

# Measuring Pavement Thickness the Efficient Way

## Findings from the FHWA Mobile Concrete Trailer (MCT)

Agencies include concrete pavement thickness in their acceptance program because of its significant impact on service life. Findings from FHWA's Mobile Concrete Trailer (MCT) field visits across the country indicate that the majority of state agencies specify taking cores for thickness from newly built concrete pavements. Taking cores for pavement thickness is a widely accepted and recognized practice; however, there are certain disadvantages to this approach:

- 1) Labor intensive (coring, inspecting, transporting, measuring core thickness, filling the core hole)
- 2) Expensive (time and effort involved; labor, drill rig, core bits, replacement concrete for core holes etc.)
- 3) Not real-time (coring is not performed until several days to weeks after paving)
- 4) Time consuming (at least 15 minutes to core per location)
- 5) Destructive (only limited number of cores can be taken)

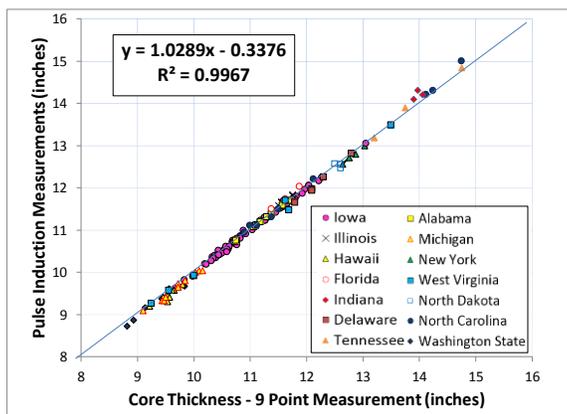


Metal 'Target' (2.5" to 12.5" dia) MIT Scan T2

## Using Pulse Induction Technology to Measure Pavement Thickness

**Technology:** The MIT Scan T2 Pulse Induction device requires preplacing a thin metal 'target' (plate) on the base before paving. After paving occurs, and as soon as the pavement can be walked on, a pulse induction device is used to detect the target. Once detected, the distance between the plate and surface of the pavement is measured by the device to obtain pavement thickness.

**Accuracy:** The MCT demonstrated this technology in numerous states and field verified the technology by taking cores at the same locations. MCT field data from fourteen states, which included a wide range of pavement thickness and bases, are shown in the graph below. The correlation between the two is excellent.



MCT's Cores vs. Pulse Induction Measurements

### Benefits of using this Technology

- Excellent accuracy and repeatability
- Non-destructive
- Easy to use and handle
  - Does not require extensive training.
  - Tests can be performed by one person.
- Economical
  - Compared to coring, costs per measurement can be reduced up to 75%.
- Rapid measurements
  - Test takes less than two minutes to perform.
- Near real-time
  - Measurements can be made as soon as the pavement can be walked on (allows for correction on the next day's placement, if a deficiency is identified).
- Independent of the paving material
  - Can be used on concrete, asphalt, or soils.
- Allows for greater number of measurements
  - Statistically more robust data.

### Limitations of this Technology

- Requires the placement of targets prior to paving
- Does not work on continuously reinforced pavements
- The targets must be at least 2 feet away from metal

**Summary:** With staff reductions and budget constraint challenges at agencies, the use of this technology can be a significant advantage since the time, effort, and cost involved in taking cores for acceptance can be greatly reduced. This technology can also be used for Quality Control by contractors; unlike cores, it allows them to make necessary thickness adjustments during construction. Additional information on this technology is available at <https://www.fhwa.dot.gov/pavement/concrete/pubs/hif09023/hif09023.pdf>.