When Critical Controls Fail

Intelligent Transport Systems - Explained

Technologies to operate and manage transport infrastructure

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Hey everyone!

In the Autumn edition of **ITS Edge** the feature article looks at the implications that the recent air crash in Ahmedabad poses for safety critical systems, such as ITS.

From our partner **ERTICO - ITS Europe**, we have an update from **Joost Vantomme**, where he provides an overview of achievements so far in 2025, and a piece by **Dr Nikolaos Tsampieris** and **Dr Eusebiu Catana** who explain how 6G and AI will revolutionise ITS and logistics in particular. We also hear from partner **Intelligent Transport Systems UK**, where **Max Sugarman** looks at how policy is set to reshape transport.

In addition, we have a round up of events at the recent ITS World Congress in Atlanta, reporting on the huge range of accomplishments that were made.

We also look at a number of topics, including the threat that vehicle technologies pose to the future of ITS infrastructure, and the landscape of opportunity and complexity that the UK ITS sector presents to foreign companies.

We finish this edition with our Technology Insight item for an episode from Season 4 of the @ITSNow YouTube Channel. In this, we have worked with **Streetwise Technology** to look at how technology can be used to make Zebra Crossings safer for users.

See you next time,
Alistair

When Critical Controls Fail

LESSONS FOR ITS FROM THE AHMEDABAD AIR CRASH

Alistair Gollop looks at the implications that the recent air crash in Ahmedabad poses for safety critical systems, such as ITS.

The recent air crash in Ahmedabad, where a critical fuel cut-off system was activated during take-off, resulting in catastrophic engine power loss, sends a chilling message across all safety-critical sectors. While the precise cause (malicious intent, accidental activation or technical malfunction) remains under investigation, the incident highlights profound vulnerabilities in the design and operation of complex systems. For the Intelligent Transport Systems (ITS) sector, which increasingly relies on interconnected, automated and safety critical technologies, the lessons from Ahmedabad are not just relevant they are imperative.

ITS encompasses a vast array of systems, from autonomous vehicles and smart traffic management to intelligent rail networks and interconnected infrastructure. Each of these components, in isolation and as part of a larger ecosystem, carries inherent risks. A failure, whether human, mechanical or cyber-related, can have devastating consequences, much like the Ahmedabad tragedy. This incident compels us to re-evaluate our approach to designing and implementing ITS, focusing on minimising both the incidence and magnitude of such safety breaches.

The Unseen Hand: Human Factors and System Design
One of the immediate takeaways from Ahmedabad is the critical role of human factors in system safety. Even with highly automated systems, human operators remain the final line of defence and, simultaneously, a potential point of failure. The Ahmedabad incident highlights a potential design flaw where a critical control could be triggered, either accidentally or maliciously, too easily. In an ITS context, this means designing interfaces for vehicle controls, traffic management systems and emergency protocols to be intuitive, unambiguous and resistant to accidental inputs. This includes ensuring that critical controls are physically segregated and guarded so they cannot be confused with routinely used

features, perhaps they might have additional safeguards such as protective covers or require multiple, distinct actions to activate. It also involves logical redundancy, requiring confirmation or a sequence of inputs for safety-critical actions to prevent single-point failures due to human error, for instance, in an autonomous vehicle, a manual override for braking might require a sustained press rather than a momentary touch. Furthermore, clear visual and auditory cues are essential, meaning that when a critical control is activated, the system must provide immediate, unmistakable feedback to the operator. This could involve flashing lights, distinct alarms or clear on-screen messages, ensuring the operator is fully aware of the system's state.

Regardless of the sophistication of ITS, human operators (be they drivers, traffic controllers, or maintenance personnel) need rigorous and ongoing training. This training must go beyond routine operations to include scenarios involving unexpected system behaviour, degraded modes, and emergency procedures. Although the Ahmedabad flight only lasted about a minute, during the high-activity period of take-off, it still underscores the need for simulator-based training, replicating high-stress, low-frequency events in a controlled environment to allow operators to develop muscle memory and decision-making skills under pressure. It also necessitates proactive error detection, where training should emphasise recognising early warning signs of system anomalies, rather than simply reacting to full-blown failures, and this includes understanding the expected behaviour of complex systems and being attuned to deviations. Finally, clear protocols for anomaly response are vital. Standard Operating Procedures (SOPs) need to be comprehensive, easily accessible and regularly reviewed, particularly for managing unusual or critical system states.

The Spectre of Malice: Cybersecurity and Resilience
The possibility of malicious activation in Ahmedabad underscores the escalating threat of malicious actions, with cyberattacks against infrastructure such as Intelligent Transportation Systems (ITS) becoming increasingly prevalent. As the technologies that manage and operate mobility become increasingly interconnected and reliant on data, the potential for attack grows exponentially. Should a malicious actor gain control of a critical system, such as traffic signals, autonomous vehicle controls or public transport, the consequences could be widespread chaos, severe economic disruption and even loss of life.

Therefore, it is crucial that ITS systems are built with security by design principles, rather than treating security as an afterthought. This means implementing a multi-layered defence, which includes firewalls, intrusion detection systems and robust access controls at every level of the ITS architecture. Furthermore, it is essential to ensure data integrity and authentication, verifying that all data transmitted and received within the ITS ecosystem is authenticated and its integrity confirmed. This prevents data poisoning or spoofing that could lead to erroneous system decisions. Encrypted communication for all communication between ITS components is also vital, especially safety-critical ones, to prevent eavesdropping and manipulation. Finally, regular vulnerability assessments and penetration testing are necessary to proactively identify and patch security weaknesses before they can be exploited.

The ambiguity surrounding the Ahmedabad incident's cause, whether accidental or malicious, highlights the critical need to address insider threats. This requires strict access control and least privilege principles, limiting access to critical systems and data only to those who absolutely require it for their roles. Behavioural anomaly detection is also key, involving the monitoring of user behaviour and system logs for unusual patterns that might indicate malicious activity from within. Lastly, background checks and vetting of personnel with access to safety critical ITS infrastructure are indispensible.

The Imperative of Resilience: Fault-Tolerant Design
Regardless of the cause, a critical control failure during a high-stakes operation like take-off points to the need for ultimate system resilience. In ITS, this translates to redundancy and diversity, just as aircraft have multiple engines and backup systems, ITS must incorporate redundancy for critical functions. This can include hardware redundancy, duplicating critical hardware components so that if one fails, a backup can seamlessly take over, software diversity, implementing different software algorithms or even different programming languages for redundant critical functions to avoid common-mode failures, and geographic redundancy, distributing critical infrastructure across different locations to mitigate the impact of localised disasters or attacks.

