Enhanced Durability Through Increased Density

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SEPTEMBER 21, 2017
Ultimately, achieving increased in-place asphalt pavement density that results in the highest asphalt pavement performance.
Enhanced Durability of Asphalt Pavements through Increased In-Place Pavement Density

- Demonstration projects (10)
  - Mobile Asphalt Testing Trailer (2)
Enhanced Durability of Asphalt Pavements through Increased In-Place Pavement Density

Workshop Only (18)

Demonstration projects (10)

Mobile Asphalt Testing Trailer (2)
Next Steps

• Field experiment – Phase 1
  – 10 states selected
  – Projects completed in 2016
• Extend field experiment – Phase 2
  – 9 states selected
  – Projects under construction in 2017 and early 2018
• FHWA’s best practices communication
  – Summary document
  – Tech Brief
  – Additional workshops
    • Funding dependent
Enhanced Durability of Asphalt Pavements through Increased In-Place Pavement Density

Workshop Only (18)
Demonstration projects (10)
Mobile Asphalt Testing Trailer (2)
Ph. 2 Demonstration (9)
Summary Document

NCAT Report 17-05

“Demonstration Project for Enhanced Durability of Asphalt Pavements through Increased In-place Pavement Density”

July 2017

http://eng.auburn.edu/research/centers/ncat/files/technical-reports/rep17-05.pdf
Can We Achieve Increased In-place Density?

Yes!

Test sections had increased % TMD:
• 8 of 10 states achieved > 1.0% increase
• 7 of 10 states achieved > 94.0% $G_{mm}$
• 6 of 10 states achieved > 95.0% $G_{mm}$

Will there be changes?
• 7 of 10 states are changing specifications
How Do We Achieve Increased In-place Density?

Best practices cannot be mentioned enough

- Compactive Effort
  - Wide differences from state to state
    - Number of rollers
    - Types of rollers
    - Number of passes
- Consistency
- Temperature
How Do We Achieve Increased In-place Density?

Measuring density (1)
Reference density (1)
Density of pavement to meet requirements (4)
  – Some at 90 to 91% $G_{mm}$
  – Others at 94% $G_{mm}$
Type of specification (2)
  – 22 states use minimum lot average
  – 25 states use PWL
    • Impacts contractors’ target and consistency
Consistency (2)
  – Standard deviations <1.00 were achievable

(#) – States making changes or in the process
How Do We Achieve Increased In-place Density?

Incentives (3)
- 37 states have incentives: range from 1 to 10%
- Average 2.9%

Mixture design changes (5)
- Many states changing Superpave to get more asphalt
- Must also look at density specification

New technologies (2)
- Did not help improve density, but were a good troubleshooting tool

(—for States making changes or in the process)
States Ask: Should we look at our density specification?

Option 1: Case-by-case basis
• Contact me for additional discussion to find out if your SHA’s density could be improved.

Option 2: Put a number out there?
• Average densities on a project are ??? (< 91 or 92% $G_{mm}$)
  • Definite benefits
• Average densities on a project are ??? (< 92 or 93% $G_{mm}$)
  • Time spent wisely