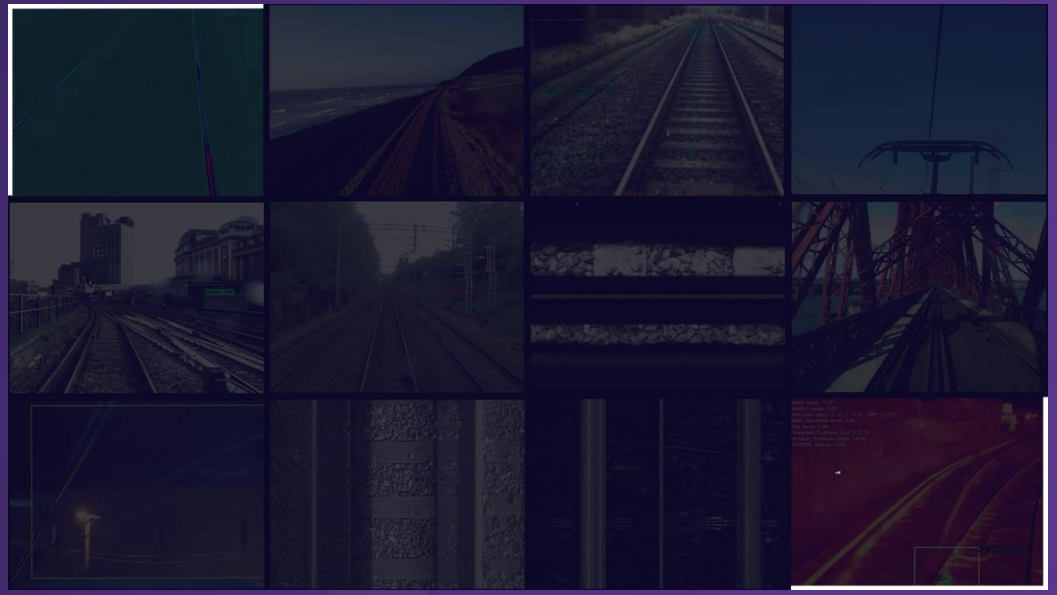
AiVR



Supporting Your Digital Journey

For any questions contact:

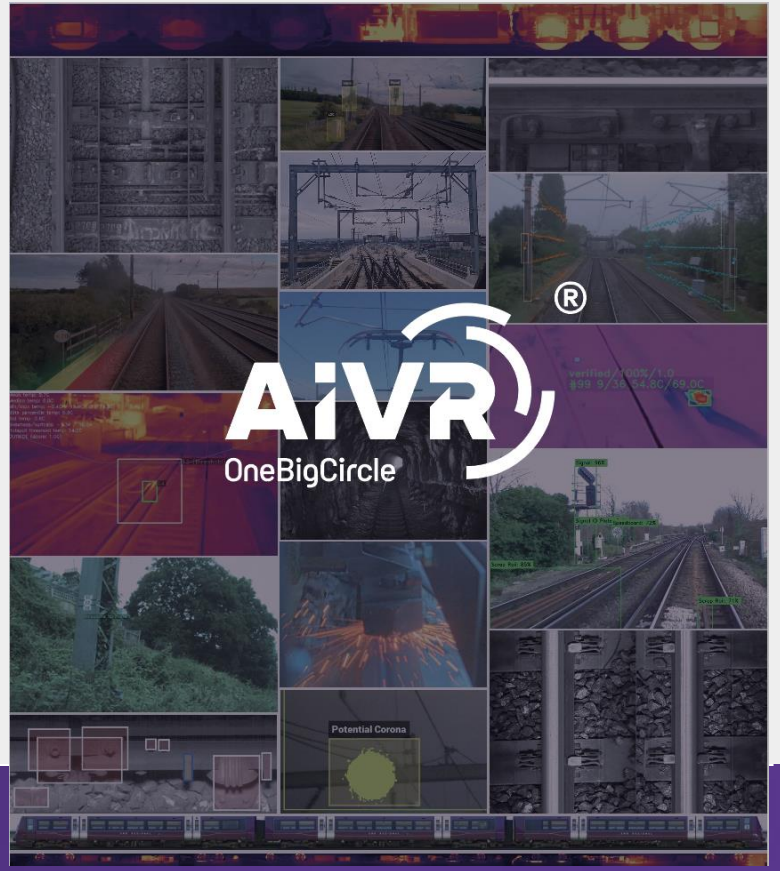
enquiries@onebigcircle.co.uk

OneBigCircle

Agenda

Thank you all for sharing your lunch with One Big Circle!

1. Introduction
2. Automated Intelligent Video Review
3. ‘Supporting your digital journey’
4. Step 1 - Harness your data
5. Step 2 - Power up your data
6. Step 3 - Energise your workflows
7. Questions & closeout



One Big Circle

OneBigCircle

- We are a Bristol-based SME with **120+ years combined experience** in video system design and installation, specialising in Intelligent Video, AI, Machine Learning and integration.

- We develop both **Software and Hardware** systems in-house.

- We work closely and **collaboratively** with multiple organisations including **Network Rail** and **Transport for Wales.**

- We are the creators of the **multi-award-winning AIVR** technology.

NATIONAL RAIL AWARDS 2021 WINNER

NATIONAL RAIL AWARDS 2022 WINNER

NATIONAL RAIL AWARDS 2023 WINNER

THE RAILWAY INDUSTRY INNOVATION AWARDS 2020 WINNER

RISE Awards 2021 WINNER

RailBusiness AWARDS 25 WINNER Innovation of the Year 23 February 2023

RailBusiness AWARDS 23 February 2022 WINNER Supplier & Contractor Excellence

SPOTLIGHT Rail Awards Winner 2023 Product of the Year

Automated Intelligent Video Review

OneBigCircle

Automated Intelligent Video Review

The **multi-award-winning** system that provides **digital inspection capability** and more, enabling experts from any rail discipline to **monitor the lineside environment remotely and safely**.

End-to-End System

Location

- ELR Mile & Chain
- What3Words
- Lat/Long

Transmission via **4G/5G**

Cloud

AIVR Platform

Accessible online via secure licences (SSO login available)

- Measure
- Annotate
- Review Safe Cess
- Advanced Sighting
- PDF Reports
- Export
- Analyse

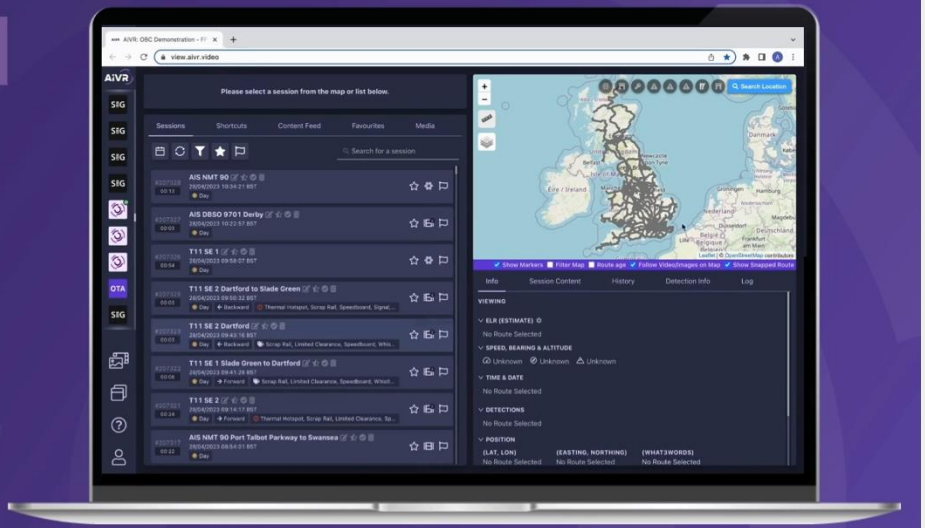
AIVR Platform

AIVR Platform

Search by Location

Search by:

- ELR Mile & Chain
- ELR Mile & Meterage
- ELR Mile & Yards
- Latitude/Longitude
- What3Words
- Assets
- Stations



Powered by OneBigCircle

‘Supporting Your Digital Journey’

Rail's 'Digital Journey'

CP7 and Digitalisation

Key takeaways

- The industry is increasingly moving towards data driven decision making
- Unwavering focus on improving safety and efficiency
- Maximise on existing technologies – ‘don’t reinvent the wheel’

£ 21m

“Our Infrastructure Monitoring programme is essential for us to drive a more efficient railway – from trains that use ultrasound to find faults within the rails, to those that monitor and record track geometry.”

”Delivering an Efficient Railway – Our National Efficiency Plans 2024-2029” – Network Rail

Improved Use of Technology
Regions will work in partnership with the Technical Authority to develop and deploy new technologies from II and utilise the RD&I pipeline. Improvements to BAU operations and the network will be delivered at lower cost and more efficiently.

Using Data & Technology from Trains & Infrastructure
We will use data and technology to better understand the condition of assets and reduce the time our people must spend on the network.

4 **Leveraging Technology, Innovation and Smarter Working to Streamline Processes and Drive New Efficiencies –** using smarter, more integrated approaches we will equip our front line staff with relevant data to allow more efficient management of our asset base.

