AV '21 CONFERENCE ASPHALT PAVEMENTS 2021

Comprehensive, Full Spectrum, Road Condition Measurements – An Essential Element for Robust Road Maintenance and Rehabilitation Management

Bjarne Schmidt and Simon Tetley

23 – 24 November 2021, České Budějovice

Motto:
While we're driven by a passion for data and technology,
our purpose is people and the pavements that take them smoothly and safely from A to B.

40 SDRUŽENÍ PRO VÝSTAVBU SILNIC
ČESKÁ SILNIČNÍ SPOLEČNOST CZECH ROAD SOCIETY
EAPA
PRAGOPROJEKT
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Intelligent Pavement Assessment Vehicle

Subtitle: Comprehensive pavement condition measurements

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+ Roughness
Left & Right wheel paths

+ 3D Roughness
Full Lane

+ Texture
Centre & Both wheel paths

+ 3D Rutting
Full Lane

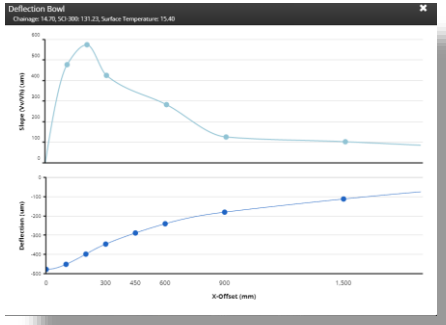
+ GNNS DGPS
geospatial location

+ 3D Cracking
Full Lane

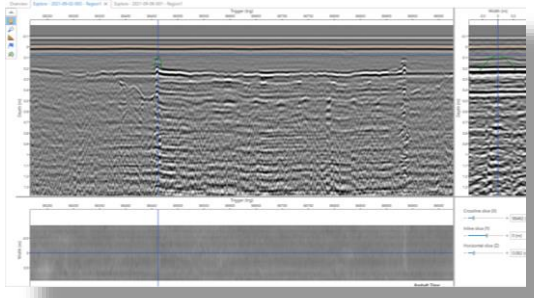
+ Geometry
Crossfall, Grade, Horizontal & Vertical curvature

+ 3D Surface Defects
Full Lane

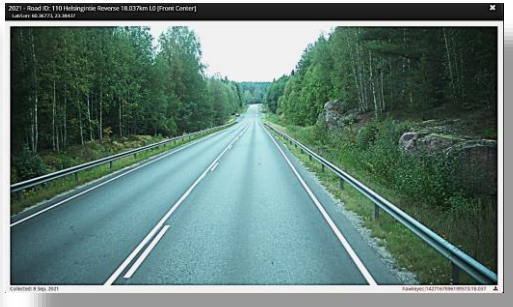
Continuous Deflection Measurement

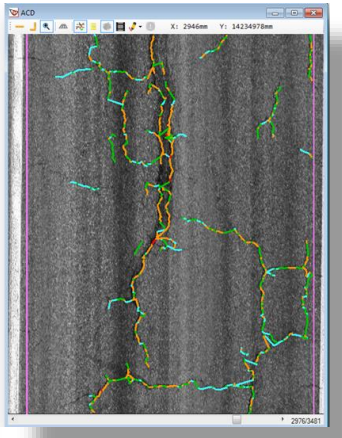


+ 3D Ground Penetrating Radar



+ Digital Imaging System





Simultaneous collection of Functional + Pavement layer + Structural data = Comprehensive Pavement Assessment

