ADEPT Lunch and Learn

The detail in the data

The role of highway condition data in carbon management

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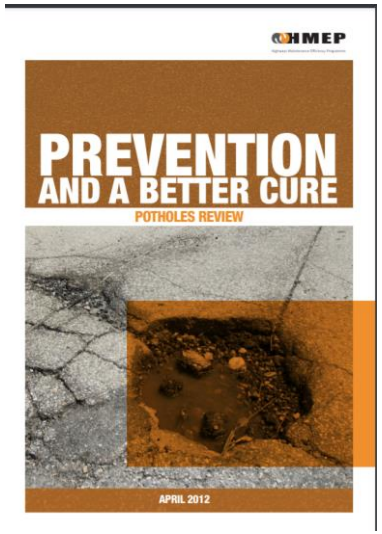
Context

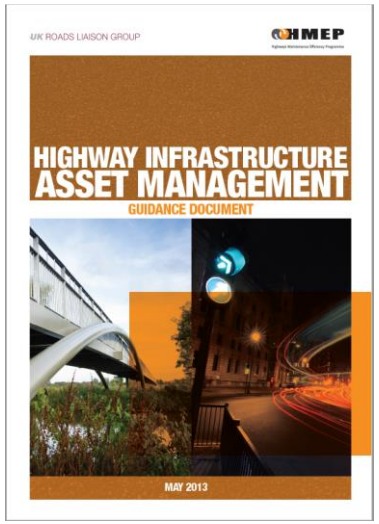
2012 – Potholes Review

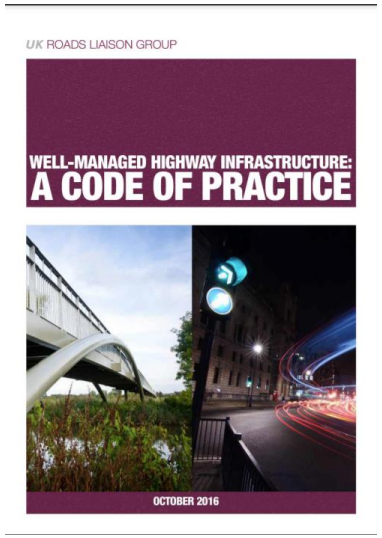
2013 – Highway Infrastructure Asset Management

2016 – Well-managed Highway Infrastructure

2021 – COP 26 (Net Zero CO_2 by 2050????)







Typical Defects

Survey Vehicles

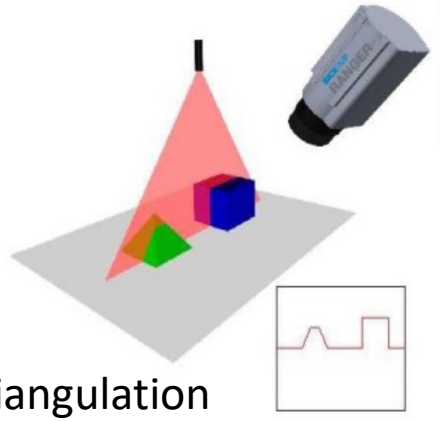
- SCRIM – surface friction plus capacity to add additional measurement systems

- WDM's Road Assessment Vehicles or RAV's simultaneously measure over 40 different measurements of road condition.
- High resolution scanning lasers and downward facing imagery allow many different surface characteristics to be determined. The SCANNER Specification and the focus on RCi (road condition index) means that most of this information has been ignored.

Measurement Systems

SCRIM Test Wheel Assembly

Transverse profile system lasers



On all WDM SCANNER vehicles

Transverse Profile is measured using Laser Triangulation

A laser light in a fanned shape

A multi-scan camera provides a 3D output

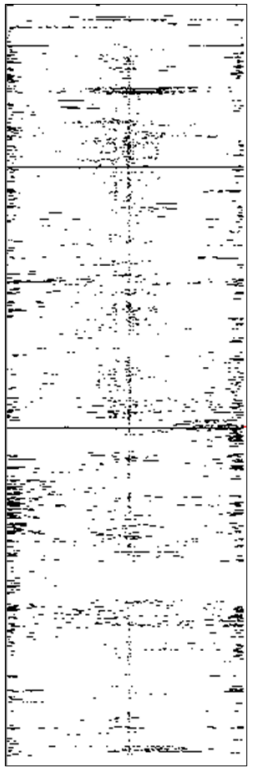
Rutting is calculated using image of the profile

Road Assessment Vehicles

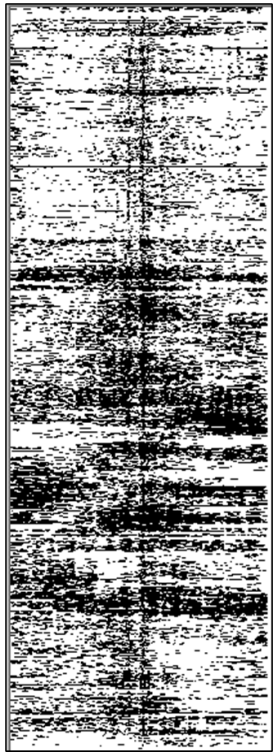
Cracking system laser and camera unit.

Road Assessment Vehicles - Additional Data sets

If we step outside the constraints of the SCANNER specification and release the true capability of the cracking and transverse profile systems, we can access some really powerful data sets.



