



Promoting Innovation Through SHRP2's Pavement Solutions

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U.S. Department of Transportation
Federal Highway Administration

AMERICAN ASSOCIATION
OF STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

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SHRP2 – Alabama DOT Implementation Efforts



- ▶ ***Performance Specifications for Rapid Renewal (R07)*** – Lead Adopter
- ▶ ***Precast Concrete Pavement (R05)*** – Lead Adopter
- ▶ ***Technologies to Enhance Quality Control on Asphalt Pavements (R06C)*** – Lead Adopter
- ▶ ***Tools to Improve PCC Pavement Smoothness During Construction (R06E)*** – Lead Adopter
- ▶ ***Nondestructive Testing for Concrete Bridge Decks (R06A)*** – User Incentive
- ▶ ***Techniques to Fingerprint Construction Materials (R06B)*** – Proof of Concept

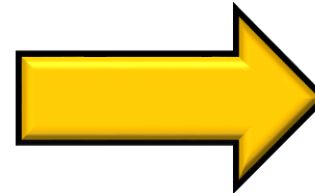
Why So Many Pavement Projects?

▶ Challenges to Alabama

▶ Why SHRP2?

- ▶ Enables us to introduce new proven technologies to DOT.
- ▶ Supported by research, financial, and technical assistance.
- ▶ Allows for flexibility in an era of changing cultures, retirements, and staffing reductions.
- ▶ Helps us solve problems!!

TOTAL ROAD MILES
10,850



BY SURFACE TYPE

BITUMINOUS
10,690

CONCRETE
144

UNPAVED
16

Precast Concrete Pavement (R05)

Challenge

- ▶ Traffic delays due to roadway repair and rehabilitation result in lost productivity, increased fuel use, driver irritation and safety issues.

Solution

- ▶ R05 **guidelines** and **model specifications** help agencies to select best uses of PCP and to design, fabricate, and install long-life PCP systems.



Benefits from Use of PCP



▶ **Maintenance of Traffic**

- ▶ Limited lane-closure times
- ▶ Work-zone safety
- ▶ Open to traffic immediately

▶ **Long-Life Pavement Performance**

- ▶ Off-site fabrication/quality assurance
- ▶ High-strength durable concrete

Types of PCP Applications



- ▶ Unbonded overlay of existing pavement
- ▶ Continuous lane replacement
- ▶ Full-depth joint replacement
- ▶ Complete slab replacement
- ▶ Inlay of existing asphalt
- ▶ Bridge approach panels
- ▶ Intersections
- ▶ Underpasses
- ▶ Ramps