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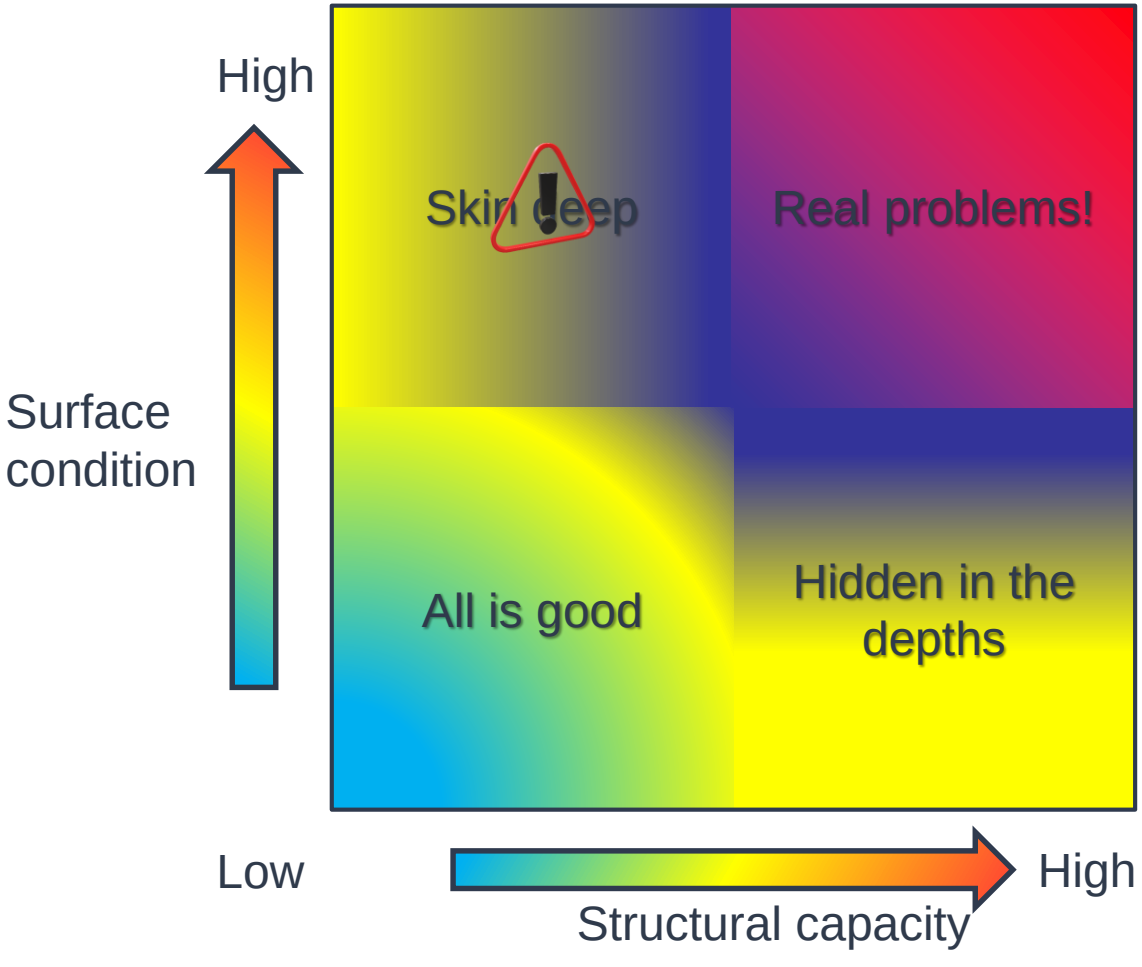
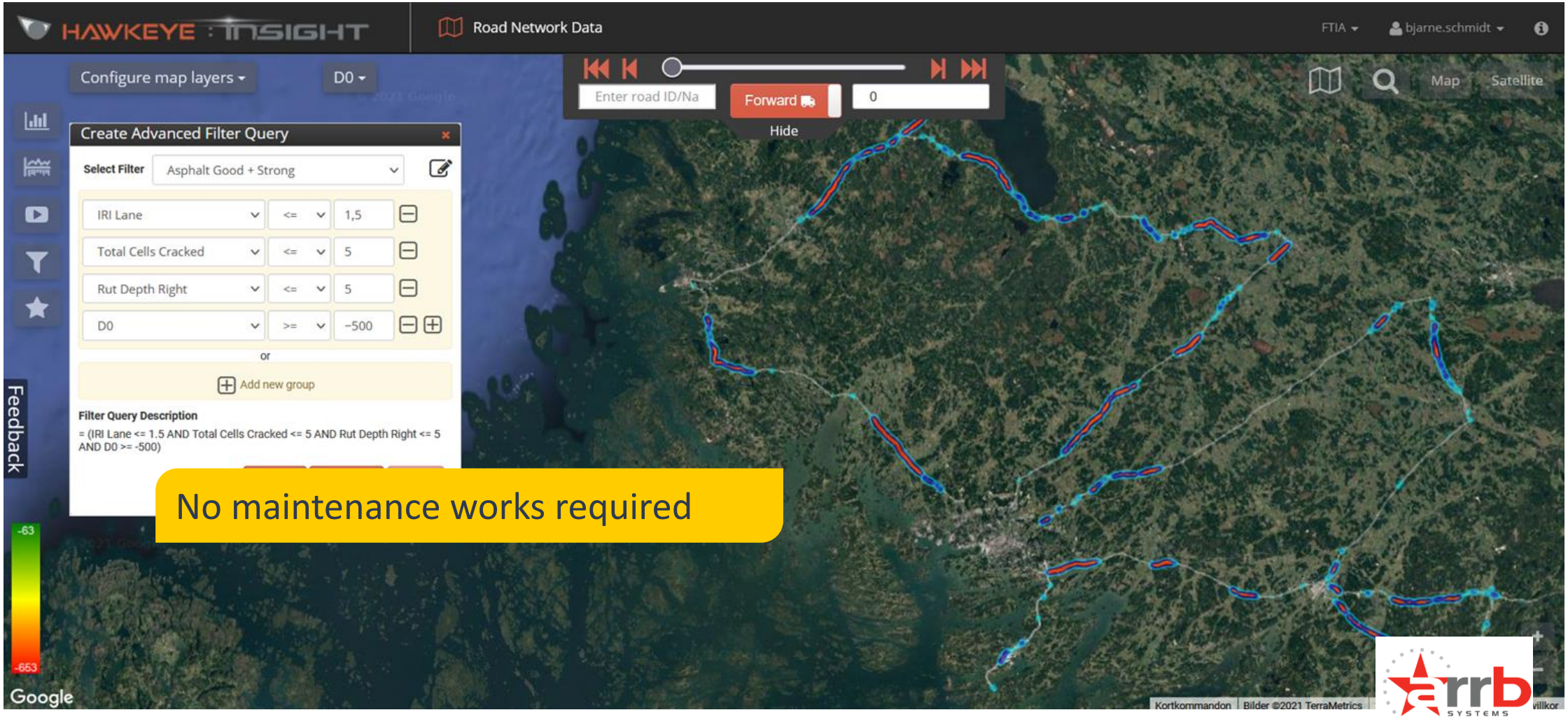
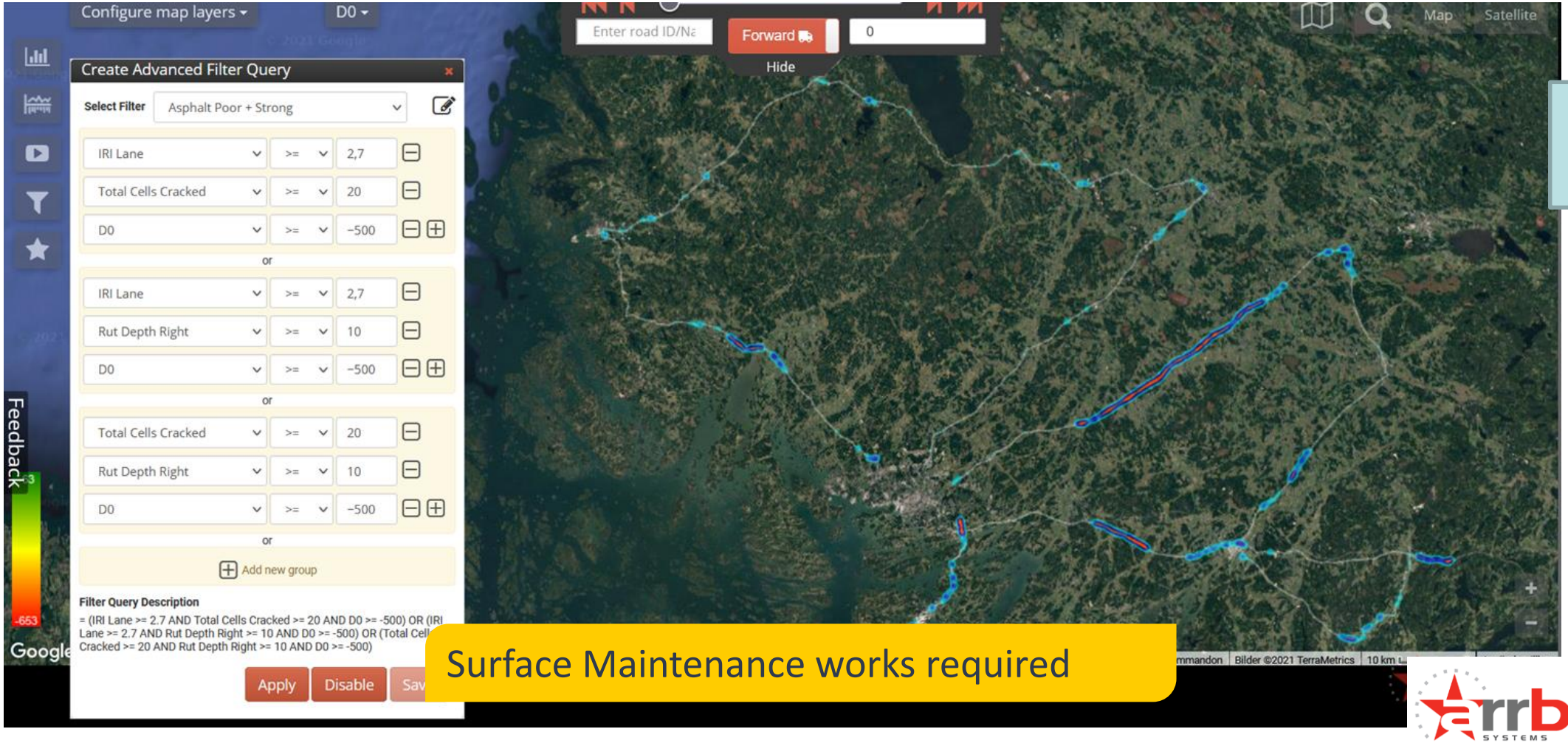
Advanced Filtering



