



SHRP2 R07 Montgomery Workshop



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Research Administrator
November 5, 2015



St. Louis Arch

- **Inception and Early Funding (1933-1935)**
- **Design Competition (1945-1948)**
- **Construction Start: February 12, 1963**
- **Construction Completed: October 28, 1968**
- **Cost: \$13 million (\$180 million 2013 \$)**
- **Height: 630 feet**

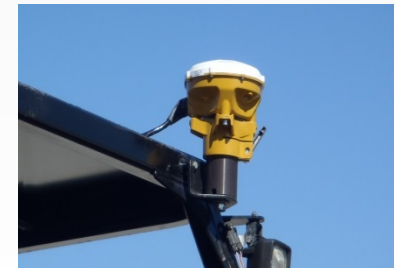


MoDOT participation in SHRP2 R07 Research



- **Project R07- Performance Specifications**
- **Developing Model specifications for Section 200 (Grading) of the MoDOT spec book**
- **Pilot project selected to incorporate into (R07) performance specifications research**

(Route 141, St. Louis County)





Equipment Used-Caterpillar





Equipment Used-Caterpillar



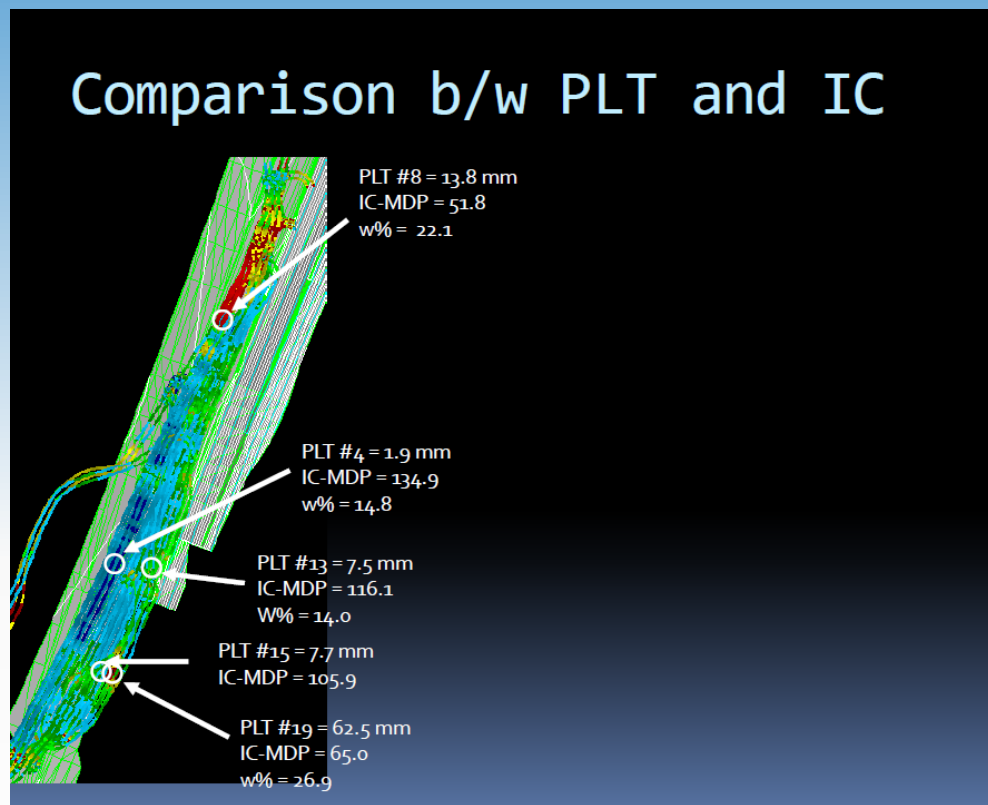


Test Trailer



IC Results from Route 141

Results from Pilot Testing



IC Workshop and Equipment Demo

- **Intelligent Compaction Data Management (ICDM) Workshop March 19, 2014**
 - Overall IC presentation
 - VEDA Intelligent Compaction Software training
- **Equipment Demonstration, March 20, 2014**
 - Caterpillar and Hamm Roller
 - Trimble Demonstration
 - 60 Attendees-Contractors,
Consultants and MoDOT Staff