Challenge: Rutting of Pavements on Ramp into Port of Mobile

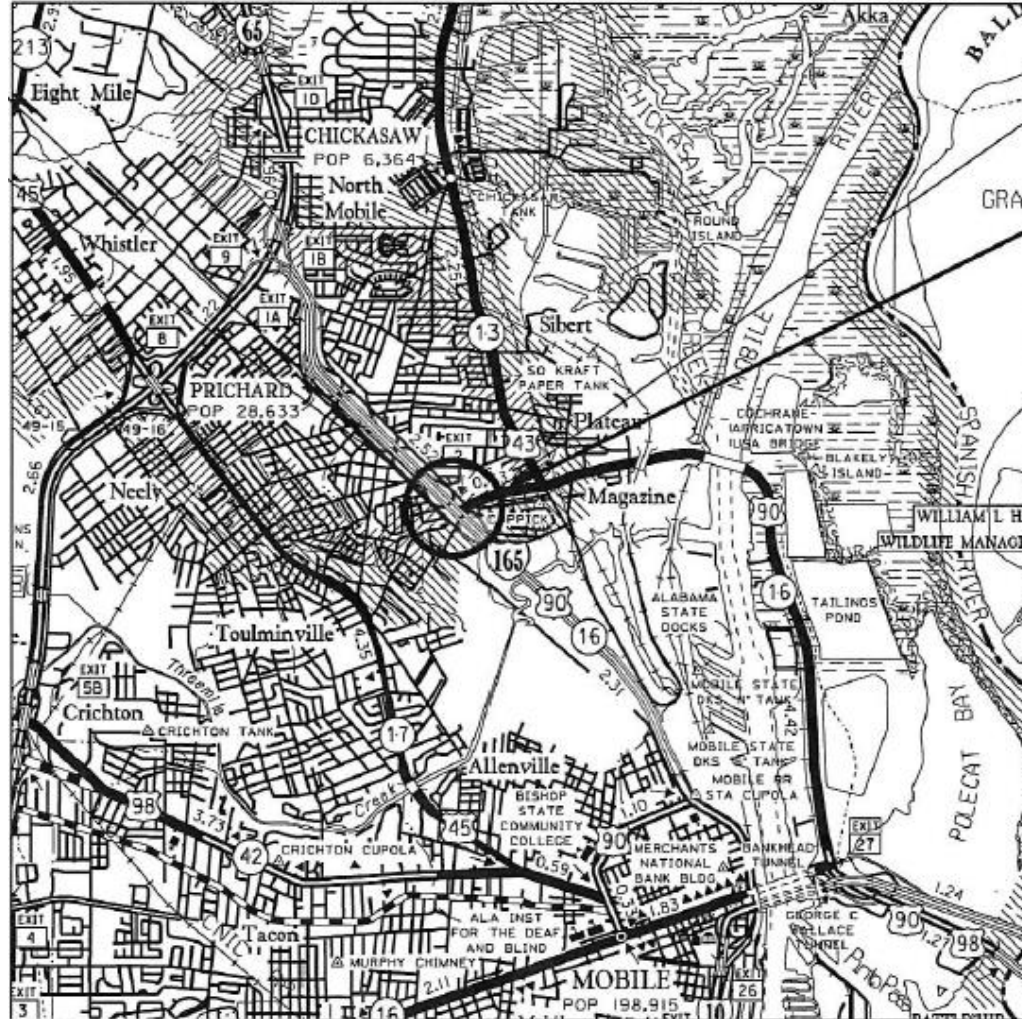
► Heavy Truck Traffic



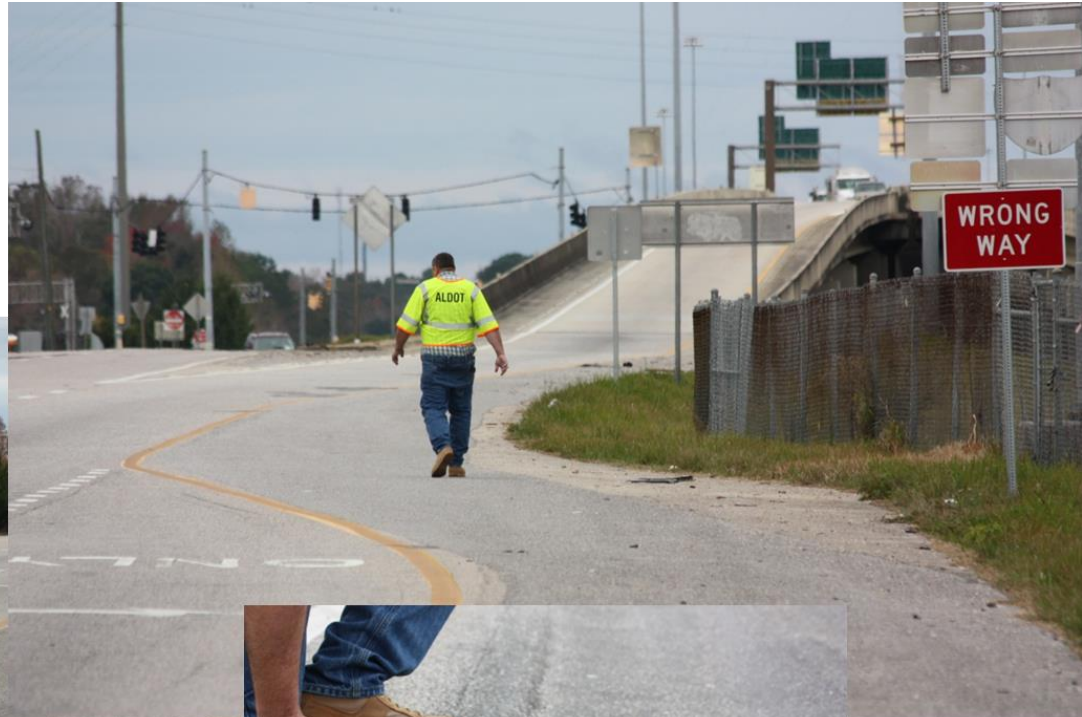
Exit 2 Ramp from I-165 to US 90

40	- -
78	3 - 4
346	4 - 5
544	5 - 6
716	6 - 7
603	7 - 8
438	8 - 9
359	9 - 10
384	10 - 11
423	11 - 12
	- PM -
402	12 - 1
422	1 - 2
401	2 - 3
585	3 - 4
743	4 - 5
753	5 - 6
325	6 - 7
181	7 - 8
123	8 - 9
128	9 - 10
72	10 - 11
41	11 - 12
8188	TOTALS :

