Performance Specifications for Rapid Renewal – Panel Discussion

Alabama’s Experiences

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Why So Many Pavement Projects?

- **Challenges to Alabama**

- **Why R07?**
  - 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

- **Bituminous**: 10,690
- **Concrete**: 144
- **Unpaved**: 16

*By Surface Type*
Aabama State Facts

- Camellia
- Johnstone Junonia
- State Flag
- Largemouth Bass
- Yellow Hammer
- Oakleaf Hydrangea
- Southern Pine
- Fighting Tarpon
- Eastern Tiger Swallowtail

Alabama Great Seal
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.
What is 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.
- Utilizing IC, IR, and IRI for **full Quality Control coverage** of the pavement surface.
Types of Construction Specifications

- Method Specifications
- End-Result Specifications
- Quality Assurance Specifications
- Performance-Related Specifications
- Performance-Based Specifications
Two Processes

PRS

SAME CONSTRUCTION SCHEDULE

PBS

DIFFERENT MEASURE OF PERFORMANCE
SPAN TWO POINTS WITH A...
Example

• Project
  – Span Two Points with Boards
  – Connect Boards Together
  – Place a Load in Middle of Boards

• Materials
  – Wood Boards
  – Epoxy
  – Load
Performance–Related Specifications

- **Materials Attributes**
  - Performance of the in-place product
    - Treated Wood versus Composite Wood
    - Wood Glue versus Wood Epoxy
  - Specify only product Quality Characteristics

- **Mathematical Models**
  - Based on product data
  - Distress prediction
  - Life-Cycle Cost (LCC)
    - As-Designed LLC
    - As-Constructed LCC

- **Price Adjustments**
  - Related to the expected LCC
Performance–Based Specifications

• **Desired Performance Level / Target to be Achieved**
  – Engineering properties that are predictors of performance
    • Creep between boards
    • Fatigue after specified loads or time

• **Performance Concern**
  – Final in-place product
  – Define in terms of Outputs instead of Inputs

• **Mathematical Models**
  – Quantify relationship between engineering properties measured and product performance
  – Acceptance limits established using statistically valid basis
  – Price adjustments based on the expected LCC of final product
Summary

- **PRS**
  - Use quantified Quality Characteristics and LCC relationships that are correlated to product performance
  - PRS are improved Quality Assurance Specifications

- **PBS**
  - Focuses on outcome rather than process
  - Complete PBS do not yet exist
  - Requires good Management System data to generate and validate models
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.**
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QUESTIONS?