IC Workshop and Equipment Demo



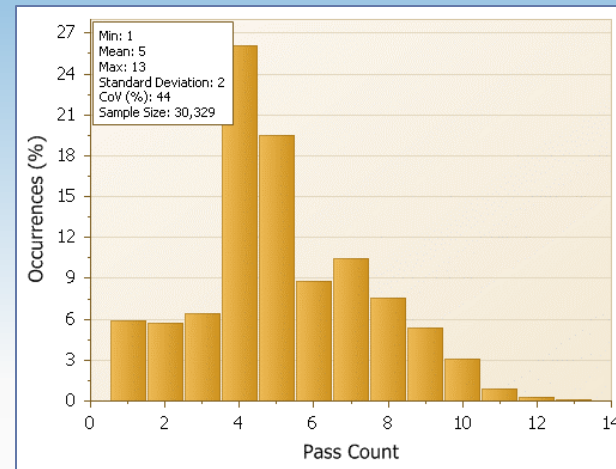
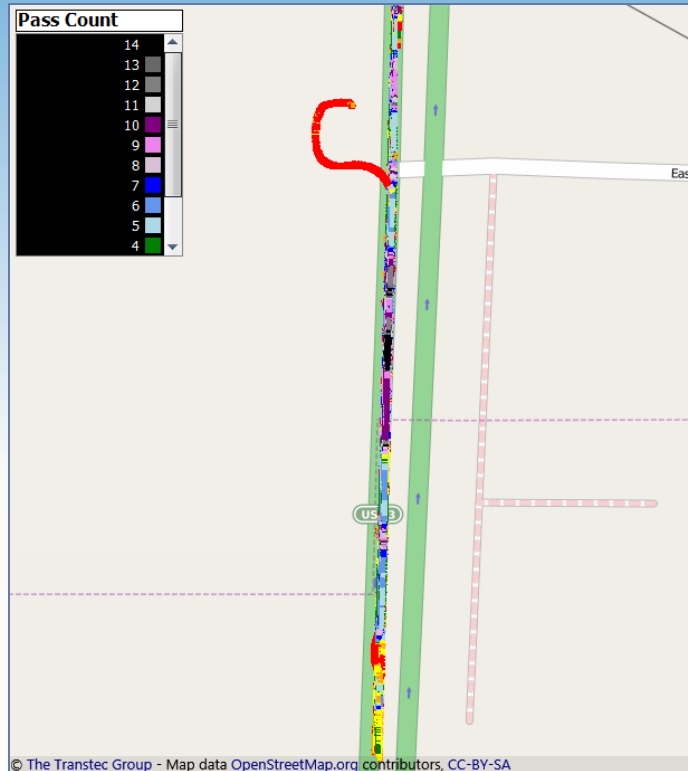
Proof of Concept IC project (4 day test)

- **Route 63 – Northbound and Southbound lanes**
- **Intelligent Compaction System / Rollers**
 - 2 Breakdown Rollers and Finish Roller w/IC
 - Finish Roller with Temperature Sensors
- **MOBA Infrared Technology at Paver**
 - On loan for one week
 - Collects real time thermal profile of 100% mat



