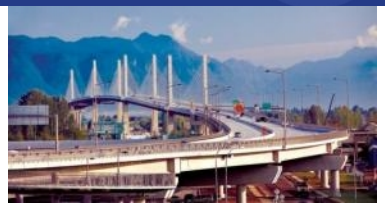




SHRP2 SOLUTIONS

STRATEGIC HIGHWAY RESEARCH PROGRAM

FHWA

SHRP2 Overview & National Perspective

Steve Cooper

SHRP2 Renewal Pavement Engineer

U.S. Department of Transportation

Federal Highway Administration

American Association of State Highway and Transportation Officials

AASHTO

The Voice of Transportation

TRB

Our Visit Today

SHRP2 Overview

National Perspective

SHRP2 at a Glance

Connecting next-generation professionals with innovations

SHRP2 Solutions Products

100

Solution Development

- Processes
- Software,
- Test procedures
- Specifications

Field Testing

Implemen-tation

64

- Projects
- Adopt into practice

SHRP2 Education Connection

275+

SHRP2 projects nationwide

Outcomes → Impacts

- Three CORE Benefits…

Save LIVES

Save MONEY

Save TIME

Four Focus Areas

Safety: fostering safer driving through analysis of driver, roadway, and vehicle factors in crashes, near crashes, and ordinary driving

Reliability: reducing congestion and creating more predictable travel times through better operations

Capacity: planning and designing a highway system that offers minimum disruption and meets the environmental and economic needs of the community

Renewal: rapid maintenance and repair of the deteriorating infrastructure using already-available resources, innovations, and technologies

Participating States

SHRP2 Solutions in the Field

Testing, demonstrating, and talking about SHRP2 Solutions across the country.

State DOTs, transportation agencies, and other advocates are testing, implementing, and talking about SHRP2 Solutions across the country. Learn about what is happening in your state or see what your neighbors are doing to help save lives, money, and time with SHRP2 Solutions.

ALASKA

Implementation Activities

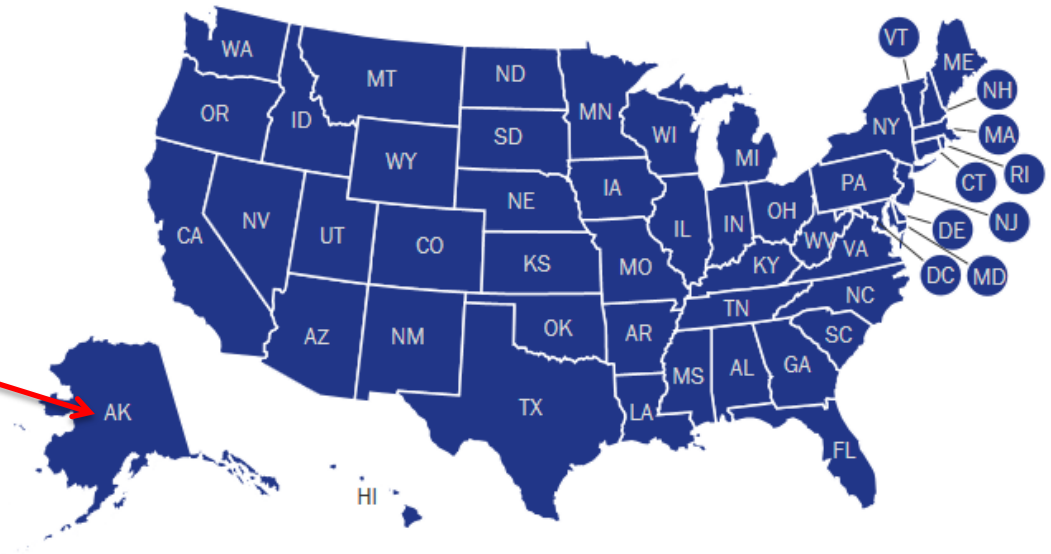
Technologies to Enhance Quality Control on Asphalt Pavements (R06C)

Activity: Implementation Assistance Program – The Alaska Department of Transportation and Public Facilities is planning to use IR to gain 100 percent test coverage of highway projects so that failure areas are detected and corrected early. Success will be defined as asphalt pavements that function well for 20 years.