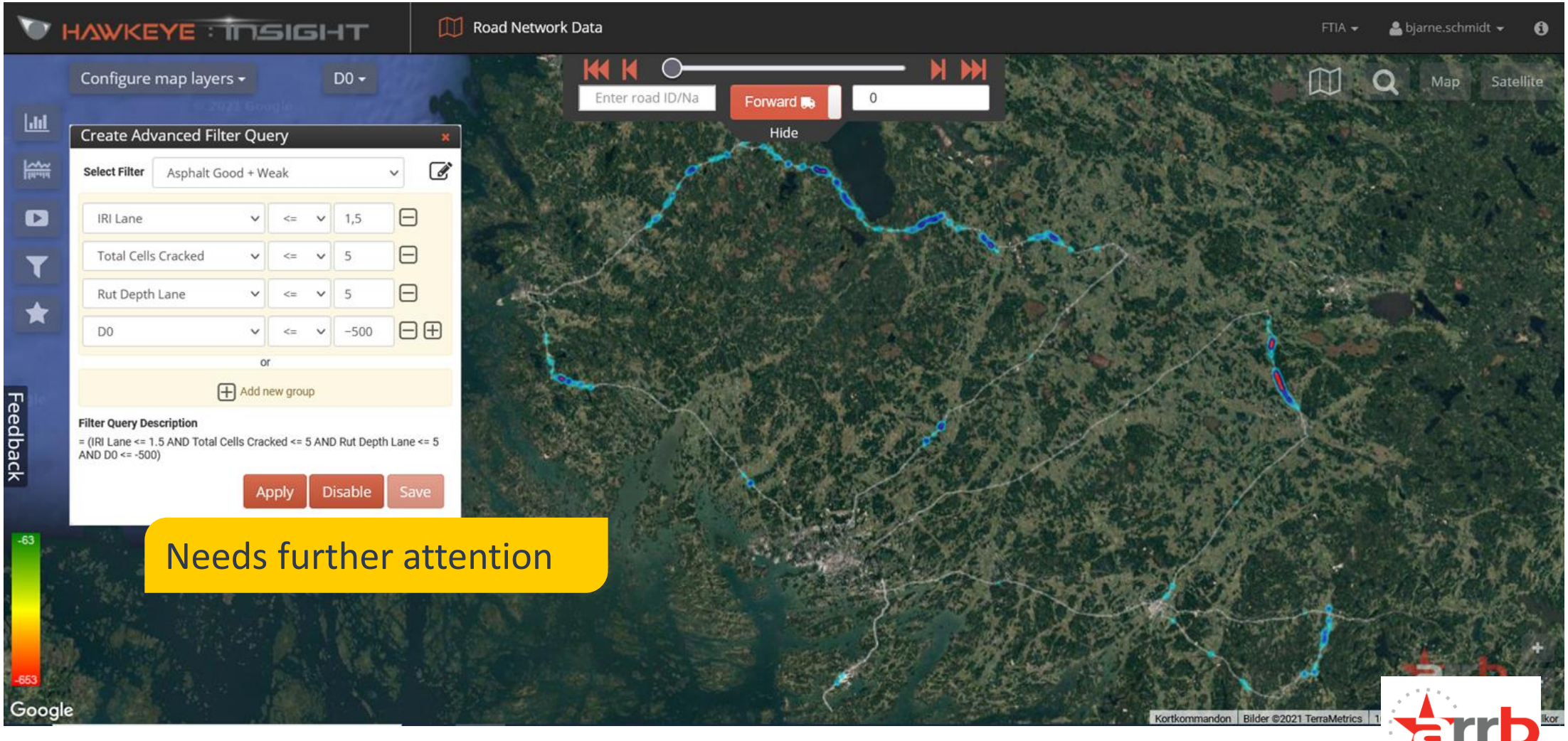
Good surface and a Strong structure



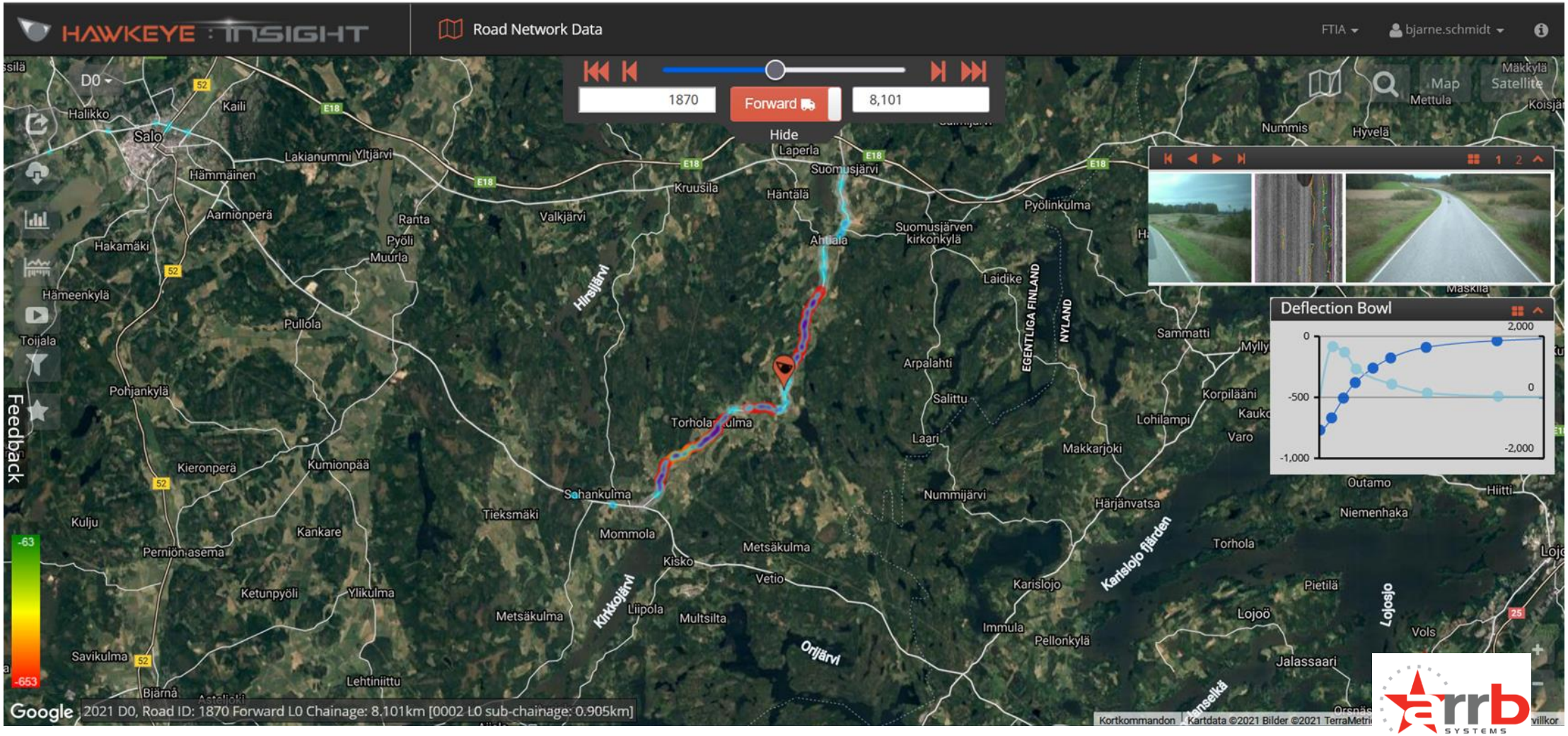
Poor pavement surface but a strong structure



Good surface condition, but weak structure



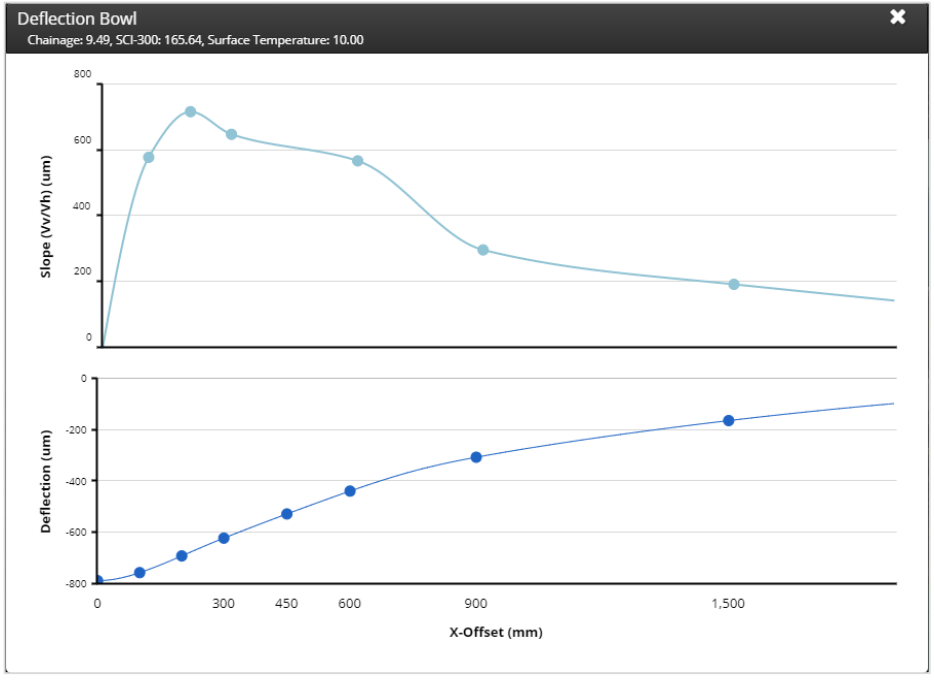
Network level data, project level detail