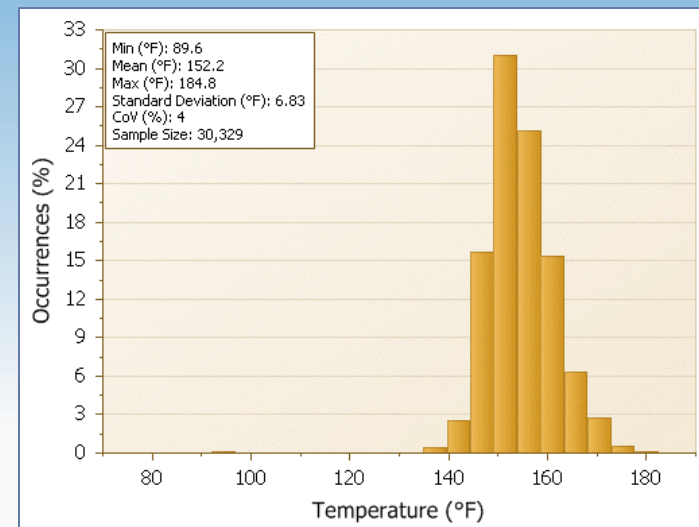
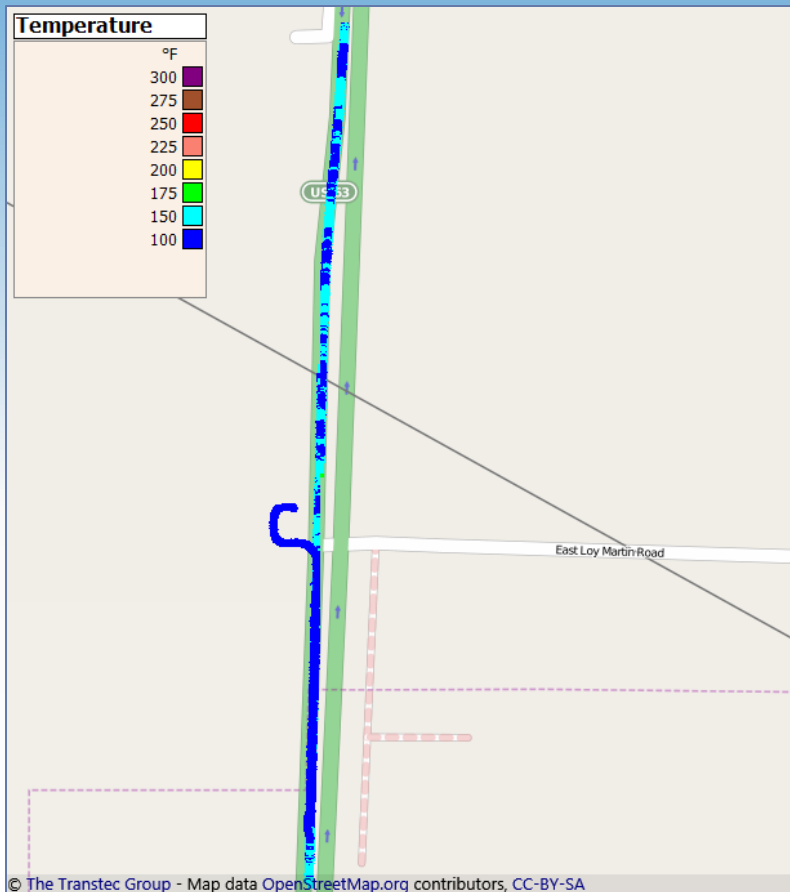
Proof of Concept IC project (4 day test)

Pass Count



Proof of Concept IC project (4 day test)

Temperature



Proof of Concept IC project (4 day test)