Contact: Richard S. Giessel, richard.giessel@alaska.gov

Managing Risk in Rapid Renewal Projects (R09)

Activity: Implementation Assistance Program – The Alaska Department of Transportation and Public Facilities



http://www.fhwa.dot.gov/goshrp2/Solutions/SolutionsInTheField

2013 Round 1… rundown

6 Round

5 Round

4 Round

3 Round

2 Round

1 Round

Round 1 at a Glance

- 34 States and the District of Columbia selected
- 6 SHRP2 Solutions at work on 108 different transportation projects
- 2 proof of concept pilots
- 74 lead adopter incentives
- 24 user incentives
- Limited technical assistance to 8 States
- The Round 1 application period opened on February 20 and closed on March 22, 2013

Managing Risk in Rapid Renewal Projects (R09)

View Recipients

Project Management Strategies for Complex Projects (R10)

View Recipients

Organizing for Reliability Tools (L06/L01/L31/L34)

View Recipients

Implementing Eco-Logical (C06)

View Recipients

Innovative Bridge Designs for Rapid Renewal (R04)

View Recipients

Guidelines for the Preservation of High-Traffic-Volume Roadways (R26)

View Recipients

2014 Round 4… rundown

6 Round

5 Round

4 Round

3 Round

2 Round

1 Round

Technologies to Enhance Quality Control on Asphalt Pavements (R06C)
View Recipients

Tools to Improve PCC Pavement Smoothness During Construction (R06E)
View Recipients

Nondestructive Testing for Tunnel Linings (R06G)
View Recipients

Managing Risk in Rapid Renewal Projects (R09)
View Recipients

Project Management Strategies for Complex Projects (R10)
View Recipients

New Composite Pavement Systems (R21)
View Recipients

Economic Analysis Tools (C03/C11)
View Recipients

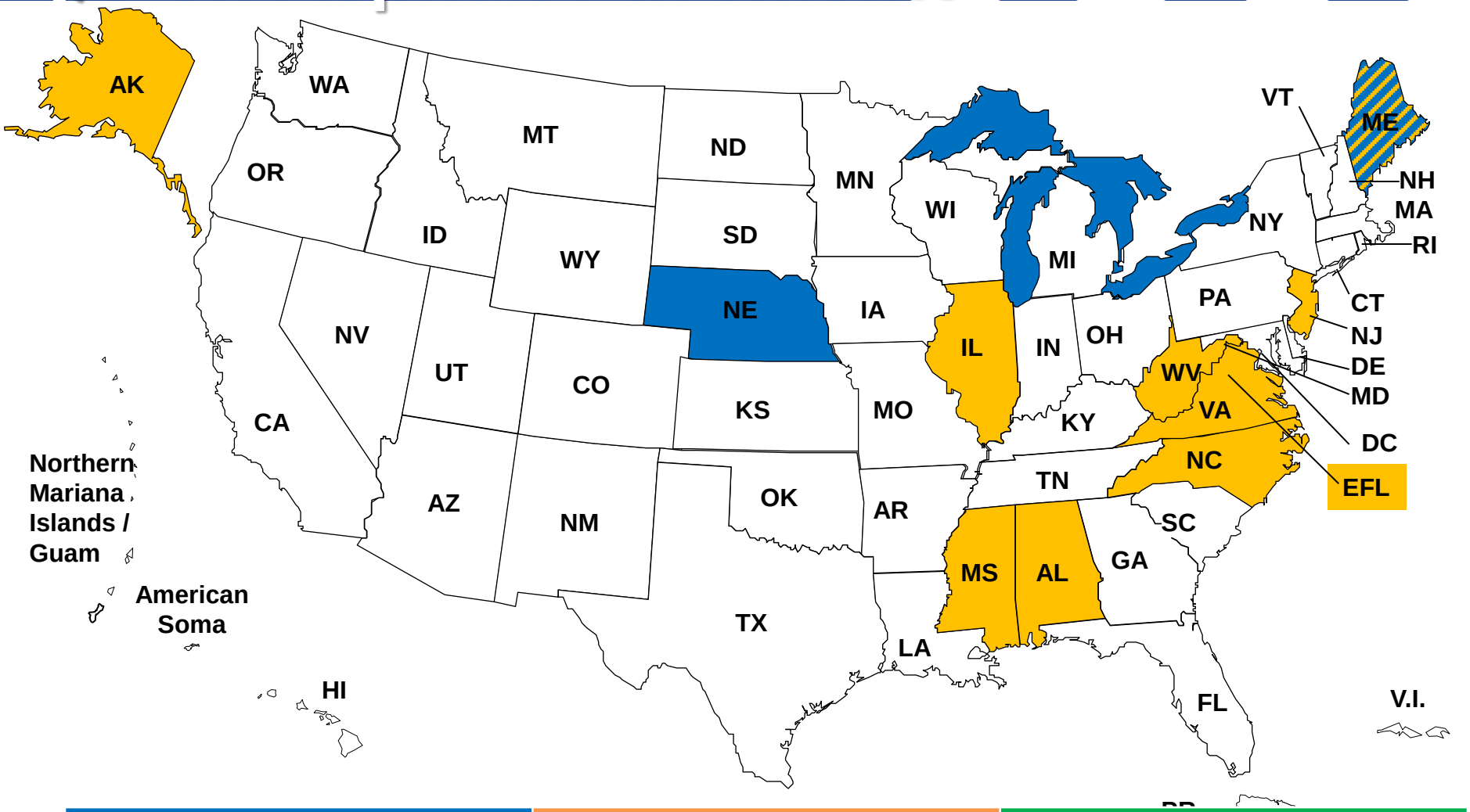
Advanced Travel Analysis Tools for Integrated Travel Demand Modeling (C10/C04/C05/C16)
View Recipients

