

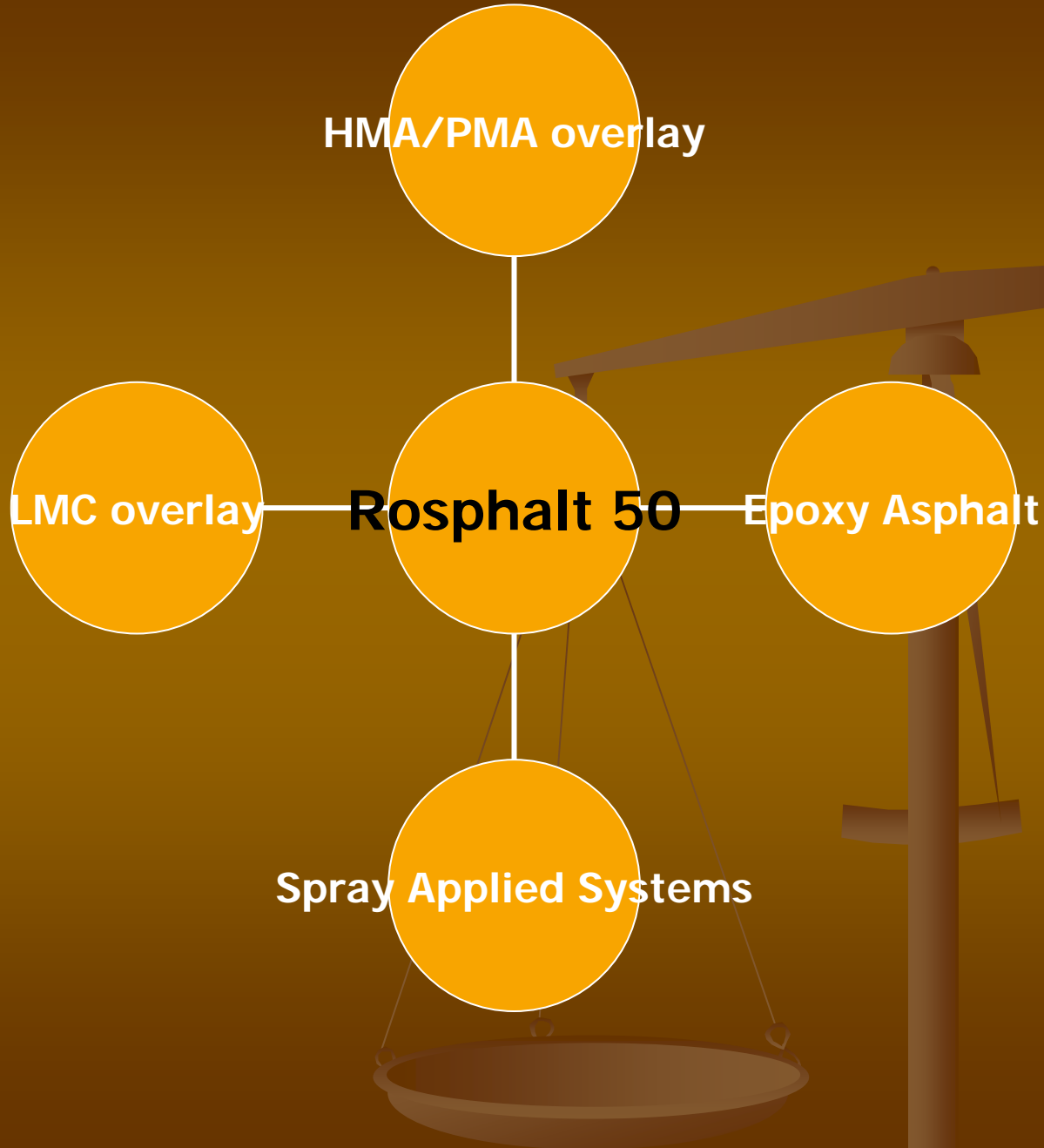
Long Term Protection on Concrete Bridges

Asphalt---the smoother
ride

Ohio Asphalt Paving Conference

Presented by: Doug Zuberer

Email: dzuberer@chasecorp.com



HMA/PMA overlay

LMC overlay

Rosphalt 50

Epoxy Asphalt

Spray Applied Systems

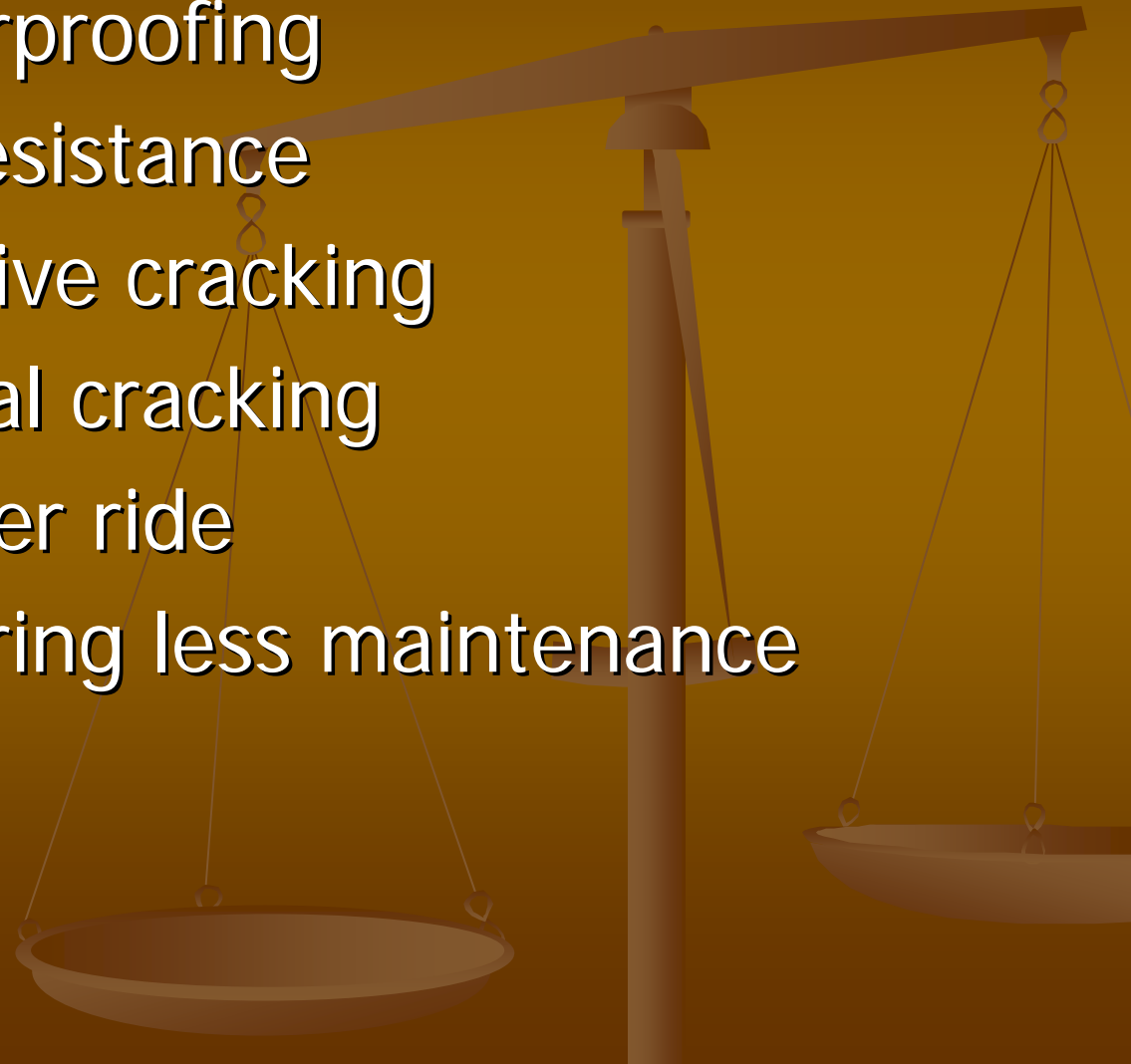
Mix design very important

- Objectives of the variables must be consistent to specifications
 - Deformation resistance
 - Fatigue resistance
 - Low temp cracking resistance
 - Durability
 - Moisture resistance
 - Skid resistance
 - Workability

