

MIDWESTERN STATES IN- PLACE RECYCLING CONFERENCE



Kansas Perspective

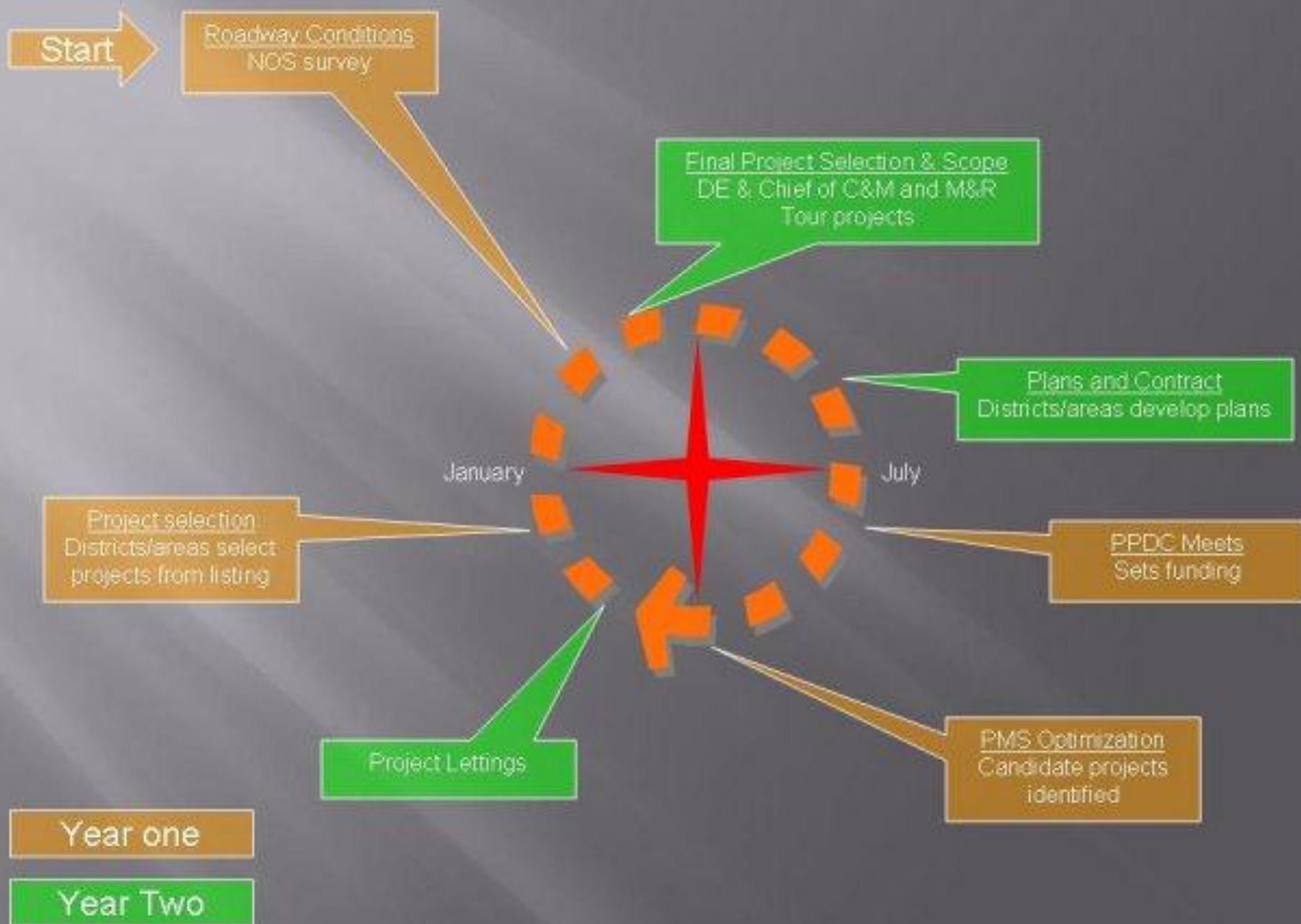
Roy D. Rissky, P.E.

