Intelligent Transport Systems UK
Empowering Transport Technology

review

Annual Review 2026

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Minister Lilian Greenwood: Why this year marks a turning point for road safety in Great Britain

Mayor Ben Houchen: How Tees Valley is utilising digital twin technology to deliver real benefits

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In this issue

Lilian Greenwood
Minister, Department for Transport

Intelligent Transport Systems UK
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THE TRAFFIC GROUP

FROM THE PRESIDENT

Transport 4.0: Integrated. Inclusive. Intelligent.

Steve Norris
President, ITS UK and former Transport Minister

I am delighted to introduce this year's ITS UK Annual Review not least because this last year has seen some very significant steps forward in the development and implementation of technologies which are at the heart of what we exist to promote.

The good news is that our sector is in rude health. There is a growing recognition in Government that the technologies developed by our members are central to how our economy and society will develop in future decades. For more than thirty years since this was my brief as a Minister, I have argued that as fossil fuels became less significant as a source of Government revenues, we would inevitably move to a pay per mile system which - by definition - would be based on technology.

It took much longer to emerge than I had assumed but it is now clear that as EV volumes increase, fuel duty receipts are declining. So, the Government has announced its intention to charge EV owners to offset the advantage they currently enjoy over ICE drivers.

The system they are proposing does not look particularly robust and we at ITS UK will be helping Government to come up with a more effective solution, but the move to pay per mile is clearly now underway - not just in UK, but around the world, where for decades governments have seen fuel duty as one of the simplest and most predictable sources of revenue. It is also worth commenting that while in time it looks as if every car will be electric, the same is unlikely to be true for trucks or plant, where hydrogen really does come into its own.

We have also seen an equally seismic development with the first driverless cars cautiously navigating around our city streets. Early days again, but even more significant in terms of its potential impact on society. The United Nations has stated that more men are employed driving on this entire planet than in any other occupation.

The aim inter alia is to eliminate road casualties. While the UK is one of the safest in the world, too many are still killed or seriously injured every year on our roads. This again is a huge challenge for governments. But whilst driverless vehicles may be safer, we must consider how the system will act when the inevitable collisions happen. And who will be responsible for their integration into our largely human driven road network?

We are very clearly in the Fourth Industrial Revolution in the transport sector where the accent is on change. We must ensure technology is delivered in a way which benefits society as a whole - is inclusive, integrated, and always intelligent.

ITS UK, with Max at the helm, has yet again grown in numbers, in its impact on our sector and in our value to Government. The future of transport lies as ever in technology. It is a global challenge and one in which the wider ITS family is clearly capable of making a very significant contribution indeed.

Steve Norris
President, ITS UK

FROM THE CHAIR

A pivotal moment for the ITS sector

Catherine Whitfield
Chair, ITS UK

It is my pleasure to welcome you to the ITS UK 2026 Annual Review. As our President, Steve Norris, has already commented, this has been another year of rapid change for our sector and I am struck by both the pace and the growing responsibility we carry.

Intelligent Transport Systems are no longer an optional enhancement to our networks; they are essential to how we manage demand, reduce carbon, improve safety and deliver value from constrained budgets.

Across the industry, expectations continue to rise. We are being asked to do more with existing infrastructure, to respond more quickly to disruption, and to demonstrate clearly the social, environmental and economic outcomes that technology can deliver. This places integration, data and operational insight firmly at the centre of transport decision-making. Efficiency can no longer be defined simply by saving time or money in individual parts of the system; the real value lies in how well the network performs as a whole.

That challenge plays directly to the strengths of ITS UK and the unique and increasingly influential role we play in addressing it. With a membership that spans consultancy and design, technology supply, systems integration and operations, and covers all transport modes, we are uniquely positioned to convene the sector, inform policy and act as a trusted advisor, giving ITS UK both credibility and responsibility. Over the past year we have continued to strengthen our external-facing work, supporting our members by engaging with policymakers, industry partners and international counterparts, and by ensuring the value of intelligent transport systems is properly understood.

I am also convinced that how we work is just as important as what we deliver. Our sector is improving in terms of gender diversity and the breadth of thinking it brings into the room, but we still have more to do. Increasing intellectual diversity, welcoming different professional backgrounds, disciplines and lived experiences, will be critical if we are to solve the complex problems facing transport. Progress is being made, but it will only continue if we are deliberate about creating inclusive spaces, developing talent and challenging established ways of thinking.

Looking ahead, our focus is the ITS World Congress in Birmingham in October 2027. Hosting the Congress is a huge opportunity for the UK sector - but it will only be the success we want it to be if we move beyond good ideas and good intentions to coordinated action. That means showcasing real-world solutions, demonstrating delivery at scale, and being honest about the challenges as well as the successes. As a community, we now need to match our ambition with momentum and I encourage all of you to get involved and seek out opportunities to participate.

As Chair, I remain immensely proud of the commitment shown across ITS UK. As always, my sincere thanks go to our Board Directors and Forum Officers for their continued volunteer leadership and expertise. I am particularly pleased this year to welcome our three new Appointed Board Directors, Jo Field, Chacasta Pritlove and Claire Spooner. I am confident their addition to the Board will enable us to expand our thinking and better serve our membership.

I would also like to thank the ITS UK team, Max Sugarman, Eduardo Pitts, Lydia Dumont, Priscilla Ross, Harry Mandel and Elva Tehan, for their energy, professionalism and ability to deliver an extensive and high-quality programme of activity in a demanding environment. It never ceases to amaze me how such a small team can deliver with such might and I know it takes effort, dedication, personal sacrifice and passion to do so.

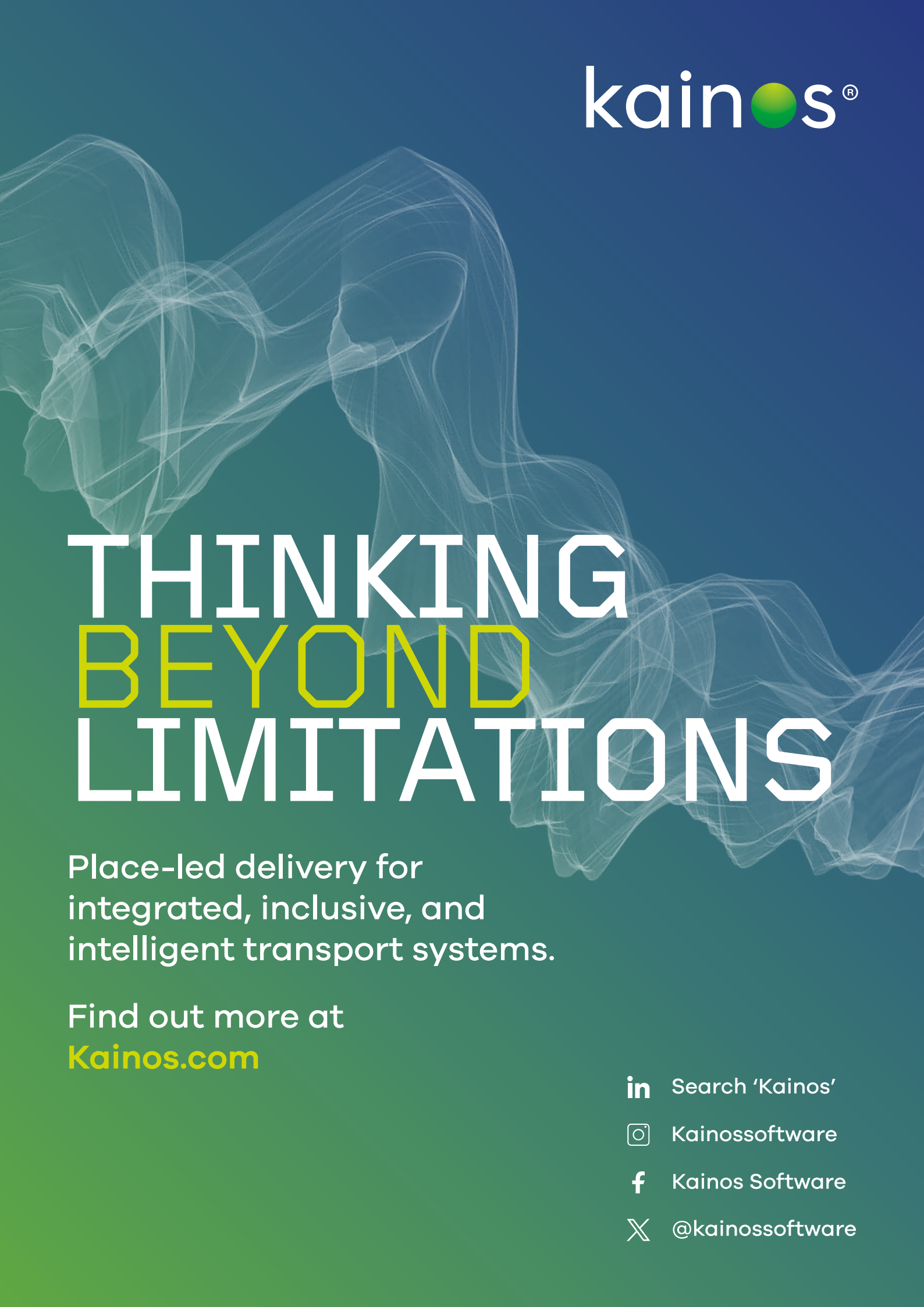
Finally, I would like to thank all of our members. Your engagement, challenge and collaboration are what give ITS UK its relevance and authority. This Review reflects the strength of that collective effort, and I hope it also provides confidence in what we can achieve together as we move from conversation to delivery.

Catherine Whitfield
Chair, ITS UK

Intelligent Transport Systems UK
Empowering Transport Technology

CHAPTER 01

What we're up to at ITS UK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FROM THE CHIEF EXECUTIVE

A moment of change for the transport tech sector?

Max Sugarman
Chief Executive, ITS UK

Welcome to this year's Annual Review!

This year, our theme is 'Transport 4.0: Intelligent, Inclusive, Integrated',reflecting the most significant change taking place across our transport system: the growing influence of technology.

It barely needs saying that technology is reshaping how we move, as the Fourth Industrial Revolution changes all parts of our society. But, it feels like this year is particularly pivotal for the transport tech sector – with growing recognition of its role on the network and in Government policy.

THE ECONOMIC VALUE OF TRANSPORT TECHNOLOGY

At the start of the year, ITS UK published a new study, commissioned by independent consultants, Capital Economics, to identify the true value of the transport technology sector. The findings showed that the sector delivers double the economic value previously identified at £3.2 billion, as well as supporting 45,000 jobs and some £500 million in tax revenue every year.

Identifying the value of the sector was no easy task, not only because technology plays a role across every part of transport, but also because of the breadth of its applications. Nevertheless, the figures show a key, strategic sector for the UK – one that is supporting economic growth and employment opportunities across the country.

The importance of integrated, seamless transport has been an issue that ITS UK has been advocating for a number of years, including in our Manifesto for the Future of Transport.

THE GROWING IMPORTANCE OF TECHNOLOGY TO TRANSPORT POLICY

One of the very noticeable changes this year has been how much technology is playing a central role within Government policy. Nowhere is this more obvious than in Better Connected, the Government's new strategy for integrated transport.

The importance of integrated, seamless transport has been an issue that ITS UK has been advocating for a number of years, including in our Manifesto for the Future of Transport. And we were particularly delighted when a new integrated transport strategy was announced, as it gave us the opportunity to contribute through a series of workshops with members. It is clear from Better Connected that technology is critical to integration – whether through smart ticketing, funding for digital twins, the role of data (highlighted in the accompanying Transport Data Action Plan – which we acted as a critical friend for) or through initiatives like the National Parking Platform.

Aside from Better Connected, there are many opportunities emerging for the sector. At the end of last year, we saw the Government announce plans for a new Electric Vehicle Excise Duty (eVED), a proposal for a pay-per-mile national road charge. As our President Steve Norris sets out (Page 5) this is a significant opportunity for

the transport technology sector. The scheme proposed by Treasury offers little in the way of technological implementation, preferring a simple reading of the odometer in vehicles to determine the distance driven. However, when you consider the challenges around enforcement, driving overseas (where cars will still pay eVED) and the issues around ease of paying the duty, it becomes clear that opt-in technology solutions will be vital. We've been busy making the case to Government on this – calling for a technology-based option to be available from day one of the new scheme.

Elsewhere, we are seeing plenty of opportunities for the growth of technology. 2026 looks to be the year that autonomous vehicles will begin rolling out on the streets of the UK; work is underway by DfT to develop a Connected Vehicles Framework; Great British Railways is moving towards establishment, offering opportunities for better use of rail data; Mayoral Strategic Authorities are gaining new powers to bring together their transport networks; DBT is looking to develop a smart data scheme in transport; and we now have a Road Safety Strategy with a clear target to reduce Killed or Seriously Injured (KSIs) by 65% - a goal that will critically need a more effective use of data and digital assets. The list could go on; it is clear that there are extensive opportunities within the sector for the greater use of tech.

WHAT ITS UK IS DOING TO SUPPORT YOU

ITS UK sits right at the heart of a number of these changes, acting as a conduit between members and Government, and as your voice when change is required. As our Public Affairs & PR Manager Eduardo Pitts sets out (Page 16), this year we've increased our presence amongst local and devolved policymakers. And we've continued to push for policy and regulatory change to benefit our members, whether that's our new Stuck on Red campaign highlighting the need to replace traffic technology or our continued advocacy on Home Office Type Approval (HOTA) for enforcement equipment.

New this year is our updated Forum structure. Having consolidated our Forums into five core topics, following a review by Strategy & Industry Advisor Rachael Quinn, we have now begun ensuring our Forums are shot through our work like the writing through a stick of rock. You'll see our Monday Newsletter is now divided by Forum topic, that this Review is chaptered by Forum and that we are now hosting larger one-day conferences for each Forum, as our Head of Events & International Lydia Dumont explains (Page 11).

One issue we have members raise with us regularly is skills. Getting young people interested in the sector is critical – particularly in an industry like ours that is so reliant on digital skills. That's why we launched *Project ROUTE*, a new initiative with our partners at DigData. The aim of *Project ROUTE* is simple: engage 10,000 students to make them more aware of the digital opportunities in transport. We've been overwhelmed by the support we've received, both from the sector and Government, who have endorsed the initiative. You can find out more on Page 13.

THE JOURNEY TO 2027

All this makes for an exciting period for ITS UK and the ITS industry. However, the excitement is only growing as we build up to the ITS World Congress in 2027. We've been working closely with the team at Transport for West Midlands, the Department for Transport and ERTICO to prepare for the leading event in transport technology as it makes its way to Birmingham next October.

If you aren't already involved, I would strongly recommend reading what Mike Waters has to say (Page 19) – this is a one-in-a-generation event for the sector, that is not to be missed.

DELIVERING TRANSPORT 4.0

Thank you for once again working with ITS UK, and being part of the community. 2026 is the year where technology really does become a strategic part of our transport network. I really look forward to working with you to make Transport 4.0 a reality.

We launched Project ROUTE, a new initiative with our partners at DigData. The aim of Project ROUTE is simple: engage 10,000 students to make them more aware of the digital opportunities in transport.

Five new Forums covering the key issues of importance to members

DATES FOR YOUR DIARY

SafetyTech	28 May, Leonardo Royal Hotel, Birmingham
Digital Transport	15 July, Marriott Hotel, Liverpool
Freight, Logistics & Maritime	8 September, Hilton Southampton
Intelligent Mobility	1 October, Cardiff
Future Roads	3 December, Edinburgh

I'd like to introduce myself as the new ITS UK Head of Events and International. I joined ITS UK at the end of March 2026, and in such a short space of time, I've learnt a lot about intelligent transport systems. I'm excited to embrace so much more that this progressive and forward-thinking industry has to offer.

Lydia Dumont
Head of Events & International, ITS UK

A major part of my role at ITS UK is to manage our events programme and that includes developing a new format for our Forums. Starting this year, the Forum programme has been consolidated into five key themes, each with their own flagship, one-day conference, held at key locations across the UK. Each event will offer a professionally curated agenda featuring keynote speakers, expert panel discussions, and dedicated networking time for those key conversations.

DEVELOPING THE FORUM PROGRAMME

Following an extensive review by our Industry & Strategy Advisor Rachael Quinn last year, we have brought our 15 Forums down to five, covering key topics for the sector:

- **SAFETYTECH**, exploring the latest technology supporting a safer transport network, across all modes;
- **DIGITAL TRANSPORT**, examining the latest in AI, data, cyber, digital twins and digital technologies;
- **FREIGHT, LOGISTICS AND MARITIME,** covering all aspects of technology around the movement of goods;
- **INTELLIGENT MOBILITY,** exploring areas like smart ticketing, demand responsive transport, MaaS, journey planning and public transport; and
- **FUTURE ROADS,** looking at the topics like road pricing, connected and automated mobility and intelligent traffic management.

A PROGRAMME WORTHY OF OUR MEMBERS

The five Forums reflect the full landscape of the ITS UK membership. Our intention is simple: every single member should find a natural home in at least one of these Forums, if not several, and every member should have a clear and compelling reason to attend.

One of the most important decisions we made in redesigning the programme was to open all five Forums to local authorities and the wider public sector. This is not simply a logistical choice, it is a strategic one, and it speaks directly to what our membership needs most. By bringing the public sector into the room alongside our members, we are creating an environment for real, substantive conversations between buyers and suppliers, between innovators and decision-makers.

And we've now elected Expert Committees, made up of representatives from the membership, to help guide the direction of each event, as well as to inform our wider work in each Forum's particular area.

HOW TO GET INVOLVED

First, make sure you come along to a Forum! Places are complimentary for members and we are also keen to get members involved in speaking opportunities and shaping the agenda.

For the first time, each Forum will offer also full sponsorship and exhibition opportunities, giving members the space to position themselves at the heart of the conversation. The exhibition will be integrated into the catering/ refreshment breaks to enhance networking opportunities.

This kind of platform creates genuine return on investment and provides valuable face time with the right people, in the right environment. We are proud to be able to offer our members a route to market that is as impactful as it is professional.

See you at a Forum!

We are excited about what this new era of ITS UK events represents, and we look forward to welcoming you to your Forum in the coming months.

All available information on the Forums can be found on our website:

its-uk.org/events

The network behind the network: ITS UK membership in the Transport 4.0 era

Harry Mandel
Membership & Business Development Executive

The transport sector has never moved faster. Transport 4.0 is reshaping how the sector operates and with it, the commercial landscape too. New opportunities are emerging as new players are entering the market - meaning the businesses that thrive won't simply be those with the best solutions. They'll be the ones who are visible, well-connected, and in the right conversations at the right time.

HOW ITS UK MEMBERSHIP CAN HELP

With a membership spanning multinationals, local authorities, SMEs, start-ups and academia, ITS UK sits at the heart of the sector. The breadth of membership isn't just good for networking. It is a genuine asset for every organisation within it.

From Forum series and Executive Dinners to the Annual Conference and international delegations, ITS UK's activities give members consistent opportunities to build their profile and stay visible with the people that matter. With attendees spanning both public and private sector, every event is an opportunity to be in the right room with the right people.

Beyond events, ITS UK actively engages with local and national government on behalf of its members, ensuring the sector's voice is heard where it matters. That access to policy conversations is something members can draw on directly, ensuring they are not just aware of the changes coming down the line but are part of shaping them too.

MAKING CONNECTIONS

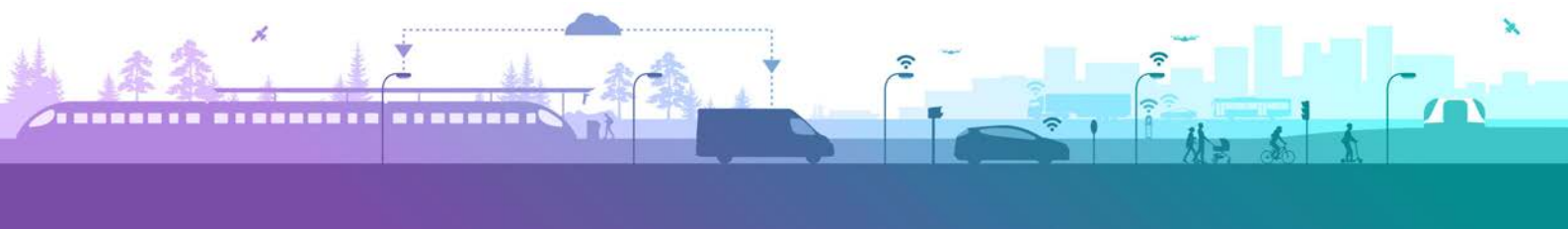
The events programme gathers members with leaders and decision makers across the sector, to discuss, network, and shape conversations on the biggest challenges facing the UK's transport system. The ITS UK team can open doors across the membership directly, connecting members with the right organisations at the right time. Each of these touchpoints works on its own, but the members who get the most out of ITS UK are the ones who use them together – attending events, sharing thought leadership and getting involved in developing the latest thinking in the future of transport. In a landscape defined by change, connecting regularly with peers is what turns membership into a genuine commercial advantage.

HOW TO GET STARTED

The question I often get is: how do I get started with ITS UK membership? The first thing to say is that, by reading this Review, you've taken the first step. Next, come and speak to us, meet us for a coffee or attend one of our many events across the UK. Get involved in a Committee or Forum, write a post on our Blog, submit an award for the President's Dinner, share your news story for us to promote across the sector. There are infinite ways to benefit from your ITS UK membership – so do get involved.

BE VISIBLE, CONNECTED AND IN THE RIGHT NETWORK

Transport 4.0 is not a moment, it is a direction of travel. The sector will keep evolving, new technologies will emerge, new markets will open up, and the competitive landscape will keep shifting. The businesses that are best placed to grow through that change will not just be the ones with the best products or services, they will be the ones who are visible, connected, and embedded in the right networks. ITS UK exists to make sure its members are all three.



This year, ITS UK has been partnering with the Data Inspiration Group (DIG) to launch Project ROUTE – a new initiative to engage 10,000 students on the digital and data roles available in the transport sector. At the ITS UK Annual Conference at Interchange, Rachel Keane, Chief Data Inspirer at DIG, launched the programme and sat down with Danielle McGrellis, an Associate at Arup; Veron Charles a Business Management Student at Manchester Metropolitan University; Joe Collis, Head of Profession at Amey; and Aliyyah Mohammed, a Transport Data Development Officer at the Department for Transport. Here is their interview.

Own your future: Why transport needs the next generation of digital talent

"I had to really push myself into these opportunities. Doing placements, internships and events like this helps you understand the industry more."

Veron Charles

"I'm really proud to work somewhere where data is embedded in the processes we use to make recommendations."

Aliyyah Mohammed

With the Annual Conference falling on the same week as National Careers Week, the panel were looking to focus on one critical question: how can the transport sector inspire and attract the next generation of digital and data-driven talent? The session, titled *Own Your Future*, explored the changing landscape of transport technology careers and the many different pathways into the industry.

STARTING OUT IN THE SECTOR

Opening the discussion, Rachel explained that the transport sector is evolving rapidly, with data and digital skills now central to how the industry operates. Yet many young people remain unaware of the breadth of opportunities available or how accessible those careers can be.

"This session isn't about a single programme or pathway," she explained. "It's about people - people who have built careers in transport and technology through very different routes, some planned, some unexpected."

One of those was Danny, whose career journey turned out very differently from what she originally imagined.

"When I started out my career, I had it all planned," she said. "I came out of university and landed my dream job at Arup as a

structural engineer in the buildings team."

Danny explained that her move into digital and data-focused work happened almost accidentally while working on a project involving more analytical work.

"It wasn't really a conscious decision," she admitted. "I thought I'd end up leading a structural engineering team, but now I'm working in digital services in the transport sector. It just shows that you should take opportunities when they come because you never know where they'll lead."

Joe's story was similarly unexpected. Originally thinking he would be a teacher or work in a bank, he ultimately found transport far more engaging.

"I realised my motivations were much more about the saving-the-world bit than the making-loads-of-money bit," he said.

Now working in transport consultancy, Joe uses mathematics, technology and data to solve large-scale public sector challenges.

