

IDOT HMA Update



David L. Lippert, P.E.

Engineer of Materials & Physical Research

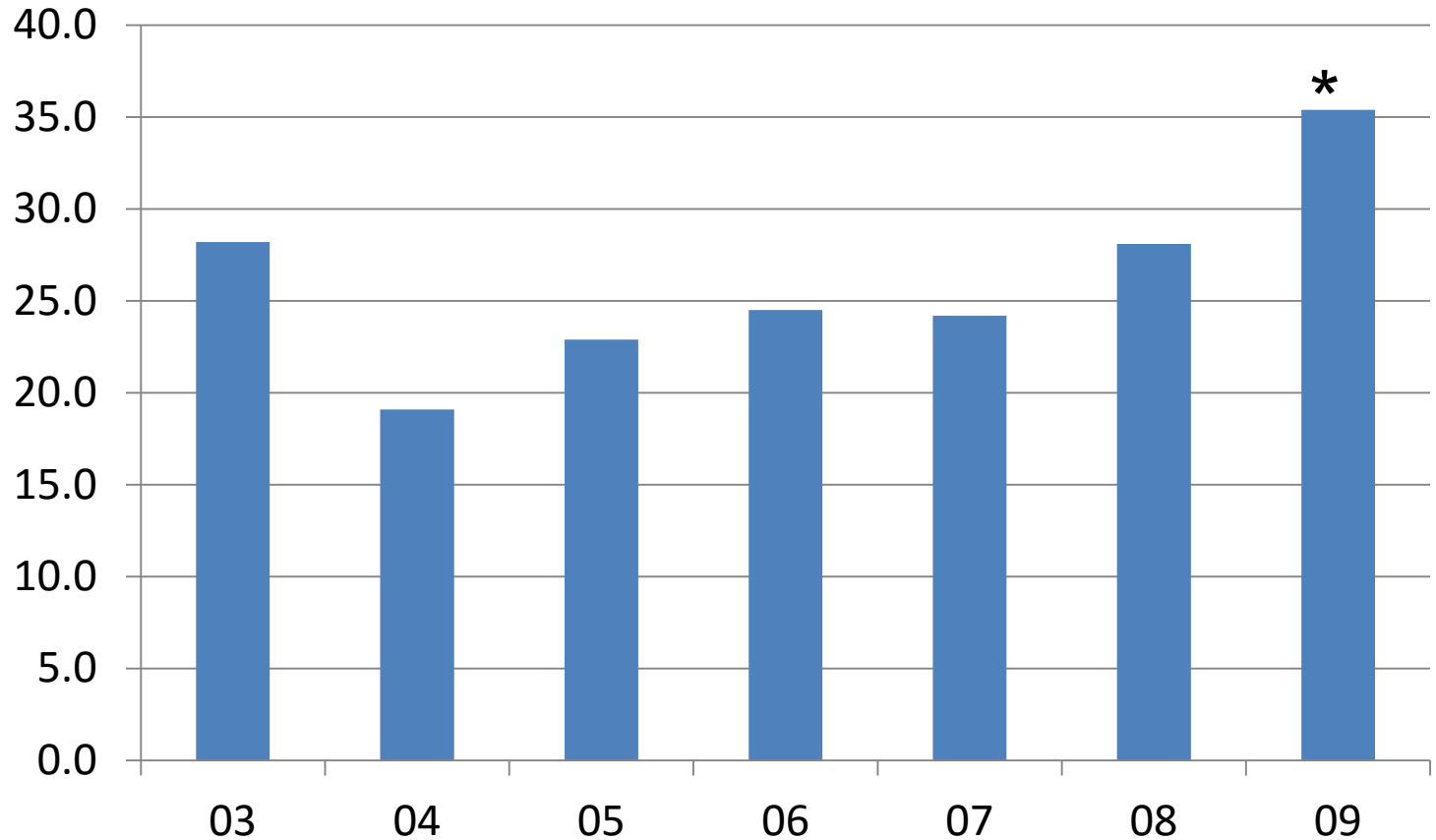
Illinois Department of Transportation

50th Annual Illinois Bituminous Paving Conference



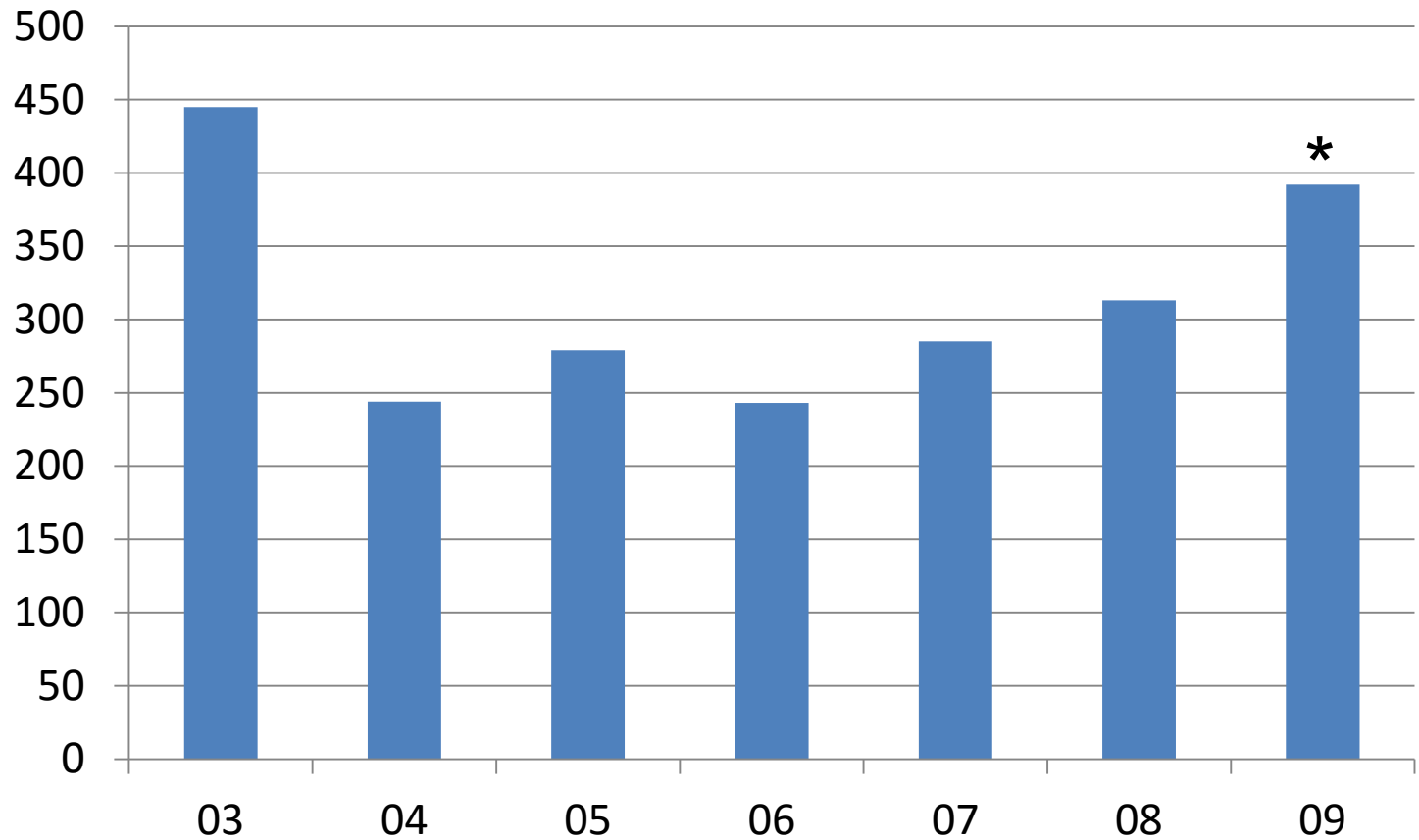