Challenges

What blockers does the industry face in moving towards digitalisation?

High Costs

Costs of acquiring new equipment, retrofitting existing systems, and ongoing maintenance and support.

Regulatory Hurdles

New tech must be compliant with regulations and safety standards from multiple regulatory bodies.

Integration Challenges

Legacy systems or infrastructure can be incompatible with new tech, requiring extensive modifications or even complete overhauls.

Supporting Your Digital Journey

Whether need an **off-the-shelf solution** or a **tailor-made technology**, AIVR is designed to support you **wherever you are in your digital journey.**

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Step 1 - Harness your Data

Harness your data

Harness your Data

Install permanent cameras & sensors for enhanced monitoring

Access data from your onboard CCTV system with ease

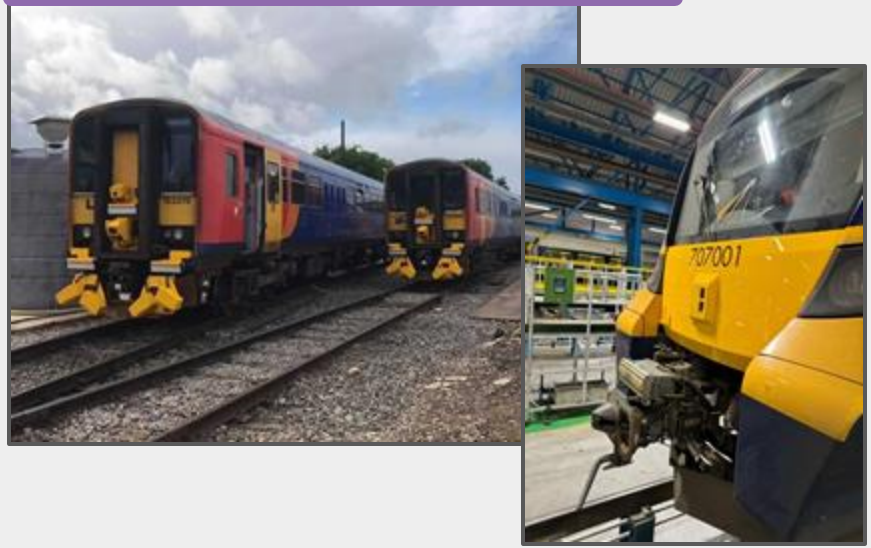
Aggregate and analyse data from multiple sources efficiently

