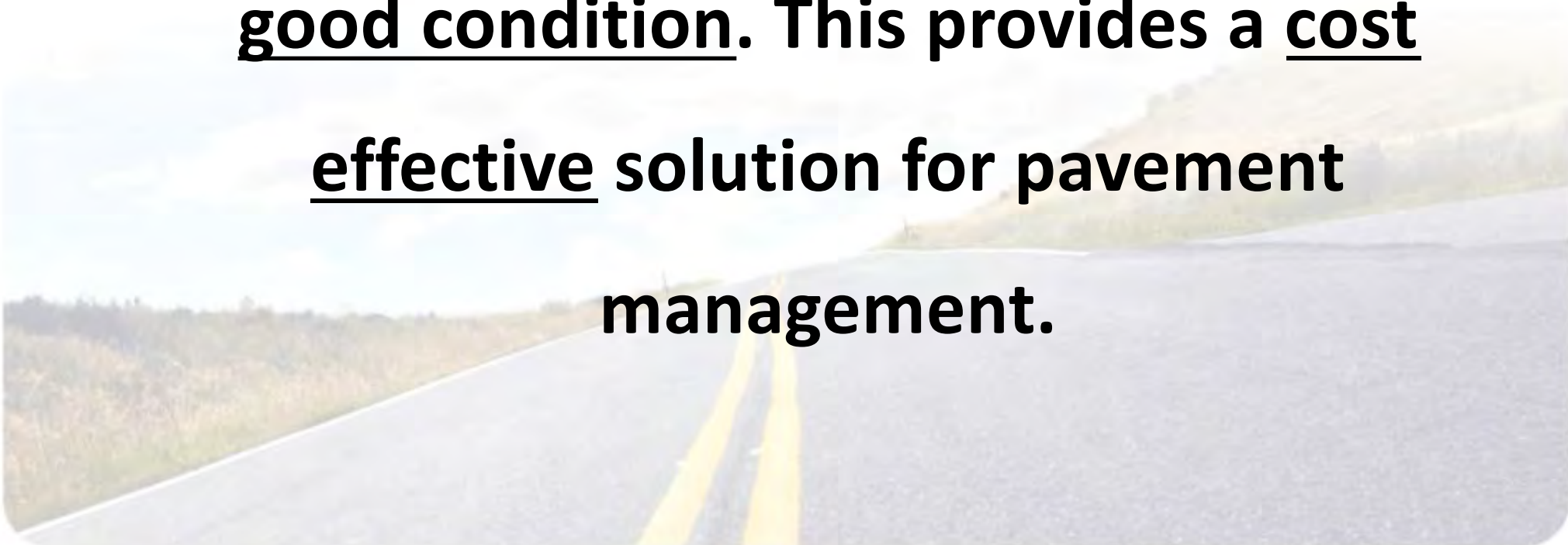
**Hammonton, NJ**



**Tampa, FL**

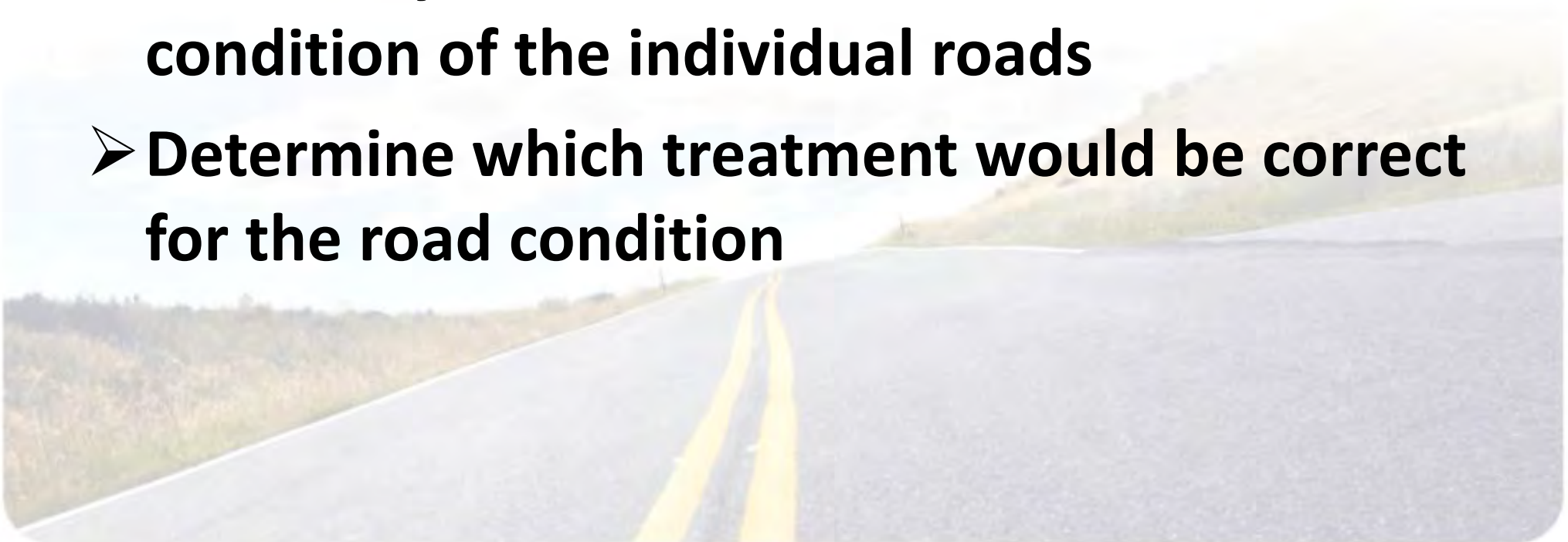
# Definition of Pavement Preservation

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

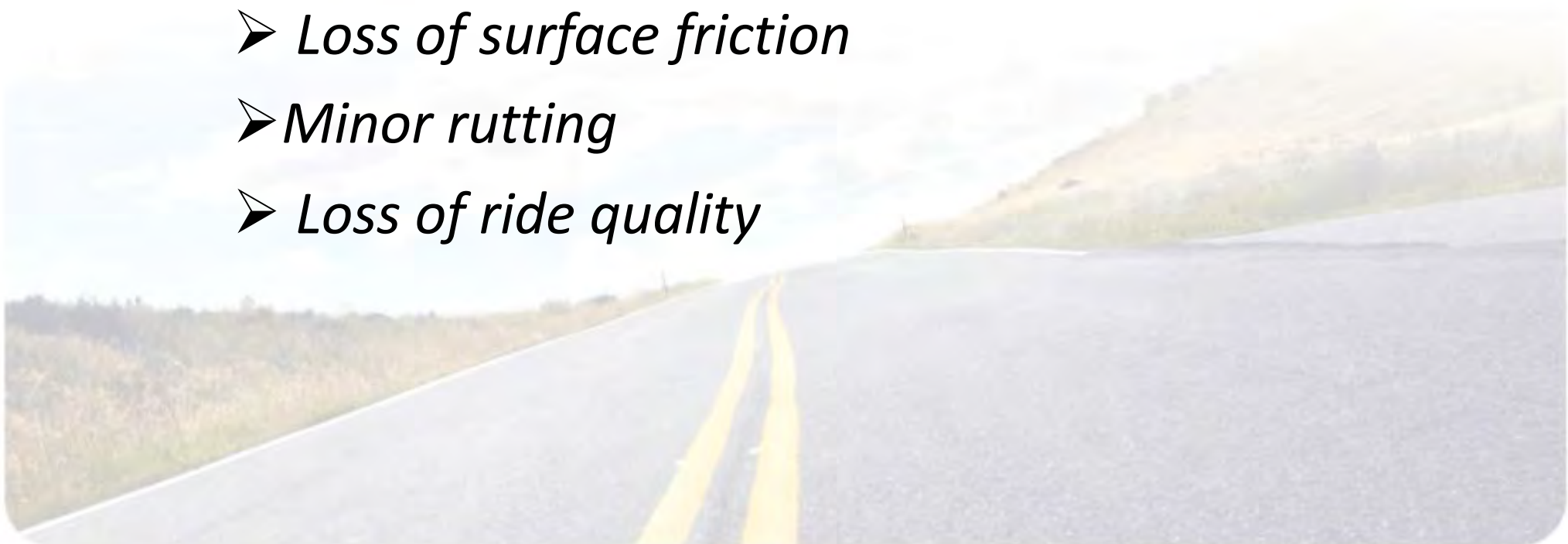
- **The objective is to maintain pavement condition such that corrective rehabilitation isn't needed**
- **Evaluate your overall road network and condition of the individual roads**
- **Determine which treatment would be correct for the road condition**



