



NETWORK SURVEY VEHICLE KroRuSS - LCMS

Automated Pavement Evaluation Survey System using Laser Crack Measurement System (LCMS)

Meet requirements of all applicable national and international standards for pavement evaluation and visual surface defects measurement. Data quality is better than manual, as the process is fully automated and computer driven and objective, with accurate results and better repeatability. NSV captures high-resolution pavement surface images using advanced cameras and imaging systems, enabling detailed analysis and documentation for maintenance planning and performance evaluation.

Network Survey Vehicle (NSV) is a special type of vehicle equipped with advanced technologies that scan and inspect the road surface condition and road performance parameters. It is great reliability, flexibility and ease of use for anyone who needs to collect road survey data accurately and quickly in automated mode. NSV can dramatically reduce labor costs and project completion time, and provide a visual record of surface conditions including, roughness (bumps), rutting, cracks, potholes, lane marking, and many other defects.

LCMS

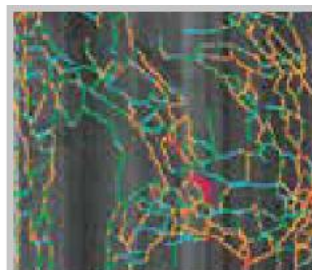
The LCMS - 2 delivers standards-compliant and industry-proven results on more surfaces than any other sensor in the market. Pavemetrics Laser Crack Measurement System (LCMS - 2) is the ultimate single-pass 3D sensor for pavement inspection. It can automatically geo-tag, measure, detect and quantify all key functional parameters of pavement in a single pass.



Rutting



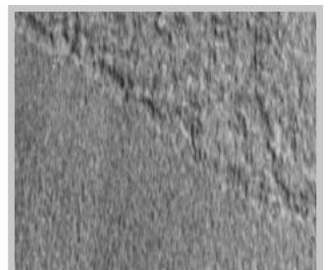
Cracks



Roughness



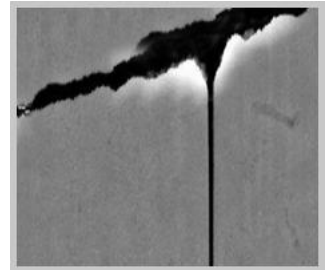
Texture



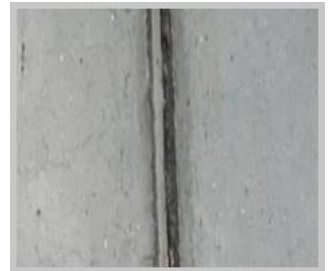
NSV Features

- ▶ Fully automated computer driven system
- ▶ All working based on 3D technology; x,y,z measurement
- ▶ Road Defect Rating calculations in automated mode
- ▶ Customized user defined template for defect reporting
- ▶ Readymade MS Excel File for RAMS / HDMI4 / NHAI format
- ▶ User defined distance (5m, 10m, ...) based data reporting
- ▶ GIS mapping and color coded map of surveyed area
- ▶ Display of pictures on GIS map along with road defects
- ▶ Inventory measurement and counting
- ▶ Accurate Right of Way measurement in tunnels, underpass & RoB etc.
- ▶ 360° Camera integrated GPU, CPU, GPS, IMU DMI
- ▶ Mobile Mapping integration for GIS mapping
- ▶ Automated stitched and compressed pictures from 5 m onwards
- ▶ Geotagged and Chainage stamping on all pictures
- ▶ Video making by stitching geotagged images
- ▶ Defect Detection and measurement without human interference
- ▶ Longitudinal Profile and Roughness for entire lane width
- ▶ IRI calculation for both wheel path as per ASTM E950
- ▶ Rutting measurement by 5 different methods in one lap
- ▶ Macro Texture measurement in MPD & MTD
- ▶ Bridge Approach and Expansion Joints measurement
- ▶ Merging of multi lanes data and pavement images
- ▶ Slope, Cross Fall and Super Elevation measurement
- ▶ GPS tagging of all defects and pavement Images
- ▶ Pavement Marking dimension measurement
- ▶ Sewer & Storm Drainage and Rumble Strip
- ▶ Pavement Type (Flexible / Rigid) Detection
- ▶ Automatic detection and measurement of length, width, depth (3D) and quantify for Sealed & Unsealed Cracks, Potholes, Rutting, Shoving, Raveling, Bleeding, Pick-out / Disintegration, Depression / Water Entrapment, Edge Dropoff and Curb.