Capture additional data of your area using lightweight devices

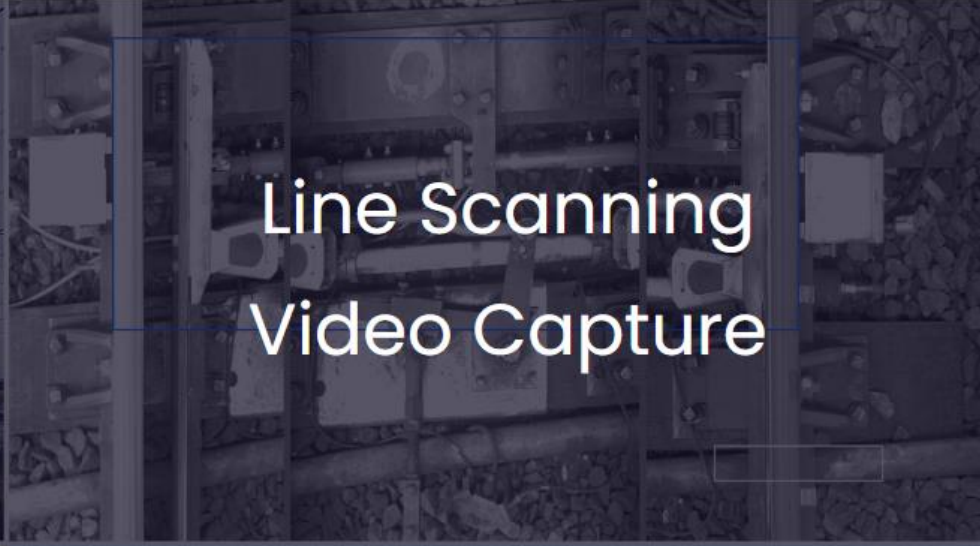
Capture & Install

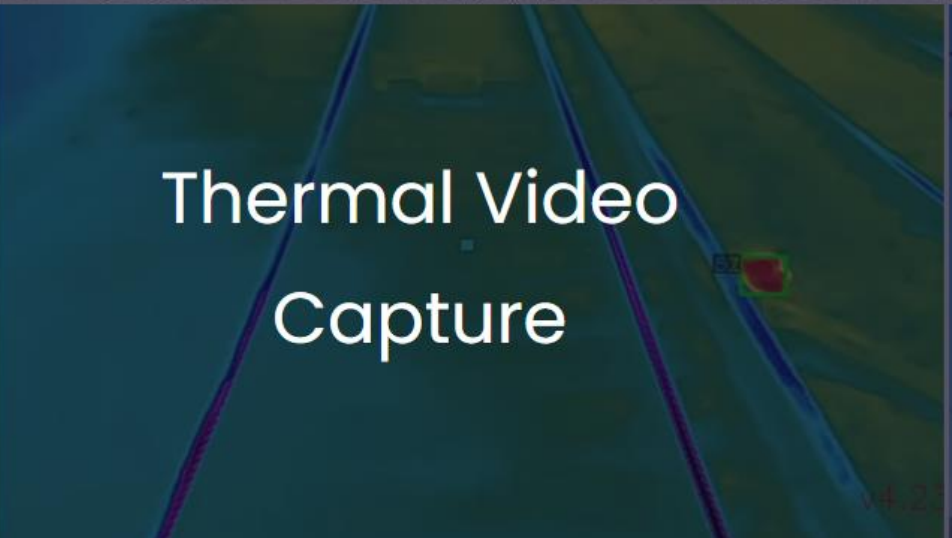
Portable, low-cost options

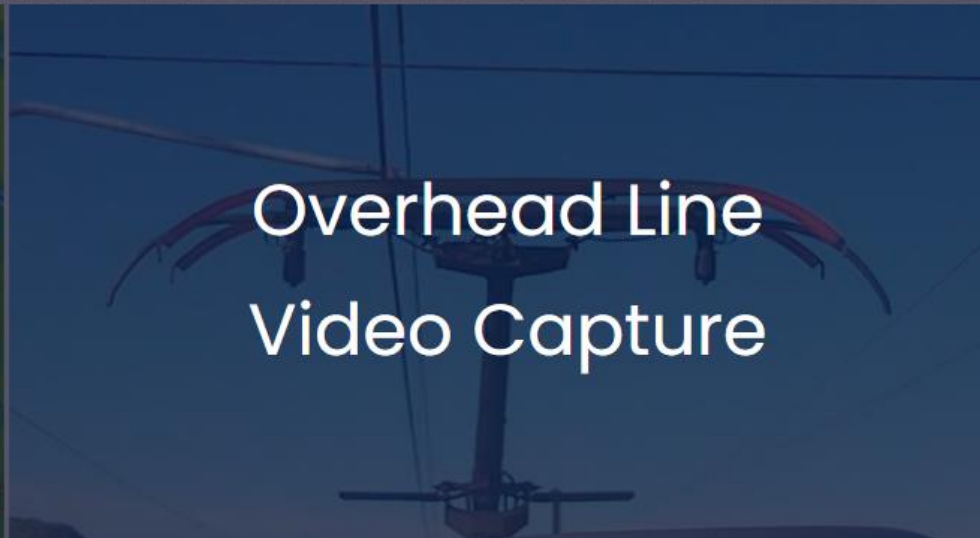
Premium, permanent installations




Forward Facing
Video Capture

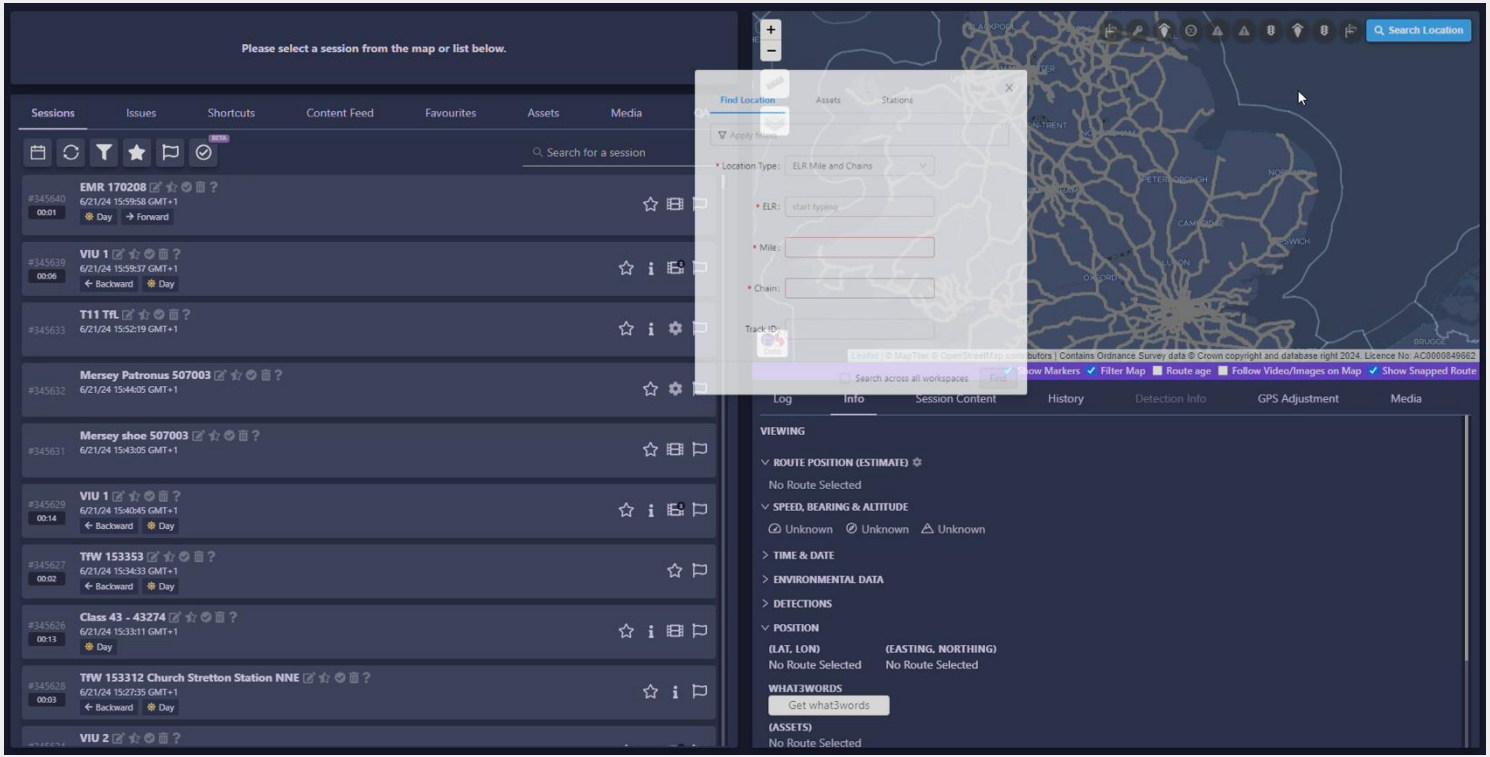

Line Scanning
Video Capture


Thermal Video
Capture


Overhead Line
Video Capture

AIVR FFV

AIVR FFV



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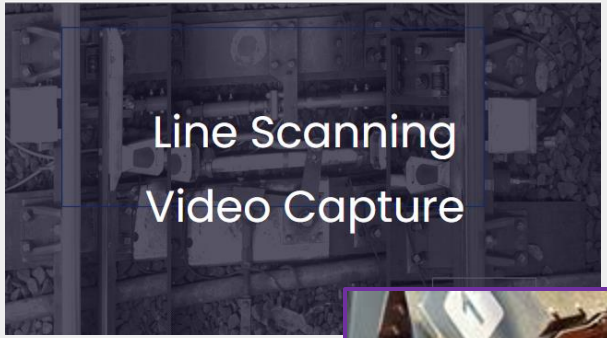
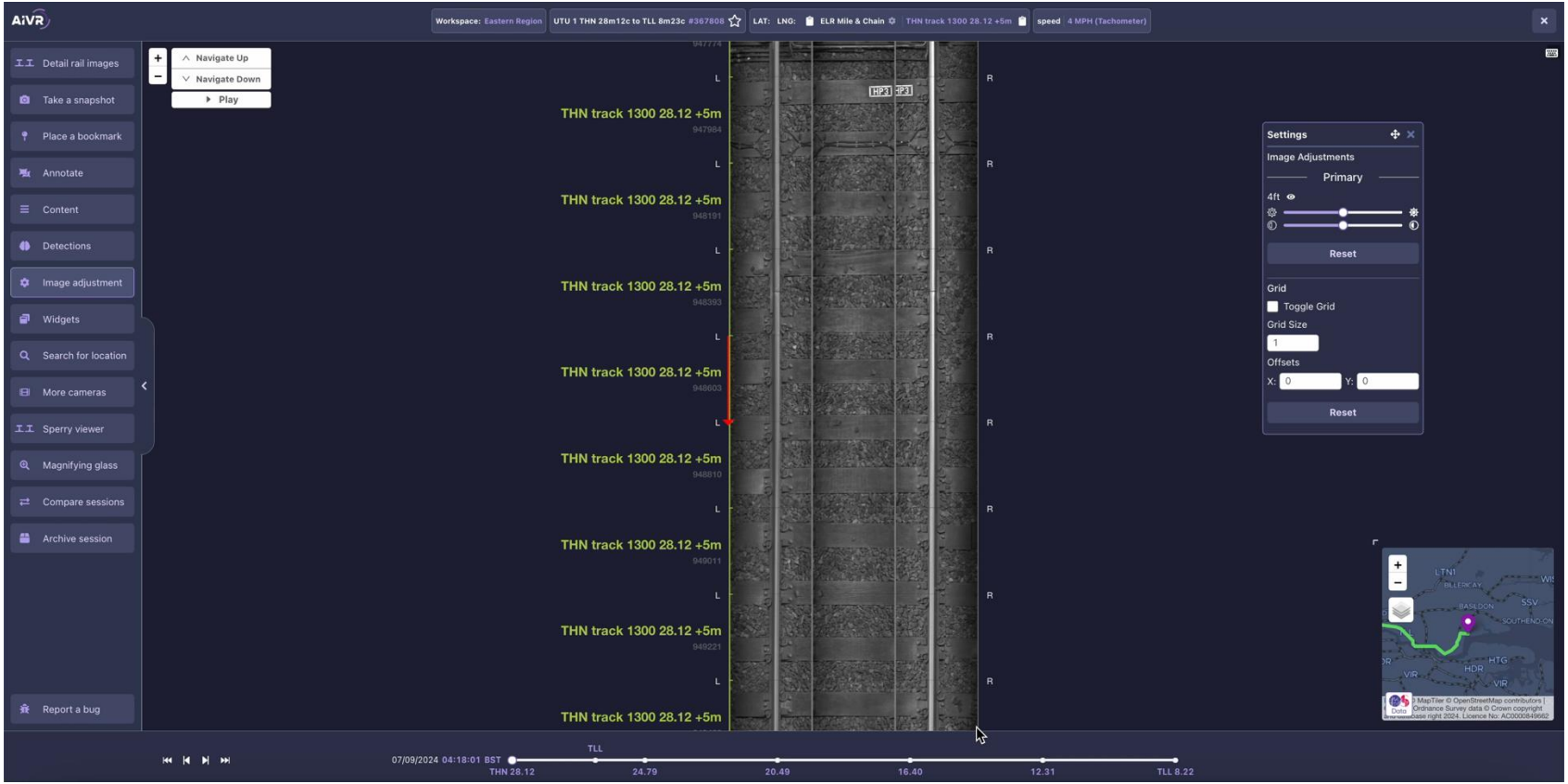
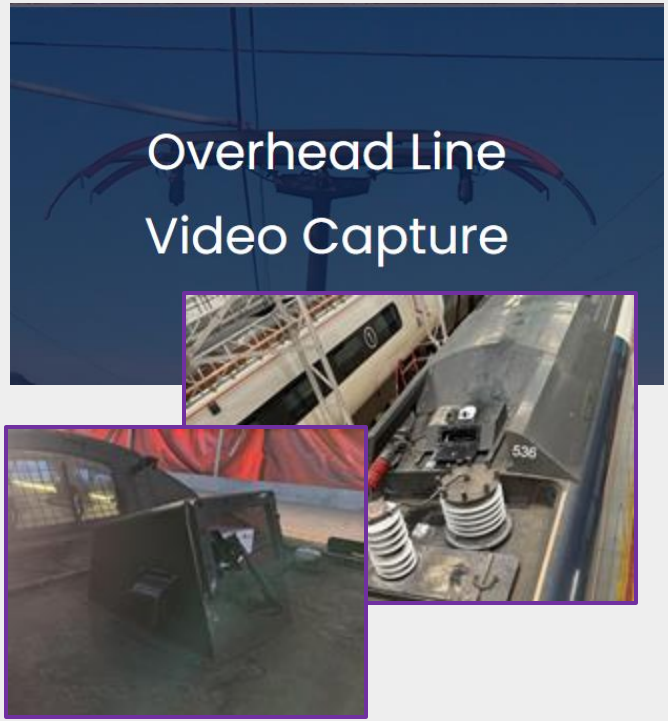
AIVR Focus