This also extends to fail-safe and fail-operational design, where systems should be designed to either fail safely or fail operationally in the event of a critical failure. This further entails graceful degradation, meaning that rather than a catastrophic shutdown, systems should be designed to degrade gracefully, maintaining essential functions even when some components are compromised, and automatic fallbacks where pre-defined procedures and automated systems should be in place to switch to backup modes or alternative pathways in the event of a primary system failure.

Finally, there is a strong need for post-incident analysis and continuous improvement. The aviation industry has a strong culture of rigorous accident investigation and lessons learned. The ITS sector must adopt a similar approach, focusing on mandatory incident reporting, creating a culture where all incidents, near misses and anomalies are reported without fear of blame, fostering a learning environment. This also requires root cause analysis, going beyond superficial causes to identify the underlying systemic issues that contributed to an incident, and establishing feedback loops, ensuring that lessons learned from incidents are systematically incorporated into future designs, operational procedures, and training programmes.

The Ahmedabad air crash is a stark reminder that even in the most advanced technological domains, the potential for failure, both human and systemic, remains ever-present. For the rapidly evolving ITS sector, it serves as a powerful call to action. By meticulously integrating human factors, robust cybersecurity and comprehensive fault-tolerant design principles, and by fostering a culture of continuous learning from all incidents, we can strive to build Intelligent Transport Systems that are not just efficient and convenient, but fundamentally safe and resilient for all. *The lives that depend on these systems demand nothing less.*

> To see the accompanying video, scan the QR code or go to:

https://youtu.be/lZf_yqrJ8ns

Joost Vantomme, CEO of ERTICO – ITS Europe provides an update on achievements so far in 2025.

The first eight months of 2025 have been transformative for ERTICO – ITS Europe. As we reflect on this dynamic period, I am proud of the milestones achieved in close collaboration with our Partners, Supervisory Board, Strategy Committee and dedicated team. Each success has reaffirmed our shared ambition to shape the future of mobility across Europe and beyond.

This year, our focus has remained firmly on delivering tangible value through innovation, expertise and cross-sector collaboration. We've explored the depths of digitalisation, from connected mobility and data ecosystems to AI-driven solutions, while championing sustainability, resilience, safety and human-centric design.

A defining moment came in June with the inaugural Annual Partnership Forum and our 35th General Assembly. This event marked the launch of ERTICO's renewed vision and mission, alongside four strategic areas supported by enablers and outcomes. We also unveiled our refreshed branding and new website, reflecting our forward-looking identity and commitment to clarity and impact.

Digitalisation and artificial intelligence have been central to our work. ERTICO contributed to the European Commission's Automotive Industrial Action Plan, which prioritises software-defined vehicles, data accessibility and AI as pillars of competitiveness. Our engagement in high-level dialogues, such as the 'Technology and Digital Innovation' meeting, underscored the importance of aligning digital transformation with Europe's sustainability goals.

We've also played a key role in shaping policy and funding frameworks. Our input into the Multiannual Financial Framework (2028–2034) and advocacy for FP10 funding reflect our commitment to research and innovation. Structured dialogues with the European Parliament, including a breakfast meeting hosted by MEP Virginijus Sinkevičius, allowed us to discuss strategic initiatives and legislation such as the ITS Directive, AI Act and Cyber Resilience Act.

Artificial intelligence has emerged as a defining theme of 2025. Our White Paper on AI in Mobility and the "Focus On" webinar series have fostered dialogue with DG MOVE, DG CNECT and DG RTD, as well as through our collaboration with ITS Germany under the AIAMO Project. These efforts support the safe and effective deployment of AI across Europe's transport systems.

On the global stage, ERTICO has maintained a strong presence. The 16th ITS European Congress in Seville was a standout success, with over 3,000 participants and 150 sessions showcasing real-world mobility applications. We also contributed to events in Helmond, Ispra, Rome, Paris, Athens and Istanbul, reinforcing our role as a thought leader in transport digitalisation.

Looking ahead, our preparations for the 2027 ITS World Congress in Birmingham are well underway. We've welcomed eight new Partners and launched ten new EU-funded projects, while concluding several flagship initiatives. Our values, **Cooperative**, **Impactful**, **Open**, **Passionate**, **Visionary**, continue to guide our work.

As we enter the final stretch of 2025, our mission remains clear: to deepen thought leadership, strengthen partnerships and deliver inclusive, resilient mobility solutions. Together, we are not just imagining the future, we are building it.

Atlanta 2025: From Vision to Deployment at the ITS World Congress

Alistair Gollop rounds up what happened at the ITS World Congress in Atlanta

The global heart of transport innovation beat strongly in Atlanta, Georgia, USA, at the 2025 Intelligent Transportation Systems (ITS) World Congress. From the 24th to the 28th of August, the Georgia World Congress Center became a bustling nexus for nearly 6,000 delegates from 61 nations. Engineers, policymakers, academics and industry titans convened under the resonant theme, "Deploying Today, Empowering Tomorrow." This was not merely a slogan; it was a declaration of intent, signalling a crucial pivot in the sector from futuristic concepts to tangible, real-world applications that are reshaping our relationship with mobility. The congress left attendees with an unambiguous message: "**the future of transport is no longer on the horizon; it is here, and it is being deployed on our streets right now**".

A Landmark Announcement: Atlanta's C-V2X Breakthrough

The most significant and widely discussed development of the congress was undoubtedly the announcement of America's first "**Day One Deployment District**" **for Cellular Vehicle-to-Everything (C-V2X) technology**. This landmark initiative, centred in Atlanta, represents a monumental step towards creating a truly connected and cooperative transport ecosystem.

So, what is C-V2X? It is a technology that allows vehicles to communicate directly with each other (Vehicle-to-Vehicle, V2V), with roadside infrastructure like traffic signals (Vehicle-to-Infrastructure, V2I), and

with pedestrians carrying smart devices (Vehicle-to-Pedestrian, V2P). This constant, low-latency stream of data exchange creates a digital awareness of the surrounding environment that far surpasses the capabilities of human senses or standalone vehicle sensors.

The "Day One Deployment District" moves this technology from controlled test tracks to the complex and unpredictable environment of a living city. Within this zone, vehicles and infrastructure are equipped and actively communicating. This means a car can receive a warning that another vehicle, hidden from view around a blind corner, is about to run a red light. It means traffic signals can dynamically adjust their timing based on real-time vehicle flow, easing congestion and reducing emissions. It means a cyclist's smartphone can alert an approaching lorry to their presence, dramatically enhancing the safety of vulnerable road users. This initiative provides an invaluable real-world laboratory to refine the technology, prove its benefits to the public, and develop the regulatory and commercial frameworks necessary for a nationwide rollout. It firmly establishes Atlanta as a leader in smart city innovation and provided congress attendees with a powerful demonstration of the "Deploying Today" theme.

