

# CGI SensorInsights360 for Transport

Improving Railway Reliability



**CGI**

# Challenges



1

Effectively and accurately capturing Rough Ride events, enabling validation of the passenger or driver experience

2

How alerts can be automated based on quantifiable data sets from various classes of rolling stock

3

Improving reliability, reducing delay penalties and reducing unnecessary speed restrictions safely

4

Providing detailed positioning of event locations to focus investigations by maintenance teams

5

Monitoring track degradation or improvements over time to ensure successful infrastructure maintenance

6

How onboard systems can be used to determine lifecycle management and preventative maintenance

7

How engineers compare rolling stock performance across different classes and fleets



# Our solution



## Real time event detection



Real-time environmental condition monitoring and performance data for events such as:

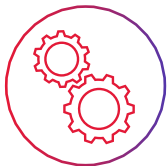
- Incidents reported by driver
- Carriage temperature and humidity fluctuation
- Carriage pressure changes
- Mechanical or electrical noise
- Daylight or light detection
- Changes in direction, strength, or relative change of a magnetic field

## GPS location data



- Sensor data matched with GPS co-ordinates every second
- Easily integrated with existing on-board systems
- Data output maximised whilst not compromising on-board WiFi performance and minimising data backhaul to the CGI cloud

## Automated incident alerts



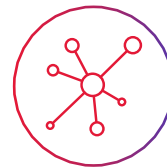
- Automated alerts based on pre determined thresholds
- Track maintainers provided with near real-time location data, reducing effort to investigate and resolve emergency and temporary speed

## Asset and infrastructure performance monitoring



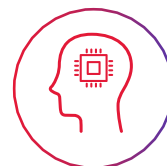
- Comfort scores calculated to assess asset or track performance
- Algorithms based on mathematics derived from ISO 2631-1 & BS EN 12299:2009
- Environmental data reported to the cloud
- APIs available for existing geospatial tools

## Data querying and geospatial tools



- User interface to understand the performance of assets in operation
- Capability to understand the effect environmental changes have on asset performance
- Conditions set, adjusted and compared across multiple sensors, fleets, routes and class of vehicle
- Geospatially agnostic toolset

