Digital Realities for Infrastructures
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Stuart Woods

Vice President – Geospatial Solutions

Leica Geosystems AG

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Growing Population

THE WORLD'S POPULATION IS GROWING
TODAY 7.4BN - 10BN IN 40 YEARS

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London's Infrastructure - Victorians Underground Achievements

Starting in 1861, Victorian engineers built several miles of purpose-built subways large enough to walk through, for running gas, electricity, water and hydraulic power pipes through. These works removed the inconvenience of continually excavating highways to allow access to underground utilities.

Fresh water & Sewers
London, like most other major cities, also has extensive underground infrastructure for fresh water supply and sewers.

Gas & Electricity
Starting in 1861, Victorian engineers built several miles of purpose-built subways large enough to walk through, for running gas, electricity

Railway
The London Underground was the first underground railway in the world, and remains one of the most extensive. Its construction began in 1860 with the 3.7-mile (6.0 km) Metropolitan Railway.
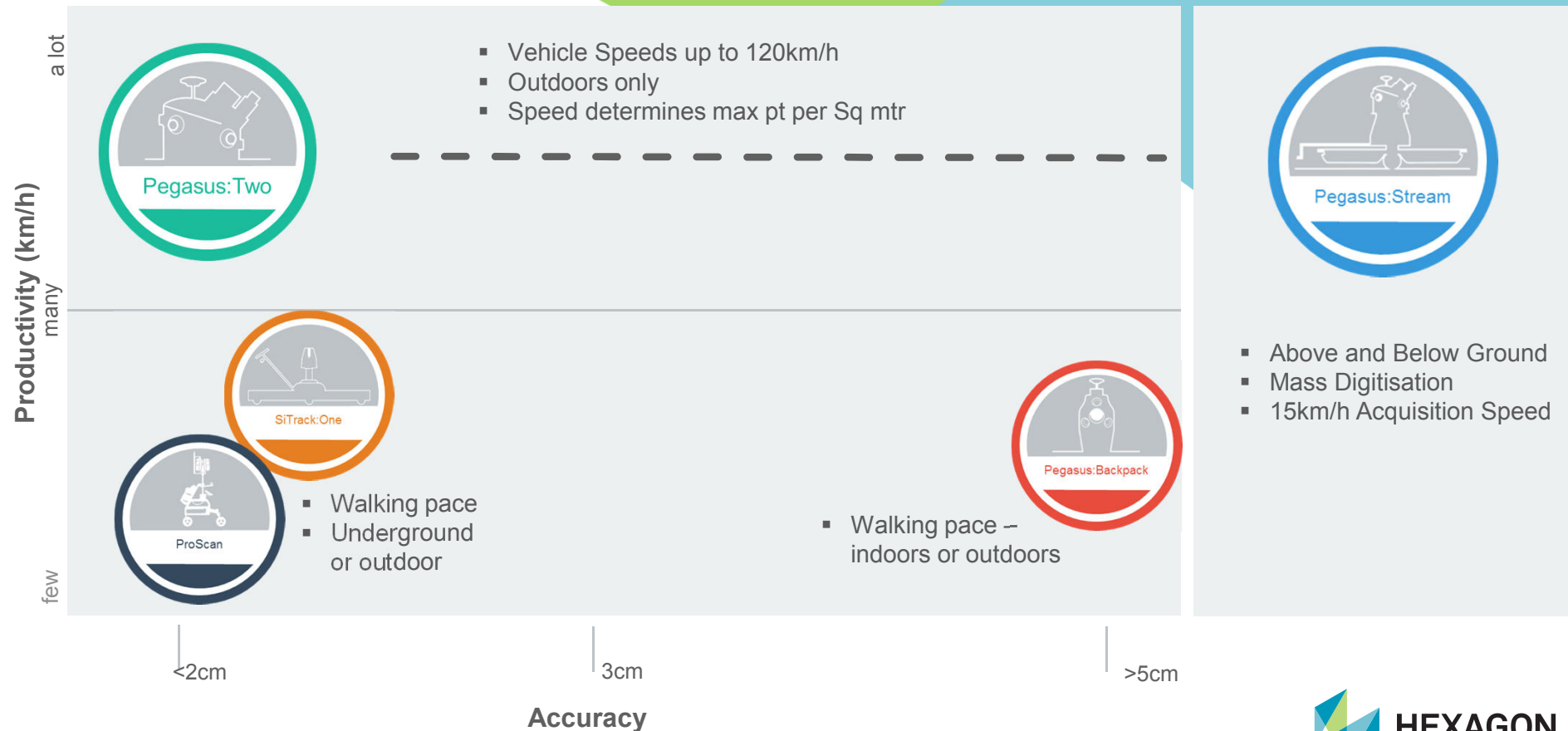
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Digital Realities for Infrastructures

Infrastructure refers to structures, systems, and facilities serving the economy of a business, industry, country, city, town, or area, including the services and facilities necessary for its economy to function.