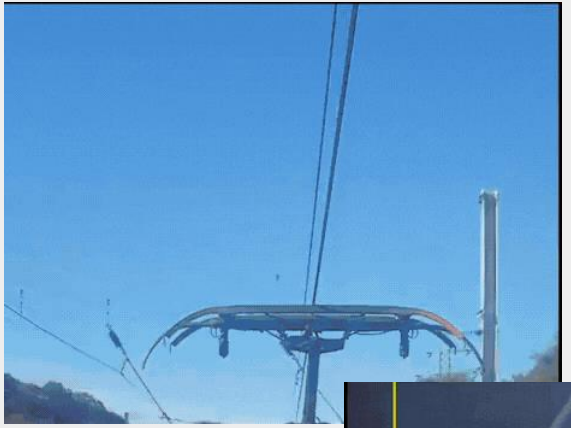


AIVR Focus


AiVR
Workspace: Eastern Region
UTU 1 THN 28m12c to TLL 8m23c #367808
LAT: LNG:
ELR Mile & Chain
THN track 1300 28.12 +5m
speed 4 MPH (Tachometer)
Detail rail images
Take a snapshot
Place a bookmark
Annotate
Content
Detections
Image adjustment
Widgets
Search for location
More cameras
Sperry viewer
Magnifying glass
Compare sessions
Archive session
Report a bug
Navigate Up
Navigate Down
Play
THN track 1300 28.12 +5m
947984
948191
948393
948603
948810
949011
949221
Settings
Image Adjustments
Primary
4ft
Reset
Grid
Toggle Grid
Grid Size
Offsets
X:
Y:
07/09/2024 04:18:01 BST
TLL
THN 28.12
24.79
20.49
16.40
12.31
TLL 8.22

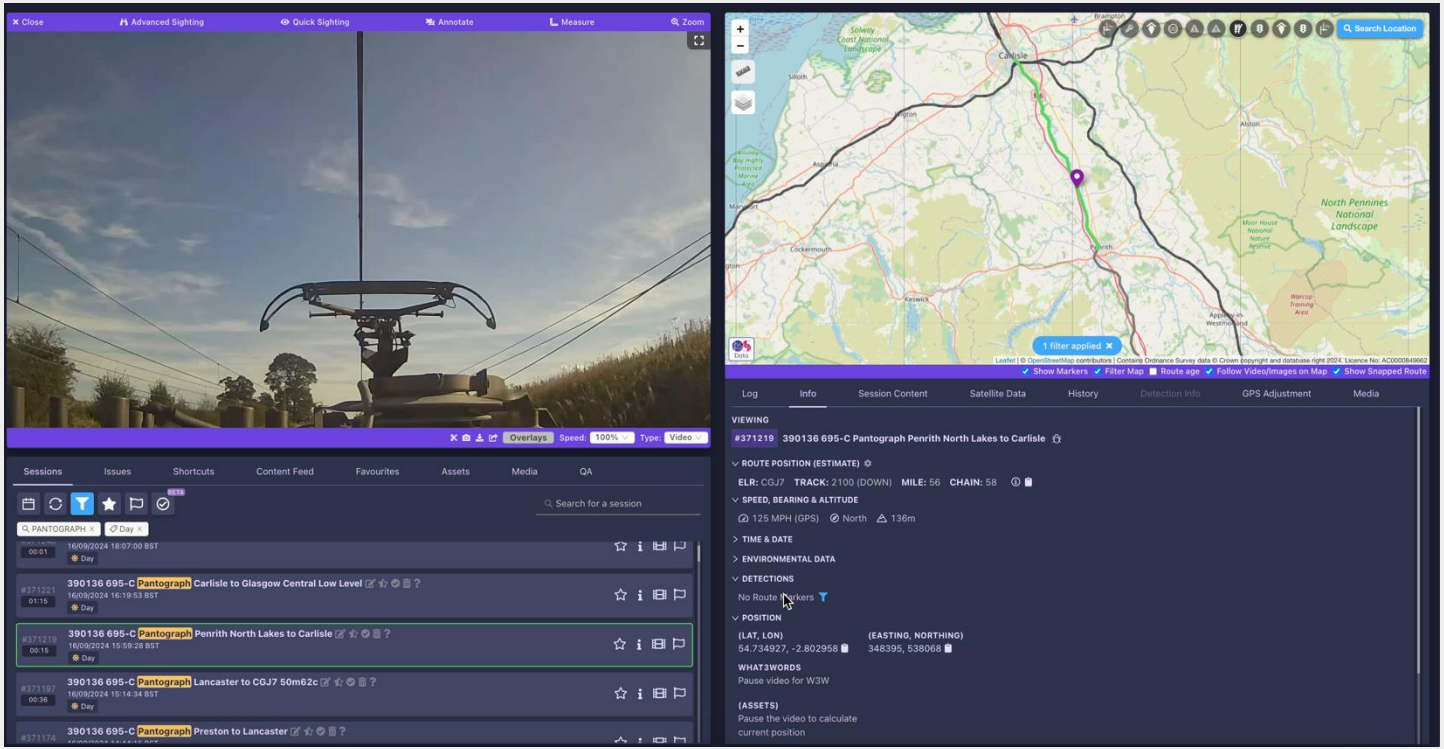
AIVR OLE





AI

AIVR OLE



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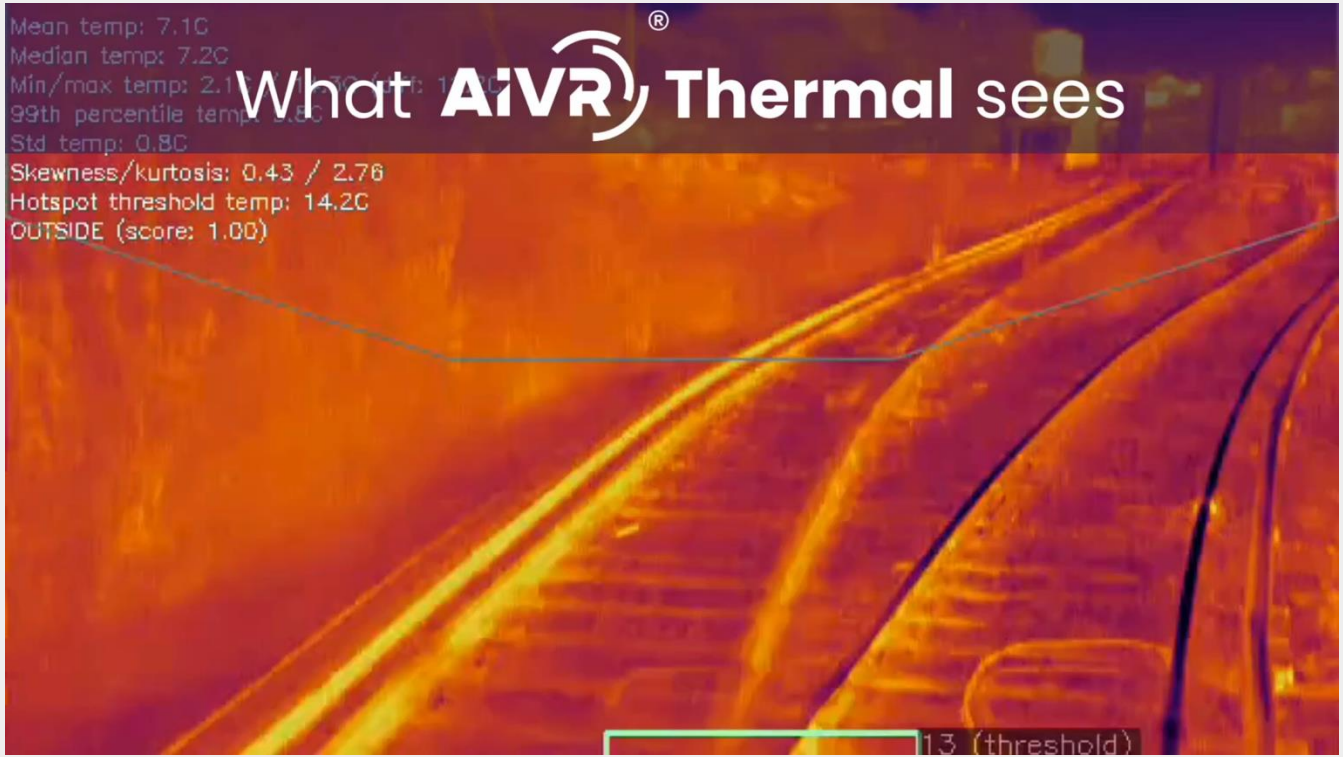
AI

AIVR Thermal

AI

AIVR Thermal



Step 2 – Power up your data

AI

Power up your data

Power up with AI

Apply bespoke AI to your data to monitor assets & their conditions

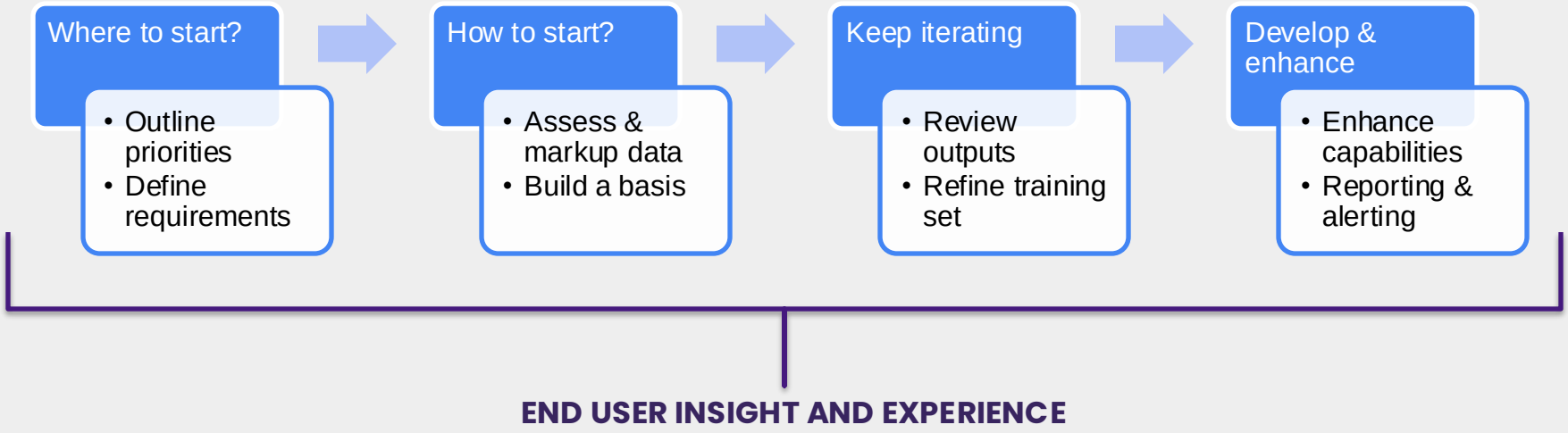
Stay informed with **automated email alerts** for detected assets