Debating the Future: Insights from the Plenary Sessions
The core intellectual debates of the congress unfolded across its major plenary sessions, each tackling a critical facet of the ITS revolution.

The first session, "**Creating a Safer Future with Connected and Automated Technologies**" delved into the profound safety implications of ITS. Discussions moved beyond the hype of fully autonomous cars to the more immediate benefits of Advanced Driver-Assistance Systems (ADAS) and V2V communication. Experts agreed that the journey towards "Vision Zero"—the goal of eliminating all traffic fatalities and severe injuries—is heavily reliant on these technologies. A key talking point was the protection of vulnerable road users. Innovations in V2P and sophisticated sensor

technology are creating a digital safety net for pedestrians and cyclists, who are disproportionately represented in accident statistics. The session also acknowledged the remaining hurdles, including the need for robust regulatory frameworks, public trust, and solutions for complex ethical dilemmas.

The second plenary, "**Realising Growth through Secure and Interoperable ITS**" shifted the focus to the economic and structural underpinnings of this new era. A central theme was interoperability—the absolute necessity for different systems and vehicles, regardless of manufacturer, to speak the same digital language. Without common standards, the industry risks creating a fragmented landscape of proprietary "walled gardens," which would stifle innovation and limit the network effect that makes connected technology so powerful. Panellists explored the immense economic potential, from highly efficient logistics and supply chains to new business models based on mobility-as-a-service (MaaS). The "secure" aspect of the title was also heavily emphasised, with experts from the cybersecurity domain stressing that as our transport systems become more connected, they also become more vulnerable to cyber-attacks, making robust security a non-negotiable foundation for public trust and safety.

Finally, "**Building a More Resilient Transportation System with AI & Emerging Technologies**" looked at how ITS can future-proof our networks against disruption. In an age of increasing climate volatility and unforeseen crises, resilience is paramount. This is where Artificial Intelligence (AI) comes to the fore. AI-powered platforms can analyse vast datasets to predict traffic congestion before it happens, dynamically reroute vehicles in response to accidents or extreme weather events, and optimise public transport schedules in real time. The discussion also touched upon the concept of "digital twins"—virtual replicas of entire city transport networks where new strategies can be tested and simulated safely before being implemented in the real world, empowering cities to adapt and evolve with unprecedented agility.

The Innovation Showcase and a Greener Journey
The sprawling exhibition hall was a vibrant testament to the industry's ingenuity. It was a space where public-private partnerships were forged and where theory was translated into functioning hardware and software. Automotive giants stood alongside agile tech start-ups, and city transport authorities exchanged ideas with leading academic researchers.

On display was an incredible array of technologies. Advanced LiDAR and radar systems promised ever-more-perceptive autonomous vehicles. Sophisticated data analytics dashboards offered city planners a god-like view of their transport networks, enabling proactive management rather than reactive problem-solving. Demonstrations of on-demand autonomous shuttles showcased a potential solution for the "first and last mile" problem, seamlessly connecting people's homes to major public transport hubs.

Crucially, sustainability and multimodal integration were woven throughout the congress programme. There was a clear understanding that the goal of ITS is not simply to make driving a private car more efficient, but to create a holistic, sustainable, and equitable transport system. This involves using technology to optimise routes that reduce fuel consumption and emissions, developing smart charging infrastructure to encourage electric vehicle adoption, and, most importantly, integrating various modes of transport. The vision is one of a seamless journey where a single app allows a citizen to plan, book, and pay for a trip that might involve a train, an on-demand bus, and a shared e-scooter for the final leg, making public and active transport more convenient and appealing than ever before. This integrated approach, powered by intelligent data systems, is fundamental to building the green, liveable cities of tomorrow.

Previous page: Ribbon cutting ceremony.
Top: Laura Chace, President ITS America; Conference Floor; Exhibition; Bottom: Live technology demonstration

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The Road to Relevance in the I2V Era

The Intelligent Transport Systems (ITS) sector stands at a critical juncture. For decades, it has served as the silent architect of modern mobility, deploying infrastructure like traffic signals, variable message signs and congestion management systems that keep our networks moving. However, a new paradigm is taking shape, one dominated by the vehicle itself. As car manufacturers invest billions in advanced in-vehicle technology, the flow of innovation is reversing, moving from the dashboard outwards. The new battleground is not merely Vehicle-to-Infrastructure (V2I), but the more holistic and commercially powerful concept of Infrastructure-to-Vehicle (I2V). If the ITS sector does not take the initiative to deploy I2V features, it risks becoming a legacy player, relegated to the sidelines while vehicle manufacturers dictate the future of transport.

Alistair Gollop calls on the ITS sector to be proactive or be left in the dust!

The rise of I2V, as championed by companies like Nissan, showcases a world where a car's onboard systems, equipped with advanced sensors, AI and augmented reality, integrate with cloud-based data to reveal information that would otherwise be invisible to the driver. A car might "see" a pedestrian obscured by a building or predict traffic congestion around a blind corner. These features are not just safety enhancements, they are commercial products sold directly to consumers, with manufacturers controlling the user experience, data and revenue streams.

For the ITS sector, this presents a formidable challenge. The traditional model, where infrastructure providers deliver services to a captive audience, is being subverted. Vehicle manufacturers are building their own sophisticated ecosystems, collecting proprietary data, and developing advanced analytics that bypass conventional ITS deployments. In this scenario, road operators' risk being reduced to mere conduits for manufacturer-led services, with little control over the future of their own networks. The road to irrelevance is paved with a passive, wait-and-see approach.

By proactively leading the deployment of I2V, the ITS sector can reclaim its narrative and demonstrate its essential, systemic value. Unlike vehicle manufacturers, which have a commercial interest limited to the features within their brand's ecosystem, the ITS sector operates with a mandate for public good: to optimise the entire network for safety, efficiency and sustainability. A sector-led approach ensures that I2V deployment is:

1. Equitable and Universal, Not Proprietary: Vehicle manufacturers' I2V systems are, by their nature, proprietary and limited to their brand's models. This creates a fragmented and inequitable system where only owners of high-end vehicles benefit from the most advanced safety and efficiency features. In contrast, an ITS-led approach would ensure that foundational I2V data and services are available to all vehicles, regardless of brand or age. This is the difference between a few high-tech cars enjoying better service and an entire transport network becoming smarter and safer for everyone.