Infrastructure	NEW	OLD
Progressive Scanning	X	
Update or new drawings		X
Monitoring	X	X

Productivity Driving Reality Capture Products for Infrastructure

Productivity (km/h) — a lot / many / few

Accuracy — <2cm / 3cm / >5cm

Pegasus:Two
- Vehicle Speeds up to 120km/h
- Outdoors only
- Speed determines max pt per Sq mtr

SiTrack:One

ProScan
- Walking pace
- Underground or outdoor

Pegasus:Backpack
- Walking pace – indoors or outdoors

Pegasus:Stream
- Above and Below Ground
- Mass Digitisation
- 15km/h Acquisition Speed

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Infrastructures Need Flexiblity - Leica Pegasus:Two

- Fast to deploy – no preparation
- Vehicle independent
- Boat, train, trolley, car
- Significantly flexibility in applications
- Battery operated

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# Breadth of Digital Infrastructure Surveying

Pegasus:Two

- Expressways, Highways, Roads corridor mapping.

- Railways , Fast Trains, Tram ways corridor mapping.

- Canals and distributaries system, having service roads.

- 3D City modeling, City surveys & Topographic Surveys.

- Surveys for Airport runways and adjacent areas.

- Surveys for Telecommunication – along road network.

- Water and Gas pipe lines survey along the existing roads.

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Customer Example: Infrastructure Mapping of Hydroelectric Dam in Italy
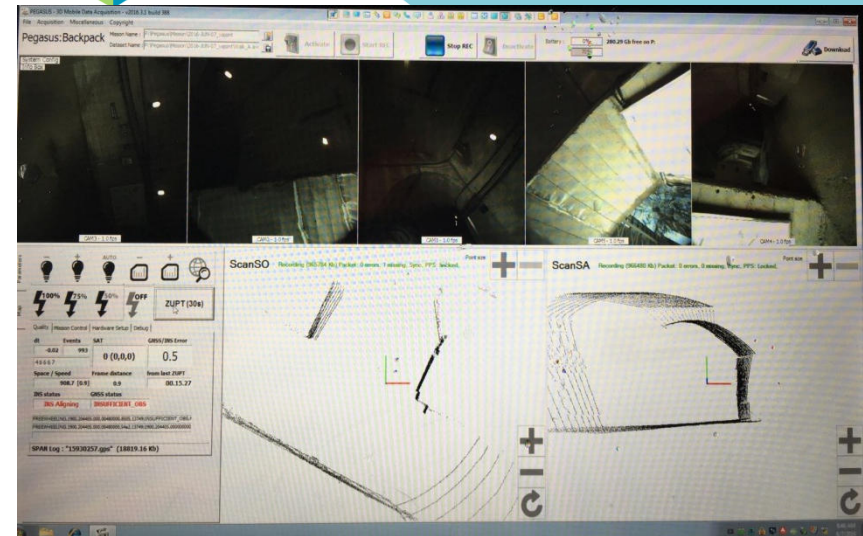
Pegasus:Backpack