"We help government agencies spend tax money on things that keep the economy moving and provide huge social outcomes," he explained. "The technical problems are ferocious and really interesting to get stuck into."

For Aliyyah, who is at an earlier stage in her career, keeping an open mind proved to be the key. After studying engineering, she joined the UK Government's Fast Stream leadership programme and now works within the Department for Transport in a data-focused role.

"I didn't start off knowing what I wanted to do at all," she said. "I purposefully kept an open mind, and I think that helped me stay open to opportunities."

Aliyyah admitted she had been surprised by the scale of data use within Government.

"I think people sometimes assume decisions aren't always made using data," she said. "But I'm really proud to work somewhere where data is embedded in the processes we use to make recommendations."

ENGAGING IN DATA AND TRANSPORT

The panel also included Veron, a first-year Business Management student at Manchester Metropolitan University, who spoke passionately about his early interest in transport and logistics.

"The real root of my interest was cars," he said. "My first word was actually 'car'."

Over time, that interest developed into a broader fascination with logistics and global transport systems.

"I thought, this is one of the key sectors in society, not just here but in every country," he explained. "I think it should be talked about more."

Veron described how he proactively sought out opportunities to learn more about the industry, eventually connecting with the DigData programme through LinkedIn.

"I had to really push myself into these opportunities," he said. "Doing placements, internships and events like this helps you understand the industry more."

DEVELOPING SOFT SKILLS

A major theme throughout the discussion was the importance of soft skills alongside technical knowledge. Joe reflected candidly on his own development as a manager and leader.

"We want to see that someone can develop a deep understanding of something meaningful and apply those skills." Joe Collis

"The industry is moving very quickly. Being open, adaptable and willing to move with change is really valuable." Danielle McGrellis

"The hard technical skills were there," he explained, "but I realised I needed to broaden my soft skills."

He recalled learning that different people communicate and process information in very different ways.

"I was very direct and wanted to solve problems immediately," he said. "What I didn't realise was that other people needed time to process information first."

Danny agreed that adaptability is

becoming one of the most important qualities employers look for in early-career talent.

"The industry is moving very quickly," she said. "Being open, adaptable and willing to move with change is really valuable."

WHAT EMPLOYERS ARE LOOKING FOR

Both Danny and Joe stressed that employers are not expecting young people to arrive as "finished articles." Instead, they are looking for curiosity, flexibility and evidence of problem-solving ability.

"It's not just about surface-level knowledge," Joe explained. "We want to see that someone can develop a deep understanding of something meaningful and apply those skills."

TRANSPORT, BUT NOT AS YOU WOULD THINK

The conversation then shifted towards widening participation and challenging stereotypes around data and transport careers. Veron argued that opportunities should not be limited to students from technical or mathematical backgrounds.

"Don't narrow it to one subject or one degree," he said. "People's interests change all the time."

Aliyyah added that accessibility and language are critical when engaging young people.

"If we use too much jargon, people are immediately intimidated," she explained. "We need to make these careers sound exciting, accessible and understandable."

CALL TO ENGAGE

The panel concluded with a call for industry professionals to engage directly with schools and colleges to raise awareness of transport careers.

"If everyone in this room engaged with just three schools over the next few months, we would reach thousands of children," Danny said.

Rachel closed the session by urging organisations to get involved with Project ROUTE, the new skills initiative to get young people engaged in digital skills in transport.

Project ROUTE is endorsed by the DfT and supported by industry, and will kick off in September, with the aim of reaching 10,000 students.

Find out more about Project ROUTE at www.its-uk.org/project-route

Project ROUTE
Powering the future of transport with data skills

Going Local:
ITS UK ensures the sector's voice is heard during devolved and local elections

Eduardo Pitts
Public Affairs & PR Manager,
ITS UK

With elections taking place in Scotland and Wales in 2026, ITS UK drafted its first ever manifestos for the Scottish and Welsh Parliaments, a significant step forward in our ambition to ensure the voice of the transport technology sector is heard not just in Westminster, but across the UK's devolved nations.

WHY ENGAGE WITH DEVOLVED PARLIAMENTS?

Transport is a devolved matter, meaning Holyrood and the Senedd hold significant powers over how transport networks are planned, funded and delivered in their nations. The Scottish Government controls a budget of around £45 billion, while the Welsh Government manages approximately £20 billion — with both making independent decisions on everything from bus regulation to active travel investment and road safety.

The political context made 2026 the ideal moment to act. With Holyrood and Senedd elections both falling this year, our manifestos offered a timely opportunity to put the case for transport technology directly to candidates, parties and incoming governments at the point when policy priorities are being set for the next parliamentary term.

WHAT IS IN THE MANIFESTOS?

In Scotland, our five recommendations focus on renewing obsolescent urban traffic signal infrastructure, expanding the MaaS Investment Fund, increasing local authority operational budgets for transport technology, leveraging Demand Responsive Transport in rural and island areas, and delivering a Scottish Bus Open Data Service.

In Wales, our four recommendations call for building on smart ticketing rollout, upgrading ageing traffic technology, mandating open real-time data as the backbone of an integrated transport system, and continuing support for on-demand bus services like the successful Fflecsi scheme.

Both provide clear, concise and actionable recommendations for the new governments - ensuring we can monitor and evaluate if and how these policies are achieved.

WHAT ABOUT OTHER LOCAL ELECTIONS?

Scotland and Wales weren't the only parts in the UK with elections. Large parts of England held elections for local councils - another key policy arena for the ITS sector. Following the elections, we provided a briefing on what the results could mean for transport technology, and on 1 June we held our first Local Government Exchange, bringing together East Midlands councillors with members to discuss transport policy in the region.

WHAT HAPPENS NEXT?

With elections concluded, we are actively engaging with newly elected Members in both Parliaments, sharing our manifestos and seeking meetings with relevant Ministers, MSs and MSPs. The work begins now to ensure we continue bringing the asks contained within the manifestos to policy makers over the next parliamentary term.

You can find the manifestos, and information on our wider policy work, at www.its-uk.org/policy-advocacy

Is it time to consider Executive Membership?

ITS UK has two tiers of membership, our standard rate which is categorised by size (Micro Business through to Corporate) and type of organisation (public or private sector), but also an Executive tier which provides greater benefits. If you haven't considered Executive Membership, it is well worth your time!

Priscilla Ross
Membership Executive,
ITS UK

GREATER INFLUENCE IN SETTING OUR DIRECTION

Executive Members can feed into ITS UK's strategy, stand for the Board, and become Chair or Vice Chair. Executive Members vote on who they want to take up a seat on the Board too, before nominations are confirmed at our AGM.

We hold regular Executive Updates, where members can feed into our activity and inform the direction of travel for the organisation – ensuring we deliver for you. These Executive Updates provide an opportunity for key public sector organisations to present on their current activity, providing useful insights into opportunities in the sector.

MEET WITH SENIOR LEADERS

One of the most valued aspects of Executive Membership is the quarterly dinners we hold with senior leaders. Over the past three years we've welcomed the leaders of major transport authorities, including TfL, TfGM, TfWM, Transport Scotland and National Highways, senior civil servants from the Department for Transport, politicians like the Shadow Roads Minister and Transport Select Committee Chair, and representatives from bodies like Great British Railways X.

What makes these dinners special is that they offer an informal setting where members and industry leaders can discuss important issues face to face. Held under the Chatham House Rule, the dinners include around 30 to 40 guests, giving those around the table the chance to have their say in a welcoming environment.

EXCLUSIVE EVENTS AND DISCOUNTS

It's not only Executive Dinners that we offer. We've held roundtables exclusively for Executive Members, including a session exploring the use of AI in the roads sector at Highways UK. We occasionally get limited invites to external events, and when we do, it is usually our Executive Membership that we approach first.

Executive Members also receive discounts on our events, including our annual President's Dinner, on trade delegations and for events like our Local Government Exchange.

GREATER BRAND AWARENESS

As part of your Executive Membership, you get your logo on a prominent page of the ITS UK website, and we highlight your logo within our Directory in this Review too.

Interested? Get in touch!
contact@its-uk.org

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Block the dates:
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Birmingham ITS World Congress 25-29 October 2027

Mike Waters
Chief Technology and Insight Officer, The West Midlands Combined Authority

I expect it's in your diary already - given that, for our industry, it is the biggest event in more than two decades. But if it isn't then I'll forgive you for stopping reading for a moment now to block out Monday 25 - Friday 29 October 2027.

The ITS World Congress at Birmingham's NEC will be huge - an amazing opportunity to meet, learn from and share knowledge with 15,000 innovators from around the world, discussing and showcasing the latest technology making transport safer, cleaner and more efficient.

It's your chance to share innovations on a global stage as the world comes to the West Midlands - not only on traditional stands, but through interactive demonstrations, and by sharing expertise in one of more than 200 technical sessions, workshops and seminars over five days.

So many sectors are already committed to being a part of it, including original equipment manufacturers (OEMs), Tier-1 automotive suppliers, smart infrastructure experts, system integrators and telecommunications firms. This highlights the broad appeal of the Congress across the global mobility and transport technology sectors, and means participants will be both in good company and part of something important.

The West Midlands, a birthplace of the industrial revolution, is now delivering cutting-edge technology in safety and security, connected and automated mobility, smart ticketing, sustainability and new modes, such as Coventry's revolutionary Very Light Rail. I'm confident that transport network operators will find solutions to save money or boost efficiency, while businesses will discover new opportunities to grow their bottom lines.

As well as the actual event, please may I also earmark some other important dates for you. We'll be opening our Call for Contributions in autumn 2026, begin delegate sales in spring 2027, and be releasing the plan for the public day in the summer. It's also worth noting that the country's leading highways and transport show, Highways UK, will be running in parallel to the ITS World Congress during the same week in a neighbouring hall at the NEC, so you will be sure of seeing a huge amount of exciting new initiatives.

The last time the UK hosted the World Congress, in London 2006, the cutting-edge products on show included 'sat navs' which used live traffic conditions to help plan a route, a solution that let you buy train tickets online, and the world's first online multi-modal journey planning program. This was long before these were standard features on any mobile phone. Let's get together in 2027 and show the world what the future of transport looks like now. Products that will be brand new next year, and taken for granted just a few years later.

If you want to know more about the 2027 ITS World Congress or be part of one of our advisory groups, please contact Jordan Cowley, our UK partnerships manager - jordan.cowley@tfwm.org.uk

CHAPTER 02

Safety Tech

How data, automation and innovation are shaping Britain's new road safety strategy

This year marks a turning point for road safety in Great Britain. For many years, deaths and serious injuries on our roads have been treated as inevitable. On 7 January, we published the Road Safety Strategy, which challenges this assumption.

Currently, around four people a day die on our roads. Behind these numbers are families whose lives have been changed forever. I have met many bereaved families, and it is without doubt the hardest part of my job.

They are united by a desire for change – to ensure no other family faces the same loss. We share that aim, and the Strategy sets ambitious targets to reduce the number of people killed or seriously injured on British roads by 65% and 70% for children, by 2035. This would mean **19,219** fewer people killed or seriously injured in **2035** and **1690** fewer children under the age of 16 being killed or seriously injured in **2035** compared to the **2022-2024** baseline.

Our targets will focus the road safety work being delivered across Great Britain, including measures to protect vulnerable road users, update vehicle safety technologies and review motoring offences.

Importantly to ITS UK readers, smart use of data and technology will be central to delivering the Strategy.

We have seen innovation across the world, which has led to new technologies that have the potential to increase road safety in Great Britain, if harnessed correctly. It is important that we get the balance right between supporting the development of new technologies, and making sure they are properly tested, understood by users, and regulated so they deliver real safety benefits before being widely deployed.

Lilian Greenwood
Minister, Department for Transport

The Road Safety Strategy includes taking advantage of technology, data and innovation for safer vehicles and post collision care as one of its four key themes, and highlights the important role that this can play in reducing harm.

But to realise and maximise these benefits we need to work across the transport network. This is why we have committed in the Strategy for Government to work closely with the transport industry to make this a reality.

In time, we expect to see a wider roll out of automated vehicles on our roads, and safety remains at the heart of this new technology. We intend to introduce a scheme that will enable self-driving passenger pilots later this spring. We will carefully assess evidence from these pilots to further embed safety in any future roll out.

We are also aiming to make new vehicles safer by consulting on mandating the fitment of 18 new safety technology features. This will ensure that new cars introduced on Great Britain's roads have the safest technologies to keep all road users safe.

Advanced Driver Assistance Systems (ADAS) enhance driver awareness, reducing the risk of fatigue and preventing collisions, whilst also improving comfort and convenience. To realise these benefits, drivers must understand how to use these systems correctly and safely. That is why we have committed to working with manufacturers, insurers, retailers and safety groups to maximise the benefits of ADAS and new vehicle technologies.

We are also listening to concerns from road users, which is why we are looking at evidence around headlamp glare. We are reviewing the initial research we published in November and work is already underway at an international level looking at further measures to reduce the occurrence of glare from vehicle headlamps. We expect to undertake further targeted vehicle-based research to help inform future international lighting regulations and consider what more can be done domestically.

We are committed to making best use of available data, whether that's from vehicles, academic studies or police investigations.

Increasingly, vehicles have connective capability and exchange data with other vehicles and infrastructure. The use of this data has enormous potential to make roads safer and that is why we are exploring how this data can be utilised to improve real-world outcomes.

We are introducing a new Road Safety Investigation Branch to conduct thematic investigations based on the rich data sources available to identify causes of collisions and make recommendations to help cut deaths and injuries.

Addressing the issues that most affect vulnerable road users is essential to reducing the disproportionate levels of death and serious injury they face on our roads.

This is why we are consulting on the introduction of a minimum learning period for young drivers, mandatory eyesight testing for older drivers and reforms to motorcycle training, testing and licensing.

We're also addressing poor behaviours on our roads by consulting on reforms to motoring offences.

By introducing the Strategy, Government is leading the charge, but it will be a collective effort, in partnership with local authorities, industry, emergency services and communities that will bring the required changes to make our roads safer for everyone.

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From roadside signals to in-vehicle intelligence:

Why governance, not technology, will define the next era of road safety

For more than fifty years, roadside signalling has been the quiet authority of the strategic road network. Gantries, lane control signals and variable message signs have shaped driver behaviour at scale—guiding, warning and reassuring millions of road users every day. Most drivers rarely stop to think about them, yet their influence on safety and network performance is profound.

Wen Atkinson
Associate Director, Arcadis

Today, that authority is beginning to shift.

Navigation intelligence is moving decisively into the vehicle itself. What was once delivered by nationally governed roadside infrastructure is increasingly mediated by vehicle manufacturers, software platforms and artificial intelligence. This transition is not simply a technological upgrade; it represents a fundamental change in how information is created, governed and trusted on the road network.

The critical question is no longer whether this shift will happen, but how safely and coherently it will be managed.

THE RISE OF PREDICTIVE, IN-VEHICLE INTELLIGENCE

Modern navigation systems bear little resemblance to the route planners of a decade ago. Increasingly powered by artificial intelligence, they are becoming predictive rather than reactive—anticipating congestion, inferring driver intent and optimising journeys based on factors such as energy consumption and vehicle performance.

At the same time, the boundary between navigation and advanced driver assistance systems is dissolving. Real-time vehicle data, driving behaviour analytics and routing decisions are now tightly linked, creating an adaptive driving environment that responds continuously to both network conditions and the driver behind the wheel. One of the most visible manifestations of this shift is augmented reality guidance.

Head-up displays project lane-level instructions directly into the driver's field of view, reducing the need to glance away from the road. In complex or unfamiliar environments, this has the potential to reduce cognitive load and improve compliance.

Yet capability alone does not guarantee safety.

A CHALLENGE TO THE STRATEGIC ROAD NETWORK

For decades, roadside systems have delivered a single, consistent voice. Information has been carefully governed—deciding not just what to display, but when, where and how often. That consistency has shaped predictable driver behaviour, particularly around incidents, roadworks and lane closures.

As instructions migrate into the vehicle, that consistency can no longer be assumed. The road authority needs to influence the in-vehicle guidance to be able to manage the network effectively in the environment of increasingly collaborative and autonomous vehicles. As part of this management the road authority will harvest the real-time data that collaborative vehicles produce to feed into the algorithms controlling the network, and AI will be used to tune and improve strategies and algorithms based on that data.

But, who assures the quality and authority of in-vehicle instructions in the context of the network operator's requirements? How is the real-time data assured before influencing the control systems? How are conflicts resolved when guidance from a vehicle contradicts roadside signals or the physical reality of the road ahead? And crucially, who is accountable when fragmented information leads to unsafe outcomes?

These are governance questions, not technical ones—and they demand urgent attention.

WHAT THE ROADSIDE HAS TAUGHT US

Over the past 15 years, Arcadis has worked alongside National Highways using our operational capability and behavioural experience to understand how roadside information influences real driver behaviour. Extensive studies and on-road trials have demonstrated that safety and network capacity depend on more than simply providing information.

Key insights include:

- understanding the optimum distance between advance warning and the start of a cone taper at roadworks
- The importance of spacing and the number of signals on the approach to incidents to drivers' understanding and compliance
- How drivers respond—over time and under pressure—to repeated red X and lane control signals

The conclusion is consistent: timing, repetition and authority matter. Information must be trusted, predictable and reinforced to achieve compliance at scale.

As in-vehicle systems evolve, failing to apply these lessons risks undermining decades of evidence-based practice.

THE RISK OF FRAGMENTED INSTRUCTION

Nowhere is this risk more acute than around incidents and roadworks. Safe working methods for road responders depend on predictable driver behaviour.

When drivers receive conflicting cues—one from their vehicle, another from the roadside, and a third from the physical scene ahead—clarity is lost, precisely when it is most needed.

Fragmented instruction does not merely confuse; it increases risk for road users, traffic officers and emergency responders alike. Trust, once fractured, is difficult to restore.

Nowhere is this risk more acute than around incidents and roadworks. Safe working methods for road responders depend on predictable driver behaviour.

WHAT DRIVERS SAY IS NOT WHAT DRIVERS DO

Designing effective guidance cannot rely solely on stated preferences.

Focus groups and surveys provide valuable insight into expectations, but they do not reliably predict behaviour under real-world conditions. Driver simulator trials repeatedly show a gap between belief and action. Participants who assert they would never ignore a red X will nevertheless drive through one when placed in a simulated environment—despite fully understanding its meaning.

This disconnect reinforces a critical point: in-vehicle guidance must be designed and tested against observed behaviour, not aspiration.

THE CASE FOR STRONG, NATIONAL GOVERNANCE

As navigation intelligence moves inside the vehicle, governance becomes more—not less—important.

If roadside signals have taught us anything, it is that safety at scale depends on consistent, authoritative instruction. That principle does not change simply because the interface has moved from gantry to dashboard.

Clear national standards must define how critical safety information is conveyed in-vehicle, how conflicts are resolved, and where ultimate authority lies. In some cases, this may require legislative backing to ensure that all systems—regardless of manufacturer or platform—deliver consistent direction to road users.

CARRYING THE LESSONS FORWARD

The transition from roadside signalling to in-vehicle intelligence is technologically inevitable. Whether it delivers safer, more efficient journeys is a choice.

The systems of the future must be informed by the hard-won lessons of the past: evidence-based design, behavioural realism and strong governance. Without these, innovation risks eroding the very safety it seeks to enhance.

The next era of road safety will not be defined by algorithms alone—but by the decisions we make about authority, trust and responsibility on the strategic road network.

How the West Midlands is delivering on safer transport

Across the West Midlands, millions of journeys are made every week by bus, train and tram. The vast majority of these pass without incident, thanks to a network which is safe and reliable.

The statistics show that the chances of encountering crime or anti-social behaviour on the region's transport network are tiny, and this is backed in surveys where 85% of passengers say they feel safe.

But people make their travel choices based on feelings, not data. Perceptions vary significantly depending on the time of day and location, as well as a passenger's own experiences – shaped by factors such as age, gender, ethnicity, disability and neurodiversity.

We know that it is often the fear of crime that can stop people from making a journey, especially women travelling alone late at night, whether they are walking, waiting at bus stops or sitting in an empty train carriage. That creates a huge barrier in their life, limiting their opportunities. They can be effectively locked out of employment and training opportunities, stifling their potential and holding back our economic growth.

This is why we have placed safety for women and girls at the centre of our three-year Safer Travel Strategy – something all members of our Safer Travel Partnership have agreed.

Technology is playing a key role in creating a transport network that is not only safe but, crucially, feels safe.

Between Transport for West Midlands (TfWM) and our operators we have a network of thousands of CCTV cameras monitoring our stations, stops and inside our buses, trains and trams 24/7.

We continually assess the data to identify hotspots or vulnerable locations and use this to direct our CCTV control room operators and to deploy our Transport Safety Officers to where they are most likely needed at any time.

But it's not just about cameras. We know that women and vulnerable people may walk further to a well-lit bus shelter or somewhere equipped with visible cameras or help points, so we have developed new design guidance for our stops and stations.

We are installing more live chat help points – allowing those feeling at risk to talk directly to our trained control room staff while they wait. People can also discreetly text or call our teams through the Ask Empower service, and staff are White Ribbon trained and accredited to identify and tackle violence against women and girls.

Our drone team has expanded. Initially set up to monitor live traffic conditions, our drones are increasingly adding to the surveillance of the transport network.

And we continue to innovate – such as pairing our extensive camera network to AI facial recognition technology, which can identify signs of aggression and alert staff on the ground to intervene. The aim is to combine digital intelligence with the visibility of our camera network and Transport Safety Officers to build a system that not only responds to crime and anti-social behaviour, but works to prevent it.

And community engagement is crucial, which is why we work with schools, colleges and other groups to educate the public. Our *What Can I Do?* film shows people how to be an ally for women at risk.

When delegates come to ITS World Congress Birmingham 2027, they will see much of this in action across our public transport network and enjoy a pleasant time in the knowledge that our partnership is working round the clock to keep them safe.

Technology is the eyes and ears of our network, but the confidence it gives our passengers to travel freely is its greatest achievement.

When delegates come to ITS World Congress Birmingham 2027, they will see much of this in action across our public transport network and enjoy a pleasant time in the knowledge that our partnership is working round the clock to keep them safe.

Richard Parker
Mayor, West Midlands Combined Authority

Can new technology help end the number plate wild west?

Across the West Midlands, millions of journeys are made every week by bus, train and tram. The vast majority of these pass without incident, thanks to a network which is safe and reliable.

It was the first time I'd heard of a 'ghost' plate, the catch-all term for a number plate that cannot be read by ANPR (automatic number plate recognition). Most of the plates look totally normal to the naked eye, but are manipulated in some way which means that the cameras that keep our roads safe cannot detect them.

Why is this significant? Because number plates are fundamentally important to road safety and should be considered as critical national infrastructure. They are like a car's passport, and if a vehicle cannot be identified the driver cannot be traced either. This means that in the case of a crash, it might be harder to bring a speeding driver to justice. It also means that it's more difficult to enforce the rules of the road, whether it's a yellow box, parking spaces or bus lanes, and they are often harnessed by criminals who use the roads to carry out illegal activity undetected.

It's also significant because 'non-compliant' behaviour on the roads such as using a ghost plate is strongly correlated with other kinds of illegal road use, whether that's driving without insurance, parking illegally, or violating traffic laws. This has significant negative impacts for safety on our roads.

Since last January, I have spoken several times in Parliament about ghost number plates, about their impact on road safety, and the importance of harnessing technology to enforce the rules of the road. I was shocked to learn that the penalty for using a ghost number plate was only a £100 fine, and isn't even an endorsable offence, meaning you cannot get points on your licence. This is hardly a disincentive if you're intent on using the roads as a racetrack, and especially if you're carrying out serious criminal activity.

Last summer for example I went out on an enforcement activity with the police in my area. Within seconds of getting into the police car, their system started dinging. 'No insurance.' 'Invalid MOT.' We stopped a car whose driver had not paid their road tax and discovered they were also using a ghost plate. This number plate had raised characters (also known as a 3D or 4D plate) but we used the infrared goggles and found that the digits were reflective, and therefore unreadable, by the ANPR camera. This was an eye-opening

experience, and in that moment I understood what the police were up against.