Reliability Data and Analysis Tools (L02/L05/L07/L08/C11)
View Recipients

Nondestructive Testing for Concrete Bridge Decks (R06A)
View Recipients

Service Life Design for Bridges (R19A)
View Recipients

R06C GPR & IR Technologies to Enhance QC on Asphalt Pavements



Proof of Concept Pilot (2) $100k/ea. (GPR) + In kind	Lead Adopter Incentive (10) $40.5k/ea. (IR) or In kind	User Incentive

R06C Technologies to Enhance QC on Asphalt Pavements

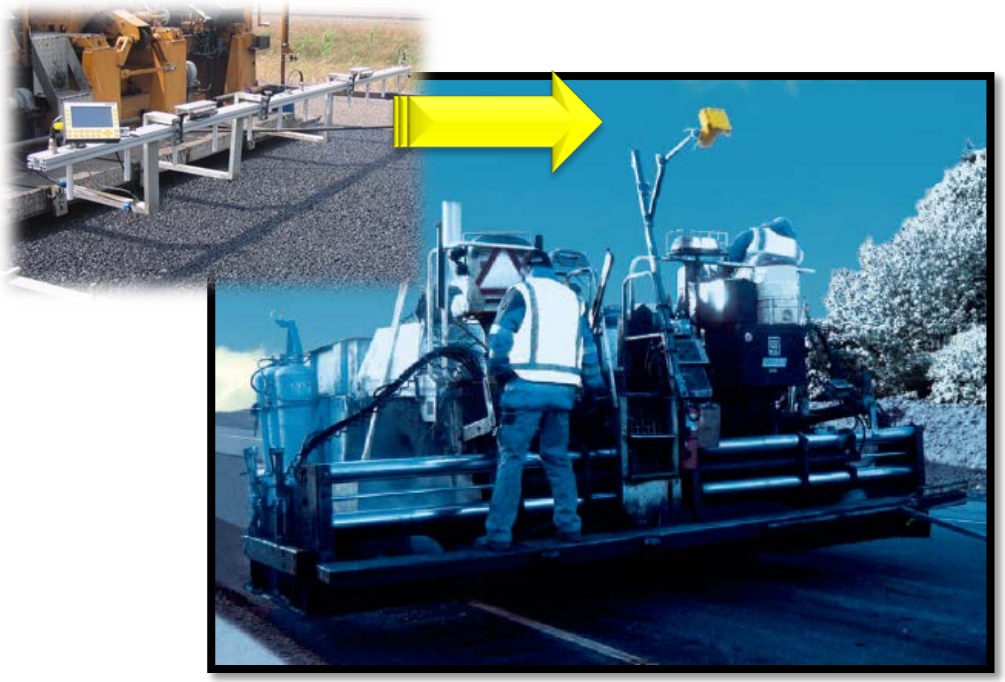
THE CHALLENGE: Develop solutions to measure and quantify non-uniformity of asphalt mixture construction

Localized non-uniform areas fail prematurely. Random testing seldom catches problem

Increased use of night paving makes inspection more difficult

SHRP2 Solutions

Thermal Profile during Placement: Pave-IR



Cold spots generally become low density

Density uniformity after Compaction: Rolling Density Meter

Measures density at 6 in. intervals non-destructively

Rolling Density Meter "Proof of Concept"

