

New Zealand



IPWEA

INSTITUTE OF PUBLIC WORKS
ENGINEERING AUSTRALASIA

ROAD INFRASTRUCTURE
MANAGEMENT FORUM

Our Carbon Equation

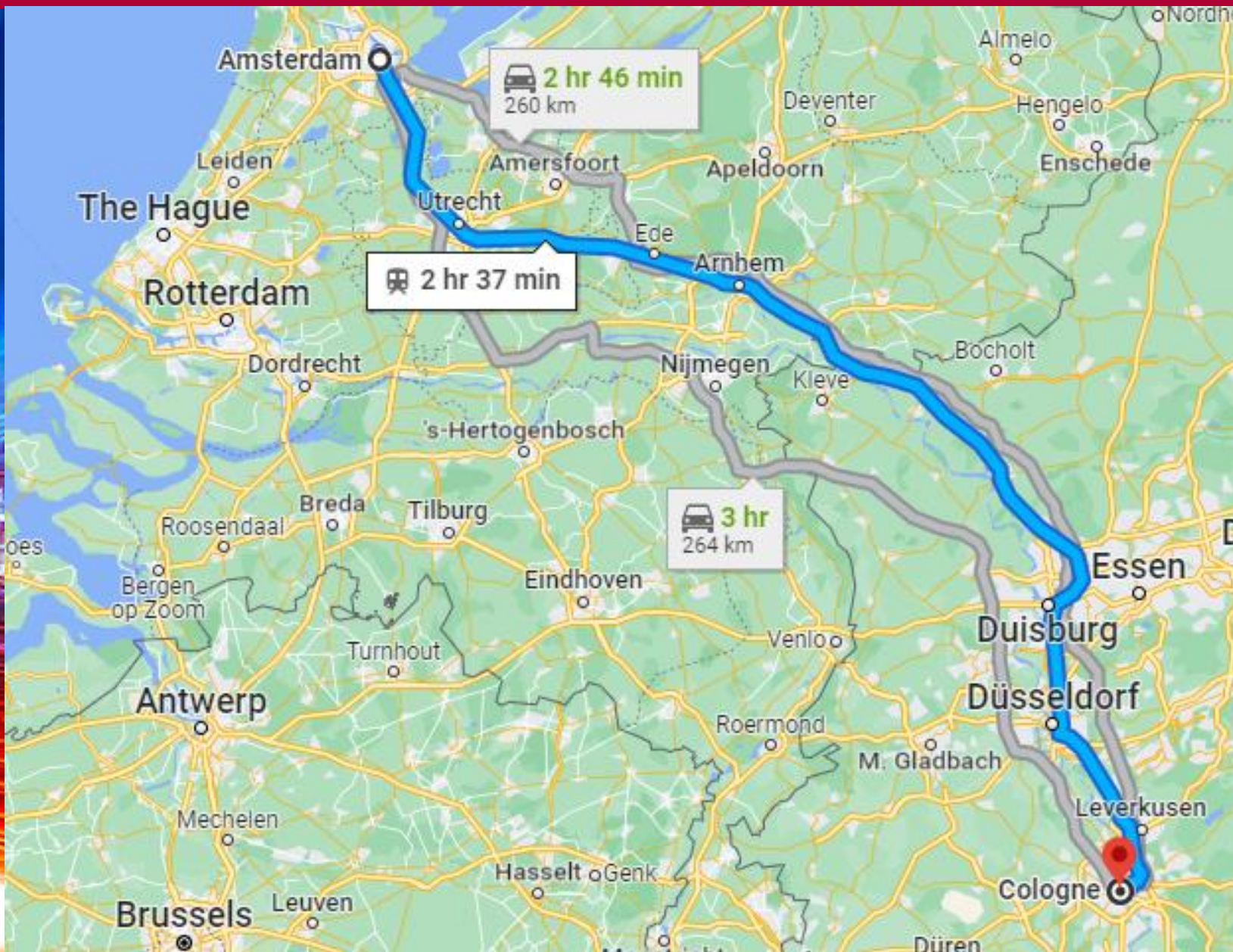
The Rise of IoT and BIG Data in Rail Cologne 2022