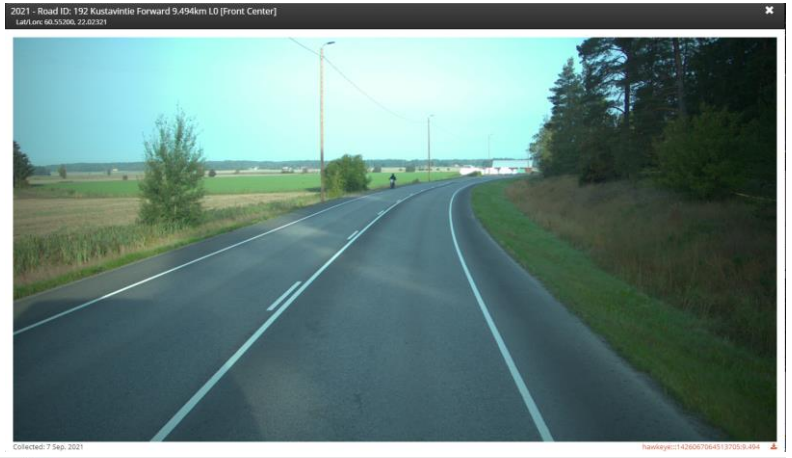


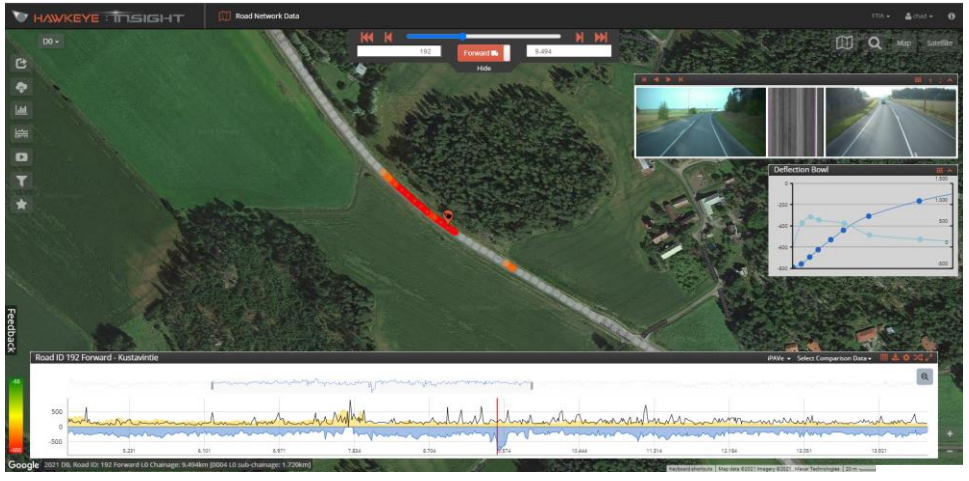
Project-level investigations

Good Surface/Weak Subgrade

- Area of weaker subgrade (high 600 slope)
- No surface indications
- Investigate further with GPR

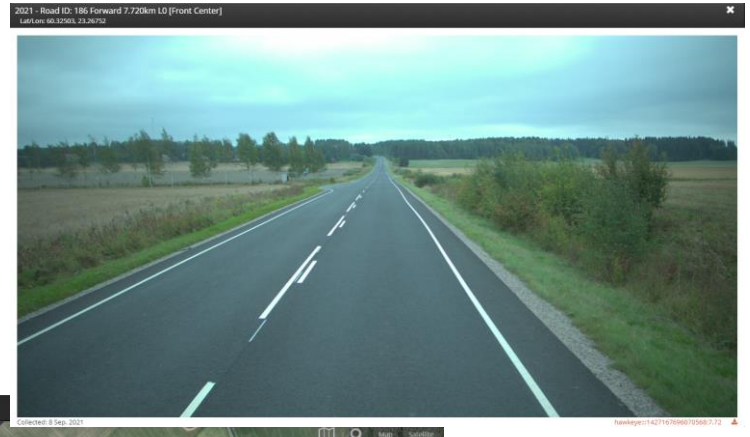


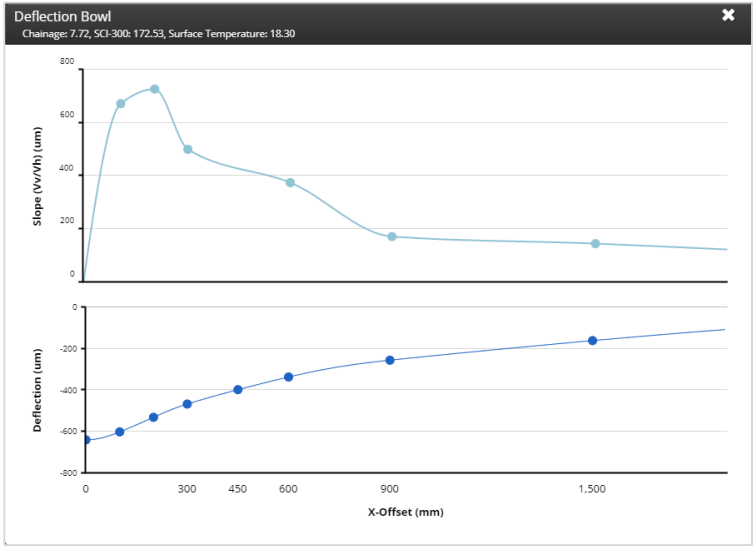




Good Surface/Weak Subgrade

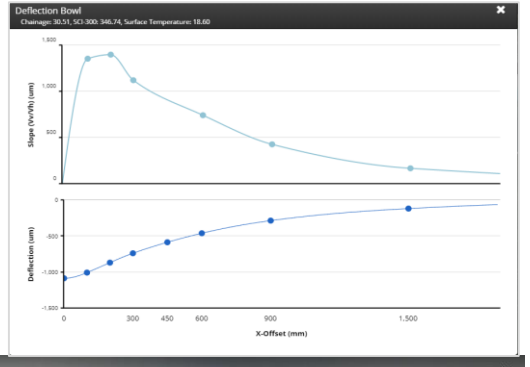
- Brand new surface with areas of weakness
- No surface indications
- Terrain and drainage seem ok
- High Slope 600
- Investigate further with GPR