- Real-time measurement of surface dielectric of asphalt mixture using GPR
- Operator establishes correlation of dielectric with mat density from field cores
- Once established automated output of final mat density (air voids)
- 6 in. reporting interval yields substantially increased testing coverage
- With multiple passes can test nearly 100% of constructed area
- Tests final product that agency is buying

SHRP2 Evaluation

- ALL products will contain a summary of *output* actions
- ALL products will be evaluated for *outcome* i.e. near-term success
- Specific products have been selected for longer-term *impacts*
- Renewal Products Targeted for *impact* evaluation:

R06C IR: Outcomes → Impacts

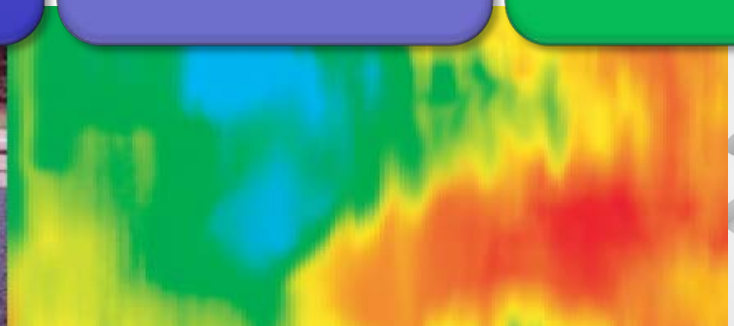
Evaluating uniformity of the pavement in real time with greater ease minimizes the need for future pavement corrective actions, thus reducing driver exposure to future roadway and work zone hazards.

More inspection coverage helps avoid noncompliance penalties. Better quality control leads to more durable, longer-lasting pavement for owners…

Real-time testing results in time savings during construction operations. Increased testing coverage area lessens the need for corrective action due to low-density asphalt pavements.

Resource Responsible – achieved through long-life pavement systems.

Impact: 10+? States/Agencies routine use by 2017



SHRP2 Opportunities?

- SHRP2 Round 7 IAP:
  - ✓ Application Period: April 1 - 29, 2016
  - ✓ Announcements on June 10, 2016
  - ✓ Webinar in Feb/Mar 20-16
- Anticipate Products?

Round 7 Products

CAPACITY

PlanWorks (C01)

Systematic web-based resource that supports collaborative decision making to deliver projects that meet environmental, community, and mobility needs.

RENEWAL

Utility Bundle (R01A/R01B/R15B)

Products to identify, record, and retrieve utility locations throughout the design process to aid in reducing costly relocations.

Railroad-DOT Mitigation Strategies (R16)

Model agreements to improve coordination between transportation agencies and railroads.

Techniques to Fingerprint Construction Materials (R06B)

Procedures and equipment to identify various construction materials in the laboratory and with portable devices.

Advanced Methods to Identify Pavement Delamination (R06D)

Tools to detect subsurface delamination in asphalt pavements.

Guidelines for the Preservation of High-Traffic-Volume Roadways (R26)

Your guide to selecting the most-affordable options for extending pavement life.

Nondestructive Testing for Concrete Bridge Decks (R06A)

Recommended technologies to detect deterioration of concrete bridge decks.

Nondestructive Testing for Tunnel Linings (R06G)

Nondestructive testing technologies to pinpoint defects in or behind tunnel linings.

Service Life Design for Bridges (R19A)

Guidance, training, and technical assistance promoting service life design concepts and methods.

Service Limit State Design for Bridges (R19B)

Tool kit to perform state or site-specific calibrations for service limit state design for bridges.

RELIABILITY

Reliability Data and Analysis Tools bundle (L02/L05/L07/L08/C11)

Tools to help transportation planners and engineers improve monitoring and analysis of data to achieve more consistent, predictable highway travel.

Reliability in Simulation and Planning Models (L04)

Guidelines for incorporating reliability performance measures into travel models.

Regional Operations Forum (L36)

Regional training program to advance transportation systems management and operations.

9 Renewal Products being offered!!

For More Information

Pavement Contact:

Steve Cooper
SHRP2 Pavement Engineer

Visit: www.fhwa.dot.gov/GoSHRP2

Sign up: www.fhwa.dot.gov/goshrp2/contact

Email: GoSHRP2@dot.gov

Our Visit Today

SHRP2 Overview

National Perspective

Title 23 Code of Federal Regulations – CFR – Subchapter G – Engineering and Traffic Operations

Part 626.3 Policy.