PG Liquid Binder Usage

Percent Polymer Usage 2003 to 2009



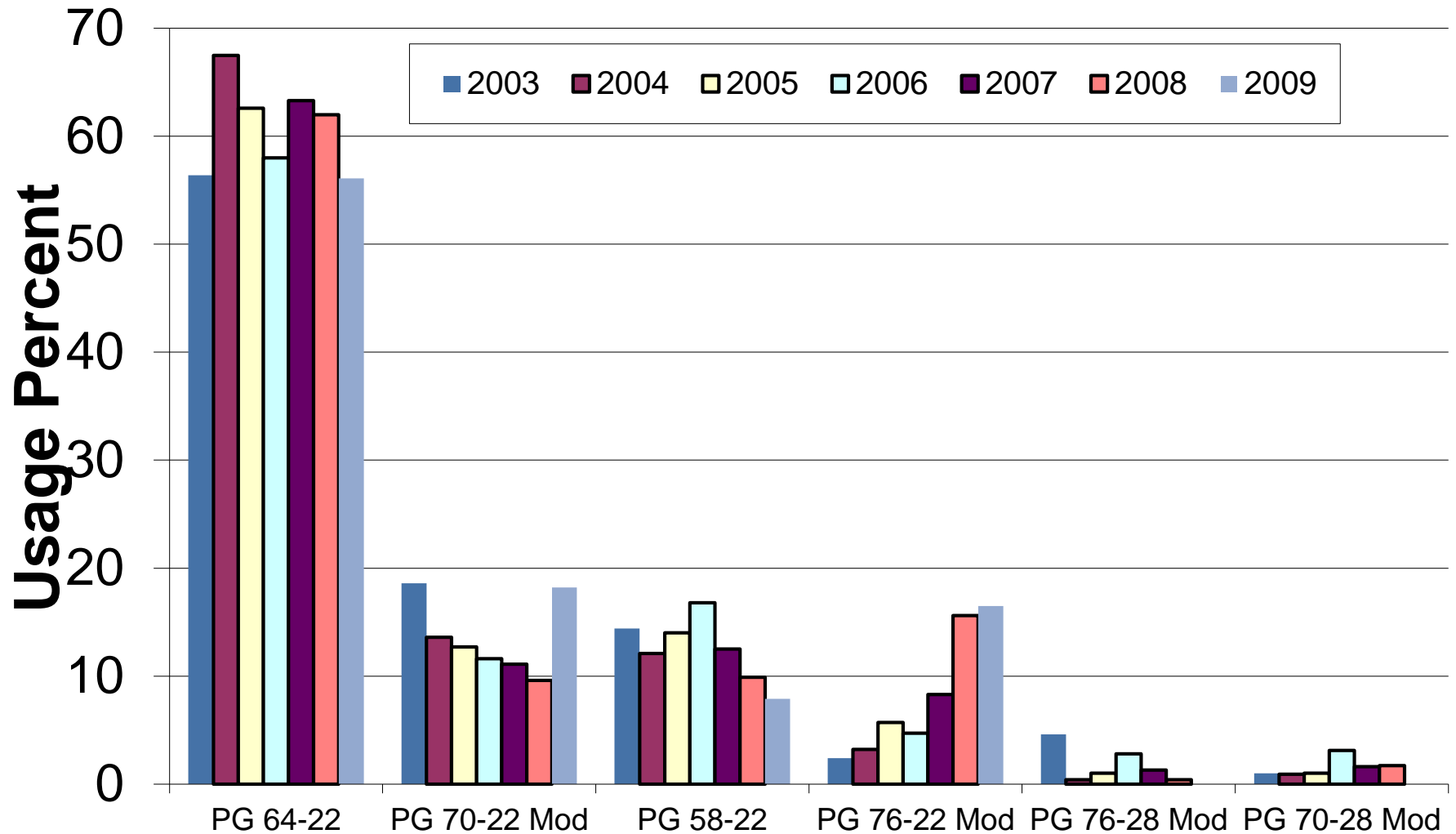
*** As of 10/31/09**

Tons of Binder Used (in thousands)

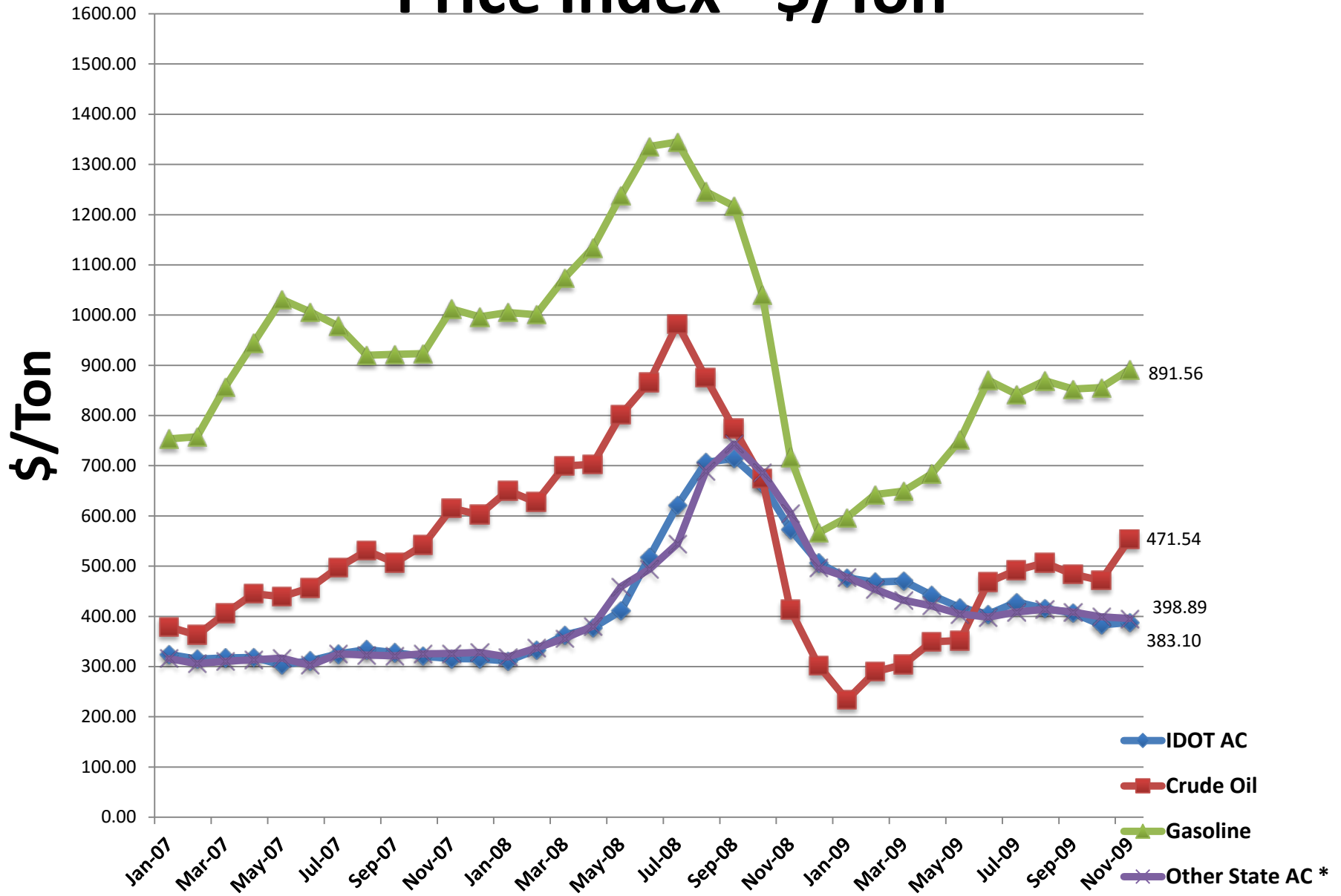


*** As of 10/31/09**

2003 to 2009 Grade Usage



Price Index - \$/Ton



Materials Peer Exchange

- Invited states of MO, IN, TX and NH
- Items discussed:
 - Each state testing program
 - National programs
 - National Transportation Products Evaluation Program (NTPEP)
 - Risk
 - Testing in line with risks?