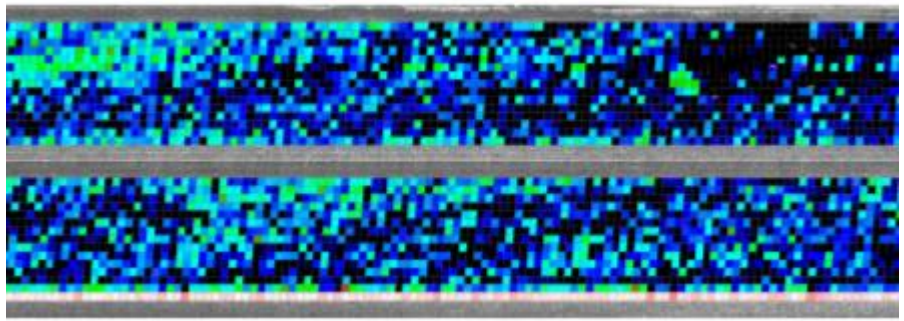
Crack detection SCANNER spec filter



Cracking detection WDM proprietary filter

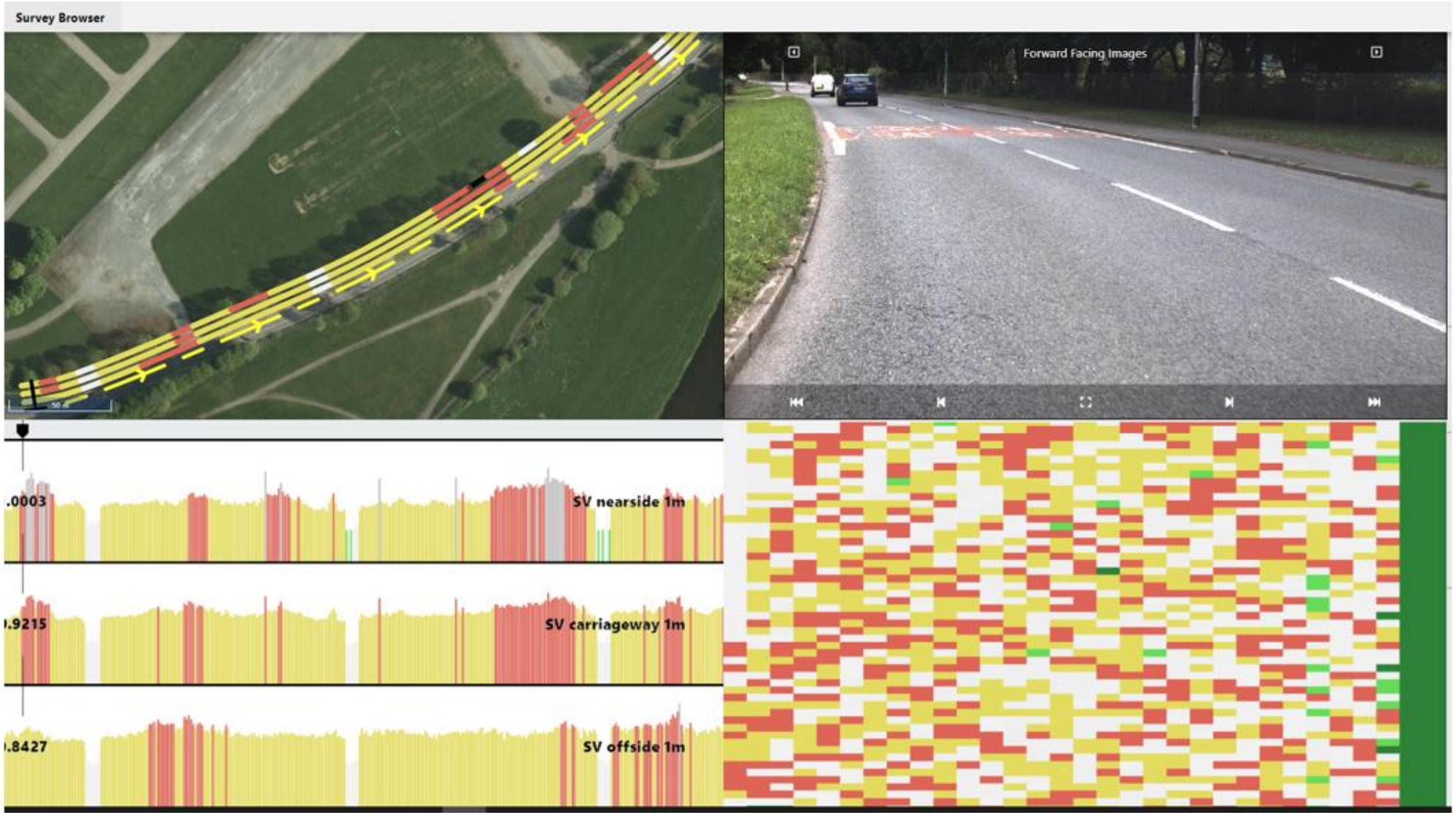
Road Assessment Vehicles - Additional Data sets

Analysing both cracking and scanning laser output files on a 100mm x 100mm grid produces a detailed 3D scan of the road surface.