Gain comprehensive **visibility across all disciplines**

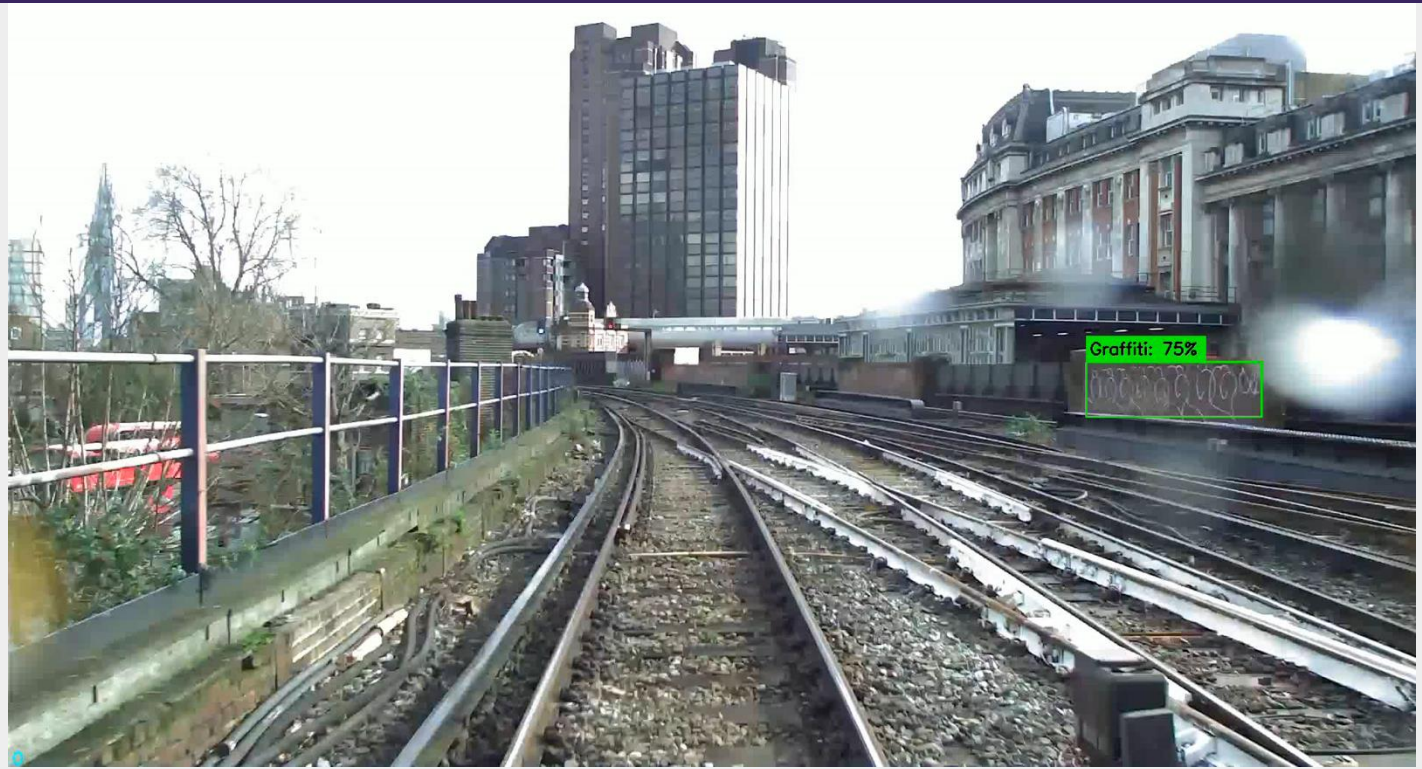
Integrate AI from multiple data sources for a holistic view

How we ‘power up’ using AIVR data

Harnessing data is the first step – **AI and Machine Learning** helps to **power up data to further enhance efficiency and safety.**



AIVR AI

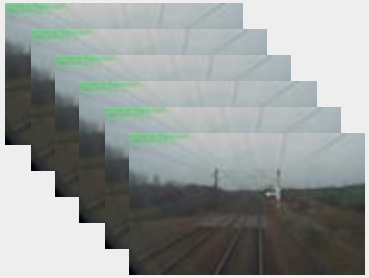


Project Example 1

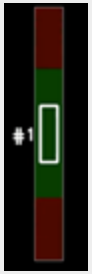
Example 1 – Balance weights

Frame Detections

Observations



Prediction Model



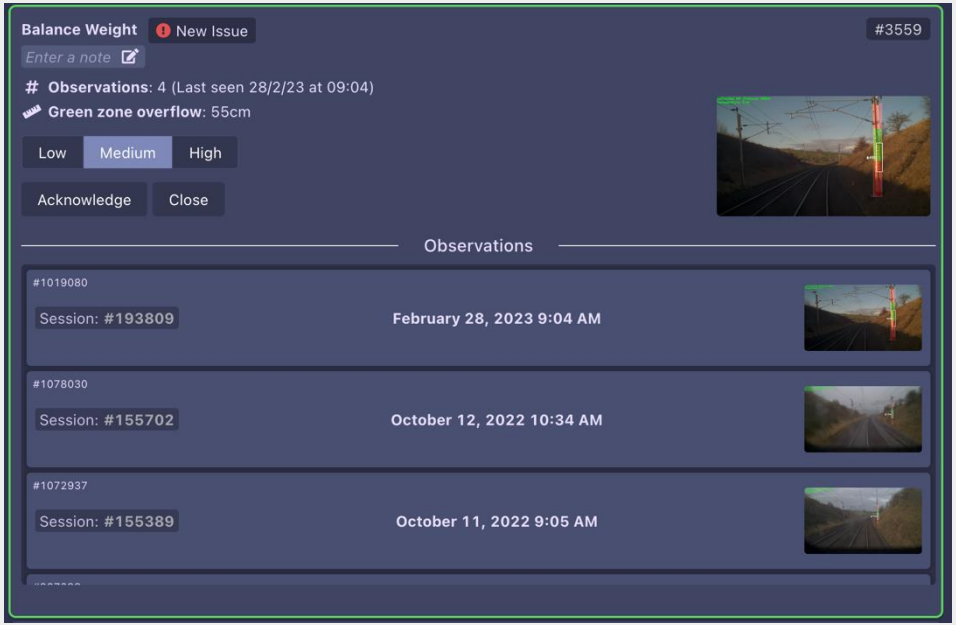
Measurement

Comparison

Location Mapped Issues

Project Example 1

Example 1 – Balance weights



Project Example 2

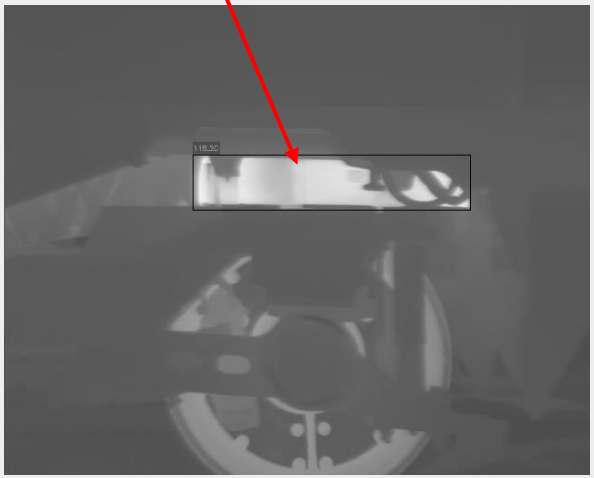
Example 2 – DepotMATE, detecting thermal hotspots

Original raw temperature information

Isolate top 5% hottest regions

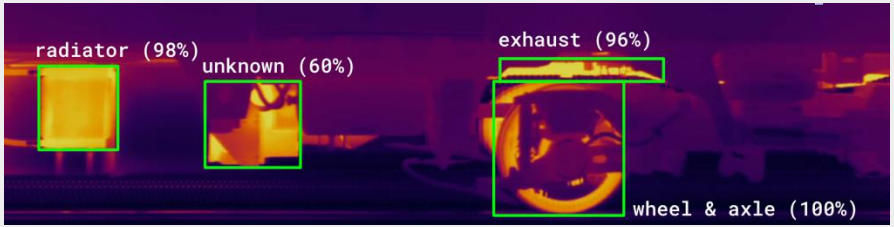
Find contours of each hot section and discard anything below a temperature threshold

