Pavement Preservation For Longitudinal Paving Joints

With A

Maltene Based Polymerized Emulsion

May 2008 Meeting

Atlanta

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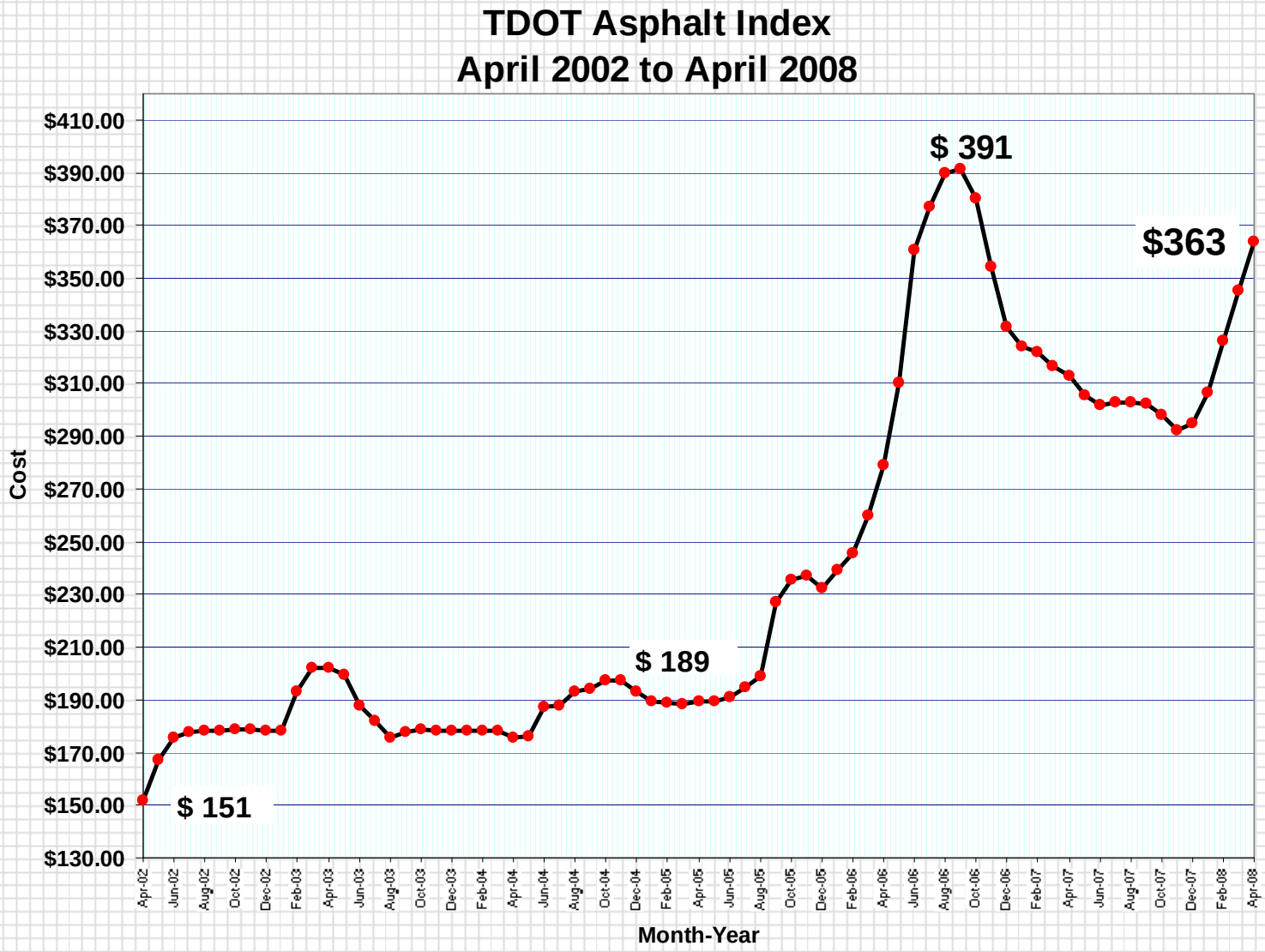
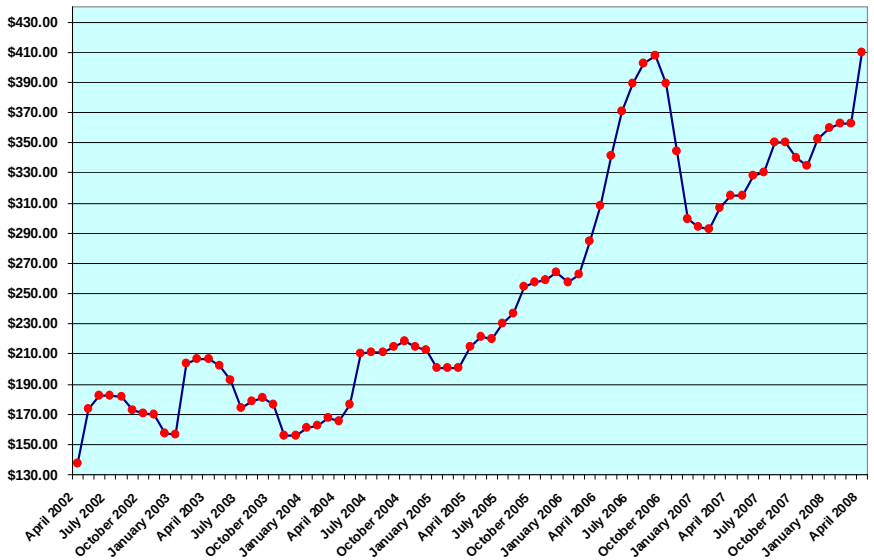
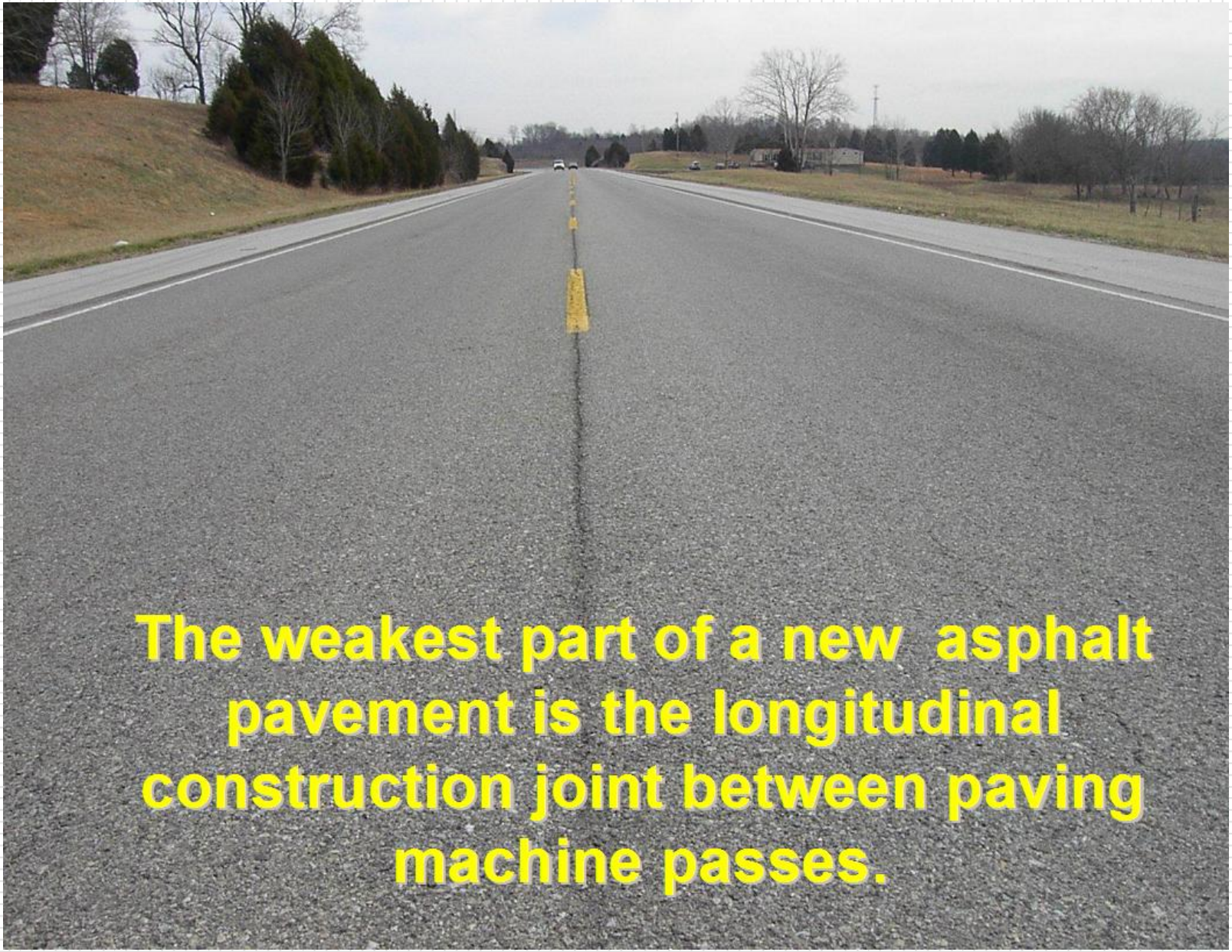
Why worry about Longitudinal Paving Joints ???