Like these hard-working officers, over the past year I have been heartened by the work of individuals and organisations who are working hard to defeat the scourge of ghost plates on our roads. The National Persistent Evader Database is being set up, which will work to identify those who repeatedly break traffic laws, and help local authorities to target their enforcement more effectively. There are the companies who are adopting technological solutions to detect ghost plates too, by using cameras with infrared and colour imaging and using artificial intelligence to match details with the national ANPR database. There are others who are working closely with local authorities such as my own in Sandwell, to station cameras in antisocial driving hotspots, including on the stretch of dangerous road in my constituency that I mentioned before.

These cameras can detect vehicles that run red lights, speed, or block yellow boxes and build a picture of repeat offenders. They also work closely to find cars that have 'disappeared' from police ANPR networks and detect ghost plates too. Often these findings can alert local authorities about parts of the road network that need to be redesigned to prevent collisions, about dangerous pedestrian crossings or blind-spots too.

Sometimes people choose to use a ghost plate because they think it is a victimless crime. That's totally wrong. Obscuring a vehicle's 'identity' on the road is not only illegal, but extremely dangerous too. I'm glad that after my year of campaigning the Government has agreed that change is needed. The penalties for using ghost plates will be strengthened, the sellers of these plates will face a crackdown, but even more importantly – the way we sell number plates in Britain is going to be tightened up. The 'humble number plate' as it has been called, is far too critical to our roads, our police and our safety to continue with the wild west number plate sales system that exists today. I know many in the transport sector have been banging this drum for years. I'm glad Government has finally woken up and is stepping in. Change couldn't come soon enough.

Sarah Coombes MP

The penalties for using ghost plates will be strengthened, the sellers of these plates will face a crackdown, but even more importantly – the way we sell number plates in Britain is going to be tightened up.

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Saving lives on the road:

How technology is tackling distracted driving and seatbelt non-compliance

Have you ever spoken to someone who's had a knock on the door from a police officer, telling them that a loved one has been killed on the road?

Victoria Curran
Marketing Executive
Jenoptik

Without exception, every person who tells that story describes a harrowing experience. It is clear it never leaves them – they live with the pain of an unnecessary death every single day. That is the human cost of poor road safety, and no amount of context that the UK has some of the safest roads in the world matters to those who lose someone – that loss is total, and context means nothing.

This is why we should never give up on improving road safety, and we should use every tool available to do so.

We are known for our average speed camera technology, and we know it contributes to changes in driver behaviour. Previous analysis by independent transport safety and road user behaviour company Agilysis found that, when comparing before-and-after collision data on roads with our cameras, casualties were down 50 percent.

That is why Jenoptik is now delivering solutions to tackle another of the fatal five – distracted driving and failure to wear a seatbelt.

Using high-quality cameras, machine vision and artificial intelligence, we can spot when someone is using a mobile phone at the wheel. The AI analyses images in a fraction of the time it would take a human, identifying potential offences. These are flagged for human review to make a final decision, and the police then decide what action to take.

I am confident that, as distracted driving technology and seatbelt detection are rolled out across the country, they will have a similar effect on behaviour as average speed cameras. When people see our yellow cameras, they know there's no point speeding because they will get caught. As they learn about this technology, they'll know it's not worth using their phones or driving unbelted.

Using high-quality cameras, machine vision and artificial intelligence, we can spot when someone is using a mobile phone at the wheel. The AI analyses images in a fraction of the time it would take a human, identifying potential offences.

Camera technology has a range of uses, giving us rich data on traffic flows, volumes and vehicle types, as well as real-time analysis. All of this helps to make our roads safer, journeys more reliable, and emissions lower.

There will always be people on the roads, but by using technology we can maximise its value to make the air we breathe cleaner, our transportation more efficient, and, most importantly, keep our roads safer.

No one will ever know that a loved one is still here because technology made roads safer. They won't experience that dreaded knock on the door. Knowing that our work helps to prevent that pain is what drives me every day.

A shifting policy landscape for road safety

Within the space of three months at the start of 2026, the Department for Transport has published two documents that clearly define the landscape for anyone working at the intersection of road safety and intelligent transport. Although they were produced by different teams for different audiences; together they tell a coherent story.

Richard Owen
Chief Executive, Agilysis

After years of stalled progress, the UK is serious about regaining its place at the forefront of road safety performance, and it has concluded that data and technology are the mechanism through which that can happen.

This conclusion was spelled out by the DfT Parliamentary Under-Secretary, Lilian Greenwood, at the Joining the Dots conference held in Birmingham in March. In her keynote speech she said that, *"A safer future is in our sights and it's driven by data"*, a statement I wholeheartedly agree with and one that has an important message for the ITS sector.

The Road Safety Strategy (January 2026) is the first comprehensive national road safety strategy in over a decade, setting bold targets for a 65% reduction in those killed or seriously injured by 2035 along with critical Safety Performance Indicators. The Strategy is explicit about how data and technology will enable these targets to be delivered. A whole theme (taking advantage of technology, data and innovation), commits Government to a new Road Safety Investigation Branch built on linked datasets and advanced analytics, to the secure linkage of police collision data with NHS healthcare data, to exploring membership of Data for Road Safety, and to maximising the safety benefits of ADAS and connected vehicles.

The Data Action Plan provides much of the foundation for these commitments which depend on: interoperable standards, APIs as

the default sharing mechanism, a Transport Data Marketplace, a Transport Data Ontology, and governance frameworks that unlocks rather than restrict appropriate use.

Neither document works in isolation and is a coherent and combined vision. For example, a Road Safety Investigation Branch cannot produce systemic insight without a data ecosystem capable of feeding it; a Transport Data Marketplace demonstrates public value by supporting policy target of preventing death and serious injury.

HOW ITS SUPPORTS ROAD SAFETY WITH DATA

For the ITS community, this convergence opens several clear opportunities and to begin with I will focus on the role of data. For many years the sector has relied on historic collision data to inform decision making on road safety priorities and specific interventions. Rather than continuing with a reactive STATS19-based approach, we can add richer datasets that more clearly describe risk analysis which aligns clearly with a Safe System approach. The Safe System tells us that we have to be proactive, not to wait for someone to die before taking action, and there are great examples of how better data is already being used.

We are seeing a huge increase in the use of AI technologies too, either to assess safety directly or to analyse multiple data points rapidly and almost predict whether a crash is likely to happen.

One of the most popular approaches is the adoption of road traffic data including counts and speeds obtained from Floating Vehicle Data (FVD). For three years now, Ordnance Survey have made available basic data to the public sector free-of-charge via the Public Sector Geospatial Agreement. The uptake of use within local authorities and police forces has been rapid and we estimate that around one-third of these bodies are now replacing traditional surveys with this, instantly-accessible type of data, saving millions of pounds a year. Use cases are very clear, especially within organisations who use this intelligence to prioritise resourcing. Commercial suppliers are adding in richer datasets with higher sample sizes to allow a day-by-day analysis which is supporting more detailed evaluations of engineering and policy measures such as 20mph scheme impacts.

Beyond this simple dataset, new metrics are becoming available through the sharing of systems data obtained directly from connected vehicles. The possibilities are enormous with intelligence on vehicle manoeuvres (acceleration, braking, swerving) adding insight into road user behaviour at junctions, pedestrian crossings, and when unexpected queues are encountered. Information on road infrastructure, obtained through built-in cameras, is providing real-time updates on the location of road signs and markings allowing road authorities to link maintenance and safety objectives. Road friction and road condition data obtained from tyres and suspension systems which help to tell us about the effectiveness of winter maintenance and drainage at individual locations. At Agilysis we are working with colleagues across Europe on an exciting new project called

CAMBER that is evaluating all of these data sources to understand how they can provide rapid analysis of safety performance without the need for on-site visits.

ITS SAFETY SYSTEMS AND INNOVATION

The UK has arguably led the world in the development of roadside technologies to support safety objectives. Speed and traffic enforcement equipment systems are continually improving, and more advanced road user feedback technologies are being used in communities to influence road user behaviour. Innovation requires an enabling framework of legislation, however, and delays in the HOTA system would seem to be stifling certain opportunities to deliver solutions that can save lives.

We are seeing a huge increase in the use of AI technologies too, either to assess safety directly or to analyse multiple data points rapidly and almost predict whether a crash is likely to happen. Adding live video feeds, connected vehicle data and predictions about traffic volumes and weather are being touted as the next generation of road safety tools.

As a sector we need to speak loudly about the potential we have to deliver on the new road safety targets, both to Government as well as the wider public sector. I am looking forward to the years ahead as we innovate to support these ambitious new goals.

CHAPTER 03

Digital Transport

Tees Valley Digital Transport:

From early delivery to the UK's first truly smart region and the next generation of mobility

Ben Houchen
Mayor, Tees Valley Combined Authority

Transport networks are under growing pressure to perform efficiently, reliably and sustainably within constrained funding environments. In the Tees Valley, the Combined Authority has responded by adopting a long-term, digitally led approach to transport delivery, using data and intelligent transport systems to transform how the network is managed.

The Tees Valley Digital Transport Programme sets out a clear ambition to establish a digitally enabled, integrated transport network that supports all modes and users, while positioning the region to become the UK's first truly smart region. Led by Sean Fryer (Tees Valley Combined Authority, Digital Transport Delivery Manager) and backed by £70 million of Mayoral Development Funding, the programme is already moving from strategy into delivery, demonstrating how digital technology delivers tangible operational benefits.

CAM Vehicles Tees Valley Testbed

THE UK'S FIRST REGION-WIDE, AUTOMATED TRANSPORT DIGITAL TWIN

At the core of the programme is the Tees Valley Digital Twin, live across all five local authority areas. This represents a UK first, a region-wide, AI-enabled, automated traffic digital twin embedded within Urban Traffic Management and Control and in communication with on-street infrastructure.

The Digital Twin integrates real-time and historical data from signals, detectors, buses and roadside infrastructure into a continuously updated model of the network, enabling traffic managers to move beyond reactive control towards proactive, predictive management. This provides a clear understanding of network performance and supports early identification of emerging issues, and allows interventions to be tested virtually before deployment on street.

Early operational results demonstrate clear benefits. Where automated incident detection and targeted strategies have been applied, average delays across evaluated hotspots have reduced by around 14%. For bus services, the system supports rapid recovery from disruption, with average bus speeds improving by over 11 mph within 15 minutes of intervention, returning services towards normal operating conditions more quickly.

IMPROVING EFFICIENCY AND RELIABILITY THROUGH DIGITAL SERVICES

Alongside the Digital Twin, the programme is delivering public facing digital services designed to improve network efficiency.

A key component is the rollout of FUSION Next Generation Adaptive Traffic Control, representing the largest commercial implementation of this technology outside of London. Latest monitoring and evaluation show improvements in journey time performance compared to existing control strategies with peak period delay reductions of up to 50% on key routes and sustained benefits across AM, inter-peak and PM periods.

Crucially, these improvements translate into measurable real-world impact. Analysis indicates significant annual travel time savings across all assessed corridors, with some locations delivering in excess of 2,700 hours of travel time saved per year. This demonstrates not only improved traffic flow, but tangible economic and efficiency gains from data-driven, adaptive control.

SCALING UP: THE NEXT PHASE OF DIGITAL TRANSPORT DELIVERY

While early delivery has focused on improving current operations, the Digital Transport Programme has been designed as a scalable, long-term capability. Future phases will expand the Digital Twin and public-facing digital services to include AI-enabled incident detection, floating car data, computer vision, additional sensors, air quality management, and pedestrian and cyclist digital twin modules. These capabilities will support more holistic, outcome-led transport management, linking network performance to environmental, health and accessibility objectives.

In parallel, the programme is moving into its next strategic phase with the integration of Connected and Automated Mobility (CAM). Led by Andrea Reacroft (Tees Valley Combined Authority, Digital Transport Programme Delivery Manager), an additional £20 million has been allocated to deliver CAM as part of the wider programme, bringing total investment to £90 million.

CONNECTED AND AUTOMATED MOBILITY AS THE NEXT STEP

CAM is being progressed through the Connected Automated Strategic Teesside Logistics Ecosystem (CASTLE) programme, building directly on the digital foundations already in place.

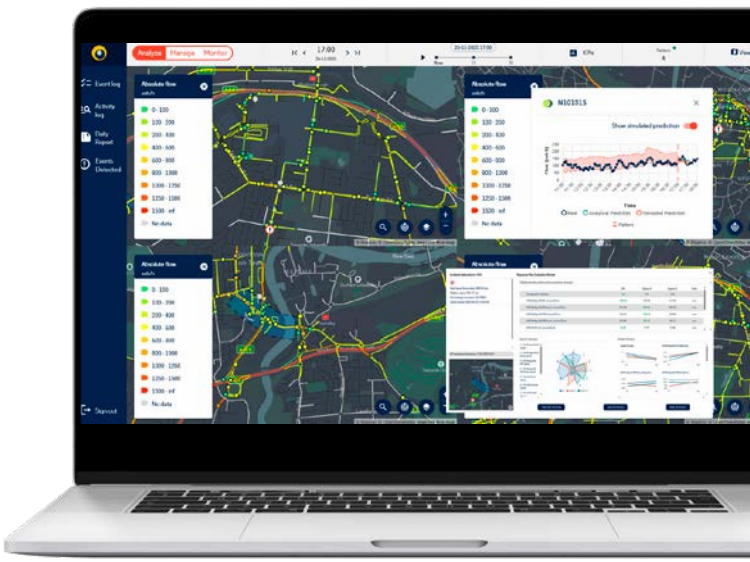
CASTLE will be delivered in three phases, starting with a CAM hub at Teesside International Airport, using controlled environments to test and deploy autonomous people and freight movement solutions.

Subsequent phases will scale these applications to public-facing services, including autonomous park-and-ride and town-centre deployments. CAM will be integrated with the region's existing Digital Twin, UTMC systems and data platform, ensuring automated vehicles are managed as part of the wider transport network and deliver improved access, reduced emissions and more efficient infrastructure use.

FROM EARLY WINS TO LONG-TERM TRANSFORMATION

The Tees Valley Digital Transport Programme demonstrates how digital technology can deliver real benefits at regional scale. Early wins from the Digital Twin, adaptive signal control and passenger information systems show that data-driven approaches can improve efficiency and reliability today. Integrating CAM into the same digital ecosystem builds on this foundation by combining delivery with long-term ambition, we are building a transport network that is smarter, more resilient and ready for the future of mobility in the Tees Valley.

Tees Valley Digital Twin operational platform



Digital Twins: From concept to capability in an integrated transport future

Ryan Hood
Digital Highways Leader, Arup

The UK's transport system is at a point of inflection. As set out in the Government's recently published *Better Connected: A Strategy for Integrated Transport*, the challenge is no longer simply building new infrastructure but making better use of what we already have: delivering a system that is integrated, resilient and user-focused.

Digital twins are increasingly recognised as a critical enabler of this shift. Alongside the Department for Transport (DfT) Transport Data Action Plan, the direction is clear: a more connected, intelligent transport system, underpinned by real-time data, advanced analytics and new operational capability.

This is particularly important as our networks reach maturity. With limited opportunity to add physical capacity, the focus is turning to optimising performance: improving reliability, resilience and user experience through faster, better decisions.

FROM AMBITION TO REALITY

The UK has made steady progress in moving digital twins from concept to delivery.

The DfT, supported by its Science Advisory Council and Transport Research and Innovation Board (TRIB), has helped establish a clear direction, including the TRIB Digital Twin Roadmap to 2035 and supporting Economic Benefits Analysis that sets out the scale of potential value.

At the same time, initiatives such as the Tees Valley Traffic Digital Twin are demonstrating practical application at a local level, with early benefits including improved network visibility, reduced travel times and improved bus speeds.

Across the sector, the shift is clear: from research towards operational capability.

A NATIONAL STEP FORWARD: CRISIS RESPONSE AND RESILIENCE DIGITAL TWIN

A major step forward is the development of the UK's national transport Crisis Response and Resilience Digital Twin (CRDT), commissioned by the Department for Transport.

This programme responds directly to transport-related risks set out in the National Risk Register, from extreme weather to infrastructure failure, many of which have significant impacts on how people and goods move.

Over the past six months, the foundations of this capability have been established, bringing together:

- Real-time detection of events across modes
- A knowledge graph to connect data and provide context
- Simulation to understand impacts and responses
- Visualisation to support decision-making

Early use cases have been demonstrated, including flooding scenarios and cross-network event detection. Crucially, this is being developed as an operational capability, not a theoretical model.

Equally important is how it is delivered. Using agile methodologies, with users embedded in development, the initiative is delivering usable capability in weeks rather than years.

CRDT impact assessment of a major flood event in the North East using Agent Based Modelling

This focus on adoption is key.

The ambition is clear: to enable the UK to better plan for, monitor and respond to transport disruption at a national scale.

BUILDING CAPABILITY ACROSS THE SYSTEM

CRDT is not an isolated example. Across the UK and globally, digital twin capabilities are evolving rapidly. We are now seeing:

- National platforms reducing modelling times from weeks to minutes
- AI-enabled decision support systems supporting real-time operations
- City-scale digital twins optimising the performance of public transport

Together, these developments are laying the groundwork for a new generation of transport operations and the evolution of control centres. The future control centre will increasingly rely on digital twins as a core capability, enabling proactive, system-wide optimisation rather than reactive management.

WHAT COMES NEXT

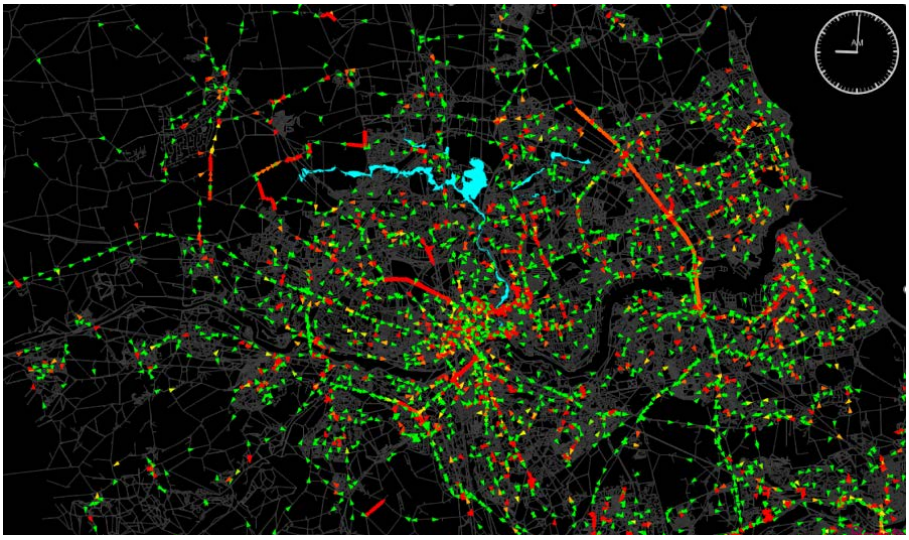
As these capabilities mature, adoption will accelerate.

Over the coming year, DfT will support transport authorities through a £30 million investment in regional Integrated Transport Digital Twins, marking a shift to scaled deployment.

These programmes will focus on improving performance, resilience and coordination across modes, underpinned by stronger data sharing across organisations and geographies.

For transport authorities, success will depend not just on technology, but on leadership, collaboration and a clear focus on operational value.

DfT National Transport Analysis Platform underpinned by digital twin technology reducing analysis time from weeks to minutes



A DEFINING MOMENT

Digital twins are becoming a core part of how transport systems are managed and optimised.

The UK now has the foundations in place. The next phase is scaling into operational reality.

Those that move early will be best placed to realise the benefits of a truly integrated, intelligent transport system, reflecting the ambition of **Transport 4.0.**

Smarter, Safer Mobility:

Secure and intelligent detection for connected and inclusive transport

The way infrastructure operates is changing, shifting from static, hardware-led systems to intelligent, connected, and data-driven environments. In transport, this transformation is particularly significant.

Giorgio Potenza
International Business Development Manager, AGD Systems

Road networks are no longer viewed as fixed assets but as dynamic systems capable of sensing, analysing, and responding to real-time conditions. This shift is underpinned by advances in artificial intelligence and ethernet-based communications, all of which enable infrastructure to become part of a wider digital ecosystem.

A key characteristic of this evolution is the flow of high-quality data. Modern transport systems rely on accurate, real-time information to optimise signal timings, prioritise different modes of travel, and improve safety outcomes. This requires sensors and detection technologies that go beyond simple presence detection, instead providing rich insights into how infrastructure is being used. Ethernet connectivity plays a central role here, offering a standardised and scalable way to transmit this data into traffic control systems and, increasingly, into broader smart city platforms.

FACING RISKS FROM CYBER

However, increased connectivity introduces new challenges. As roadside devices become part of IP-based networks, they also become potential entry points for cyber threats. This is where regulatory frameworks such as the Cyber Security Act and associated UK resilience standards become critical. They set clear expectations around how connected infrastructure should be designed, deployed, and maintained, with a strong emphasis on security by design.

In practical terms, this means that intelligent transport devices must incorporate robust cybersecurity measures from the outset. Secure configuration processes, controlled access, and the ability to integrate into protected network environments are all essential. Just as importantly, Ethernet-enabled devices must support modern security practices such as authentication, encryption, and network segmentation. The goal is to ensure that while infrastructure becomes more connected and capable, it does not become more vulnerable.

Within this context, solutions such as the AGD646 Pedestrian and VRU Detector illustrate how detection technology is evolving. Rather than acting as standalone sensors, they form part of a connected system, delivering structured data over Ethernet that can be securely managed within a wider architecture. This approach aligns with the requirements of modern cybersecurity frameworks, enabling authorities to deploy intelligent infrastructure with confidence.

At the same time, processing data directly is becoming increasingly important. By analysing data locally, devices can make immediate decisions without relying entirely on central systems. This not only improves responsiveness but also enhances resilience, as critical functions can continue even if network connectivity is disrupted. The combination of local intelligence and secure connectivity reflects a broader move towards decentralised yet integrated systems.

INCLUSIVITY IN TRANSPORT

Alongside these technological shifts, there is a growing emphasis on inclusivity within transport networks. Historically, much of traffic management has been centred around vehicular movement, particularly cars and, more recently, buses. While bus priority remains a key focus for many authorities, there is now increasing recognition of the need to support a wider range of road users, particularly cyclists and pedestrians.

This is where solutions like the AGD650 AI Multi Modal Detector contribute to a broader conversation about modal shift. By enabling more accurate detection of cyclists at junctions and crossings, such technologies help remove one of the long-standing barriers to cycling adoption: unreliable or inconsistent detection. When cyclists can interact with traffic signals in a predictable and responsive way, the overall experience improves, making active travel a more attractive option.

This has important implications for transport policy. Encouraging modal shift away from private vehicles is central to reducing congestion, lowering emissions, and improving urban environments. However, achieving this requires infrastructure that actively supports alternative modes, not just in principle but in day-to-day operation. Intelligent detection plays a subtle but critical role in this, ensuring that cyclists and pedestrians are properly accounted for within signal control strategies.

