Traffic Speed Deflectometer (TSD)

- Manufacturer: Greenwood Engineering, Denmark (http://www.greenwood.dk/tsd.php)
- Estimated Date of Availability in the US: August 2013

Specifications

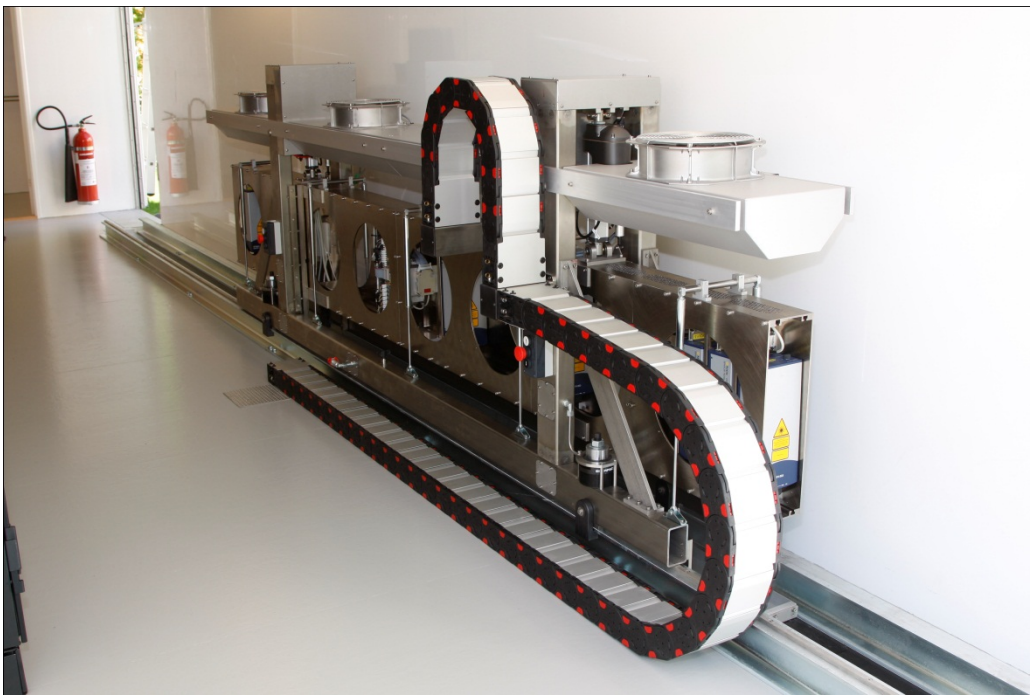
- Seven laser Doppler system, one of which is used for reference, giving six measuring points inside the deflection bowl - sensor positions (in inches in front of the center of the load): 4, 8, 12, 24, 36, and 48
- Right-of-Way ROW capability using one forward facing camera inside the cabin of the truck
- Longitudinal profile and International Roughness Index (IRI) measured in the same wheel-path as the deflections
- Load dynamics measured using strain gauges on the load axle
- Air and road surface temperatures are also measured
- The load of the TSD can be varied by taking off ballast
- The driving speed while measuring is in the range 25-50 mph
- Sensor data, as well as data from other individual transducers like accelerometers, gyros and inclinometers in the inertial unit, temperature sensors, odometer etc. are available.
- Several indices are produced including SCI300, SCI200. D0 and other absolute deflections are also calculated except for very stiff structures (D0<50µm)

Testing Logistics

- Test sections must be selected and communicated to Greenwood in advance. A clear test plan stating the specific sections including start and stop is preferred. The mix of pavement types and structural information like layer thicknesses are not required. However, information of this type can support the evaluation of the performance of the TSD. Extensive experience has been obtained with flexible pavements. Very limited experience with rigid pavements exists.
- For calibration of the odometer: one straight section of 1-mile measured as accurately as possible and marked with reflective tape. It is preferred that the section be located in light trafficked route. Calibration sections must be selected and communicated to Greenwood in advance.
- For the determination of Doppler angles: one straight section with not less than 1.5 mile that can be passed with 50 mph. Apart from the 1.5 mile, distances for accelerating and decelerating the vehicle at each end is required. It is practical if the vehicle can be turned around at each end without too much effort because the section must be passed 6 times. Often a highway section between two exits is practical.

A suitable facility for overnight equipment storage is preferred, for example a closed parking lot, garage or parking with surveillance. The client is required to have a support vehicle present during calibrations and test, for solving transportation needs that may arise in the field.

Traffic Speed Deflectometer (Owner - ANAS, the Italian Roads and Motorways National Agency; Photo Courtesy – Greenwood Engineering)



TSD internal pavement response measurement instrumentation (Photo Courtesy – Greenwood Engineering)

-