"Pavement shall be designed to accommodate current and predicted traffic needs in a safe, **durable**, and cost effective manner."

Asphalt Pavement Compaction

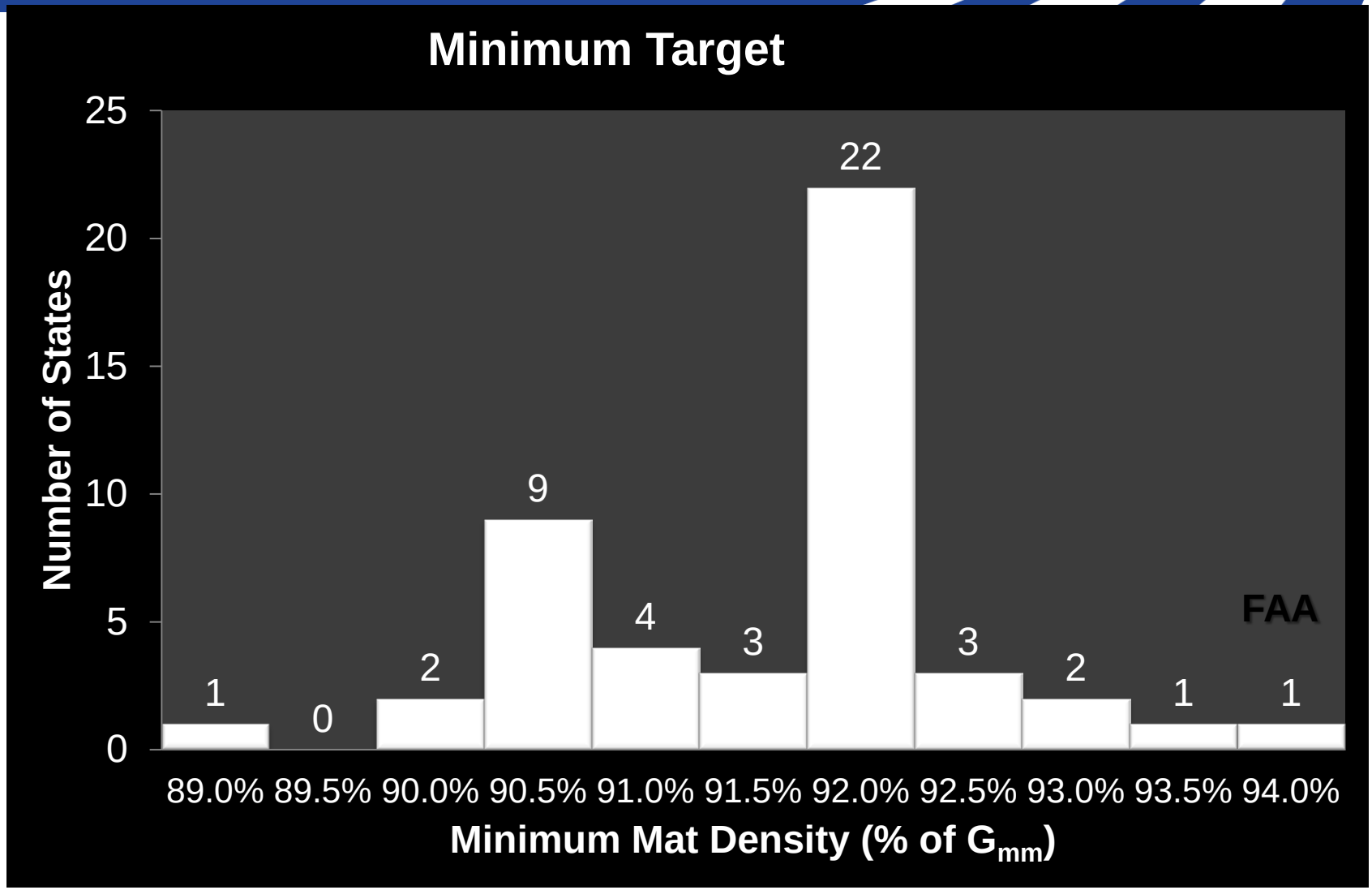
Typical Asphalt Pavement Density requirements are based on ***what was achievable yesterday***.