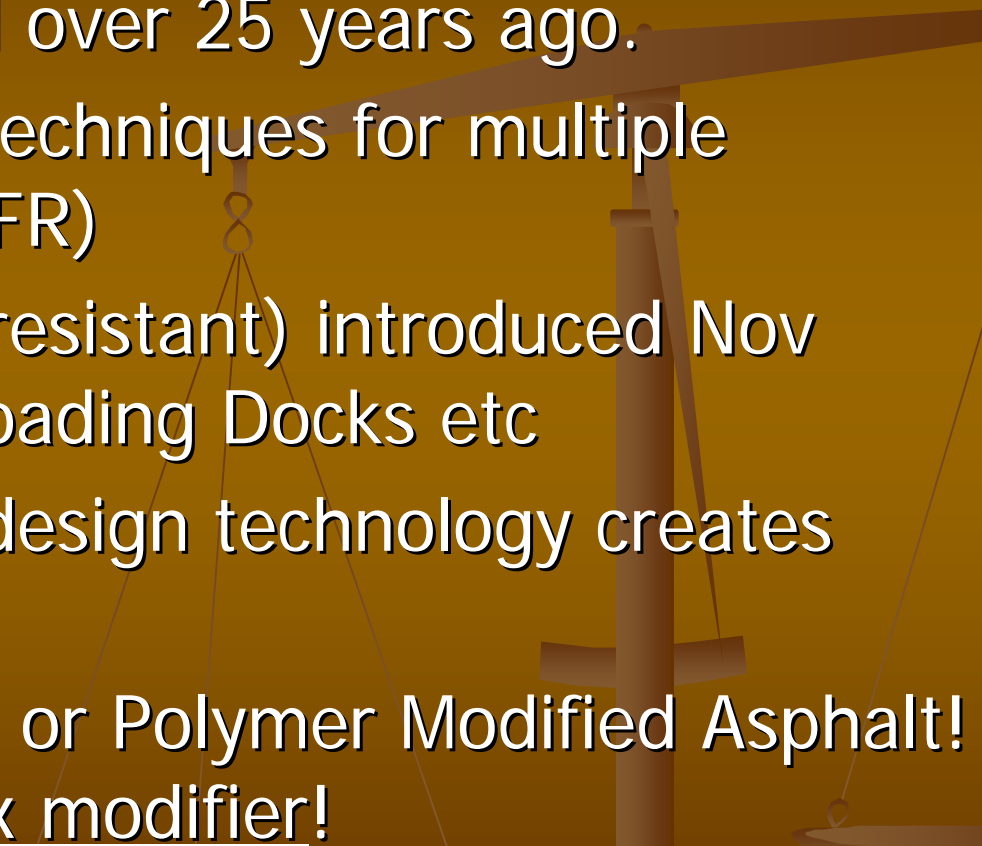
Rosphalt JMF exceeds all other HMA's

Rosphalt 50 has enhanced physical properties

- Enhanced waterproofing
- Increased rut resistance
- Reduced reflective cracking
- Reduced thermal cracking
- Smoother/quieter ride
- Durability requiring less maintenance

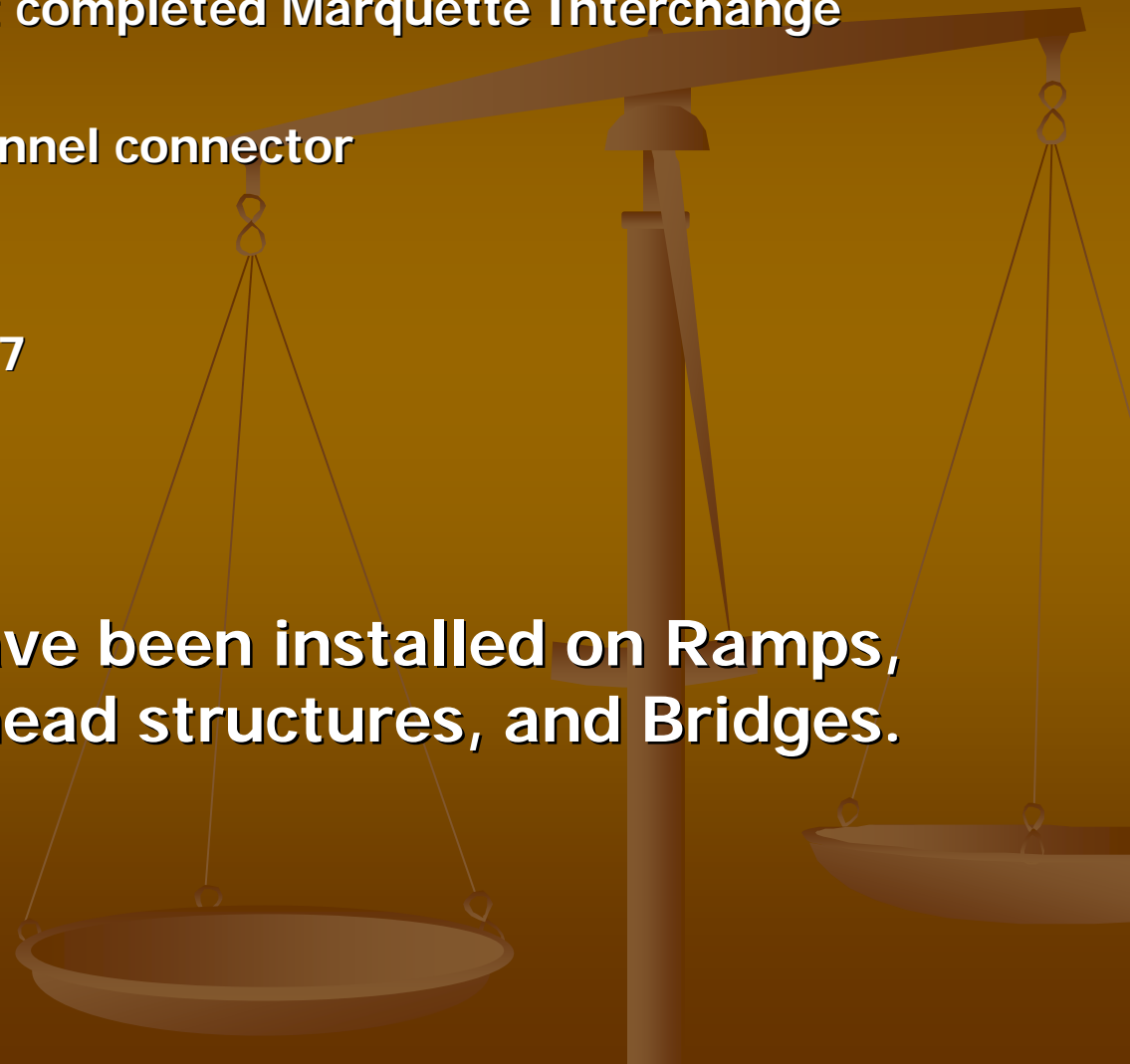


Royston Laboratories

- Product developed over 25 years ago.
 - Newly developed techniques for multiple applications.(R50/FR)
 - Rosphalt FR (fuel resistant) introduced Nov 2006, Specialty, Loading Docks etc
 - Dry mix modified design technology creates greater longevity.
 - This is not Asphalt or Polymer Modified Asphalt!
–Better said as Mix modifier!
- 

Rosphalt solutions on Interstate Highway System

- WI I-39, I-43, I-94, just completed Marquette Interchange
 - TN I-40
 - MA I-90 Ted Williams Tunnel connector
 - ME I-95, I-395
 - MI I-75, I-94
 - NY I-81, I-84, I-87, I-287
 - NYC I-95, I-278
 - KY I-64, I-65
-
- **These solutions have been installed on Ramps, Approaches, overhead structures, and Bridges.**



Milwaukee High Rise

Wisconsin DOT reports outstanding performance with
ZERO Failures!



