Laser XVP

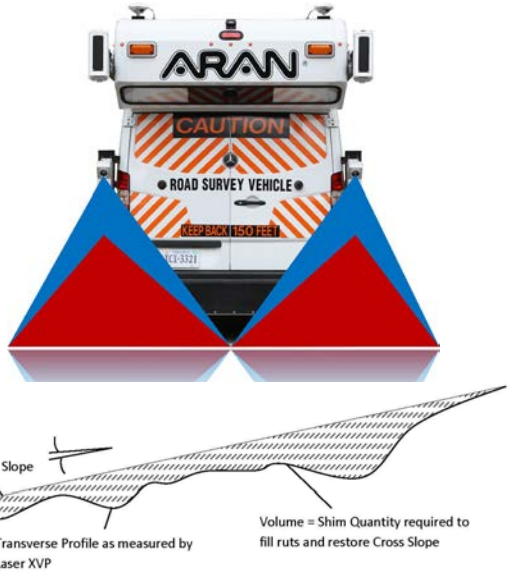
The Laser transverse profiler (Laser XVP) is a vehicle mounted subsystem that uses dual scanning lasers to accurately measure the transverse profile of the road. Transverse profile is measured in order to calculate the depth of roadway rutting. By measuring the complete profile instead of just the ruts, the effect of vehicle wander on measured rut values is eliminated.

Laser Transverse Profiling System

The Laser XVP uses two synchronized, laser-based devices to measure the transverse profile of a 4.1 m (13.5 ft) lane width, with a lateral resolution of approximately 1,280 points. The Laser XVP may be utilized in either of two user selectable modes. Free running mode allows for the obtainment of measurements at the maximum frequency that the system will allow. Measurements are recorded and summarized for the applicable distance interval. Alternately, the system may report at user defined distance intervals.

High-Speed (250 Hz Sensor): Offers a free running sampling frequency of 250 Hz, which equates to transverse profile samples every 0.2 m at a speed of 108 km/hr or 0.7 ft at a speed of 67 mph. The system may also be set to report on a distance based interval, utilizing a sample rate of approximately 230 Hz.

With either configuration, 1,280 raw data points may be individually reported, or filtered to produce a reduced point transverse profile. Measured profiles are linear-referenced using an onboard Distance Measurement Instrument (DMI) and are synchronized with all other ARAN data such as pitch and roll from an onboard geometric subsystem (if the ARAN is so equipped); resulting in a tightly coupled data set. The simultaneous measurement of transverse profile as well as vehicle pitch and roll can be used to accurately measure existing cross slope of



Laser XVP

the road and can be used to compute mill and shim quantities required to restore cross slope to design specifications.

The full lane width coverage of the Laser XVP also permits the measurement and reporting of shoulder/edge drop-off conditions. Combined with the Position and Orientation System for Land Vehicles (POS LV, a tactical-grade inertial guidance system), the Laser XVP can be used to capture profiles that are suitable for Digital Terrain Modeling.

Features

- Measures up to 1,280 data points across lane
- 1 mm (0.04 in) rut accuracy
- Transverse profile measurement at highway traffic speeds
- Measures 4.1 m (13.5 ft) lane width
- Available frequencies of operation: Standard (25 Hz) and High-Speed (150 Hz)
- Day or night operation
- Compatible with all other ARAN subsystems
- Graphical reporting software
- Cross slope measurements when combined with geometric subsystem
- Provides accurate DTM data when combined with POS LV subsystem
- When combined with an ARAN geometric system, ARAN applications calculate mill and shim quantities and ponding depth

Fugro Roadware
2505 Meadowvale Boulevard
Mississauga, ON, Canada L5N 5S2
North America Toll Free: +1-800-828-ARAN (2726)
Phone: +1-905-567-2870
roadware@fugro.com

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