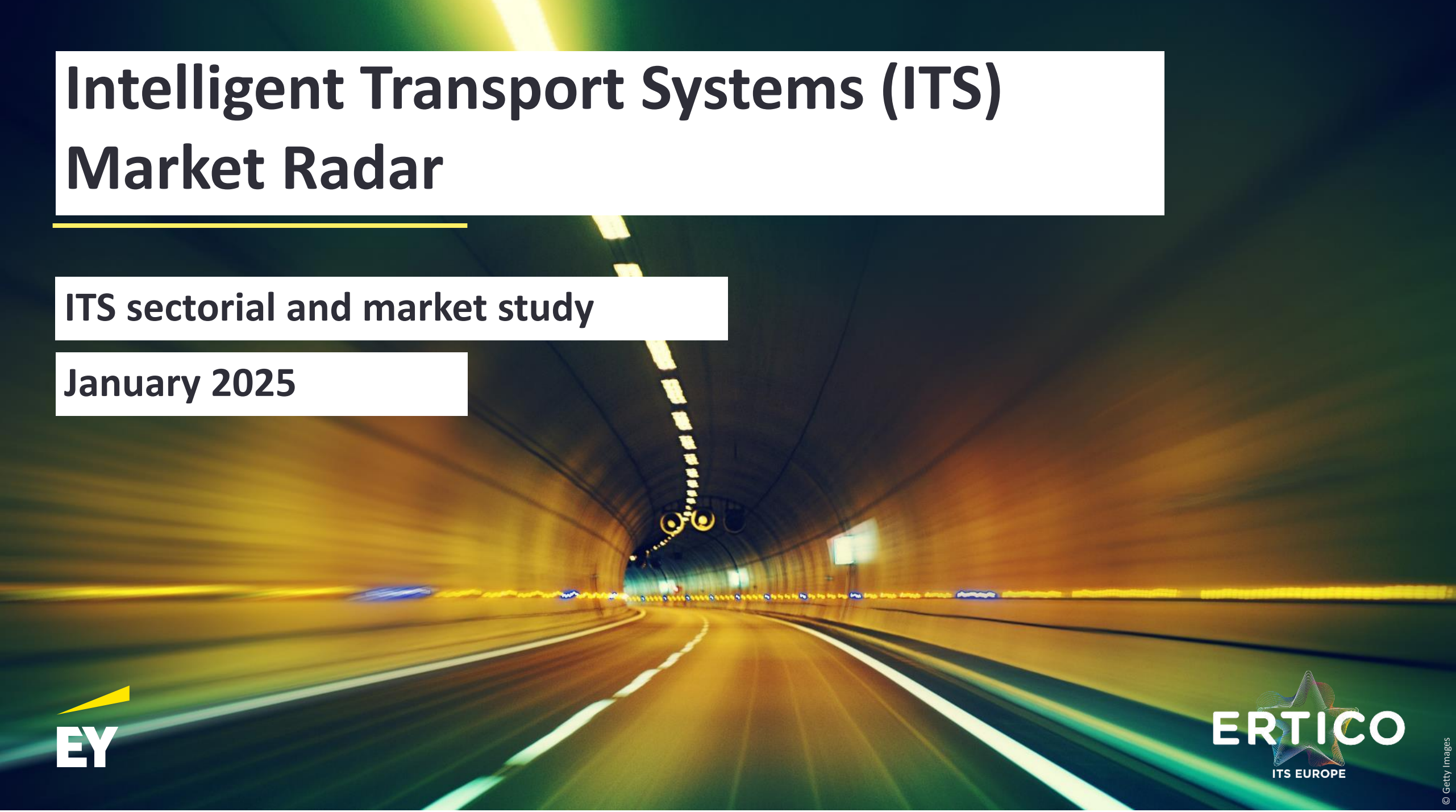
Intelligent Transport Systems (ITS) Market Radar

ITS sectorial and market study

January 2025



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More information on ERTICO is available on the Internet (https://ertico.com).

Publications, 2025

Issue 2

Public Authorities sector

Research sector

Users sector

Dear Reader,

Welcome to our second edition of the ITS Market Radar!

ERTICO-ITS Europe was established in 1991, driven by the European Commission's initiative to foster innovation in the transport value chain. Since then, we have successfully completed over 100 EU-funded projects, hosted 30 ITS Congresses, and engaged in numerous research activities. Our journey continues with a focus on European leadership in smart and sustainable mobility. Innovative technologies and new ways of moving and living have deeply integrated our sector into daily life, whether as consumers, businesses, associations, or public authorities. Our eight sectors within the ERTICO Partnership, where we connect the dots, exemplify this integration.

The ERTICO Partnership remains committed to advancing Intelligent Transport Systems and services. As part of our thought leadership and advocacy efforts, we continuously assess trends, challenges, barriers, and opportunities in our sector. The first ITS Market Radar report, published in January 2024 (link), covered the Service Providers and Traffic & Transport Industry sectors.

I am pleased to present this second ITS Market Radar report, which focuses on three additional sectors within the ERTICO family: Public Authorities, Research, and Users.

Enjoy the read and stay tuned on www.ertico.com!