Kansas Dept. of Transportation

August 12, 2009

Selection Process for HIR

- Pavement Management System selects candidate projects.
- Distribution of share of 1200 miles to each District is based on statewide condition.
- Districts Selects projects to be reviewed on tour.
Yr 2=40%, Yr 2&3=60%, Yr 2,3,4=75%
remaining 25% is Districts choice
- Selection Teams drives projects to determine appropriate scope.
- Projects developed by Districts and let by HQ's



Selection Process for HIR

- ▣ Surface distress type plays key role in action selection.
- ▣ Good candidates for HIR action:
- ▣ Transverse thermo cracks, longitudinal cracks, and fatigue cracking in wheel paths
- ▣ Ride #'s, oxidation, and surface course rutting
- ▣ Previous actions within the top 3" is important
- ▣ Is overall structure carrying the present loads

Selection Process for HIR

- ▣ Cost considerations:
- ▣ 2" SR w/ Chip seal = 95-100 K/centerline mile
- ▣ Other surface courses used: Ultra-thin bonded asphalt surface (novachip), Modified Slurry seal (microsurfacing), HMA if structure needed
- ▣ Experimenting with 1 mile section of leaving the HIR as surface last year.
- ▣ 2 projects picked for letting next year with no surface treatment: K-31 in Wabaunsee Co. (10 miles) and K-4 in Ellsworth Co. (7 miles)

HIR SURFACE COURSE



HIR SURFACE COURSE



HIR SURFACE COURSE



Design for HIR

- Road Sciences does our design work. Lab in Tulsa, OK.
- Establish Emulsion content (ARA-1P)
- Hamburg rut test at 60 degrees C in water
- Tensile strength at optimum emulsion content (KT-56)
- Indirect Tensile test (KT-60)
- Volumetric Properties @ Trial emulsion content: Gmb and Air voids versus Emulsion Content
- Gradation on Ignition oven Sample

HOT IN-PLACE SURFACE RECYCLING MIX DESIGN



Road Science, LLC Laboratory 8502 S. Yale Ave Tulsa, OK 74136

Project Location - US420, Etna, GA
 Agency - KDOT
 Project # - U400-G29 U/2167-01
 Contractor - Duhal
 Date Completed - 8/28/2009

Road Science ID - US420-RS-2008-0019
 Technical Contact - Pat Denney, Louis Harter
 Phone # - 318-250-1268
 Design Engineer - Pat Denney
 Account Manager - Jason Johnson

Emulsion Properties

Emulsion Designation	ASA-1P
Emulsion Producer	SenMixSystems
Emulsion Plant	El Dorado, KS
Optimum Emulsion Content	1.21 %
Application Rate (gals/yd ²)	8.29 to 9.85
Emulsion Residue Content	82.5 %
Penetration after Densification	170.5 dmm

Volumetric Properties at Optimum Emulsion Content

Density (pcf)	141.3
Maximum Specific Gravity (G _{mm})	2.51
Bulk Specific Gravity (G _{mb})	2.284
Air Voids (%)	9.7%

Tensile Strength (Kt-GS) at Optimum Emulsion Content

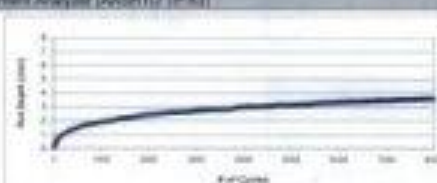
Tensile Strength	149.7 lb/in ²
Conditioned Tensile Strength	128.6 lb/in ²
Tensile Strength Ratio (TSR)	86.2 %

Project Properties

Milling Depth (in)	2.0
Core Density (pcf)	139.3

Asphalt Pavement Analysis (AASHTO TP 63)

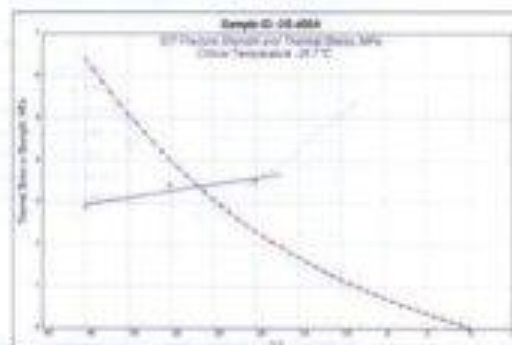
Mat Depth (mm)	3.0
% Emulsion Content	1.21



Indirect Tensile Test (Kt-GS)

Predicted Failure Temperature (°C)	-18.7
Emulsion Content Tested (%)	0.5

Pavement Temperatures	
Station ID	Godge City Mile Age
Depth (mm)	Temp (°C)
0	-20.8
25	-18.9
50	-17.0
75	-16.4



This data document contains test data generated by laboratory testing procedures. It is not laboratory knowledge or an opinion. It is the condition that may affect the use of material from which the test results were taken, and is not an indication of responsibility in handling this data after it has been reported that they represent reliable representations of the properties of the sample represented and tested.