Customer Example: Infrastructure Mapping of Sewers
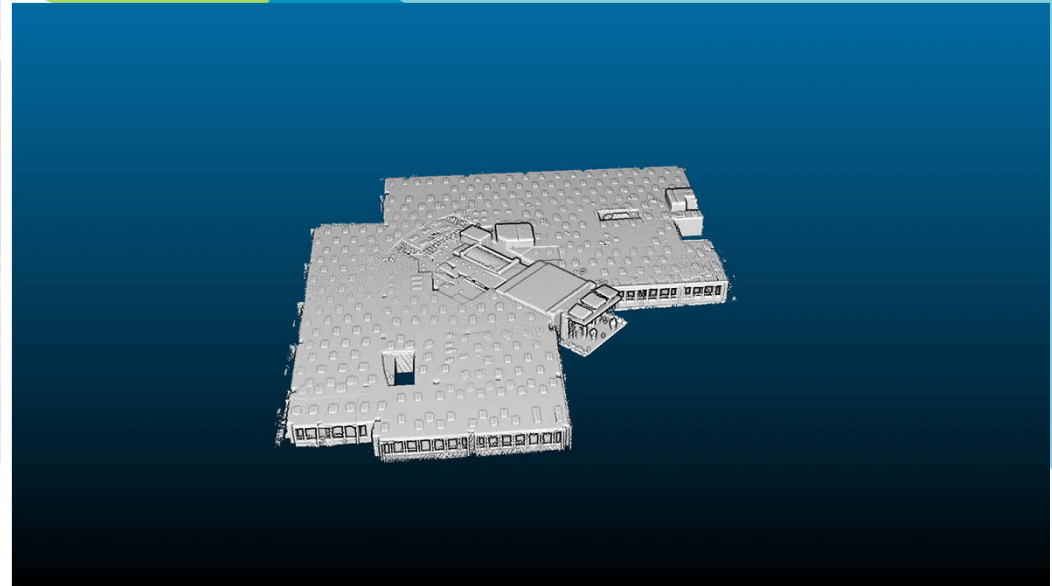
Pegasus:Backpack

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Customer Example: Infrastructure Mapping of Sewers

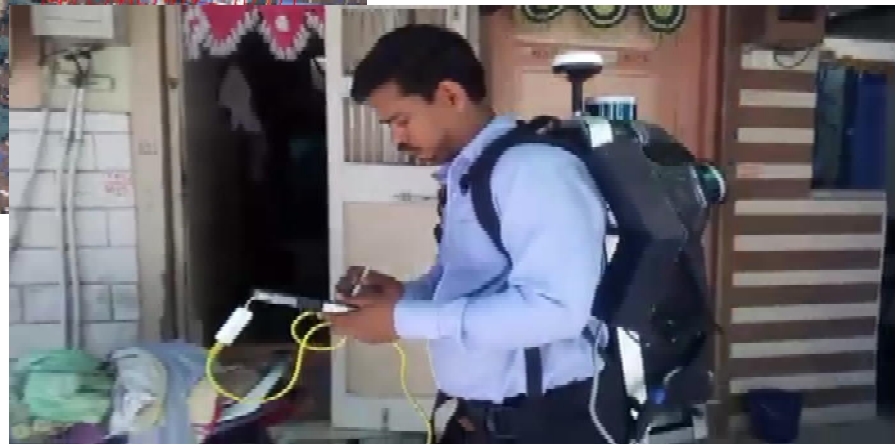**Pegasus:Backpack**

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Customer Example: Infrastructure Mapping of New Construction

Pegasus:Backpack

# Urban Planning and Monitoring – Infrastructure?

Credit: Genesys International

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Urban Planning and Monitoring

- Dimly lit corridors even during Mid-Day (Problem solved by using Flash mounted on the backpack)

- Extremely narrow lanes and by lanes

- Haphazard lane and by lane layouts

- Hutments present below ground level

- Closely spaced hutments with overlapping roofs causes problems in acquiring GPS fixes

- Varying Terrain Undulations

- Turbulence from slum dwellers and political unions
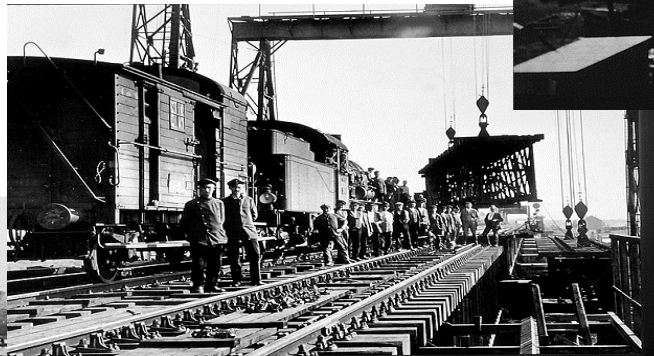
Credit: Genesys International

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Urban Planning and Monitoring - Deliverables