Triboro Bridge- NYC High ESAL traffic...ESAL=existing single axle load----Or ADT=avg. daily traffic



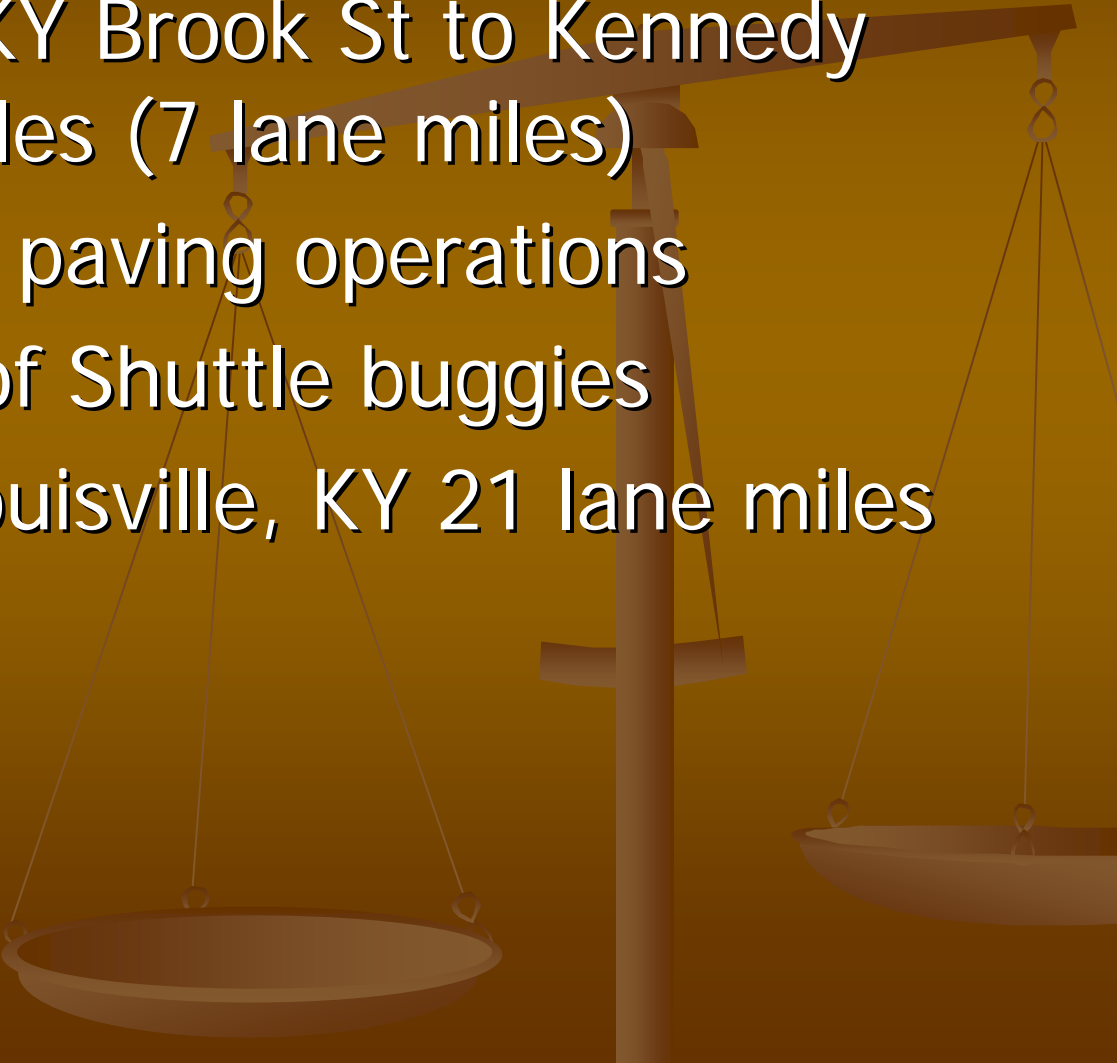
FAST TRACK INSTALLATIONS!

Tobin Bridge Boston

- Rosphalt 50 system installed at a rate over 1.2 miles in less than 6 hours!
- Excellent traffic control and mobility options using Rosphalt solutions.



Longest Interstate Project

- I-65 Louisville, KY Brook St to Kennedy Bridge-----1.3 miles (7 lane miles)
 - Utilized multiple paving operations
 - First utilization of Shuttle buggies
 - I64/Riverside Louisville, KY 21 lane miles
- 