Preliminary Results for HMA

- Liquid AC testing
 - Most states sample at much higher frequency
 - Up to 1/day
 - Pay Adjustments based upon PG Grade in actual mix
 - IDOT to review testing program
- Durability testing of mix design
 - Currently using a retained strength (Tensile Stress Ratio – TSR)
 - Texas uses Hamburg Wheel plus modified LA Abrasion
 - BMPR and Dist 1 obtaining Hamburg wheel

Pay For Performance (PFP) Update



PFP Features

- Pay Incentive/Disincentive
 - PWL Pay Factors:
 - Air Voids (30%), Field VMA (30%), Density (40%)
 - Dept test results
- Sample Security:
 - Undisclosed random samples
 - Samples by Contractor
 - Witnessed by Dept
- Addresses FHWA requirements for QA



2009 PFP Experience

- District 1 - 16 contracts
- District 2 - 5 contracts (3 completed)
- District 8 - 1 contract (1 completed)



2009 PFP Positives

- Better communication between IDOT & Contractor
- Better & more uniform density
- Failing contractor tests are quickly addressed



2009 PFP Negatives

- More effort & manpower for Dept (plant sampled)
- Difficult for IDOT personnel to completely give up control
- Spec needs some areas clarified
- Dispute occurs at the end of the job rather than after each lot
- Lab comparison/uniform procedure concerns

Spec Revisions for 2010

- Additional cores – improved density statistics
- Make test strip optional
- Dispute testing only if outside limits of precision
 - Increase dispute charge

Implementation Goals

- ❑ Single Specification – Statewide above 8,000 tons
- ❑ 2010 – Roll out to all Districts
- ❑ 2011 – Full Implementation for projects
- ❑ Need to Look at what to do with smaller projects
 - QC/QA with secure/independent IDOT testing
 - PFP - light
 - Other
- ❑ “Best Practices Guide” Needed



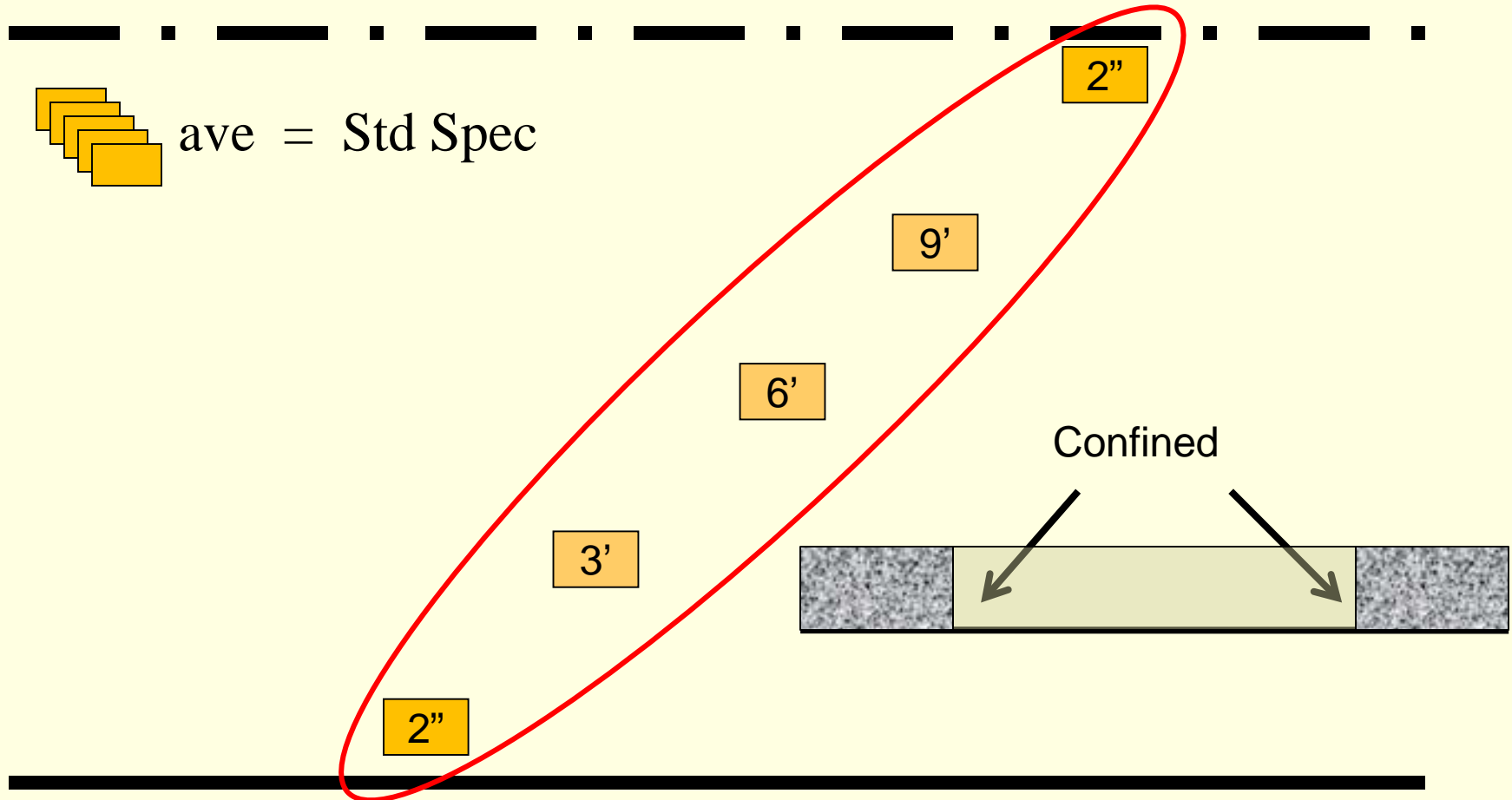
2009 / 10

SPECIFICATION UPDATE

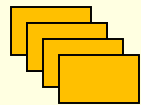
Longitudinal Joint Density Specification

- IDOT worked w/ Industry to come up with acceptable Longitudinal Joint Density Specification
- Special provision (BDE on all HMA contracts starting with January 2010 letting.