Hut Wall Extraction Top View

Hut Wall Extraction Side View

Credit: Genesys International

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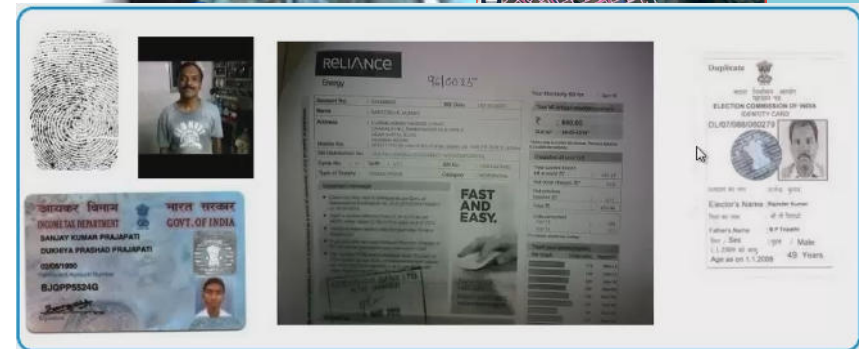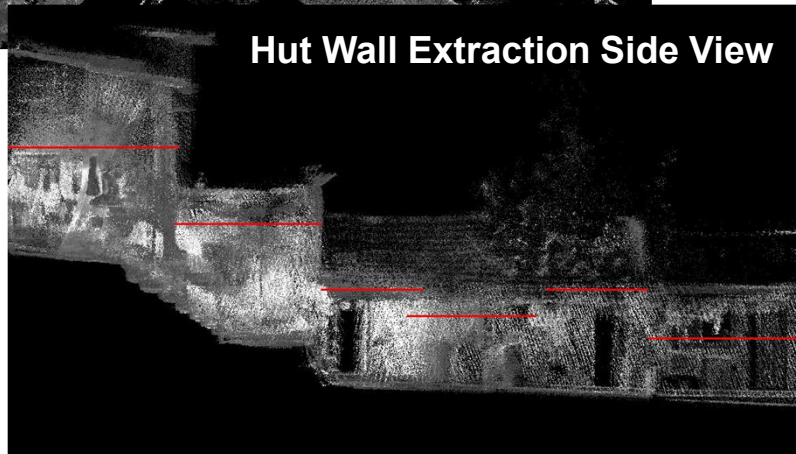
Rail Infrastructure – Maintenance of Rail Bridge

SiTrack:Two

Weserbridge
northern Germany
built 1873

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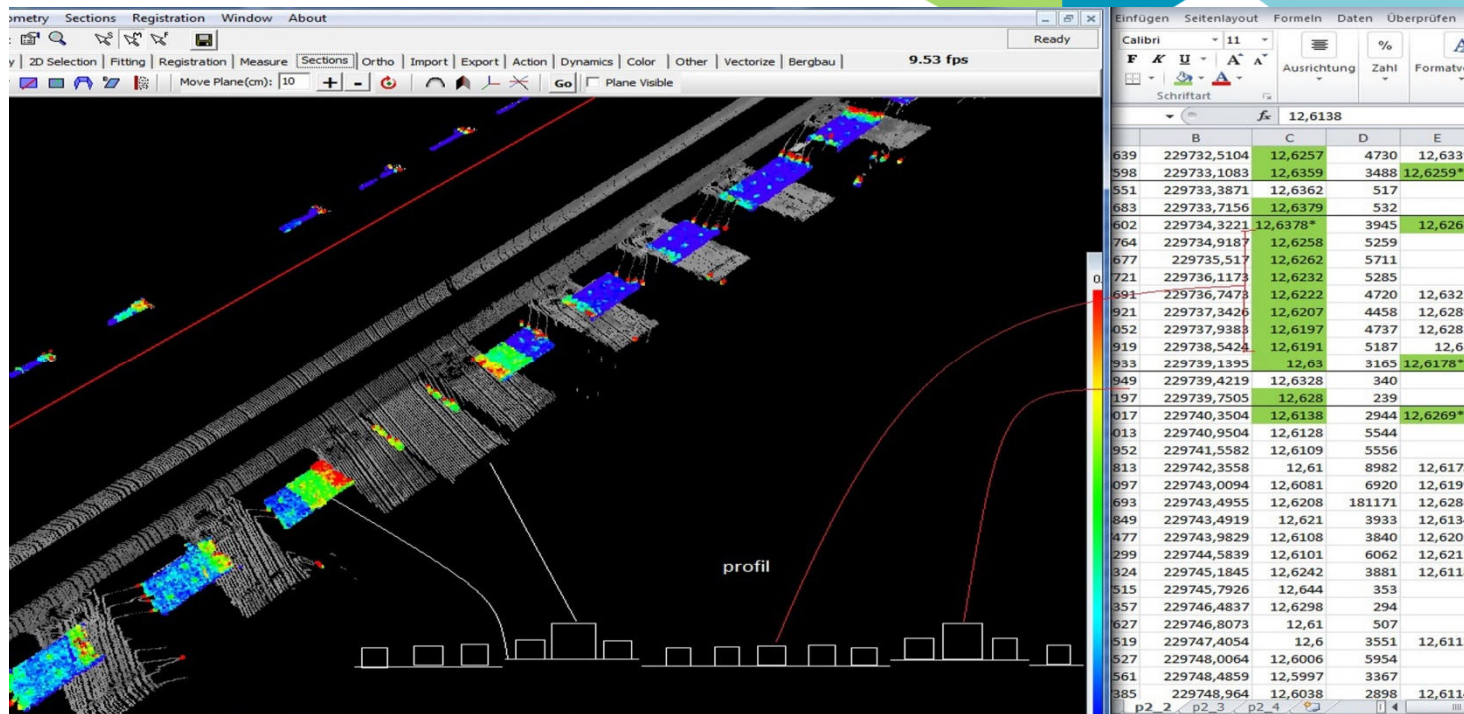# Rail Infrastructure – Maintenance of Rail Bridge