HOT IN-PLACE SURFACE RECYCLING MIX DESIGN



Road Science, LLC Laboratory 4802 E. New Ave. Tulsa, OK 74116

Project Location - US410, Ellis Co.

Road Science ID - US-OK-MS-2008-0119

Agency - KDOT

Technician Contact - Pat Denney, Louis Hader

Project # - 0405-026 (J 2185-01)

Phone # - 214-250-0248

Contractor - Stalder

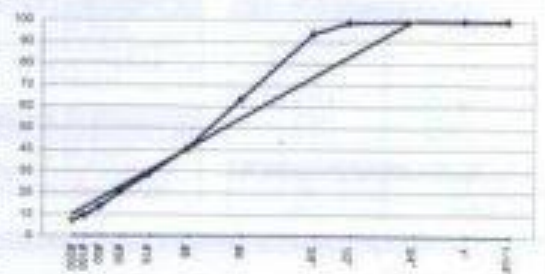
Design Engineer - Pat Denney

Date Completed - 4/26/2008

Roadway Manager - Jason Johnson

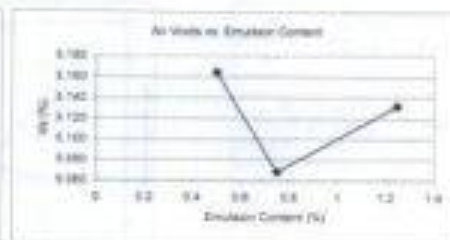
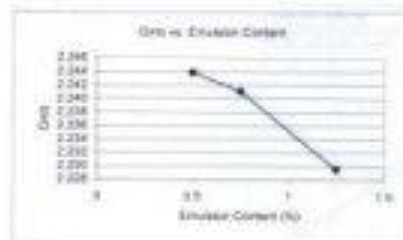
Gradation as Supplied Data Summary

Sieve		% Passing
U.S.	Metric	
#100	1.75	100
#20	850	100
#40	425	100
#60	250	98.2
#80	190	94
#100	150	80.2
#120	125	40.2
#150	105	38.6
#200	75	30.6
#250	60	15.6
#300	50	8.6
#425	75	7.3
Binder Content (%)		6.22



Volumetric Properties & Unit Emulsion Contents

Emulsion Content	Gmb	Air Voids
0.5	2.344	5.182
0.75	2.347	5.085
1.25	2.239	5.132



This data sheet has been prepared by a laboratory employee, based on the knowledge of, or control over, the conditions that may affect the use of material from which the samples were taken, and reports no responsibility, including this data sheet, for any material that may be used in construction of the project or for any other use of the data.

Cost Effectiveness

- **GREEN ASPECT:** 100% Recycle of existing surface as opposed to 2" mill & Inlay can only use 25% of RAP on this project so 75% of aggregate needs to be virgin material.
- Create competition by bidding 2" SR w/ Chip Seal versus 2" CM & IL same day to appease HMA Industry.
- Does not increase the elevation of roadway as opposed to overlays and so shoulders don't need addressing.
- No drop offs with this process.

CHALLENGES

- ▣ HMA Industry says product and voids structure not as good as their superpave mix.
- ▣ We counter with rutting hasn't been an issue.
- ▣ Inexperience contractor can become a disaster.
- ▣ Fire issues in dry conditions can be a problem.
- ▣ Smoke issues due to incorrect heating or maintenance patches.
- ▣ Questioning from public on why sealing HMA?



PROPANE

MOBILE
ASPHALT
RECYCLE
SYSTEM II

























CR46

DUSTROL, INC.

INNOVATIVE ASPHALT MAINTENANCE

SINCE 1973

PR 29



TEREX

OK

TRV









QUESTIONS