# 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*



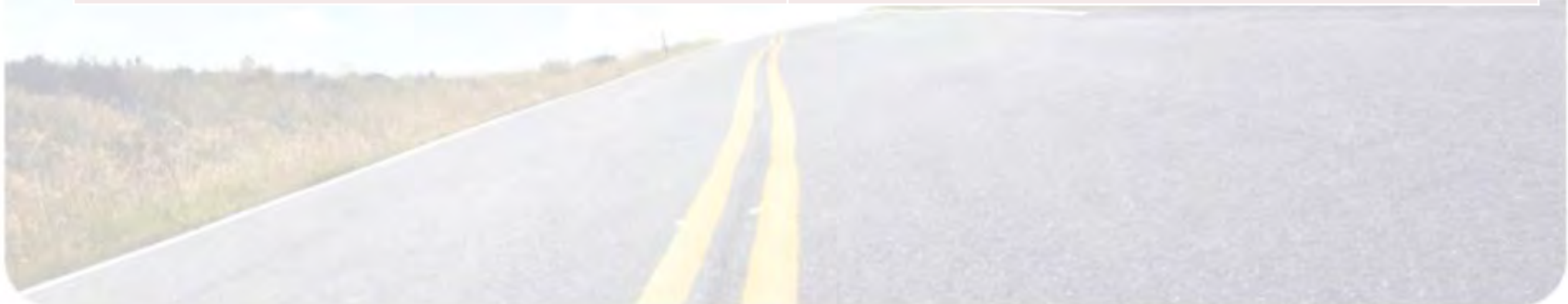
# Life cycle extension based on preservation techniques

Treatment	Life extension
<u>Preventative</u>	
Slurry Seal	3 - 5 years
Chip Seal	3 - 6 years
High Performance Chip Seal	5 - 8 years
Micro Surfacing – Single Application	5 - 8 years
Double Application	6 - 10 years
Cape Seal	6 - 10 years



# What is the proper time of year to Apply Preservation Techniques to Pavements?

Treatment	Dates
Slurry Seal	May 1 to October 1
Chip Seal	May 15 to September 15
High Performance Chip Seal	May 15 to October 1
Micro Surfacing ( Applied Nighttime)	June 1 to September 15
Micro Surfacing ( Applied Daytime )	May 1 to October 15
Cape Seal	May 15 to October 15





# 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

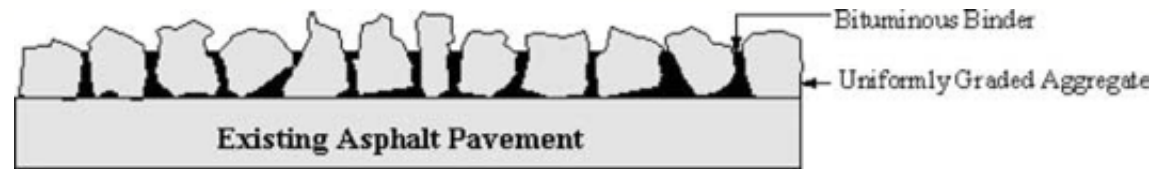
- Medium term (3-6 years) dependant on traffic and weather
- Wearing course for medium to low traffic levels.