Joost Vantomme

CEO of ERTICO – ITS Europe

Brussels, January 2025

Welcome to the Intelligent Transport Systems (ITS) market report, a partnership between EY Belgium and ERTICO, tailored for the research sector, the public authorities, and users. ITS have the extraordinary capacity to transform the way we move, leading to a transport ecosystem that is more sustainable, safe, and efficient. In line with the European Union policies and initiatives for Smart and Sustainable Mobility, and with ERTICO's projects, events, and expert insights, this report delivers an in-depth analysis of these domains, delving into the principal trends, obstacles, and opportunities.

This report is structured as follows:

- **Introduction and sectorial transition** introduces an ITS sector overview, the scope of the report, the historical context and evolution of the sector, the ecosystem of the ERTICO sectors.
- **Key trends and innovation** delves into the mobility developments related to automation, connectivity, efficiency and sustainability that are reshaping transport.
- **Users** provides insights into the behaviours, preferences, and experiences of individuals and communities within the mobility ecosystem.
- **Sectorial figures** presents an analysis of statistical data, offering a quantitative perspective on the performance and impact of mobility sectors.
- **Employment** explores the job market dynamics, highlighting employment trends, skill demands, and workforce developments within the mobility industry.
- **Key challenges** investigates the primary obstacles and issues facing the mobility sector, discussing their implications and the efforts to address them.
- **Key projects and partnerships** outlines significant initiatives and collaborations that are driving innovation and progress in the mobility landscape.
- **Annexes** conclude the market report with the methodology used, namely regarding the stakeholder consultation.

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1. INTRODUCTION AND SECTORIAL TRANSITION

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ITS overview and introduction

ERTICO adopts a holistic approach to sustainable and smart mobility including Connected, Cooperative and Automated Mobility, Urban Mobility, Clean and Eco-mobility, Transport for logistics *while emphasising cross-sector activities like interoperability to enhance the digitalisation of transport systems. To ensure seamless service integration and data exchange, ERTICO facilitates cooperation between eight different sectors from the private industry and public sector.*

Regulatory developments and communications at EU level shaping the ITS industry

Regulation (EU) 2024/1679: Development of the Trans-European Transport Network (TEN-T) aiming for an integrated and intermodal transport infrastructure across Europe, connecting key transport hubs via rail, road, and waterways.

EC Staff Working Document April 2024 on 'Status of progress on Connected, Cooperative and Automated Mobility in Europe'

Implementing Regulation 2022/1426: Establishing uniform procedures and technical specifications for the type-approval of the fully automated vehicles' automated driving system (ADS).

Directives 2010/40/EU & 2023/2661/EU: Framework aiming to accelerate ITS deployment in Europe with other modes of transport, including multiple Delegated Acts

Regulation (EU) 2019/2144: General safety standards for motor vehicles and their components.

Regulation (EU) 2019/881: the Cybersecurity Act provides a unified approach to cybersecurity across the EU, facilitating the operation and interoperability of ITS services.

COM(2020) 789 final: EU strategy for sustainable & smart mobility, making the EU transport system sustainable, smart and resilient.

COM(2019) 640 final: European Green Deal, setting EU's commitment to sustainability and reducing greenhouse gas emissions in transport.

COM(2016) 766 final: EU strategy for ITS through the promotion of cooperative, connected and automated mobility.

ERTICO vision and mission for intelligent transport systems

Empowering intelligent, safe and resilient mobility for an inclusive and sustainable society

To enable its vision, ERTICO connects stakeholders, leverages innovation and knowledge, and promotes deployment of an integrated and user-centric transport system while fostering digitalisation, competitiveness, leadership and future growth in alignment with European values.

Overview of the ITS sector and ERTICO focus areas

Intelligent transport systems refer to the integration of telecommunications, electronics and information technologies with transport engineering to provide innovative services for different modes of transport and traffic management. While promoting ITS, ERTICO focuses on building a cleaner, safer and more efficient transport system through four focus areas, as described below.

Connected, cooperative and automated mobility (CCAM)

Developing and integrating technologies that enable vehicles to communicate with each other, with traffic infrastructure and with other road users (pedestrians, cyclists), facilitate automated driving and enhance traffic flow and safety.

ERTICO fosters stakeholder collaboration and standardisation to integrate CCAM into the transport system, while supporting decarbonization as per the EU Green Deal.

Urban mobility

Implementing smart solutions and encouraging multimodal travel allow to mitigating specific challenges of transportation in urban environments such as congestion and accessibility.

ERTICO identifies specific areas of interest in new and emerging mobility services: mobility-as-a-Service (MaaS), such as on-demand and shared vehicles; active mobility (cycling and walking); and urban air mobility.

Clean and eco-mobility

Reducing the environmental impact of transport and improving air quality, namely for a climate-neutral transportation sector.

In alignment with the EU's ambitious emission targets, ERTICO aims at promoting the use of clean and sustainable energy sources (e.g. electricity, hydrogen), through more energy-efficient and eco-friendly vehicles as well as zero-emissions vehicles.

Transport for logistics

Optimising freight transport and logistics operations to enhance the reliability and security of supply chains through the application of ITS technologies.

This sector is moving towards a data-driven, technology-empowered network, focused on efficient, secure, and sustainable multimodal transport, with ERTICO at the forefront of advancing innovation and advocating for eco-friendly practices.

Historical context and sector evolution – focus on latest developments

Over the years, the ITS industry has undergone significant growth and transformation. The sector has seen impressive progress that have fundamentally changed our understanding and interaction with transport. ITS is one of the solutions to the escalating difficulties brought on by intricate transport networks, driving the demand for more intelligent, efficient, and eco-friendly approaches to mobility.