Spalling



Failed Joint Sealant



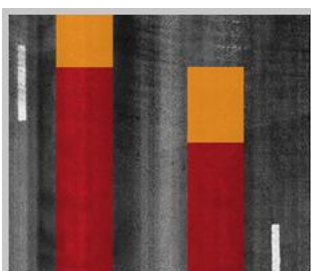
Corner Breaks



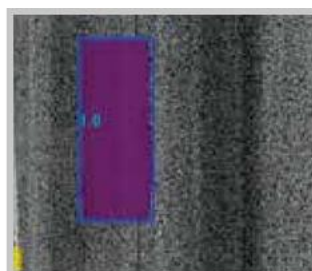
Faulting



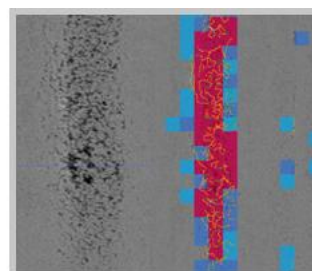
Bleeding



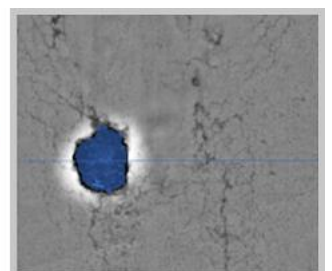
Patches



Raveling



Potholes



NSV Specifications

Meeting Standards	: Applicable AASHTO and ASTM for defects
Measurement Type	: 2D and 3D Both
Measurement Parameters	: Length, Width, Height / Depth and quantity in terms of numbers, area, % or volume etc.
Rutting Measurement	: ASTM E1703, Taut Wire, Moving Ruler, Brazilian method, 5 Point rut depth calculation
Roughness	: ASTM E950 Class 1 Profiler, IRI measurement for entire lane width
Macro Texture	: In all 5 AASHTO band
Data Repeatability	: Using driver wendor control
Reporting Format	: User define and customizable
No. Of Laser Profilers	: 2
Sampling Rate	: 28,000 profiles / s
Vehicle Measurment	: In built IMU for compensation
Vehicle Speed	: 0 - 100 km / h
Profile Spacing	: Adjustable (1 - 5 mm)
3D Points Per Profile	: 4096 points
Transverse Measurement Width	: 4 m
X-axis (Transverse) Resolution	: 1 mm
Depth Measurement Range	: 250 mm
Z-axis (Depth) Accuracy	: 0.25 mm
Z-axis (Depth) Resolution	: 0.05 mm for IRI at 25 mm interval
Data Reporting Distance	: 5 m onwards (10, 50, 100, 500)
DGPS	: > 1 meter accuracy in dynamic mode
IMU With LCMS	: Built In High Precised
Encoder / Distance Accuracy	: $\pm 0.1\%$ for 10 km distance
In Vehicle PC For LCMS	: 64 GB RAM 2 TB SSD Licensed Windows
In Vehicle PC For Camera	: 16 GB RAM 1 TB SSD Licensed Window
Camera Type	: 360° Camera with built in CPU & GPU
Camera Sensors	: Inbuilt IMU, GPS & Internal Memory
Camera Trigger	: DMI / Encoder (Separate for Camera)
Picture Resolution	: 4000 x 3000 Pixel
Lidar Integration	: Optional
Mobile Mapping	: Optional

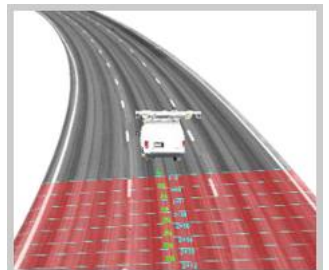
Edge Drop-Off



Disintegration



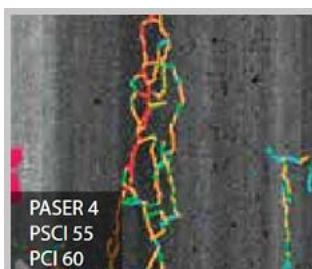
Lane Merging



Road Geometry



Pavement Condition Index



Curbs



Manholes



Depression



Camera

- ▶ Durable, Precise & Reliable 360° Camera For Infrastructure Mapping
- ▶ 6 X 12.35 MP Sony Image Sensors with Wide Angle Lenses
- ▶ Sealed and Water Resistant Aluminum Body
- ▶ Integrated High Frequency 9 Axis IMU
- ▶ High End Centimeter Precision Built In GPS for Better Accuracy
- ▶ Inbuilt Powerful GPU and CPU for on Board Processing
- ▶ User Defined Trigger from 5 M Onwords
- ▶ Road Chainage and GPS Stamping on all Pictures
- ▶ Making Video by Sticking Pictures
- ▶ Inventory Detection, Measurement and Counting (Automatic - Optional)



