



INDOT Research

TECHNICAL *Summary*

Technology Transfer and Project Implementation Information

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Upgrading the INDOT Pavement Friction Testing Program

Introduction

A cost-effective network pavement friction testing program plays a great role in enhancing wet-pavement travel safety. Because of the many advantages with the smooth test tire, INDOT started to use it in the network pavement inventory friction testing in 1996. Each year, INDOT conducts approximately 6,500 lane-miles inventory friction testing. In the past 7 years, a great amount of pavement friction data has been measured on the INDOT friction test track, interstates, State roads, and US highways with the smooth tire. This study addressed those issues

associated with pavement friction testing. This study investigated the complicated friction phenomenon during the process of tire-pavement interaction using 3-D FEM simulation. This study also investigated the primary frictional variations such as system variations, seasonal variations, spatial variations, and temporal variations. Based on the results, this study has finalized test frequencies, test tire, test speed, friction correction, and friction requirement for INDOT network pavement inventory friction testing program.

Findings

3-D FEM simulation may be a useful tool for researchers to investigate tire-pavement friction phenomenon in light of energy dissipation. Pavement friction is the result of tire-pavement interaction and depends on many factors. The frictional variations due to testing system errors are less than 5 measured in friction number. No consistent trend was observed in the seasonal variations of friction. It is difficult but not necessary to apply seasonal corrections to friction measurements. The largest lateral friction variation occurred due to the effect of wheel track. Pavement friction varies in time and the interstate pavements

experienced more significant friction variations than pavements on other highways. The friction differences between smooth and ribbed tires vary with pavement surface texture. On average, the pavement friction number measured with the smooth tire is 20 less than that with the ribbed tire. Speed gradient curves vary with the type of test tire and surface texture. It is advisable to test interstate pavements every year and other highway pavements at least every three years. A test spacing of one-mile is reasonable. A friction requirement of 20 is justified with respect to the smooth tire at 40 mph.

Implementation

The findings will be employed to upgrade the existing INDOT network pavement friction testing program so as to

provide realistic pavement friction information to INDOT individual districts and Program Development Division.

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