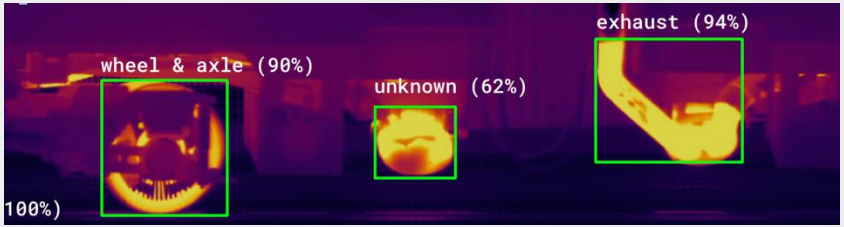
Final detection



Project Example 2

Example 2 – DepotMATE, detecting thermal hotspots

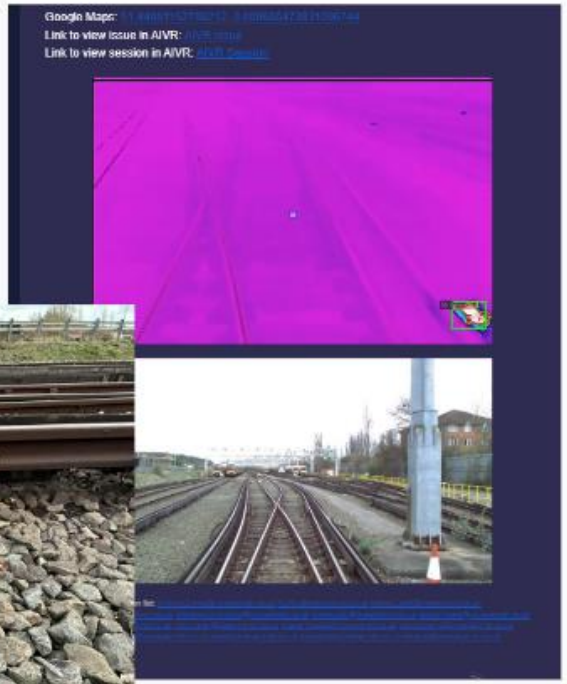




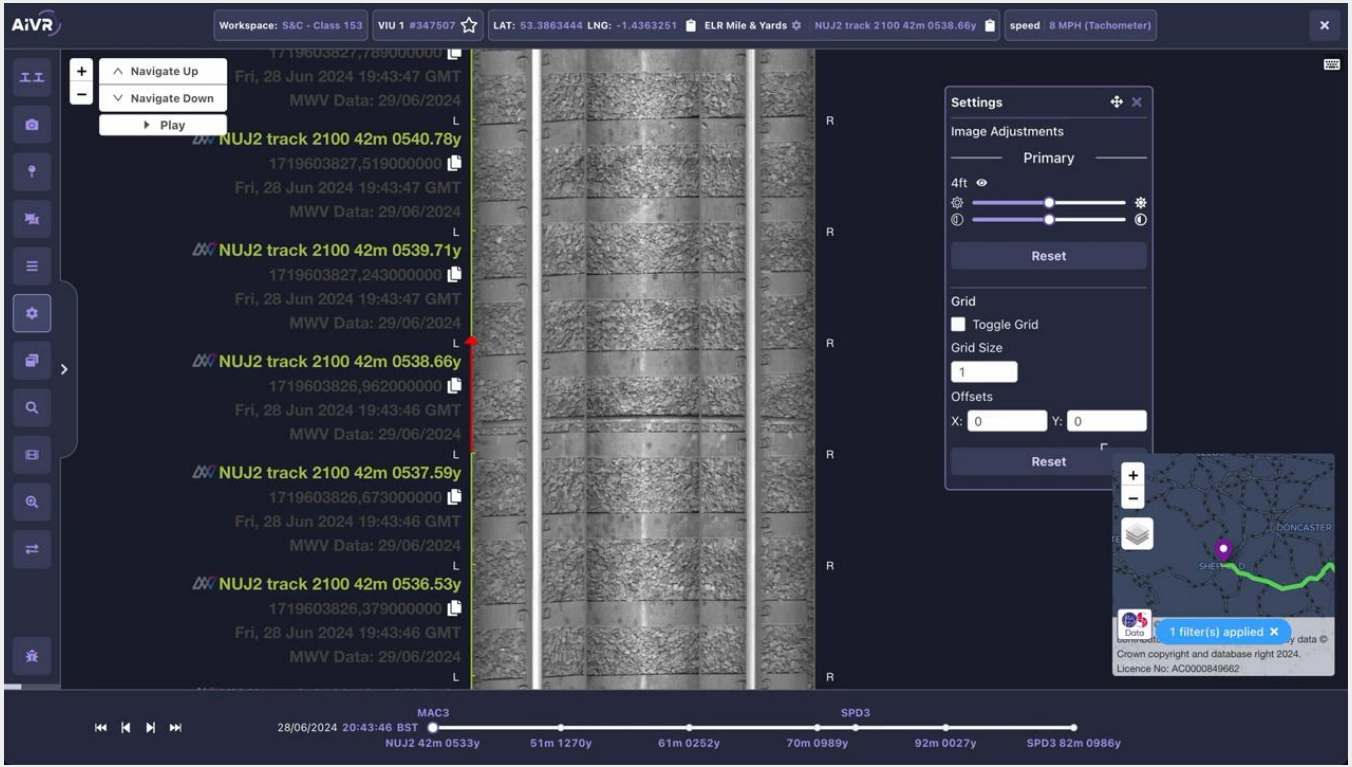
Case Study – AIVR Thermal

Thermal defects: Detection of welded hook switch

- AIVR Thermal captured and automatically detected hotspot
- Emailed alert sent to specific users with images and location details
- Fault reported to track engineering team who attended site and foundhook switch had overheated and welded which prevents track being isolated.



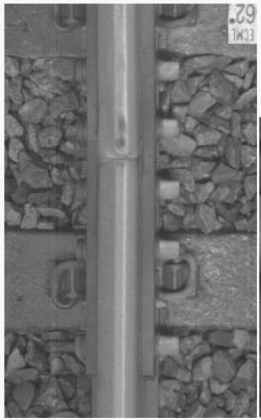
AIVR Focus – Track Inspection AI

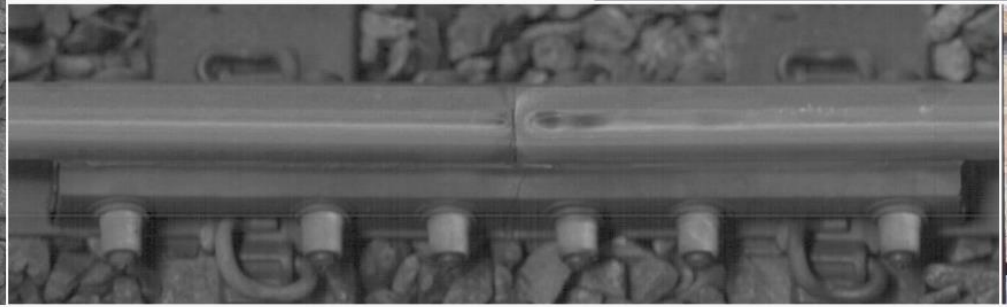


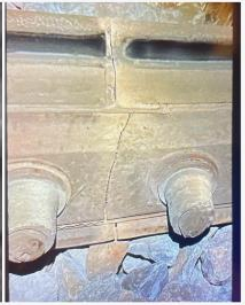
Case study – AIVR Focus

Track defects: Detection of a cracked IBJ

- Track geometry showed a dip angle at the position of a joint
- Synchronised inspection imagery of the joint showed a crack
- Fault reported to track engineering team, who imposed an emergency speed restriction and welded the joint