# Preventative Maintenance: Chip Seal

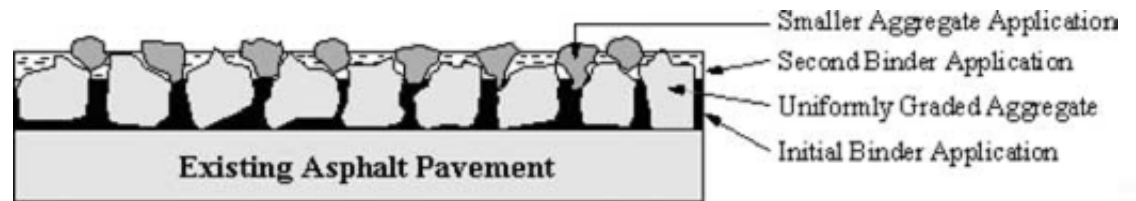


# Preventative Maintenance: Chip Seal

## ➤ 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



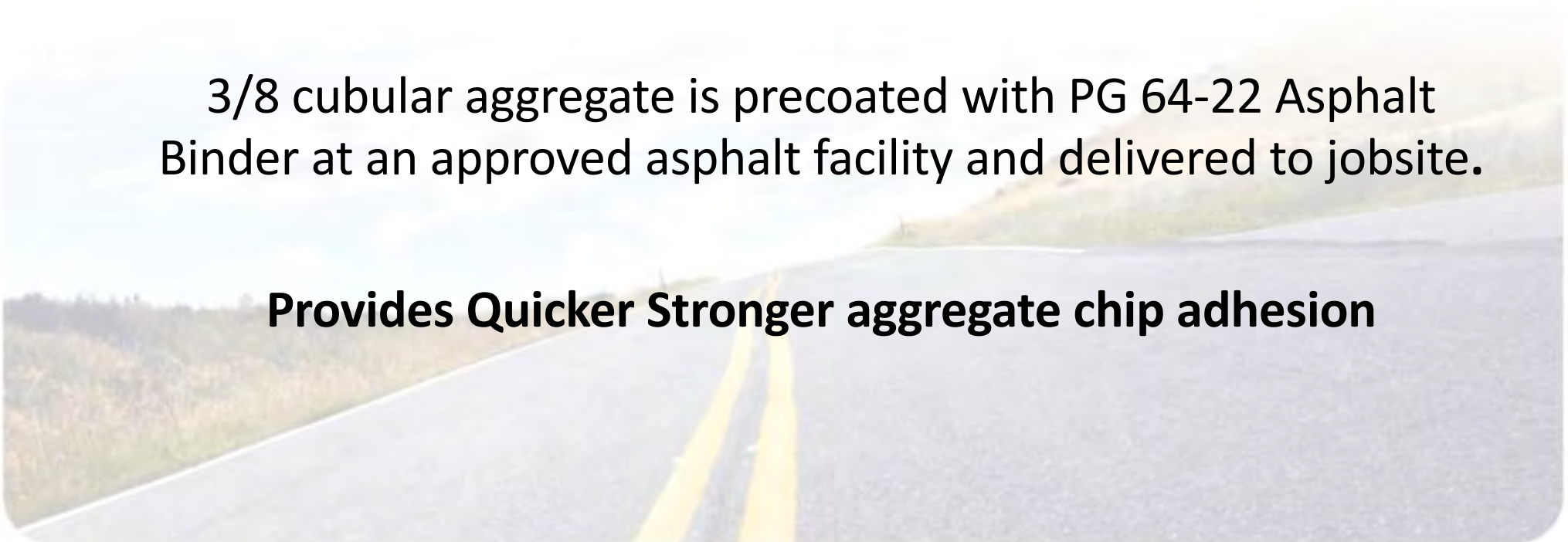
# High Performance Chip Seal

## 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**



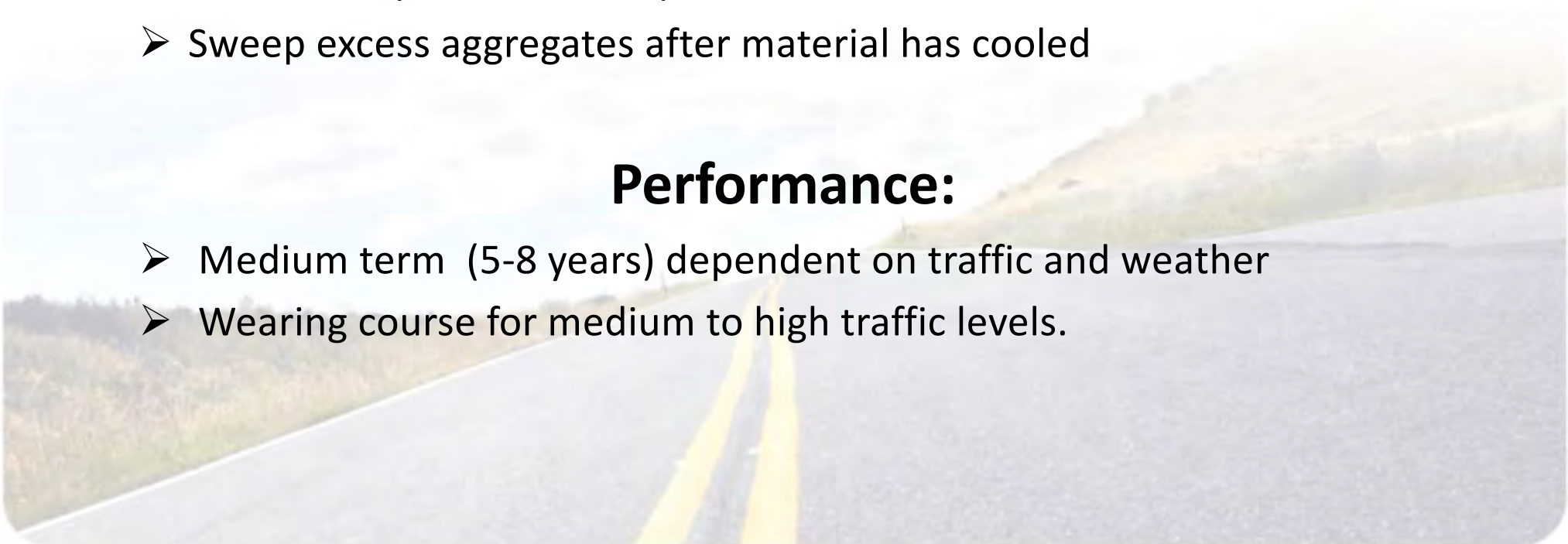
# High Performance Chip Seal

## 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



# Preventative Maintenance: Microsurfacing/Slurry Seal

## 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



# Preventative Maintenance

## 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

<b>Material</b>	<b>Application Rate Gal/per SY</b>	<b>Application Temperature (F)</b>
Polymer Modified Tack Coat (Spray Jet Paver)	0.05 – 0.15	140 – 175
CSS-1 , CSS-1H	0.05 – 0.15	70 – 140
RS-1 , RS-1H (NJDOT)	0.05 – 0.15	125 – 185
High Performance Trackless	0.05 – 0.15	140 – 160
CRS-1 , CRS-1H (NJDOT)	0.05 – 0.15	125 – 185