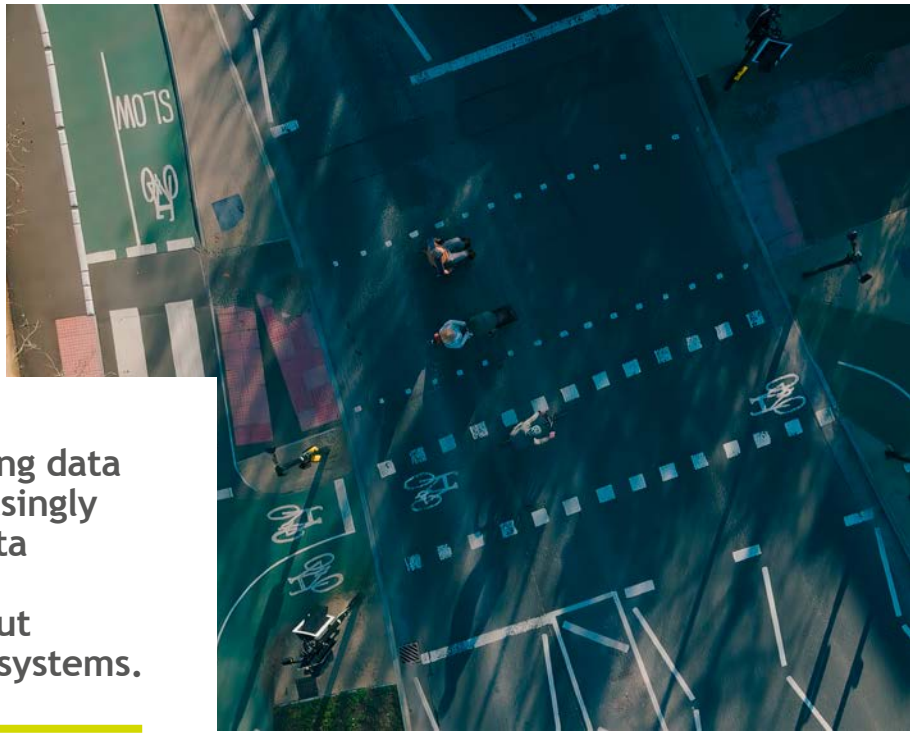
At the same time, the continued prioritisation of buses highlights the need for balance. Public transport remains essential for moving large numbers of people efficiently, and investment in bus priority systems is unlikely to diminish. The challenge, therefore, is not choosing between buses and other modes, but creating systems that can intelligently manage multiple priorities.

This is another area where modern connected technologies demonstrate their value. By providing detailed, real-time data on different types of road users, connected detection systems enable more subtle decision-making. Instead of fixed hierarchies, traffic control can become adaptive responding to current conditions and balancing competing demands in a way that maximises overall network performance.

MORE THAN TECHNOLOGY

Ultimately, this transition in transport is about more than technology; it is about enabling better outcomes. Safer crossings, more reliable journeys, and more inclusive infrastructure are all part of this vision. Achieving these goals requires solutions that are not only intelligent and connected but also secure and resilient.

By aligning with cybersecurity requirements, embracing Ethernet-based communication, and supporting a more inclusive approach to mobility, AGD Systems' solutions are positioned within this wider transformation. They reflect a move towards infrastructure that is not only smarter, but also more adaptable, more secure, and better suited to the evolving needs of modern transport networks.



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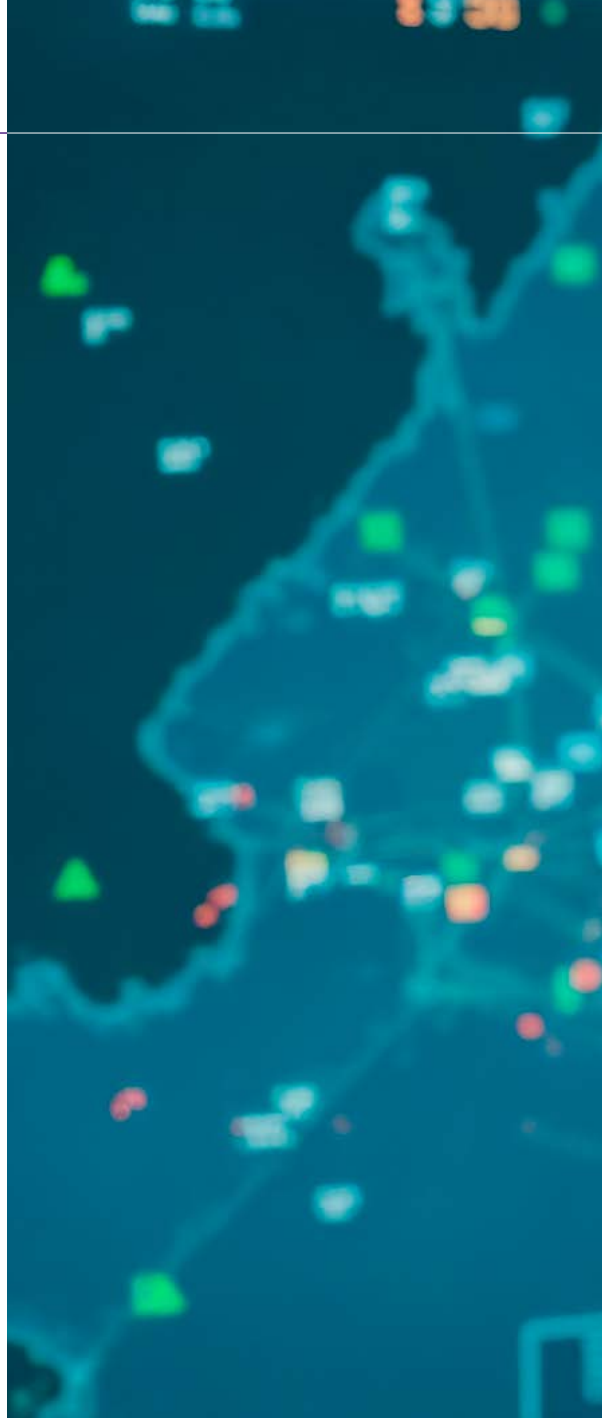
How Indra's traffic and access control systems are redefining smart infrastructure



Mobility is undergoing a profound transformation driven by digitalisation, artificial intelligence, and connectivity. Transportation, roads, infrastructure, and vehicles no longer function as isolated systems; they are becoming part of a hyperconnected digital ecosystem capable of exchanging information in real time.

Manuel López
Traffic & Infrastructure Director, Indra

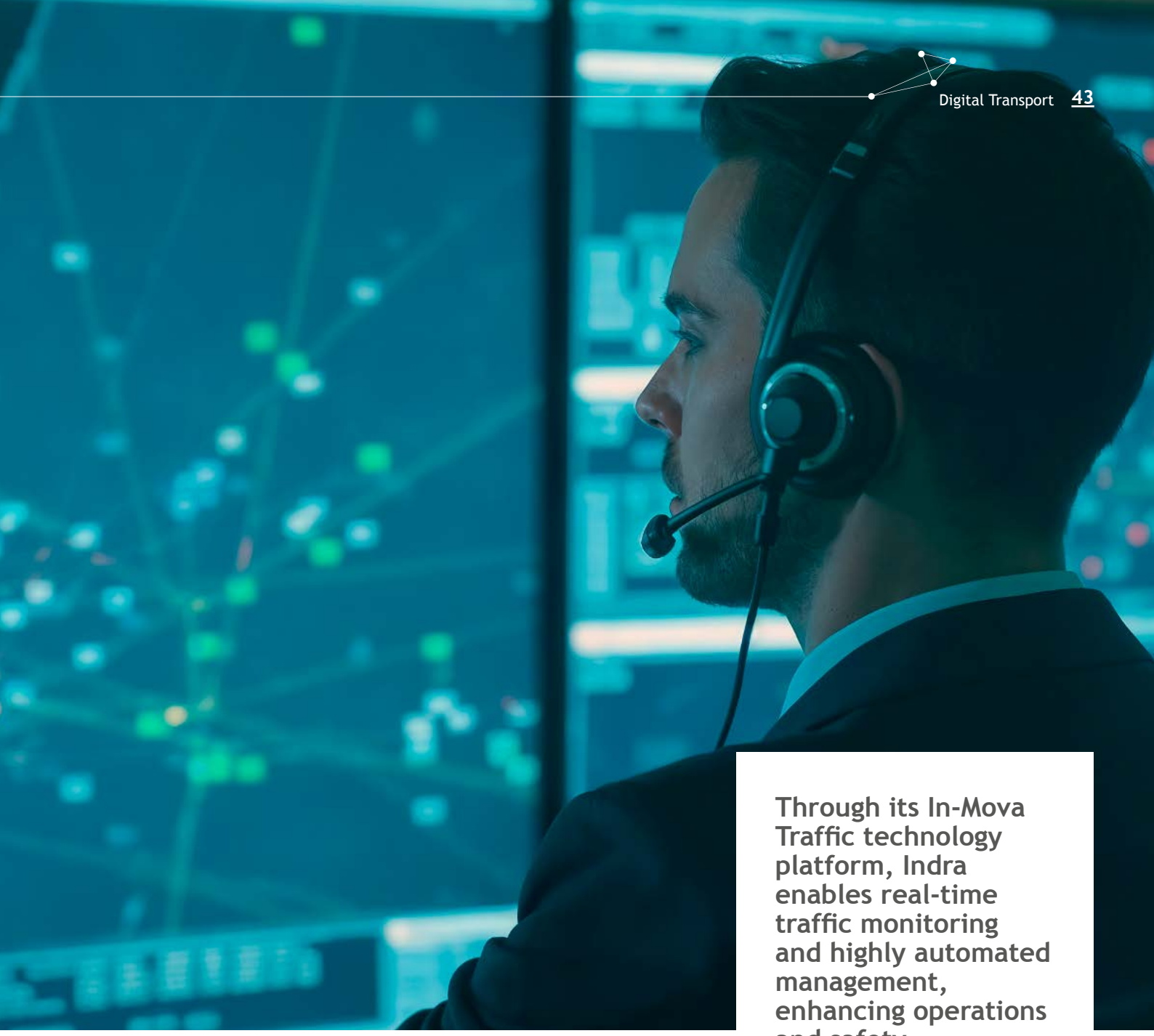
We are witnessing a new paradigm, known as Transport 4.0, which reflects the impact of the Fourth Industrial Revolution. This shift transforms user experience, offering smoother and safer mobility, real-time information, and more efficient and sustainable management that contributes to reducing emissions and traffic congestion.

TRAFFIC MANAGEMENT, TAKEN TO THE NEXT LEVEL

Through its In-Mova Traffic technology platform, Indra enables real-time traffic monitoring and highly automated management, enhancing operations and safety—particularly in incident and emergency response, and especially in complex environments such as tunnels. Since 2017, Transport for London (TfL) has used this platform through its Surface Transport and Traffic Operations Centre to manage London's 12 road tunnels in real time. Indra has deployed the system across key infrastructure, most recently in the Silvertown Tunnel—a project that received the 2025 A Sustainable Environment through Technology Award from ITS UK—and beyond London.

ACCESS CONTROL IN CITIES

One of the latest transformations impacting mobility and transportation in major cities—and one that is advancing rapidly—is the evolution of access control systems. Vehicle



Through its In-Mova Traffic technology platform, Indra enables real-time traffic monitoring and highly automated management, enhancing operations and safety—particularly in incident and emergency response, and especially in complex environments such as tunnels.

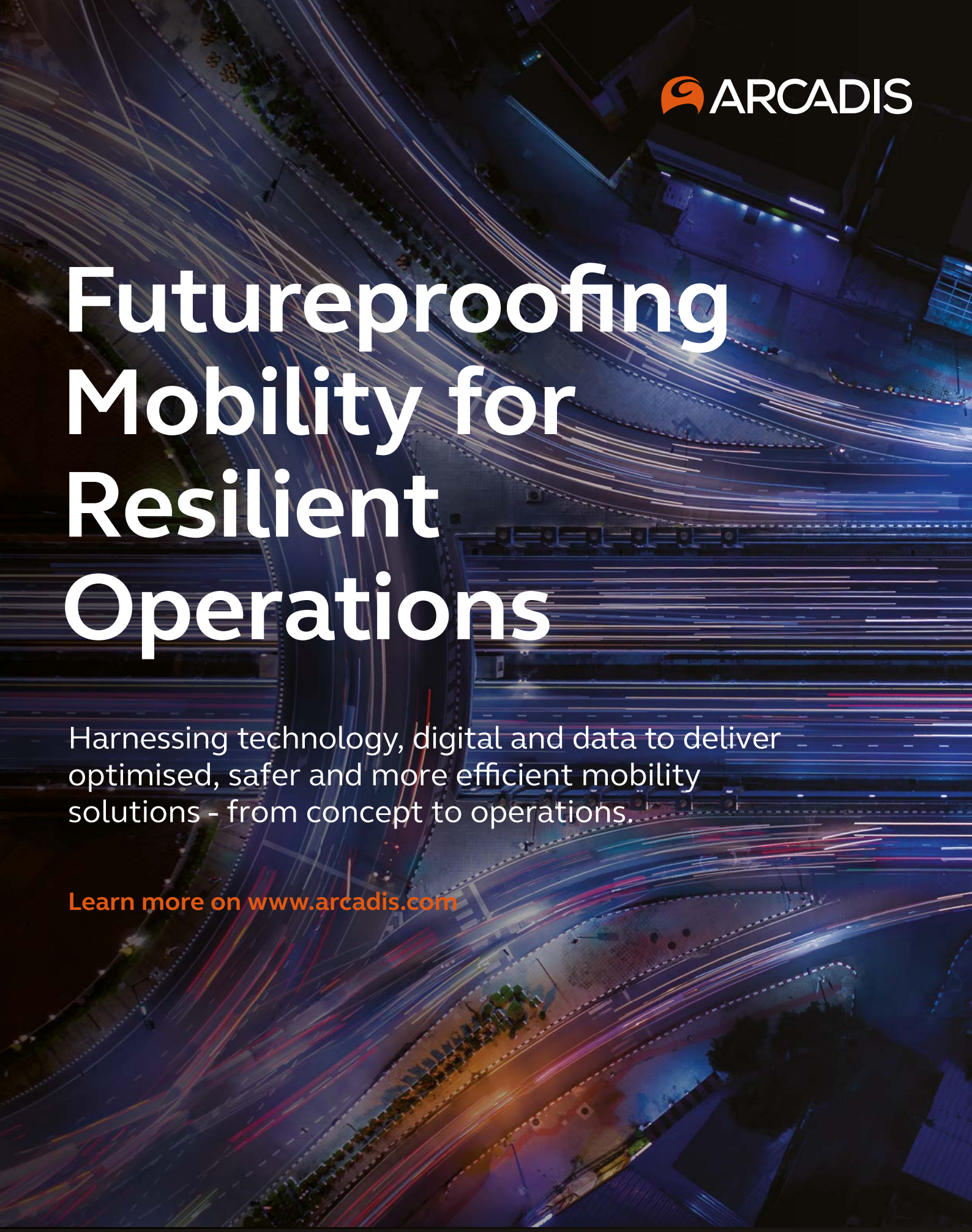
detection technology is critical for their proper implementation. Using non-intrusive, highly reliable solutions powered by artificial intelligence and technologies such as 3D LIDAR, ANPR and High Occupancy Vehicles (HOV) detection, this technology enables real-time automatic detection of vehicle type, as well as front and rear occupants of any vehicle, without requiring stopping or slowing down.

Indra Group's technological capabilities enable the deployment of these systems, making it possible to prioritise and promote the use of public transportation and high-occupancy, low-emission vehicles—improving traffic flow, air quality, and noise levels.

TECHNOLOGY FOR PUBLIC TRANSPORTATION AND URBAN MOBILITY

Promoting the use of public transportation requires providing the best possible service to users. Indra is one of the leading international companies in public transportation technology, specifically in ticketing and automated fare collection (AFC); by incorporating cutting-edge technologies, such as the use of bank cards, mobile devices, or the Be-In-Be-Out (BIBO), as well as management through traveller accounts (Account-Based Ticketing, ABT), a more advanced and efficient model ensuring the best available fare is charged.

These solutions include improvements in accessibility, with intuitive interfaces and adapted features; a prime example of this is the fact that Indra Group will be responsible for the ticketing and access control system for the entire London public transport network, or the implementation and operation of sales channels for the entire public transport network in Ireland.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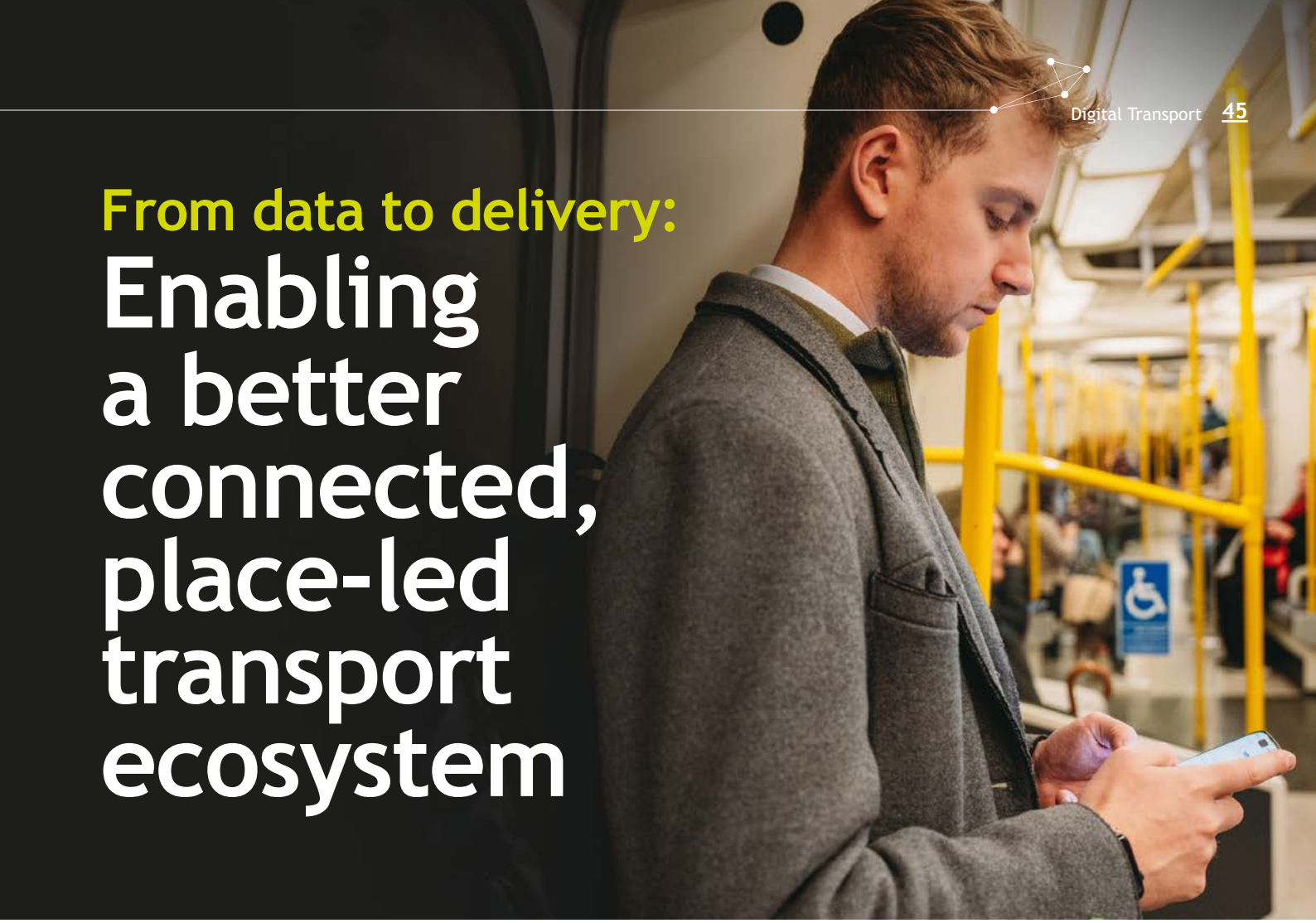

From data to delivery:

Enabling a better connected, place-led transport ecosystem

Mark Oldfield
Business Development Director, Kainos

Transport in the UK is going through a period of significant change. Devolution, Rail Reform and accelerating digital innovation are reshaping how services are planned, delivered, and experienced. Alongside this, Department for Transport strategies such as Better Connected and the Transport Data Action Plan signal a clear shift towards transport systems that are more integrated, more responsive, and better aligned to the needs of people and places.

While the ambition is clear, the starting point is complex. UK transport systems remain fragmented, with data split across modes, organisations and legacy technologies, and services often designed and delivered in silos. Individually, many parts of the system work well, but they do not always come together coherently. The challenge is moving from this fragmented landscape towards integrated transport ecosystems that work across organisational and modal boundaries.

As control shifts towards regions, transport must increasingly be place-led, with priorities shaped by local needs and constraints. Transport is experienced differently across the country due to variations in travel patterns, infrastructure, governance, and economic priorities. What works well in one region may not work in another.

Devolution adds more complexity. Delivery increasingly depends on coordination across multiple public and private organisations, each with different responsibilities, systems and incentives. *Better Connected* recognises this reality, emphasising the importance of integration across modes and regions. Turning this ambition into practice

organisations, decision-making and delivery models to be aligned around the needs of specific places.

The DfT's Transport Data Action Plan places strong emphasis on improving access to data, enabling sharing and unlocking innovation, recognising data as a strategic asset. However, the value of data lies not in availability alone, but in how effectively it informs decisions and action. While real-time data, predictive analytics, and emerging AI applications offer new ways to understand networks, anticipate disruption and improve performance, it can exist separately from the decisions it is intended to inform, limiting its impact. For data to deliver value, it needs to be accessible across organisational boundaries, trusted and consistent, embedded into everyday workflows, and clearly linked to outcomes, accountability, and decision-making.

Delivering a genuinely connected transport system therefore requires a shift from designing individual services to thinking and acting at a whole system level. Transport operates as an interconnected ecosystem, where decisions in one area can affect congestion, reliability, user experience and environmental outcomes elsewhere. Whole system design considers the end-to-end journey, and how services, data, platforms, and organisations need to work together to support it.

As digital capability advances, there is growing potential to move from reactive to proactive transport management. Real-time data, combined with predictive analytics and AI, can help organisations anticipate issues, optimise network performance, and respond more effectively to changing conditions. However, these capabilities depend on strong digital foundations. Secure, interoperable platforms are needed to bring data together, ensure consistency, and enable advanced analytics. Without this, underpinning opportunities to apply AI and automation remain limited and difficult to scale.

Achieving a connected transport ecosystem is less about technology alone and more about how systems, organisations, and decisions are aligned. It requires interoperability, shared standards, effective governance and collaboration across public and private partners. Above all, it demands a shift in mindset from delivering discrete services to enabling connected ecosystems that can adapt to real-world complexity and the needs of specific places.

Kainos' expertise sits in the space between strategy and delivery, where uncertainty is real, constraints are unclear, and the right answer is not obvious at the outset. Our teams of service designers, researchers, behavioural scientists, technologists, AI and data specialists look beyond individual services to understand how organisations, policies, data and technology interact across the wider transport system, and how change in one part affects the whole.

We are already delivering complex services that work across multiple organisations, users, and constraints. Within the Department for Transport, programmes such as Street Manager and the Bus Open Data Service support better data sharing, coordination and decision-making across the network, while work in automated vehicles is helping to lay the foundations for more connected, data driven transport services.

Digital services delivered with the Driver and Vehicle Standards Agency, including Theory Test and MOT platforms, sit within the broader driver and vehicle owner ecosystem. Our work with Network Rail on leveraging modern cloud services is supporting more resilient, data driven infrastructure, enabling better use of data within complex operational contexts.

The next phase of transport transformation must be shaped at a local level, starting from place, not platforms. It will require a deep understanding of context; how people travel, how operators work day-to-day, how policy and funding constraints shape decisions, and how data flows across organisational and geographic boundaries. Services cannot be designed in isolation. Meaningful progress will depend on bringing together policymakers, delivery teams, operators, and technologists alongside citizens; whose lived experience provides critical insight into what works, what does not, and why.

Data must support judgement and action, not just analysis or reporting. This means embedding insight into operational processes, clarifying ownership and accountability, and ensuring emerging capabilities such as AI enhance human decision-making.

Enabling better connected transport systems ultimately requires a shift: from designing individual services to enabling whole system outcomes; from top-down implementation to place-led delivery; and from abstract strategy to solutions shaped by real-world conditions. Done well, this creates the conditions for transport systems that are not only better connected, but more resilient, more effective, and better aligned to the people and places they serve.

The ‘digital control tower’ has the power to unblock road and multi-modal transport

The UK's transport crisis won't be solved by building more infrastructure, but by finally joining up the data we already have. A new era of transport orchestration promises smarter operations, more inclusive networks and even faster emergency response

Caroline Hildreth
Principal, Transport, Netcompany

For decades, the response to the UK’s growing transport demands has been expansion. More lanes, more track and larger terminals. But in an era of tightened public purses and net-zero commitments, the sector has reached a ceiling. It’s no longer possible to build our way out of congestion. The challenge for today’s transport authorities is about extracting more value from what’s already in place.

