



United Kingdom
West Midlands

Transport Innovation Projects

In partnership with



Transport for
West Midlands



Transport connectivity

How can 5G help to ease urban traffic congestion, navigate the changing environment due to COVID-19 and make public transport more attractive to residents and visitors? That's the fundamental challenge for West Midlands 5G's (WM5G) transport team.

Transport is at the heart of the West Midlands which is why we've put transport connectivity at the heart of our delivery strategy for 5G.

Working with our partners – including mobile network operators, Mobile network providers and operators, public transport operators, and the automotive sector – we are looking for ways to implement 5G with the aim of:

- Making transport more efficient and reliable
- Improving access to work, study and leisure
- Enhancing the experience of travellers by improving services and products across the transport system

Our aim is to develop quick-wins that can make a difference now and develop, longer-term opportunities that will have greater impact.

This is why we are working closely with our partners at Transport for West Midlands (TfWM) to ensure that developments align with local policy objectives and help to deliver the region's industrial strategy – creating a happier, healthier and better-connected place to live.

5G will help us to build a region that is easily accessible to residents, visitors and businesses as they establish themselves at a thriving hub of the UK economy.

Road Sensor Network

WEST MIDLANDS 5G IN PARTNERSHIP WITH TRANSPORT FOR WEST MIDLANDS

Overview

Over recent years, the West Midlands has seen a rapid increase in demand for travel. Before the pandemic 50% of road traffic was carried on just 7% of the available road network. This dilemma has resulted in high levels of congestion, crowded public transport and long journey times for drivers.

To this end WM5G has launched the UK's first 5G road sensor network in collaboration with Transport for West Midlands (TfWM). As part of this project, high-definition cameras and other sensors have been installed at heavily trafficked road-junctions across the Key Route Network, connected via 5G to the Regional Transport Coordination Centre (RTCC). By using anonymised real-time data from the sensors, it is possible to test and prove the opportunity to optimise traffic flows and thereby help reduce congestion and pollution.





Aims and benefits

The road sensor network project aims to support the deployment of 5G connected sensors across the West Midlands Key Route Network to help improve traffic management, reducing congestion and emissions levels.

By enabling access to valuable, real-time data it is possible to develop a picture of congestion over time and better understand how the flow of traffic around the region can be managed and improved in the long term.

Ensuring people can travel around the region for leisure, business and academia purposes quickly and easily will support local as well as regional economic growth.

Status

The project is currently underway and is supported by further transport projects and trials undertaken by WM5G.

Location

The road sensor network project is taking place across the West Midlands Key Route Network with equipment being installed and trialled at heavily trafficked junctions and roads.

Consortia members

West Midlands 5G and Transport for West Midlands

Capacity Manager

WEST MIDLANDS 5G IN PARTNERSHIP WITH BLACC,
IMMENSE, ONE.NETWORK AND UNIVERSITY OF WARWICK

Overview

There is currently limited data relating to the road network and its users, making it difficult to accurately estimate the impact on capacity of planned roadworks and public events that disrupt traffic.

The capacity manager trial will explore how real-time sensor data transferred anonymously over 5G and analysed using artificial intelligence (AI) could more accurately predict how incidents, roadworks, and general congestion are managed.

If proven, the capacity manager project will dynamically monitor and predict capacity across the road network, help plan for highly disruptive activities such as construction and public events so they can be better managed.