## Data insight and machine learning

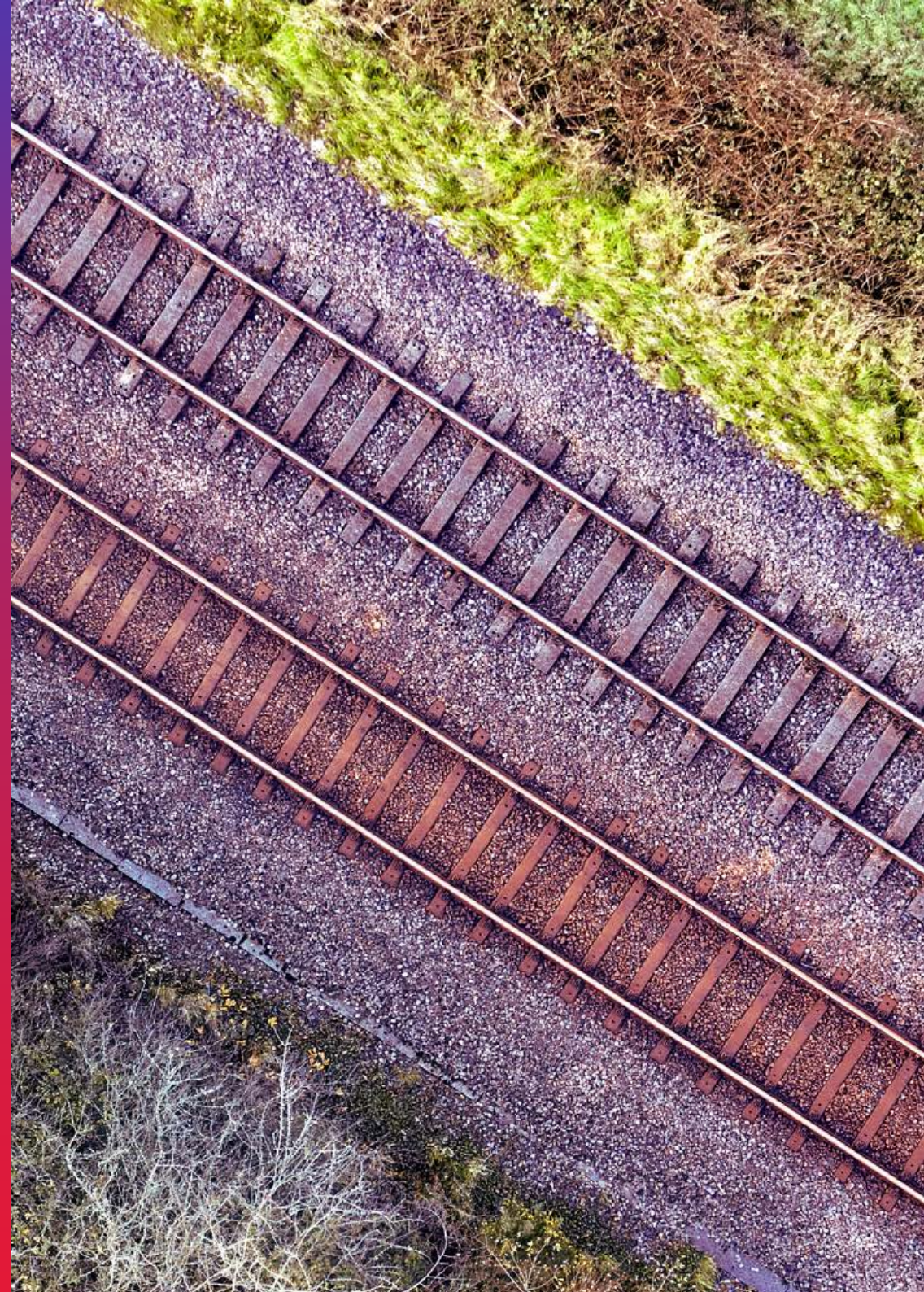


- Data set evaluation to determine the best possible algorithm to make the required operational outcome
- Analysis of data over time can identify trends and areas to focus attention
- Comparison of train assets to highlight outliers



# Benefits

- 1 Provides quantitative data to confirm against Rough Ride events reported by drivers
- 2 Reports track degradation over time through algorithms and machine learning
- 3 Enables infrastructure owners to pinpoint areas requiring maintenance using GPS technology
- 4 Reduces timescales to identify active fault areas, allowing emergency and temporary speed restrictions to be implemented swiftly with accuracy
- 5 Reduces delay penalties for operators
- 6 Improves passenger experience and network performance





# CGI in Rail

“CGI’s Train Asset Monitoring system removes the hard, complicated task of processing the data and simply provides me with a comprehensive picture of what’s going on with the trains. The patterns identified by the data analysis enable me to provide added value to my customers by informing them of potential leaks or inefficient fuel usage or increasing temperatures. This all enables Angel Trains Ltd to provide a more responsive and accurate service to customers.”

**Graham Dutton**  
Product Technology Manager, Angel Trains Ltd



We have been supporting the UK railway industry for more than 40 years, providing solutions and personnel to support some of the most complex engineering, communications, billing, and passenger experience projects. As well as providing IT services, we work closely with ROSCOs, TOCs and Infrastructure owners globally to improve business and operational performance.



“By using the My Metro app, customers have all the information that they need about the network at their fingertips.”

**Carl Williams**  
West Midlands Metro Director of Operations

## About CGI

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across 21 industry sectors in 400 locations worldwide, our 78,000 professionals provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

## Contact

James Comley  
[james.comley@cgi.com](mailto:james.comley@cgi.com)

Roger Kuipers  
[roger.kuipers@cgi.com](mailto:roger.kuipers@cgi.com)

[cgi.com/uk](http://cgi.com/uk)



# CGI