IDOT HMA Update

Illinois Asphalt Paving Association
Annual Meeting
March 17, 2008

Topics

- Rubblization
- Pavement Warranties
- Extended Life Pavements
- Asphalt Usage
- PPA
- State Highway Program
- RAP
- WMA Demonstration Projects
- Specifications

RUBBLIZATION

Rubblization with HMA Overlay

Performance

- Overall performance has been good, But….Have had some problems
  - Tufa – a form of Calcium Carbonate
  - Underdrain outlets getting covered during final shoulder shaping and causing water to be trapped in pavement

Rubblizing Future

- Rubblizing remains a specialized design requiring approval for use
- Future projects planned for 2008 and beyond
  - Expect 1-3 projects/yr between State and Locals

PAVEMENT WARRANTIES

Pavement Warranties

- Legislative Mandate:
  - 20 Contracts
    - 10 Contracts to have 30-year life cycle
  - 5-years in length
  - Transfers risk from the Department to the contractor.

Warranty Specifications

- Full-depth Bituminous Pavements
- Bituminous Overlays
- Concrete Pavements (Jointed and CRC)
- Concrete Bridge Decks and Bridge Approach Pavement

For 30 Year Life Cycle:

- Extended Life Concrete (30 and 40 Year)
- Extended Life HMA

Warranty Projects by Project Type

Project Type	Number of Projects
Bituminous Overlay	3
Bituminous (20-yr.)	2
Bituminous (30-yr.)	7
Concrete (20-yr.)	3
Concrete (30-yr.)	12
Concrete (40-yr.)	1
TOTAL	28

Warranty Project Status

- Construction complete on all projects.
- 7 out of 28 (25%) projects have reached the end of the 5-year warranty period.
- 3 of the 7 required corrective action at the end of the warranty period.
  - Crack sealing done on one other project.
- Repair work also performed on other projects where warranty has not expired.

Future Efforts

- Five projects with warranties expiring in 2008.
- Majority do not expire until 2010 or 11.
- Will Continue to monitor sections.
- Look for renewed interest due to harsh winter and needed repairs.

Extended Life HMA Design in Illinois

Extended Life HMA Design

- In standard HMA design, as traffic ↑, pavement thickness ↑
- Extended Life Design based on Fatigue Endurance Limit
- Keep strain at bottom of HMA layer low enough to prevent damage
- Result is long-life pavement
- Will need to renew surface