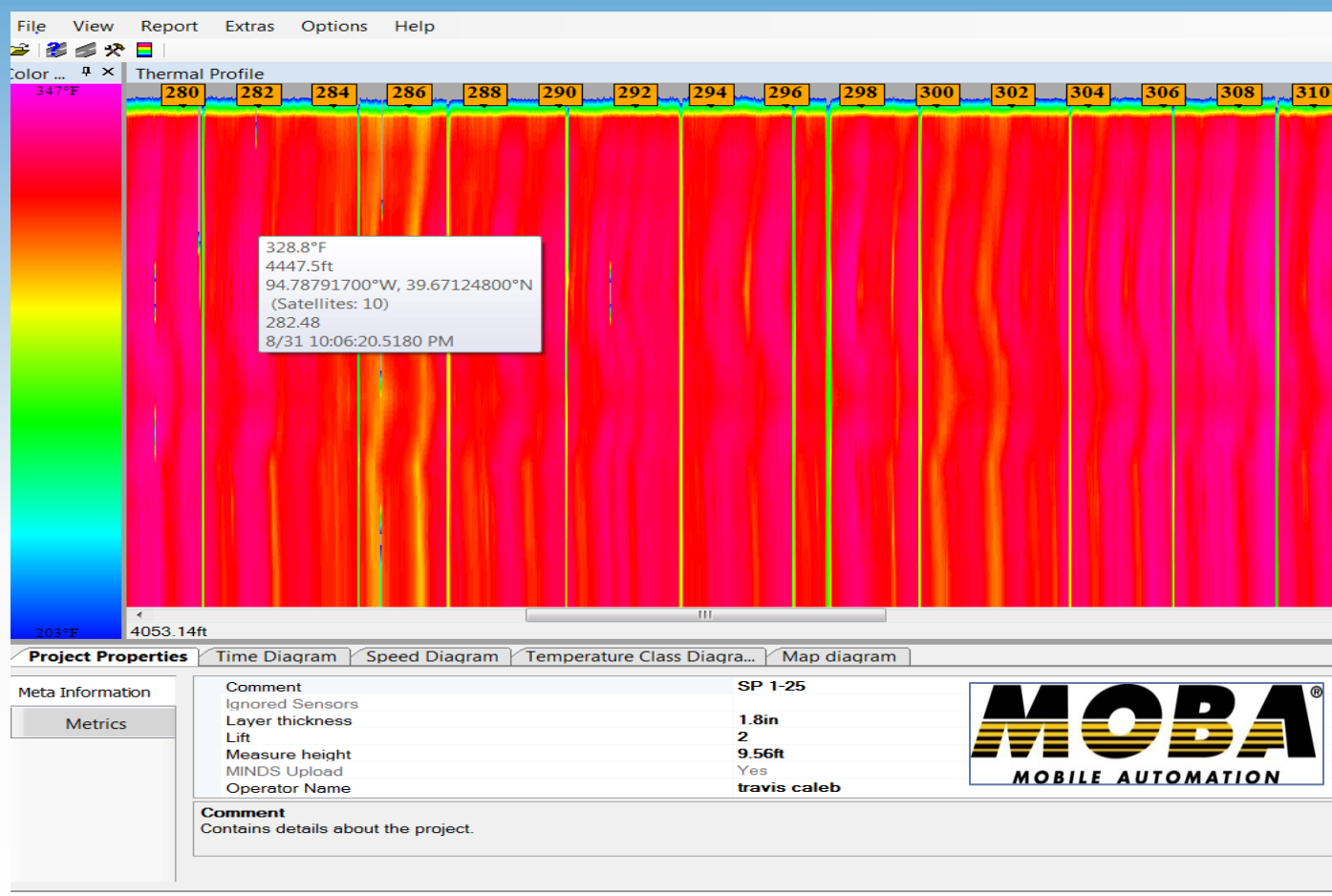
MOBA Pave-IR Equipment





Proof of Concept IC project (4 day test)

MOBA Pave-IR





R07 Proposal to develop Performance Specifications

- **IC Specifications Team Formed**
- **IC specification to include**
 - **Soil/Base compaction-Original**
 - **Asphalt compaction-Original**
 - **Asphalt mix design-New**
- **Solicit Consultant to develop specifications**
- **Develop Data Management process/protocols for Intelligent Compaction Data**
- **Identify future IC projects (10 targeted for January Letting)**
- **Further education on benefits/processes**

Performance Specification Request for Proposal (RFP)



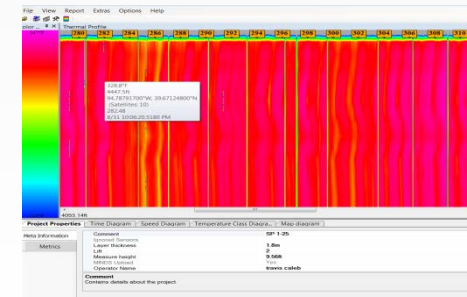
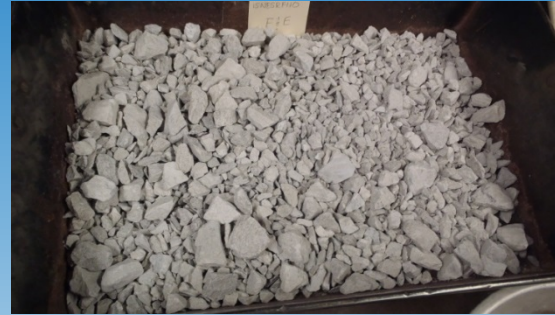
- **Objective to develop and implement performance specifications working with MoDOT Spec Team**
- **Utilize R07 SHRP2 products during development**
- **Review existing Intelligent Compaction Specifications for incorporation into MoDOT specs**
- **Provide on-site support for implementation of IC Performance Specifications**
- **Deliverables include Final Report and Training recommendations for MoDOT staff**