Major Route into the State Docks

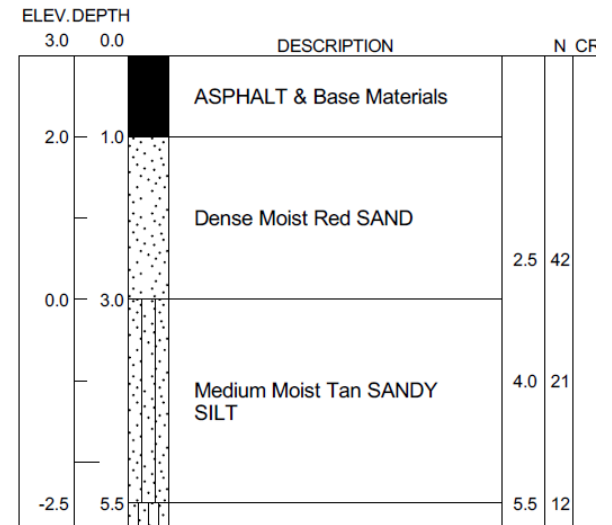


Asphalt Wasn't Working for Us



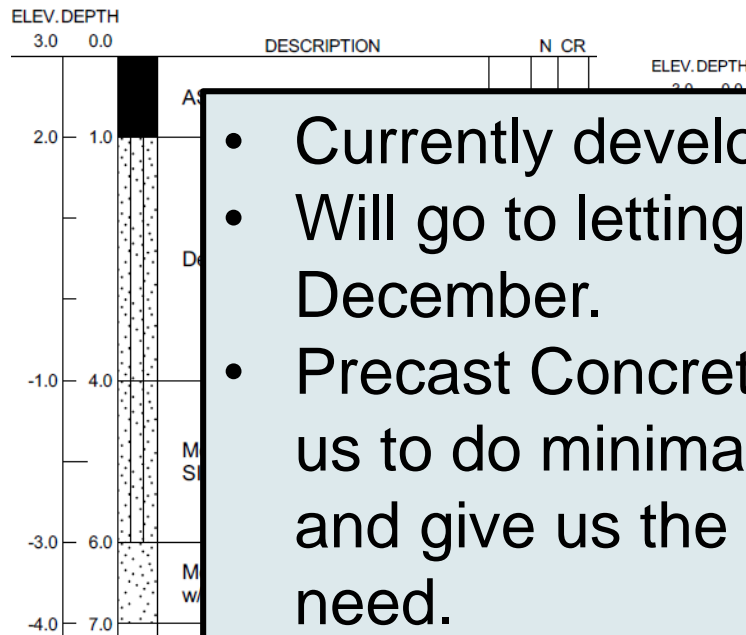


BORING # C-1
INTERSTATE-165



BORING # C-2
INTERSTATE-165

BORING # C-4
INTERSTATE-165



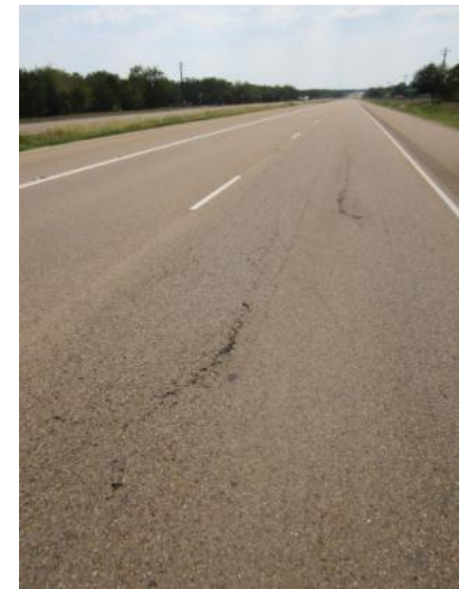
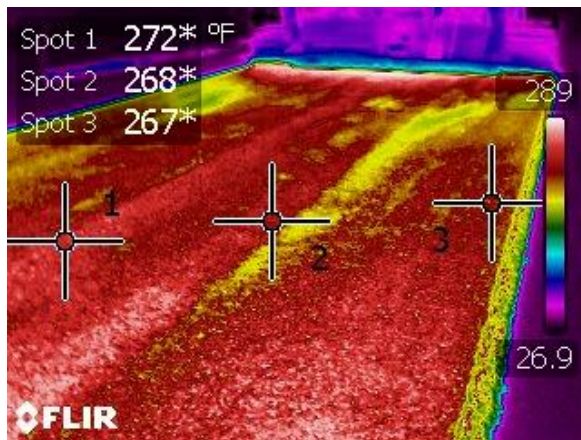
- Currently developing the specification.
- Will go to letting in November – December.
- Precast Concrete Pavements will allow us to do minimal night time closures and give us the long-term solution we need.