IHR-39-1, Validation Of Extended Life HMA Pavement Design Concepts

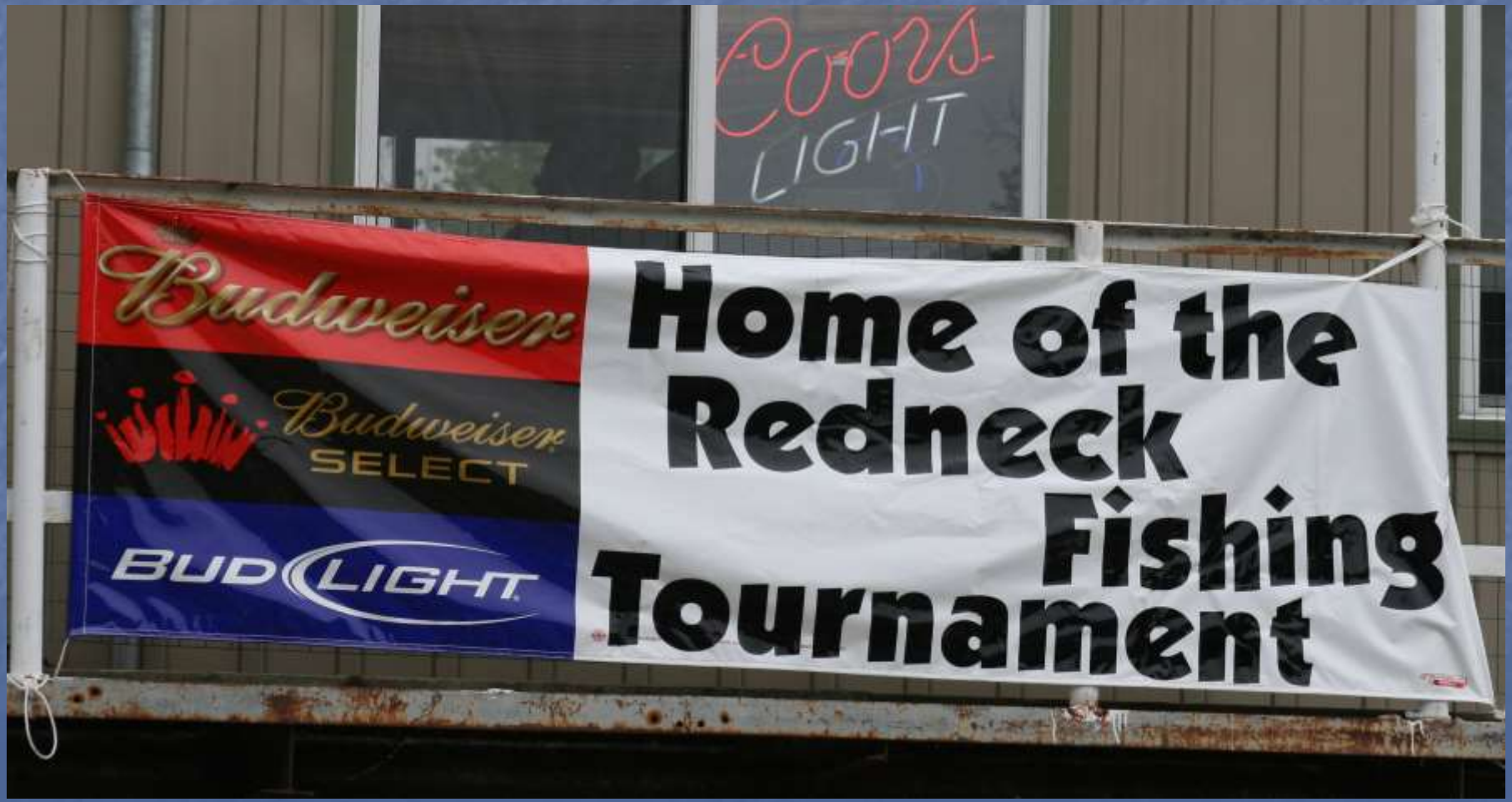
- Characterize dynamic modulus and fatigue for current IDOT mixes
- Determine existence/magnitude of Fatigue Endurance Limit (FEL)
- Of all IDOT mixes tested, none had FEL below 70 microstrain

ILLINOIS CENTER FOR TRANSPORTATION

Extended Life HMA Design

- Develop maximum HMA thickness using FEL = 70 microstrain
- Design for worst-case scenario
- Develop standard extended life HMA cross- section and policy for use
- Meet with industry