Key breakthrough developments for the industry

Now

Advanced automation and Interconnectivity: Advancements in connected vehicle technologies and the Internet of Things (IoT) are laying the basis for Connected, Cooperative and Automated Mobility (CCAM).

2010s

Launch of mobile navigation applications & autonomous vehicle experiments: Tools for route planning and navigation along with successful pilot programmes towards future automated and driverless transportation.

2000s

Establishment of ITS regulations and standards: Worldwide acceptance leading to unified standards for system interoperability and cohesion. Integration of telematics and tracking technologies in road transportation.

1990s

Automated toll payment systems: The introduction of electronic tolls streamlining vehicle traffic.

1960s

First traffic control systems: The inception of intelligent transport systems, focusing on data-centric traffic management.

Notable achievements in the ITS field

The ITS sector has achieved significant milestones, including:

- ✓ Connected and automated vehicles (Vehicle-to-Everything communication)
- ✓ Mobility as a Service (MaaS) (subscription-based models, multimodal trips)
- ✓ Electrification and clean mobility (e-bikes and scooters, low-emission zones)
- ✓ Big Data and predictive analytics (machine learning algorithms)
- ✓ Cellular and short range connectivity (real-time data transmission)

Ecosystem of ERTICO sectors and actors

ERTICO sectors are represented by its members within the sectors below. Their synergy is crucial for the successful deployment and operation of ITS. Each contributes to the system's overall functionality and efficiency, and collaboration is key to addressing the complex challenges of modern transportation.

Public authorities

*Responsible for facilitating the implementation of ITS, they set regulations, standards, provide funding for research and development, and ensure that the transport systems meet the safety, journey and efficiency needs of the public. They also manage public transport systems and infrastructure. Public authorities **can be both ITS service providers and users**. E.g. Ministries, public roads administrations, city councils.*

Research

*Focuses on innovation and the development of new technologies and methodologies to improve transportation. Research institutions often **collaborate with industry partners and public authorities** to develop and test new ITS solutions. E.g. Universities, research centres.*

Industry

Suppliers

Provide the hardware and software components that are essential for ITS, including sensors, control units, traffic signal systems, and the software platforms that analyse and manage the data collected.

Vehicle manufacturers

*Integrate ITS technologies into their vehicles, enabling features such as ADAS, in-car navigation, and automated driving capabilities. They **work closely with suppliers and connectivity providers to ensure their vehicles can communicate** with the ITS infrastructure.*

Connectivity industry

Provides the necessary communication technologies that allow for information exchange between vehicles (V2V), infrastructure (V2I), and networks (V2N). It is the backbone that enables ITS to function by allowing real-time data sharing and communication.

Traffic and transport industry

Companies and organisations that manage and operate transportation systems, such as transit companies and logistics providers. They use ITS to optimise routes, reduce congestion, and improve overall efficiency.

Service providers

*Develop and offer services based on the data and connectivity provided by ITS, including traffic information services, route guidance, payment services for tolls and parking. They **rely on public authorities and research to access the data** necessary to offer their services.*

Users

*Public and commercial transport operators are the main users of ITS services, also including end-users of ITS services (e.g. drivers, passengers). They benefit from the enhanced safety, reduced travel times, and increased comfort provided by ITS services. They **provide the feedback and the demand that drives innovation and adoption** of ITS technologies across all sectors.*

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2. KEY TRENDS AND INNOVATION

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General key trends in ITS

The Intelligent Transportation Systems industry is a vibrant and constantly changing field that consistently adopts new technologies, concepts, and methods. As digitalisation accelerates and innovations emerge, the sector of transportation is experiencing a significant transformation. This change is reflected in the current and future identified trends from the ***research sector*** *and* ***public authorities****' insights.*

This section aims to present an **overview of the current and emerging trends** considered in the ITS sector:

- ✓ Key sectoral trends that are contributing to the successful adoption of ITS within the Research sector and among Public authorities.
- ✓ Key benefits and roles of Research and Public actors for the top trends.
- ✓ Highlighting the current and future trends, with specific insights identified by ERTICO's member organisations thanks to a survey.
- ✓ Future research topics related to Intelligent Transportation Systems.

Latest key trends in the ITS sector that help foster a more sustainable, safe and inclusive transportation ecosystem

Public authorities

- Higher levels of automated transport
- Electrification of transport
- Intermodal transportation systems
- Cybersecurity
- Improving road safety
- Inclusivity and accessibility

Public authorities are also focusing on sustainable mobility as well as on talent engagement and retention.

Research organisations

- Artificial intelligence and machine learning
- Autonomous vehicles and self-driving technology
- 5G, 6G and wireless communication
- Datafication of the sector
- Predictive modelling and analytics
- Internet of Things (IoT) connectivity

Research actors are currently focusing on these trends: human-machine interaction for user-friendly interfaces for operators and passengers, connectivity (e.g. vehicle-to-vehicle (V2V), vehicle-to-everything (V2X)) and ITS for climate and for health.

Key general trends among Public Authorities

The selection of trends presented below are based on the contribution of ERTICO's public authority partners in determining the top key trends which they believe has the most impact on ITS in their respective field, with #1 being the trend with the most anticipated impact. This section dives into the factors and the benefits of the most important ITS trends and defines the role of public authorities for each of them.