Pam Fletcher - Downer NZ Ltd

RIMS
Rooding Infrastructure Management Support

in association with

IDS 
Infrastructure
Decision Support

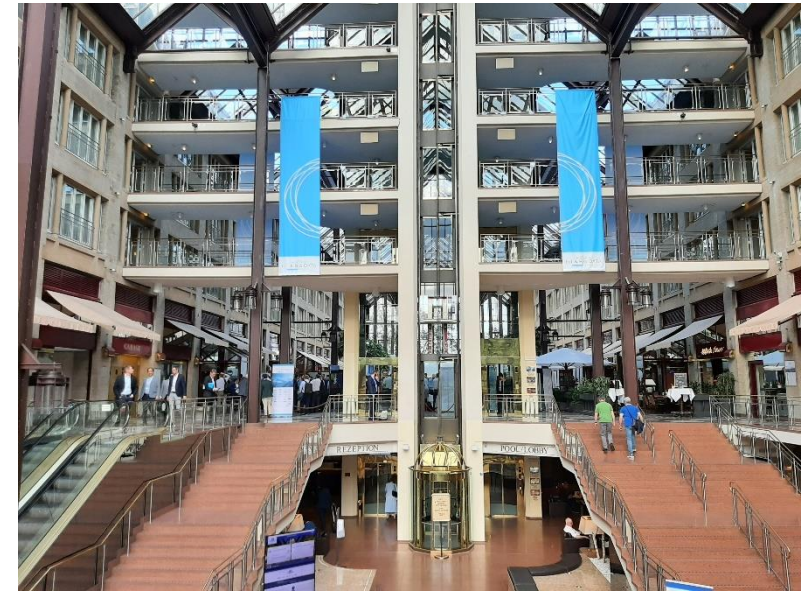


Our Carbon Equation

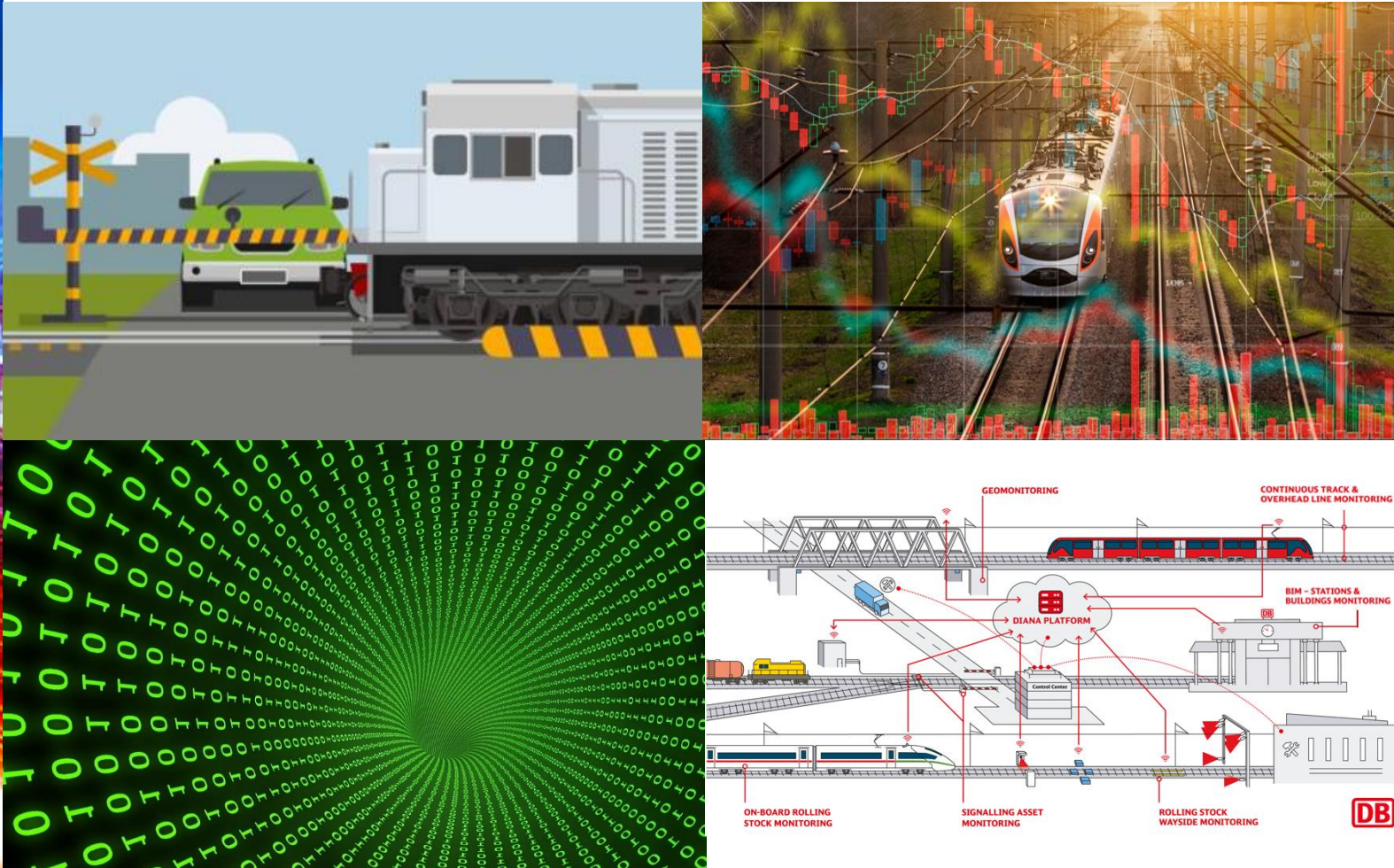
THE RISE OF IoT & BIG DATA IN RAIL

BY ROTAIA MEDIA

 GOLD	 GOLD	 GOLD	 GOLD	 GOLD	 GOLD
 GOLD	 GOLD	 GOLD	 GOLD	 GOLD	 GOLD
 GOLD	 GOLD	 GOLD	 GOLD	 GOLD	 SILVER
 SILVER	 SILVER	 BRONZE	 BRONZE	 BRONZE	 BRONZE
 BRONZE	 BRONZE	 BRONZE	 BRONZE		
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Rail?



- Safest form of transport
- Includes rolling stock and infrastructure
- Sensors
- Abundance of under-utilised data

Our Carbon Equation

Big data?

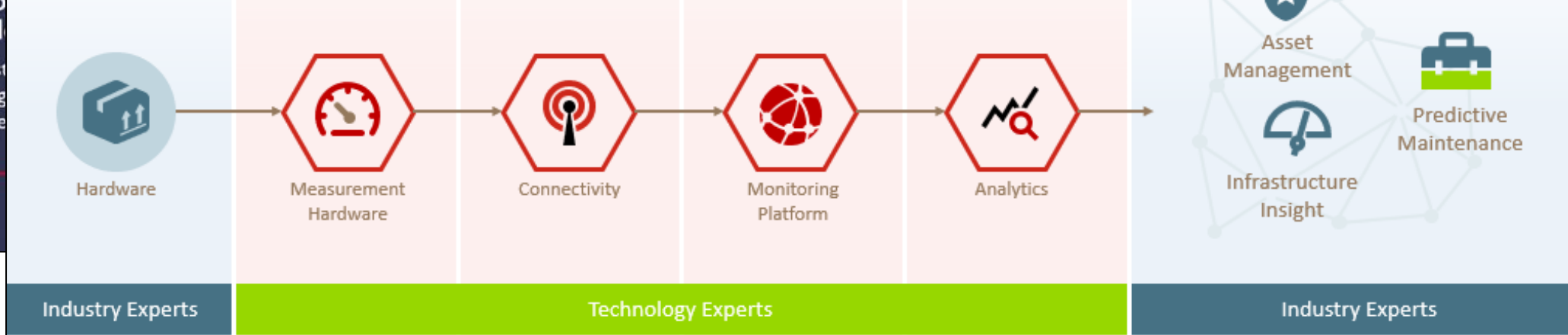
- Industry 4.0
- Digital Transformation
- IoT
- Big Data
- Machine Learning
- Security
- Automation
- Forecasting
- Optimization
- Customer Experience
- Collaboration
- ...

We improve the performance of the Rail Industry, saving time, money and carbon emissions



Sensors installed and existing extract data

The Path to expand to data-driven Business models – Requires different types of Experts



Our Carbon Equation

Data Quality

- Data quality is a precursor for success
- Data must be available and accurate for your purpose
- Data quality is different for every use case
- So you can say the data is of a certain kind of quality for this purpose but you cannot qualify it as good for everything

Common themes



- Operations meets technology
- POC to implementation
- Collaboration
- Organisational commitment
- Environmental sustainability

Our Carbon Equation

Predictive Maintenance

Asset Sustainment Maturity

Levels of Asset Sustainment Decision Making



Age Based

Replacing the oldest assets first



Condition Based

Completing condition assessments and replacing the worst condition assets first



Current Risk Based

Including the consequence of failure and calculating the probability of failure to replace the highest risk assets first