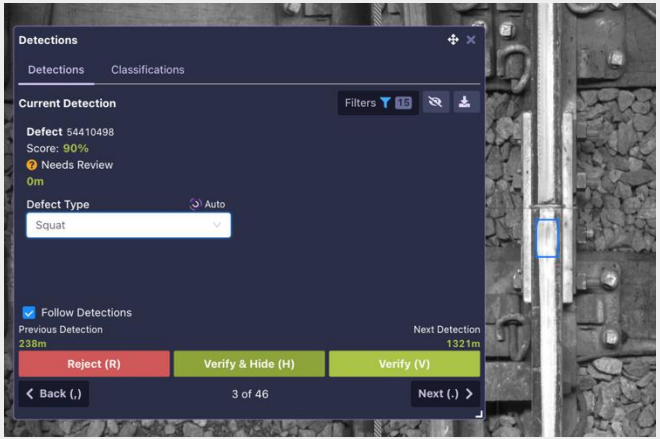


AI

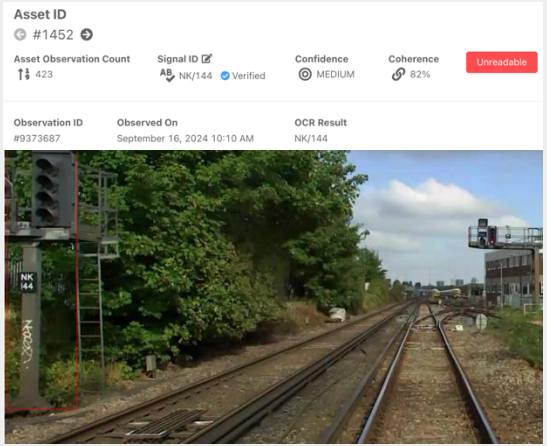
Build Data Intelligence

The benefits of ‘powered up’ data

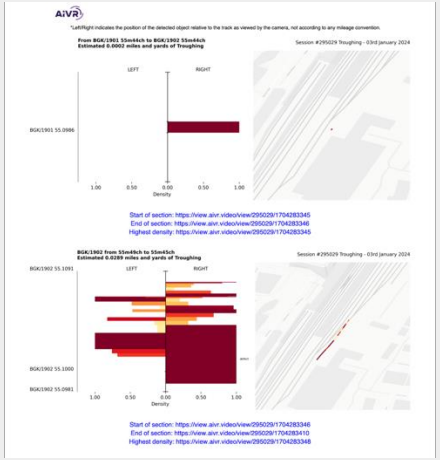
Find and resolve issues quickly and efficiently



Automatically map network infrastructure



Enhance knowledge and inform existing practices



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Step 3 – Energise your Workflow

AI

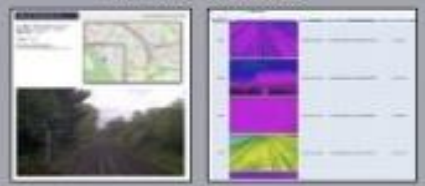
Energise Your Workflow

Energise your Workflow

Develop custom APIs to smoothly integrate & manage your data

Generate tailored Form outputs, e.g. BVI & other specific formats

Create personalised reports in various formats



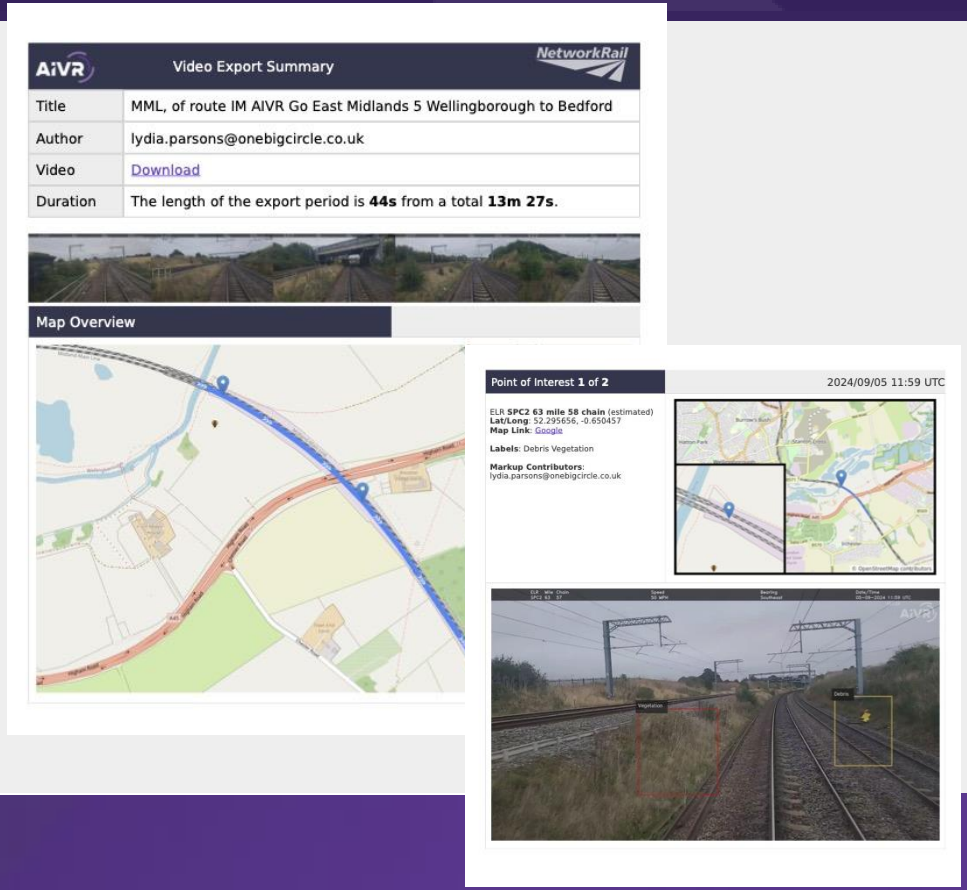
Configure & customise views to suit your specific needs

AI

Digital Reporting

Personalised Reporting

- The AIVR interface enables users to create personalised reporting forms
- Collate asset information and ‘work arising’ information in one visual output
- Feed in critical details from up-to-date imagery into workflows



AiVR Video Export Summary — NetworkRail

Title	MML, of route IM AIVR Go East Midlands 5 Wellingborough to Bedford
Author	lydia.parsons@onebigcircle.co.uk
Video	Download
Duration	The length of the export period is **44s** from a total **13m 27s**.

Map Overview

Point of Interest **1 of 2** — 2024/09/05 11:59 UTC

ELR **SPC2 63 mile 58 chain** (estimated)
Lat/Long: 52.295656, -0.650457
Map Link: Google

Labels: Debris Vegetation

Markup Contributors:
lydia.parsons@onebigcircle.co.uk

AI

Example Outputs

Personalised Reporting

Ballast condition monitoring report

From (Miles.Yards)	To (Miles.Yards)	Start Timestamp	End Timestamp	Amount of Low Ballast (Miles.Yards)	Severity Score (max. 100)*	Highest Scoring Image (with hyperlink)	Second-Highest Scoring Image (with hyperlink)	Third-Highest Scoring Image (with hyperlink)
BOKS/3700/0.1549	BOKS/2100/0.1587	2024-08-13 17:05:00.594	2024-08-13 17:05:05.427	0.0030	15.3			
BOKS/2100/0.1622	BOKS/2100/0.1635	2024-08-13 17:05:09.827	2024-08-13 17:05:11.327	0.0012	12			
BOKS/2100/2.1222	BOKS/2100/2.1232	2024-08-13 17:12:24.457	2024-08-13 17:12:25.123	0.0009	12.6			
BOKS/2100/2.1396	BOKS/2100/2.1401	2024-08-13 17:12:35.408	2024-08-13 17:12:35.742	0.0005	6.6			
BOKS/2100/2.1540	BOKS/2100/3.0460	2024-08-13 17:12:43.490	2024-08-13 17:13:26.428	0.0502	31.3			

Rail troughing condition report

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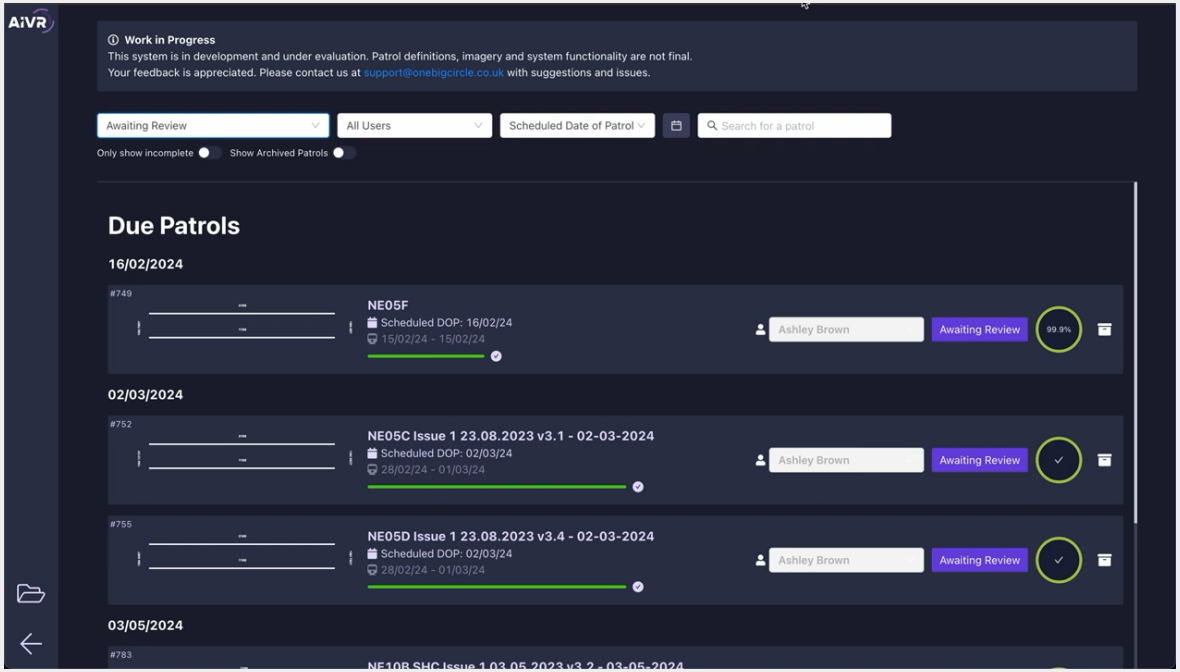
AI