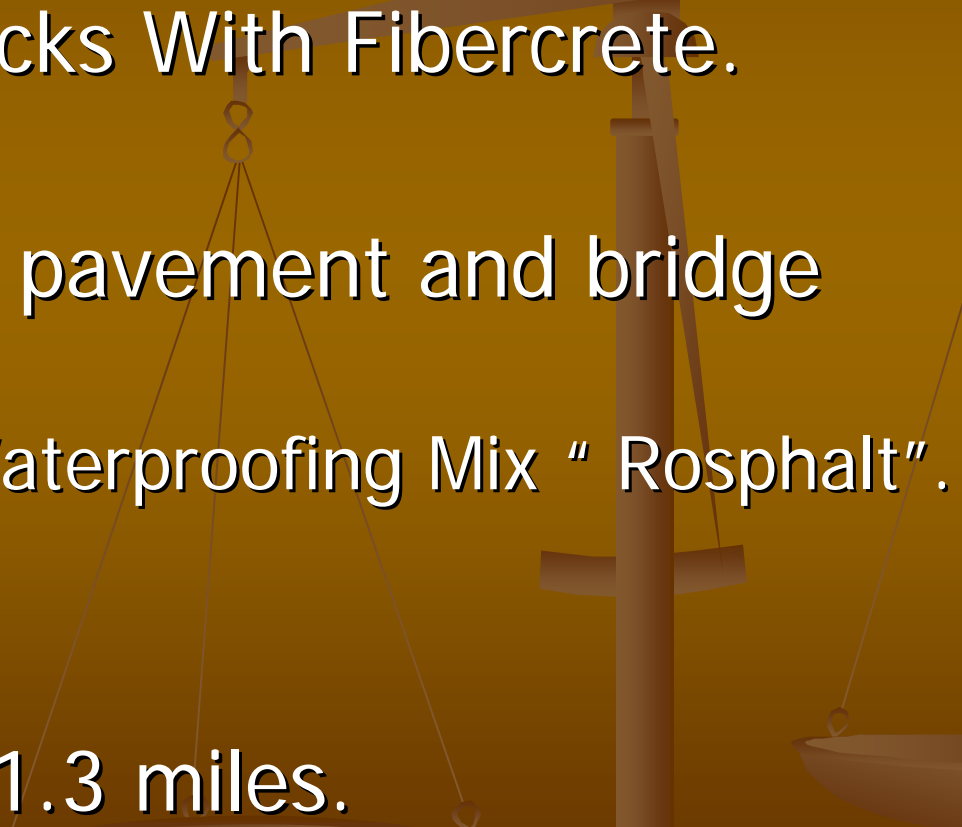


N
85
136
0

St. Louis
Lamar

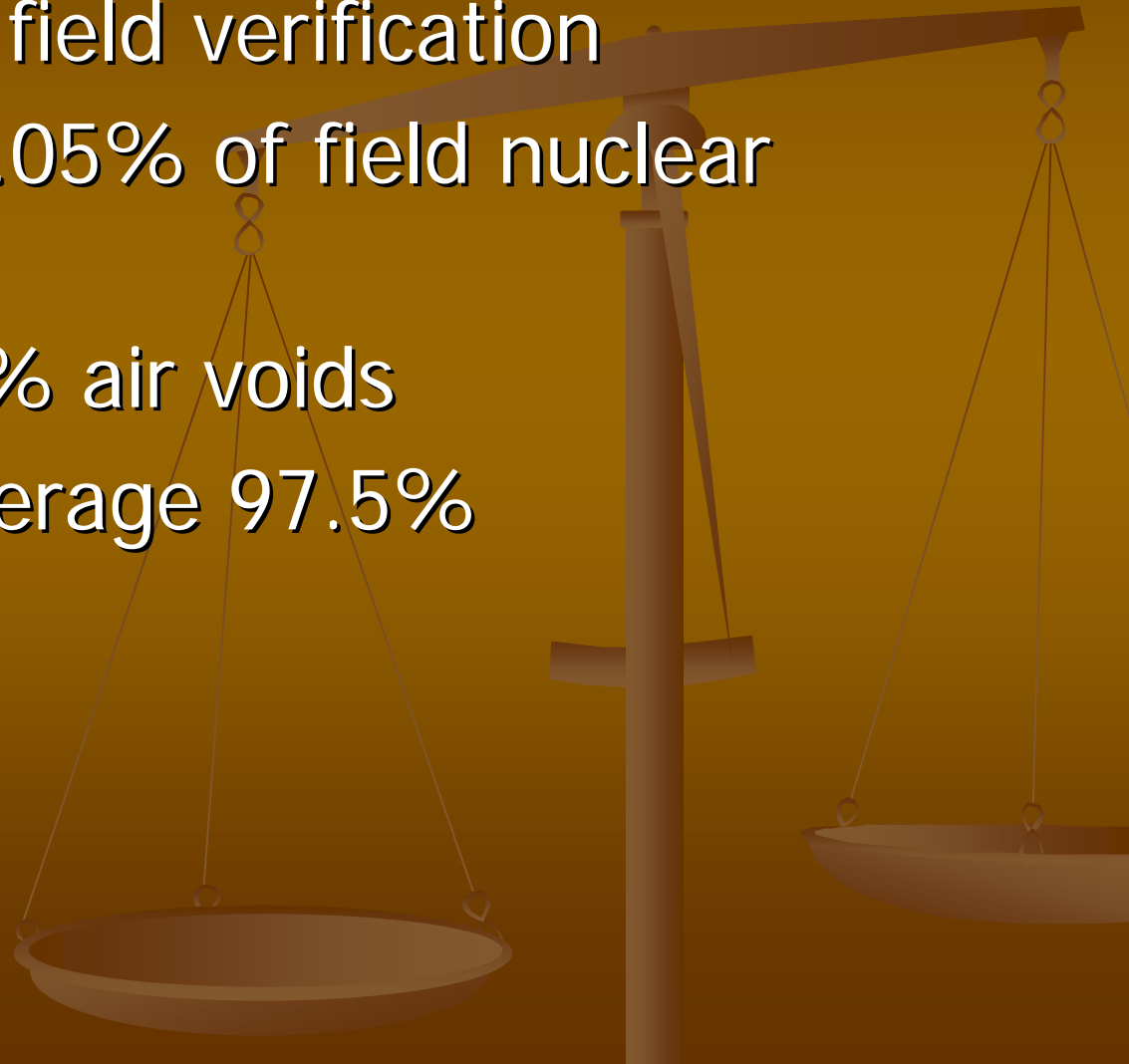
The Beef
Lover's
Choice.
ANGUS

Hospital Curve to Kennedy Bridge

- Patch Bridge Decks With Fibercrete.
 - Overlay existing pavement and bridge decks:
 - 1 ½" Asphalt Waterproofing Mix " Rosphalt".
 - 6,350 Tons.
 - Rosphalt area , 1.3 miles.
- 

I-65 Density Checks

- Cores taken for field verification
- Cores % with 0.05% of field nuclear density checks
- Lab design = 1% air voids
- Field density average 97.5%



