



**Project Number**

BE385

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# Florida Department of Transportation Research

## Develop Statistical Models Quantifying the Relationship between Pavement Surface Friction Characteristics and Traffic Accident Rates

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### Current Situation

The relationship between pavement friction and roadway safety may seem obvious: the more friction a roadway provides, the more control a driver will have, and the safer the roadway will be. However, crashes are complex events, and pavement friction is only one factor to consider along with driver distraction, tire wear, braking, visibility, and others. As engineers strive to make highways safer, balancing these factors requires a more precise understanding of the factors that contribute to safety. With friction, this is difficult because the desirable amount of friction itself depends on many factors, such as speed limits, type of traffic, type of road, etc. Most highway authorities use values for desirable friction that have been developed over time, but with changes in scientific methods of analysis as well as methods of design and construction, it is important to revisit issues like this one periodically to bring the latest techniques to bear and develop better methods and standards.



*Pavement friction is one of several factors that are important for roadway safety.*

### Research Objectives

In this project, researchers from Applied Research Associates of Champaign, IL, (1) quantified the relationship between pavement surface friction characteristics, traffic crash rates, and other important factors deemed important and (2) determined and recommend critical threshold levels below which crash rates would significantly increase.

### Project Activities

The researchers thoroughly reviewed existing literature on pavement friction, focusing on current practice of FDOT and other highway authorities for evaluation of pavement friction and standards for new and existing roadways. The researchers documented and evaluated practices recommended by the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and the National Cooperative Highway Research Program (NCHRP). Through an in-depth comparison of Florida practices with respect to other agencies and recommended practices, they found that Florida practices in the area of pavement friction were up to date. However, areas for possible improvement were also identified, specifically, a better relationship between pavement friction and roadway safety – the principal reason the study was commissioned in the first place.

The researchers conducted preliminary analyses of the statistics of crashes, friction, and traffic. They then developed a statistical relationship between Florida crash rates and pavement friction, texture characteristics, and other pavement-related data. The new statistical model was accompanied by a reliability-risk analysis for determining the recommended levels of friction. Furthermore, recommendations on Florida Department of Transportation’s Friction Guidelines, Friction Course Policy, and Safety Analysis Practice were developed.

### Project Benefits

A more precise understanding of pavement friction will help state highway agencies develop updated friction related guidelines and policies and thus improve roadway safety.

*For more information, please see [fdot.gov/research](http://fdot.gov/research)*