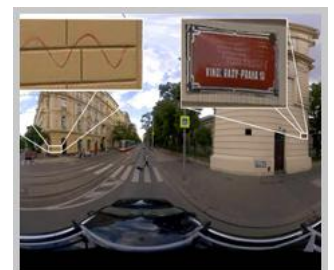
Camera Installed



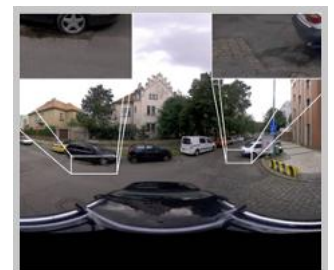
Camera View



Camera View



Camera View



Camera View



Camera



Camera View



Camera



Other Items

Contact DMI on Wheel



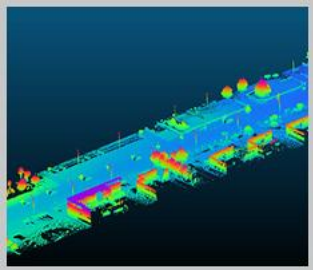
DGPS for GIS Mapping



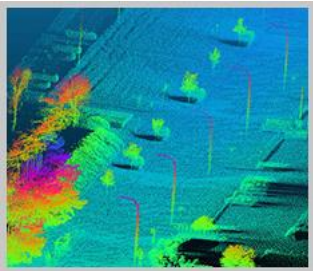
Lidar for Inventory measurement



Lidar Output



Lidar Output



Vehicle Outside DMI



Vehicle inside DMI



Vehicle Installation



Vehicle Installation



Vehicle Installation



Vehicle Installation



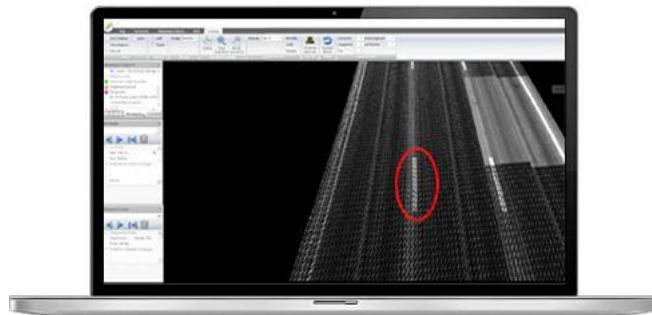
Software



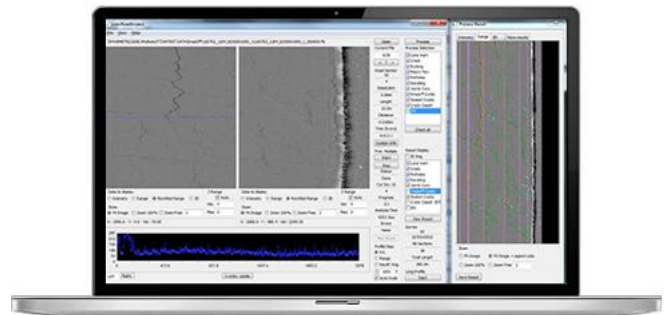
Data Reporting



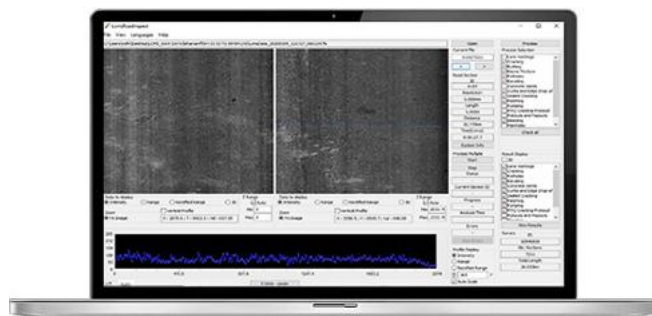
Report Format



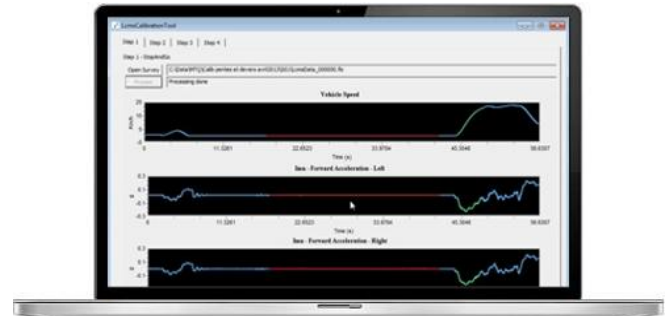
Lane Merging



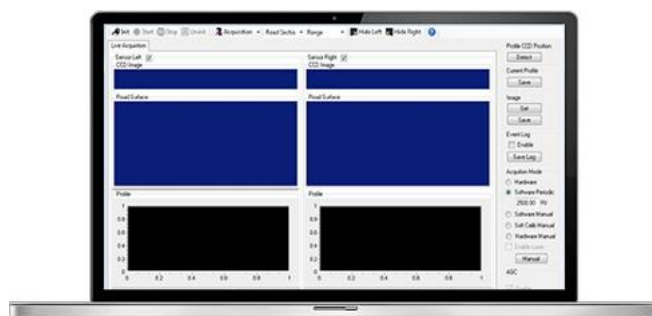
Data Processed



Data Processing



Data Calibration



System Setup



Data Acquisition



NSV Data Acquisition



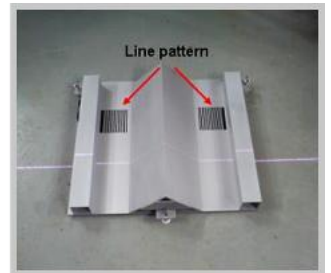
DMI on Wheel



LCMS Controller & PC



Calibration



Intellitest Solutions Pvt. Ltd.

12A08, Business Hub, Sector - 81, Faridabad - 121007 (Delhi NCR), India

+91-129-297 6069/ 298 6069/ 409 6069 / +91-9250059892 - 93

solutions@intellitest.co.in / intellitestspl@gmail.com

www.intellitest.co.in