98⁵

✓

98³

✓

97⁹

✓

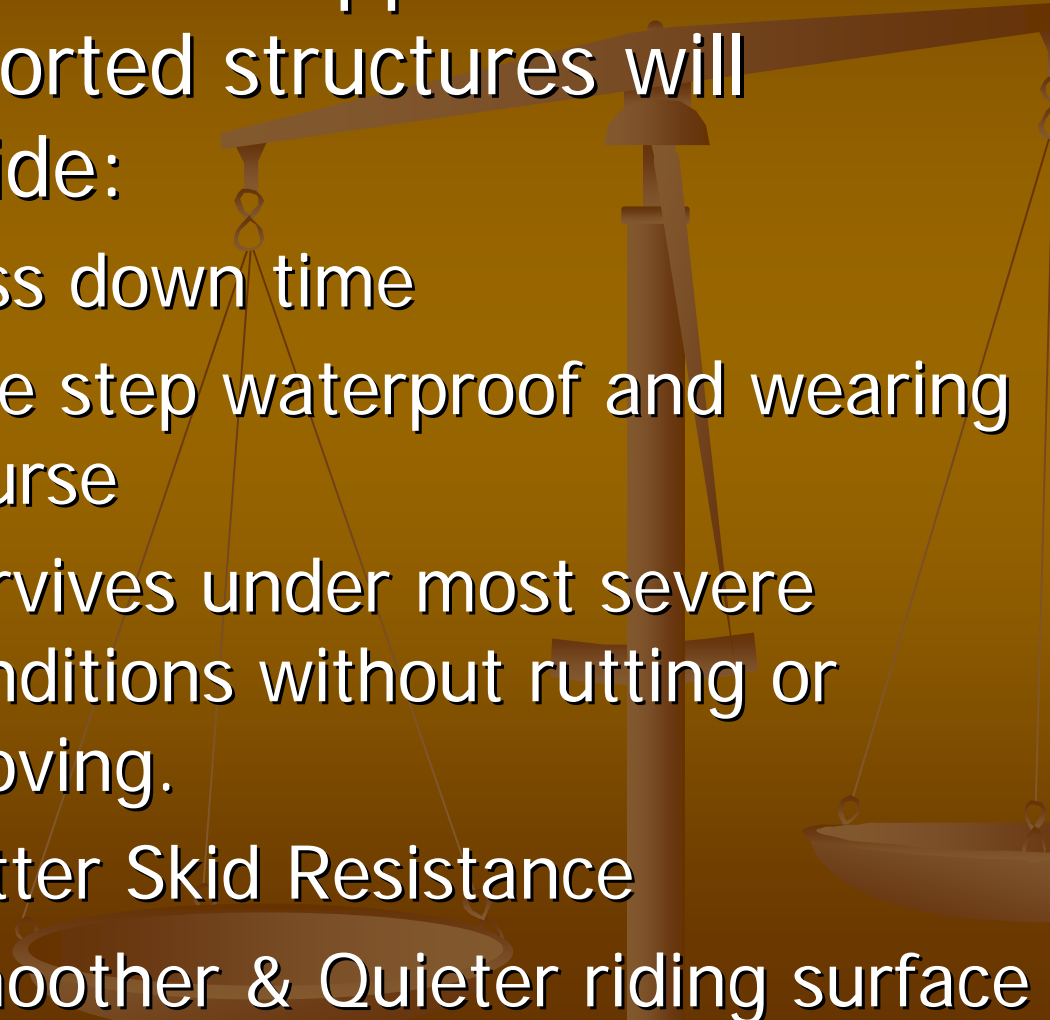
96⁷

✓

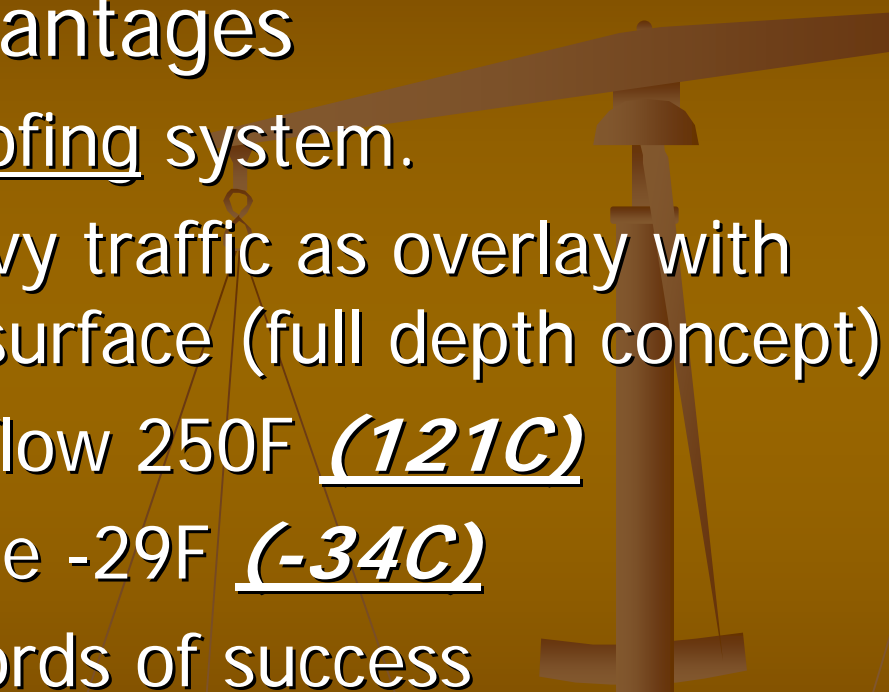
97⁹

✓

Royston's One Step Solution

- Rosphalt 50 application on supported structures will provide:
 - Less down time
 - One step waterproof and wearing course
 - Survives under most severe conditions without rutting or shoving.
 - Better Skid Resistance
 - Smoother & Quieter riding surface
- 

Royston one-step Process

- Rosphalt 50 advantages
 - BEST Waterproofing system.
 - Withstands heavy traffic as overlay with superior riding surface (full depth concept)
 - Will not soften flow 250F (121C)
 - Will not embrittle -29F (-34C)
 - Established records of success
- 

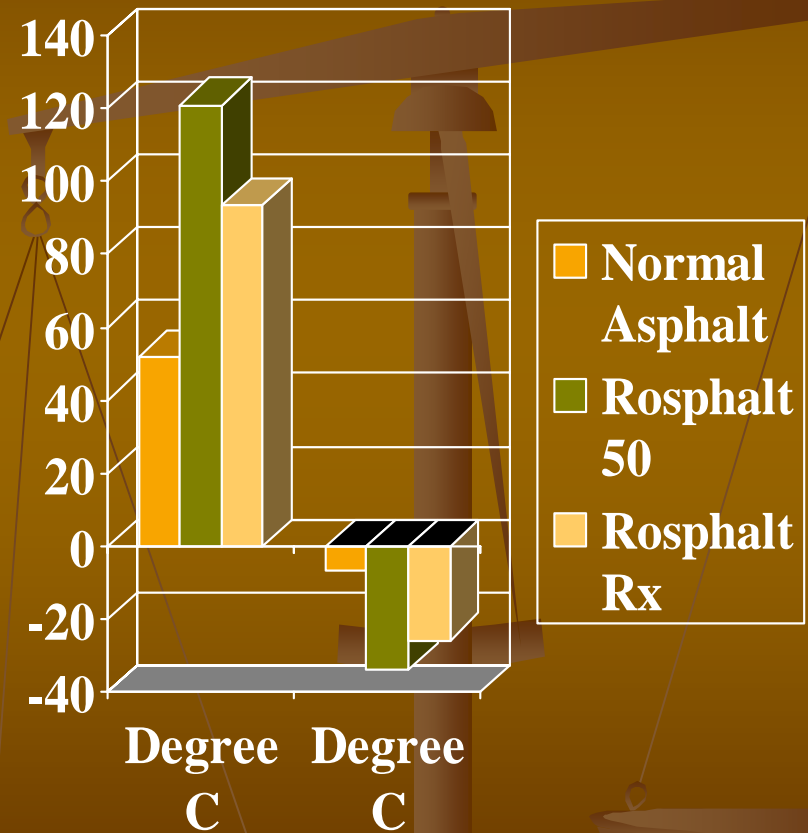
Other potentials

- Heavy Traffic Intersections replacing White Topping cost effectively. White Toppings average \$90/Yd² installed compared to \$45/Yd² for a Rosphalt 50 solution and ½ the time
- Airports-exceeds FAA specification P401---CitgoFlex FR selling for around \$180/ton installed –We should be competitive and also offer better stability with less rutting or shoving potential.
- Difficult road solutions & Race Tracks
 - * Better skid resistance—Reports available
 - * No rutting/shoving—Refer WVA article for opportunities to pursue.
 - * Reflective cracking solutions—Test Data---KY 53 SOLUTION
 - * Acoustic enhancer---smoother than asphalt—WORKING WITH D-5 IN LOUISVILLE, KY

Rosphalt comparison

Best performance for temperature variations

- Soften and flow characteristics
- Rosphalt50@121C vs. 51.7C for standard asphalt—Rx@93.3C
- Embrittlement
- Rosphalt50 @-34C vs.-6.7C for standard asphalt—Rx@-25.6C