Now something really different




Happy Hooker
IL 3662 JT
YAMAHA

ASPHALT

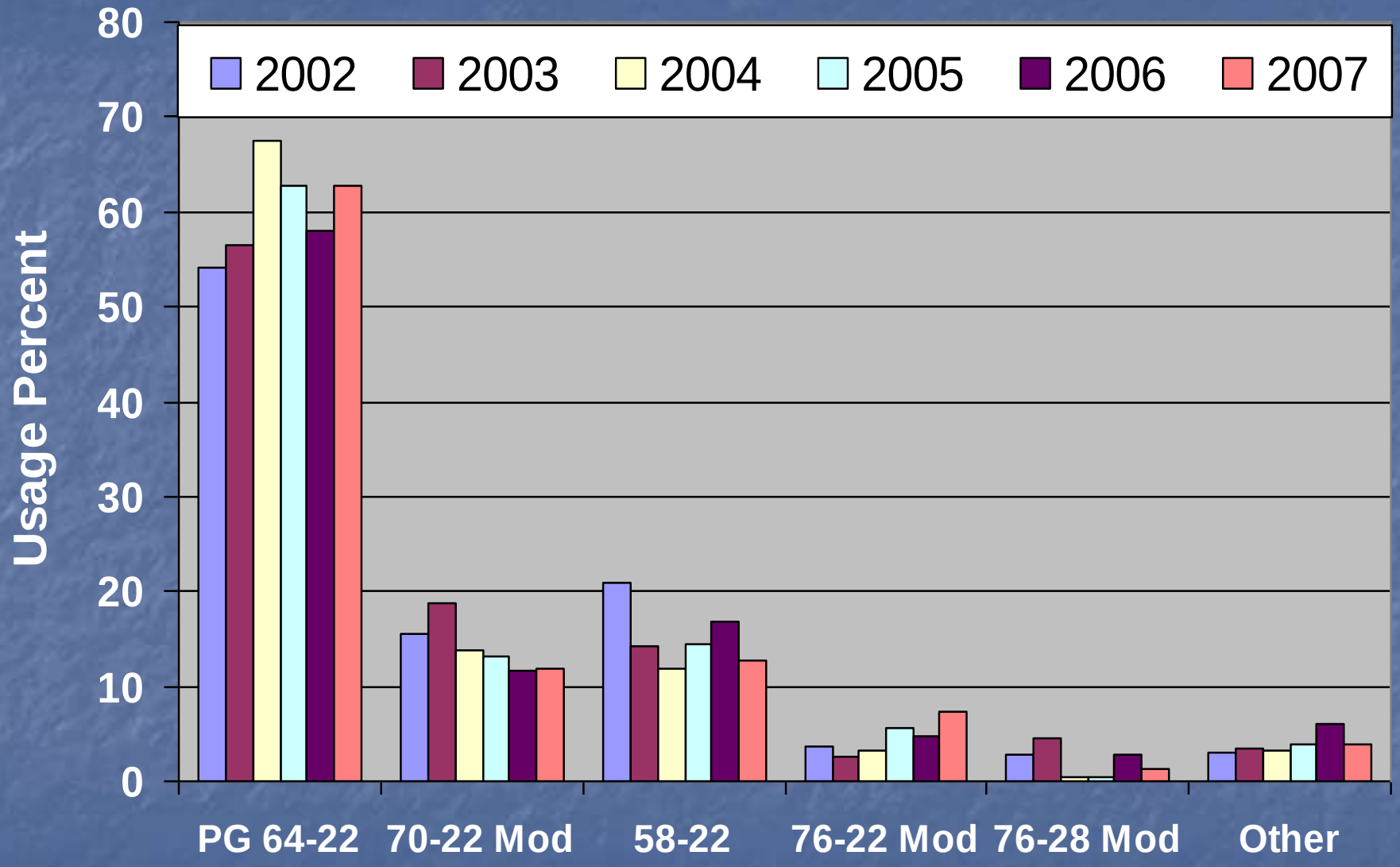
Happenings and Usage

New Certified Sources

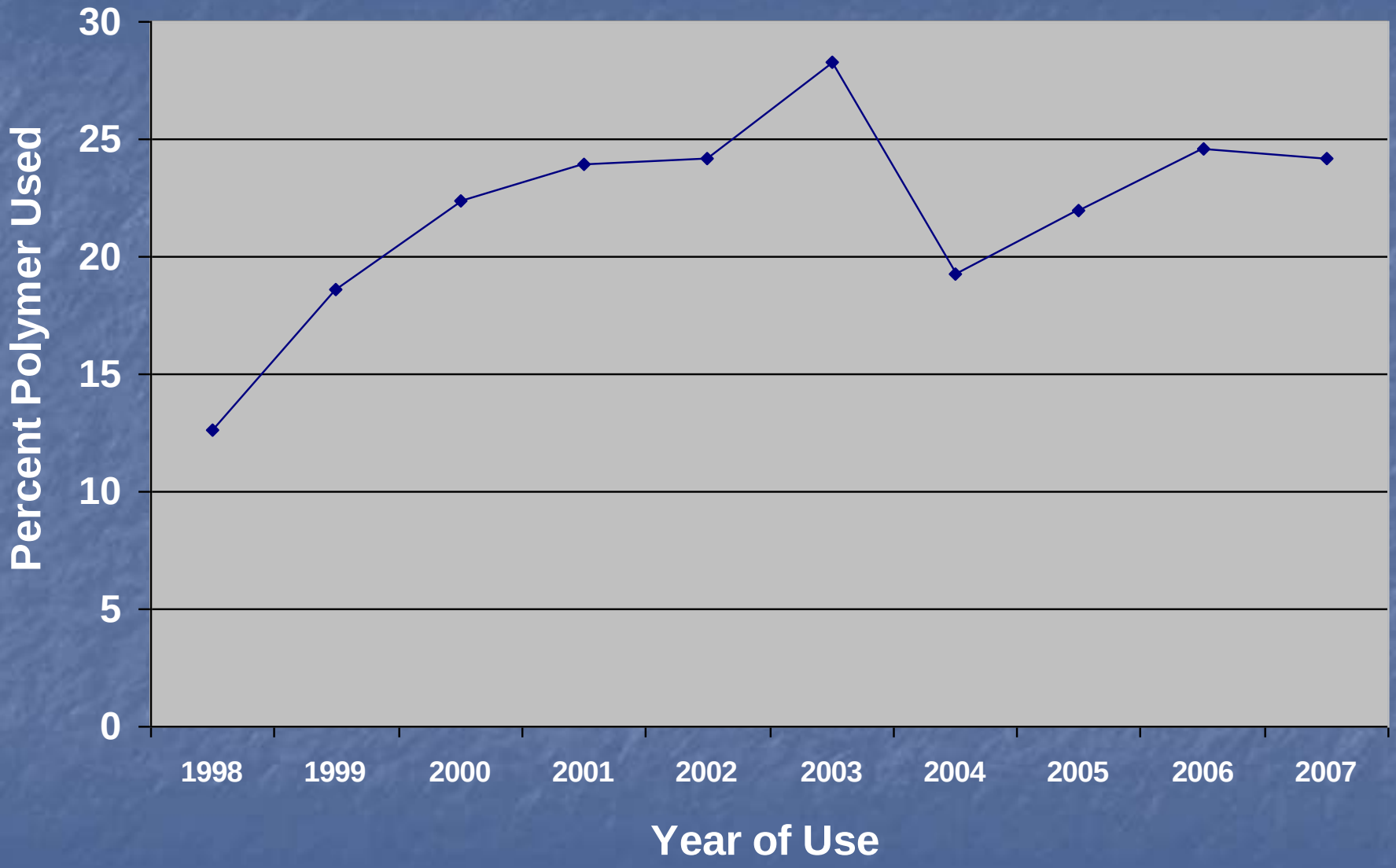
Interstate Asphalt Corporation, Chicago	PG 64-22
FLINT Hills Resources, Rosemont, MN	PG 64-22 PG 58-28
Flint Hills Resources, Savage MN	SBSPG 64-28
TexPar Energy, LLC, Davenport, IA	PG 64-22, PG 58-28, PG 46-28

Name Change
Peoria River Terminal, Peoria, IL is now
Interstate Asphalt Corporation