Today we have made ***significant advancements*** in material and construction technology and techniques.

Today we are also ***placing more and more resource responsible materials***, containing higher levels of recycled, reclaimed, and reuse (RRR) products.

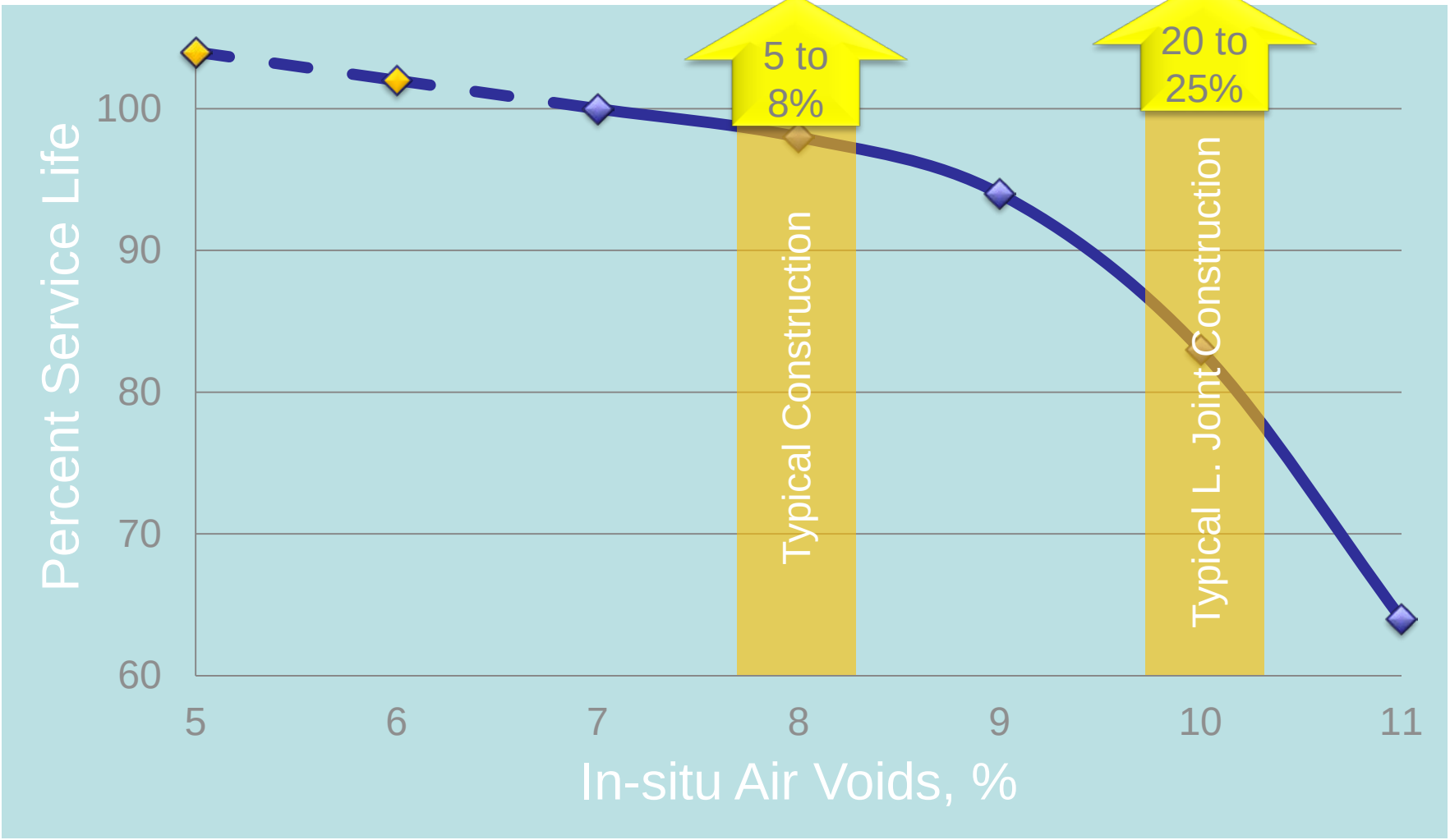
Challenge: Can we leverage today's technology and techniques to ***raise-the-bar on in-place density*** to improve durability and extend pavement service-life?