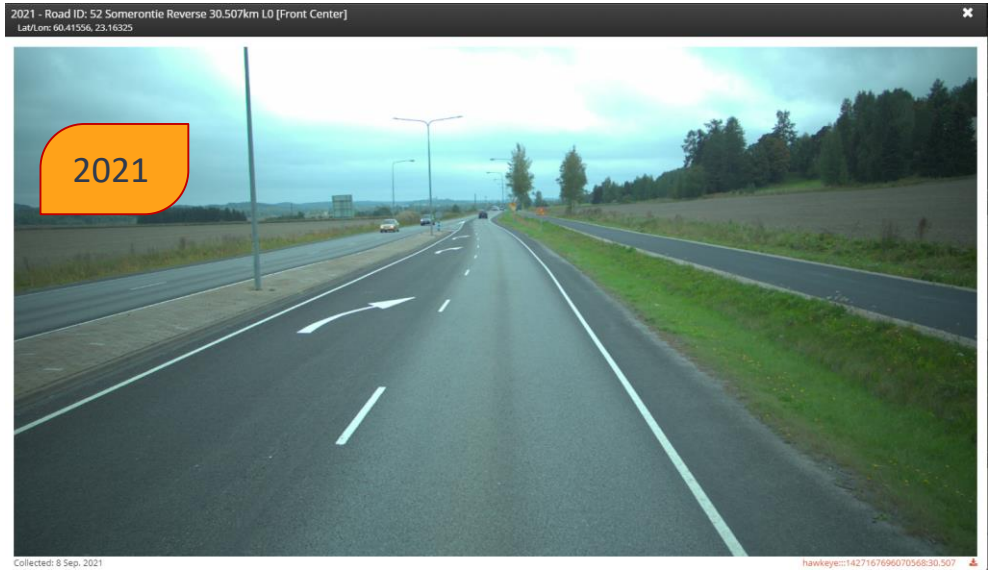




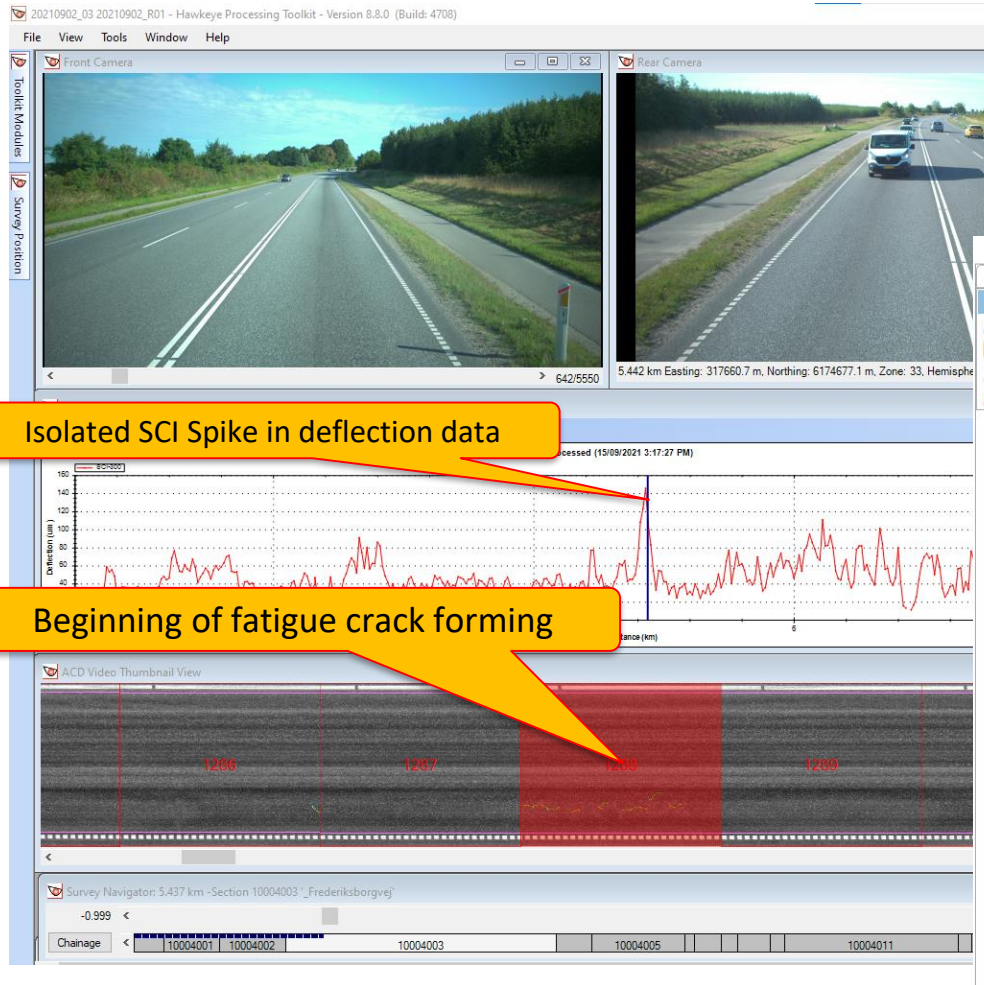
Future Structural Failure?

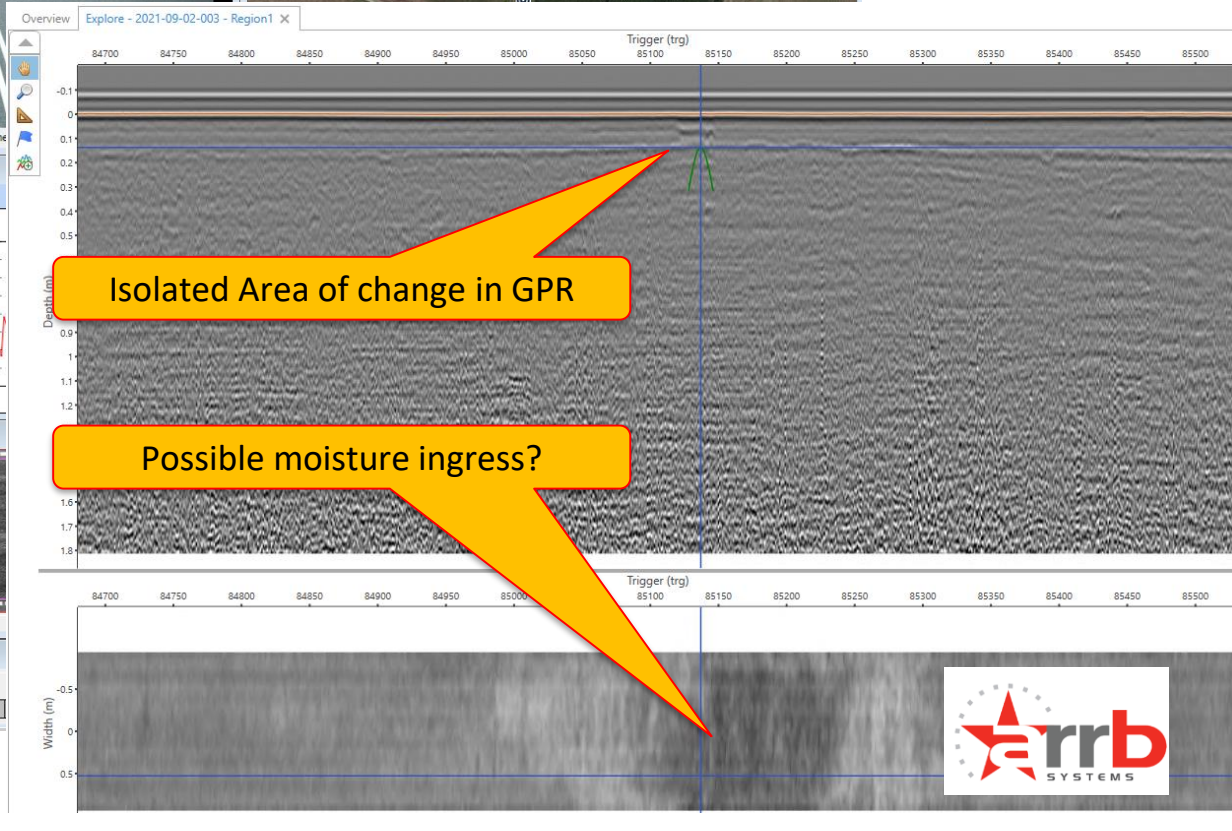
- Good surface with area of weakness
- 2021 No surface indications
- 2020 imagery shows extensive patching/fatigue issues
- Future Structural failure?