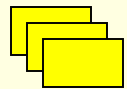
0 unconfined edges (inlay)



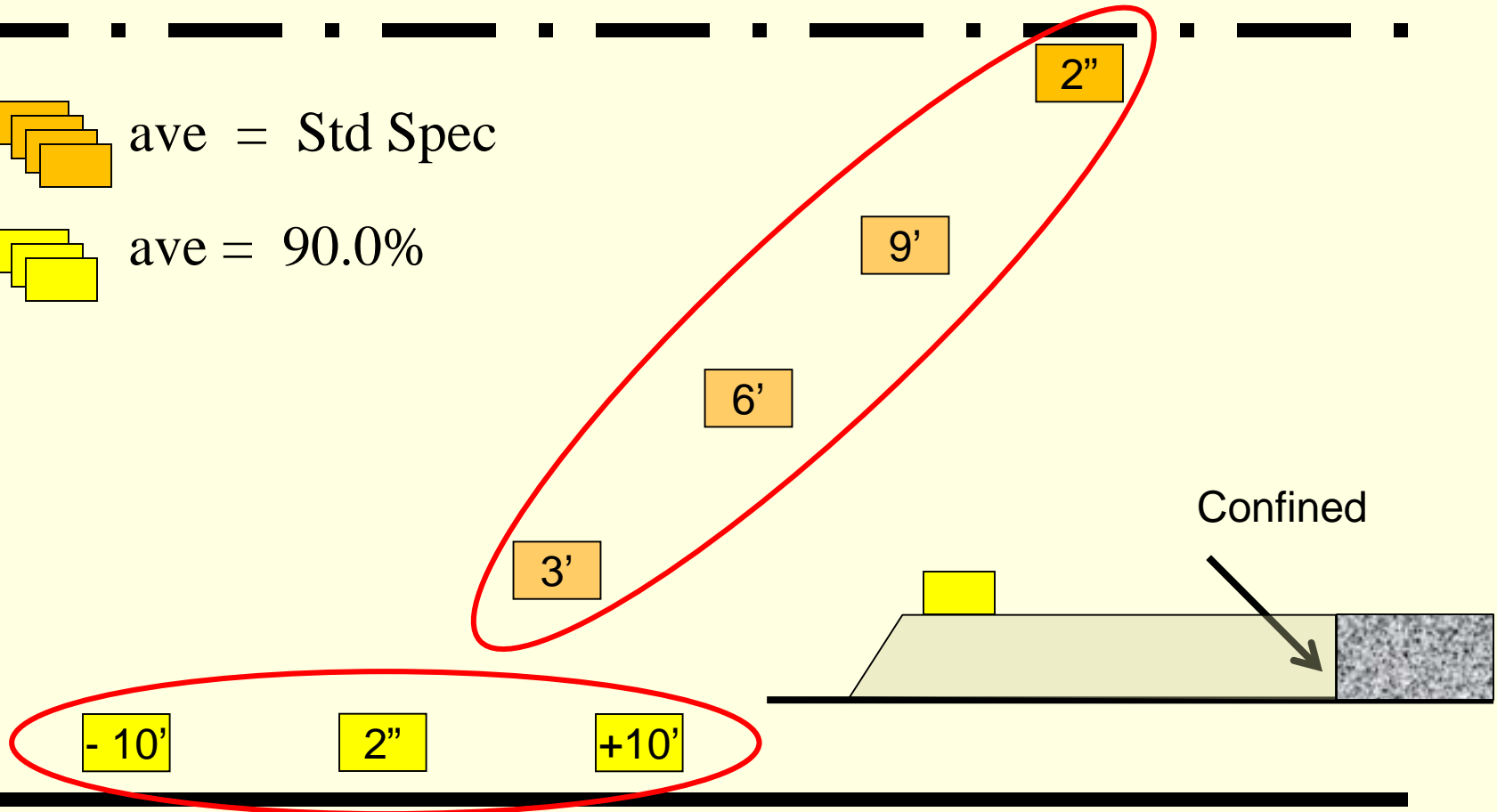
1 unconfined edge



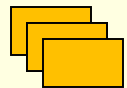
ave = Std Spec



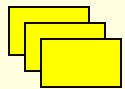
ave = 90.0%



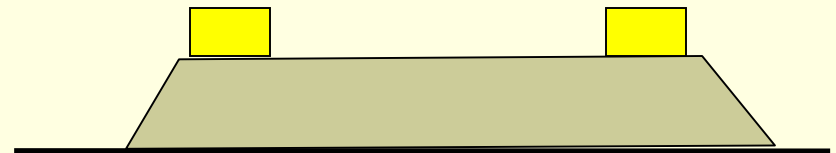
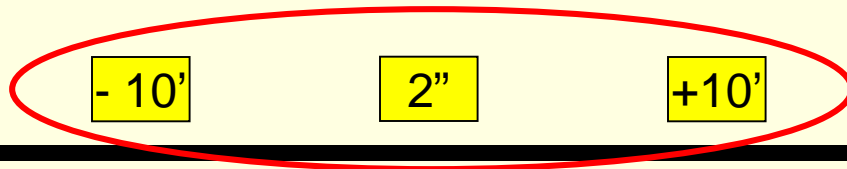
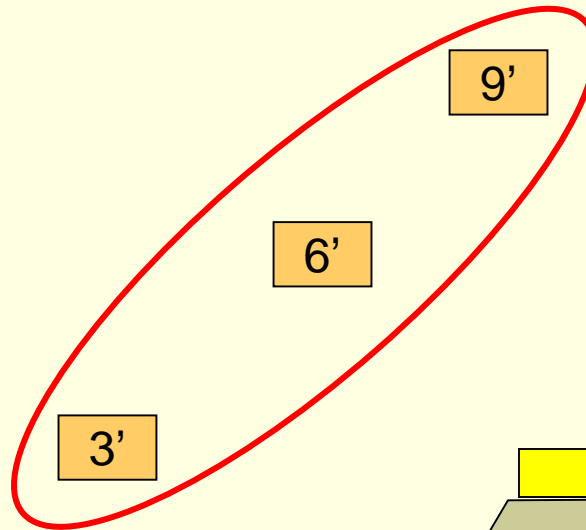
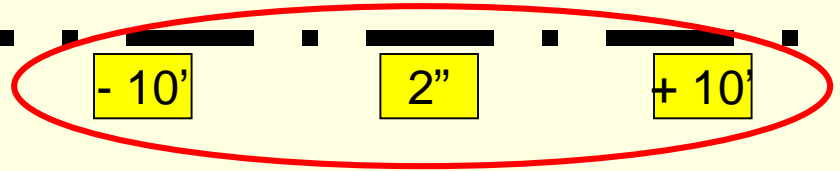
2 unconfined edges



ave = Std Spec



ave = 90.0%



RAP Special Provision



- WMA option added:
 - Allows reduced binder grade bumping if RAP usage between 20 & 30%
- Fractionated RAP (FRAP) option added:
 - Allows higher RAP usage
 - Divided on #4, 1/2" or anything in between
 - FRAP fractions must be tested for quality & meet a $\leq 15\%$ Micro-Deval requirement

MTD Spec Revisions



- Front-Dump Hopper and Conveyor. The conveyor shall provide a positive restraint along the sides of the conveyor to prevent material spillage. Material Transfer devices having paver style hoppers shall have a horizontal bar restraint placed across the foldable wings which prevents the wings from being folded.







MTD Spec Revisions



- Use of a ~~The~~ material transfer device with
a roadway contact pressure exceeding
20 psi (138 kPa) will be limited to ~~will be~~
~~permitted on~~ partially completed segments
