



# Data Collection Support



Data collection support for transportation organization is typically separated into structural and functional evaluation. Fugro has an experienced crew of engineers and technicians specializing in data collection support.

## Structural Evaluation

Structural evaluations are intended to determine the structural response to wheel loads and joint load transfer efficiencies, as well as variables within the structural properties.

### Distress Surveys

- Automated distress vehicles collect data at normal traveling speeds. They offer fast and cost-effective data collection and use high-definition imagery to determine cracks along the pavement surface using innovative technologies.
- Manual distress surveys can be conducted when appropriate on smaller projects. These surveys rate the performance of the pavement and are good indicators of maintenance or rehabilitation requirements.

### Radar Testing

Radar testing is used to determine layer thickness and variability. Ground Penetrating Radar (GPR) can be utilized to effectively identify possible moisture concerns within the pavement structure. GPR testing is performed at normal traveling speeds.

### Deflection Testing

- The Falling Weight Deflectometer (FWD) measures pavement response to loading. This form of nondestructive testing efficiently identifies pavement layers that could be structurally weak.
- The Heavy Weight Deflectometer (HWD) determines the heavier load capacity by applying a substantially larger load. HWDs are commonly used at airports, intermodal facilities, and ports.



Distress surveys with Automatic Road Analyzer (ARAN)



Pavement analysis using Falling Weight Deflectometer (FWD)



Ground Penetrating Radar (GPR)

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## Materials Sampling and Testing

Fugro utilizes material sampling and testing to determine pavement thickness and identify subgrade materials. Samples are collected through pavement coring and soil boring and laboratory tested for identification and classification. Pavement properties including Superpave asphalt mix design and analysis can be confirmed through these techniques.

## Pavement Structural Analysis

The analyses of pavement structures utilize both distress surveying and deflection testing. The combination of the two can provide the following informative analysis:

- Back-calculation of layer moduli use data collected from the Falling Weight Deflectometer and layer thickness to determine the stiffness of material layers.
- Remaining life analysis is determined from structural and functional conditions and can be used to plan improvements.
- Load transfer analysis measures the Load Transfer Efficiency (LTE) between concrete pavement joints. This information is used to determine probable cause of pavement distress and the appropriate rehabilitation method.

## Dowel Alignment Testing (MIT-Scan 2)

The MIT-Scan 2 is able to acquire dowel alignment parameters accurately, efficiently, and nondestructively. It has applications in construction process quality controls and forensic investigations.

## Functional Evaluation

Functional evaluations allow for a complete assessment of the roadway performance and transportation facility. We provide surface friction testing, ride quality assessments, and asset inventory and mapping.

## Ride Quality

Fugro's Automatic Road Analyzer (ARAN) provides automated, high-quality pavement roughness, rut depth, and other ride quality assessments. These assessments can be performed for project acceptance after construction and also to determine the overall condition of a roadway network.

## Surface Friction Assessment

Friction testing helps determine if a pavement needs to be resurfaced or treated to provide appropriate friction resistance. Friction assessment is important to any pavement surface in order to reduce skid-related accidents.

## Cross-Slope

Fugro uses Inertial Measurement Units (IMU) on all of our data collection vehicles. These increase the accuracy of our GPS positioning and measure the roll and pitch of the vehicle. The IMU and other sensors measure the grade and cross-slope of the road in real-time.

## Asset Inventory and Mapping

Fugro provides asset inventory and assessment of street signs, sidewalks, curbs, gutters, ADA ramps, and guard rails. Services include high-resolution imaging, GPS referencing and database integration for roadway functionality.



Friction testing



Coring is used to verify pavement thickness and to calibrate the GPR

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