2. Systemic, Not Isolated: A manufacturer's I2V system is optimised for its own vehicle. An ITS-led system, by contrast, is optimised for the entire network. Infrastructure-centric I2V could, for example, communicate with all connected vehicles to manage traffic flow dynamically, provide advance warning of network-wide issues and optimise speed limits based on real-time environmental conditions. The ITS sector can use its unique oversight of the entire network to create a truly cooperative and integrated mobility system.

3. Data-Rich and Policy-Driven: Vehicle manufacturers collect data for their own commercial purposes. Public and private ITS agencies collect data with policy goals in mind, reducing congestion, curbing accidents and improving sustainability. If the ITS sector takes the lead, it can establish data-sharing protocols and ethical frameworks that serve the public interest. By creating an open, standardised I2V platform, the sector ensures that the valuable data generated by I2V is used to inform network-wide decisions and drive policy, rather than being siloed in commercial entities.
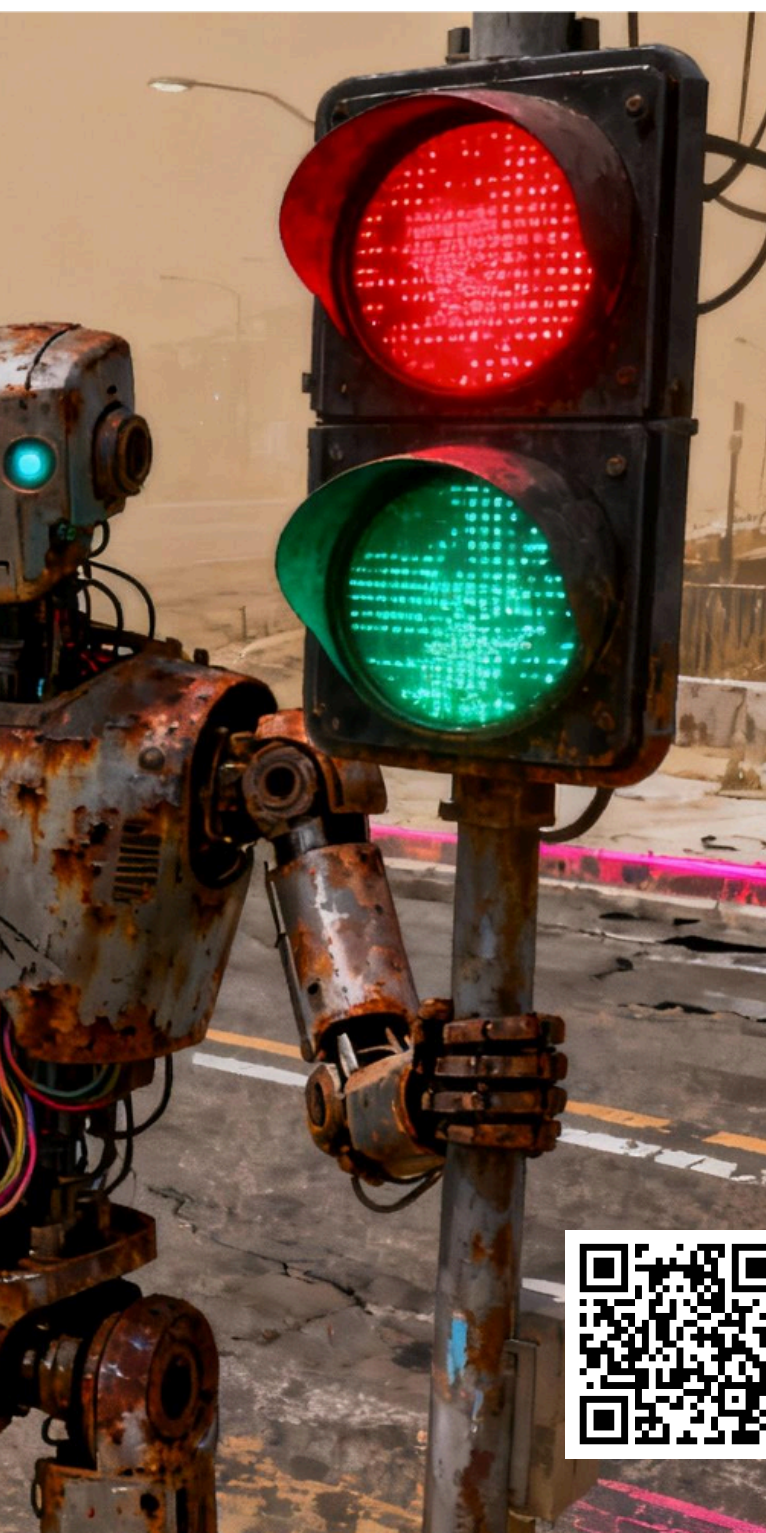
So, how can the ITS sector take the initiative?
First, by accelerating investment in interoperable infrastructure. This involves deploying edge computing, advanced sensors and communication systems (like G5, 5G and future cellular technologies) that can collect, process and transmit data with the low latency required for real-time I2V features. By leveraging government funding and public-private partnerships, ITS agencies can build the digital infrastructure that all vehicles will ultimately rely on.

Second, by establishing common standards for I2V communication. The fragmentation of proprietary systems used by vehicle manufacturers is a major barrier to a truly intelligent transport network. The ITS sector must work with standards bodies and across the industry to define common protocols for I2V communication and data exchange. This will create a level playing field, encourage innovation and prevent the market from being dominated by a few powerful tech or car companies.

Third, by developing a service layer that demonstrates infrastructure value. Instead of just reacting to vehicle manufacturers' innovations, the ITS sector can create its own suite of compelling, infrastructure-led I2V services. These could include predictive traffic management features, network-wide parking availability information or real-time hazardous weather alerts that are superior to any in-vehicle-only system. By showcasing the unique value that only an infrastructure-based system can provide, the ITS sector can prove its continued relevance.

The alternative, a passive stance, leaves the sector vulnerable to being commoditised. In a world where mobility is increasingly defined by in-car technology, the ITS sector could lose its influence over traffic management, network policy and the equitable distribution of mobility benefits. The future of intelligent transport is not just in the vehicle or the infrastructure, it is in the cooperative, integrated relationship between the two. The ITS sector must take the wheel and lead this integration.

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6G and AI: Building the foundations of next-generation logistics

Dr Nikolaos Tsampieris and **Dr Eusebiu Catana**, Senior Managers at ERTICO (ITS Europe) explain how 6G and AI will revolutionise ITS and logistics in particular.

In the near future, the logistics industry will experience a dramatic shift in how it operates, driven by the convergence of Sixth Generation (6G) wireless networks and Artificial Intelligence (AI). This potent combination is poised to transform freight transportation, warehousing and last-mile delivery, creating a highly intelligent and self-learning ecosystem. By enabling unprecedented levels of connectivity and data analysis, these technologies will move logistics away from its fragmented, reactive state towards a responsive, proactive and fully optimised model.