Experience across the sector – including eight years working closely with National Highways – suggests a red thread connecting successful transport projects: the move toward efficiency through data. Yet, while the industry is now data-rich, many authorities remain insight-poor, and the volume of fragmented information has become a barrier to progress. To break through this ceiling, the focus must shift from system integration to transport orchestration.

THE HUMAN INTEGRATION PROBLEM

Step into a typical operations control centre (OCC) and the challenge is obvious. Skilled operators act as a manual layer of human integration, managing dozens of screens and cross-referencing data between incident

logs, urban traffic control systems and CCTV feeds.

This was the core challenge identified during our recent work with Transport for Greater Manchester (TfGM). As they delivered the Bee Network – the UK's first truly integrated transport system outside the capital – operators were navigating over 60 applications to manage the network. When a tram delay occurred, understanding its impact on connections or local traffic required a high-pressure effort to gather disparate data.

This fragmentation creates a massive cognitive load and forces staff into a reactive cycle of firefighting, where time to validate sources is time taken away from a resolution. Until these legacy systems are unified, proactive network management remains a theoretical goal.

BUILDING THE DIGITAL CONTROL TOWER

The solution lies in a 'digital control tower' – a platform that sits above existing infrastructure rather than seeking to replace it. By using a platform like PULSE, authorities can ingest data from every mode (bus, rail, tram, and road) and correlate it into a unified interface.

In Greater Manchester, this involved taking over 10 disparate data sources and modelling them into entities such as 'Incident' and 'Vehicle Activity.' By creating this operational picture – comprised of Waze feeds, bus data, CCTV, traffic signals and more – the platform removes the need for screen switching and, once an incident is logged, it becomes a visual overlay on a map, showing real-time data across the entire multimodal network.

The platform surfaces the most relevant information and suggests actions based on real-time data, allowing human operators to make better-informed decisions faster. The needle shifts from 'what happened?' to 'what should we do now?'

INCLUSIVITY AND ACTIVE TRAVEL

The benefits of orchestration extend beyond human efficiency; they are fundamental to creating a transport network that works for everyone. Smart technology must be inclusive by design and for families, the elderly, or passengers with disabilities, a seamless journey is a necessity.

Through a digital control tower, an authority gains awareness to support these users. If a lift failure is reported at a rail station, an orchestrated system can immediately alert bus operators on connecting routes, allowing them to proactively assist passengers. This level of cross-modal communication is only possible when data is released from its traditional silos.

Orchestration also allows for better management of active travel and pedestrian flows. Consider the impact of a major event, such as a football match. By predicting the moment thousands of passengers disembark at a transport hub, an orchestration ecosystem can automatically adjust signal timings to prioritise pedestrian safety and clear the influx before it spills over into road traffic. It allows the city to operate in-sync with its people.

THE EMERGENCY GREEN WAVE

Looking ahead, the potential for orchestration to save lives is significant. One of the most compelling future use cases, for example, is the integration of emergency services.

Currently, ambulances and fire engines navigate traffic that is often unaware of their approach until the last second. In an orchestrated future, the control tower could identify an emergency vehicle's route in real-time and communicate directly with the Urban Traffic Control (UTC) system. This would create a green wave of synchronised traffic signals, clearing a path and potentially saving vital minutes – and lives.

THE PATH FORWARD

The technology required to transform British transport already exists. The success of the Bee Network proves that we don't need to rip and replace systems to see results. We can start small, focusing on high-impact cases and scaling orchestration as the network evolves. This requires a shift in mindset, moving away from system integration and toward network orchestration.

The industry stands at a crossroads. We can continue to manage infrastructure in isolation, fighting the traffic crisis with the tools of the past. Or we can embrace the intelligence already sitting within our systems and build a transport network that is responsive, inclusive and orchestrated.

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By using a platform like PULSE, authorities can ingest data from every mode (bus, rail, tram, and road) and correlate it into a unified interface.

Delivering transport's orchestrated future

PULSE is the orchestration platform for in-sync, collaborative decision making. It turns raw operational data into safe, auditable actions, moving you from hindsight to AI-driven foresight.

Netcompany

The transport sector is entering a new era. Across infrastructure, operations, logistics and passenger mobility, the pace of technological change is accelerating. Digital platforms, automation, AI, connected devices and real-time analytics are reshaping expectations of how transport systems should perform. In this environment, success will not come from more information alone. It will come from turning the right information into better operational decisions.

Why integrated weather solutions matter for Transport 4.0

Daniel Johns
Senior Strategic Consultant, OpenWeather

That is the challenge of Transport 4.0: creating systems that are integrated, inclusive and intelligent.

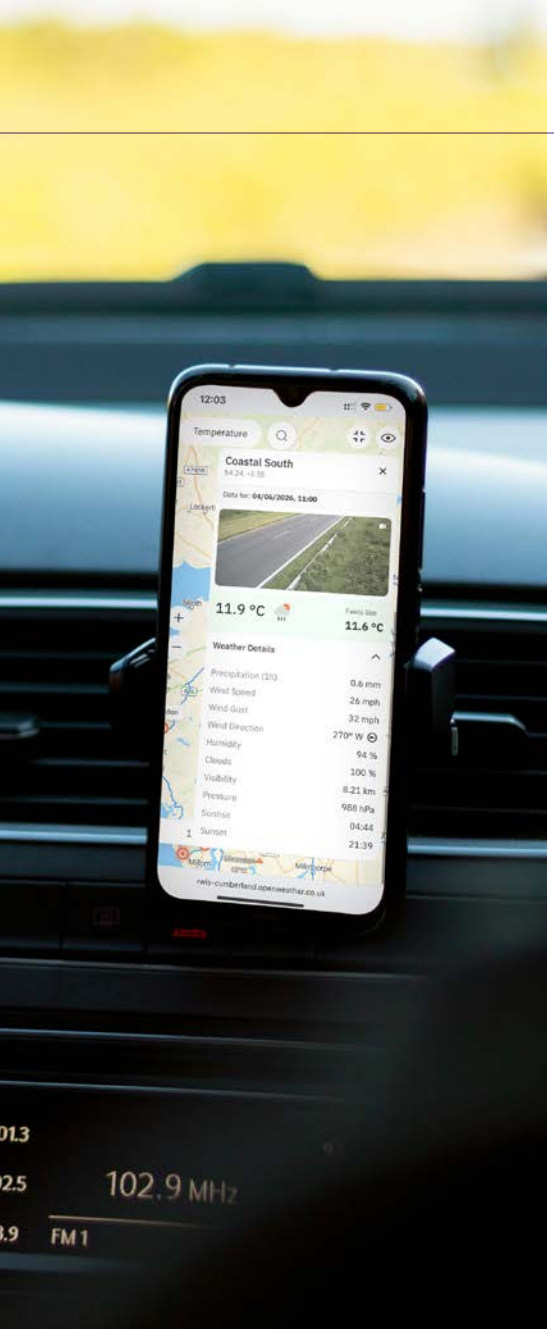
Weather must be part of that transformation.

For too long, weather has been treated as a background condition rather than an operational factor. It is acknowledged when disruption occurs, but too rarely built into everyday planning, real-time operations and long-term resilience. Yet weather affects almost every part of transport performance. It influences safety, reliability, passenger behaviour, asset exposure, journey times, modal choice and demand patterns. If transport systems are to become more adaptive and resilient, weather intelligence must be built into the way they are managed.

OpenWeather starts by understanding the customer's operation, then builds the right weather solution around it.

That is what an integrated solution means. It is not a single forecast feed or a standalone technology product. It is a practical combination of the components needed to solve a real operational problem in a way that fits the customer's business. For one organisation, that may mean local weather stations and sensors at critical points in the network. For another, it may mean tailored models for wind, heat, rain or ice risk. For others, it may mean a platform that turns weather intelligence into alerts, dashboards and decision-support tools, backed by meteorologists who provide expert interpretation, reports and advice.

In simple terms, an integrated weather solution brings together



hardware to measure, models to process, platforms to deliver, and meteorologists to advise; it is all designed around the operational realities of a specific industry.

That matters because transport organisations do not need weather in the abstract. They need weather intelligence that helps them act. The value lies not in any single element alone, but in how measurement, forecasting, delivery and expertise are combined into one working capability.

This is where the future of meteorology connects directly with the future of transport.

In practical terms, weather models are becoming sharper, faster and more local. If older forecasts were like low-resolution images, modern models are moving towards far greater clarity. They can capture local variations that would once have been blurred or missed altogether. In dense urban environments, that matters enormously. Wind behaves differently around buildings. Heat accumulates differently across streets and open spaces. Rainfall exposure can vary significantly even over short distances. As resolution improves, so does the ability to understand those differences and act on them.

For transport, that opens up major opportunities, especially because weather does not only affect infrastructure. It affects human behaviour.

Transport 4.0 will not be delivered by isolated datasets or disconnected technologies. It will depend on systems that combine sensing, modelling, analytics, platforms and expert judgement in ways that solve real operational problems.

Our work with academic partners including the London School of Economics and FourthRev, using Transport for London data, has helped quantify this relationship in greater detail. The findings show that weather does not simply increase or reduce total demand in a uniform way. Instead, it reshapes behaviour across time, mode and geography. Tourism-related mobility can increase during sustained warm conditions. Leisure activity falls as rainfall intensifies. Weekend Underground demand is far more sensitive to heavy rain than weekday commuting, showing the difference between discretionary and essential travel. Cycling is especially weather-dependent, with a substantial share of variation in cycle hire explained by weather conditions alone. Adverse weather also redistributes demand, as people choose more sheltered routes, stations or modes to minimise exposure.

If operators understand not only the forecast itself but the likely operational and behavioural effects of that forecast, they can make better decisions. They can anticipate demand shifts, protect exposed assets, adjust staffing, improve passenger communication and respond earlier to operational stress. Weather becomes not something observed from the sidelines, but something built into the decision-making process.

This is also where inclusion matters.

An inclusive transport system is not only one that is physically accessible. It is also one that recognises that weather disruption is not experienced equally. Heat, heavy rainfall, wind and icy conditions affect different users in different ways. Older people, disabled passengers, children, shift workers, outdoor staff and those making complex multi-stage journeys can all face greater difficulty when conditions deteriorate. Integrating weather intelligence into transport planning and operations helps organisations identify those vulnerabilities earlier and respond more effectively.

For ITS, this is especially relevant. Intelligent transport systems depend on timely, contextual and actionable information. They need more than generic inputs. They need decision-ready intelligence that can support real-time operations, infrastructure management, passenger services and resilience planning. That is exactly where integrated weather solutions have the greatest value.

Transport 4.0 will not be delivered by isolated datasets or disconnected technologies. It will depend on systems that combine sensing, modelling, analytics, platforms and expert judgement in ways that solve real operational problems.

This is the shift now underway: from weather as background information to weather as operational intelligence.

And in the transport systems of the future, that intelligence will matter most when it is delivered as a complete solution.

CHAPTER 04

Freight, Logistics & Maritime

Maritime ITS in the Nordics: Towards integrated transport systems

What is Maritime ITS?
ITS is usually about cars and roads. However, UK, Finland and Norway have added maritime to their ITS activities, much because of their dependency on maritime transport. As an example, Norway has about six times the number of passenger-km by sea than average in Europe. For Finland, over 95% of the country's foreign trade moves by sea.

Nordic maritime transport is also closely integrated with road transport. Numerous highway ferries cross fjords and lakes and connects islands to the mainland. Long coastlines makes sea transport an important part of the transport system. This requires close integration with road transport for the last mile transport. Digital data exchanges across this sea-land interface – covering cargo information, vessel schedules and port resource availability – is as much an ITS challenge as the physical transport infrastructure itself.

Maritime ITS technology also overlaps with road ITS. The maritime sector has used anti-collision radars since 1969, was the largest civilian user of GPS in the 1990s and mandated the use of Automatic Identification System

Ørnulf Jan Rødseth
Director, Maritime ITS
ITS Norway

Olli Soininen
Head of Programs
Fintraffic

(AIS) in 2002. AIS is the sea's sister of the connected, cooperative and automated mobility (CCAM) system for roads. Since 2015 autonomous ships have also been very relevant for sea transport. It is expected that the International Maritime Organization (IMO) adopts a voluntary code for autonomous ships (MASS) this year, with a mandatory code expected in 2032.

WHY BOTHER ABOUT MARITIME ITS?

Ships are different from cars! They are bigger, slower and travel over greater distances. Differences are also seen in technology: While cars rely on mobile data for communication, ships are dependent on satellites. AIS for ships use low frequency VHF while CCAM for cars normally use GHz frequencies. There are limits to technology exchange between the modes, but there are other reasons why the maritime sector is interested in ITS.

Maritime is a small sector. There are around 100,000 ships in international trade versus around 1.3 billion cars in the world. This means that the maritime sector is dependent on learning from other modes.

Maritime is silo oriented. The maritime community suffers from strong silo thinking between parties and shipping types. The problem is particularly visible in data exchanges: Ports, shipping companies, logistics operators and authorities each run separate systems with limited interoperability. This is creating delays, duplicate reporting and gaps in supply chain visibility that a common ITS framework can address.

There are also reasons why the road community should be interested in the maritime sector.

Convergence of technology: Autonomous ships and cars is one example. There are commonalities in safety thinking and formal description techniques, e.g. by the adoption of the ODD also for ships. Communication challenges in sparsely populated areas, e.g. along the coast is a common problem.

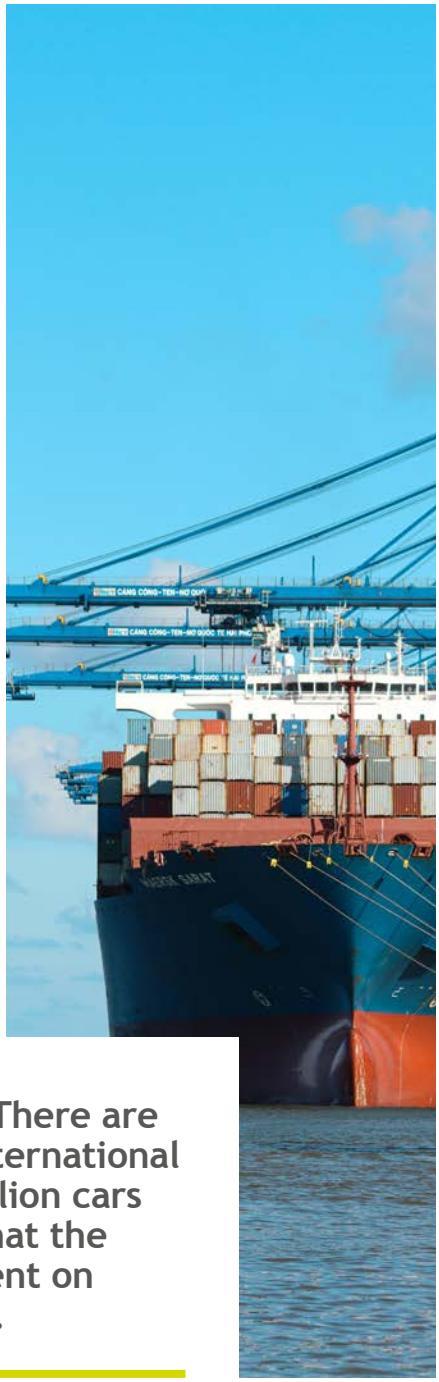
The multimodal aspect: Passenger and cargo transport is often multi-modal, and we need efficient interfaces between road and waterborne transport services. Decarbonisation of the transport sector requires optimal utilisation of the different transport modes as a system. Better synchronisation of ship arrivals with port services can reduce fuel consumption and emissions by 20-24% for the ship while also enabling better hinterland synchronisation and lower supply chain costs.

Increased resilience: With climate and geopolitical tensions worsening, sea or ferry transport can be an important backup if railways, roads, bridges or tunnels are closed. For countries like Finland, where sea is the primary channel for goods, real-time maritime situational awareness maintained by national traffic management authorities is itself a critical resilience and security-of-supply asset.

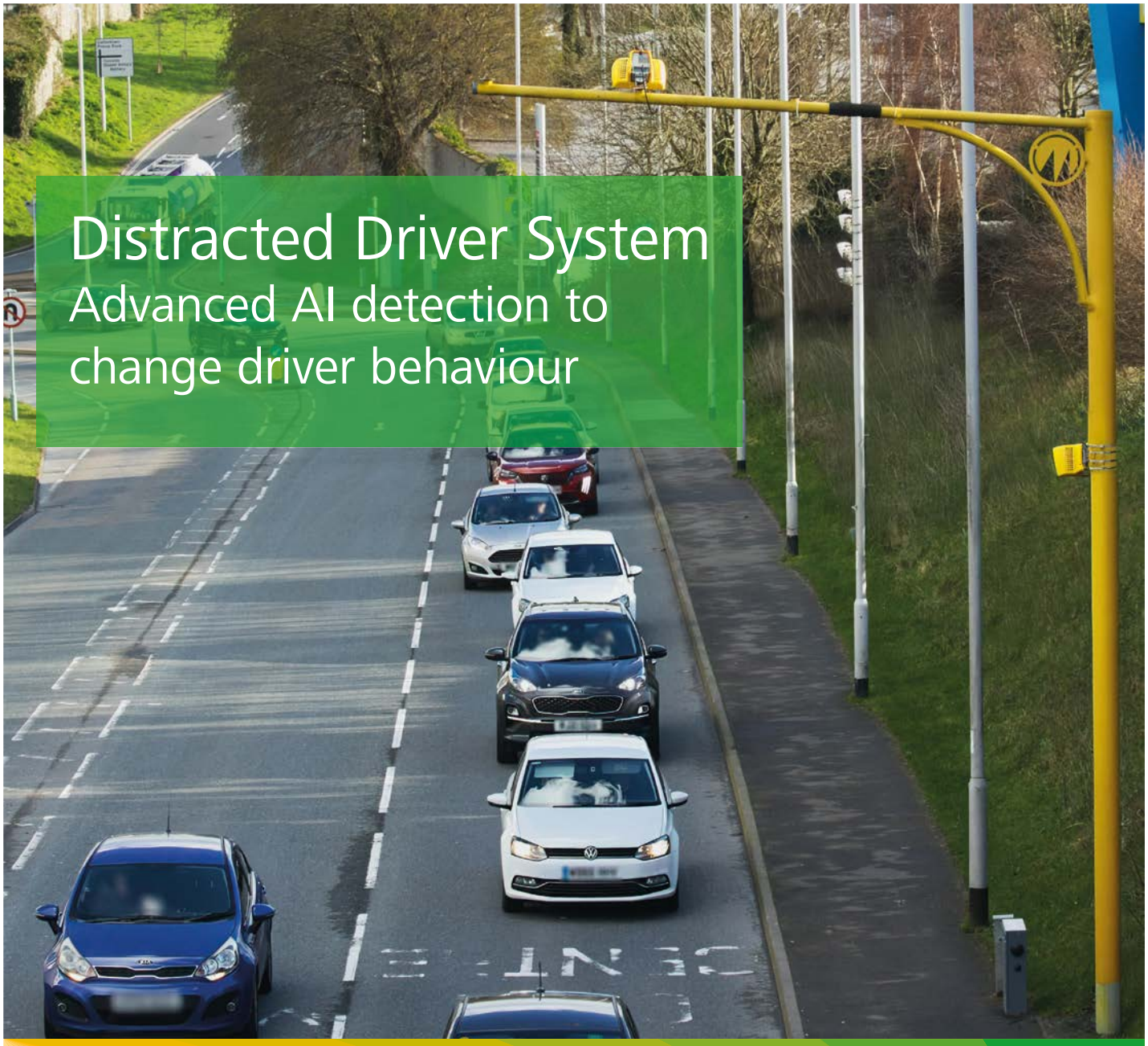
A dimension often underrated in ITS discussions is logistics data integration. EU regulations for sea (EMSWe) or other modes (eFTI) create a legal mandate for digital data exchange, but their value is only realised through coordinated national implementation. Without a clear owner for the common data exchange infrastructure – connecting ports, authorities, shipping companies and industry into a shared ecosystem – these mandates risk being met only at minimum compliance level, leaving the broader supply chain efficiency and emissions benefits unrealised.

THE WAY AHEAD

The Nordic countries and UK have already included maritime in their ITS activities. We encourage others to consider how their overall transport system similarly can be made more intelligent and future ready. One approach is to anchor maritime ITS in national vessel traffic management that already operate safety-critical services. These bodies have operational expertise, institutional trust and continuity. Extending their mandate to encompass data coordination for the broader maritime logistics ecosystem avoids duplication, ensures alignment with EU regulatory frameworks and IMO standards, and creates a natural bridge between maritime safety services and the wider supply chain digitalisation agenda — a gap that commercial actors alone cannot close at the required system level.



Maritime is a small sector. There are around 100,000 ships in international trade versus around 1.3 billion cars in the world. This means that the maritime sector is dependent on learning from other modes.



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The term "smart port" is increasingly common across the transport and logistics industry, yet there is still no universally accepted definition of what a smart port actually is.

Smart ports are not a destination; they are a direction of travel

Dorian Isaacson
Member, ITS UK Freight, Logistics and Maritime Committee

For some, it means automation. For others, digital infrastructure, AI, data integration or connected operations. In reality, perhaps the more useful question is not what defines a smart port, but rather what impact a smart port creates.

Because the true value of a smart port is rarely confined within the boundary of the port itself.

Ports sit at the centre of a much wider multimodal ecosystem. Shipping lines, freight operators, hauliers, rail, local authorities, highways teams, warehouse operators and even the travelling public are all affected by how efficiently and intelligently a port operates. When ports function well, the benefits extend far beyond the terminal gates.

In the UK, ports are increasingly exploring how digital systems, operational data and connected infrastructure can improve the movement of people and goods. Portsmouth International Port is one example of this evolving mindset, with ongoing work to modernise operations and move away from historically paper-heavy processes toward more connected, real-time decision making.

This is not simply about digitising forms or installing new technology for the sake of innovation. The larger opportunity lies in improving flow across the entire ecosystem surrounding the port.

For hauliers, smarter operations can reduce waiting times, congestion and uncertainty. For operators, it can improve safety, utilisation and operational visibility. For local authorities and nearby communities, better coordination can reduce pressure on surrounding roads and improve air quality and traffic conditions. At a national level, incremental improvements in port efficiency can have meaningful economic impact given the critical role ports play in the movement of goods into and across the UK.

Internationally, ports such as Port of Helsinki demonstrate what this broader vision can look like in practice. Helsinki's approach has focused heavily on creating a more integrated digital experience, where services, ticketing and operational information are brought together into a connected ecosystem rather than existing as isolated systems. The result is not simply a "smarter port", but a smoother multimodal journey for passengers, operators and freight alike.

Importantly, becoming a smart port is not a single transformation project or a final destination that can be fully achieved and completed.