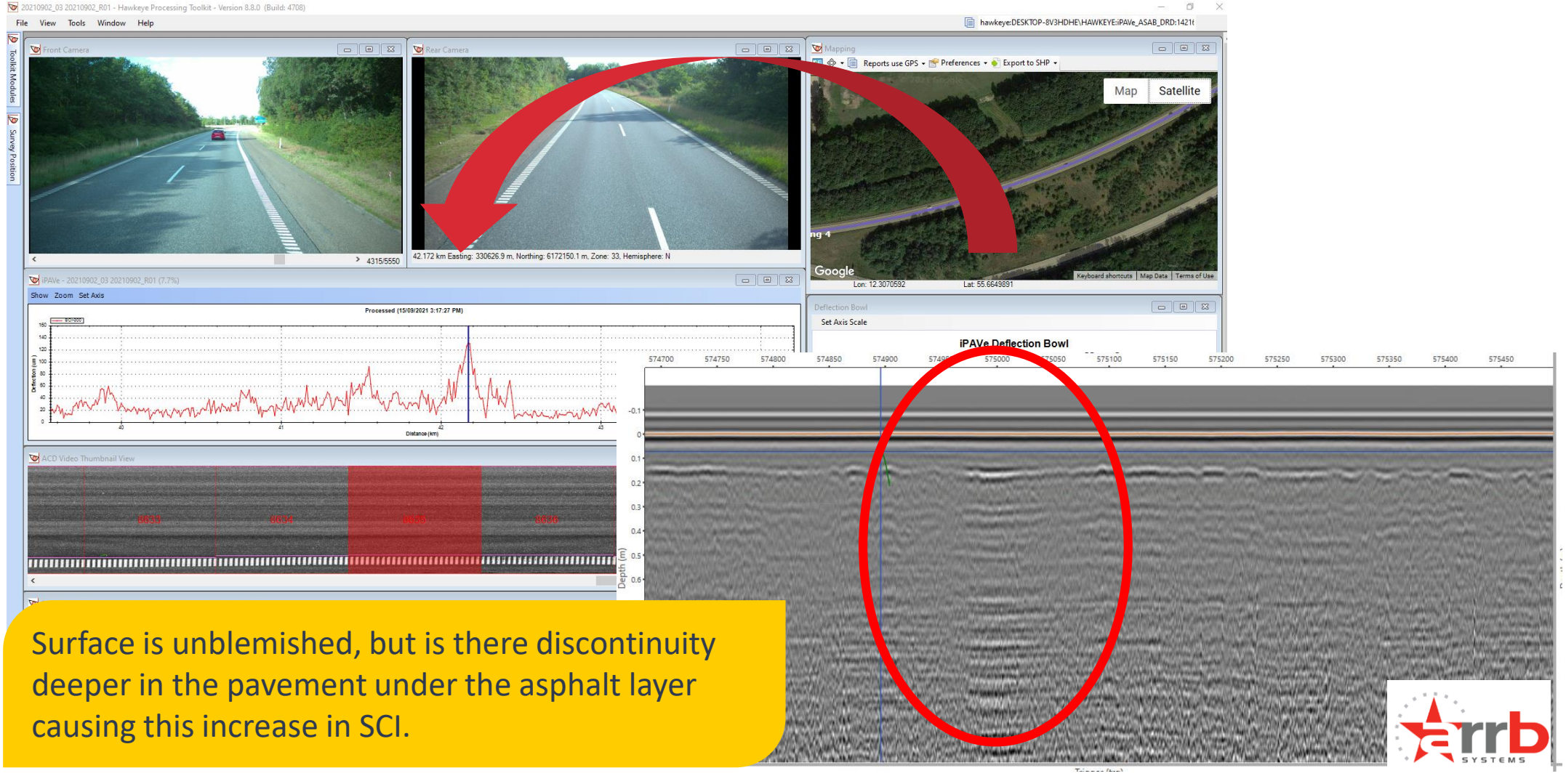


iPAVe with GPR



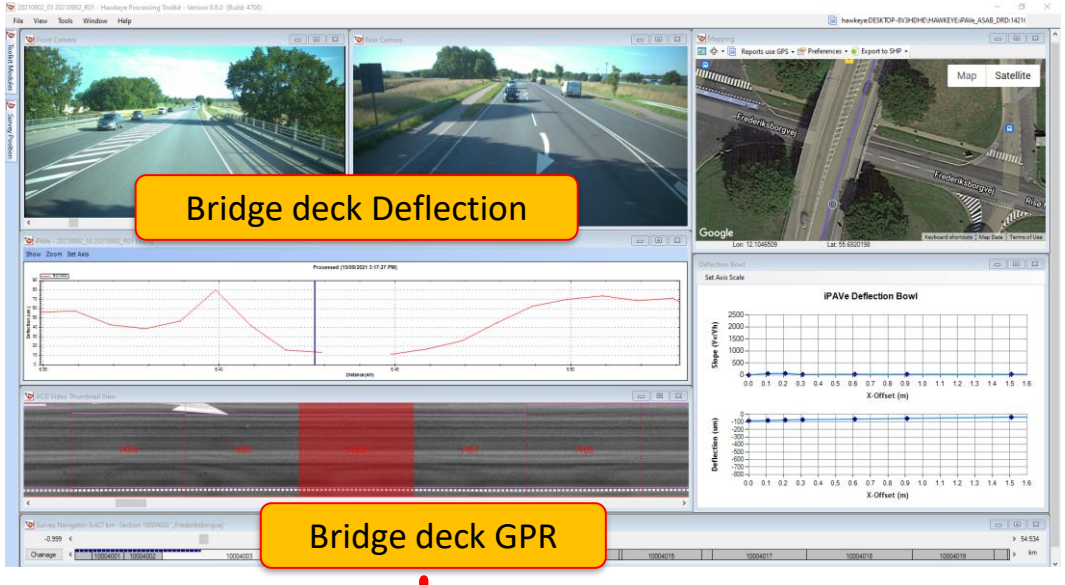


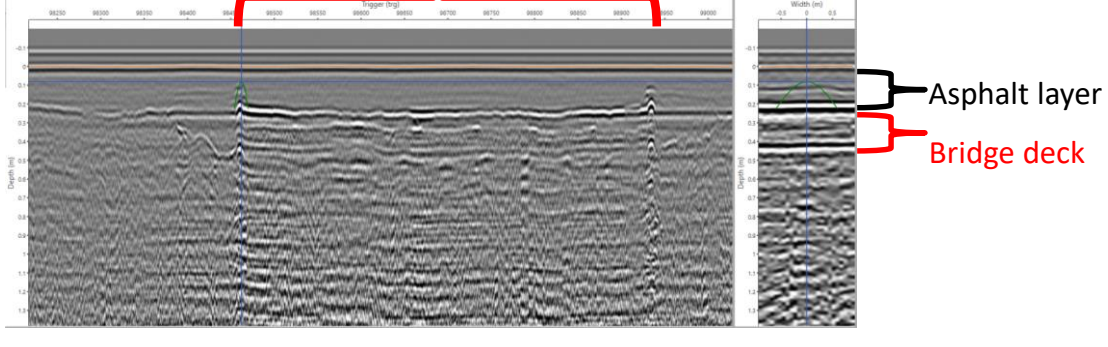
iPAVe with GPR



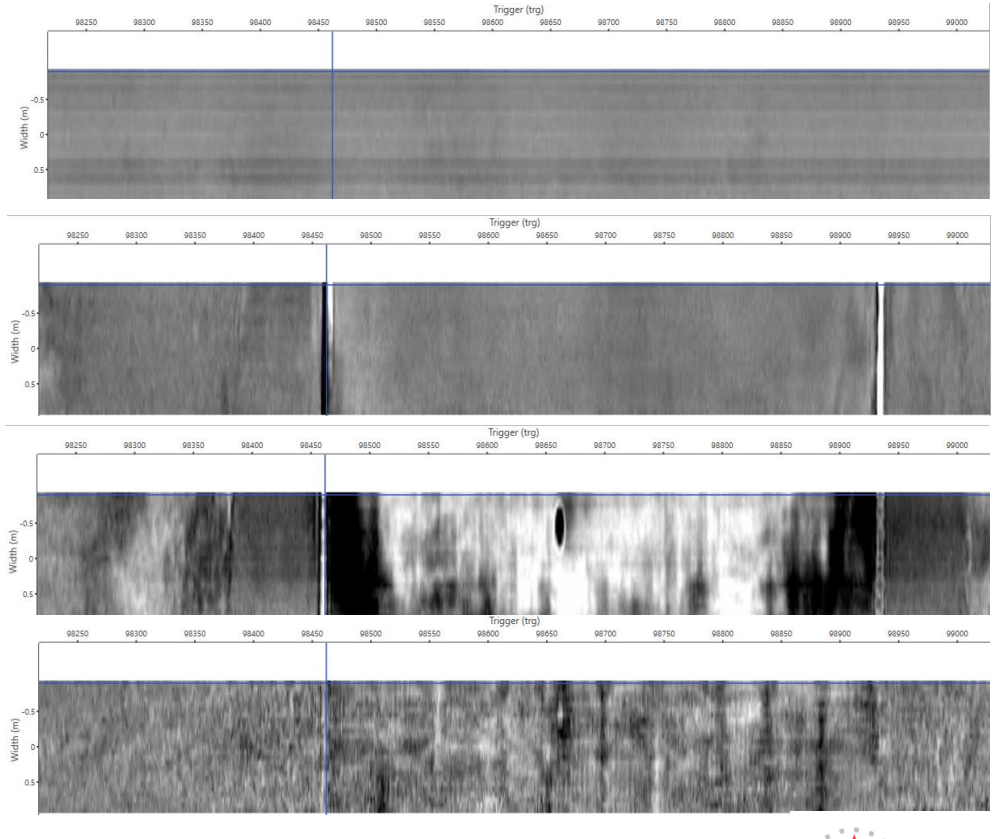
Surface is unblemished, but is there discontinuity deeper in the pavement under the asphalt layer causing this increase in SCI.

iPAVe with 3DGPR





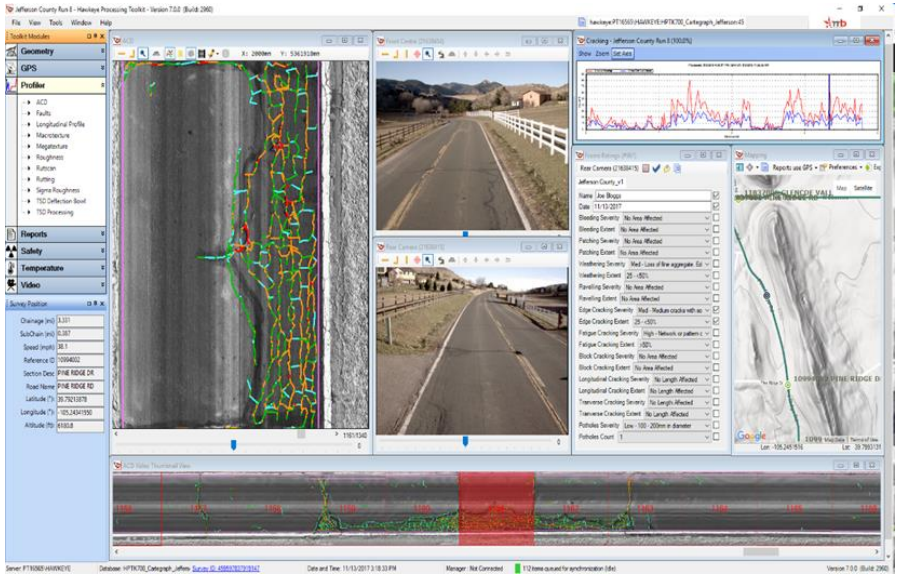
3D Radar allows for layer slicing to examine each layer in detail



Often asked questions?