The arrival of 6G, the successor to 5G, will bring with it a step-change in wireless technology. It promises **ultra-high capacity**, **microsecond-level latency** and **truly ubiquitous connectivity** for billions of devices simultaneously. This immense capability will enable the real-time sharing of data across the entire logistics network, from the factory floor to the customer's doorstep. IoT-enabled infrastructure, including delivery vans and drones, smart warehouses, seaports and airports, will be in constant communication, creating a seamless and integrated network where data flows freely and instantly.

This enhanced connectivity will enable a suite of high-impact applications that are currently only conceptual. Imagine real-time **Digital Twins**, virtual replicas of entire supply chains that are continuously updated by data from millions of sensors, vehicles and other IoT devices. This will give logistics managers a complete and up-to-the-minute overview, allowing them to simulate scenarios and identify potential issues long before they occur. Furthermore, the extreme precision of 6G will provide **sub-centimetre indoor and outdoor localisation**, a critical requirement for autonomous warehouse operations and delivery robots. A key feature of 6G will be its '**Zero Gap Coverage**', ensuring global communication across vast distances, including remote ports and international shipping routes, via integrated Non-Terrestrial Networks (NTN).

Working with 6G, AI will serve as the intelligent engine that leverages this flood of real-time data to drive better decisions. Sophisticated machine learning algorithms will analyse historical patterns and live information to predict demand, refine delivery routes and pinpoint potential disruptions before they escalate. AI will make logistics operations fundamentally more autonomous, with smart trucks, drones and robots navigating their environments and managing workflows powered by real-time 6G data streams. **Predictive demand forecasting** will allow AI to anticipate supply and demand fluctuations with far greater accuracy, helping to minimise shortages and to reduce waste. Similarly, **dynamic route optimisation** will enable real-time vehicle re-routing based on live information about traffic, weather and supply, dramatically improving delivery efficiency.

The combined force of 6G and AI will automate the vast majority of logistical operations, making them faster, more transparent and significantly more reliable. The synergy of these two transformative technologies will herald an era of agile and sustainable supply chains. This autonomous, smarter and safer generation of logistics will not only drive innovation and economic growth but will also contribute to a more sustainable future for the transport and distribution sector.

> **>** To see the accompanying video, scan the QR code or go to:

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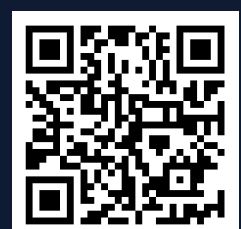
Intelligent Transport Systems UK

What does the policy landscape mean for the future of transport?

Max Sugarman, Chief Executive, Intelligent Transport Systems UK - looks at how policy promises to reshape the future of transport

Transport policy in the UK is undergoing one of its most significant shifts in decades. A new Government has already set out plans that will reshape how decisions are made and how new technologies are deployed. For the intelligent transport sector, the implications are far-reaching.

At ITS UK, representing nearly 200 members across all modes and applications of transport technology, we see first-hand how policy changes translate into opportunities — and challenges — for industry. Below we cover some key trends we are seeing and cover what we're doing to support the sector.

A shift to devolved decision making
There is no doubt that the Labour Government are focused on devolving a number of policy decisions, including in transport. The Buses Bill, currently making its way through Parliament, and the recently introduced Devolution Bill, will together, shift a number of powers to Mayors and Strategic (previously Combined) Authorities, including over bus franchising, micromobility schemes and highways management. Mayors will soon have the powers to regulate much of how their local transport networks run, and will have the ability to appoint Transport Commissioners to help in their decision making.

For the sector, it is going to mean Combined Authorities become even more important stakeholders. At ITS UK, we've been working to engage Mayors across the UK, for example, holding a roundtable at the start of the year with Liverpool Mayor Steve Rotheram to explore the use of digital twin technology. At the upcoming Party Conferences, we'll be hosting Cambridgeshire and Peterborough Mayor Paul Bristow too, at our Transport Tech Showcase.

Intelligent Transport Systems UK

< To find out more, scan the QR code or go to:
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A focus on integration

Another critical focus of this Government is transport integration. Last year, in November, the then-Transport Secretary Louise Haigh set out her vision for an integrated transport network, and got the ball rolling for a strategy that would look at how we can deliver joined up, seamless journeys around the UK. Technology and the better use of data will play a key role, with the Department for Transport also planning to publish a Transport Data Action Plan alongside it.

Whether its through smart ticketing or data sharing across modes, building an integrated transport system will require multiple forms of technology that bridge the traditional siloes we've built in transport. Traffic managers will increasingly need to be able to speak to their bus and rail counterparts, and will also need to share data that allows the end users, the travelling public, to have a more seamless experience when using the network. We've been working with the Integrated National Transport Strategy (INTS) team, delivering workshops over the past year, to ensure the sector feeds into the Government's plans.

Embracing technology

Across Government, we have seen a keen focus on how technology can deliver. Nowhere is this more apparent than in the field of autonomous vehicles, with the current Government recently publishing consultations on the secondary legislation required to get self-driving cars onto roads. In September 2025, ITS UK published its responses to two of these consultations, on the Statement of Safety Principles and the Marketing Terms, stressing the importance of both robust safety standards and honest marketing to foster public trust in this emerging technology.

Elsewhere, there has been a big focus by ITS UK on where current regulations or rules are acting as a blocker to the use of technology. In the area of road enforcement, for a number of years the Home Office's Type Approval process (HOTA) has acted as a barrier to innovation, due to rigid nature of what technology is accepted, and uncertain timelines for applications to be approved. After a campaign by ITS UK over the last year, we're really pleased to see the Home Office now working with the British Standards Institute to review HOTA.

Similarly, for the bus sector, we've been working hard to promote the role of on-demand buses (demand responsive transport) in a rapidly changing bus market. In March, we gave evidence to Parliament's Transport Select Committee urging regulations to be changed to ensure these dynamic services don't have VAT applied to them (which they currently do when using smaller vehicles) and were delighted a few weeks back to see the Committee adopt this policy as a report recommendation.

A challenging fiscal environment

It would be remiss, of course, not to discuss the fiscal backdrop that will play on the minds of all policymakers, including in transport. It is clear that – with the upcoming Budget – tough decisions will need to be made by the Chancellor.

In this area, ITS UK would highlight two key points. First, the sector can help – particularly by supporting the roll out of a national road pricing scheme. It is clear that falling tax revenue from fuel duty will continue to exacerbate the already difficult financial situation the Government is in, and a dynamic, pay as you go scheme could help recover income currently set to disappear as the car fleet becomes electric. The sector has the technology, knowhow and experience to deliver – we just need the political willpower.