Rut Analysis

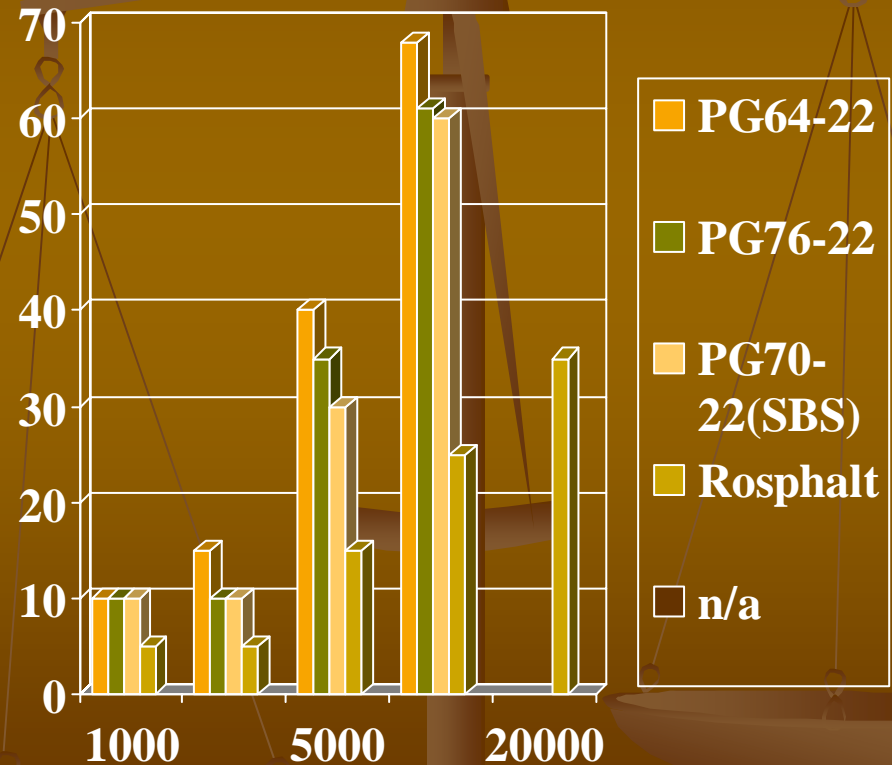
Best performance for temperature variations

Rut testing in cycles
per mm 10=1mm
etc.

WPI testing more
severe than other
analysis

Standard test per
Hamburg for
others—8,000
cycles

Source of other than
Rosphalt per
Asphalt Institute

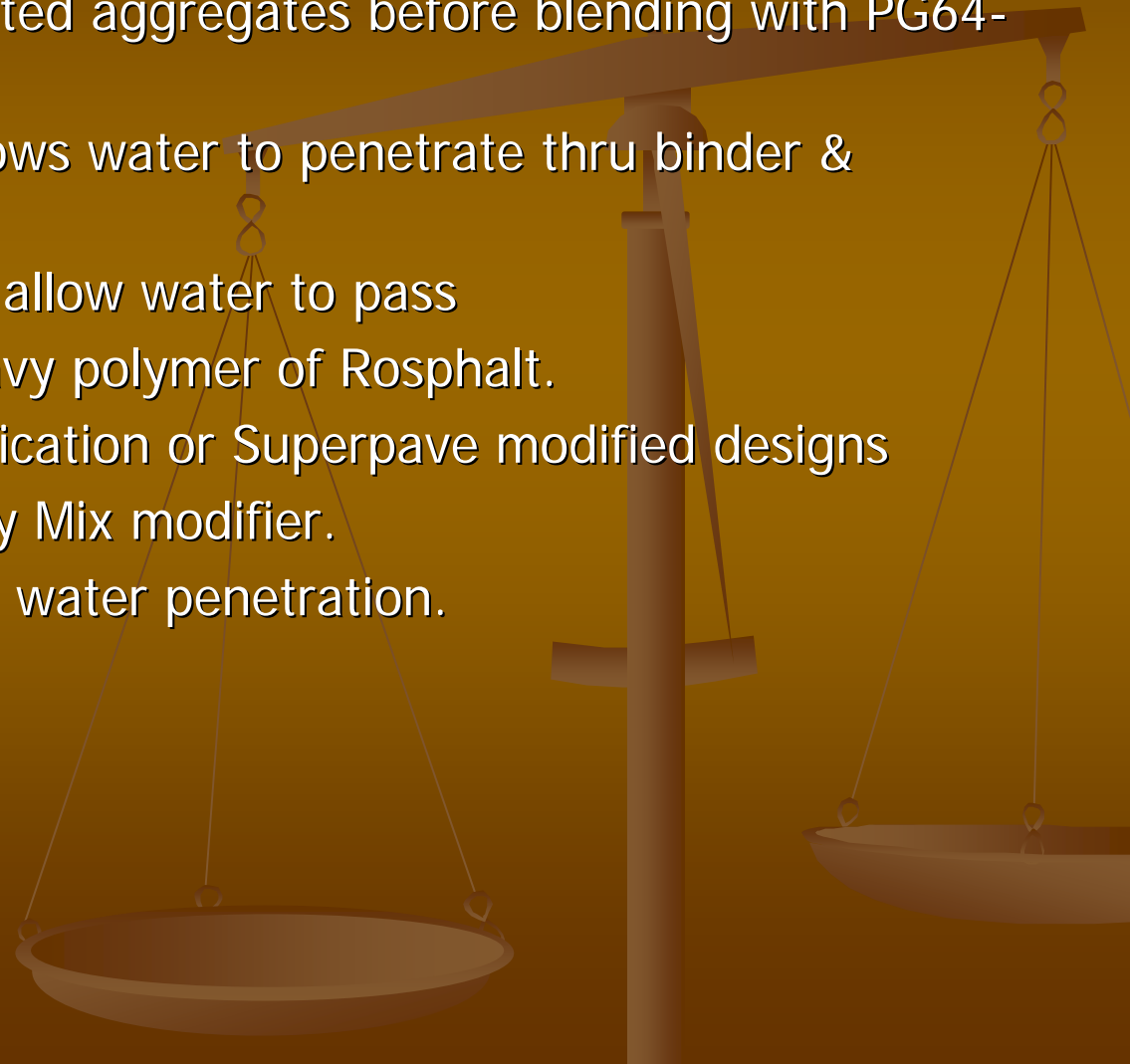


Skid Resistance

- Typical states reporting skid resistance considered good range between 35-45 depending on type of design.
- Concrete requires diamond grinding to be comparable, BUT PRESENTS ROUGHER RIDE!
- PA, KY, NY and ME testing on Rosphalt design between 46-54!