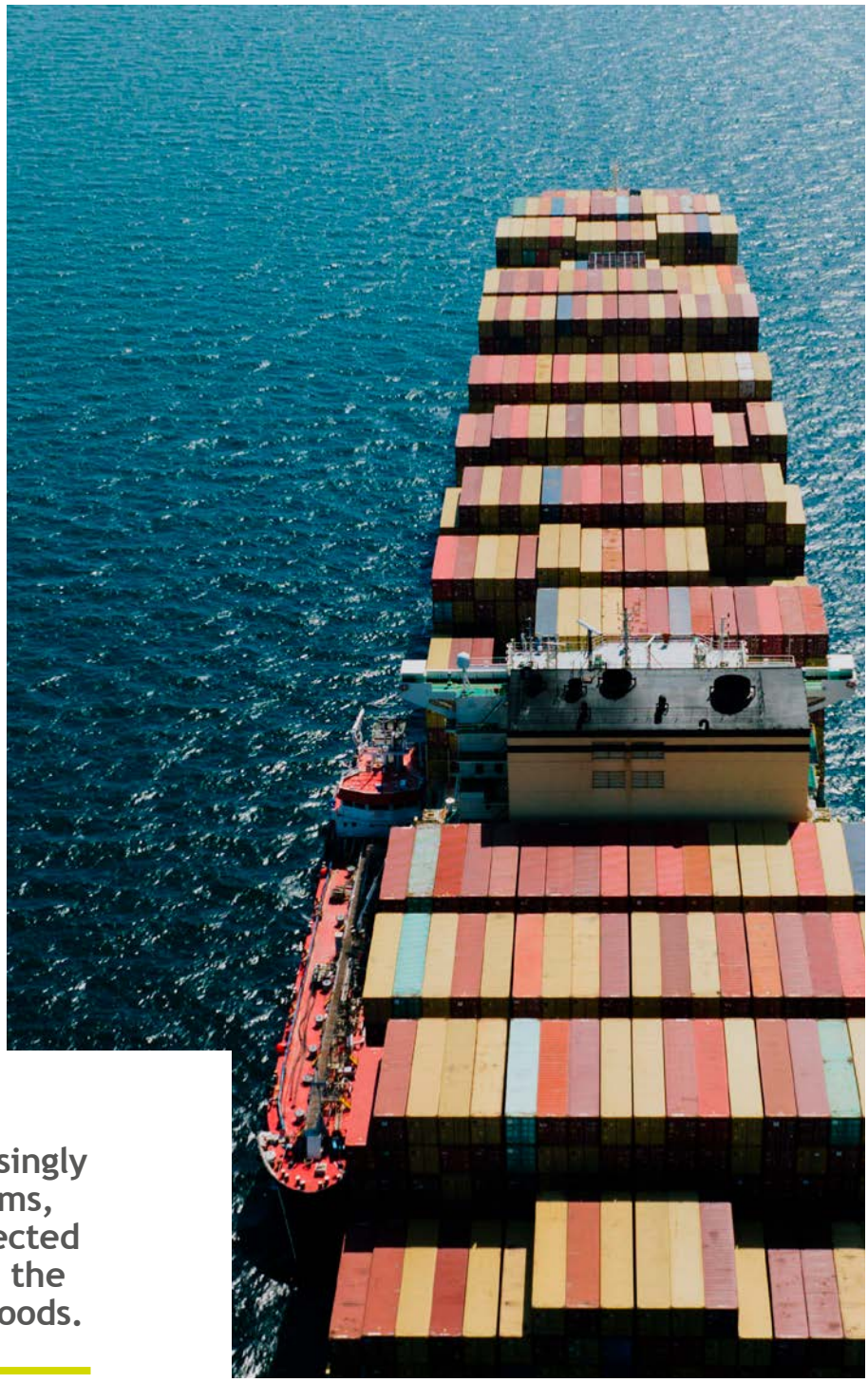
It is better understood as a sequence of building blocks.

Each improvement, whether operational visibility, digital tagging, integrated traffic systems, predictive analytics or better communication between stakeholders, contributes toward a more intelligent and responsive environment. Over time, these systems begin to compound in value as more data, context and operational understanding become available.

In that sense, port intelligence behaves much like human intelligence itself: it is never truly finished. It evolves continuously through observation, learning and adaptation.

That is perhaps why defining a smart port too narrowly can become unhelpful. The technologies will continue to change. The terminology will evolve. But the underlying objective remains consistent: creating ports that are more connected, more efficient, safer and better integrated with the wider transport ecosystem around them.

Ultimately, the smartest ports may not be those with the most technology, but those that create the greatest positive impact across the entire network they serve.



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INDRA

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Indra, a global technology leader, excels in smart mobility, recently becoming the ticketing system integrator across Tranwsport for London's entire public transport network and managing transport infrastructures like London's Silvertown Tunnel, Brisbane's Transurban highway or Virginia's I-66. Indra's innovative solutions include AI, 3D LIDAR, Intelligent Transport Systems, Vehicle Occupancy Counting, Radars, Mobility as a Service and Low Emission Zones, to enhance safety and user experience.

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Our services: Tolling or road user charging, Enforcement, Demand responsive transport, IoT, 5G & Connectivity, Passenger Experience & Journey Planning, Ticketing & Payments, EV & Charging technology, Traffic Management, Telematics & Navigation Systems, Data Services & Cloud, Digital twins & predictive maintenance, Mobility as a Service, Other

Innovate UK
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Our services: Other

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Intelligent Instruments
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Our services: Enforcement, Ticketing & Payments, Data Services & Cloud

Intelliscape Limited
With over 25 years of experience, Intelliscape delivers intelligent transport systems that increase road safety, reduce pollution, and improve network efficiency. Its Roadflow platform provides authorities across the UK and USA with a cutting-edge, flexible system for traffic enforcement and road user charging, enhancing public trust through reliable, responsive technology.
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Our services: Associated Services, such as recruitment, communications or HR

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Our services: Tolling or road user charging, Passenger Experience & Journey Planning, Ticketing & Payments, Traffic Management, Mobility as a Service

ISR Recruitment
Specialist ITS recruitment and exec search services, trusted by vendors, integrators, consultancies and contractors for 24 years. Focused on Traffic Engineering, Enforcement, ATMS and Road User Charging — named on tenders and embedded in supply chains, delivering C-suite, Sales, Technical, IT, Digital, Operational and Product appointments.
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Our services: Associated Services, such as recruitment, communications or HR

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Our services: Other

ITSO Ltd
ITSO is the UK's non-profit guardian of the national technical Specification for smart ticketing. We enable seamless, interoperable travel by ensuring different transport operators and schemes work together effortlessly. Our mission is to make public transport more accessible, efficient, and future-ready through secure, standardised smart
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Jenoptik UK is part of JENOPTIK Smart Mobility Solutions, providing ANPR based, innovative, and sustainable technology and services for the Road Safety, Civil Security and ITS markets. Our customers include local and central government, police and enforcement agencies, as well as public and private organisations.
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Our services: Public Affairs, Stakeholder Engagement, Strategic Communications

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Our services: Enforcement, Traffic Management

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Our services: Enforcement or road safety, IoT, 5G & Connectivity, EV & Charging technology, Traffic Management, Telematics & Navigation Systems, Data Services & Cloud, Digital twins & predictive maintenance, Asset management, Other: communications and Consultancy Services

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Our services: Tolling or road user charging, Enforcement, Demand responsive transport, Cooperative systems & CAM, IoT, 5G & Connectivity, Passenger Experience & Journey Planning, Ticketing & Payments, EV & Charging technology, Traffic Management, Telematics & Navigation Systems, Data Services & Cloud, Digital twins & predictive maintenance, Mobility as a Service, Associated Services, such as recruitment, communications or HR

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Our services: Autonomy

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Our services Other – Government company, managing the Strategic Road Network in England

NAVTECH RADAR

Navtech Radar
Navtech Radar develops advanced radar systems for traffic safety, security, marine and mining applications. Backed by Halma Plc, a FTSE 100 group, we deliver proven 360° radar technology for Automatic Incident Detection and other safety-critical uses where high performance in challenging conditions is essential. With in-house engineering expertise, we work closely with customers to ensure our technology continues to meet their operational needs over the long term.
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Our services: Data Services & Cloud, Other

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Our services: Data Services & Cloud, Other

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Our services: Other

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Our services: Enforcement or road safety, Demand responsive transport, Cooperative systems & CAM, IoT, 5G & Connectivity, EV & Charging technology, Traffic Management,Data Services & Cloud, Digital twins & predictive maintenance, Asset management

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RTA Associates
RTA OrderPro: Helping TRA's on their DTRO journey. Providing cost effective expert Digital Traffic Regulation Order Solutions to Highway Authorities throughout the UK. Guaranteeing business continuity and stress-free compliance with DfT's DTRO hub, this end-to-end solution releases valuable resources for front line priorities. Designed by Traffic Engineers for Traffic Engineers.
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Smart Applications Management
SAM was created in 2010 to provide ITSO Smart Ticketing Managed Services: pooling expertise, exploiting procurement efficiencies and economies of scale to deliver schemes for Members and their Customers. We are the UK's largest independent ITSO smart ticketing Managed Service provider and host the National Procurement Framework for smart and integrated ticketing services and goods.

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4way Delivers
Award-Winning Outcomes

The Blackpool Smart Traffic Corridors project has been recognised by ITS UK as delivering measurable improvements in congestion, air quality and network performance

This is just one example of how we collaborate with our clients on innovative, digitally led solutions that improve transport networks sustainably

Our services encompass the entire project lifecycle, from development through to design and implementation of award-winning performance

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CHAPTER 05

Future Roads

Blackpool Smart Traffic Corridors: Delivering smarter, more sustainable transport networks

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The Blackpool Smart Traffic Corridors project represents a significant step forward in modernising urban traffic management by integrating emerging technologies with legacy infrastructure.

As one of the UK's most prominent seaside destinations, Blackpool accommodates approximately 21.5 million visitors annually alongside a resident population of around 141,000. This creates a uniquely dynamic transport environment, where seasonal peaks, major events, and competing demands between private vehicles, public transport, and active travel modes place considerable strain on the network. Traditional traffic control approaches, such as semi-adaptive fixed-time Urban Traffic Control (UTC), have struggled to respond effectively to these highly variable conditions, resulting in congestion, reduced air quality, and unreliable journey times.

To address these challenges, Blackpool Council developed a Smart Traffic Corridors strategy that enhances, rather than replaces, existing systems. Funded through the DfT Green Light Fund, the project demonstrates how a near-fully adaptive traffic management system can be achieved by layering advanced capabilities onto legacy infrastructure. This approach avoids the need for wholesale system replacement while delivering meaningful improvements in performance, sustainability, and user experience.

FROM LEGACY SYSTEMS TO INTELLIGENT MOBILITY

The strategy focuses on five corridors that form the backbone of Blackpool's network, including routes connecting the motorway, town centre, seafront, and major attractions. These corridors carry the highest and most variable demand, meaning that improving their performance has a disproportionate benefit on overall network efficiency. Without intervention, these routes are particularly vulnerable to congestion-related issues, including increased emissions, reduced public transport reliability, and negative impacts on the visitor economy.

The core of the solution involves the

The strategy focuses on five corridors that form the backbone of Blackpool's network, including routes connecting the motorway, town centre, seafront, and major attractions.

integration of multiple data sources into a unified, intelligent system. Existing technologies, including the UTC system, Bluetooth journey time monitoring (Bliptrack), parking guidance systems, and bus open data, are combined with new data streams generated by advanced radar detection. A network of 36 above-ground Smartmicro TRUGRD radar sensors and 16 communication hubs have been installed along the corridors, collecting high-resolution data such as traffic volumes, vehicle classification, speed, and occupancy. This data is transmitted via cloud-based platforms and integrated through APIs into a central data environment.

This environment, supported by Simplifai's AI-enabled digital twin platform and Swarco's MyCity urban mobility management software, forms the analytical core of the system. Real-time and historical data are processed to identify congestion patterns, predict network conditions, and simulate optimised traffic signal strategies. The AI platform generates refined fixed-time signal plans tailored to prevailing conditions, which are implemented through the existing UTC system via MyCity. This effectively transforms a traditionally static control system into an almost fully adaptive one, capable of responding dynamically to real-world conditions without replacing the underlying infrastructure.

A key strength of this approach is its scalability and flexibility. By retaining the UTC system as the delivery mechanism, the solution leverages established, reliable infrastructure while introducing intelligence at the decision-making layer. This architecture reduces both cost and implementation risk, but also provides a clear pathway for future enhancements, including connected vehicle integration, Green Light Optimal Speed Advisory (GLOSA), and light rail prioritisation.

Swarco's MyCity urban mobility management software

PRELIMINARY RESULTS AND FUTURE POTENTIAL

Early indications from the project are encouraging. Data collected during peak visitor events, such as the Blackpool Airshow, demonstrates the system's ability to capture and respond to rapidly changing traffic conditions. For example, radar data showed worsening journey times as visitor numbers increased throughout the day. However, simulation modelling undertaken by the AI platform optimised signal plans to reduce journey times by up to 300 seconds under certain conditions. While these results are based on modelled outputs, even partial realisation of these improvements would represent a significant enhancement in network performance.

Beyond congestion reduction, the project supports broader policy objectives. By improving journey time reliability and enabling priority for buses, cyclists, and pedestrians, the system encourages modal shift towards more sustainable forms of transport. This contributes to improved air quality and reduced carbon emissions, aligning with wider environmental goals while enhancing the overall experience for residents and visitors alike.

The project has generated valuable lessons for other authorities seeking to implement similar solutions. A key finding is the importance of ensuring that legacy systems are fully operational and capable of providing reliable data at the outset; gaps in baseline data limit the effectiveness of advanced analytics. The deployment of new detection technologies introduced unforeseen challenges, including integration issues with existing infrastructure and data communication constraints, highlighting the need for thorough testing and contingency planning. Data validation has proven critical, as input data inaccuracies significantly affect system performance and decision-making.

In addition, the project has emphasised the importance of strong integration between systems and stakeholders. The development of APIs and data pipelines required closer collaboration between technology providers than initially anticipated, and delays in these areas impacted the programme timeline. Ongoing monitoring and maintenance of data flows are essential to ensure system resilience. Furthermore, costs associated with data integration and automation should be considered early in project planning to avoid budgetary pressures later.

The Blackpool Smart Traffic Corridors project demonstrates how existing traffic management infrastructure can be transformed through the targeted application of emerging technologies. By combining AI-driven analytics, real-time data collection, and open integration platforms with legacy systems, the project provides a practical and scalable model for achieving adaptive urban traffic control. As towns and cities continue to face increasing mobility demands and environmental pressures, this approach offers a compelling blueprint for delivering smarter, more sustainable transport networks without the need for wholesale system replacement.

Enabling deployment:
CCAV's latest milestones for automated passenger services

The Centre for Connected and Autonomous Vehicles (CCAV), working in close collaboration with the Vehicle Certification Agency (VCA) and the Driver and Vehicle Standards Agency (DVSA), met a series of important milestones in Spring, marking a decisive step forward in preparing Great Britain for the safe deployment of Automated Passenger Services (APS).

Elena Gillies
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This collective effort brought together policy, regulatory and operational expertise, resulting in the publication of three non statutory guidance documents alongside the Government response to the consultation on the APS permitting scheme. Together, these outputs form a coherent and timely package that provides greater clarity and confidence for industry, local authorities and emergency services.

At the centre of this progress is the Government response to the consultation on the APS permitting scheme; the response confirms the Government's commitment to enabling innovative automated passenger services. Consultation feedback has informed a permitting approach that balances national consistency with local knowledge, clarifying how services will be assessed, monitored and, where necessary, enforced. The APS permitting scheme forms a key part of the self-driving vehicle pilot scheme.

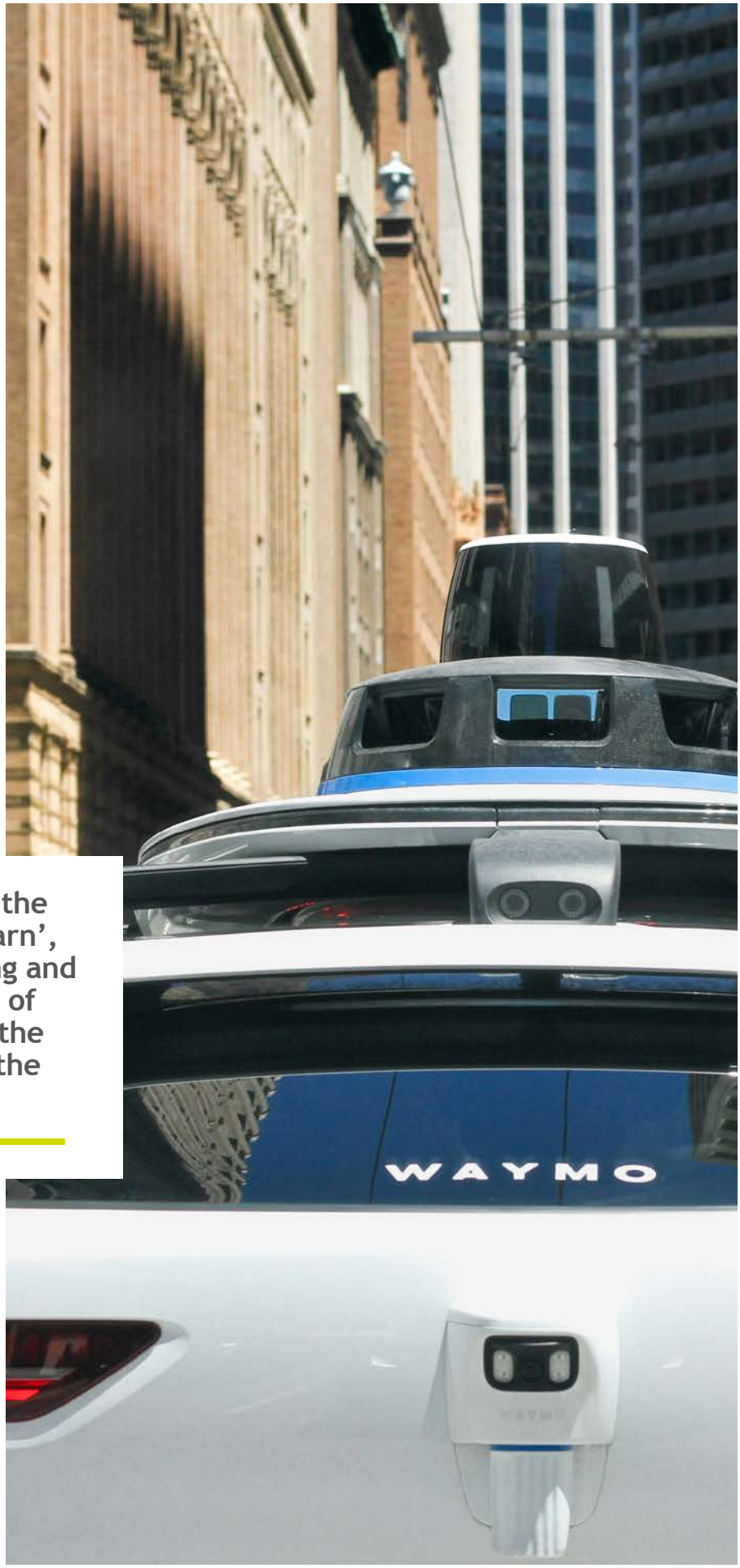
Importantly, the piloting scheme offers the opportunity to 'test and learn', enabling evidence-gathering and confidence-building, ahead of the full implementation of the Automated Vehicles Act in the second half of 2027.

Bolstering this framework is the publication of three complementary pieces of non-statutory guidance. The first provides detailed information on the self-driving vehicle pilot scheme. This guidance outlines the application process and safety, operational and reporting requirements for self-driving vehicle pilot deployments for the applicant's perspective. This guidance plays a critical role in demystifying the new scheme and enabling deployments, including setting out how an automated driving system will be assessed on its route to being listed as self-driving under the Automated and Electric Vehicles Act 2018. A successful pilot application will result in the granting of a: vehicle approval, vehicle special order (VSO)

and an APS permit, if operating passenger carrying services.

The second guidance document focuses on the roles of local authorities and transport bodies. It sets out clear expectations for engagement, oversight and collaboration, recognising that local partners are crucial to integrating automated services into existing transport networks and their support of local priorities. By articulating responsibilities in a practical and accessible way, CCAV aims to strengthen the foundations for effective local-national partnership working.

The third publication addresses a group essential to public confidence: first responders, such as police, fire and ambulance services. This guidance aims to help organisations prepare for the deployment of self-driving vehicles, explaining how self-driving vehicle pilot schemes plan to operate, and how emergency services can ready themselves to safely and effectively interact with them. This represents an important step in ensuring operational readiness and shared understanding across the system.



The piloting scheme offers the opportunity to 'test and learn', enabling evidence-gathering and confidence-building, ahead of the full implementation of the Automated Vehicles Act in the second half of 2027.

Collectively, these publications demonstrate CCAV, VCA and DVSA's shared commitment to translate policy intent into practical delivery and support for the wider automated vehicle ecosystem. As Great Britain moves closer to real world deployment of automated passenger services, CCAV's recent work underscores its central role in turning ambition into reality.

All guidance documents referred to in this article can be found on the CCAV website: www.gov.uk/ccav

Connected journeys: Why the corridor is the right unit of analysis

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Ask most local authorities how they evaluate a transport investment and the answer is still junction-level. Dwell time, queue length, cycle time, emissions at the stop line. These are valid measures. They are also incomplete if the goal is a connected journey.

A journey does not occupy a junction. It moves through a corridor, often several. The experience of travel, whether by car, bus, cycle, or on foot, is shaped by how conditions build across a sequence of decisions, not by the performance of any single point. A green wave that fails two junctions later is not a connected journey. A bus that gets priority once but queues at the next signal is not truly prioritised. If the aim is movement, the junction is the wrong unit of analysis.

This is not a rejection of junction-level investment. Optimising individual sites still matters. Controllers, detection, and local adaptive logic deliver real improvements at site level. The engineering is sound and the outputs are measurable. The issue is that junction performance and corridor performance are not the same. Treating them as if they are creates a gap between what is specified and what people actually experience.

WHAT CHANGES WHEN YOU THINK IN CORRIDORS

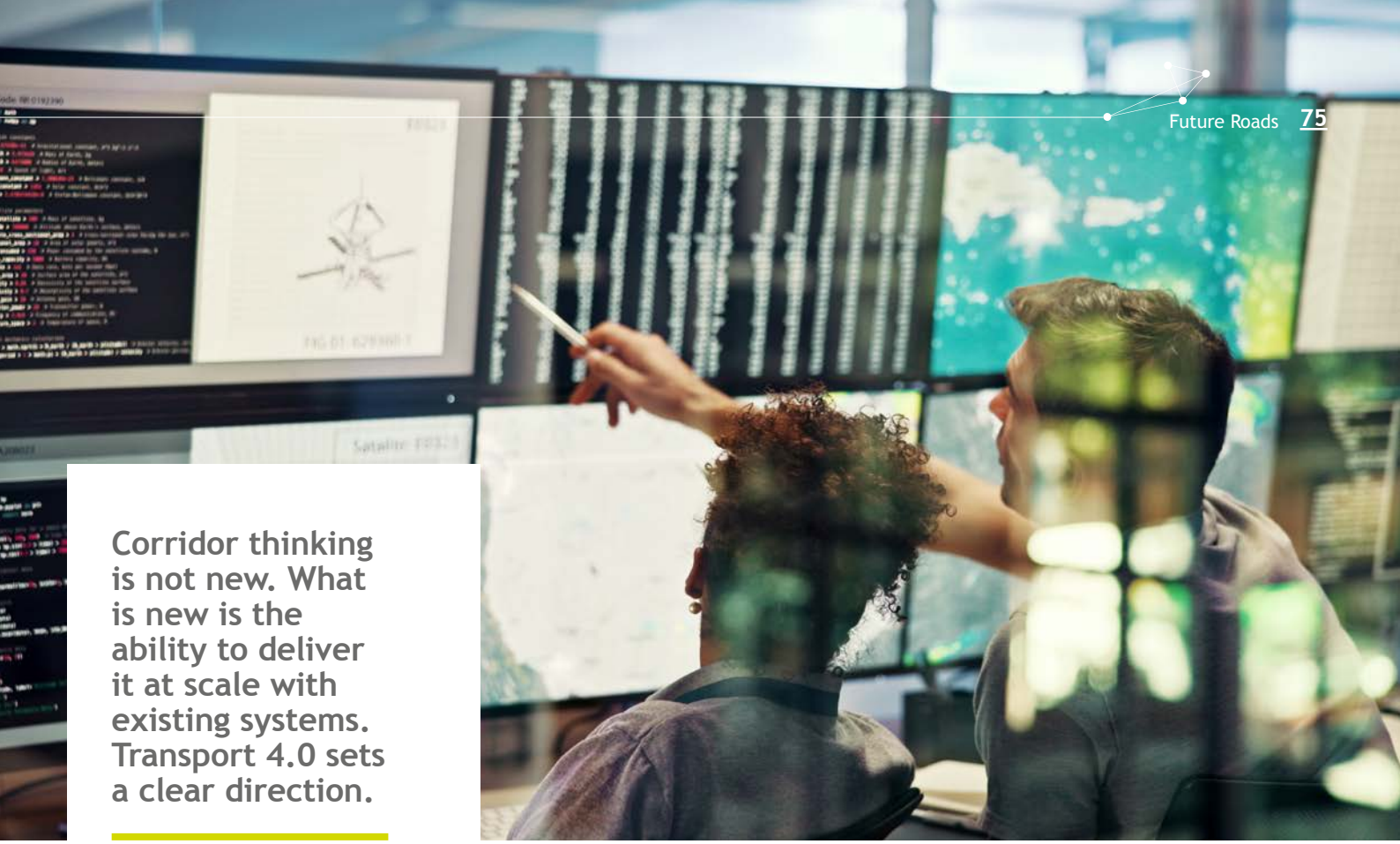
When a junction is optimised in isolation, the gains are real but limited. When a sequence of junctions shares state and responds as a system, the gains start to compound. This shift depends on how product capability is used. A modern controller such as SWARCO's PTC3 is not only a signal controller. It is a connected node that can share state, receive strategy inputs, and coordinate with other junctions. On its own, it improves a site. Connected across a corridor, it becomes part of a system that manages flow. Adaptive control extends this further. Systems such as MOVA, SCOOT, and SWARCO's ImFlow adjust signal behaviour based on real-time demand. When these systems operate across multiple junctions rather than in isolation, they begin to shape movement along the corridor rather than react to local conditions.