Secondly, we need to make the case for ITS as a sector of strategic value to the economy. We recently launched a survey to understand the economic value of the ITS sector, working with Capital Economics. This critical data will be used to demonstrate the industry's contribution to economic growth and jobs, bolstering the case for future investment. The survey is still open and we encourage all to help support this vital work.

Conclusion

The policy environment for transport is evolving rapidly, with new powers for local leaders, a stronger focus on integration, and a willingness to embrace technology. At the same time, tough fiscal realities mean Government will be looking for industries that deliver value.

For the transport technology sector, this is both a challenge and an opportunity. By demonstrating our economic value, by providing practical solutions like road pricing and on-demand mobility, and by ensuring public trust in new technologies, we can help shape a safer, more seamless and sustainable transport system. ITS UK will continue to work with Government, local authorities and industry to ensure that the sector is at the heart of these decisions.

Intelligent Transport Systems UK
Empowering Transport Technology

The voice of the transport technology industry

Advocacy & policy

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UK's Intelligent Transport Market: A Landscape of Opportunity and Complexity for Foreign Entrants

The United Kingdom's Intelligent Transport Systems (ITS) market is in a state of dynamic transformation, driven by ambitious government strategies, significant public and private investment, along with a pressing need to create a more efficient, sustainable and resilient transport network. For foreign ITS companies, the UK presents a lucrative but complex market, characterised by a sophisticated procurement landscape, evolving post-Brexit standards and the imperative for deep local understanding. With a market size estimated to reach over £3 billion by 2030, the opportunities for innovative solutions in areas such as Connected and Automated Vehicles (CAVs), Mobility as a Service (MaaS) and data-driven traffic management are substantial. However, navigating the intricacies of this mature market requires careful planning and a strategic approach.

Alistair Gollop guides you on the issues and opportunities of the UK ITS market.

The UK's commitment to advancing its transport infrastructure is underscored by key national initiatives. The "Future of Transport" program, spearheaded by the Department for Transport, sets out a vision for a tech-enabled transport system that is cleaner, greener and more user-centric. A cornerstone of this vision is the widespread adoption of ITS to tackle congestion, which costs the UK economy billions annually, and to meet ambitious net-zero emissions targets. National Highways, the government-owned company responsible for the country's strategic road network, is a major driver of ITS deployment through its "Digital Roads" strategy. This long-term vision aims to create a network that is digitally connected, enabling real-time communication between vehicles and infrastructure, predictive maintenance and enhanced safety through advanced driver-assistance systems and eventually, full autonomy.

This forward-looking agenda is creating a fertile ground for a wide array of ITS solutions. There is strong demand for advanced traffic management systems that can optimize traffic flow in real-time, reducing both congestion and emissions. The roll-out of 5G is further accelerating the potential for connected vehicle technologies, with numerous trials underway across the country. Furthermore, the UK is a key market for the burgeoning MaaS sector, with cities like London, Manchester, and Birmingham actively exploring and implementing integrated transport solutions that offer users seamless journey planning and payment across multiple modes of transport.

Navigating the Gauntlet: Challenges for Foreign ITS Companies
Despite the significant opportunities, foreign ITS companies wishing to enter the UK market face a number of formidable challenges. Chief among these is the complex and often lengthy public procurement process. While the UK government is a signatory to the World Trade Organization's Government Procurement Agreement (GPA), which provides a framework for fair and transparent competition, the reality on the ground can be daunting for newcomers. Tenders are often highly detailed and require a deep understanding of UK-specific standards and operational requirements. The recent introduction of the Procurement Act 2023 aims to simplify and streamline this process, placing a greater emphasis on value for money over the lowest cost. However, its practical impact on foreign bidders is still unfolding and building relationships with public sector bodies and understanding their long-term strategic goals remains crucial.

The legacy of Brexit has introduced a new layer of complexity. While the UK has largely maintained alignment with European standards in the transport sector to ensure interoperability, the potential for future divergence creates uncertainty. Foreign companies must stay abreast of any changes to regulations and certification requirements. The UK has replaced the EU's CE mark with its own UKCA (UK Conformity Assessed) marking for certain products and while transitional measures have been in place, ensuring compliance is an ongoing consideration. Data protection is another critical area, with the UK's GDPR framework closely mirroring its EU counterpart. However, international data flows are subject to adequacy decisions and companies must ensure their data handling practices are fully compliant with UK law.

Beyond the regulatory and procurement hurdles, a lack of local knowledge can be a significant barrier to entry. Understanding the unique transport challenges of different UK regions, from the dense urban environment of London to the rural landscapes of Scotland and Wales, is essential for tailoring effective solutions. Across England, a tapestry of local authorities are responsible for local highways in their areas, whilst the devolved administrations in Scotland, Wales and Northern Ireland have their own transport strategies and priorities. Transport Scotland, for instance, has a strong focus on sustainable transport and is actively investing in ITS to support its net-zero ambitions. Foreign companies that can demonstrate an understanding of these regional nuances and align their offerings with local policy objectives are more likely to succeed.

Intellectual property protection is another key consideration. The UK has a robust legal framework for protecting IP rights and foreign companies should ensure they have taken the necessary steps to safeguard their innovations when entering the market.

Keys to Unlocking the UK Market
For foreign ITS companies with a strategic and well-informed approach, the UK market remains a prize worth pursuing. Building strong local partnerships is often the most effective route to market. Collaborating with established UK-based companies, academic institutions, or consultants can provide invaluable local knowledge, help navigate the procurement landscape and build credibility with public sector clients.

A clear and demonstrable value proposition is also essential. With a mature market and a number of established domestic and international players, new entrants must be able to clearly articulate how their solutions are more innovative, cost-effective or better suited to the UK's specific needs than a competitor's. A focus on delivering tangible outcomes, such as reduced congestion, improved air quality or enhanced passenger safety, will resonate strongly with UK transport authorities.
Finally, a long-term commitment to the UK market is crucial.

Success is unlikely to be instantaneous and requires a sustained effort to build relationships, understand the evolving policy landscape and adapt solutions to meet the changing needs of the UK's transport network. Those who invest the time and resources to do so will find a market that is not only profitable but also at the forefront of the global transition to a smarter, more sustainable transport future.