of full-depth HMA pavement if where the
thickness of binder in place is 10 in.
(250 mm) or greater.

Recycled Asphalt Shingle (RAS)

- IDOT permits use of manufacturer's waste shingles in HMA
 - Must be scrap shingles generated from production of asphalt roofing shingles
 - Max of 5%
- Tear-Off Shingles currently not permitted due to concern w/ asbestos

2009 RAS Demo Efforts

- District 1 & Gallagher Asphalt
- Bishop Ford Demo
- 5% RAS in SMA binder & surface
 - RAS allowed a 20% replacement of asphalt binder
 - Sections were constructed using PG76-22 & PG70-22
 - Moisture, strength & rheology testing being tested by District 1, U of I & BMPR

Future of RAS

- **Statewide Spec for 2010**
 - **Manufactured Waste only**
- **Tear-Off Shingles**
 - **Tollway taking lead working with ILEPA**
 - **Beneficial use needs to be declared by ILEPA**
 - **Regulatory process needs to be developed in IL**
 - **Asbestos inspection/controls**
 - **Liability if asbestos found in HMA**

Ground Tire Rubber (GTR)

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- 2009 updated GTR Spec for Dist 1 use
 - 3 GTR projects \approx 5,000 tons each
 - All were N90 F surface mixes using slag & dolomite
 - Intent was to compare constructability & performance to SBS polymer-modified N90 F surface mixes