Key trends which are shaping the future of ITS for Public authorities:

#1 Higher levels of automated transport

#2 Electrification of transport

#3 Intermodal transportation systems

EY, ERTICO partners survey (2024)

Insights from ERTICO partners on the #1 trend

Higher levels of automated transport within the ITS sector, such as future automated feeder traffic and public transport services, bears significant growth potential and is an enabler for improved road safety, reduced energy consumption and greener power solutions.

Anticipated benefits include reduced traffic congestion due to improved efficiency with vehicle-to-vehicle (V2V) and infrastructure-to-vehicle (I2V) communication, safer traffic by reducing the probability of accidents with the use of advanced sensors and AI, potential environmental benefits by optimising fuel or battery usage, and improved accessibility for people.

It will **drastically change business models** via the introduction of new services for passengers and freight. However, public authorities must learn how to scale these services to collect all growth benefits.

Public authorities' role in key trends

Ahead of these trends, the implementation of basic requirements must be prioritised before all actors adopt ITS solutions (e.g. road marking and signs should be uniform at national level).

#1 Authorities create a regulatory environment that ensures the safe integration of autonomous vehicles into existing road networks, including establishing safety standards, updating traffic laws, and investing in pre-required and necessary infrastructure. They also engage in public education campaigns to build trust in autonomous technologies and address privacy, ethical and environmental concerns. **Authorities' role is key to set the priorities, such as renewing and maintaining road infrastructure, to successfully achieve ITS deployment**.

#2 By promoting electric vehicles (EVs), **authorities support the transition to a more sustainable transportation system** and the benefits it can bring, such as reduced greenhouse gas emissions and lower dependence on fossil fuels. They can invest in the necessary infrastructure (e.g. accessible EV stations) and provide incentives for the adoption of EVs, such as tax breaks, subsidies, or access to carpool lanes. **By setting such policies or schemes that encourage the use of EVs, public authorities are facilitating the uptake of ITS.**

#3 Authorities can invest in the necessary digital infrastructure to enable information sharing across different transport modes and operators. They can enact policies and establish partnerships between private and public transportation providers, ensuring a cohesive transportation network addressing user needs. **On top of being a key factor for increased sustainability, the integration of intermodal transport services offers the promise of a more efficient and user-friendly travel experience** coordinated through smart technology.

Key general trends in Research

The selection of trends presented below are based on the contribution of ERTICO's partners involved in research in determining the top three key trends which they believe will have the most impact on ITS in their respective field, with #1 being the trend with the most anticipated impact. This section dives into the factors and the benefits of the most important ITS trends and defines the role of research for each of them.

Key trends which are shaping the future of ITS in Research:

#1 Artificial intelligence (AI) and machine learning

#2 Autonomous vehicles and self-driving technology

#3 5G, 6G and wireless communication

EY, ERTICO partners survey (2024)

Insights from ERTICO partners on the #1 trend

AI and machine learning will be extensively used in most tools related to mobility (e.g. smartphones, vehicles). As the impact of this technology in other sectors is already visible, the potential for the ITS sector is perceived as huge – namely for enabling new capabilities in traffic management and for enhanced road safety. AI and machine learning is also seen as one of the main technologies for achieving the 2030 UN sustainable goals.

Research's role in key trends

#1 Artificial Intelligence and machine learning enable the analysis of vast amounts of data from various sources, such as traffic patterns, vehicle diagnostics, and road conditions, to improve traffic management, reduce congestion and enhance safety. **Research can help develop more efficient and adaptative algorithms**, namely for real-time decision-making, predictive maintenance, and personalised travel.

#2 Research for autonomous vehicles is crucial for **addressing challenges related to safety, ethics, and legal frameworks**, and for exploring their integration with existing transportation networks, infrastructure, and systems. Core technologies are the focus of this topic, including sensors, computer vision, and navigation systems. The widespread adoption of CCAM could lead to a significant change in mobility, by reducing accidents and increasing road capacity.

#3 As an opportunity to enhance ITS, 5G and 6G are a very relevant topic for research. Indeed, 5G still needs to be explored for mobility, and the benefits of 6G are starting to be studied. Connectivity is important as **higher levels of automation as well as autonomous systems** cannot be adopted without it.

Future research focus and technological trends

- ✓ Climate and health considerations, as ITS can foster new behavioural shifts.
- ✓ Emerging technologies such as artificial intelligence, sensor technologies, V2X, and 6G, to optimise traffic and reduce congestion.
- ✓ Vehicle sensors can enhance near-miss and incident predictions, contributing to vulnerable road users' safety.
- ✓ Emphasis on CCAM, MaaS, Software-Defined Vehicles, and air mobility, to provide efficient and safer transportation options for all users.

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3. USERS

Overview of the ITS user group

Intelligent Transportation Systems serve a diverse array of users, ranging from public and commercial transport operators to individual drivers and passengers, all of whom play a role in the deployment and use of ITS services. These stakeholders benefit from the advancements in safety, efficiency, and comfort that ITS technologies provide and which are promoted by ERTICO across Europe.

The **users of ITS** can be categorised as follows:

- Public and commercial transport operators constitute the main **users** of ITS solutions and infrastructure. They are partially in charge of offering and deploying ITS services and comprise public transit vehicles (e.g. buses, trains, logistics), commercial vehicles (e.g. trucks, delivery vans), and emergency vehicles (e.g. ambulances, fire trucks). These involved different users at local, regional, and national levels.