> To find out more, scan the QR code or go to: **https://youtube.com/shorts/OAE1KWRgOR0**

Also, find more details about UK ITS localisation and sector appropriateness: **https://alistairgollop.com**

USING TECHNOLOGY TO MAKE ZEBRA CROSSINGS SAFER

In our rapidly evolving urban landscapes, the seamless flow of traffic and the safety of pedestrians are paramount. As cities become denser and more dynamic, the challenges of managing complex interactions between pedestrians, cyclists and vehicles grow exponentially. Many of us will be familiar with the concept of kerbside and on-crossing pedestrian detection at signalised crossings, but how can you use this type of technology to make non-signalised Zebra-style crossings safer too? As we continue to transform our streets in response to the change in the hierarchy of road users, which elevates active and public transport modes above vehicular traffic, we are starting to see innovations which offer, in this case, pedestrians, safety enhancements for the ubiquitous Zebra crossing, located across most urban neighbourhoods. This particular innovation is from a company called **Streetwise Technology**, who are reimagining pedestrian safety with a human-centred, data-driven approach that is set to transform our streets.

The Enduring Challenge of Pedestrian Safety

Every day, our city streets witness countless near-misses and, tragically, accidents involving pedestrians. These incidents highlight a critical vulnerability in our urban design. Congestion, increased vehicle numbers and the sheer complexity of modern traffic flows contribute to a hazardous environment for those on foot. The question, then, is how can we improve the safety of active transport modes when crossing the street at Zebra-type crossings?

Many of us will be familiar with the concept of pedestrian kerbside and on-crossing detection at signalised crossings, such as PUFFINS. These devices are used to detect the presence of pedestrians waiting to cross at the kerbside and can then be used to increase the crossing period in response to users taking longer to cross, typically due to mobility impairments. So, how can this type of safety feature be implemented at Zebra crossings where there are no traffic signals which can be used to provide clear instructions to drivers of approaching vehicles?

What is a Zebra Crossing?

Categorised as a 'Controlled Crossing', Zebra crossings are most easily recognised by the presence of a black and white striped crossing and flashing yellow globes, commonly referred to as Belisha beacons. They are only located on roads with a 30 mph or less speed limit and minimise delays to pedestrians because they have precedence over vehicles. According to the Highway Code, drivers "*should give way to pedestrians waiting to cross and MUST give way to pedestrians on a zebra crossing*".

To see the accompanying video, scan the QR code > or go to: **https://youtu.be/TFrs-MK6LMo**

Enhanced Pedestrian Safety: A Proactive Approach

At its core, the **Streetwise Technology** system uses sophisticated radar technology to identify the presence of pedestrians, cyclists and vehicles. However, unlike camera-based systems, which can raise privacy concerns, the use of radar detection accurately identifies the presence of users without capturing identifiable footage. This crucial distinction ensures privacy while delivering highly precise data.

As a pedestrian approaches a Zebra crossing, the smart beacon instantly registers their presence. If the system detects an approaching vehicle and its AI predicts a potential conflict, it can trigger immediate, targeted alerts to the driver and the pedestrian. It's an intelligent intervention system designed to capture a driver's attention precisely when it matters most, preventing an incident before it occurs.

How Does it Work?

The equipment is pole-mounted on the Belisha beacon poles on both sides of the crossing. Currently, this is in a small box enclosure, but this could be integrated within the beacons themselves. The radars are used to detect and categorise pedestrians, cyclists and vehicles and using edge processing, can determine if a potential conflict may occur.

This information can then be used in a number of ways:

- **In-vehicle Pedestrian Warning System** – Drivers of approaching vehicles can be notified of the presence of a pedestrian on the crossing using connected vehicle facilities. Streetwise are working with Vodafone using the STEP network to provide instant communication to connected vehicles.
- **Pedestrian Warning System** - A particularly groundbreaking feature for accessibility is the potential integration with 'Auracast' Technology. This innovative capability allows the system to broadcast location-specific audio directly to compatible Bluetooth-enabled hearing aids and other supported devices, including Smartphones and Watches.
- **Beacon Display** – For non-connected vehicles, a simple solution to warning drivers could be to integrate this system into the Belisha Beacons. Many modern beacons are equipped with a Halo display to make the flashing yellow display more visible to drivers. This could potentially be used to provide a display to indicate the presence of a pedestrian.

Other Uses

This system also offers the potential to provide data for a range of uses, including near-miss heatmaps, predictive risk notification and increased insight for optimising traffic planning.

The Future of Urban Mobility

Streetwise Technology is delivering more than just a pedestrian warning system, it is helping to build a more responsive, intelligent and human-centric urban infrastructure. By leveraging advanced sensor technology, AI-driven analytics and connected systems, they are actively creating streets that offer a safer, more efficient and accessible environment. The future of urban mobility is here and it's looking brighter – and certainly safer – thanks to pioneering innovations like those from Streetwise Technology. As ITS professionals, understanding and embracing such advancements will be key to shaping the smart cities of tomorrow.

To find out more, visit **Streetwise Technology** at:
https://streetwise.technology/
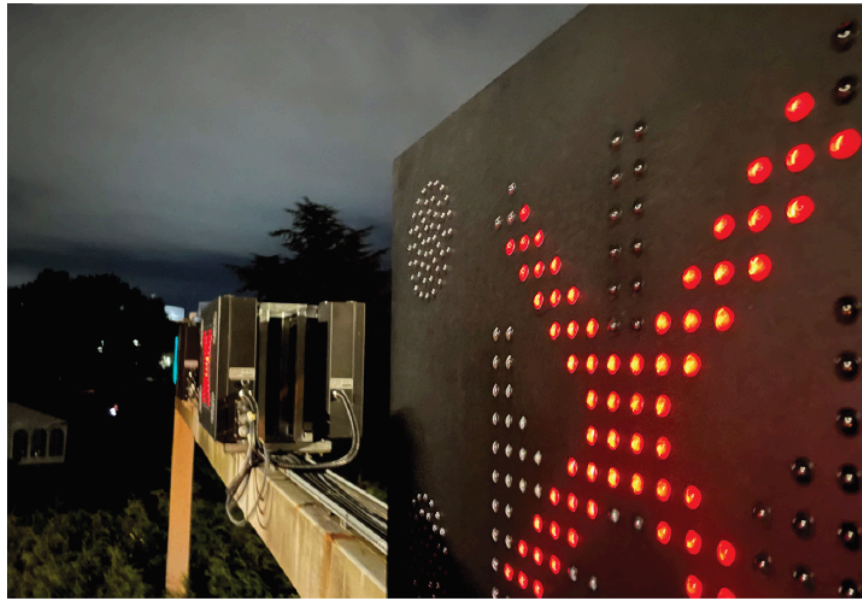
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ITS & Traffic Signal Consultancy

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Your Fractional Intelligent Transport Systems (ITS) Technical Advisory Executive

In today's world, our transport networks are complex ecosystems, undergoing a profound transformation driven by technology. Creating infrastructure that is safer, more efficient and sustainable requires more than just new hardware or software. It demands deep expertise, strategic foresight and a clear understanding of how technology translates into real-world value.