2003 AASHTO SOM Survey

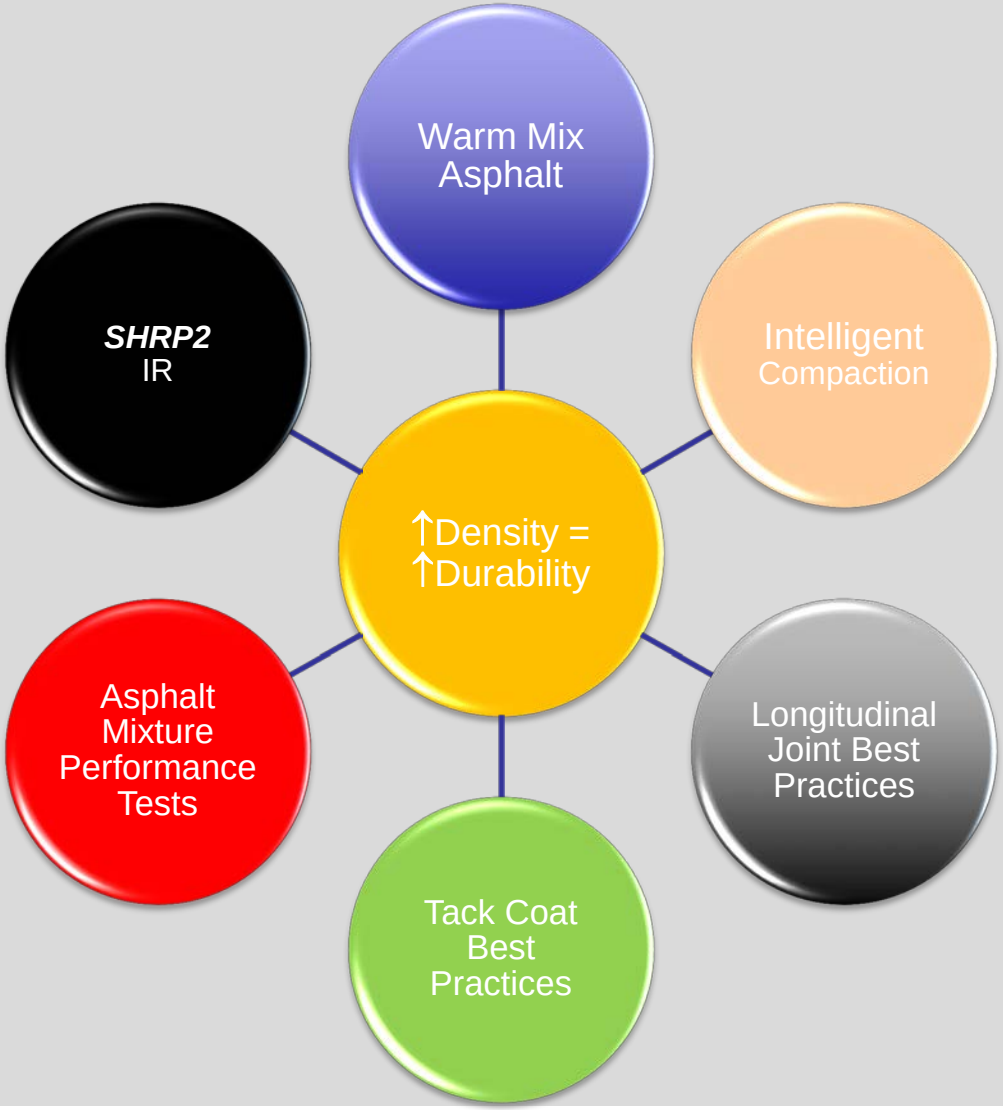


Effect of In-Place Voids on Life

Washington State DOT Study



Let's Bring it ALL together…
↑ Density = ↑ Durability



Asphalt Pavement Technology Initiative – Improved Durability through Increased Field Compaction

- A 2% increase in field compaction will increase asphalt pavement service-life from 5 to 25%!
- Today's compaction target is 92% of maximum (G_{mm}) or 8% air voids), with varying requirements for the area near the longitudinal joint
- **Increased Density Pavements** target across the entire pavement!
  - Just 2% more… makes a huge difference!
- **FHWA working to advance initiative** (more to follow)

Summary

- AASHTO & FHWA ranked R06C the highest of solutions for advancement as part of the SHRP2 IAP.
- One of FHWA's next national initiatives with Asphalt Pavement is looking at improving durability through increased field compaction.
- Technologies and practices that aid in achieving this initiative are encouraged.