NEW JERSEY DOT Asphalt Index
April 2002-2008




The weakest part of a new asphalt pavement is the longitudinal construction joint between paving machine passes.


This is the area where most pavements first begin to fail.

LJ cracking typically starts showing up 3-5 years after the wearing course has been put down.

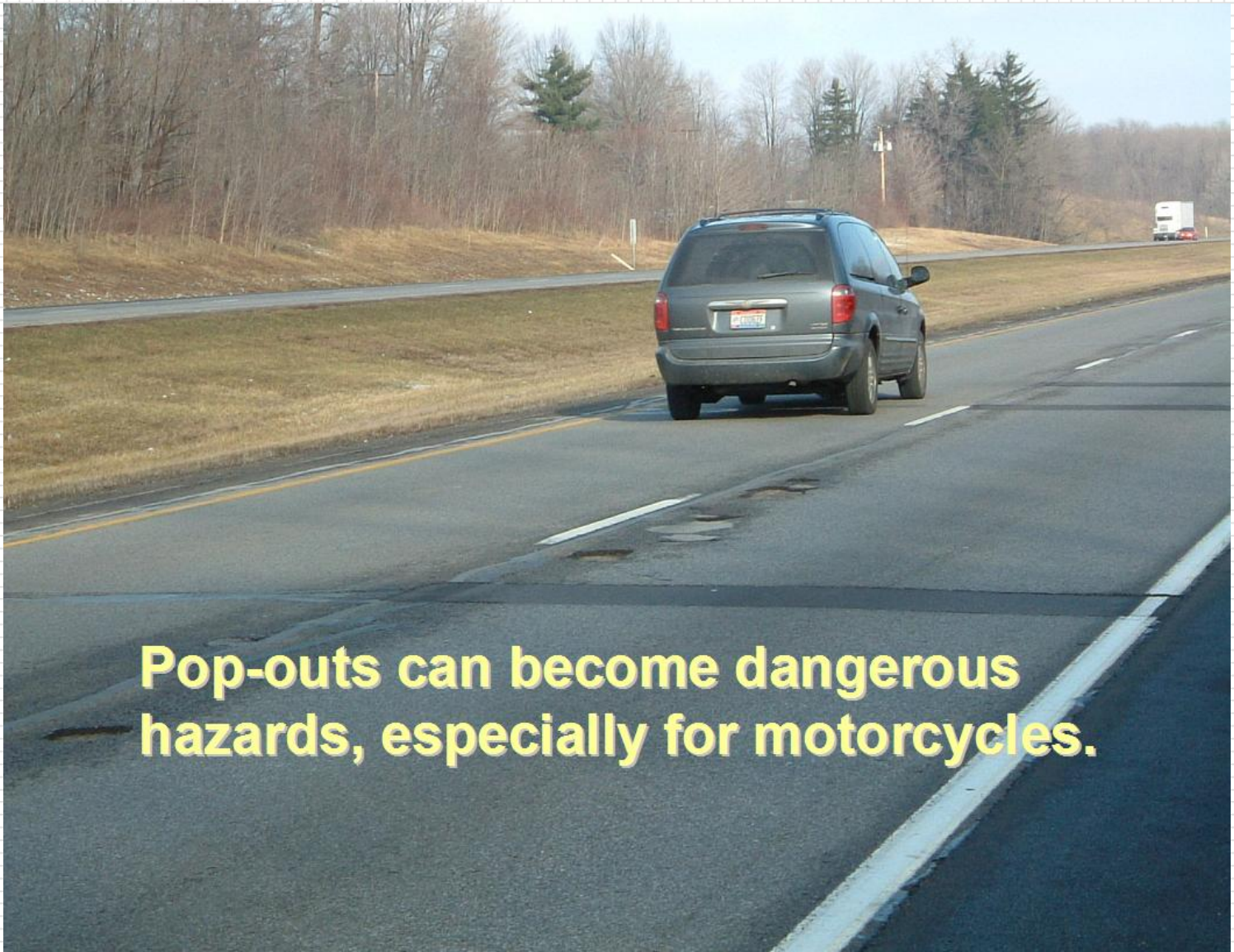
The joint begins separation with hairline cracking then the width grows a little wider each year.