SiTrack:Two

Detection of the beams
because of bridge sleeper
renewal

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Rail Infrastructure – Maintenance of Rail Bridge

SiTrack:Two

Automatic beam detection and calculation of new sleeper dimensions
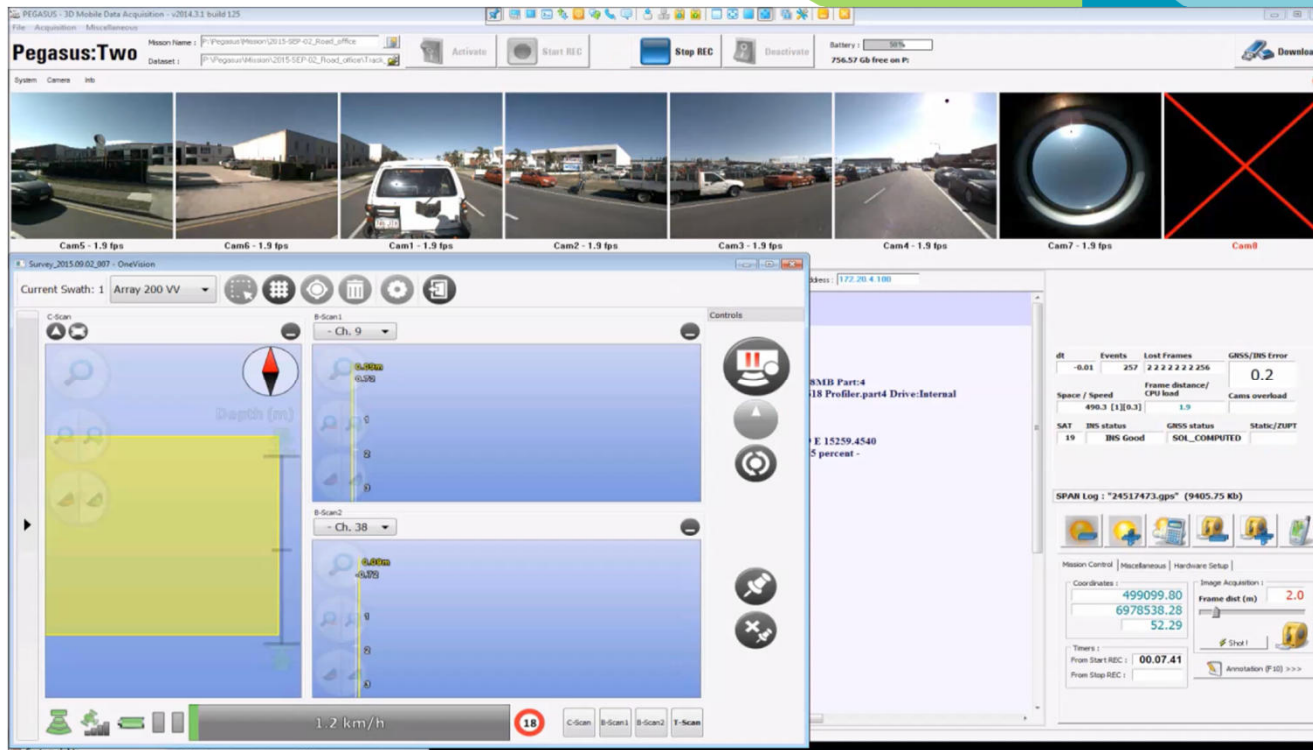(about 2000 sleepers) – measurement overnight (3 hours)