- Drivers and passengers are considered the **end-users** of the ITS ecosystem. They benefit from the enhanced safety, reduced travel times and increased comfort provided by ITS services. They provide the feedback and the demand that drives innovative services and adoption of ITS technologies across all sectors. This user group includes vulnerable groups and the general public for which their opinions are considered from a policy-making or consumer angle.

ERTICO **research partners** primarily engage with the following user groups on ITS services:
1. General public
2. Public transport operators
3. Commercial transport operators

ERTICO **public authority partners** primarily engage on ITS services with the below user groups:
1. Public transport operators
2. Commercial transport operators
3. Pedestrians, cyclists, and vulnerable groups (e.g., elderly, disabled)

Other groups such as national or local administrations and authorities, decision- and policy-makers, manufacturing firms, and insurance firms are also involved, depending on the specific missions of the organisation.

Some ERTICO public partners have a role as a **national contact point for users** who want to develop and implement ITS products and services. This way, institutional support can enable different stakeholders to form national consortia to participate in various European projects in the ITS sector, or authorities can advise them on the type of investments which could be beneficial during a specific period.

Challenges

The user groups are central in shaping the ITS ecosystem, namely by expressing their needs and requirements which are the basis for ensuring a successful development and deployment of ITS solutions. However, within the ecosystem, user groups may contribute to a slow ITS uptake as one main challenge rises: the lack of awareness of ITS solutions and their benefits. The below subsection therefore details this challenge and its factors.

Lack of knowledge of ITS solutions and their benefits

Users

Users, such as car concessions companies, may not be fully aware of ITS technical capabilities or solutions. However, they are aware about the benefits it can bring to them and to their customers/end-users. A related challenge is that their customers might be reluctant when it comes to some ITS services such as autonomous vehicles or systems. Therefore, most user groups are depending on their customers' needs which can hinder the adoption of some ITS solutions.

End-users

On average, ERTICO partners indicated that end-users (car drivers), mainly from the elderly, were not very knowledgeable about ITS solutions (e.g. ADAS systems, infotainment systems, parking assistance systems). Indeed, the general public has to get used to new ITS solutions for a large-scale deployment of services. The most important aspect is to link these services with their added value, by showing end-users in which way they are helpful (e.g. safety benefits).
It was nevertheless mentioned that younger drivers or passengers are less reluctant to use new functions and digital ITS solutions than older persons who have long-time habits.

Other challenges arise such as financial constraints for buying a new car equipped with ITS, especially electric vehicles.

Factors contributing to users' the lack of knowledge

1. Lack of awareness about the benefits and value of ITS solutions and services
2. Complexity of the ITS solutions and services, making it difficult for users to grasp
3. Lack of understanding of the ITS solutions contributions towards their vision and objectives
4. Lack of user acceptance / resistance to adopting new technologies
5. Lack of time or resources to consider ITS solutions and services
6. Unsatisfactory experience with ITS innovation deployments

Way forward

This section addresses the challenges identified in the previous slide, namely the lack of awareness and acceptance of some ITS solutions. It provides potential actions and interventions to implement locally in order to enhance the deployment of these solutions and services. This involves engaging with user communities and including them in the ITS ecosystem.

Filling in the acceptance and awareness gaps

By actively engaging with public and commercial operators, and other stakeholders, ITS solutions can be tailored to **meet the specific needs and challenges of users and end-users**. Establishing user groups and feedback channels ensures that ITS solutions are user-centric, practical, and more likely to be adopted.

Experts mentioned that, while citizens are first reluctant, showcasing pilots for autonomous shuttle drives acceptance among them. It is therefore highly important to **bring the new technology to the users** to better understand the benefits, as long as their needs were considered for the development of the solution.

The key to fill in the awareness gaps is to link ITS solutions to their added value in a clear way, e.g. by showing the users that some services are helpful in terms of safety. People will get used to it, allowing for large-scale deployment of ITS. There is a need to **showcase solutions to the outside community** of ITS.

If the acceptance gap is not fulfilled, there will be an issue of good technological solutions developed but with low use.

Inclusivity and accessibility: New mobility for all citizens

Many rural areas where there are on-demand services or shared mobility services are still **underserved**. Additionally, as the percentage of the elderly population is expected to increase in Europe, new technologies should be easy to use. Indeed, **user experience** should be facilitated, and systems should be intuitive.

Identified actions for users

1. **Involve users or user representatives** to consider their needs and requirements in the development of ITS solutions or in decision-making processes
2. **Promotional efforts and resources to educate users**, especially on successful business use cases of using ITS
3. **Training or onboarding programmes** (e.g. for public sector employees of a specific authority)

Some of the ERTICO public authority partners have already implemented information initiatives on ITS services with their specificities and different purposes.

Identified actions for end-users

- ✓ Awareness campaigns and events are proved to be effective for end-users to fill in any gaps related to knowledge about ITS solutions. In this sense, online face-to-face workshops, trainings and surveys are believed to be the most effective for public engagement. Some of ERTICO partners have launched events open to the public to discuss various topics related to intelligent, connected and sustainable mobility.
- ✓ Co-creation methods with end-users for policy-making better fitted to their needs.
- ✓ Engagement with end-users at a regional or local level.

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4. SECTORIAL FIGURES

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Funding overview and expected developments

A financial snapshot of the ITS market is presented here, focusing on the budgetary insights from ERTICO organisations and the impact of European Union funding. Through targeted interviews, we unveil the financial figures that will shape the ITS industry's growth and the strategic use of EU contributions in fostering advancements in this dynamic sector.