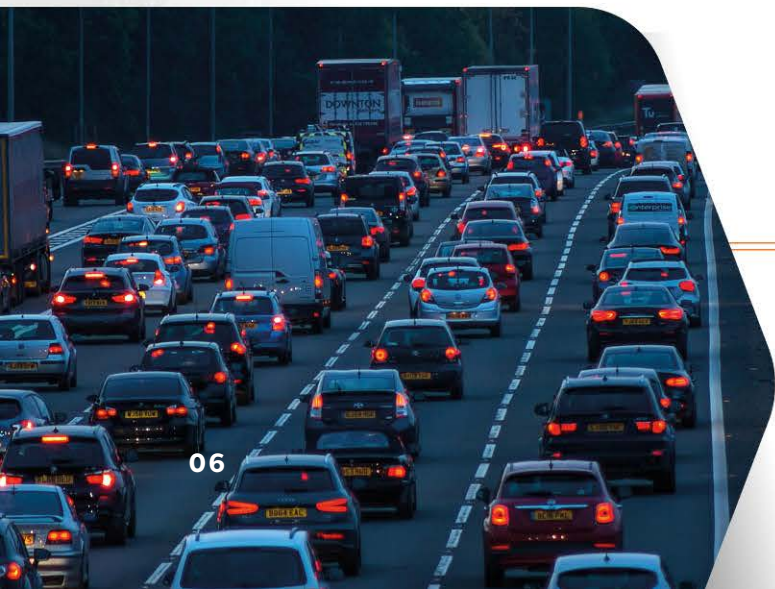
The benefits from the trial would prove incredibly valuable to the region where £10bn of infrastructure investment, construction of HS2 and the 2022 Birmingham Commonwealth Games are likely to cause some disruption in the short-term.

Aims and benefits

This trial aims to test the traffic management solution model, combining real-time data transferred over 5G with AI to analyse historic event information and insights to better manage incidents and congestion.

Improvements can be made to modelling and real-time management capabilities by deploying AI analysis of current and historical data, generating improvements to travel times and reduction to levels of congestion and pollution.

This will ultimately improve the experience of those travelling around the region, improve journey times and reliability.



Status

The project is underway with trials taking place on earmarked roads.

Location

The core testing area for the project is the A35 from M42 J6 to the Birmingham Ring Road. There are also plans to add the A4114 to Coventry and the A38 from M6 J6 to Minworth Island.

Consortia members

West Midlands 5G, Blacc, Immense, One.network and University of Warwick

CURBS

WEST MIDLANDS 5G IN PARTNERSHIP WITH VORTEX IOT, NATIONAL EXPRESS, BT/EE AND INNOVATE UK

Overview

As our cities continue to experience rapid urbanisation and population growth, there is greater pressure than ever before on our urban environments. However, by using 5G technology it is possible to create safer and more sustainable cities.

Smart cities require significant amounts of continuous, real-time data to enable effective mapping, tracking, monitoring and processing and this is where the Continuous Urban Scanner (CURBS) can contribute both data and information.

Buses and similar vehicles that travel the same route every day can become mobile scanners, providing data in real-time and enabling overlaying, processing and updating of streamed information.

CURBS works through the intersection of three transformative technologies: LiDAR, 5G and Artificial Intelligence. The 3D LiDAR devices are used as mobile laser scanners which collect gigabytes of point-cloud data per mile, which can place significant stress on bandwidth, latency, storage and processing.

