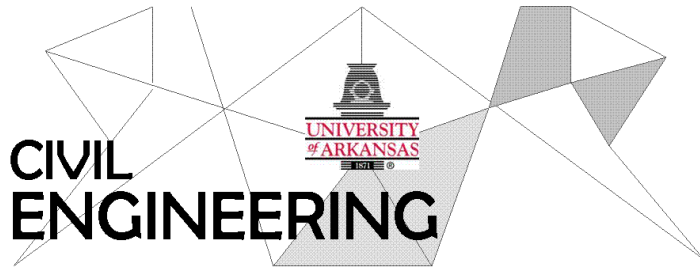


Polymer-Modified Interstates in Arkansas: A 5-year Review



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AMAP

Austin, TX
February 12, 2008



Outline

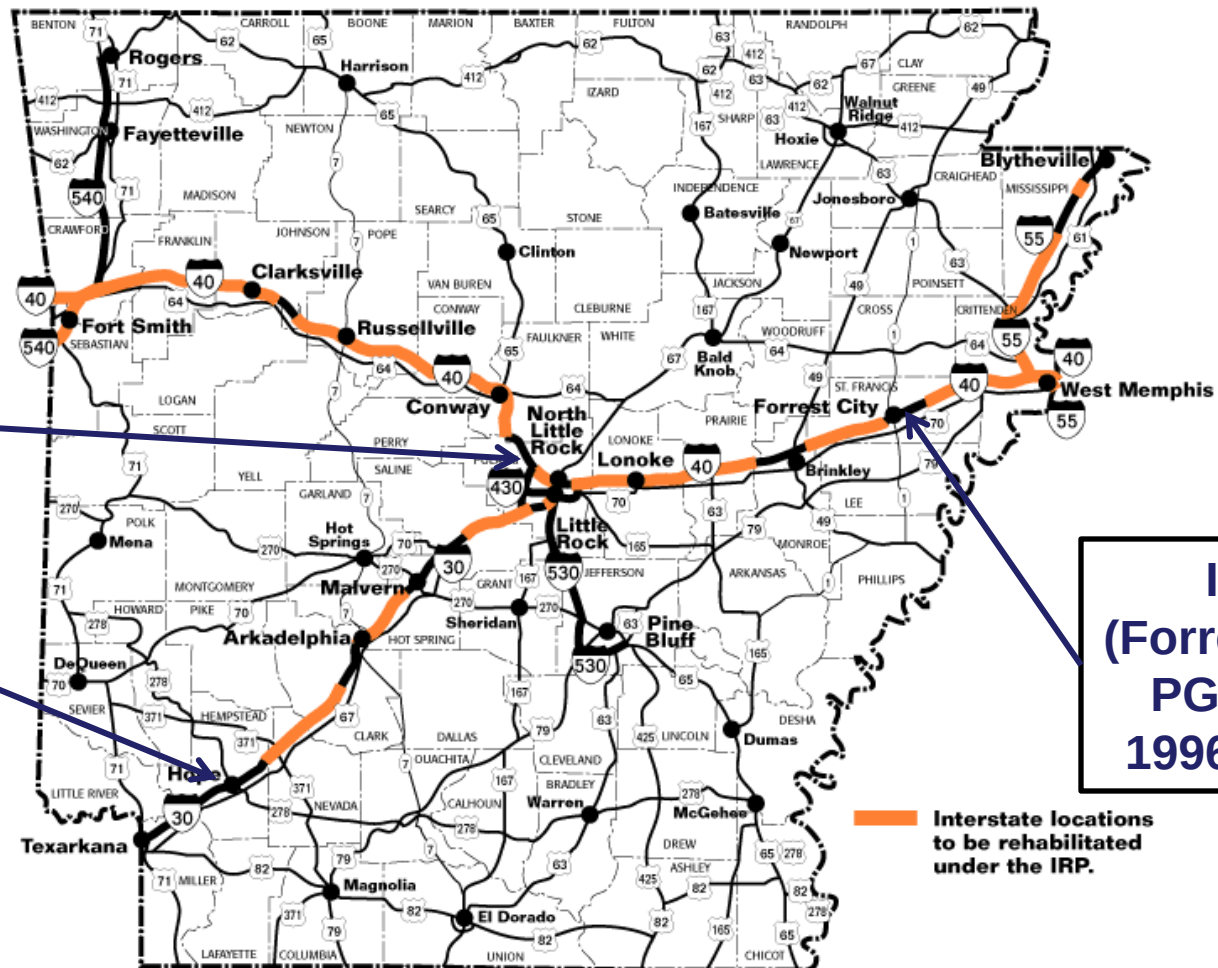
- Overview
- Mix Design
- Construction
 - Rubblization Process
 - Pavement Structure(s)
- Monitoring and Performance
 - Structural
 - Ride
- Keys to Success