ERTICO partners' insights

- There is a **call for greater specificity and clarity in EU funding**, with an emphasis on deployment and operational aspects of ITS. ERTICO is well-positioned to accelerate deployment across Europe by collaborating with national ITS organisations and the European Commission. To align with the European Commission's objectives, EU funding programmes should be refined accordingly.
- However, it is important to recognise that simply increasing the budget or expenditure does not guarantee the advancement of ITS. Experts highlight that investment success hinges on quality rather than quantity; organisations must **prioritise strategic expenditure of EU or national funds** to meet the defined objectives.

EU funding programmes which constitute a large part of partners' project fundings

- ✓ **Horizon Europe, "Cluster 5 – Climate, Energy and Mobility"**: as the current framework programme for R&I, Horizon Europe focusses on industrial competitiveness, smart mobility, and on safer and more sustainable and accessible transport and mobility. Key Digital Technologies partnership is also an interesting instrument from the programme, boosting Europe's electronics industry.
  - ✓ Horizon Europe ITS-related projects include many areas such as CCAM, zero emission transport, city planning and sustainable batteries.
  - ✓ Since 2021, 27 CCAM projects were supported for a total of 208 million euros.
  - ✓ Former framework programme "**Horizon 2020**" supported 27 ITS projects for a total for 108 million euros.
- ✓ **Connecting Europe Facility (CEF)**: supporting transport and connectivity infrastructure projects, in line with the implementation of TEN-T.
  - ✓ Since 2014, the CEF supported 60 projects with 660 million euros of EU funding, resulting in a total of 1,57 billion euros of investments.
  - ✓ In the last 5 years, an estimated 75 lives were saved, and 2,000 injuries were prevented thanks to ITS implementation, supported by the CEF, resulting in approximately 55 million euros safety-related cost-savings.

Additionally, research organisations also benefit from the **Digital Europe Programme** aiming at developing connectivity and artificial intelligence-related projects. More than 20 million euros of EU contribution is for Transport & Mobility projects.

Public authorities

The following details provide an overview of the financial landscape within public authorities, summarising past and anticipated funding for ITS-related research, projections on budget evolution, and expected sector expansion. To complement the figures, specific insights on financial trends are provided by ERTICO's public sector partners. These insights help to understand the broader financial context and the anticipated growth and development within the sector.

Budget for ITS

There is no European imposed system based on the budgetary information collected; as organisations from different countries and levels were surveyed, a comparison analysis is complex. Here are the takeaways:

- Half of the public authorities surveyed have an annual **ITS budget** lower than 0,5 million euros. Rare are the public authorities that possess a budget over half a million euros, and nearly inexistant are those who have a budget over 10 million euros.
- For the **mobility budget** however, including ITS activities, results show that most of ERTICO public partners have between 1 and 5 million euros budget, and nearly 1/3 of these partners have a mobility budget which is above 100 million euros. The mobility budget can include various investments ranging from transportation and vehicle infrastructure, road maintenance and construction, cycling and pedestrian facilities, to public awareness campaigns.

- ✓ Budget for ITS activities remained stable and unchanged from 2023 to 2024.
- ✓ Over the next five years however, most partners see a slight increase in their organisation's budget or spending from ITS.
- ✓ More than 3/4 of public authorities indicated to have received less than 1 million euros funding from EU programmes, while the rest received between 1 and 10 million euros funding. However, no decrease nor increase is foreseen in EU or national grant funding for ITS-related research projects in the years to come.

Research sector

The below information offers a snapshot of the Research sector's financial landscape, outlining past and future ITS-related research funding, expectation on increase or decrease of research budget, projected growth, and the main topics driving future research, as well as providing insights on budgetary and financial trends from the ERTICO research partners consulted.

Budget for ITS

There is no European imposed system based on the budgetary information collected; a comparison analysis is complex. Here are the takeaways:

- Half of the respondents have an annual **ITS budget** lower than 1 million euros. The other half of the research organisations surveyed have budgets exceeding 1 million euros, and only a few organisations do spend above 10 million euros for ITS activities. However, none of the research partners consulted indicate an annual budget for ITS above 50 million euros.

- Regarding the overall **mobility budget**, half of ERTICO's research partners have indicated that it ranges between 1 and 10 million euros.

- ✓ On average, ERTICO research partners show an increase of their budget for ITS of 12% from 2023 to 2024.
- ✓ Over the next five years, most partners see a slight increase in their budget or spending, confirming the trend from the past year. This is due to the evolving mobility domain in which ITS solutions are clearly involved. However, approximately one third does not foresee any change.
- ✓ Research organisations have primarily received between EUR 0.5 and 5 million funding from EU programmes. A slight increase of approximately 9% on average is expected from EU and national grant funding for research projects related to ITS in the coming years.