Journey time reliability improves because decisions reflect conditions across the corridor, not just local demand. Bus priority becomes consistent rather than occasional because upstream signals can respond to what is happening further back. Incident response improves because action can be taken before congestion forms, not after it has spread. Integration is what makes this work in practice. Sensors provide the real-time picture. Controllers act on that information. Platforms bring it together. A system such as SWARCO's MyCity creates a single operational layer where data from signals, parking, digital signs, and environmental sensors is combined and turned into decisions. This is how separate assets operate as one system.

The impact on inclusion is also clear. When progression is managed across a corridor, different modes can be balanced with intent. Pedestrian phases, cycle crossings, and vehicle flow can be coordinated rather than competing. Public transport priority can be sustained across a route, not delivered in isolated pockets. The result is a network that works more evenly for more users. Intelligence sits on top of this integration. Real-time data, adaptive strategies, and decision logic allow the system to respond to changing conditions across the corridor. The value is not in the data itself. It is in how quickly and consistently the system can act on it.

THE TOOLS ARE ALREADY IN PLACE

The capability to manage corridors as systems is not new. Adaptive control, networked detectors, and central



Corridor thinking is not new. What is new is the ability to deliver it at scale with existing systems. Transport 4.0 sets a clear direction.

platforms have been deployed for years. What has changed is how these elements come together into a coherent solution. Processing power, connectivity, and software maturity now allow corridor-level control to operate in a way that is practical for a wide range of authorities. Platforms such as MyCity integrate legacy infrastructure with new technology, allowing existing signals to be connected, new sensors to be added, and adaptive strategies to be applied without full replacement.

Controllers such as PTC3 provide the foundation at junction level. Intelligent sensors provide visibility of flow, speed, and environmental conditions. Adaptive systems such as ImFlow enable coordinated response across multiple sites. Digital signs influence behaviour along the route. Parking systems manage demand at the destination. When these elements are connected through a platform, the corridor becomes manageable as one system. This is the shift from fragmented control to integrated operation. Operators are no longer limited to monitoring individual junctions. They can understand and manage how a corridor behaves as a whole.

The constraint is no longer technical. It is conceptual. Investment is still often framed around sites rather than journeys.

FRAMING INVESTMENT AROUND OUTCOMES

When authorities move to corridor-level thinking, the investment conversation changes. The questions change first. Instead of asking how a junction performs, the focus moves to how a corridor behaves end to end. That shift also changes how product sets are evaluated. Controllers, sensors, adaptive systems, and platforms are assessed on how well they work together to deliver a corridor outcome. The business case also changes. A case built on corridor-level journey time reliability is usually stronger than one based on isolated cycle time improvements. The benefits reach more users and connect directly to outcomes that matter, such as public transport reliability, network resilience, and user experience.

These benefits are measurable. Reduced variability on a bus route links to ridership and service quality. Faster incident response links to lower operational cost and less disruption. Corridor-level platforms support this by providing a single view of performance across the route rather than fragmented data from individual sites. Procurement follows the same pattern. Specifications that describe corridor outcomes create space for integrated solutions. They allow suppliers to demonstrate how controllers, sensors, adaptive systems, and platforms work together across multiple sites. This shifts the focus from individual products to system performance.

Integration, inclusion, and intelligence are not separate goals. Integration enables coordinated behaviour. Inclusion depends on that coordination. Intelligence depends on both.

THE MOMENT TO ACT

Corridor thinking is not new. What is new is the ability to deliver it at scale with existing systems. Transport 4.0 sets a clear direction. Systems need to be integrated, inclusive, and intelligent. That cannot be achieved if investment and evaluation remain fixed at the level of individual assets.

Authorities do not need new tools. Controllers, adaptive systems, sensors, and platforms already exist and are in operation. The opportunity is to connect them and apply them at the level of the journey.

If the objective is a connected journey, the unit of analysis needs to match it. That unit is the corridor.

The evolution of transport control centres in an automated age

Alastair Boswell
Director, Intelligent Mobility, Arup

As transport systems move toward digital twins, predictive modelling and AI enabled control, multimodal control centres are being redefined.

Technology alone will not deliver resilient operations. After 18 months working on future control centres across the Middle East, one lesson stands out—change is only sustainable when people, processes, organisation and data evolve alongside the technology.

HISTORY REPEATING?

Since the late 1980s, transport operations have embedded algorithmic and predictive capabilities into live networks. Systems such as MIDAS (with HIOCC queue protection) and ramp metering (with ALINEA) introduced short term predictive control to improve safety and flow. Deployed cautiously via trials, safety cases and validation, they progressively removed low level, time critical decisions from human operators, improving reaction time and reducing reliance on manual intervention.

A similar process of risk acceptability is playing out in autonomous vehicles (AVs). Moving from SAE Level 3 toward 4, manufacturers must define Operational Design Domains and demonstrate trusted performance within them. After decades of development and a wave of commercialisation, the AV market is often estimated at USD 70-250 billion—driven mainly by partial automation, commercial fleets and constrained domains rather than fully autonomous private cars.

Using reasonable assumptions, you can estimate the global value of transport control centres at roughly USD 160-260 billion, a comparable scale to AVs. Although investment is largely public rather than commercial, control centres are on the same trajectory: more automation, more data led decisions, and shifting accountability and risk. The challenge is introducing new capability with governance and assurance that protect public safety.

FROM REACTIVE TO PROACTIVE ENVIRONMENTS

Control centres are shifting from reactive response to proactive anticipation. Predictive analytics and richer data can forecast congestion, flag emerging asset risks and anticipate disruption.

However, predictive capability is only as strong as its foundations. Clean, well-governed data, clear ownership and consistent standards are prerequisites; without them, advanced analytics become unreliable or untrusted. Future control centres will place as much emphasis on data architecture and governance as core operational capability.

FROM SINGLE MODE CONTROL TO MULTI MODAL ORCHESTRATION

Future transport systems need orchestration, not optimisation in isolation. Technology is expanding the influence of control centres, and multi modal coordination is increasingly essential to move people and goods efficiently.

Centres must manage roads, buses, rail, freight and active travel as one ecosystem. That requires more than integration: aligned organisations—shared performance objectives, common processes and clear decision rights. Otherwise, integration becomes superficial: impressive dashboards rather than genuine operational coordination.

EFFECTIVE HUMAN-AI PARTNERSHIPS

Automation will handle more routine monitoring and rule based responses, but the future control centre remains human. Operators shift from continuous supervision to informed oversight, judgment and exception management.

This needs deliberate investment in skills, training and trust. Tools must be explainable and designed for real work under pressure. Operating models must specify when people intervene, how accountability is retained, and how learning feeds back into systems—otherwise advanced technology can create operational fragility.

A FRAMEWORK FOR THE FUTURE?

The transport control centre of the future will be defined less by walls and screens and more by its ability to orchestrate complex systems. Success depends on integrating technology with people, processes and organisational design, not treating them as separate workstreams.

As with AVs, an SAE style autonomy model for control centres could create a shared language for progress—from manual and assisted operations to increasingly autonomous but supervised environments. Paired with Operational Readiness, Activation and Transition (ORAT) this could help introduce automation in a governed way, grounded in robust data and aligned with human capability. Done well, it offers a pragmatic pathway to safer, more resilient and effective transport operations and would allow a model for international benchmarking and global knowledge sharing in control and operations.

	SAE Level 0 Manual Ops	SAE Level 1 Operator Assist	SAE Level 2 Partial Automation	SAE Level 3 Conditional Automation	SAE Level 4 High Automation
Roads	Fixed Speed Limits Manual Response	Early MIDAS Advisory Speeds	Automatic MIDAS HIOCC Queue Protection	Speed Harmonisation HIOCC2 Control	Self Optimising corridors Integrated Network Control
Control Centres	Manual Monitoring Operator led decisions	Traffic awareness Decision Support	Continuous Supervision, over-ride and validation	Exception Management Performance Assurance	Strategic Oversight

Transport networks in the UK and around the world are undergoing a major transformation. As the Fourth Industrial Revolution accelerates and reshapes everyday life, the transport sector is moving toward Transport 4.0. A new era where digital and physical assets are seamlessly integrated.

Yunex Traffic: Investing in the future of mobility

A shift that is creating connected networks of smart devices and intelligent systems that use real time data to streamline operations, improve decision making, and unlock new levels of efficiency.

Intelligent Transport Systems (ITS) providers are at the heart of the revolution, enabling national, regional and city authorities to connect data, infrastructure, and users in ways that deliver cleaner, safer, more inclusive and more efficient mobility.

For Yunex Traffic, Transport 4.0 is not just about innovative and rapid technological development and systems integration. It shapes the foundation of our strategic commitment to the future of ITS and mobility. A commitment clearly demonstrated through one of the most significant ITS-sector investments in the UK in recent times - a new, state of the art UK headquarters and global manufacturing centre near Bournemouth Airport.

This facility marks a major milestone for the company: strengthening its UK R&D, service and support and global manufacturing base. The extensive site bringing office teams, engineering specialists and manufacturing operations together under one roof for the first time. Designed to enhance collaboration, increase efficiency, improve sustainability and support future growth, the site will provide the space, infrastructure and technical capability needed to meet the UK and worldwide markets' growing demand for advanced, intelligent and integrated transport solutions.

Gavin Trimnell
Sales Director, Yunex Traffic

MAJOR UK INVESTMENT SUPPORTS NEW ITS ERA

Yunex Traffic's UK operation has long been a centre of excellence for safety-critical ITS manufacturing. From its origins in Plessey, through its evolution within Siemens, to the global, market-leading Yunex Traffic group, its UK expertise and solutions

support customers around the world.

After more than 60 years' operating from Poole, this new site will future proof the company's long-term growth, securing direct manufacturing jobs in the UK and supporting thousands more across its domestic supply chain. It is a commitment not just to the next few years, but for decades to come, creating an environment where the Yunex Traffic team can imagine, engineer and build solutions that will shape how the world moves.

The new manufacturing facility incorporates bespoke production and workflow layouts that optimise flexibility, efficiency and scalability. Featuring a dedicated PCB manufacturing unit, advanced assembly stations and a global repair centre for electronic components, this impressive facility not only underpins the company's fast-growing Yunex Built manufacturing brand, expanding manufacturing capacity and creating a flexible environment for innovation, but also consolidates its position as a global leader in intelligent transport systems. As a result, the company will be even-better positioned to deliver high-quality, integrated, inclusive and intelligent technology not only to UK customers, but to markets across Europe, the Middle East, the Americas and beyond.

This investment signals the company's confidence in the ITS sector, in UK engineering expertise, and in the strategic role of Transport 4.0 in reshaping mobility globally.

Yunex's new state of the art headquarters and global manufacturing site

INTEGRATED SYSTEMS: CONNECTED NETWORKS

Designed, developed and manufactured under one roof, Yunex Traffic's systems are central to many innovative traffic management and control schemes throughout the UK. Delivering integrated, inclusive and intelligent solutions, the company's extensive portfolio is helping authorities to create more efficient, healthier, safer and more sustainable transport infrastructures which connect modes, assets, operators and users network-wide.

The company's real-time adaptive control system, Yutraffic FUSION, operates in cities nationwide, continuously monitoring traffic densities and dynamically optimising signal timings. By allowing traffic managers to embed policy into system behaviour, FUSION can prioritise active travel, public transport or freight depending on local strategic objectives and priorities to create smoother traffic flow and improved journey times for all road users.

Data integration is further enhanced through Yunex Traffic's digital twin capabilities, which use Stratos outstations, intelligent sensor data, floating vehicle data and simulation tools such as Aimsun Live to create a detailed, predictive model of network conditions. The system can forecast traffic states in advance, enabling operators to take proactive action, for example to keep buses on schedule, reduce congestion and improve air quality.

This combination of real-time data and predictive intelligence exemplifies 'integrated transport': a single environment where multimodal data informs policy, operations, and customer information services.

INCLUSIVE MOBILITY: DESIGNING NETWORKS FOR EVERY ROAD USER

Inclusivity is a key requirement of modern transport planning, supporting all road users including those walking, wheeling and cycling, and improving accessibility and ensuring safety and reliability. Yutraffic awareAI, Yunex Traffic's AI powered video detection and analytics solution, detects pedestrians and cyclists in addition to multiple vehicle classes, enabling councils to better understand how different user types interact with the network. This in turn allows them to make data-driven decisions to improve safety measures, optimise signal timings, and plan future infrastructure upgrades that support sustainable travel and reduce congestion.

Redefining multi-modal traffic detection, Yutraffic awareAI provides exceptional whole-life value with no ongoing license costs or service fees. Less disruptive, more cost-effective and data-rich, Yutraffic awareAI is the natural successor to traditional detection methods such as induction loops.

Through Yunex Traffic's proven technologies, inclusivity moves beyond infrastructure design and becomes embedded in system logic; ensuring mobility works for everyone, not just motorised traffic.

INTELLIGENT SYSTEMS: MAKING NETWORKS SMARTER

Transport 4.0 is not a distant vision, but is being delivered today through integrated solutions, inclusive system design, and intelligent, data-driven mobility technology. Yunex Traffic is at the forefront of this movement, and its new UK headquarters and manufacturing centre demonstrate its commitment to designing and powering the next generation of transport networks.

Unicard

The Smart Choice for Ticketing

Modern urban mobility solutions for transit authorities

Simple, tap-and-go travel for any network

Unicard's platform is the number one choice for multi-modal Account Based Ticketing with fare capping. Our solutions for open- and closed-loop ticketing support the most complex and demanding transit schemes. With our unified SaaS platform, transit operators and regional governments can deliver better passenger experiences whilst cutting administrative costs and simplifying workloads.

We offer an open architecture and rich data management with artificial intelligence, backed by scalable and reliable cloud hosting, 24/7 support, and a seamless migration process.

- Open-Loop Contactless EMV
- Closed-Loop Smartcards
- Mobile and Barcodes
- Combined Transport and Event Ticketing

"It's been a fantastic experience working closely with Unicard. This was a strategic and high-profile project for us, and we're delighted at the step-change in the ticketing experience we've been able to provide our customers. They have done a great job of delivering our needs."

TRAFNIDIAETH CYMRU
TRANSPORT FOR WALES

A complete managed service for ticketing

- Expert and knowledgable customer service
- Scalable and secure hosting using the AWS Well-Architected Framework
- Industry-tested, cloud-native platform scaling to billions of transactions annually
- 24/7 support desk and system monitoring
- Flexible uptime options up to 99.9%
- Local data residency

With 25 years of experience, our 80+ customers include local and regional governments, transit operators, and hardware suppliers. The Unicard platform cuts complexity and eliminates fragmentation to make implementing "tap-and-go" ticketing across any mode of transport simple and cost-effective. With it, you can meet customer demands for easy, seamless, inclusive ticketing, connect disjointed mobility networks, and generate new incremental revenue for commercial schemes.

Total Flexibility

Works with any existing hardware, payments, and tickets already in place through open APIs – or use our partners for a turn-key solution

Enhanced Control

We give you ownership of the data and platform IP, preventing lock-in, and promoting future expansion and supplier flexibility

Full Network Data

Our powerful Data Lake and Reporting tools work with all modes and ticket types, for insights and outcomes across your entire network

Travel for Everyone

Solutions for commuters, tourists, paratransit, home-to-school, veterans, back-to-work programmes, and any other type of customer

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CHAPTER 06

Intelligent Mobility

Modernising travel with smart ticketing across Liverpool City Region

As public transport systems evolve to meet rising passenger expectations, smart ticketing is one of the most powerful tools for driving meaningful, system-wide change and can act as a catalyst for wider transport modernisation.

Gary Evans
Director of Customer Operations, Liverpool City Region Combined Authority

With our passengers at the heart of everything we do, our mission in the Liverpool City Region is to make public transport ticketing easier, simpler, and more affordable and smart ticketing is fundamental to achieving that goal. While infrastructure and service frequency are all part of the mix, in many cases it is ticketing that shapes the daily experience of passengers.

If fares are difficult to understand or purchase, that friction is felt immediately and an even be a barrier. Our objective has been to remove complexity wherever possible and allow technology to do the heavy lifting.

Our multi-million-pound investment in the Tap & Go system across the Merseyrail network underpins the transition to a fully modernised, system built around contactless technology, automated fare capping, and flexible payment options. It is a platform investment not just a point solution designed to support future multimodal integration.

At the beginning of 2026, the extension of Tap & Go from MetroCards to contactless bank cards, smartphones and wearable devices marked a significant technical and operational milestone. Tens of thousands of passengers each week now tap in and out using EMV enabled gates and platform validators, allowing the back office system to calculate lowest priced fares based on actual journeys taken rather than pre selected products – we saw over 35,000 Tap & Go journeys made over the three-day Grand National Festival at Aintree Racecourse in April.

A key feature of the system is automated fare capping. Using journey data captured at entry and exit points, the system applies both daily and weekly caps, ensuring that passengers always pay the best possible fare for their journey. From a systems perspective, this requires accurate real-time validation, robust account-based processing, and clear business rules. For the passenger, the experience is deliberately simple: travel without having to think about tickets.

The successful delivery of the Tap

& Go project has been underpinned by extensive collaboration with Merseyrail, involving a diverse range of teams and external suppliers. From the integration and installation of over 50 new station gates and 200 platform validators (PVALs) to the development of sophisticated journey and fare calculation engines, and integration with new merchant acquirers, every element has required close coordination and technical expertise. This united effort has ensured that passengers can seamlessly access Tap & Go using either ITSO smart cards or cEMV payment solutions, making the system truly inclusive and versatile.

Operationally, Tap & Go delivers measurable network benefits. Reduced dependence on paper tickets lowers transaction times at stations, easing congestion at gates and helping to smooth peak-hour passenger flows. This also supports more efficient deployment of staff resources, while maintaining ticket offices, and alternative purchasing channels for those who prefer them. Importantly, our approach to smart ticketing in the Liverpool City Region is additive rather than exclusionary.

It is important to acknowledge that smart ticketing is not only making travel in our region easier and affordable, it is also an enabler of wider policy objectives. By making rail travel more attractive and removing barriers to everyday use, this approach supports people to travel easily and confidently for both work and leisure, helping to connect communities with jobs, education, services, and cultural opportunities across the Liverpool City Region.

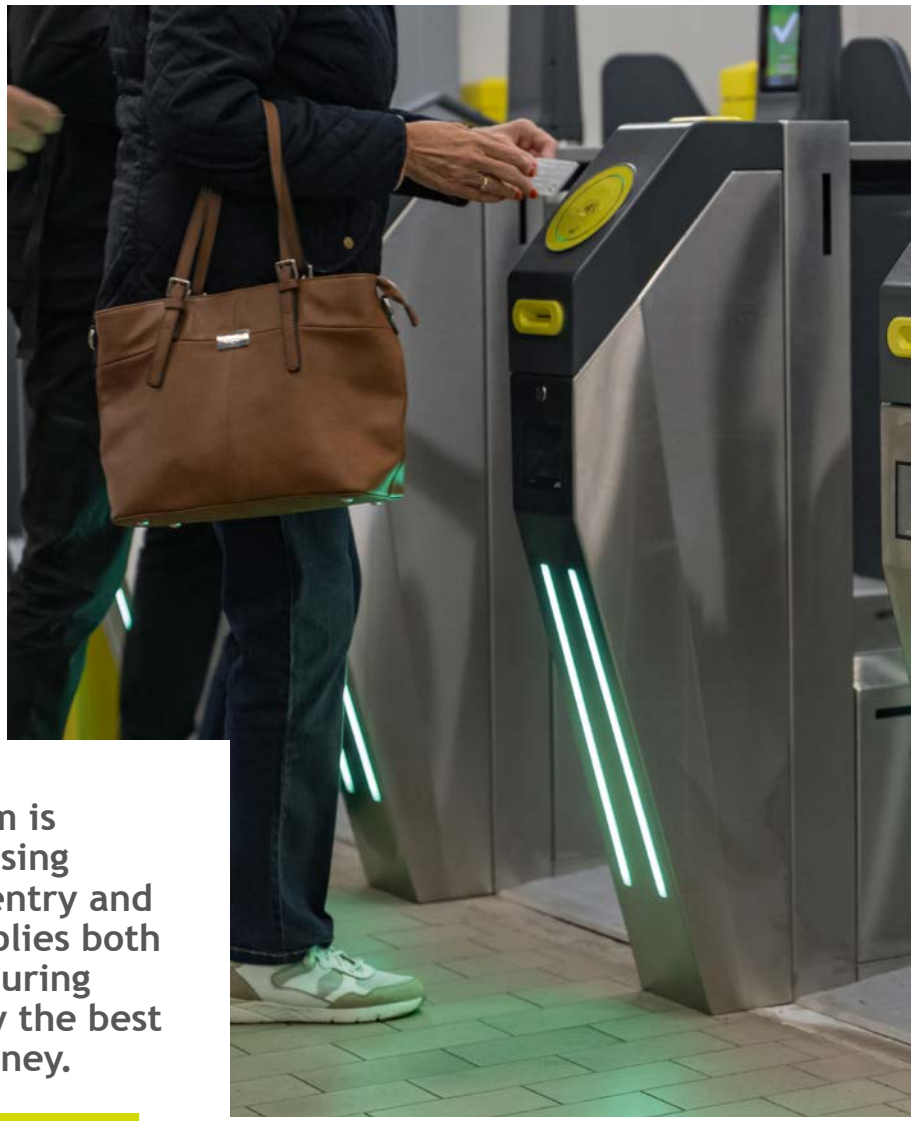
In addition, the programme supports modal shift away from private vehicles and contributes to our ambition for the region to achieve net zero by 2035. Smart ticketing may be a back-office system, but its impacts are felt across the network, the economy, and the environment.

With this critical foundation in place, our journey continues with the focus on passenger benefits. Part of our wider Smart Ticketing Strategy is the development of a customer app that supports account-based travel across modes. Rather than treating the app as a standalone retail channel, we are designing it as a core component of the multimodal Tap & Go ecosystem with a clear focus on delivering early customer value while future-proofing for region-wide integration.

This phased approach allows us to progressively introduce features such as account management, journey history, fare transparency, and capping visibility, while ensuring alignment with back-office ABT capabilities.

Looking ahead, our goal is to deliver a multimodal account-based ticketing solution across the LCR public transport network. We're out to the market currently with our functional and technical requirements needed to support cross-mode fare calculation, revenue apportionment, and scalable customer accounts at regional level.

Early engagement with suppliers has been critical to gain insight and validate our direction of travel. All these strands move us decisively towards the outcome: a single, simple Tap & Go experience that works seamlessly across rail, bus, ferries, and future modes, giving passengers confidence that public transport in the Liverpool City Region is joined-up, and designed around them.



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How do independent retailers drive passenger growth and revenue?

The transition to Great British Railways (GBR) represents a crucial moment for rail passengers. For independent retailers, this is not only about structural reform and bringing track and train together but ensuring that rail retailers continue to play a key role as GBR enters the retail market.

