

# Friction Coefficient from Steering Maneuvers of a Stationary Vehicle

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Experimental setup for scrub torque test

## Technology Summary

The friction coefficient between the tires of a vehicle and the roadway is one of the most critical parameters governing a vehicle's motion. However, most techniques for identifying road friction from vehicle motion require the operation of the vehicle in highly dynamic maneuvers that utilize a significant portion of the tire grip capacity. Thus, the excitation of dynamics sufficient to provide a reasonable estimate of the friction coefficient could also destabilize the vehicle. This technology presents an alternative approach to friction estimation wherein stationary steering maneuvers, such as those performed in moments while a vehicle is not moving within a parking lot or at an intersection, may be used to identify the tire-road friction characteristics prior to higher speed operation.

## Application & Market Utility

Advancements in vehicle technology offers opportunities to improve friction estimation and benefit other aspects of vehicle operation. Accurate friction estimates can enhance the recent and continuing deployment of driver assistance and vehicle autonomy systems. Such functionality could range from driver warnings to enhanced stability control and even situation-aware vehicle path-and-speed planning for advanced driver assistance or fully autonomous operation. This technology has the potential to reduce the number of vehicle crashes and save lives.

## Next Steps

This technology is patent pending. The research team seeks licensing opportunities.

TECHNOLOGY READINESS LEVEL

1-3

### Seeking

Investment | Licensing | Research

### Keywords

- Contact mechanics
- driver assistance systems
- coefficient of friction
- tire dynamics model
- parameter estimation

### Researchers

#### Sean Brennan

Professor of Mechanical Engineering, Penn State University

[Online Bio](#)

[Website](#)

#### Craig E. Beal

Assistant Professor of Mechanical Engineering, Bucknell University

[Website](#)

### Originating College

College of Engineering

### Office of Technology Management Contact

Rokita, Joseph  
jjr152@psu.edu  
814-863-6336



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