Once the cracking occurs one of the most common practices is to seal or fill the joint to prevent water & moisture from entering it.

If not prevented or sealed problems can occur.

Add a little rain and moisture, then some freezing weather and the next thing you know.....

.....Pop-outs along the longitudinal joint begin to show up.



Some agencies wait too long and the cracks become so wide they need HMA as a filler in addition to normal crack fill material.

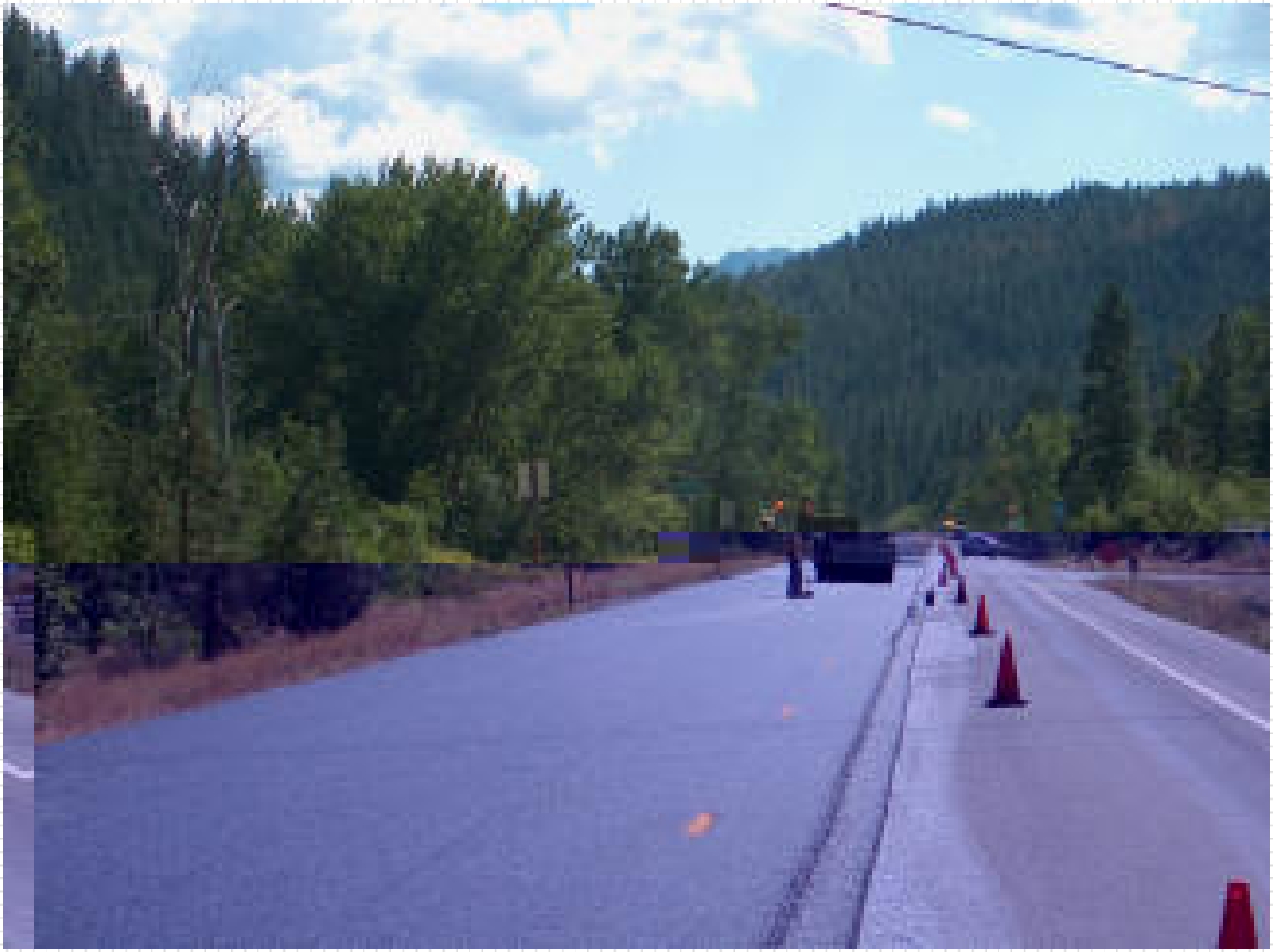
Longitudinal Paving Joint Stability

Various physical means for preventing LJ deterioration have been experimented with including the use of a notched wedge shaped attachment placed on the edge of the paving machine screed.