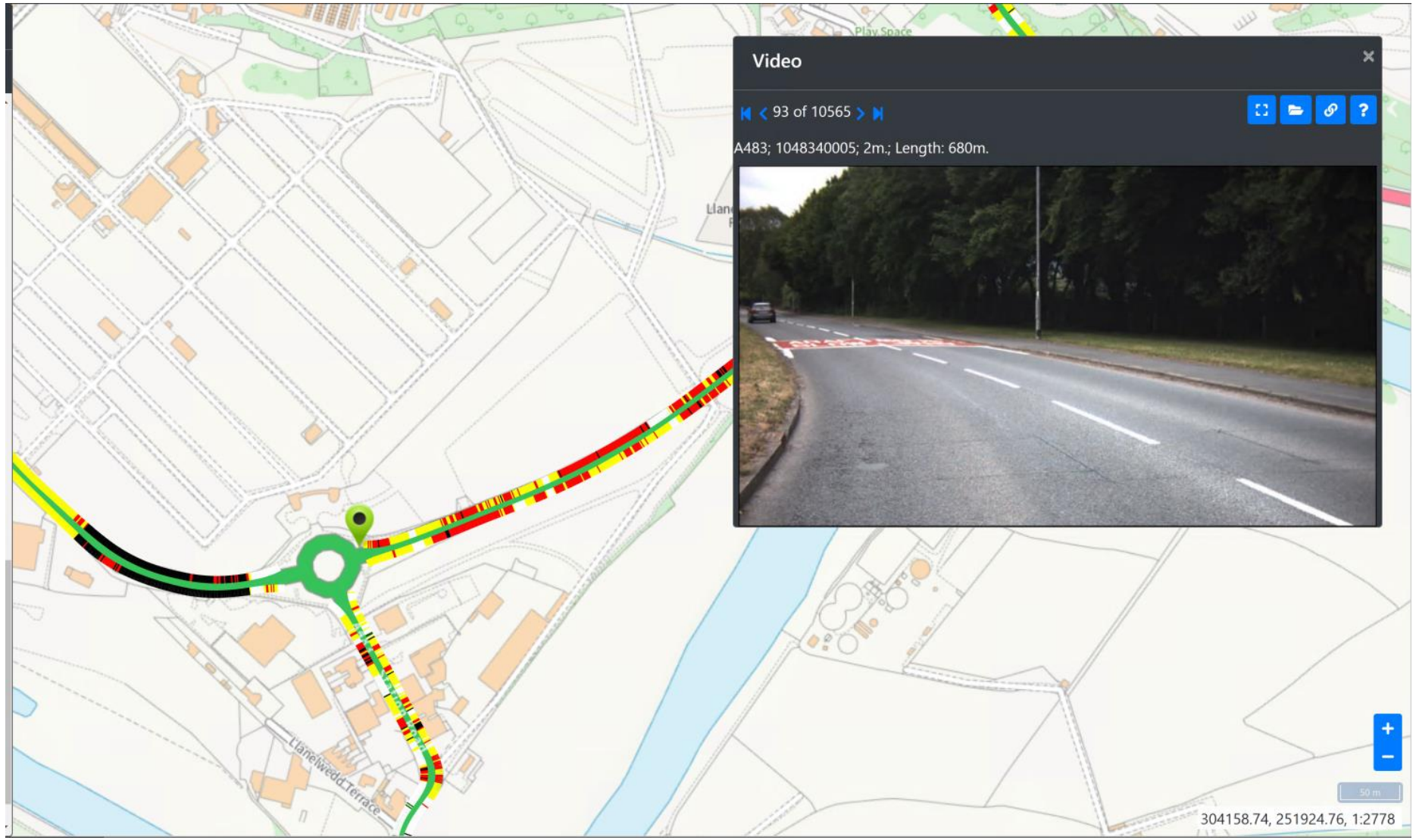


This can then be further analysed to give a very accurate and repeatable picture of the surface variation, which in turn can be combined with other datasets to track minute changes in the carriageway surface.

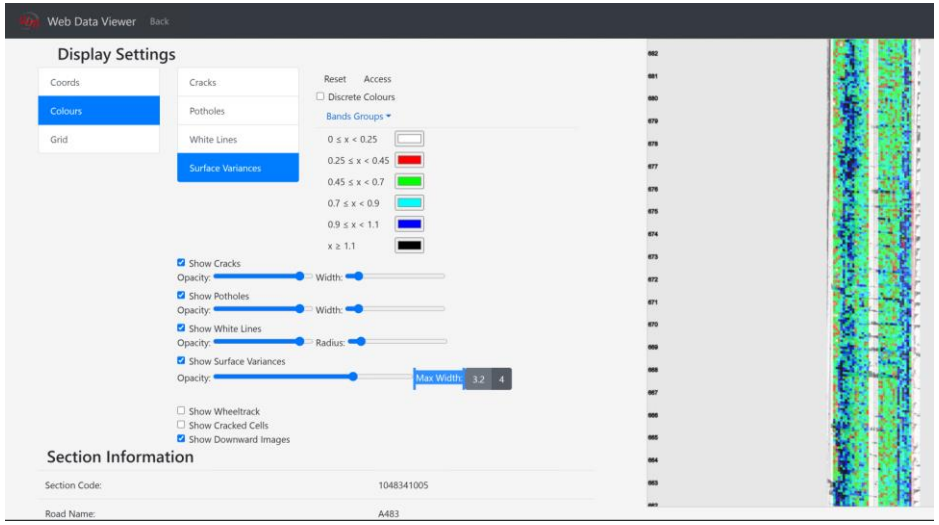
Surface Variability (100mm x 100mm grid)

