



California 1845 Industrial Drive Auburn, California 95603 Telephone: (530) 885-1482 Facsimile: (530) 885-0593	Kansas 307 Plymate Lane Manhattan, Kansas 66502 Telephone: (785) 539-6305 Facsimile: (415) 358-4340
--	--

SURFACE SYSTEMS & INSTRUMENTS, INC.

smoothroad.com

Custom Test Equipment • Mobile Technology Solutions • Inertial Profilers • ADA Compliance • FF/FL Testing

Myths of Inertial Profilers

Inertial profilers use a combination of an accelerometer and a laser height sensor to measure a 2D elevation profile. Typical questions or myths arise from past profiling systems operators have used or stories they have heard.

The fact is that all calibrated profilers that can certify under AASHTO r56 will report nearly the same data. Since data collection is rapid, data collected by any party can be easily refuted by collecting data over the same surface with another profiler.

Myth #1 – Let Air Out of The Tires for Better Ride

The accelerometers do a great job cancelling vehicle motion. Tire pressure does not affect ride quality results if: the DMI is calibrated at the new tire pressure, the wheels are balanced and do not introduce severe vibration into the sensors. SSI has installed inertial profiler systems on multiple vehicle types from segway to F350s with the same electronics and sensors.

Myth #2 – Mount the System to a Luxury Car for Better Results

Just like myth #1, the vehicle suspension has less to do with the profiler performance than most people expect. SSI inertial profilers can use the same hardware, lasers, electronics, and software on any vehicle from Smart Cars to Ford F350's – both passing certification on the same track.

Myth #3 – You Cannot Adjust Data to Improve Results

Vendor software, like SSI Profiler, guards against data tampering. The lasers and accelerometers stream data into encrypted files that cannot be edited. It is not possible to change the elevation data without leaving a trace of the adjustment. For example, if the operator incorrectly calibrated the distance to artificially spread out the elevation points, the total distance of the collection would be incorrect. If the operator added a filter to smooth out the data profiles the filter could be viewed within the PSD plot of the collection's wavelengths. The inertial profiler data is absolute and cannot be subjective or interpreted like a visual test.

Myth #4 – Calibrate to the Project Length for Perfect Distance Reports

Some operators prefer to have the collected distance match the plans. However, traveled distance is not the same as plan distance. The profiler data should be collected with true 1-inch

sampling, calibrated to a track verified with a wheel or tape. If not, the profiler may not be collecting with a true 1-inch sampling.

Myth #5 – No Operator or Vendor Can Promise Compliance or Improve Over Other Systems

Since most systems undergo a certification procedure to prove the functionality of the system it is incorrect to say one system is better than another. Data can be collected in error, with incorrect calibrations, or invalid sensor data. All vendors have different system limitations. It is up to the operator to know the system diagnostics and validity of the data. Vendor software, like SSI Profiler, should assist operators to check data and system diagnostics.