# VOGELE Spray Jet Paver

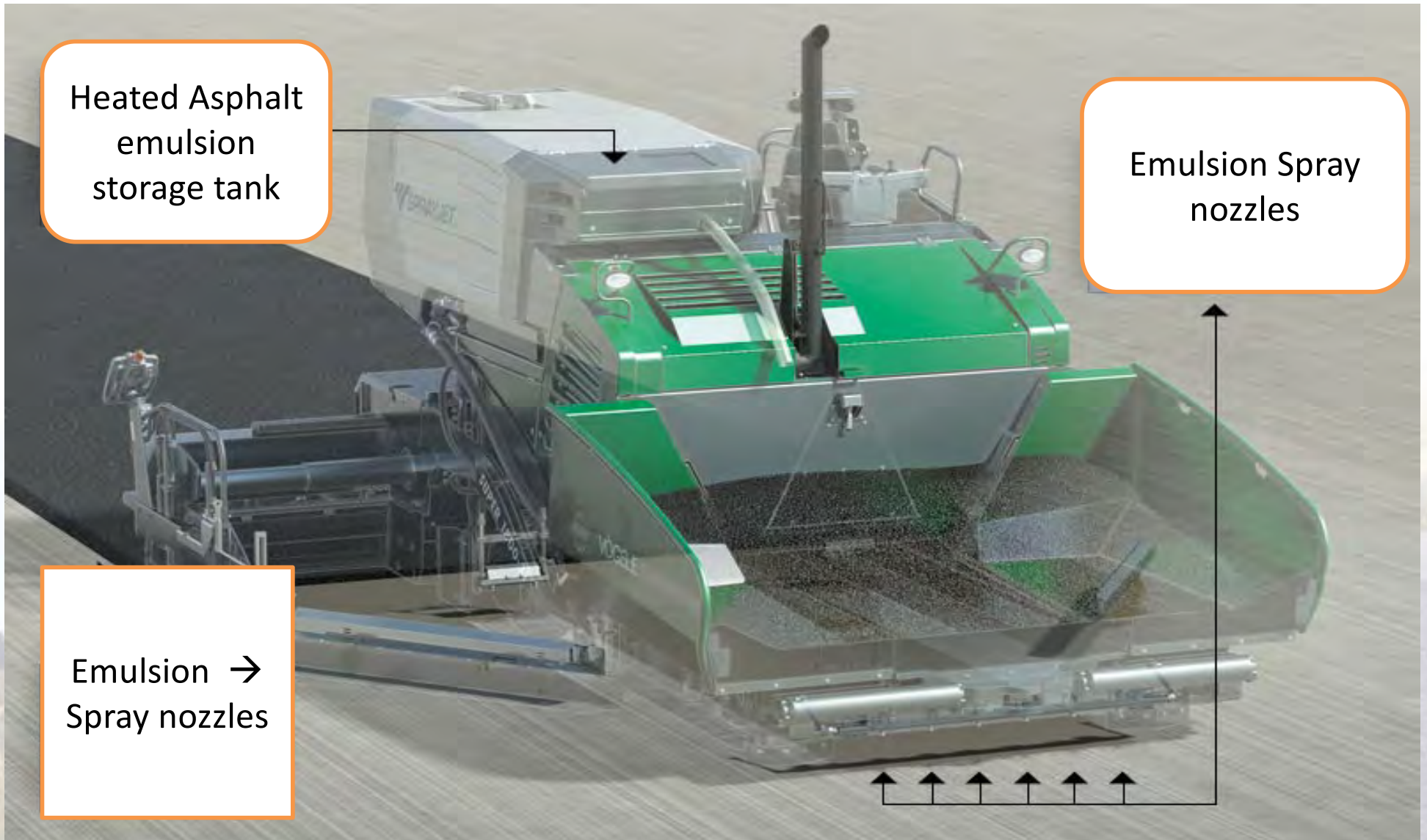


# VOGELE Spray Jet Paver

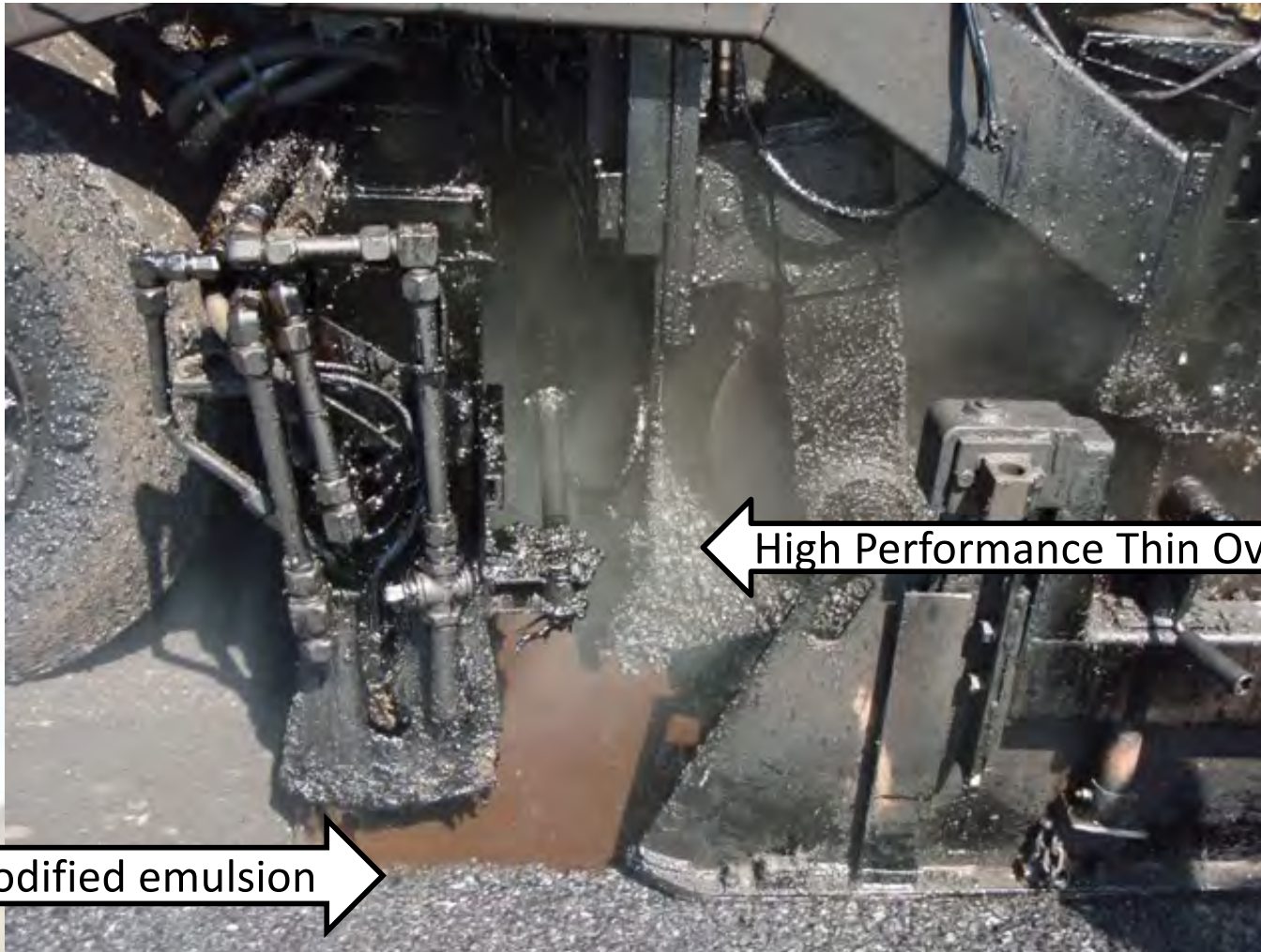
Heated Asphalt  
emulsion  
storage tank

Emulsion Spray  
nozzles

Emulsion →  
Spray nozzles



# VOGELE Spray Jet Paver



High Performance Thin Overlay (HPTO)

Polymer modified emulsion

# Conclusion

- One of the toughest parts of pavement preservation is to get the public understanding that roads in generally good condition needs 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*



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# Questions?