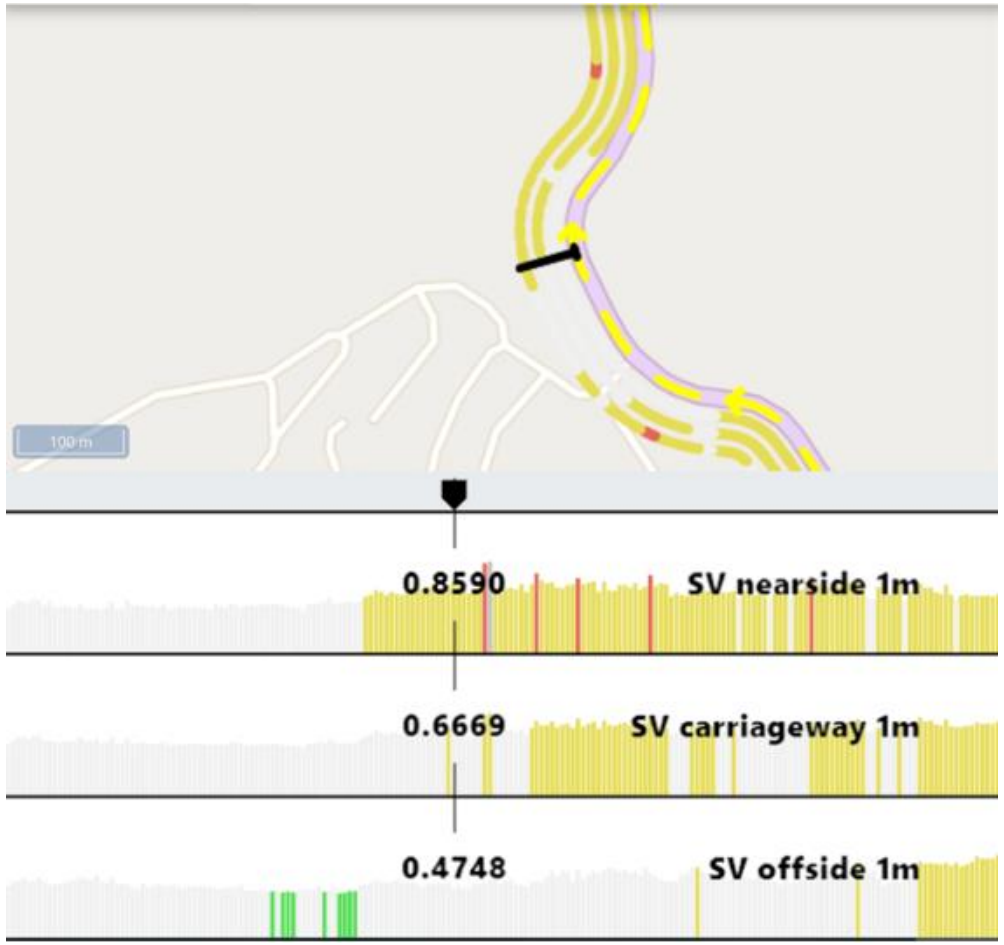


Surface Variability in PMS



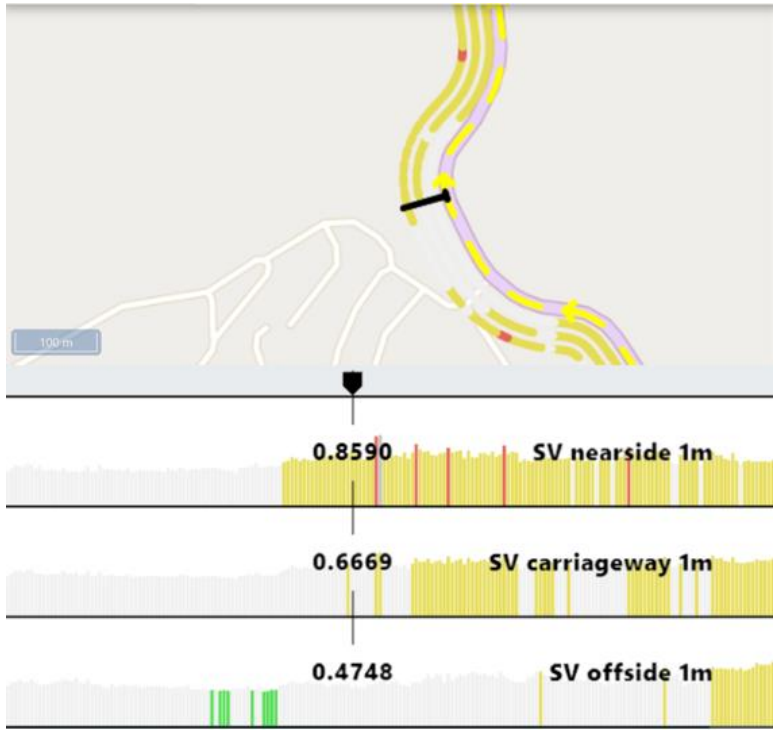
Surface Variability as a means of identifying defects



