Quantifying the Costs and Benefits of Pavement Retexturing as a Pavement Preservation Tool

The University of Oklahoma

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Project Objective

• Leverage Previous National Research
  – Skid Number vs. Crash Rates
  – Crash Rates vs. Road Conditions
  – Long Term Pavement Performance Program

• Leverage Previous International Research
  – Macrotexture vs. Crash Rates
  – Management of Pavement Macrotexture

CALCULATED VALUE BASED DECISION PROCESS!!
• 23 TEST SECTIONS
• ¼ MILE LONG (400 M)

ASPHALT SECTIONS
• 12 Surface Treatments
• 2 Chemical Treatments
• 4 Mechanical Treatments

CONCRETE SECTIONS
• 1 Chemical Treatments
• 4 Mechanical Treatments
Test Section Sponsors

- Blastrac, Inc. Edmond, OK
- Penhall Diamond Grinding, Anaheim, CA
- JLT Corp. Cushing, OK
- Ergon Emulsions and Materials, Austin, TX
- Skidabrader, Inc. Ruston, LA
- Polycon, Madison, MS
- Haskell Lemon & Hall Brothers, OKC, OK
- Pathway Services, Tulsa, OK
- Calumet Lubricants, Shreveport, LA
Testing Protocol

• Follow change in macrotexture & skid resistance over time.
• Macrotexture tests
  – ASTM STP 583 Outflow meter
  – TNZ T/3 Sand circle
  – TNZ P/17 Performance Spec for chip seal texture
  – RoboTex (Transtec)
  – High Speed Truck Mounted Laser (Pathway)
• Skid resistance measured by ODOT skid tester
  – Ribbed tire (40 mph) & Smooth tire (40 mph and 55 mph)
• Test conducted monthly for 3 years
• Plans to extend period to surface failure, but will reduce frequency to quarterly tests
Macrotecture Testing

TNZ T3 Sand Circle

Hydrotimer Outflow Meter
Test Section 15 - Blastrac Shotblasting

Macrotecture (mm)

Skid Number (mu)

Aug-08 Sep-08 Oct-08 Nov-08 Dec-08 Jan-09 Feb-09 Mar-09 Apr-09 May-09 Jun-09

Sand Patch

Hydrotimer Flowmeter

Skid
Test Section 9 - Pavement Conditioner

Macrotexture (mm) vs. Skid Number (mu)

- Sand Patch
- Hydrotimer Flowmeter
- Skid

Data ranges from June 2008 to June 2009.
Economic Analysis

• Tracking change in engineering properties must be correlated with an analysis of the cost of supplying those properties.

• Life cycle cost analysis for each tested alternative.

• Develop life cycle cost model for pavement texture over time.

• Use of Cost Index Number Theory to quantify “Bang for the Buck”
Pavement Retexturing

Questions???

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