Anthony Smith
Chair, Independent Rail Retailers

Independent rail retailers have been instrumental in shaping a dynamic, customer-focused rail retail market. Retailers are the first point of contact when a customer chooses rail; this initial interaction is crucial in shaping perceptions of the journey and the wider rail experience. Their expertise and agility have introduced features such as barcode ticketing, split ticketing, and digital journey planning platforms – all of which have been successful for customers and the passenger experience. Their continued investment has helped accelerate passenger numbers and industry revenue.

Today, members of Independent Rail Retailers serve nearly half of all passengers in Great Britain. They sell tickets, plan journeys, and deliver high-quality customer experiences. Beyond these services, they also provide rail solutions to businesses and train operating companies. Their approach is anchored in innovation, technology and marketing, focusing on the passenger and guaranteeing customers receive the best experience from the moment they search for a ticket.

For passengers, the priorities are clear: choice, value for money, and easy-to-use booking systems. Rail retailers have a deep understanding of both their customers and the systems they rely on. Through their day-to-day interactions, rail retailers are uniquely placed to identify what works well and where there are opportunities for improvement. This direct experience enables them to challenge industry norms and drive continuous improvements in customer experience, products, and overall system performance. In doing so, they act as true passenger champions, combining practical expertise with innovation and technology to deliver exceptional experiences.

However, innovation in retailing should not be limited to what currently works; it can create opportunities to go further. One potential opportunity that could accelerate passenger numbers and revenue is the Availability Distribution Service (ADS), also known as open data, which could unlock access to hundreds of fares that retailers cannot currently sell. Our members have long championed access to this system and data, recognising its potential to drive substantial growth in both passenger numbers and industry revenue.

Looking ahead, the Railways Bill sets out a vision for rail retailing in which GBR Retail will compete alongside third-party retailers. While this is a positive step, clarity is needed on how GBR Retail will operate and whether the Code of Practice will apply equally to its retail arm. A genuine level playing field is essential to ensuring equal access to data, tools, fares, and functionality across all retailers. Without this, there is a risk of distorting the market, stifling competition, and reversing the gains made in passenger growth and revenue.

Ultimately, the success of rail reform will be measured not just by integrating track and train, but by maintaining choice, driving innovation, ensuring sustained private investment, and fostering genuine partnerships with third-party retailers. By doing so, the industry can deliver a railway that is commercially sustainable, fosters healthy competition, and genuinely delivers for passengers and the wider UK economy.

What Moves YOU

Ever wonder who connects it all?

cubic® | Advancing Mobility Together®

cubic.com/transportation

We are on the cusp of a once-in-a-decade opportunity to deliver better passenger and operator outcomes, as the convenience, security, and value of tap-and-go ticketing leads more people to embrace public transport.

The future of ticketing is open

Alex Sbardella
Commercial Director, Unicard

Already, most passengers prefer to pay for public transport using contactless EMV – simply tap your card or phone and ride. In 2025, over 70% of Transport for London's PAYG journeys were made using contactless – around 4.6m journeys per day. When Unicard launched Transport for Wales' tap-and-go cEMV on rail, it took just six months to become their most popular retail channel, and continues to grow. This passenger trend is a significant opportunity for operators to deliver secure, predictably priced and seamless ticketing solutions, and generate meaningful data insights.

The ubiquity of cEMV payments offers operators the capacity to make travel increasingly integrated and multi-modal, using data insights to give passengers a convenient, personalised, and efficient experience. As both urban transport operators and regional authorities turn to cEMV, they overcome fragmented and legacy ticketing infrastructures and can meet changing passenger needs, whilst simultaneously increasing revenue.

cEMV can also form part of a token-

agnostic Account Based Ticketing system, so passengers can get the best fare and a smooth experience irrespective of whether they use cEMV, ITSO, or barcode to travel – essential for ensuring digital inclusion and working alongside concessionary travel entitlements.

When looking at Europe and the USA, we see multi-modal, multi-token ABT schemes being rolled out at pace. So why is progress in the UK so slow? In 25 years of delivering smart ticketing solutions, the main culprits we have seen are a lack of national standardisation from DfT, combined with a historic trend for vendor lock-in. Despite a strong heritage in supplier interoperability for closed-loop ticketing with ITSO, the UK lacks the equivalent standards for open-loop. This means that deployments to date have become islands, based on proprietary supplier standards for things like tokenisation that prove difficult to untangle.

Every industry experiences the limitations of single-source suppliers, and the UK has several infamous examples in transport. Once a supplier enjoys a near monopoly in a region, experience shows that they are not incentivised to adapt, integrate, or improve their proposition, with operators having little recourse for poor performance. This is particularly true when it comes to hardware, where operators accumulate vast estates of gates or readers from a single supplier which they cannot easily change. This often forces operators to use that vendor's technology for each new project, from payments to ABT – not always the best solution or value for taxpayer money. As a result, operators end up sticking with their current systems even when situations and technology change.

Current procurement approaches exacerbate this problem by focusing on technical solutions, rather than outcomes. Imagine if Project Coral, for example, was not procured as a system or solution, but as a cross-industry standardisation exercise, with a purchasing framework for certified, interoperable vendors – similar to California's highly successful

When looking at Europe and the USA, we see multi-modal, multi-token ABT schemes being rolled out at pace. So why is progress in the UK so slow?

Mobility Marketplace. The significant systems development budget could instead be spent providing funding for framework suppliers to create generic integrations with each other, and commercial support for local authorities to implement them.

Creating such an industry-wide commercial incentive to interoperate would offer operators a wide variety of supplier options for future projects. Unfortunately, instead Coral will deliver a single cEMV back-office system for multi-operator travel, and risks creating a de-facto monopoly on cEMV transactions; entirely not what operators nor passengers benefit from.

Most regional schemes are ambitious in their aims and want to deliver something faster and more in-tune with their specific requirements than a centralised system. Frameworks and interoperability spread this delivery load across the industry, rather than depending on one supplier: reducing time to market, increasing innovation, and mitigating risk. A thriving and competitive ecosystem, offering multiple vendors for any solution, allows authorities to hold incumbents to account for their performance or risk being swapped out. Lowering switching costs, combined with interoperable delivery of new services, creates better passenger outcomes and a more vibrant market for everyone.

To deliver and de-risk these improvements, authorities procuring cEMV and ABT systems today should request the best solutions for their local requirements, and specify modular, multi-vendor solutions rather than being locked into a single source one-size-fits-all solution. They should be free to access data insights and build integrations into their own systems. In a single deployment, they should also be empowered to select different suppliers for:

- Payment processing & orchestration
- Tokenisation
- Acquiring
- Hardware vendors
- Fares engines

Our own project with Transport for Wales is a great example of an authority putting these principles into practice:

- As a prime contractor, Unicard play the role of a neutral third-party in deployments, not favouring one supplier over another
- A mixed hardware estate with multiple validator suppliers working alongside each other
- Open, published APIs allowing TfW to integrate quickly and easily with new validators, fares engines, retail and customer support systems
- Options for a multi-payment solution that can direct payment requests as appropriate using different PSPs

This practice allows for better pricing, promotes collaboration and innovation, and avoids the spectre of replacing hundreds of gates in one go to deliver new passenger propositions.

Without the choice that modularity and standardisation brings, we cannot encourage competition – and monopolies ultimately harm everyone. Transport authorities, technology vendors, and the wider ecosystems have an incredible opportunity to drive much more integrated customer experiences through ticketing. The advent of open-loop systems has redefined how passengers want to travel, and we should be committed to meeting these expectations, putting the UK at the forefront of multi-modal public transport once again.

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Powering integrated, inclusive and intelligent mobility in the East Midlands

Tom Moody
Director of Transport, East Midlands Combined Authority

The East Midlands is entering a new era of mobility. With the launch of the Ride app in December 2025, the region has taken a significant step towards creating a fully integrated, user centred and intelligent transport system — one that reflects the ambitions of Transport 4.0 and places people, place and technology at its heart.

Developed through the UK Government's Future Transport Zones programme, Ride was developed jointly by Nottingham City Council and Derby City Council as a first of its kind digital transport platform operating in the UK. Its core ambition is simple but transformative: to bring transport together into a single, intuitive digital experience that enables seamless door to door journeys across modes, operators and local authority boundaries.

A GENUINELY INTEGRATED MOBILITY PLATFORM

Unlike traditional transport apps that focus on a single mode or operator, Ride integrates bus, tram, rail, walking and cycling routes alongside shared and micromobility services, including rental e scooters, e bikes and car clubs. This multi-modal approach allows users to plan entire journeys in one place, selecting the most efficient or environmentally friendly route based on their preferences. Ride provides real-time data updates, enabling users to see where their bus is and when it will arrive, as well as the state-of-charge of shared vehicles.

Crucially, Ride goes beyond journey planning. It combines planning, ticket purchase, ticket storage and validation of bus tickets through secure dynamic barcodes all within the app. Passengers can search for routes, choosing from suggested itineraries and purchase tickets for multiple operators within the same platform. This removes the need for multiple apps or accounts - significantly reducing friction and making transport easier to use for everyone.

INTELLIGENT, REAL TIME JOURNEYS

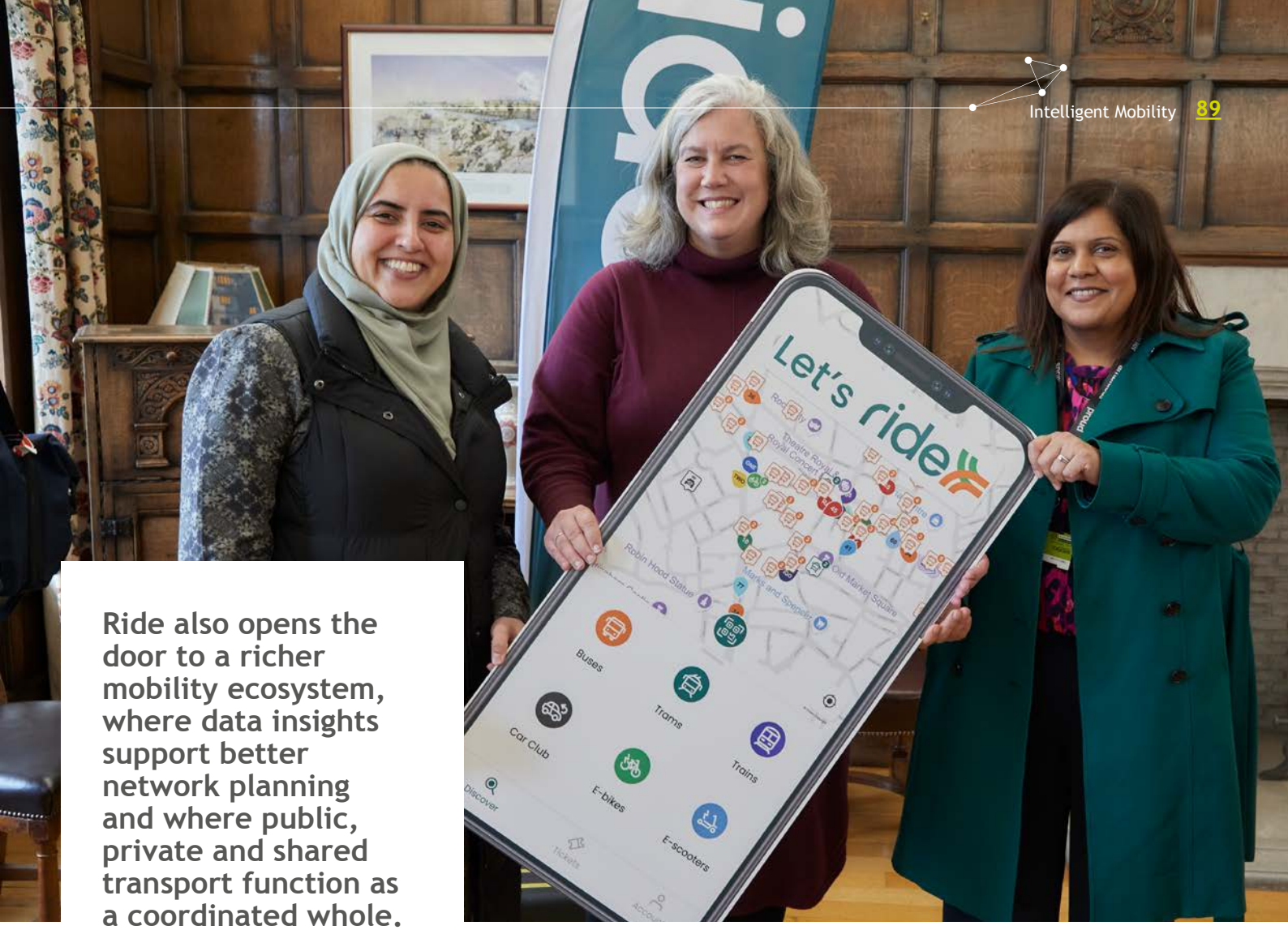
Real time information is core to the Ride app experience. Users can view live vehicle tracking across multiple bus operators on an interactive map, providing real time information about vehicle locations and accurate arrival times that helps reduce uncertainty — one of the most common barriers to public transport use. Alongside this, the app includes personalisation options, allowing users to tailor routes according to preferred transport modes, or frequently used services.

For shared and micromobility services, Ride displays vehicle availability and, where applicable, battery charge levels, enabling informed, confident choices. This integration reflects a broader shift toward flexible, on-demand transport solutions that complement traditional public transport networks. By combining these options, Ride supports more sustainable travel choices and reduces reliance on private car use.

By using real time data intelligently, Ride helps remove travel anxiety, enhances reliability, and promotes trust in the transport network.

SUPPORTING INCLUSIVE AND SUSTAINABLE TRAVEL

At its heart, Ride is designed to support more inclusive and sustainable travel choices. By



Ride also opens the door to a richer mobility ecosystem, where data insights support better network planning and where public, private and shared transport function as a coordinated whole.

Secretary of State Heidi Alexander (centre) launching Ride

combing a range of travel options into a single place, the app encourages users to choose low emission alternatives, demonstrating how digital innovation can be used to enhance everyday mobility.

EARLY SUCCESS AND GROWING MOMENTUM

Public response to Ride has been encouraging. In the first three months following launch, the app recorded over 16,000 downloads, demonstrating a clear appetite for a unified, digital approach to transport in the East Midlands.

However, Ride has always been conceived as the foundation of a longer term transformation and will only continue to improve. Responsibility for its continued development has now transitioned to the East Midlands Combined County Authority (EMCCA), with work underway to scale the platform across the entire region.

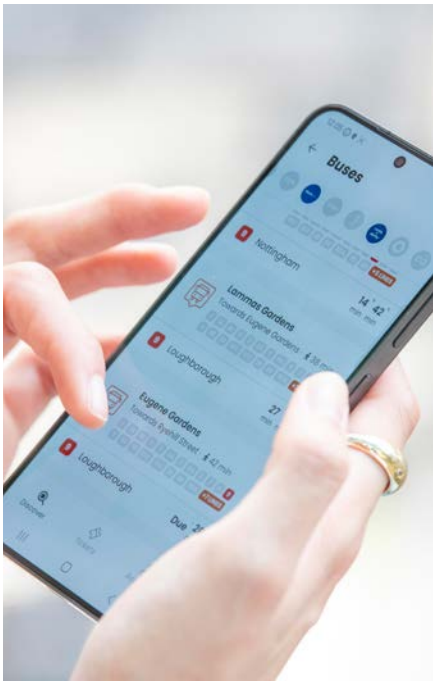
LOOKING AHEAD: FROM APP TO MOBILITY ECOSYSTEM

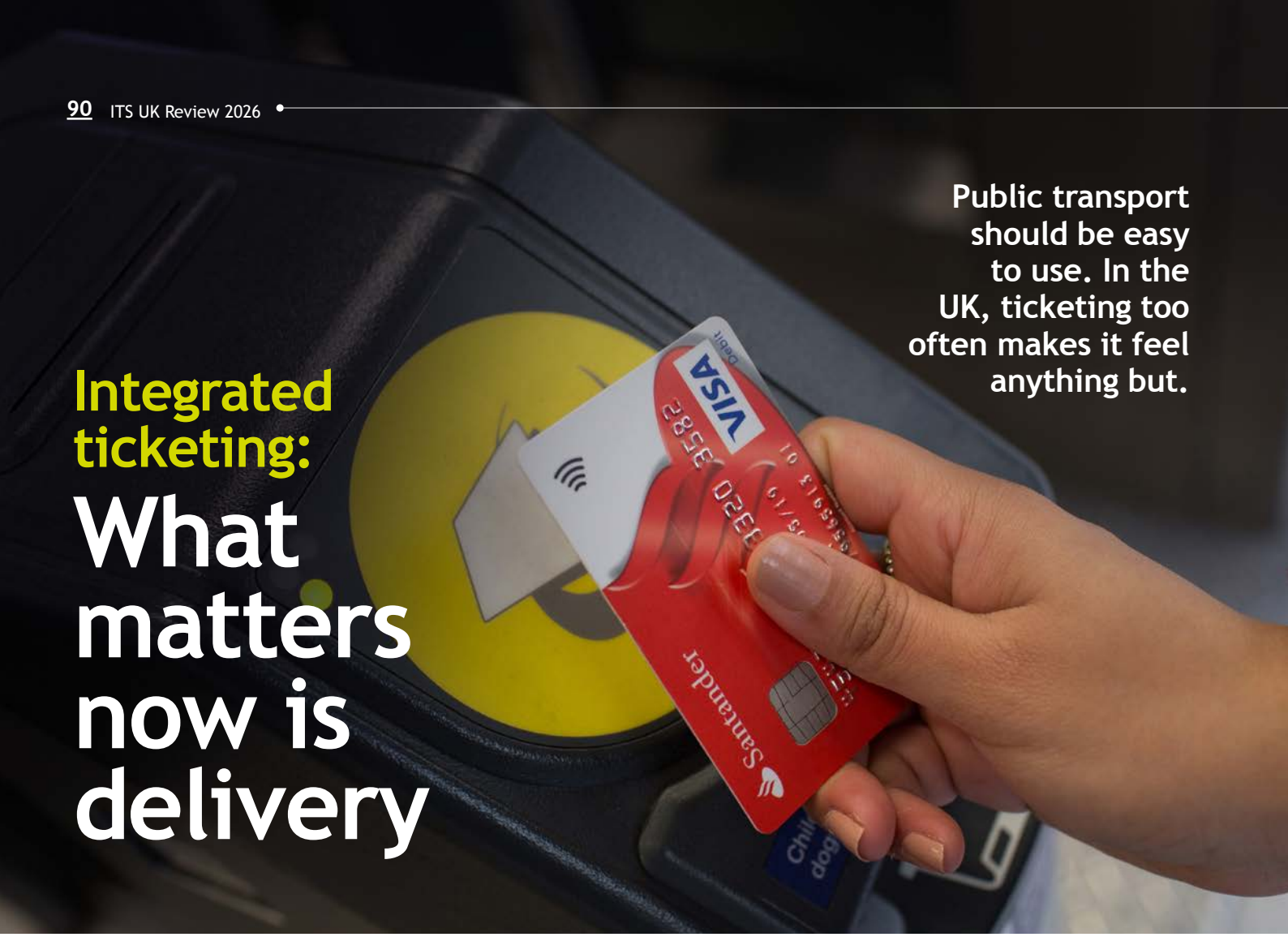
As the platform matures, ambitions include expanding operator coverage, enhancing accessibility features, deepening integration with rail, and enabling more advanced account based ticketing.

Ride also opens the door to a richer mobility ecosystem, where data insights support better network planning and where public, private and shared transport function as a coordinated whole. In time, Ride could play a key role in supporting economic growth, reducing congestion and emissions, and improving connectivity between communities, jobs and services across the East Midlands.

A MODEL FOR TRANSPORT 4.0

As EMCCA continues its journey towards a more connected and inclusive transport region, Ride provides a powerful example of how regional authorities can lead the way - not just by adopting new technology, but by re-imagining mobility around the people who use it.





Public transport should be easy to use. In the UK, ticketing too often makes it feel anything but.

Integrated ticketing: What matters now is delivery

Kevin Maslin
SVP and Managing Director, Cubic Transportation Systems

The Government's *Better Connected* strategy for integrated transport is an important signal of intent. The strategy sets out a clear desire to simplify payments, reduce friction for leisure and business commuters alike and deliver a joined-up experience for people travelling across modes and regions.

From my perspective, this alignment matters. It reflects what passengers are saying: complicated ticketing puts people off travelling.

The challenge now is not vision – it's delivery.

THE PROBLEM WE ARE TRYING TO FIX

The UK ticketing system is one of the most complex in the world. On the rail network alone, there are around 55 million fare combinations.

Research shows more than a third of people have been deterred from travelling by train because ticketing is too confusing. Many passengers worry about getting it wrong, being overcharged or getting a penalty fare.

The complexity also creates inequality. People who travel occasionally, unfamiliar with the system, have English as a second or other language, or have accessibility needs are disproportionately affected by the system. Add in people trying to travel from one region to another across boundaries, and you see why it feels inherently unfair.

At the same time, there are great systems in place locally, but they are fragmented. Local smart ticketing schemes exist but they stop at administrative borders rather than reflecting how people travel. Pay-as-you-go works well in some places, but not others. Concessions are applied, but not consistently. Data is siloed in specific areas and not shared across regions.

This isn't a failure of effort, there are a lot of people working very hard every day to make public transport accessible, fair and easy to use for passengers. But the system we are living with is a result of decades of incremental change without a single, unifying framework.

WHY THIS MOMENT IS DIFFERENT

Alignment. That's the main thing that is making this conversation different this time around.

In the UK, several major policy developments are converging. The *Better Connected* strategy. The creation of Great British Railways (GBR). The expansion of English devolution. New bus franchising powers. Growing consensus around contactless and digital payment.

Together, these changes create a genuine opportunity to deliver

integrated ticketing at scale.

There is also growing agreement on what the future system should look like. This includes:

- Account-Based Ticketing (ABT) where fares are calculated after travel and passengers are charged the best price automatically
- Contactless and digital payments as a default, without excluding those who need alternatives
- Islands and bridges: A model of local pay-as-you-go islands connected by longer-distance, pre-bookable journeys
- A digital spine that allows local systems to remain flexible while still working together nationally

WHAT DO PASSENGERS WANT?

No commuter is asking for integration. They want to get on a bus, tram, train or ferry and get to where they are going with the minimum amount of fuss.

Passengers want to travel without worrying about zones, peak rules or operator boundaries. They want to trust that they are being charged the right amount. They want clarity if something goes wrong.

Analysis shows that better transport integration could connect 1.2 million more people to city centres within 30 minutes, boosting productivity and access to jobs. The economic impact is significant. Over £17 billion in additional GDP each year, with around a third of this benefit coming from ticketing and timetable integration alone.

There is also a strong accessibility case. ABT systems remove the need to choose the right ticket before travel. They allow for multiple tokens, including contactless cards, mobile wallets and reloadable smart cards.

LESSONS FROM DELIVERY

Cubic has spent decades delivering integrated ticketing systems across the world.

In London, Cubic handles 5.2 billion annual transactions for TfL, averaging 13.2 million taps every day across one of the world's largest fare collection estates.

Fares, caps and concessions are calculated automatically in the back office. Passengers don't need to work out which is the best ticket to buy before travelling, Cubic's systems aggregate journeys and apply complex fare rules. This includes:

- Zone calculations
- Peak and off-peak rules
- Daily and weekly caps
- Concessions and travel products
- Error handling and journey completion logic
- It has become one of the most trusted systems in the world.

It's not about copying one city or region and trying to make it apply to regions across the UK or EMEA. This is about taking proven principles and lessons learned from other projects.

WHAT HAPPENS NEXT

The direction of travel is clear. The key question is how quickly, and effectively, integrated ticketing can be delivered.

This will depend on a few critical choices.

First, continued collaboration between Government, operators and authorities is essential. Integrated ticketing cannot be imposed top down.

Second, procurement decisions matter. Buying proven systems allows delivery at pace and reduces risk to passengers.

Third, the focus must remain on outcomes. Integrated ticketing is not an end in and of itself. It is a means to improve access, support economic growth and make public transport easier to use.

The opportunity is real. If the industry focuses on delivery, and if we choose to build on what already works, integrated national ticketing can move from aspiration to everyday experience.

That is what passengers deserve.

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