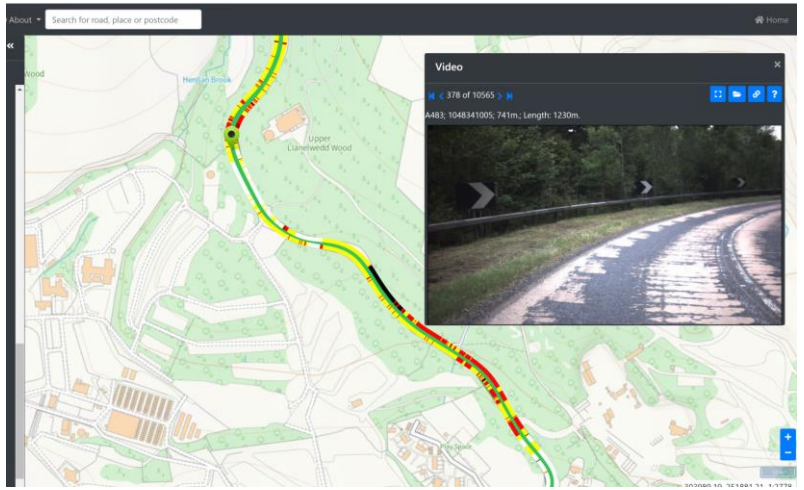


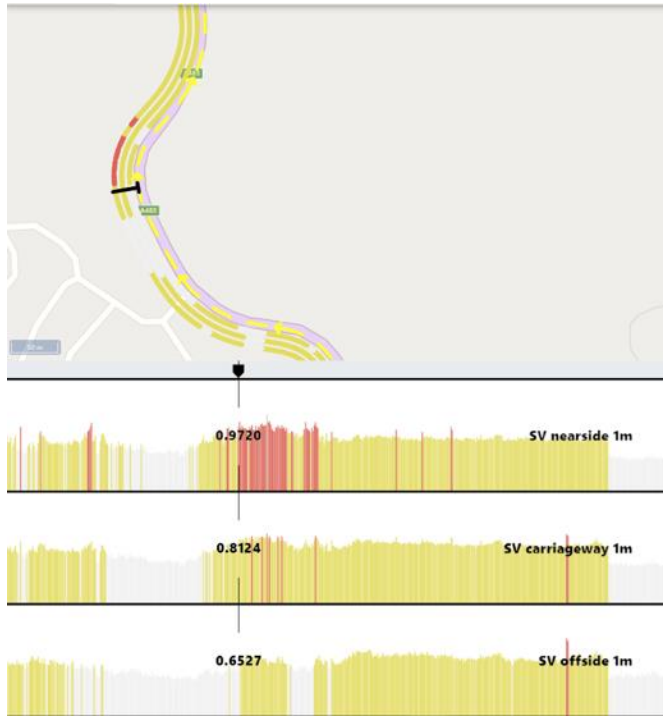
Surface Variability as a means of identifying change