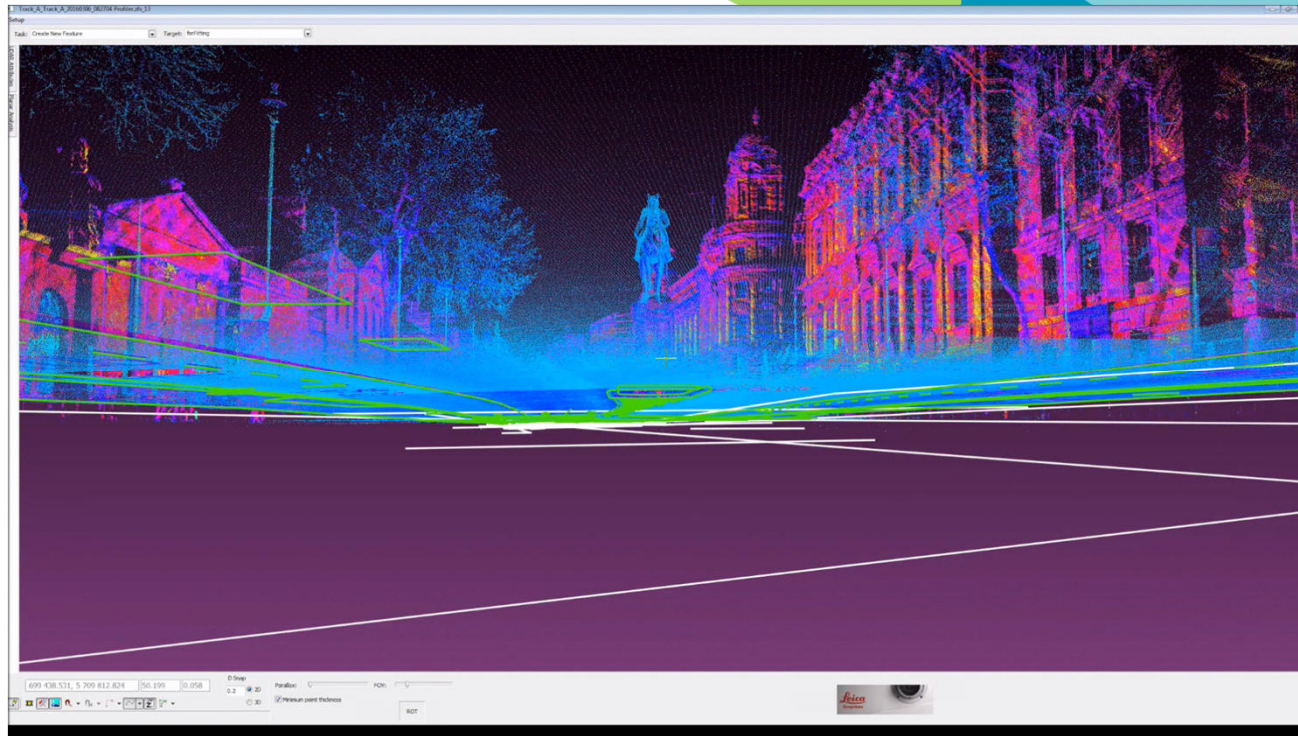# Rail Infrastructure – Maintenance of Rail Bridge

SiTrack:Two

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Below and Above Ground Asset Management

Mass asset management capture

Up to 10 m depth scan

Non-intrusive detection

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Below and Above Ground Asset Management

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Thank You

Stuart Woods
Leica Geosystems AG
E-Mail: stuart.woods@leica-geosystems.com
Website: www.leica-geosystems.com

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