RITS performs skid friction testing on the order of 2000 to 3000 miles annually for the investigation of Wet Pavement Accident Clusters (WPAC), the investigation of the Skid Resistance Level (SRL) of aggregates in bituminous pavements, and the investigation of other special circumstances, typically as requested by District offices.

RITS currently owns three Pavement Skid Friction Test System (SFT) 5040 models, manufactured by International Cybernetics Corporation, of Clearwater, Florida. These devices are specially equipped pickup trucks with custom two-wheel trailers. The pickup truck is equipped with a 300 gallon water tank (located in the bed), a water pump, and computer system electronics to control the testing and record the measurements.

The system hardware consists of an IBM-PC compatible computer System Unit with associated Super VGA monitor, compact keyboard, printer and RS-232C Serial Interface. A Data Measurement Subsystem installed in the System Unit provides interfaces to a transmission mounted distance transducer and a custom designed Event Keyboard.
The system accepts a downloaded RMS file containing all roadway information as an input database for test data. Vehicle location and roadway features are displayed on the computer screen in a Straight Line Diagram (SLD) format, and the software accepts operator inputs verifying segment locations, known as “events”. Routes can be tested in increasing or decreasing segment order, and test sections may begin on a segment beginning, ending, or any permanent landmark feature. The trailer is equipped with two standard test tires, wheels that are coupled by disc brake assemblies, and calibrated force transducers, which measure the horizontal force on the wheel under braking. The test tires may either be ribbed or smooth.

The test method and equipment are defined in ASTM E 274. The specification for the standard ribbed tire is ASTM E 501. The specification for the standard smooth tire is ASTM E 524.

Two persons are needed to perform testing, a driver and an operator. Testing is typically performed during the months of March through November, but can vary depending on weather conditions. During the winter months, test results may be misleading due to colder temperatures and the potential for the presence of anti-skid material on the pavement.

To perform the test, water is dispensed onto the pavement immediately ahead of the tire on the trailer and the trailer braking system is actuated to lock the test wheel (typically, only the wheel on the driver’s side of the trailer is used to test). The system detects and records the horizontal tractive force, which is the force necessary to slide the locked test tire along the pavement at the test speed, the vertical load on the test wheel, and the vehicle speed.

A test cycle takes approximately 2.5 seconds. Water dispersion begins 0.1 seconds prior to wheel lock (and continues during the entire test cycle), it takes approximately 1 second to lock the wheel (the higher the speed, the longer it takes to lock the wheel), and measurements are made for 1 second while the wheel is locked (200 measurements are recorded during that 1 second interval).

A minimum of five tests (cycles) are performed per segment. (A segment is a section of roadway approximately one-half mile in length.) Water is dispensed at the rate of approximately 28 gallons per minute. Approximately 200 test cycles can be performed per water tank capacity (approximately 20 directional miles). Tests are not typically performed on bridges.

The average skid number (SN) for each test cycle equals the Horizontal Tractive Force divided by the Vertical Load,
multiplied by 100. The coefficient of friction, referred to by the State Police, is simply Horizontal Tractive Force divided by Vertical Load.