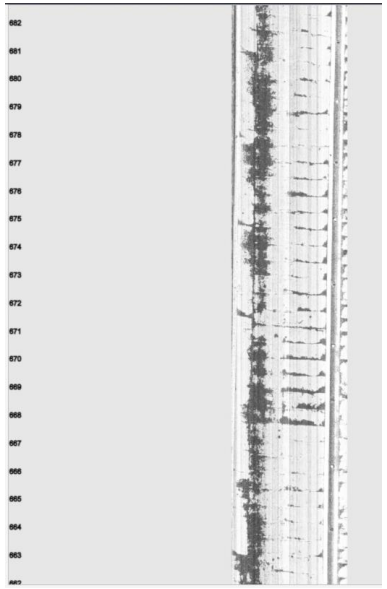
2020

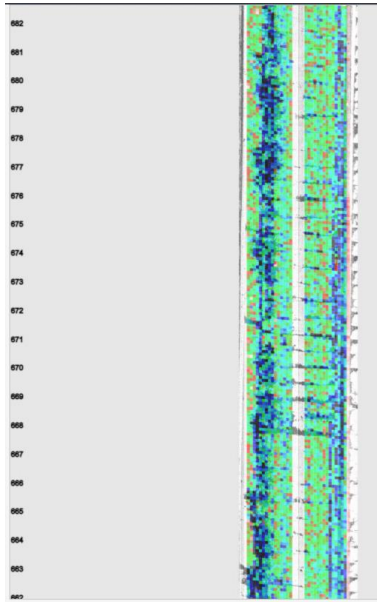


2021





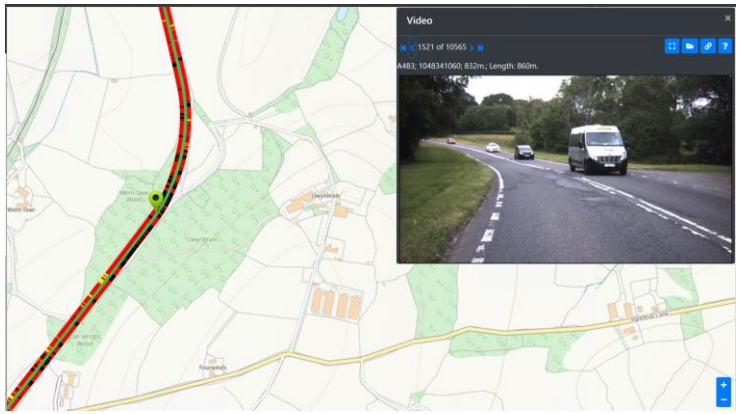


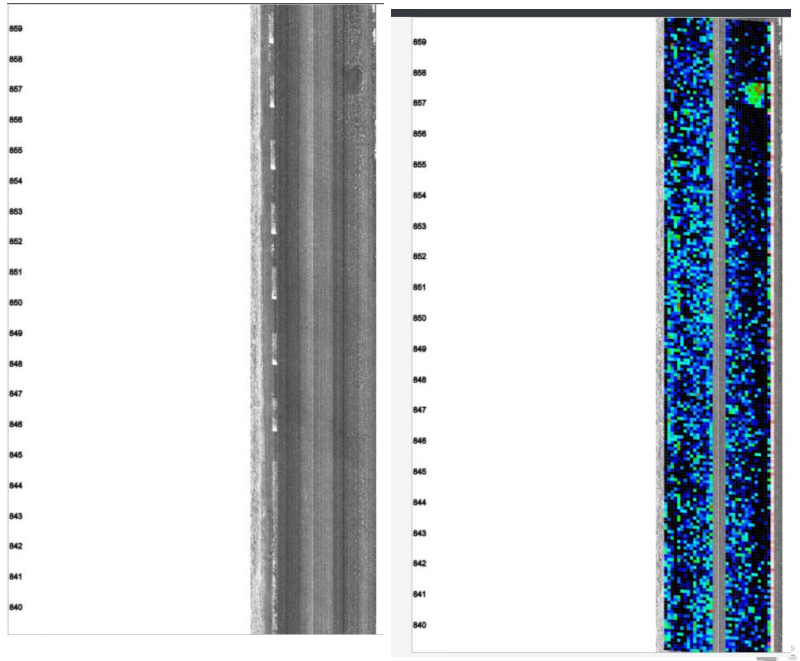


Surface Variability as a means of identifying change

2020

2021

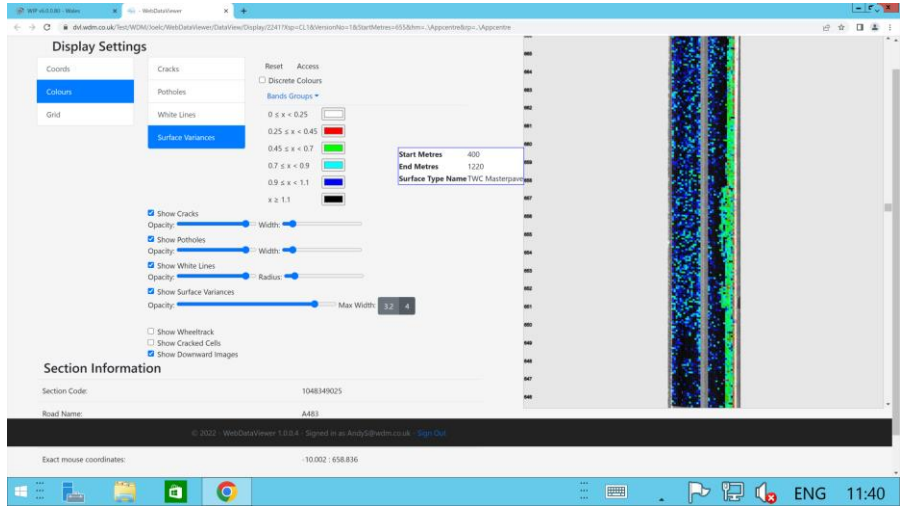


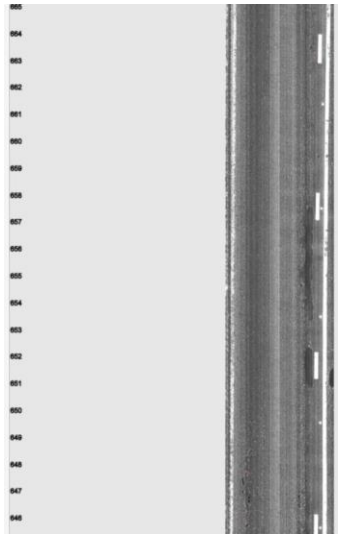


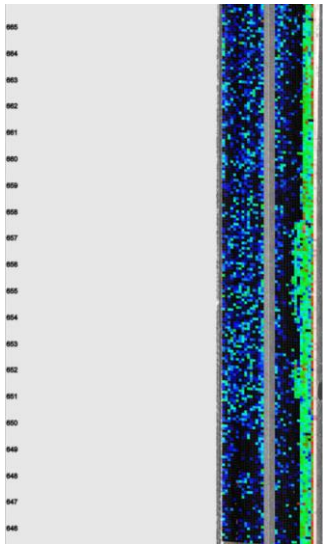
Surface Variability as a means of identifying change

