



# DENSITY DEMONSTRATION PROJECTS: STRATEGIES FOR IMPROVING ASPHALT PAVEMENT DENSITY

## RECOGNIZING THE IMPORTANCE OF IN-PLACE DENSITY

Knowing that in-place density is key for building cost-effective and durable asphalt pavements, the Federal Highway Administration (FHWA) initiated the “Enhanced Durability of Asphalt Pavements through Increased In-place Pavement Density” demonstration project.

## OBJECTIVE

The aim was to support State Departments of Transportation (DOTs) with evaluation of their existing density requirements for acceptance. It was anticipated that the results may aid State DOTs in reviewing and updating, as needed, their current field density acceptance criteria.

## OUTCOMES: CONSIDERATIONS FOR ENHANCED IN-PLACE DENSITY

- **TESTING FREQUENCY** - Conduct density testing every 250 to 500 tons of asphalt produced.
- **THICKNESS** - Use a minimum thickness to nominal maximum aggregate size (NMAS) ratio of 3.0 when in-place density is evaluated.
- **CORE SAMPLING** - Use cores for measuring in-place density.
- **Gmm VALUES** - Use theoretical maximum specific gravity (Gmm) values from plant-produced material obtained at least once per day or once per subplot as the basis to calculate percent density.
- **NUMBER OF SUBLOTS** - Use a minimum of seven sublots per lot to balance buyer and seller risk.

## • QUALITY MEASURE AND PAY FACTORS

- Use percent within limits (PWL) or average lot value with a minimum individual subplot value.
- Determine density pay factors using PWL with a lower limit of 92.0% and an upper limit of 97.0% or greater. For lot average, use a lower limit of 93.0%.

## • INCENTIVES

- Offer incentives with a maximum incentive at or above 94.0% of Gmm for PWL or 95.0% of Gmm for lot average.
- Implement a longitudinal joint density requirement with a lower limit of greater than 90.0% of Gmm for an incentive.



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View cooperative agreement materials:  
**<https://www.fhwa.dot.gov/pavement/asphalt/coopmaterials/>**



## VIEW TECHNICAL BRIEF:

**<https://www.fhwa.dot.gov/pavement/asphalt/pubs/hif21020.pdf>**

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