So Many Types of Cracking

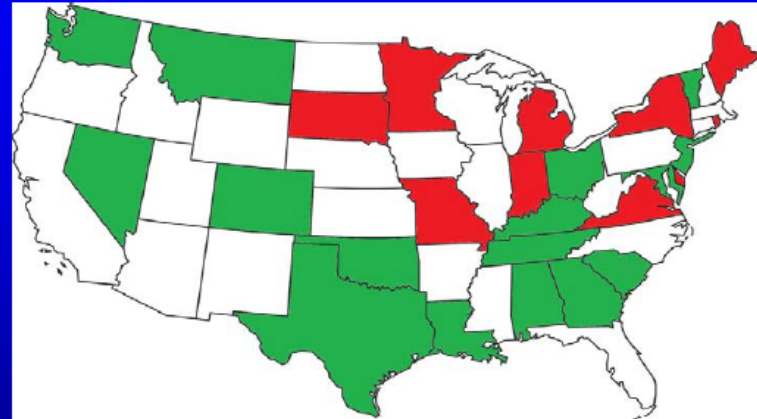
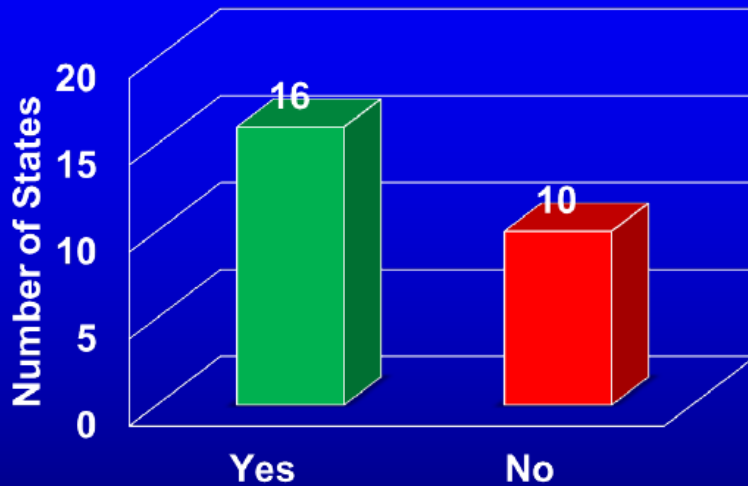
- 1. Fatigue Cracking
- 2. Block Cracking
- 3. Edge Cracking
- 4. Longitudinal Cracking
- 5. Reflective Cracking
- 6. Transverse Cracking



Many Factors Affecting Mixture Cracking Potential

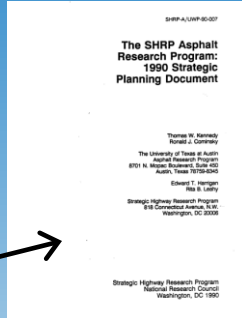


Who is using Mechanical Tests



Performance Test Needed

- Test the Final product
- Not a New Concept
- Dating Back to SHRP



The SHRP Asphalt Research Program: 1990 Strategic Planning Document

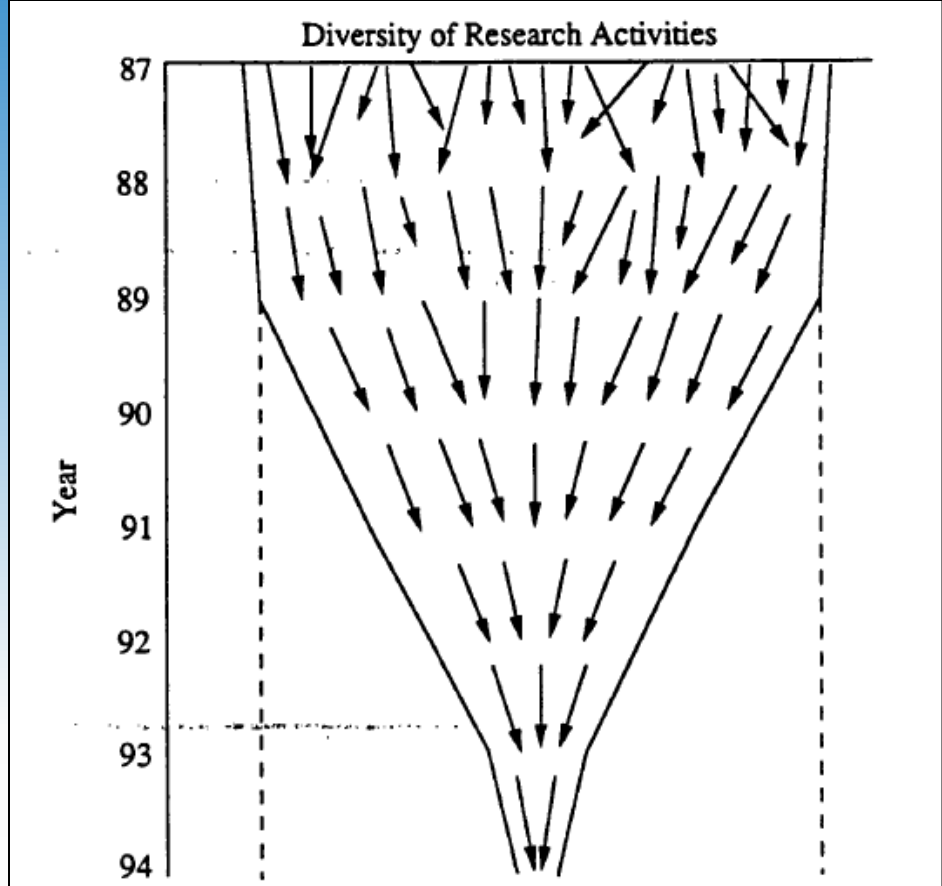
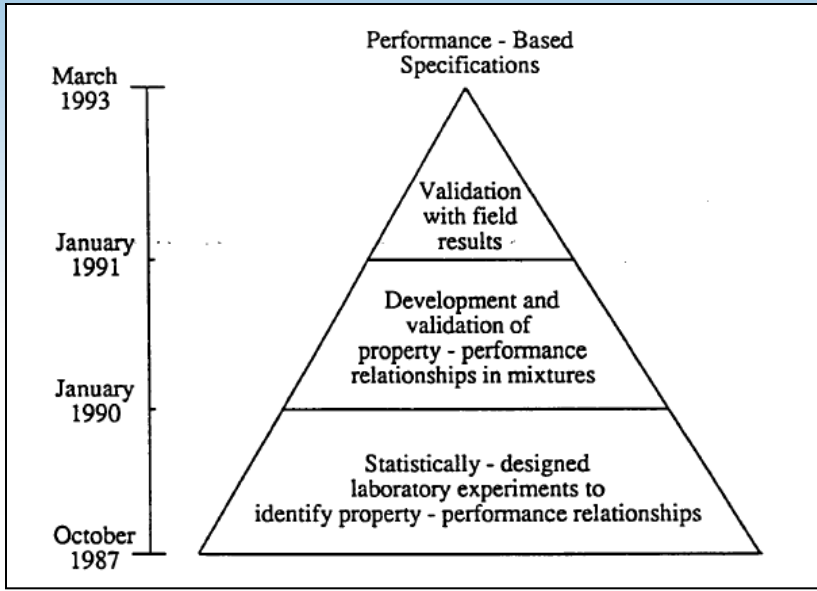