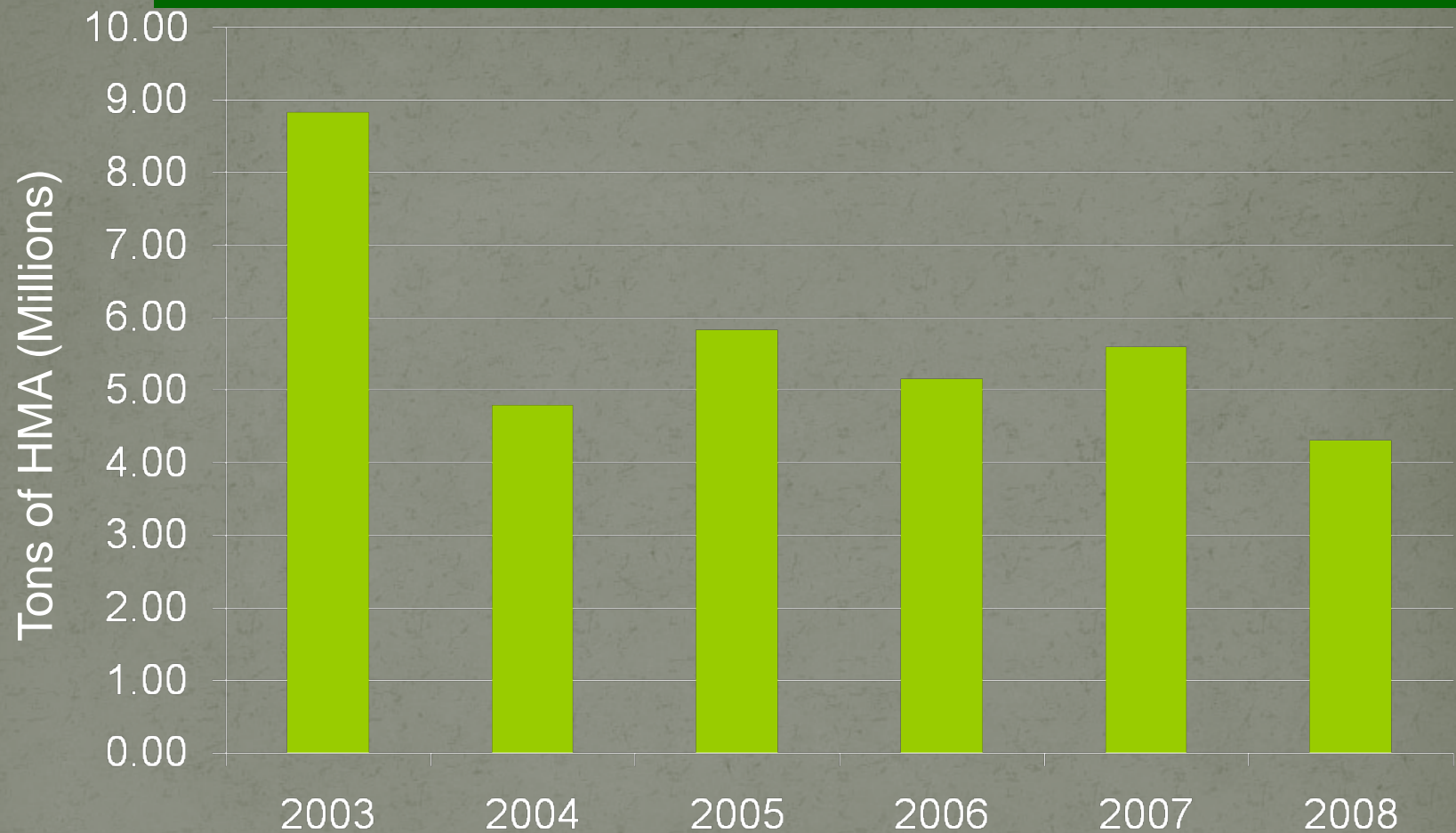
Ground Tire Rubber (GTR)

- Findings
 - No change to paving train or compactive effort
 - No problems w/ density
 - Overall positive experience
- GTR will be considered an alternative, but not an equivalent to SBS polymer

RAP Update



Production History w/RAP Percent



% RAP	8.3	10.2	7.7	8.8	10.3	9.3
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RAP Usage

- Still have issues
- District 1 area still has significant RAP surplus
- High RAP Mixes difficult to control with single feed
- Would like industry to move to fractionation with 2 or more bins

Aggregate Quality of RAP

- Quality Issue
 - Surface A or B quality
 - Binder A, B or C quality
 - Shoulders A, B, C or D quality
- Tracking quality is difficult
- Mixed piles could have multiple qualities
- Recently developed procedures for assigning aggregate quality of RAP

Aggregate Quality of RAP

- Quality determination procedures:
 - Coarse FRAP pile up to 5,000 tons
 - Sample – Multi locations and blend
 - Extract AC off aggregate
 - Trichloroethylene
 - N-Propyl Bromide (a bit safer)
 - Send aggregate sample to Springfield for testing
 - If passes assigned “B” Quality to aggregate