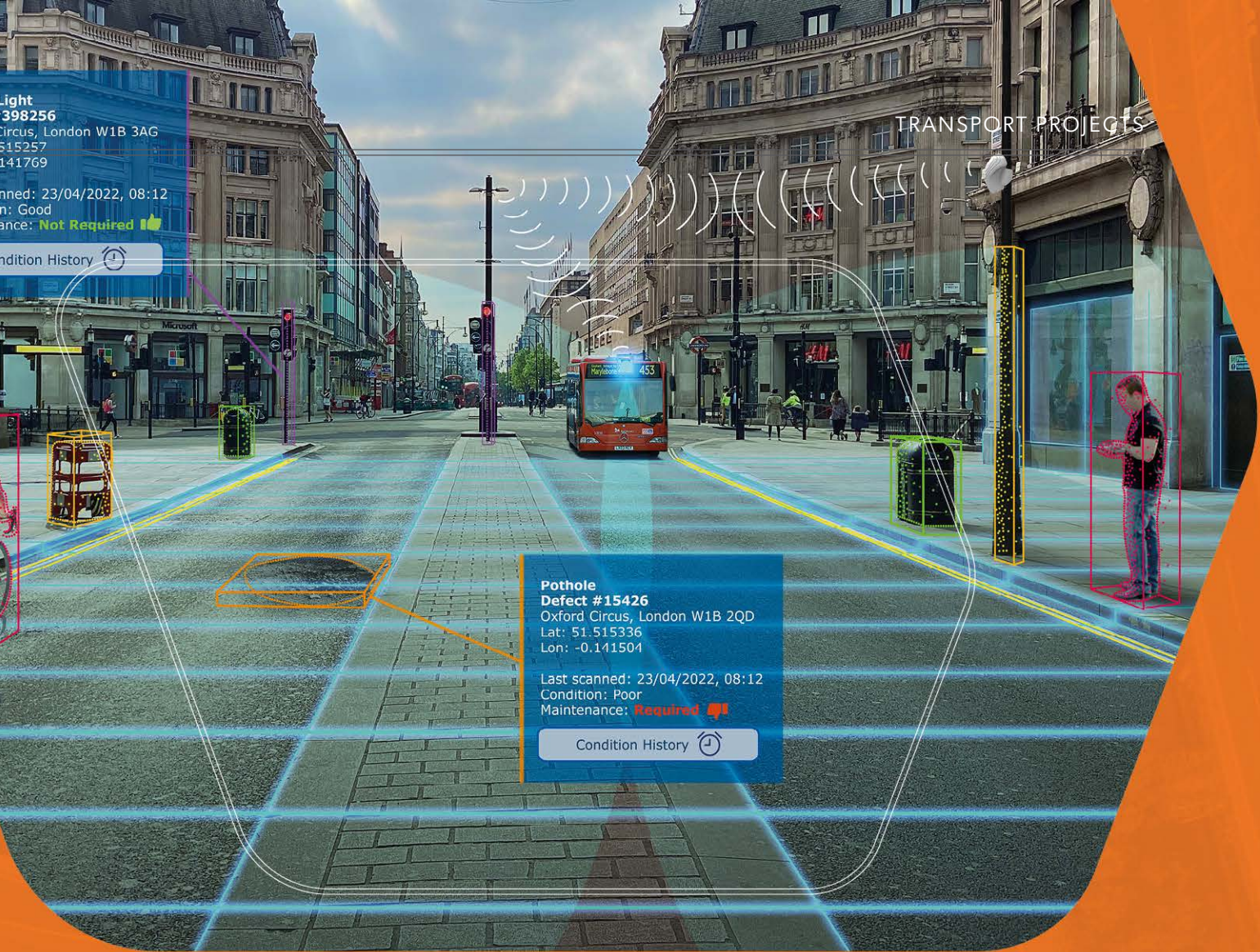
Aims and benefits

The trial seeks to prove the application of LiDAR sensors, advanced software and real-time 3D point-cloud data sent over 5G to provide and inform up-to-date maps, monitoring roads and rail infrastructure.

The information provided by the project, such as accurate passenger counts, will aid transport companies in improving their operational efficiency, by better matching vehicle types and journey times to evolving passenger demand.

Following a successful trial, the system will provide live on-street parking information, identify the location of potholes, improve cyclist safety, reduce vehicle damage and streamline city maintenance and repairs.





Light
 398256
 Circus, London W1B 3AG
 515257
 141769
 Scanned: 23/04/2022, 08:12
 Condition: Good
 Maintenance: **Not Required** 🟢
 Condition History 🕒

Pothole
Defect # 15426
 Oxford Circus, London W1B 2QD
 Lat: 51.515336
 Lon: -0.141504
 Last scanned: 23/04/2022, 08:12
 Condition: Poor
 Maintenance: **Required** 🟡
 Condition History 🕒



Status

The project is currently underway, (including a three-month pilot phase and live demonstrator in the West Midlands, within the future mobility testbed).

Location

The trial will utilise a fleet of eight buses from Bordesley Bus terminal. The trial will take place along provisionally assigned routes, including the 8A, 8C and 17 in Birmingham.