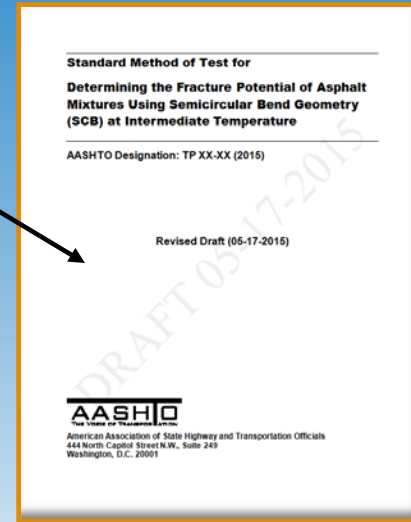
Figure 1.1 Focus of research activities.

Cracking Tests



AASHTO Semicircular Bend
Geometry (SCB) Report

- DCT
- SCB at Low Temperature
- IDT for Low Temp Cracking
- TSRST/UTSST
- Texas Overlay
- Bending Beam
- **SCB at Intermediate Temp (Louisiana)**
- IDT for Top Down Cracking
- S-VECD
- Repeated Direct Tension
- **SCB at Intermediate Temp (Louisiana)**



Most Crack Testing Requires Significant Specialized Equipment





State Emblems



State Bird: Bluebird



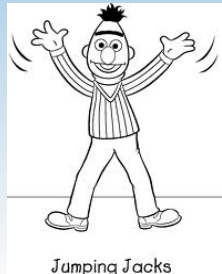
State Insect: Honey Bee



State Musical Instrument: Fiddle



State Dinosaur: Hypsibema Missouriensis Dinosaur



Official State exercise-Jumping Jacks



State Official Animal: Missouri Mule



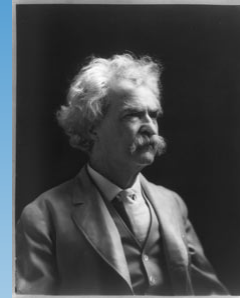
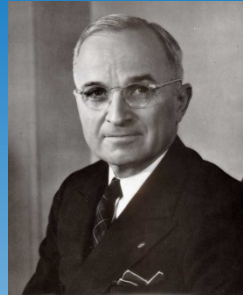
Official State Reptile: Three-toed box turtle



Official State Dessert: ice cream cone



Thank You!



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