Bespoke Interface Development

Digitalised workforms



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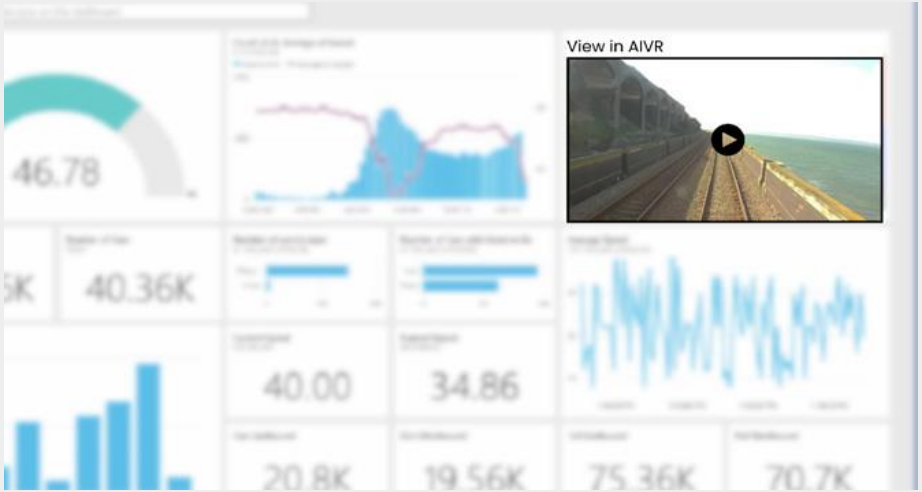
AI

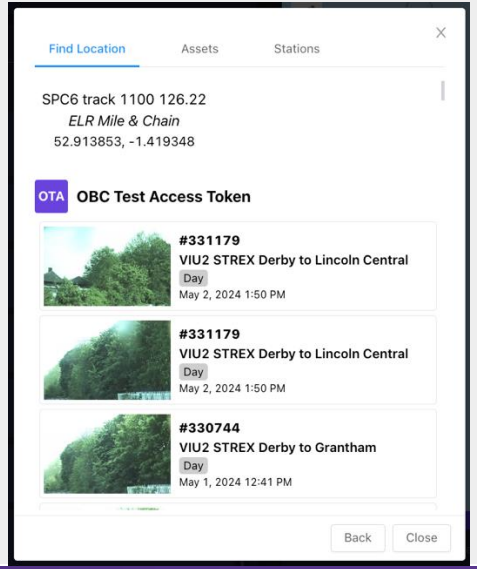
Seamless Integration

Integrate into your existing software portfolio

Widget & API provision of AIVR data



Set up ‘find links’ to link out to key data outputs



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In conclusion…

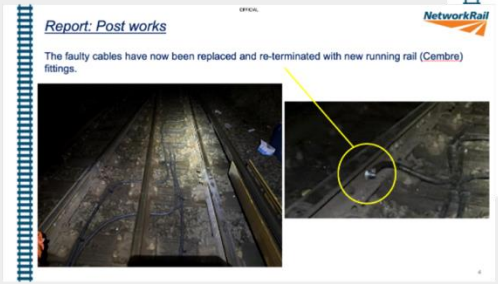
AI

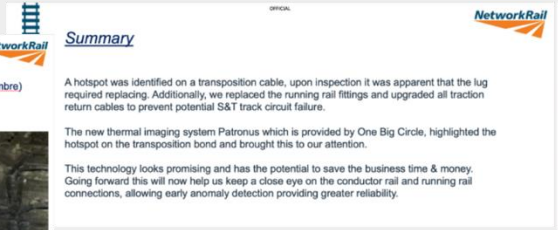
Futureproofing the Industry

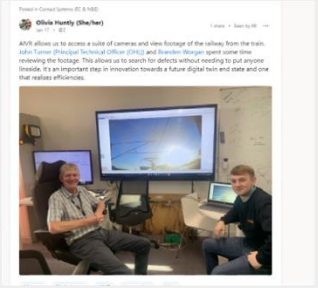
- Cost Saving
- Virtual Track Access
- Reducing Boots on Ballast
- Carbon Saving
- Increasing Safety and Efficiency
- Climate Resilience
- Automated Infrastructure Monitoring
- Collaboration
- Open approach to Data
- Online & Secure
- Digital Twin

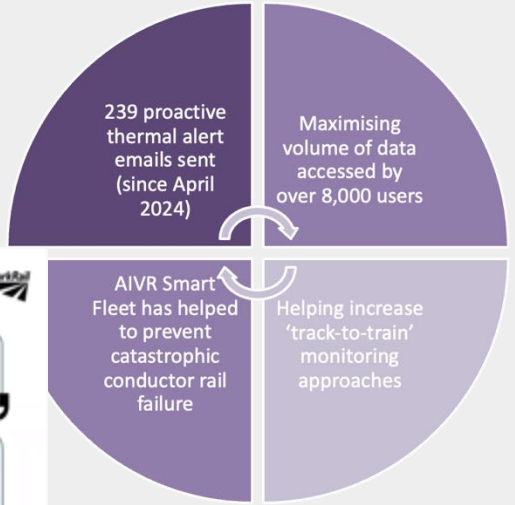
AI

Here to support your journey!









AIVR by One Big Circle has enabled our planning and site teams to gain a better understanding of site conditions and layout before attending the location, due to the availability of regularly updated high quality footage. Being able to download and use the footage in whiteboard briefings ensures everyone attending site has some degree of familiarity, which in turn helps to maintain our safety record.

Senior Planning Manager

OneBigCircle

AI

Here to support your journey!

If you'd like to find out more...

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InnoTrans 2024
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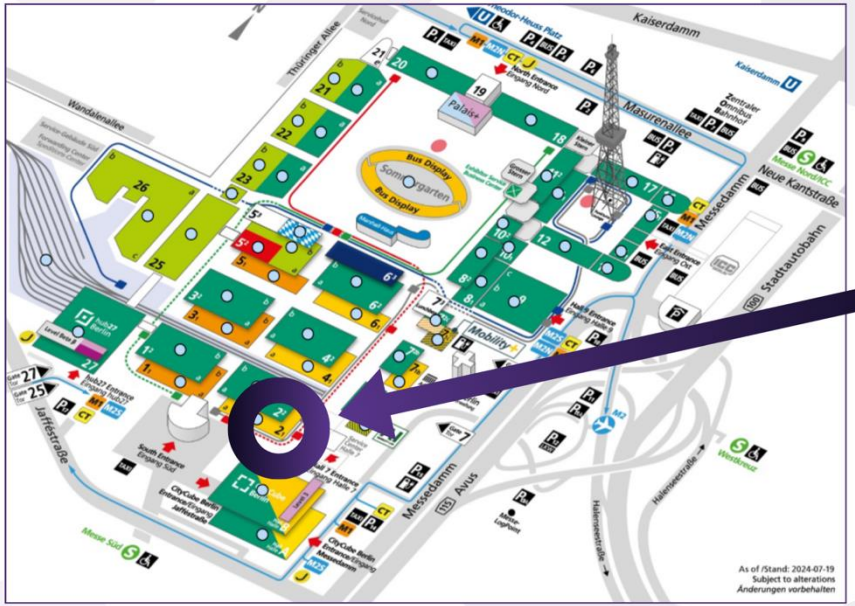

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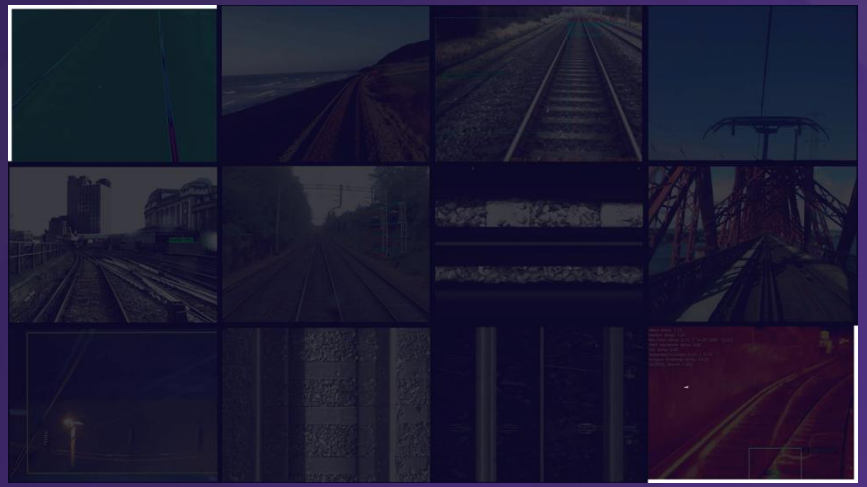
Thank you for Listening!



enquiries@onebigcircle.co.uk

0845 838 7178

www.onebigcircle.co.uk

One Big Circle, Unit 7-8 Temple Studios,
Lower Approach Road, Bristol, BS1 6QA