The intent of this method is to provide a wedge shaped overlap along the joint as a means of reducing possible early deterioration by improving density.

Longitudinal Paving Joint Stability

Longitudinal Paving Joint Stability



Longitudinal Paving Joint Stability

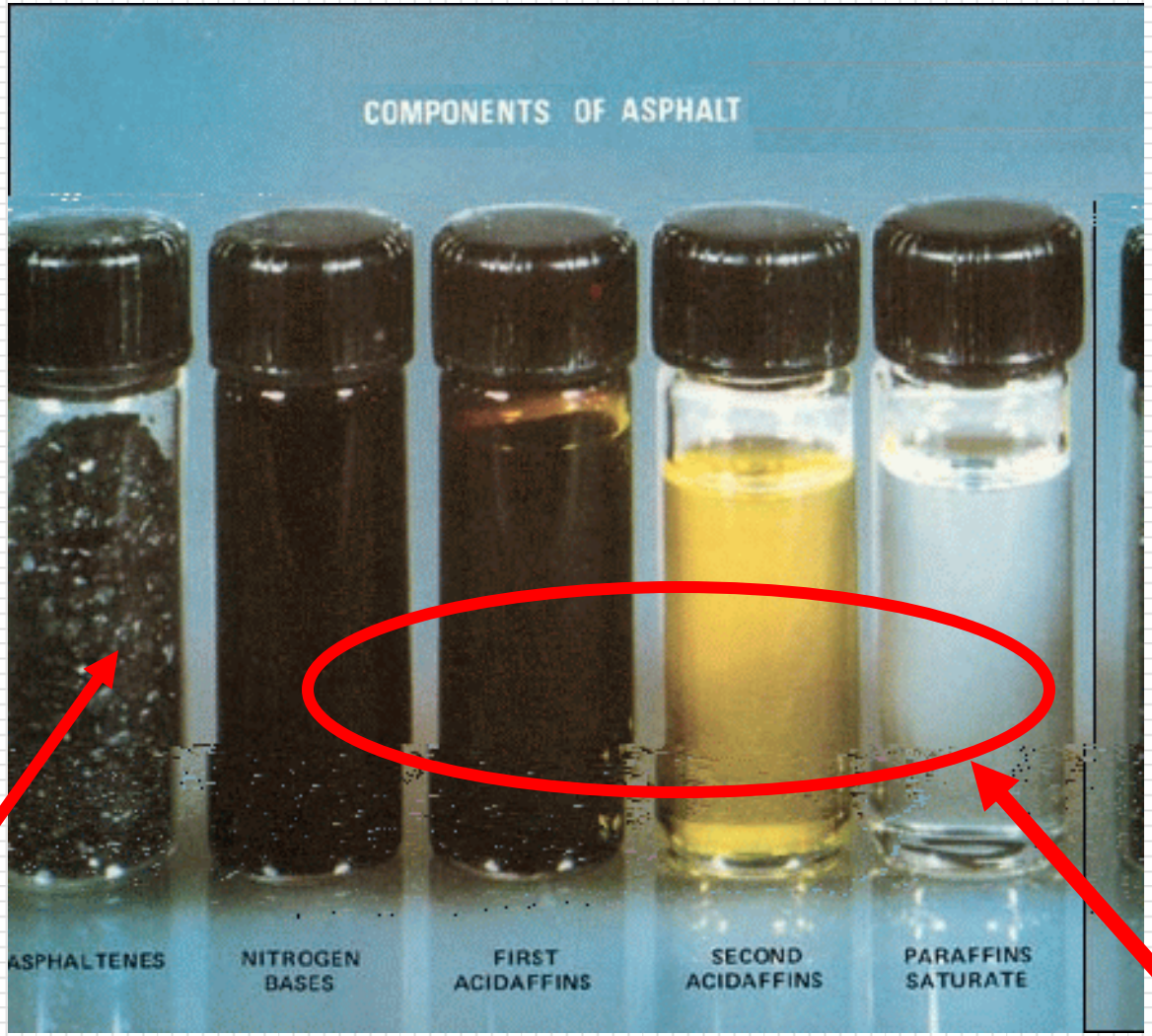
Some agencies have recognized the lack of density along the LJ as contributing to deterioration in the area adjacent to the joint and are experimenting with the requirement of contractors to obtain higher compaction density along the joint through various means.