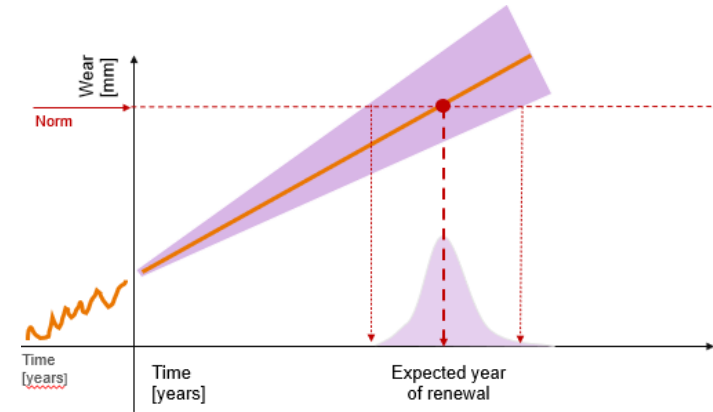
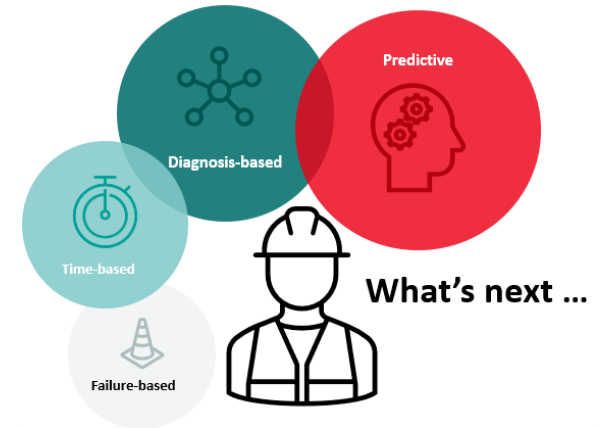
Mitigated Risk Based

Calculating the mitigated risk from replacing an asset and replacing assets that mitigate the most risk assets first



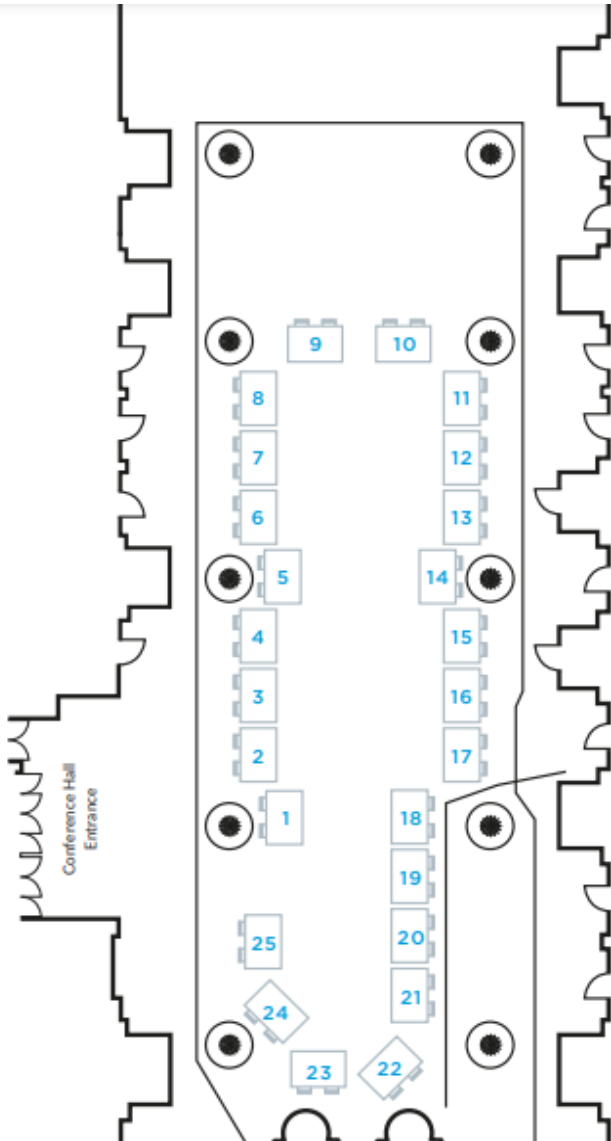
Value Based

Taking cost into consideration and prioritizing the highest-value asset replacements



Our Carbon Equation

Supplier booths



1. voestalpine Railway Systems
2. Unipart Rail Technologies
3. Atos
4. SKF
5. Predge
6. T-Systems
7. Intermodal Telematics
8. KLAS
9. Trilogical Railways
10. Expandium
11. HUM
12. Cervello
13. Stimio
14. Copperleaf Technologies
15. AVEVA
16. Hexagon
17. Nexiot
18. CAF Rail Digital Services
19. A1 Digital
20. infraView GmbH, Part of DB E.C.O. Group
21. MachinesWithVision
22. Sercel
23. Nomad Digital
24. In A Blink
25. Camlin Rail

