

# **PDP**

## **PAVEMENT DENSITY PROFILER**

**Fast & Simple Pavement  
Uniformity Assessment**



# Uniform compaction of asphalt pavement is a key factor in increasing the life expectancy of a paved road.

After asphalt pavement is laid down, the density is traditionally measured using point sampling methods such as coring, a nuclear density gauge, or a Pavement Quality Indicator (PQI).

Drilling core samples in newly paved roads is destructive, expensive and the results are not available in the field, taking days to get from a lab. Nuclear density gauges have strict safety regulations and training requirements. Further, all these traditional methods only measure at single points, leaving large gaps in the measurements and increasing the risk of areas in the pavement that fall outside the compaction quality requirements which, research has shown, leads to premature road failure.

**“STUDIES INDICATE A 1 PERCENT INCREASE IN DENSITY CAN EXTEND THE ASPHALT PAVEMENT SERVICE LIFE BY AT LEAST 10 PERCENT.”** - Federal Highways Association (FHWA) and Asphalt Institute Workshop.



## The PDP Solution

The **Pavement Density Profiler (PDP)** addresses the need to acquire density measurements of large paved areas quickly; in a non-invasive manner, with timely results.

The PDP provides continuous profile capability that allows the variability of the asphalt pavement density to be seen in real-time and quickly plotted to assess the overall quality of the paving job. Areas of high and low density can then be targeted for further investigation or corrective action.

## Powerful & Innovative PDP Features

- Real-time output
- Setup & survey in minutes
- No field calibration required
- Collect point measurements or profiles
- Transform multiple profiles into a map of pavement uniformity



### Rugged, sunlight-readable touch screen display

- Simple user interface
- User Selectable Output:
  - Reflection Coefficient
  - Relative Permittivity
  - Normalized Density
  - Density
  - Air Void Content



### Lightweight Fiberglass Cart Frame

- Minimal metal parts that would interfere with sensor
- Integrated odometer for sampling at equal intervals



### Sensor

- Measurements based on radio waves reflected from pavement
- Self-contained wireless sensor with integrated battery
- Factory calibrated – no time consuming or complicated field calibration
- Quick, in-field validation to ensure system performance daily before work begins
- Wi-Fi link to tablet for real-time output
- Data recording & storage



### Output

- Automated PDF reports of pavement statistics, can be shared while on-site
- CSV data output for further post-processing, if desired



### GPS

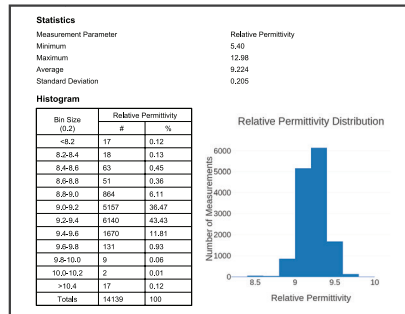
- Internal & External GPS support; data collected is geo-referenced for future use

# PDP Operating Modes



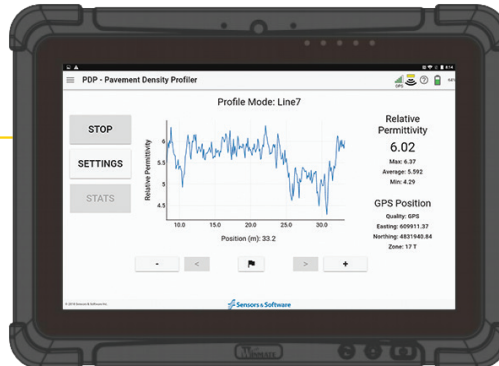
## Stationary

Measure pavement properties at a single location using thousands of measurements at one point. The system outputs an automated PDF report with plots and statistics.



## Profile

Collect measurements at regular intervals along a survey line and see the variation in pavement properties in real time.