Main research focus

Autonomous mobility		Connectivity aspects
Cooperative, Connected, and Automated Mobility (CCAM)	Mobility as a Service (MaaS)	Smart mobility of people and goods
Technologies development such as sensors and platforms		User experience

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5. EMPLOYMENT

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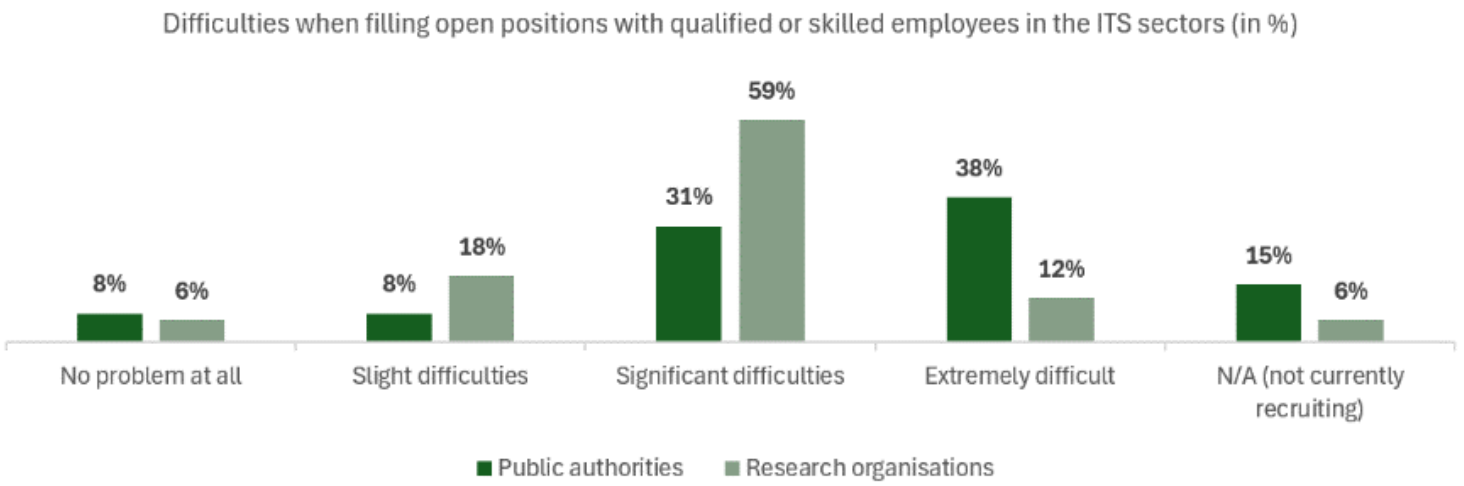
Overview of employment and skills in the ITS domain

Public authorities are instrumental in shaping the ITS workforce, namely by fostering partnerships that bridge the gap between industry needs and academic training. Research initiatives in the ITS sector not only drive technological advancements but also identify emerging skill sets, guiding institutions in developing the necessary expertise for future ITS challenges and employment opportunities. For this reason, both actors' roles are essential.

Required skills within the ITS domain

- ✓ Adaptability and willingness to learn new technologies and trends, especially related to smart mobility
- ✓ Domain knowledge in specific areas such as traffic management, public transportation
- ✓ Cross-sectorial understanding

However, both public authorities and research organisations encounter significant or extreme difficulties in finding qualified and skilled persons for ITS activities, as shown in the figure below. There is a current shortage of skilled and technical workers.



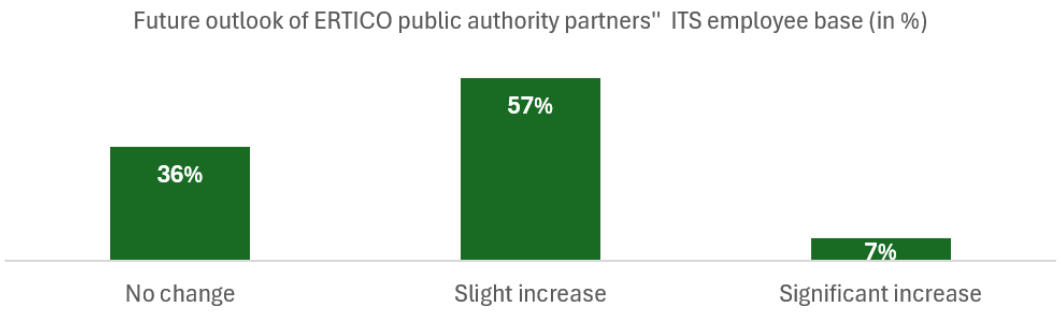
Yet, the number of ITS employees is expected to increase in the next 5 years

- ✓ Both public authorities and research organisations primarily expect a slight increase in their number of employees engaged in ITS over the next five year.
- ✓ A good portion does not expect any change in their number of employees involved in ITS for reasons which are detailed in the following slides.
- ✓ No decrease is foreseen in the number of employees working with ITS.
- ✓ Rare are the employees fully involved with ITS activities, unless the organisation focusses on it. Most workers are engaged with other activities related to mobility.

Public Authorities – Future employment outlooks

This section focusses on the outlook of ITS employment among public authorities, specifically collected during the consultation of ERTICO partners. It participates in the overview of employees engaged in the ITS ecosystem, how will this employment evolve and potential concerns. The aim is for public authorities to successfully navigate the transition, ensuring that their workforce is resilient, adaptable, and equipped for the future of ITS.

In the next five years



- ✓ A **slight increase** in the number of employees involved in ITS among public authorities is predominantly foreseen, linked to the rise of smart mobility to which ITS solutions are directly linked to.
- ✓ One third of respondents believe that no change will happened in the number of employees involved in ITS activities within their organisations.
- ✓ The average share of the total employees engaged in ITS among public authorities surveyed is 15,2%.

Addressing the increase of ITS employees

- ✓ Invest in and cooperate with the education sector, universities and the private sector to ensure that ITS positions are professionally attractive.
- ✓ Capacity building for new trends such as AI, quantum computing, CCAM, V2X.
- ✓ Reskilling and upskilling local authority's personnel.
- ✓ Hire or collaborate with more external advisors or consultants to face budgetary constraints and the need for higher ITS allocation.