Consortia members

West Midlands 5G, Vortex IoT, National Express, BT/EE, Innovate UK

Passenger Management

WEST MIDLANDS 5G IN PARTNERSHIP WITH GOMEDIA, WORDNERDS AND ICOMERA

Overview

A fundamental issue on the UK public transport network is that transport company staff don't necessarily know how customers using their services are feeling regarding their journey. This can range from a relatively small issue such as temperature in the cabin, to a concern around anti-social behaviour, and can provide the support that some disabled passengers require when using public transport.

Issues such as these can be difficult to report depending on availability of staff or the circumstances of the situation.

Many problems have been exacerbated by COVID-19; the need of passengers to socially distance on a train or tram is paramount in getting the transport systems in the UK back to operating at full capacity.

The passenger management trial explores how an AI-led system designed to improve passenger experiences and safety by providing intelligence-lead interpretation of live customer feedback over 5G.



Aims and benefits

The trial aims to provide a solution that will help public transport operators better understand passenger concerns by allowing real-time interactions and incident reporting to improve the journey experience.

In a future where technologies such as these are used more broadly, insights gained will help make public transport a more attractive way to travel. This will in turn support the region's ambition to reduce emissions and create a more sustainable transport environment.

Status

The project is currently underway with the aim of equipping five trams with 5G routers during the first 18 weeks of the project following launch in September 2020.

Location

The trial is taking place onboard five West Midlands Metro trams operating across Birmingham.

Consortia members

West Midlands 5G, GoMedia Wordnerds and Icomera

Predikt

WEST MIDLANDS 5G IN PARTNERSHIP WITH APPYWAY AND GET MAPPING

Overview

The Predikt trial uses 5G-enabled kerbside imaging to reduce the average eight minutes spent finding a parking space in urban centres. This will in turn reduce the estimated £373 million spent each year in wasted time and fuel, and the emissions caused by drivers searching for a place to park.

The trial will see multiple vehicles equipped with 5G-connected dash-cams, which can report live kerbside parking availability. It is expected the solution will prove far more effective compared to static parking bay sensors.

Through an app, drivers will be able to rely on accurate predictions and 3D mapping that will highlight the best parking options for them, before they set off on their journey.

Aims and benefits

The Predikt project aims to prove the first 5G enabled commercial parking proposition in the UK.

If successful, drivers will have access to highly accurate predictive availability of parking spaces, making their journeys quicker and less polluting by reducing the time vehicles spend circling to find a space.

It will make the West Midlands more accessible encouraging visitors, industry, academic and financial growth.

Status

This project is currently underway and is expected to run for just under a year following its launch in September of 2020. Results are expected to coincide and help guide cities reemerging post COVID-19.

Location

The trial is currently being conducted in Coventry city centre following initial testing in Sparkhill Birmingham.

Consortia members

West Midlands 5G, AppyWay and Get Mapping





Tram Safety and Security

WEST MIDLANDS 5G IN PARTNERSHIP WITH WEST MIDLANDS METRO, ICOMERA, CLASSONE SYSTEMS, DIGITALRAIL, VODAFONE AND INNOVATEUK

Overview

The tram safety and security project will develop and deploy retrofitted 5G capability to trams' existing on-board CCTV systems. The additional capability to detect safety and accessibility issues, such as when a passenger who needs assistance has arrived at a platform, allows staff to take action much more quickly. Where an issue may arise, the programme automatically sends an alert to staff who receive a live video stream over the 5G network, straight to their device.

The footage will be analysed in real-time to detect people and objects, helping to increase passenger safety, assist with social distancing, and identify where improvements to accessibility may be required. Passengers will benefit from a safer, more tailored service.

The project will also look to resolve security issues, including unclaimed bags left on transport, or if a passenger takes the wrong luggage. It can provide Yellow Line Alerts to drivers and improve business information for operators and authorities.





Aims and benefits

The tram safety and security project aims to improve the level of connectivity onboard trams and at stations to help resolve safety concerns and keep all staff and passengers safe.