2002 to 2007 Grade Usage

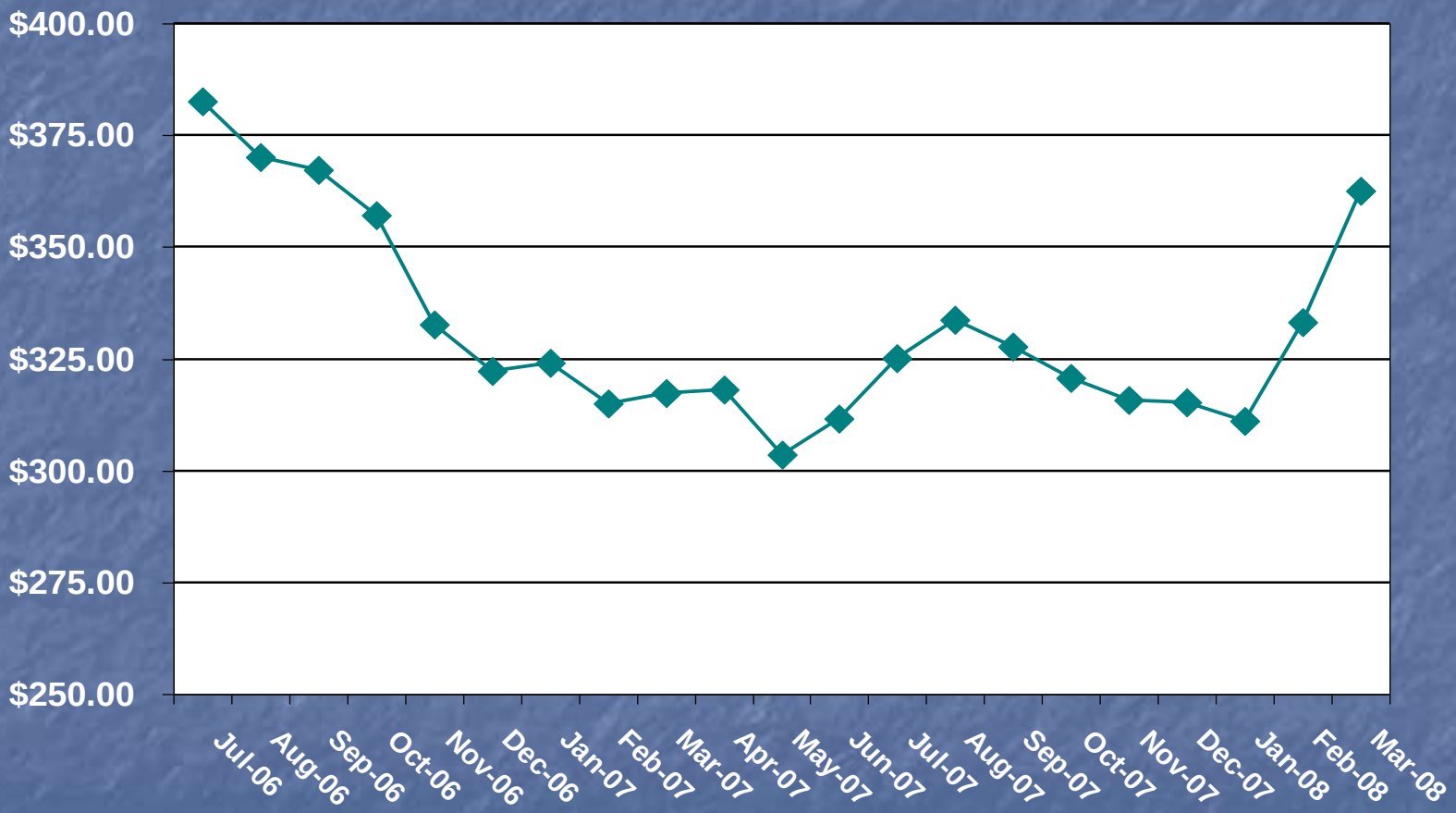


Percent Polymer Used vs. Time



Bituminous Price Index

Bituminous Price Index



Index Usage

- Projects ≥ 1,200 tons total mix
  - Contractor option
- Adjustment applied to months tonnage
- How many took option?
  - 2007: 130 of 242

HMA QUANTITIES

Summary of HMA Quantities

	HMA (tons)
2007	4,811,640
2006	4,287,573
2005	5,125,137
2004	4,303,764
2003	7,960,262
2002	8,162,904

MANPOWER

Manpower

	Division of Highways		
Year	Technical DOH	Total DOH	Total IDOT
1991	3,144	6,296	7,428
2000	3,016	5,695	6,768
2003	2,865	5,441	6,337
2006	2,469	4,801	5,602
2007	2360	4719	5377

Polyphosphoric Acid (PPA) Modification of PG Binders

What does PPA do?

- Moves the high temperature PG grade
- May allow less polymer
- May reduce cost of PG binder
- Main concern: Can make mix moisture sensitive
- Compatibility with Anti-strips??

