

NIATT *Research Summary*

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Development of a Prediction Model for Pavement Temperature

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Description

The falling weight deflectometer (FWD) is used to calculate the moduli of pavement layers. The pavement temperature is used to adjust the back calculated asphalt concrete moduli. Measuring the mid-depth pavement temperature is a required step in FWD testing. The current practice at ITD is to drill holes at the mid-depth of the top asphalt layer every three miles along the testing route a day before FWD testing. Then, mineral oil is added before covering the hole. ITD crew measures the temperature of the



mineral oil in the holes before FWD testing. Drilling holes the day before FWD testing requires traffic control that causes traffic delays and puts the ITD crew in the line of traffic. In addition, although this procedure provides accurate measurements for the mid-depth pavement temperature at the locations of the holes, the crew uses interpolation to predict the temperature at locations between holes since they are drilled every three miles. This may result in inaccurate pavement temperature predictions.

This project aims to expedite the FWD testing and operations by eliminating the need for drilling holes for measuring mid-depth pavement temperature a day before testing. The objective of this project will be achieved by developing a procedure that can be used by ITD crew to predict the mid-depth of pavement temperature as a function of pavement surface temperature, that can be measured using infrared thermometer, and the high and low air temperatures the day before testing, which can be obtained from weather records. It is expected that such procedure would save a lot of time and resources for ITD required for traffic control and drilling holes the day before testing. In addition, it will improve safety of the ITD crew and improve the accuracy of mid-depth pavement temperature at locations where no holes are drilled. Project: 851723

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