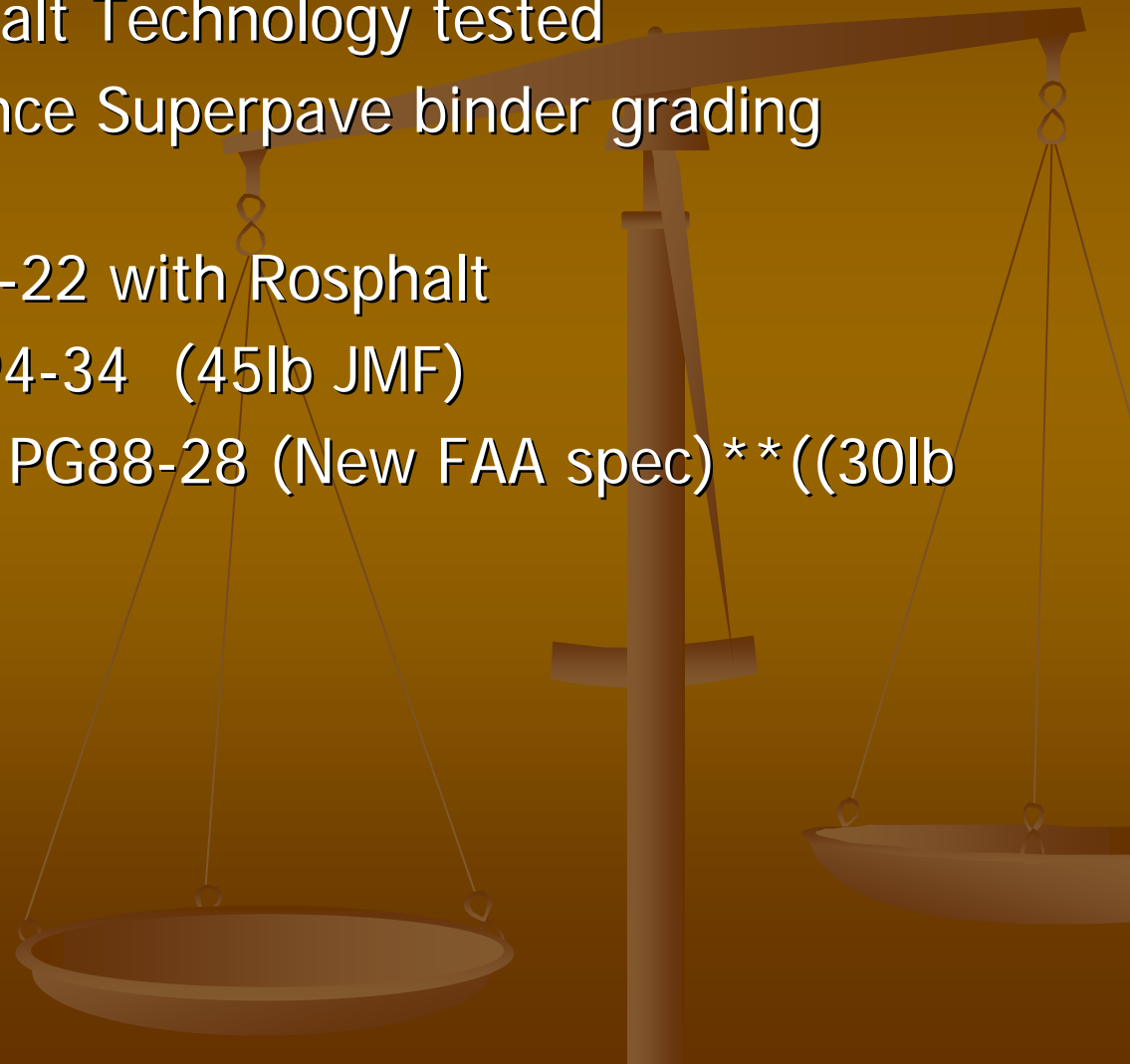
Rosphalt Dry Mix Design prevents water penetration with fewer air voids

- Rosphalt coats super-heated aggregates before blending with PG64-22 binder.
- Standard mix designs allows water to penetrate thru binder & aggregates.
- Rosphalt dry mix will not allow water to pass
- Coated aggregates & heavy polymer of Rosphalt.
- Use standard state specification or Superpave modified designs
- Modify mix design as "Dry Mix modifier.
- Becomes impermeable to water penetration.



Superpave/Binder rating Rosphalt designs

- National Center Asphalt Technology tested
- Classified in accordance Superpave binder grading specification:
- Using standard PG64-22 with Rosphalt
 - Rosphalt 50 = PG94-34 (45lb JMF)
 - Rosphalt Rx/FR = PG88-28 (New FAA spec)** ((30lb JMF))



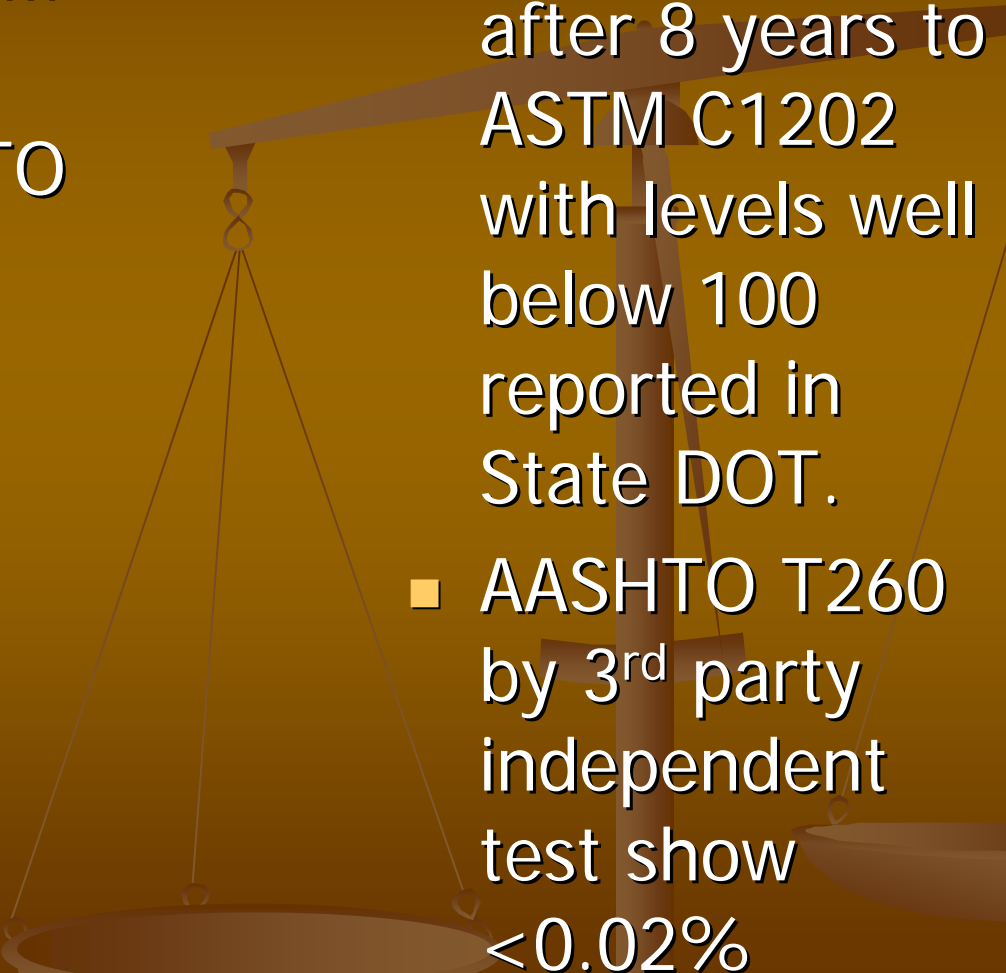
Superpave Fatigue Rating for Rosphalt designs

- Beam Fatigue Test AASHTO TP-8
 - PG 64-22 (HMA) = 76,853 cycles
 - Polymer Modified = ~80,000 to 100,000 **
 - **highest PG graded binders available
 - **R50 = 264,770(data sheet) testing conducted by Rutgers University almost 4,000,000 cycles**
- **Rosphalt will minimize your thermal and fatigue failures better than other solutions**
- Life cycle > 3.5 times longer life than PG64-22
- Better rutting/shoving and elastic recovery data available.