Current Status

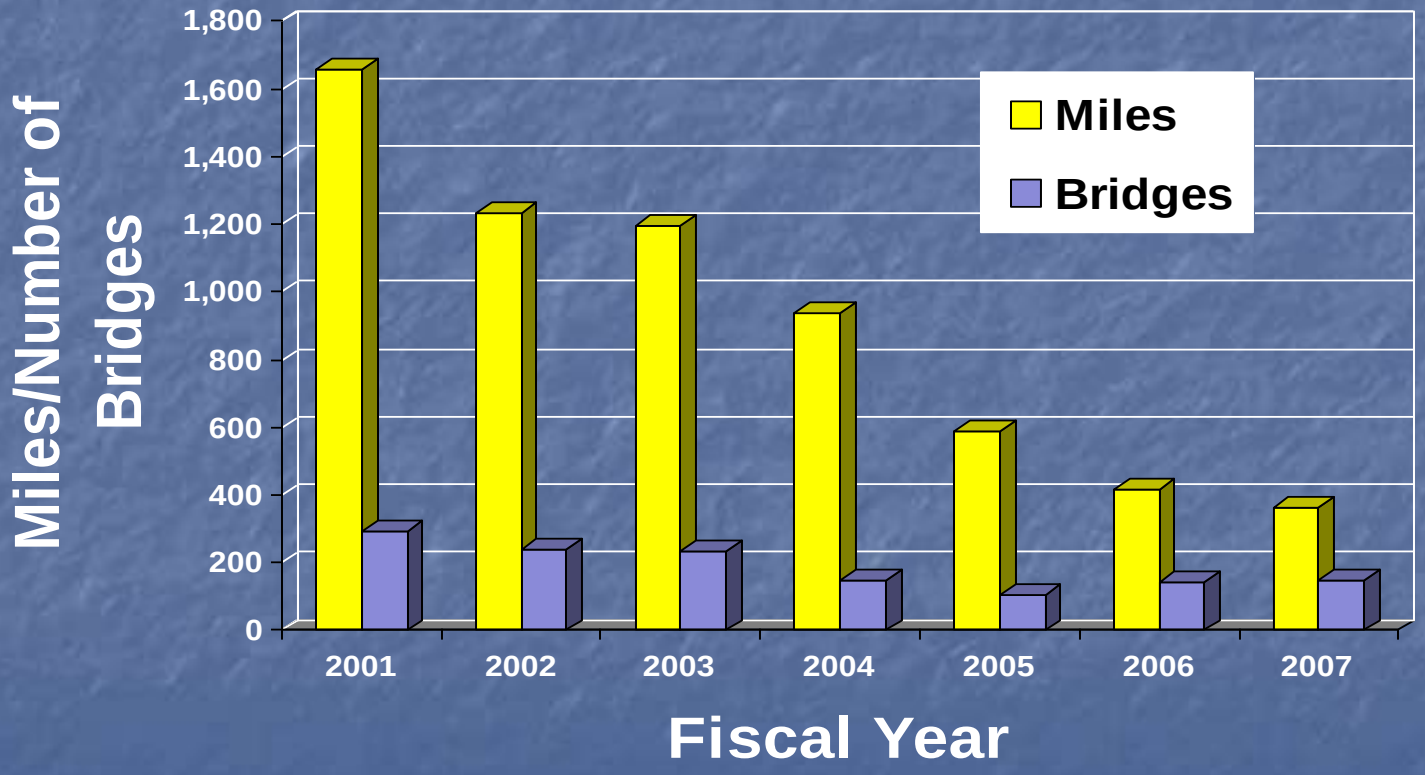
- Awaiting FHWA ongoing Research Investigation
- Discussing performance with agencies actively using PPA
- Section 1032.05(b) "Air blown asphalts, acid modification, and other modifiers will not be allowed."
- Of 36 states responding to survey, 19 do not allow PPA

STATE HIGHWAY

PROGRAM

- History-

State Highway Program



RAP Update

2007 Max RAP % Changes

N-Design	Binder/ Level Binder	Surface	With Polymer
30	30	30	NA
50	25	15	10
70	15/25*	10/15*	10
90	10	10	10
105	10	10	10