Arkansas Interstate Rehabilitation Program (IRP)

- 5 Years – initial design to final opening
~ 1998 to 2003
- Bond Issue: ~\$575 million
 - Resulted in ~ \$950 for construction
- Work Performed
 - Asphalt constructed over rubblized PCC 276 miles
 - Existing asphalt milled/asphalt inlay 64 miles
 - Existing PCC removed/replaced with PCC 40 miles

Arkansas IRP

Interstate Rehabilitation Program Overview



Mix Design



Hamburg Wheel-tracking Test Results (typ):

@ 5000 cycles: 0.0 mm rut depth

@10,000 cycles: 3.3 mm rut depth



APA Test Results (typ):

@ 8000 cycles: 2 mm rut depth

- **Binder sources: Ergon, Koch, Lion, Wright**

- **Binder %**
 - 4.7 to 6.1% (12.5 mm)**
 - 3.8 to 5.5% (25 mm)**
 - 3.6 to 5.5% (37.5 mm)**

PG 76-22

- **most mixes 'coarse graded'; typical $N_{\max}$ 209**

Rubblization Process



Asphalt Pavement Structure



4" ACHM Surface Course (1/2")
3" ACHM Binder Course (1")
4" ACHM Base Course
9" Rubblized PCCP

Construction



Construction



Construction



Construction



Full-Depth ACHM at Underpasses

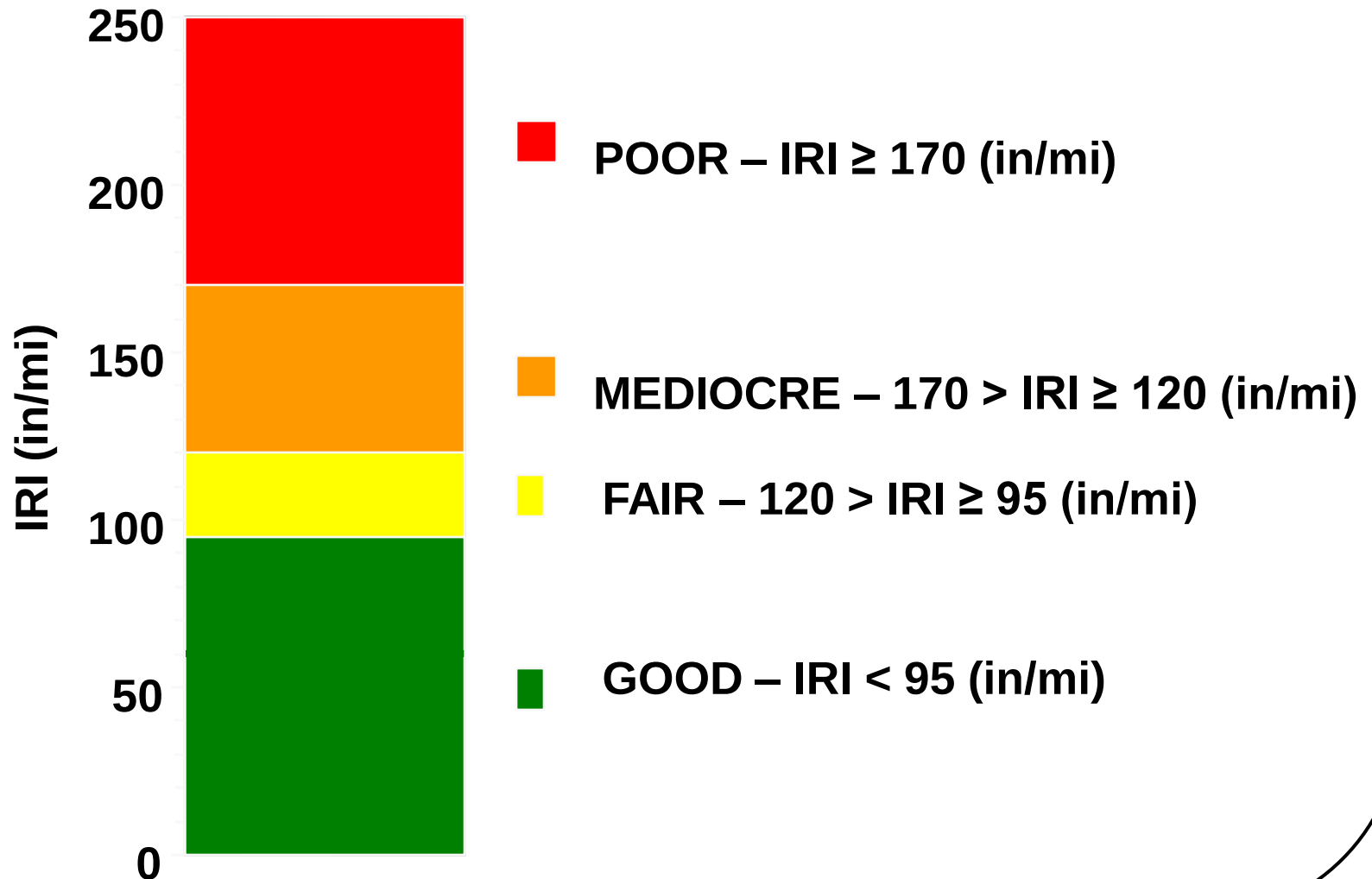
Monitoring: Measurements



Structural Performance

- Rutting
 - System-wide: $< 0.2''$ (5 mm)
- Fatigue ('bottom-up')
 - No major areas of cracking
- Cracking ('top-down')
 - Some evidence of top-down, longitudinal cracking (few isolated cases)
- Other
 - Longitudinal joint cracking (isolated areas)
 - Delamination of surface lift (one case)
 - Overheating of mix (one case)