Can we obtain results that are comparable with what we use today, when using the iPAVe for in-depth project level investigation of functional conditions?

Yes – The iPAVe produces standardized performance indicators and complies with all international standards for road surface condition measurements.



Longitudinal Profile

- *World Bank (Class 1)*
- *ASTM E950 (Class 1)*
- *EN 13036-6 (Class L1111)*
- *ASTM E1656 (Class L111)*
- *EN 13036-6*
- *ASTM E1926-08*
- *AASHTO M 328*
- *AASHTO R 43*
- *AASHTO R 54*
- *AASHTO R 57*
- *ASTM E1845*

Transverse Profile

- *AASHTO R 87-18*
- *AASHTO R 88-18*

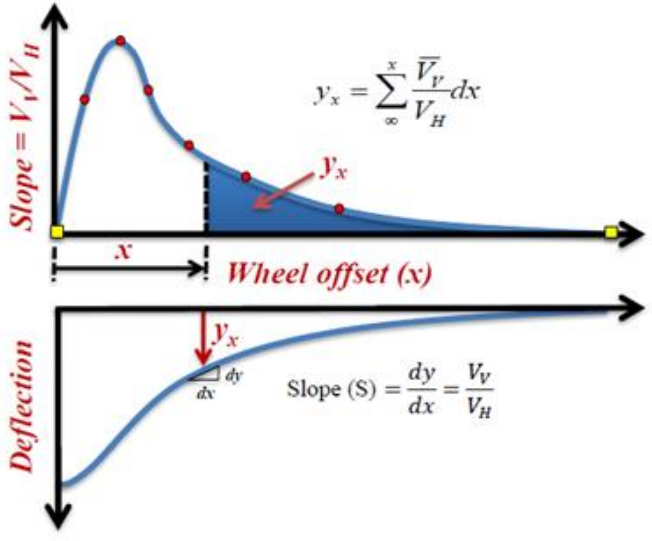
Texture Profile

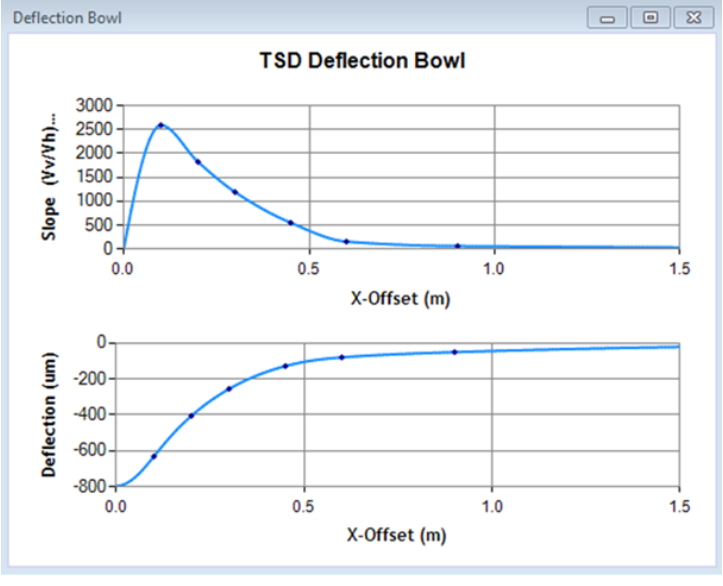
- *ISO 13473*
- *TRL Lab Rep. 639*

Often asked questions?

Can we obtain results that are comparable with what we use today, when using the iPAVe for in-depth project level investigation of structural capacity?

Yes - The iPAVe produces pavement velocity slope data that can be numerically integrated into pavement deflection data by using the "Area Under The Curve" (AUTC) approach.

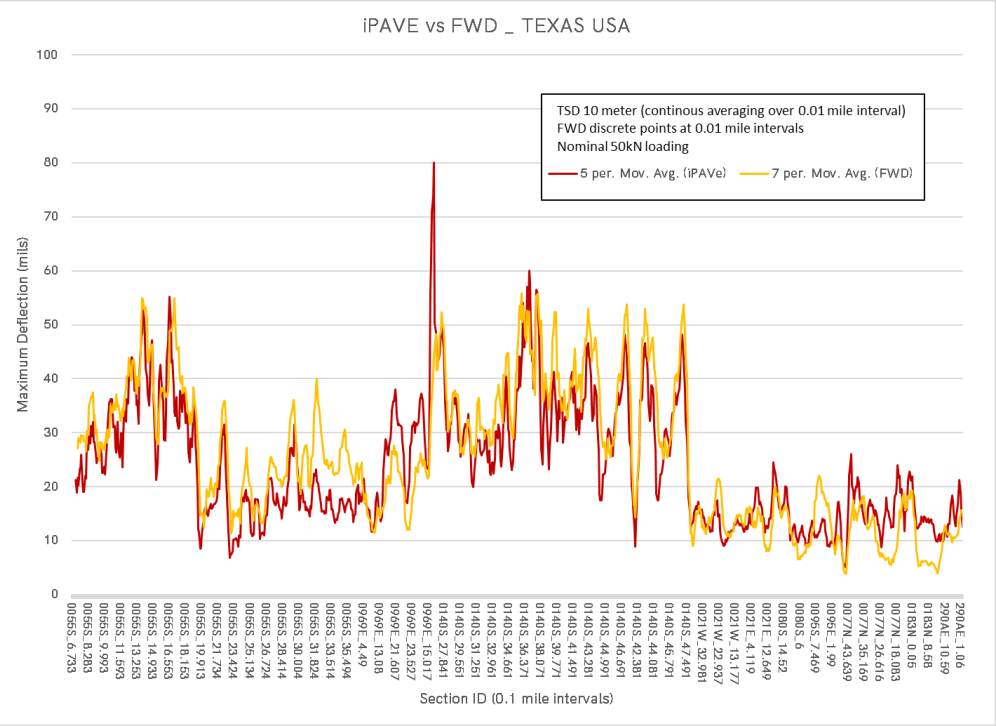


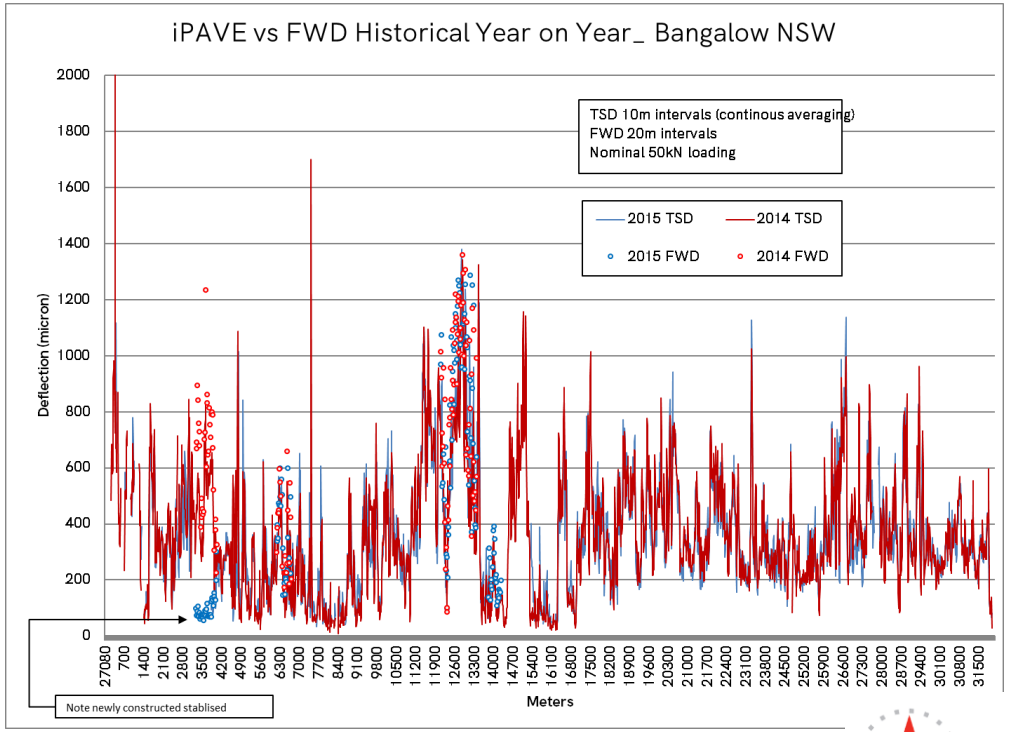


Often asked questions?