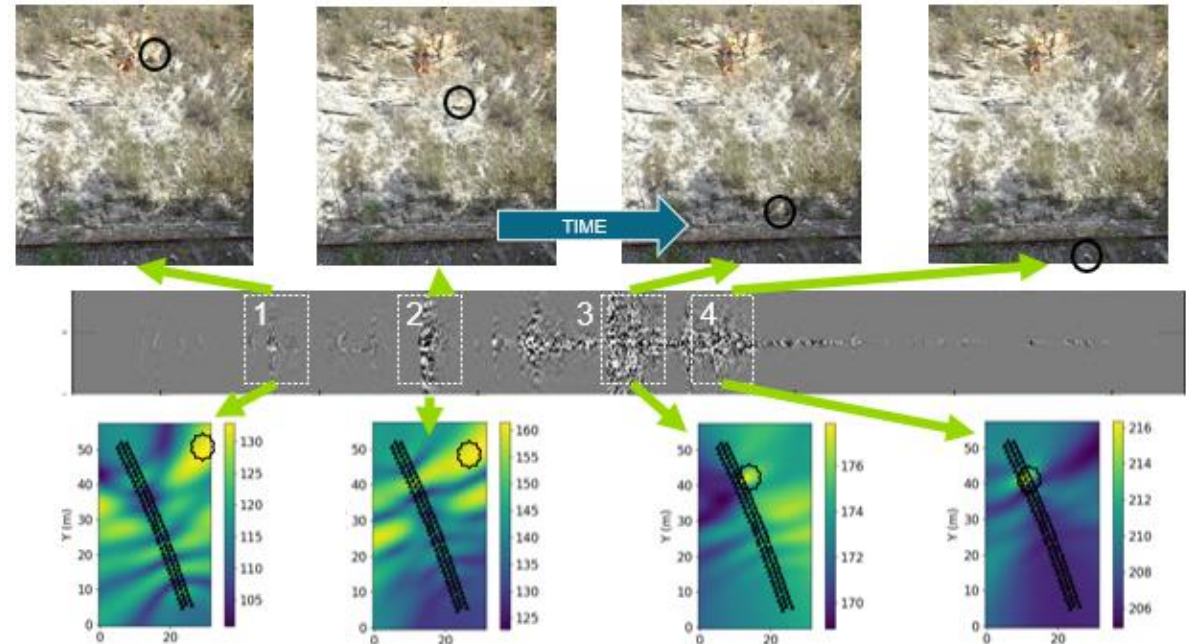
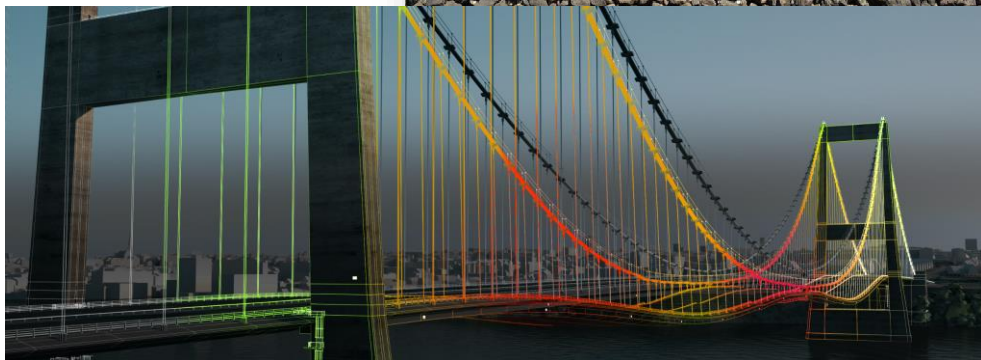
- Autonomous robotic inspections
- Cyber security start-up
- Digital Maintenance Management Systems
- Remote monitoring/modular onboard intelligence
- Digital automatic coupling
- Digital condition monitoring of bearings and seals
- Digital solutions for fleet performance and maintenance monitoring
- Digital services application suite – end to end collection - to analytics
- Asset investment consultants
- Mobile sensor data mapping (geospatial data)
- Wayside monitoring
- Tamping technology
- Complete digital ecosystem

Our Carbon Equation

Acoustic Sensing

Measuring vibrations to monitor railways

- Sinkholes
- Aging Infrastructure
- Rock fall



Our Carbon Equation

Takeaways



Our Carbon Equation



Our Carbon Equation

Thank you
Buíochas
Dank je
Grazie
Gracias

Kiitos
Merci
Tack
Vielen Dank
متشكرم