SHRP2 Opportunity - Advancing Three New Technologies Together

- ▶ Alabama DOT wants **new testing methods** to address uniformity of the mat during mix placement to get longer-term pavement performance and increase contractor productivity.
 - ▶ Lead Adopter for ***Using Technologies to Enhance Quality Control on Asphalt Pavements (Ro6C)***
- ▶ EDC's **intelligent compaction technology**
 - ▶ Identifies temperature segregation areas, zones or spots of lower stiffness, paver stops, quality of joints
 - ▶ Potentially preventing premature failure providing long term cost saving benefits.
- ▶ SHRP2 **performance-based specifications (R07)** will allow ALDOT to assess the entire roadway mat and provide real-time quality control for the contractor in asphalt laydown operations.

Technologies to Enhance Quality Control on Asphalt Pavements – R06C

- **Problem:** Thermal streaks can be very damaging, depending on the level of density achieved in localized areas. Can lead to longitudinal and centerline segregation, overall poor asphalt quality.
- **SHRP2 Solution:** Infrared Thermography – Scanners attached to pavers, enabling real-time readings while paving is occurring.



Who Else Is Using IR?

- **Alaska** – Included IR in specifications for two pilot projects this summer; using incentive/disincentives.
- **Missouri** – Letting a project this summer, again with incentives/disincentives.
- **Alabama** – Project just let to contract; work to begin soon.
- **Minnesota** and **Texas** – Using IR in all specs.
- **Michigan** – Went to the Missouri DOT showcase and the agency is now planning a workshop for its staff and industry folks.



Testing at Anchorage Airport Project

SHRP2's Performance Specifications for Rapid Renewal – R07

Performance Specifications

- ▶ Emphasize desired results
- ▶ Implementation guide;
- ▶ Numerous draft specs that can be modified to fit your contracting environment:
 - ▶ Asphalt pavement (DBB)
 - ▶ Asphalt pavement (DB)
 - ▶ Asphalt pavement (Warranty)
 - ▶ Concrete pavement (DBB)
 - ▶ Concrete pavement (DB)
 - ▶ Concrete pavement (Warranty)
- ▶ Precast concrete pavement
- ▶ Pavement (Design-Build-Operate-Maintain)
- ▶ Concrete bridge deck
- ▶ Vertical support elements
- ▶ Subsurface improvements for existing pavements
- ▶ Work zone traffic control
- ▶ Quality management



What was Alabama's Approach?

- ▶ Incorporate intelligent compaction through the use of performance-based specifications
- ▶ Our first project with IR is on **US 43 in North Alabama** using performance specs through R07
- ▶ Conduct **side-by-side testing**
- ▶ Develop a **performance-based specification** in the area of Intelligent Compaction.
- ▶ Hosted **peer exchange** in November 2015



Implementation Activities

- ▶ Add Alabama data to the **National Specifications Website** under 'Emerging Specifications'.
- ▶ Participate in **regional or national knowledge-sharing events** to promote Intelligent Compaction.
- ▶ Develop **field-testing protocol**.
- ▶ **Upgrade or purchase** testing equipment.
- ▶ Conduct **training/workshop** for Inspectors/Contractors.
- ▶ Conduct **post-construction assessment** of project and specifications.



Expected Value to Alabama DOT Using SHRP2

- ▶ Supply ALDOT with **new methods** to accurately and completely evaluate the roadway mat and placement practices of the contractor.
- ▶ **Encourage contractors** to apply greater control and ingenuity.
- ▶ **Improve** project quality.
- ▶ **Accelerate** construction.
- ▶ **Minimize costly** construction oversight.
- ▶ **Reduce claims and inspection.**



More Resources



- ▶ AASHTO R06C Product Page:
http://shrp2.transportation.org/Pages/R06C_RapidTechnologiestoEnhanceQualityControl.aspx
- ▶ AASHTO R07 Product Page:
http://shrp2.transportation.org/Pages/R07_PerformanceSpecificationsforRapidRenewal.aspx
- ▶ FHWA GoSHRP2 R05 Product Page:
https://www.fhwa.dot.gov/goshrp2/Solutions/Renewal/R05/Precast_Concrete_Pavement
- ▶ Pam Hutton, AASHTO SHRP2 Implementation Manager,
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Questions?

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