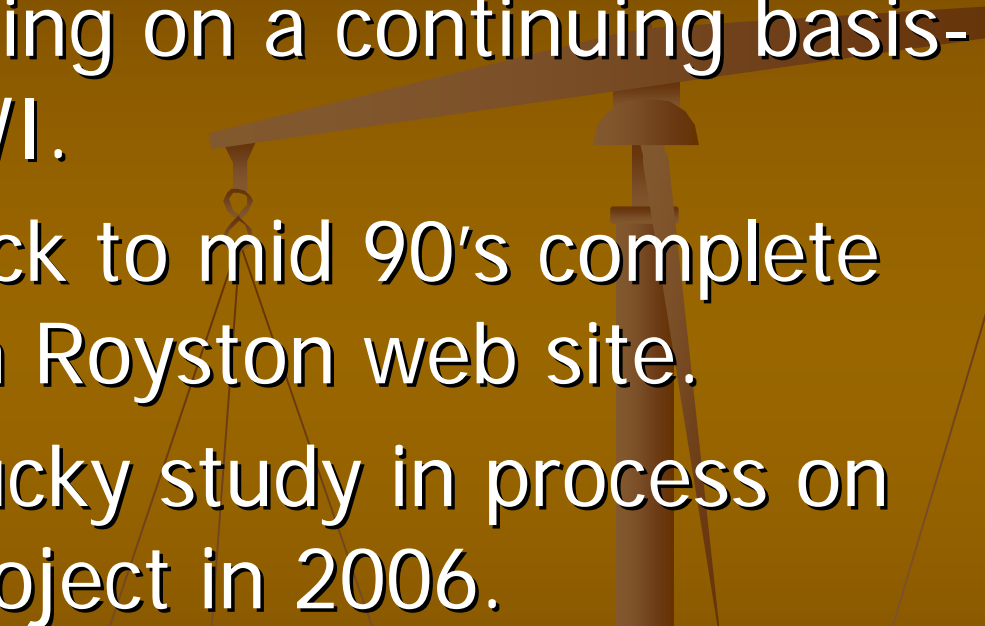
Impermeability/Resistance to Chloride Durability using Rosphalt 50

- Air voids in design <1.5% range for **MAXIMUM impermeability.**
- Test methods AASHTO T-260 <.02%(R50)
- Impermeable test methods ASTM D5084 reflect better results.(10E-8 to 10E-10) for R50
- Comparisons of Rosphalt 50 to other products and In-Situ test-data shows R50 more impermeable than other products currently available.
- More impermeable than Membranes, Concrete Overlays or Full Depth Concrete----as Rosphalt will not crack like concretes!
- Transportation Board Study Record No. 1834 with test by AASHTO--shrinkage of LMC & Micro silica Overlays----NOT ROSPHALT

Rosphalt 50 Vs In-Situ testing

- Tested to ASTM C1202
 - Test to AASHTO T260 < 1%.
 - Competitive testing available??
 - Rosphalt tested after 8 years to ASTM C1202 with levels well below 100 reported in State DOT.
 - AASHTO T260 by 3rd party independent test show <0.02%
- 

In-Situ Test Data

- States participating on a continuing basis- ME, MA, PA & WI.
 - Study dating back to mid 90's complete and available on Royston web site.
 - University Kentucky study in process on I65 Louisville project in 2006.
- 

Case Studies from National Transportation Research Board

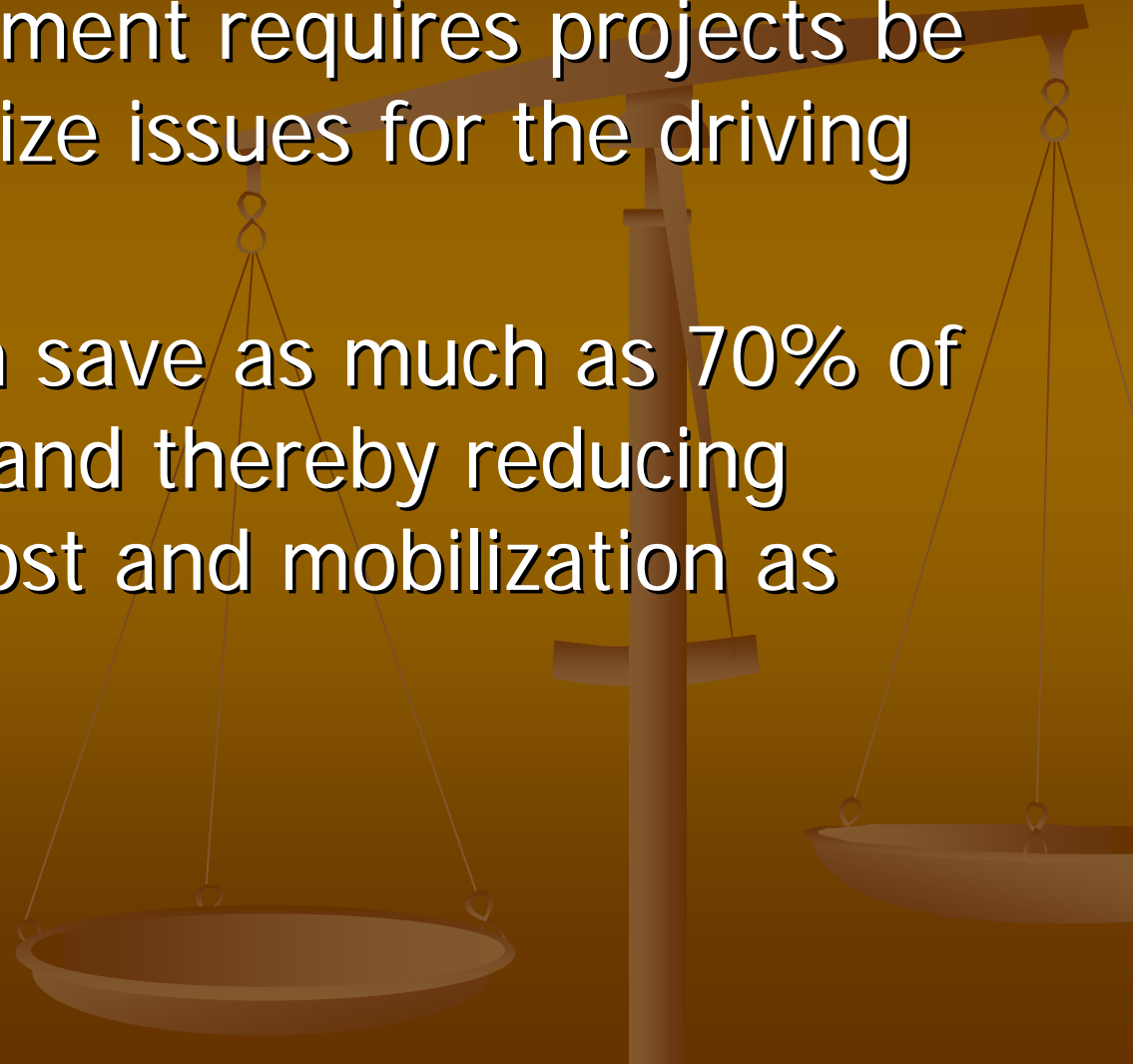
- Many states reporting early deck cracking on concrete overlays within first 2 years.
- MA Hwy and Mass Turnpike looking at replacing Micro Silica and LMC overlays recently installed as part of the “Big Dig” at contractors expense—Rosphalt is getting heavy consideration based on performance and cost!
- *Why not look at cost effective alternatives? Rosphalt 50 has a proven track record!*

Competitive Cost Analysis

- Rosphalt 50 typically competes against LMC/HP overlays, Epoxy Asphalts and Spray Applied (MMA) systems.
- Installed price of material and installation for Rosphalt 50 has been ½ other solutions.
- Depending on volume Rosphalt 50 installed price in 2006 ranged from \$24Yd² to \$45Yd².
- Concrete and Epoxy Asphalts averaged \$75Yd² and MMA around \$90Yd².
- Rosphalt 50 has proven to be the best cost effective solution.

Getting In and Getting Out

- Today's environment requires projects be set up to minimize issues for the driving public.
- Rosphalt 50 can save as much as 70% of the installation and thereby reducing traffic control cost and mobilization as well.



Rospphalt 50 ---the smoother ride

- Offers one of the most cost effective solutions.
- Offers long term durable solutions.
- Less maintenance
- Excellent utilization of agency/tax \$\$