As a highly experienced and respected freelance consultant, I provide a comprehensive range of Intelligent Transport Systems (ITS) and Traffic Signal consultancy services to navigate this complex landscape. My mission is to be the critical link between technological potential and practical implementation, ensuring innovation delivers meaningful outcomes.

I work with a diverse client base, including **highway authorities**, **engineering** / **management consultancies** and **commercial technology firms** to deliver expert guidance, innovative solutions and tangible results for transport infrastructure projects. The common thread in my work is bridging the critical gap that often exists between different stakeholders. Public authorities need to procure effective, future-proof solutions; technology companies need to align their products with genuine market needs; and engineering consultancies require specialist knowledge to deliver robust project designs. I operate at the nexus of these requirements, speaking the language of public policy, commercial strategy and technical engineering with equal fluency.

For my **public sector clients**, I provide independent, expert advice on everything from strategy development and systems specification to procurement support and project assurance. My guidance ensures that investments in new technology are sound, deliver maximum public benefit and avoid costly pitfalls. When partnering with other **consultancies**, I act as a specialist extension of their team, bringing niche expertise in advanced traffic signal control, ITS architecture and emerging mobility trends to enhance their project delivery capabilities.

For commercial **technology firms**, both established players and market entrants, I provide the strategic insight needed to succeed. This includes critical guidance on product localisation for the UK market, identifying the most appropriate applications for new solutions, facilitating strategic introductions to key industry players and providing technical business development support. By aligning your innovative technology with the specific challenges and procurement frameworks of the transport sector, I help accelerate your path to commercial success and impactful deployment.

Ultimately, my work as a technologist, author and speaker is driven by a passion for creating better transport systems. Whether I'm designing an advanced traffic signal strategy, advising a company on market entry or speaking at an industry conference, my goal remains the same: "*to apply deep technical knowledge and strategic thinking to solve real-world problems*".

I invite you to explore my services and learn how we can work together to shape the future of mobility on my **newly updated website**, I look forward to hearing from you.
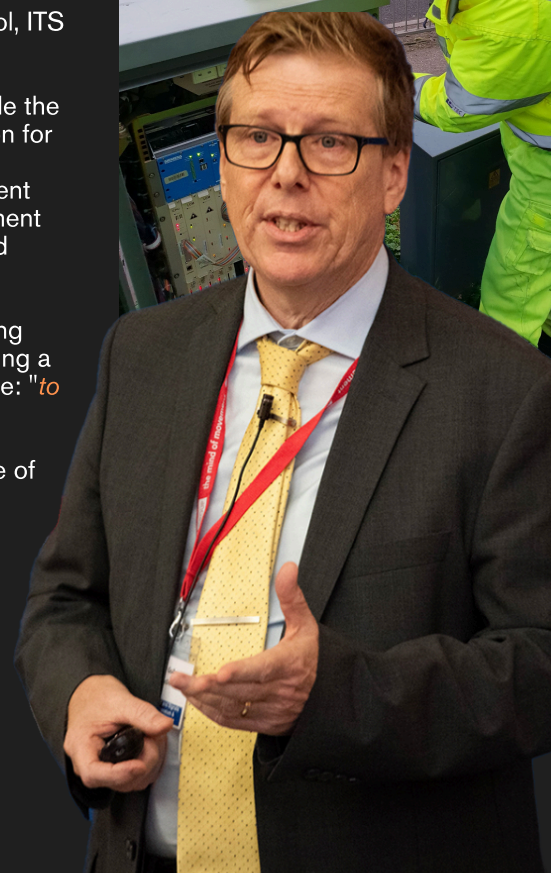
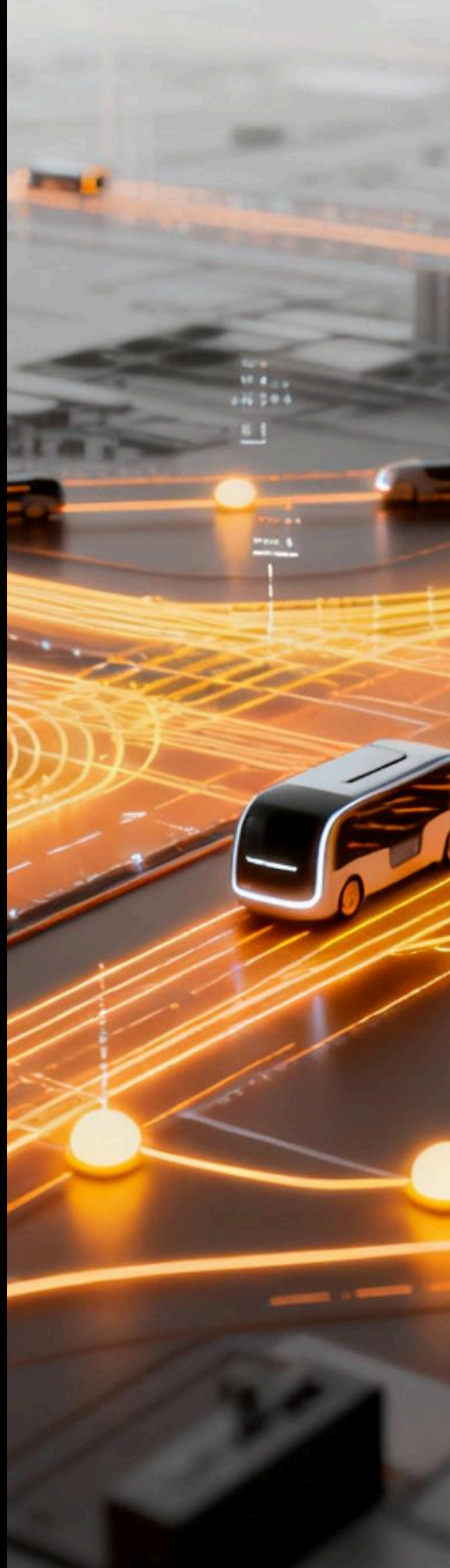Web: AlistairGollop.com

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ITS Now exists to provide informative and educational resources about Intelligent Transport Systems (ITS), and should be of interest to technology practitioners in highways and mobility, along with people working in other engineering disciplines and for anyone who has an interest in transport generally.

Resources include our website - **ITSNow.org**, YouTube channel **@ITSNow** and **ITS Edge** magazine, along with our original books and articles on a broad range of related topics.

Intelligent Transport Systems - Explained

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