When deployed at scale this technology also holds the capability of improving passenger experience, particularly for those requiring additional assistance in boarding public transport, making it easier for more people to make use of public transport.

Status

The nine-month long project is currently underway.

Location

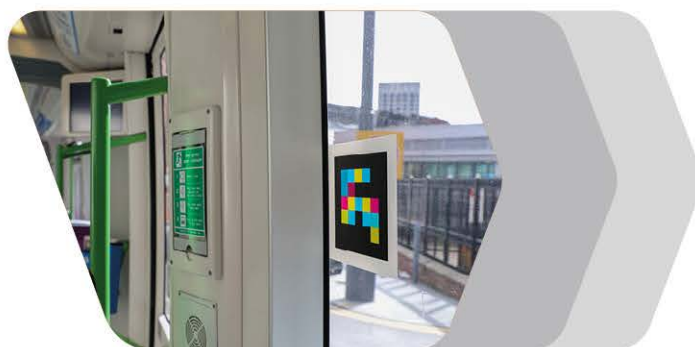
The technology will be developed and deployed onto West Midlands Metro trams for comprehensive testing of the technology.

Consortia members

West Midlands 5G, West Midlands Metro, Icomera, Classone Systems, DigitalRail, Vodafone and InnovateUK

Transport Accessibility

WEST MIDLANDS 5G IN PARTNERSHIP
WITH GOMEDIA AND ICOMERA



Overview

Over 40% of the visually impaired in the UK are unable to make all or some of their journeys on public transport independently, which represents a substantial 2 million people.

Sight loss places a significant economic cost on the UK, estimated at £28 billion per annum, which could be alleviated by getting the right information to visually impaired passengers at the right time.

The Transport Accessibility project will rectify that by creating a passenger service that makes it far easier for visually impaired people to travel on public transport by helping to develop a more inclusive transport system.

GoMedia and Icomera are collaborating with the Royal National Institute for the Blind (RNIB) to create and deliver a solution to improve accessibility for the blind by utilising augmented reality and location-based video.

Initial tests will be also be conducted to provide feedback to optimise the solution during the trial.

Aims and benefits

It will make public transport journeys safer and less daunting, thereby making the West Midlands more inclusive and accessible, while more people will be able to rely on public transport to get from A to B.

Tertiary benefits in the future will also include services such as live TV, live radio and streamed content across the network.

Status

The trial is currently underway and will seek to develop the technology and undertake laboratory tests, with a live trial on West Midlands Metro trams in early 2021.

Location

Trials will be taking place across West Midlands Metro trams and stations across Birmingham.

Consortia members

West Midlands 5G, GoMedia and Icomera





Urban Tourism 5.0

WEST MIDLANDS 5G IN PARTNERSHIP WITH
YOU. SMART. THING., LANDMRK, IMAGEMAKERS AND YST

Overview

Existing apps used by travellers to get to venues when attending live events are not always up to date with localised information – such as temporary road closures – which can create issues in navigation. Critically, there is a lack of personalisation for those who may require special assistance in planning their route, because they have luggage or mobility issues.

Urban Tourism 5.0 aids advance journey planning by providing creative and engaging media navigation to get to and from venues and events as they come back on stream. It will also utilise innovative Augmented Reality (AR) functions to bring the history of the city to life using 3D imagery.

The project is focused on using 5G technologies to deliver a next generation 'Travel Assistant' service, supporting the recovery of the live events and leisure sector.

Using 5G-enabled sensors at stations and major venues combined with booking and travel information, the Travel Assistant will create forecasts and real-time traveller demand insights for rail and road transport network operators. This information will support crowd management and ultimately improve visitor experience.

Aims and benefits

The project aims to improve the travel experience of visitors to the region as they use 'last mile' routes to destinations and events. By reporting on real time visitor numbers, and crowd movements the solution will support social distancing within public both before, during after an event.

Status

The trial is currently underway, and tests of the Urban Tourism 5.0 Travel Assistant service will take place at events running from April 2021 into 2022.