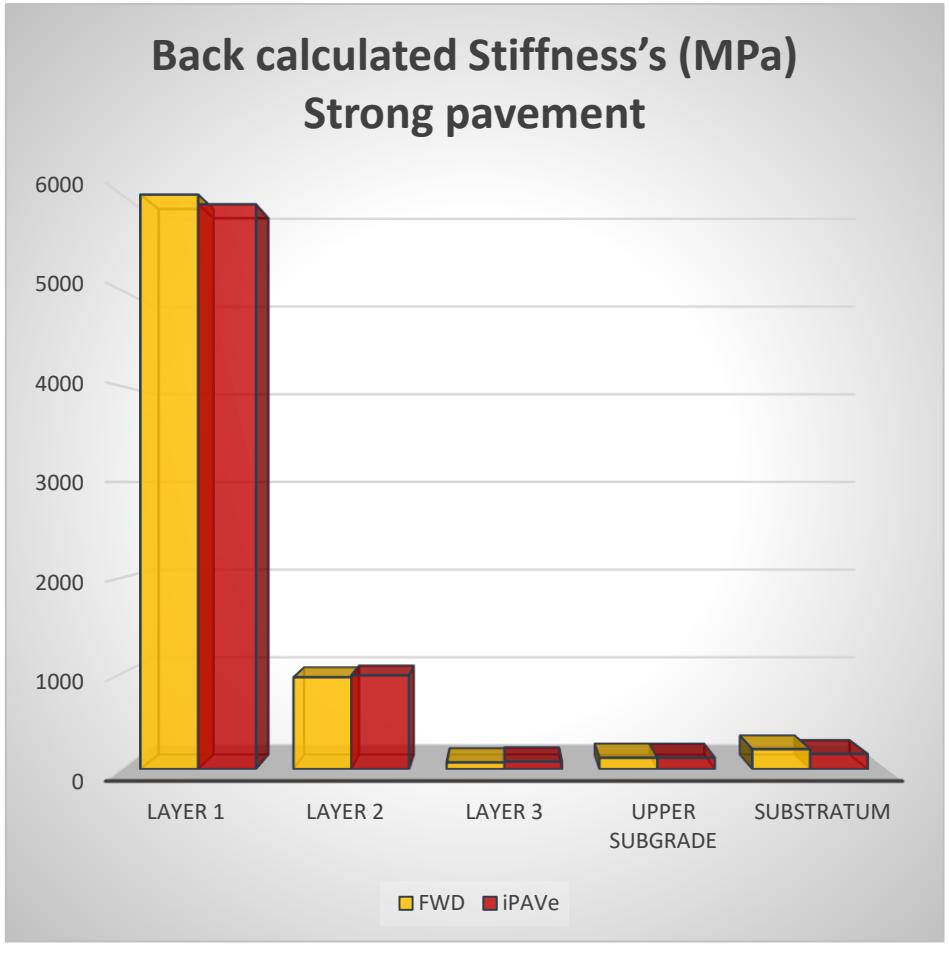
Is the iPAVe comparable with FWD when evaluating structural pavement life?

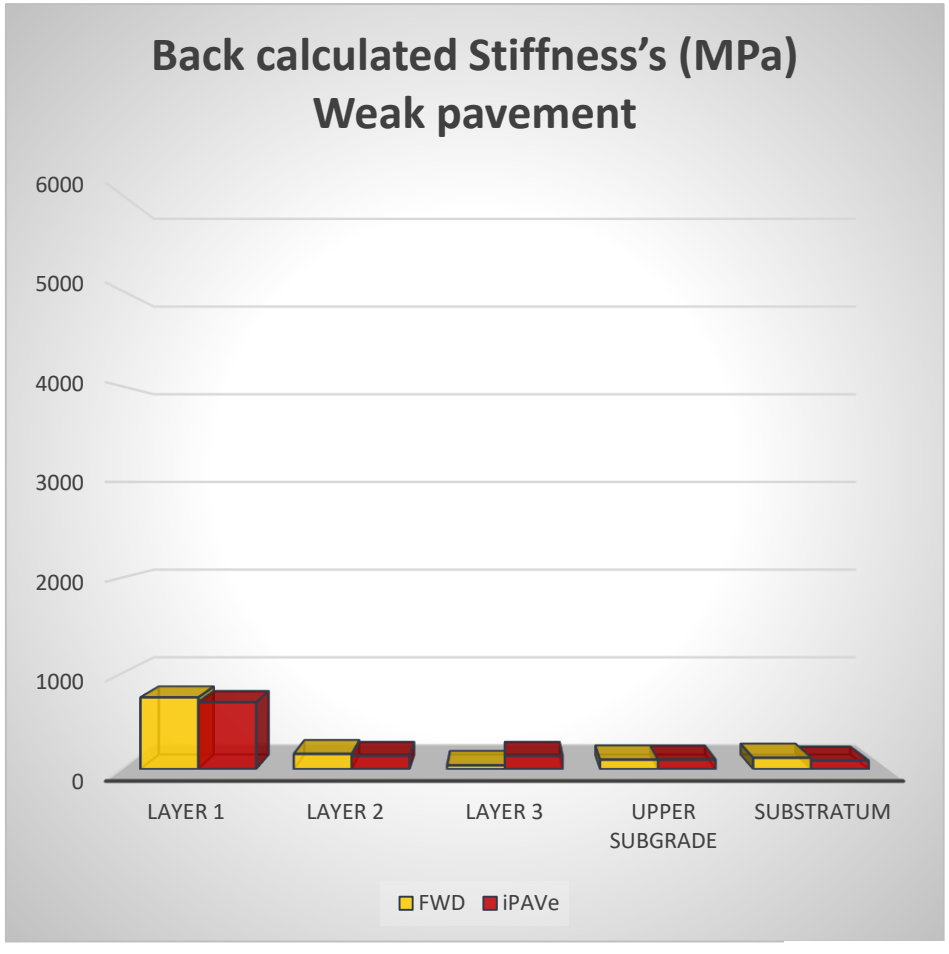
Yes - Here are real-world examples of iPAVe vs FWD comparisons all around the world





Comparing FWD and iPAVe bearing capacity





So, to answer the question…

Is the iPAVe comparable with FWD, when evaluating structural pavement life?

YES, but the iPAVe is much more than that…

Because!

- ✓ **It creates the full picture of the road infrastructure condition**
- ✓ **It allows you to study the bearing capacity and the surface condition based on equal climatic and traffic related grounds.**

Using the iPAVe, it is possible to locate and classify roads into categories such as:

Poor bearing capacity and poor surface conditions, cracks or rutting or unevenness or all together = **short lifetime**

Poor bearing capacity and good surface conditions, no cracks, no rutting, no unevenness etc. = **intermediate to short lifetime**

Good bearing capacity and poor surface conditions, cracks, rutting, unevenness etc. = **adequate lifetime**

Good bearing capacity and good surface conditions, no cracks, no rutting, no unevenness etc. = **long lifetime.**

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- Questions?

Data driven

pavement people.

While we're driven by a passion for data and technology, our purpose is people and the pavements that take them smoothly and safely from A to B.

E: Bjarne.Schmidt@arrbsystems.com
M: +46 76 343 6060
ARRB Systems AB
31 Hyllie Stationstorg,
Malmö 215 32 Sweden
europe@arrbsystems.com

PAVEMENT MANAGEMENT INTELLIGENCE