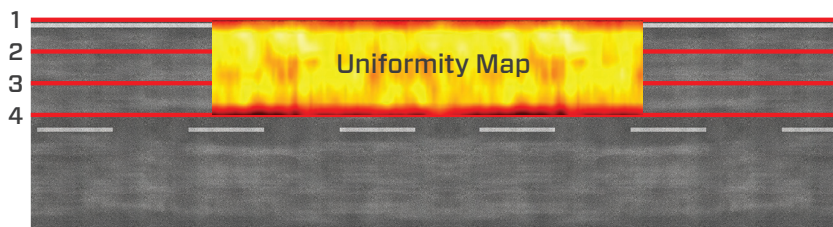


## Area Mapping Display

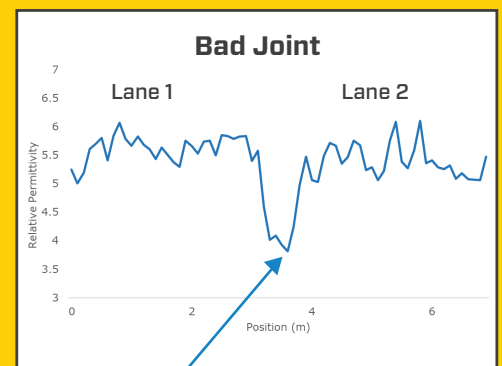
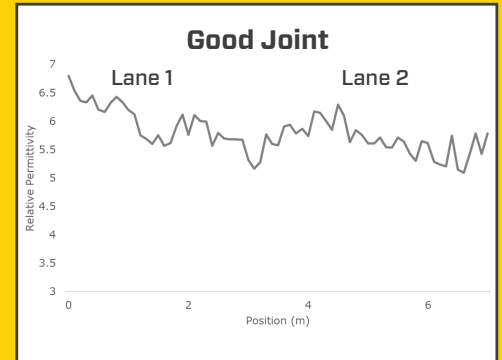
Combine profile measurements to generate a map of asphalt pavement uniformity.



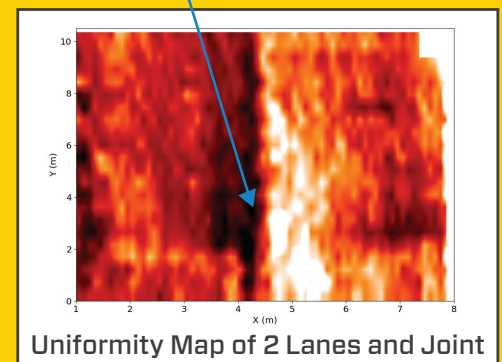
### Profiles



# Case Study Joint quality



## Low Density



The long-term effects of a bad joint are premature pavement deterioration.



# Why choose PDP?

Feature	PDP	Core	Nuclear Density Gauge	Dielectric Gauge/PQI
Point Measurement	✓	✓	✓	✓
Profile Measurement	✓	✗	✗	✗
Area Measurement	✓	✗	✗	✗
Measurement Time	<0.1 s profiling	Days	30 to 60 seconds in 2 orientations	Seconds
Non-contact Sensor	✓	✗	✗	✗
Non-Hazardous	✓	✓	✗	✓
Training Requirements	Minimal	✓	Extensive: Nuclear Materials Handling Course	Minimal
License-free	✓	✓	✗	✓
Unlimited Transportation	✓	✓	Restricted	✓
Additional Considerations	None	Destructive, random cores are not an accurate representation of the pavement	Gauge needs strict regular maintenance, proper transport and storage	Needs clean, dry and smooth contact surface

## PDP Specifications

Hardware				Software	
Weight & Dimensions	Dimension (L x W x H): 145 x 84 x 118 cm Weight: 14.2 kg (including Tablet, Sensor and Cart)			Derived Measurements	User Selectable - Normalized Density, Density, Air Void Content
Display (Rugged Tablet PC)					
Screen size: 10.1-inch display with LED Backlight Dimension (L x W x H): 27.2 x 19.7 x 1.9 cm   Weight: 1.2 kg				Modes of operation	Stationary (free run, averaging), Profile (odometer, free run)
Footprint size (Fresnel Zone)	30 cm				
Environmental & Temperature	Ruggedized, environmentally sealed unit and connections			Data Export	PDF Report, .CSV
	IP65	Operating temperature range: -10 to 50°C (-14 to 122°F)			
Sensor Power Supply	Li-Ion 8850 mAh Battery Pack offering 6 to 8 hours of operation on a single charge			Data collection interval	Standard 10 cm in profile mode
Measurement Specifications					
Reference HDPE relative permittivity accuracy (K=2.30)		±0.04	Single location relative permittivity repeatability		±1.5%

PDP is factory calibrated and can be quickly validated in the field with the provided validation procedures.  
Ground Penetrating Radar is part of AASHTO Designation PP 98-19.



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