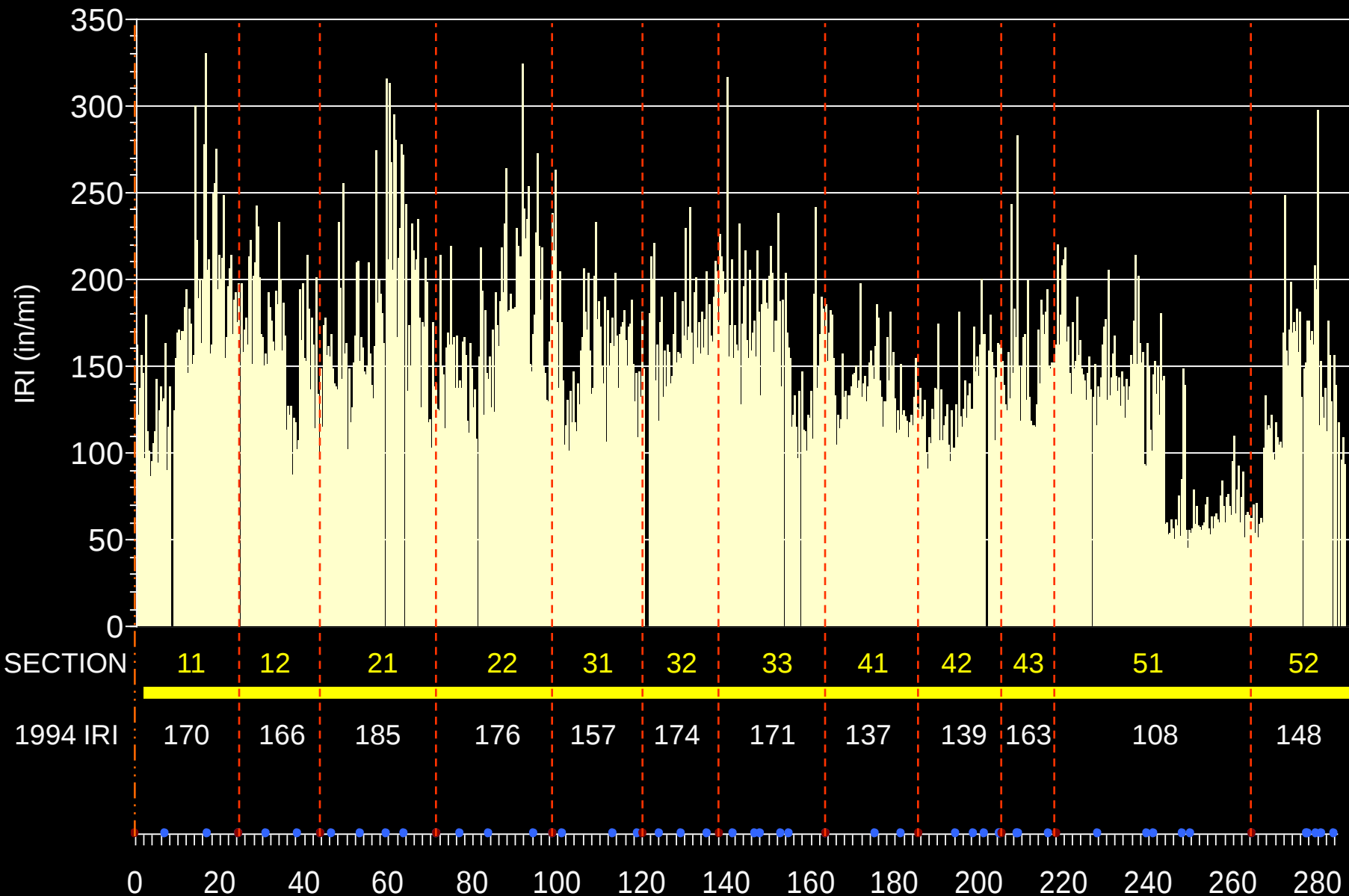
Ride: IRI Condition Scale



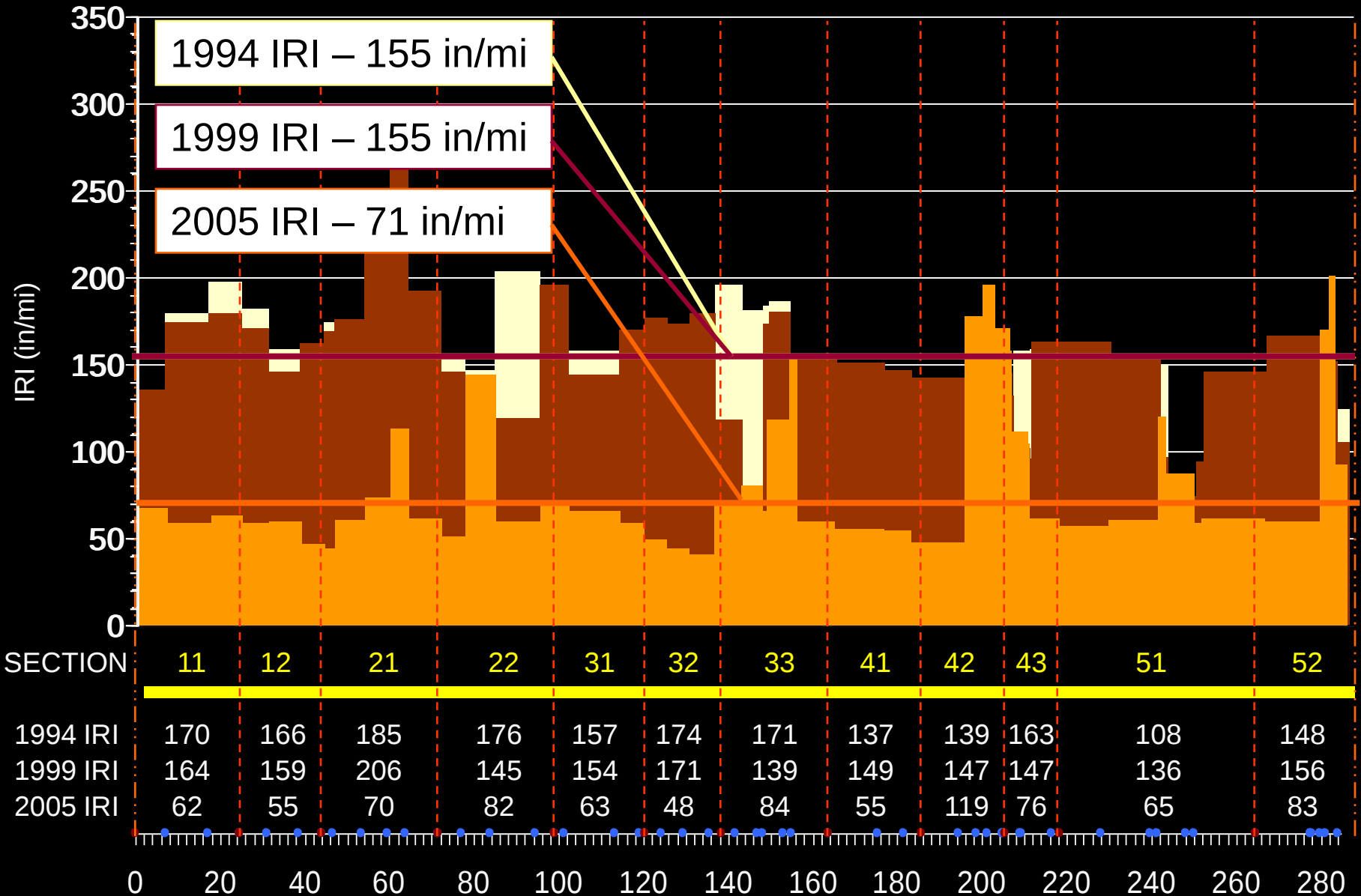
Oklahoma
State Line

Interstate 40 IRI

Tennessee
State Line

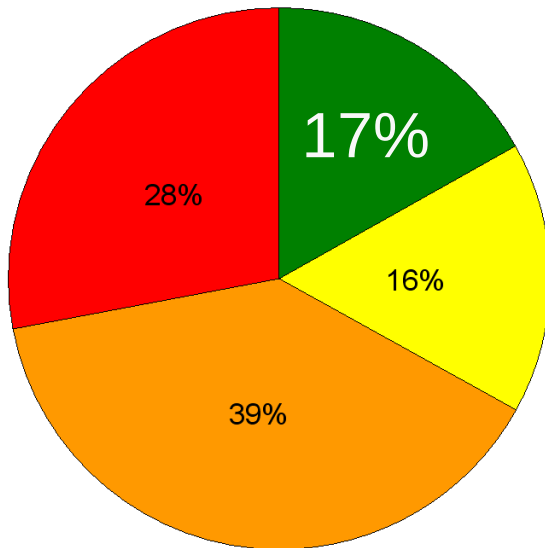


Interstate 40