2020

2021







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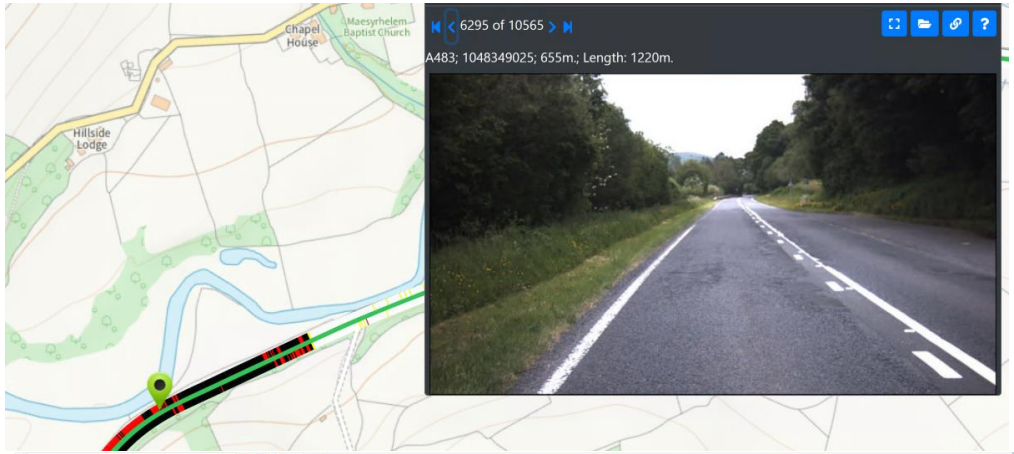
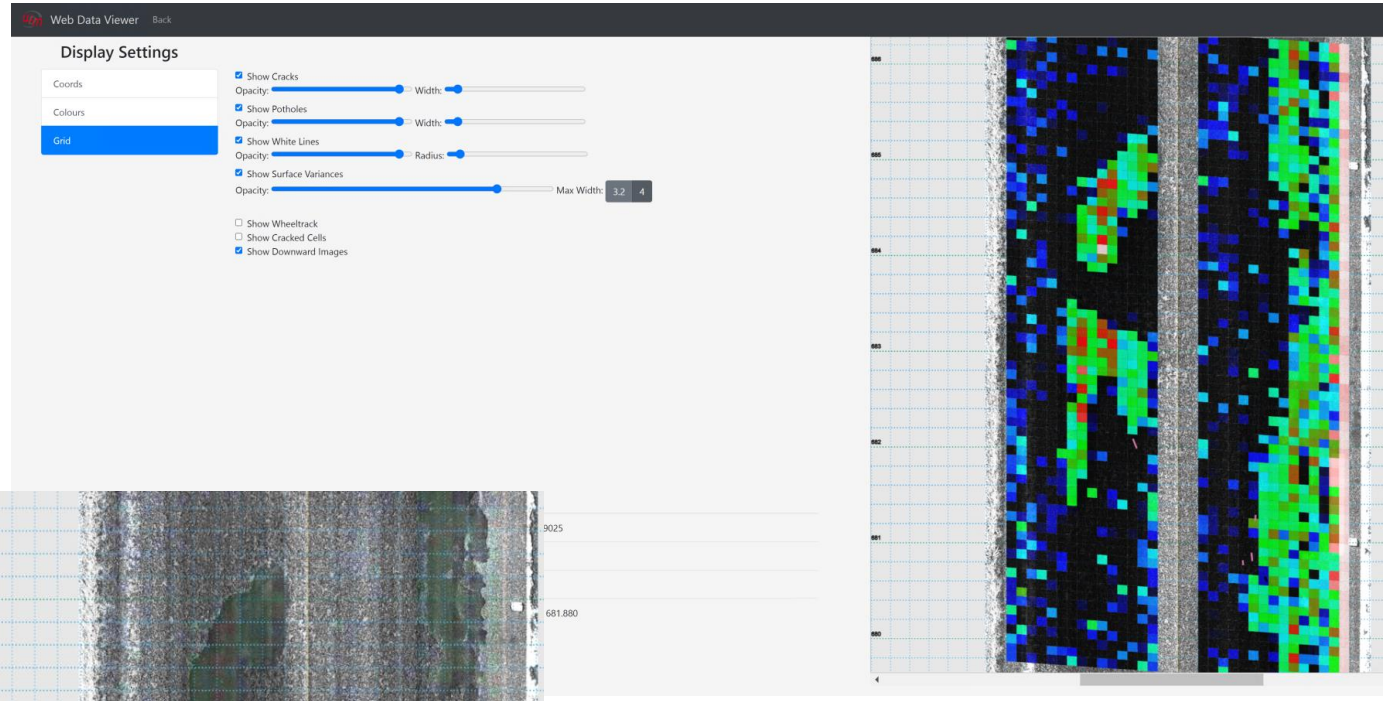
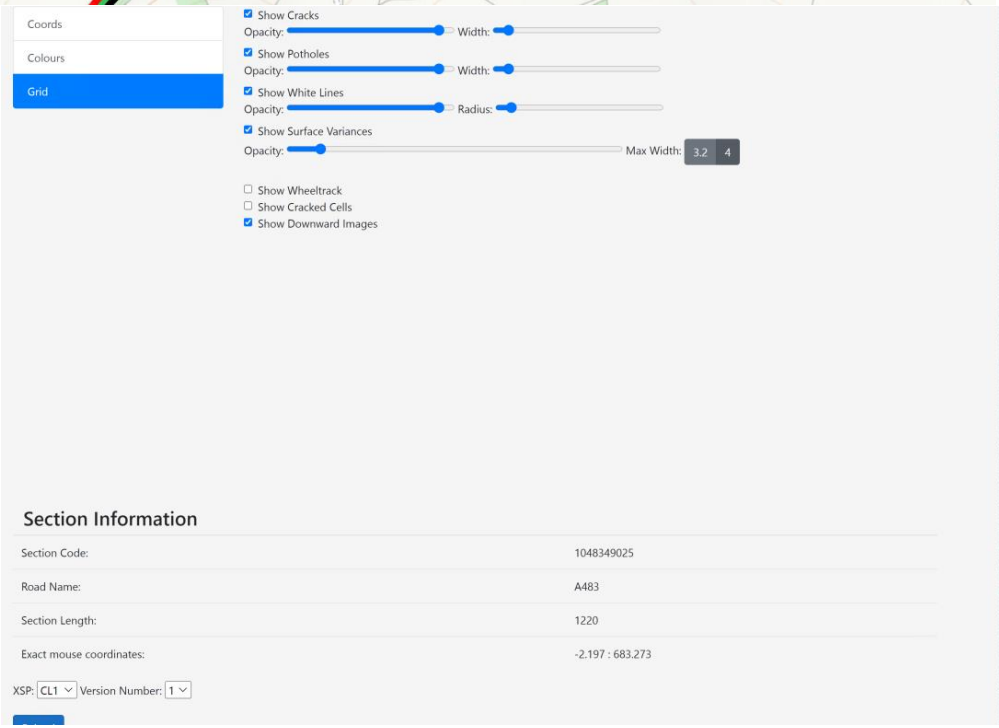
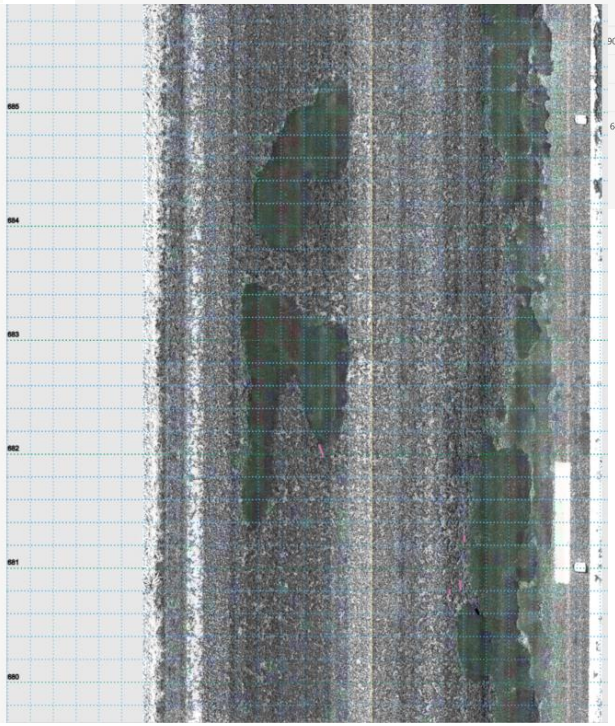
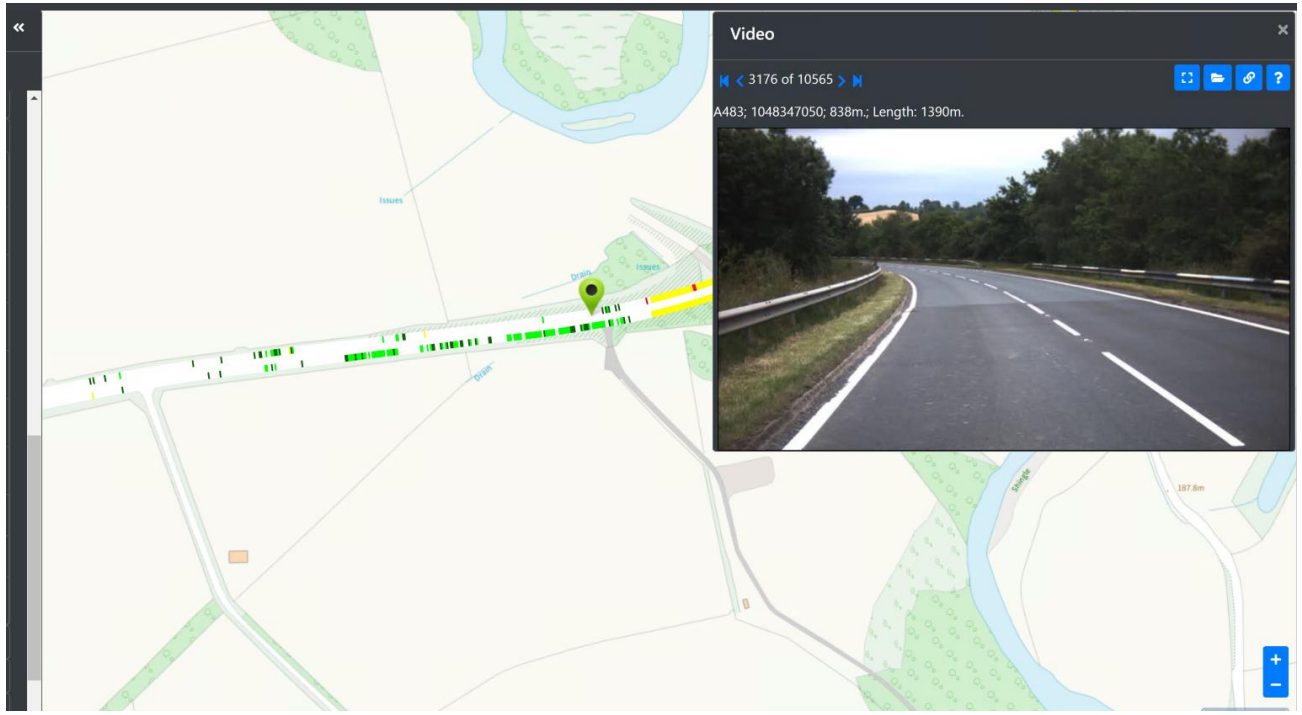








Lifecycle Planning



- By understanding the make up of the road surface, its age, condition and comparing data from previous surveys it is possible to derive an accurate picture of how a road surface changes from one survey to the next on a very detailed and accurately located basis.
- When deciding the appropriate treatment for dealing with a surface condition or friction/skidding issue we need, firstly, to understand where the surface is in its lifecycle.
- Use of the detailed information that is available enables the accurate determination of programmes for early intervention, surface dressing/micro surfacing, retexturing and those sites where resurfacing / reconstruction is required.

The road to net zero

The use of accurate data sets allows comparison between years which enables:

- The objective identification of changes in the road surface from previous datasets
- The identification of trigger points for preventative treatments
- The identification of locations where a “light touch” treatment at the optimum point in the lifecycle will extend the life of the asset.

All of which will, in turn, reduce:

- The formation of potholes
- The consumption of mineral aggregates and oil derived binders
- The amount of CO_2 associated with highway maintenance activities

Thus, ensuring that Highway Managers are able to maximise financial efficiency and significantly contribute to their corporate decarbonisation agendas.

Thanks for your attention

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