Longitudinal Paving Joint Stability

Benefits Maltene Based Polymerized Emulsion

- Helps prevent joint deterioration, separation, cracking and raveling
- Addresses both lack of density and binder deficiency.
- Quickly penetrates into the pavement
- Does not obliterate pavement markings
- Can be used on all asphalt roadways
- Treated area becomes less susceptible to water and salt brine intrusion

Why does it work?



Asphaltene fraction

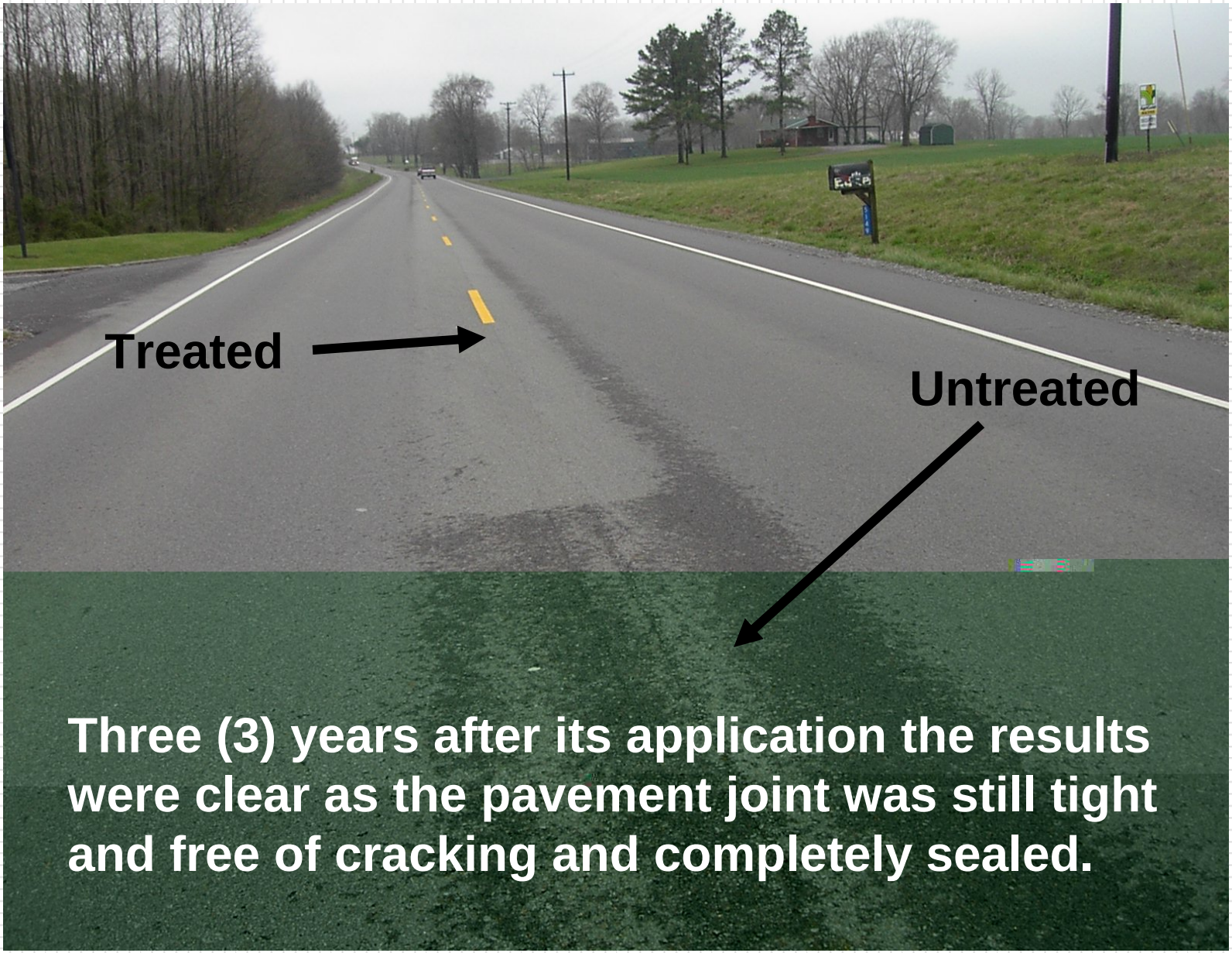
Maltene fractions

Longitudinal Paving Joint Stability

In 2003, tests were applied for the Tennessee DOT on state routes near Nashville.

Longitudinal Paving Joint Stability

Longitudinal Paving Joint Stability



Longitudinal Paving Joint Stability

After 3 years hairline cracking was observed along the untreated sections of the longitudinal joint while the treated sections remained crack free.


4-1/2 Years
Treated Section

Longitudinal Paving Joint Stability

In July 2006 TDOT approved the use of the tested product on TDOT paving projects.

Why does it work so well?

Asphalt Pavement And Recycling Technologies, Inc.
(APART, Inc.)

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Telephone: (661) 393-2748 — Fax: (661) 393-2804
e-mail: apart@hughes.net

Report: 08-0116A — February 20, 2008

Customer: Pavement Technology, Inc. – Colin Durante

Project: Centennial Blvd., Nashville, TN – Warm-Mix Pavement placed in 8/07 and treated with JOINTBOND on December 5, 2007.

Samples Submitted: The following core samples, taken on 01/08/08, were received for testing:

1. Core # 3: JOINTBOND Treated Pavement Core "B" top 3/8" (approx. application rate of 0.18 gsy).
2. Core # 3A: JOINTBOND Treated Pavement Core "B" 3/8-3/4" layer.
3. Core # 4: Untreated Pavement Core "B" top 3/8".
4. Core # 4A: Untreated Pavement Core "B" 3/8-3/4" layer.
5. Core # 5: JOINTBOND Treated Pavement "C".
6. Core # 6: Untreated Pavement "C".

Requested Testing:

Determine the viscosity at 60°C, Pa*s, phase angle, complex, elastic and viscous moduli of the asphalt binder obtained from the top 3-8-inch layer on all Cores submitted and the 3/8"-3/4" layer on Core # 3 & Core # 4.

Summary of Testing:

The top 3/8" for all Cores and the 3/8"-3/4" for Core # 3 & Core # 4 were removed separately. The asphalt binder was extracted and recovered from both layers separately by California Test Method 365. Viscosities, Pa*s, phase angle, complex, elastic, and viscous moduli were determined on the recovered asphalt binder using the Dynamic Shear Rheometer as prescribed AASHTO T316 at 60°C. See Table 1 for test results:

Table 1

Test Results on Recovered Binder-JOINTBOND Treated
City of Nashville, TN – Centennial Blvd.

Core Sample	Viscosity@60 °C, Poises	Phase Angle, °	M O D U L U S, Pa		
			Complex	Elastic	Viscous
Core # 3: Treated Core B top 3/8"	5441	85.5	5456	432	5438
Core # 3A: Treated Core B 3/8-3/4" layer	7028	84.4	7047	685	7013
Core # 4: Untreated Core B top 3/8"	8258	84.0	8279	869	8234
Core # 4A: Untreated Core B 3/8 -3/4" layer	8251	84.2	8292	833	8250
Core # 5: JOINTBOND Treated Core C	4036	85.2	4047	336	4033
Core # 6: Untreated Core C	8108	83.2	8129	965	8071

One good possibility is because it reintroduced the polymerized maltene emulsion down into the pavement to a 3/4” depth.

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This in turn improved both the Viscosity and elastic modulus of the asphalt binder.

LJ in the binder course and/or leveling course should be treated.

At a minimum, the LJ in the wearing or surface course should be treated during the construction process or up to 18 months afterwards, before any separation occurs.

With today's technology, agencies can minimize the amount of longitudinal paving joint failures and work to prevent distresses such as these along their paving joints.

For more information contact:

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