Location

The project has a regional focus on Coventry UK City of Culture in 2021 and will be trialled at several of its events, with visitors from in and around Coventry and the West Midlands region able to engage with the trial.

Consortia members

West Midlands 5G, You. Smart. Thing., Landmrk, Imagemakers, and YST

What's next?

FOR CONNECTED TRANSPORT IN THE WEST MIDLANDS?

A further six transport projects have been awarded funding to continue the expansion of 5G connectivity across the transport sector, to encourage public transport uptake, optimise logistics and support post-Covid recovery within the region.

The new projects, designed to improve passenger experience, road management and congestion across the West Midlands will be taking place over the next 12 months, working in tandem with projects already underway. This makes the West Midlands home to nearly 20 connected transport use cases, proving 5G connectivity's place in optimising travel.

Each new use case will undertake a minimum of three months of user or product testing to verify its benefit to operators and confirm how the solution will contribute towards achieving greater efficiencies, solidifying the West Midlands as a leader in UK transport innovation.

5GER

TrainFX, University of Strathclyde and University of Surrey

To improve access to information and build passenger confidence in large stations, 5GER is developing the UK's first 5G-enabled smart train station robot. Through a combination of state-of-the-art 5G technology and mobile robotics, the robot will be able to autonomously navigate large and complex railway stations like Birmingham New Street. It can interact with people, provide information and assurance to those in need of extra information or assistance to help improve passenger confidence in stations.

OCCUPANCY

Hack Partners, First Group

A vital part in growing passenger confidence in public transport post-Covid is managing passenger numbers, at stations and onboard transport. The Occupancy project will harness the power of 5G and video data learning to improve the occupancy of buses and reduce overcrowding. This will boost traveller experience and ensure alignment with passenger health and safety measures, through enhanced accuracy of occupancy assessment which provides better information to travellers and operators. While the project will initially be delivered on buses, there is the potential to extend it to other services, such as tram and rail.



WEST MIDLANDS



CAT

Westfield, WMG,
Nexor, Black

The new Very Light Rail (VLR) vehicles offer great potential to increase mobility across cities through lightweight, energy efficient rail travel. The CAT VLR project is exploring how 5G can improve the safety of such autonomous vehicles through its real time applications. The project will trial a 5G connected control system which operators will be able to interact with and respond to in real-time. CAT is also hoping to solve the major safety concern of personal items and passengers trapped in doors and will test a connected door safety system.

TRAVEL XR

BRITEYELLOW, Birmingham Uni, Bell
Microsystems

Navigation around train and bus stations, and other high-density places such as shopping centres, can be particularly difficult for vulnerable passengers or those requiring extra assistance. TRAVEL XR seeks to improve the current operating systems using 5G's higher capacity for camera data and locational accuracies, and offers a solution utilising wearables, cameras and Internet of Things (IoT) sensors to detect people in walkways. This will enable systems to offer micro guidance within stations, ultimately improving passenger safety and experience and provide station operators with real-time data to analyse passenger status and crowd density.

POLY TRACK

ESR, Southampton Uni,
Polychord

To identify wear and developing faults to tram tracks, engineers would manually survey or deploy specialist machinery to scan the line, a process which is both time consuming and laborious. POLY TRACK uses 5G's positional accuracy and real-time data transmission to detect rail imperfections on both tram and rail tracks through sensors installed on the Chassis (Bogie) of the vehicle. These sensors help operators identify and ensure maintenance is carried out to the track before imperfections deteriorate and will help optimise safety and maintenance.

HPOMS

JR Dynamics, Newcastle University,
Angel Trains, West Midlands Trains
and AQ Ltd

Overhead line (pantograph) damage costs the UK rail industry more than £100 million a year and causes delays and safety issues. HPOMS aims to develop camera systems that provide visual footage of impacts and overhanging foliage and utilise the footage to accurately measure pantograph height, wire stagger and carbon wear. 5G coverage will enable high powered and near instantaneous image processing triggering appropriate alerts, improving passenger safety as well as reducing operational costs.



wm5g.org.uk

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