Shoulders up to 50%

*RAP Max Percentage if Crushed to -3/8”

New in 2007

RAP Usage

- Overall, RAP usage up, but still have issues
- District 1 area still has significant RAP surplus
- New Effort to Increase Recycling Usage
  - North East Illinois Recycling Forum "NEIRF"

NEIRF

NorthEast Illinois Recycling Forum

- IDOT (Chicago Metro Area), Tollway, Local Agencies, & Asphalt Industry
- Initial Focus on addressing barriers preventing increased RAP usage
  - Fractionalization of RAP
  - Double PG grade bump down for higher RAP contents
  - High Minus #200
  - Other uses for RAP

NEIRF Future

- Long term look at RAP and other materials to be recycled.
  - Shingles
  - Tire rubber
  - Foundry Sand
- Intend to be long standing group

WARM MIX ASPHALT

What is WMA?

Allows reduction in

- production temps
- placement temps

How is it done?

a) Two Component Asphalt
b) Emulsion Technology
c) Mix Additives
   - Mineral
   - Organic
d) Foaming

Hot Mix Asphalt
275 - 325º F

Warm Mix Asphalt
200 - 275º F

Cold Mix Asphalt
60º F

Warm Mix Asphalt

Demonstration Projects

District #1 Sasobit Demo

- Gallager Asphalt
- 1000 tons of Stabilized Sub-Base Layer under the new CRC on Dan Ryan Expressway
- IL 19 mm N-50 @ 3% voids
- Placed in 2 - 3" lifts
- Mix produced at 260 °F & compacted started ≈ 230 °F
- At 175 °F, 1% additional density was possible

District #1 Sasobit Demo

- Sasobit Technology has merits:
  - Mix can be placed and compacted a mix at significantly lower temps.
  - Same equipment was used w/ no changes to the paving train.
- Estimated 8% fuel savings not enough to offset cost of Sasobit

District #7 Evotherm Demo

- Ambraw Asphalt
- 2000 tons N70 Surface mix
- Evotherm concentrate sprayed simultaneously with liquid AC
- Mix produced at 210 - 225 °F & compacted at 200 - 215 °F (roughly 80 °F cooler)
- No significant change in the rolling pattern

District #7 Evotherm Demo

- Evotherm Technology :
  - Mix can be placed and compacted a mix at significantly lower temps.
  - Same equipment was used w/ no changes to the paving train.
  - Evotherm results in lower voids & VMA
- Estimated 6% fuel savings not enough to offset cost of Evotherm

High RAP
with
Warm Mix Asphalt (WMA)
LOOKING FOR
A
FEW GOOD PROJECTS

Why Warm Mix Asphalt?

- Conventional HMA temperature requirement causes "burn" off lighter oils – why grade bump down is needed
- Lower temperature mix easier to produce with high RAP percents
- WMA – ability to compact mix
- Being looked at Nationally by FHWA Expert Task Group – Other states have demos started in 2007

High RAP WMA Demo

- Surface Mix (N 50 or N 70)
- 30% RAP (10 to 15% now)
- PG 64-22 No Grade Bumping
- Fractionation of RAP required
  - -1/2” to #4
  - - #4
- WMA
  - Astec Double-Barrel with Foamed Asphalt
  - Warm mix additives

2008 HIGH RAP Demo

- Would like to have 1-2 projects
- If viable, expand usage
- Bureau of Materials and Physical Research takes lead

Specification Update 2008

Specification Update

- **Field VMA Specification**
  - Effective April 2008
- **Longitudinal Joint Density Specification**
  - Retracted for 2008
  - Trial projects in each District w/2007 BMPR spec.

Specification Update, cont.

- Discontinue reduced voids testing frequency after 2nd day of production for projects ≥ 1200 tons
- Begin Efforts on Pay for Performance Spec
  - 8,000 tons or more
  - Incentive / Disincentive Pay
  - PWL
  - Jobsite sampling


THE
END