RAP Aggregate Quality Micro Deval Test

Sample
with Water

+





Before

Note sharp edges

After

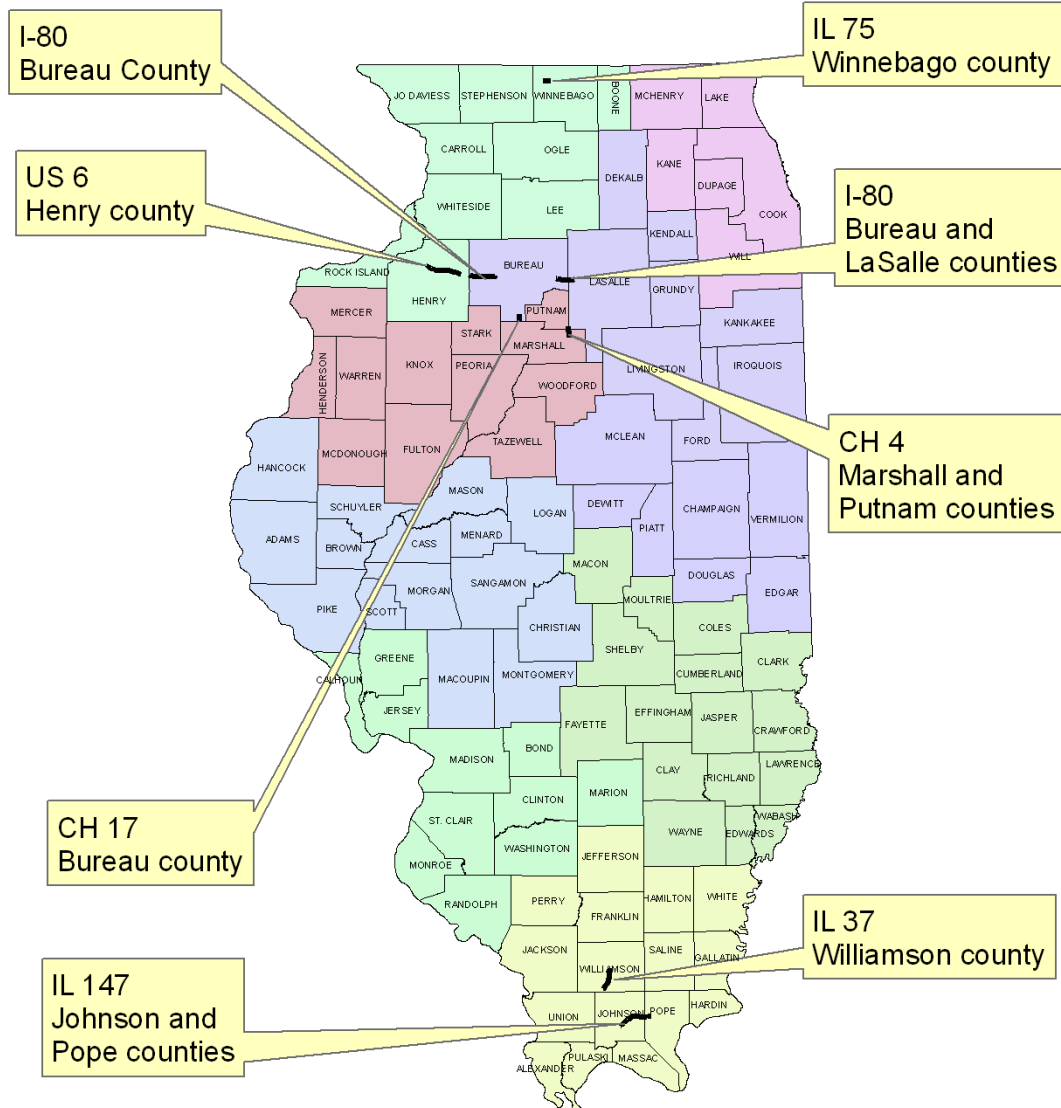
Rounded edges



Warm Mix Asphalt Contractor's Proposal

- Currently all projects let as HMA
- Contractor may make request to IDOT to allow WMA
- Contractor will be asked for proposal and to address a number of key issues.
- Savings??

Warm Mix Asphalt Projects 2009



Items Department Considers

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- What Technology will be used?
- No additional cost to Department
- RAP % with/without WMA
 - ▣ Credit may be due to IDOT
- Grade of AC with/without WMA
- Temperature range of WMA production
- Anti-strip need? – add as current practice
- If FRAP – will need gravities from BMPR
- Must meet specifications or return to HMA

Items... – Con't

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- WMA can be tender or rut above 160F
 - ▣ What is traffic control plan?
- Mix verification – HMA mix if WMA can't be reproduced in lab
- Haul time
 - ▣ May be limited for foamed processes
- Storage plan
- Contractor responsible for removal if out of spec or damaged by traffic

Main Concerns

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- ▣ Technology to be used
 - Limiting “wax” type modifiers to overlays due to impacts to PG grading of asphalt
 - Haul time concerns for water based systems
 - Impacts from opening to traffic
- ▣ Still must meet HMA specifications
 - Density
 - Mix properties

Future of WMA

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- Contracting community seems to be very excited about using
 - ▣ Plant foaming technology
 - ▣ Fuel savings
 - ▣ Worker health/conditions
- BMPR will gather project information so long term performance can be tracked
- May be driven by others to use due to emission restrictions
- Working with industry to develop WMA specification

ATTACHMENT 2

WMA EXPERIMENTAL FEATURE PROJECT BACKGROUND FORM

(To be filled out by District/Local Agency)

Contract Number	
District/Local Agency	
Month/Year of Construction	
Route	
Facility Type	
ADT for year of construction	
Project Limits - In-place stationing	
Project Limits - key route stationing (not needed for Local Agency projects)	
Existing cross-section, including rehabilitation	

ATTACHMENT 3 (Revised 6-2-09)

Warm Mix Asphalt Experimental Feature Contractor Documentation

This form is to be filled out by the QC Manager for each mix/lift and submitted to the District office for signature and submittal to the Bureau of Materials and Physical Research.

Location: _____ Contract #: _____ Route: _____ Lift: _____ (i.e. lev. binder, surface...)

Limits of WMA (lane, exact in-place stationing begin/end in each direction): _____

Limits of HMA Control Section (lane, exact in-place stationing begin/end in each direction): _____

Production Temperature: _____ WMA Technology: _____ Plant Type: _____

	Target °F	Min °F	Max °F	Average °F
HMA				
WMA				

Temperature: _____ (Immediately behind paver)

	Target °F	Min °F	Max °F	Average °F

Design: Mix Design # _____

Strength (psi) _____

Unconfined _____

Lab Comp _____

of Green _____

District Contact (name, title, phone no., e-mail address) _____

ways met _____

WMA _____

Please send in information
on forms provided

Thank You



Lincoln's Home