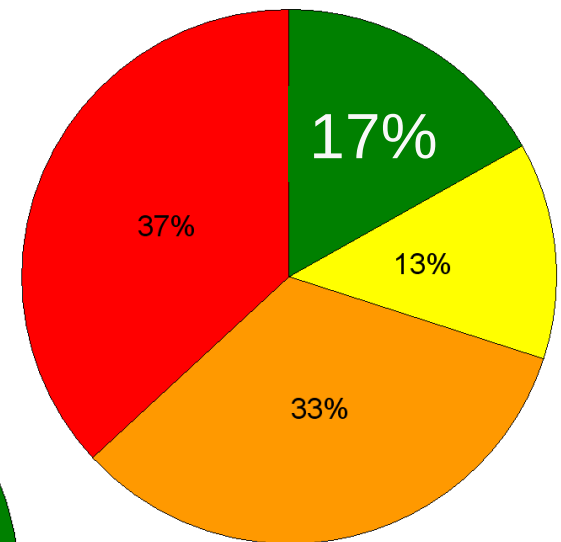


System Ride Improvement

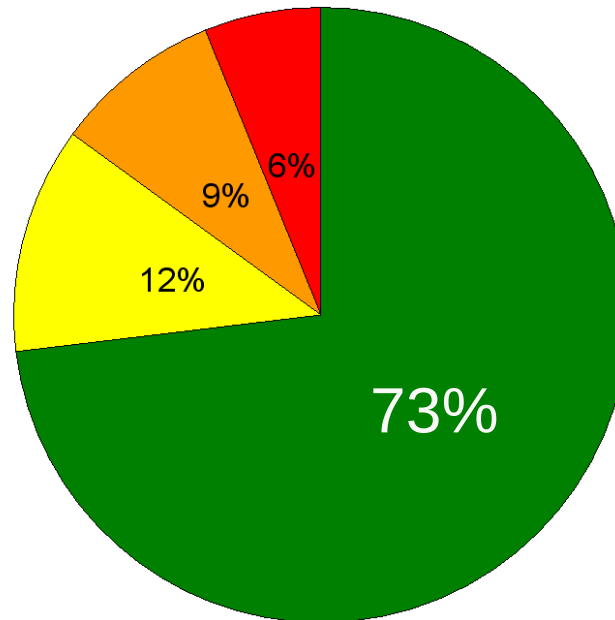
1994



1999



2006



Keys to Success

- Good Design
 - ‘inadvertent’ Perpetual Pavement (?)
 - very high-quality base (rubblized PCC)
 - Edge drain system
- Good Materials
 - PG 76-22 (polymer-modified) binder
 - Superpave mixture design system
 - Good aggregates
- Good Construction
 - QC/QA, Ride specification

Edge Drain System



Edge Drain Inspection



Edge Drain Maintenance



Thank



You.