Some organisations' employment strategies are dependent on budget allocation decisions as well as on the type of projects that they will participate in.

On potential concerns that some job positions will not be needed due to automation

In the next five years, **current positions will remain relevant** as new trends will continue to need human expertise. Beyond this period, the rise of automated traffic may contribute to a reduction in certain job categories (e.g. drivers) and areas such as road transportation monitoring, manual ticketing and fare collection systems in public transport, toll collection, and issuance of printed violation notices.

This is seen as a transition phase between new and future professions, underscoring the **importance of social aspects** as well as training and skill development to ensure that the workforce is adequately prepared to thrive in the ITS ecosystem.

Public Authorities – Skills and awareness

This section explores the core competencies that public authorities seek when filling positions linked to Intelligent Transportation Systems as well as the existing gaps related to the workforce identified by ERTICO public authority partners. As public authorities have an important role in the deployment and regulation of ITS, it is crucial that they overcome any employment-related obstacles and that they invest in talent engagement and retention. ERTICO is active in knowledge sharing and training activities.

Critical skills and competencies require to optimise ITS deployment

1. Adaptability and willingness to learn new technologies and trends
2. Domain knowledge in specific areas such as traffic management, public transportation, or logistics
3. Cross-sectorial understanding

Reasons for hiring

Implementing strategic initiatives, projects, or policy developments related to ITS		Addressing skill gaps or shortages in the organization's ITS capabilities
Replacing employees who have left or are retiring from ITS-related positions	Expanding operations in the ITS sector	Upgrading the skills and capabilities of the ITS workforce

Addressing gaps in the current workforce capabilities

ITS workforce capabilities
Significant need to enhance workforce capabilities in the area of ITS

- ✓ *While hiring contractors or consultants is a common practice, there is a preference for **developing in-house knowledge** to reduce long-term costs.*
- ✓ *Conducting an internal analysis of future trends and technologies to **map the required skills and competencies**, which will inform specific training programmes.*
- ✓ *Organizing trainings, workshops, or participating in national and international events to **increase human resources capacity**.*

Key strategies to retain qualified or skilled employees

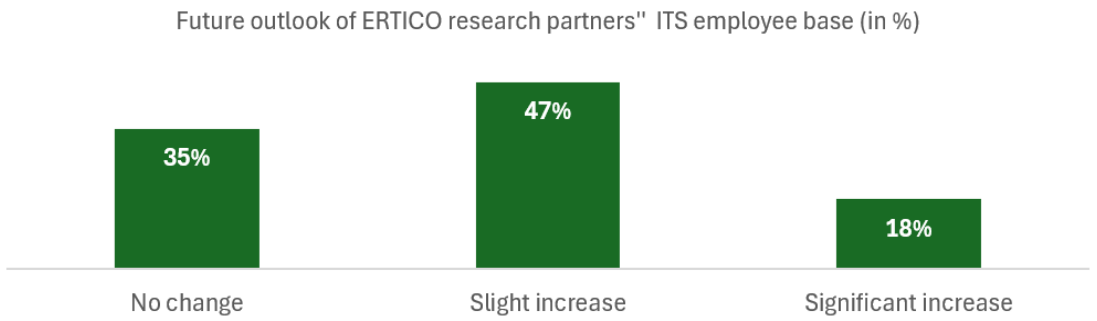
Competition with the private sector
Public sector positions may not offer as attractive salaries as the private sector

- ✓ *Considering the provision of **higher salaries** to attract and retain skilled employees within the public sector.*
- ✓ *Allocating resources to **educational programmes** or curricula that are relevant to ITS to build a skilled workforce over time.*
- ✓ ***Collaborating with the private sector** to leverage the combined workforce and resources for mutual benefit.*

Research – Future employment outlooks

This section focusses on the outlook of ITS employment within the Research sector, specifically collected during the consultation of ERTICO partners. It participates in the overview of employees engaged in ITS, how will this employment evolve and potential concerns. The aim is for research organisations to successfully navigate the transition, ensuring that their workforce is resilient, adaptable, and equipped for the future of ITS.

In the next five years



- ✓ A **slight increase** in the number of employees involved in ITS in the research sector is primarily foreseen, but a significant increase in this number was also mentioned during the consultation. This is due to the rise of smart mobility to which ITS solutions are directly linked to.
- ✓ One third of respondents believe that there will be no change in their number of employees engaged in ITS activities. There will potentially be an increase in the time allocated to ITS though.
- ✓ The average share of the total employees engaged in ITS among research organisations surveyed is 24,3%.

Addressing the increase of ITS employees

- ✓ Predominantly get more involved in interdisciplinary research and collaboration, therefore hiring multi-disciplinary personnel.
- ✓ Re-allocate internal resources.
- ✓ Increase interest in new technologies applied to ITS.
- ✓ Participate in new funded research projects, including national and Horizon Europe projects.

Some organisations' employment strategies are dependent on budget allocation decisions from political considerations, based on the structure itself of public authorities.

On potential concerns that some job positions will not be needed due to automation

Current positions will remain pertinent, while also pointing to the emergence of new job profiles which will require **higher degrees of specialisation** or competence. However, a significant workforce replacement is not anticipated in the near term.

As operational ITS services become more prevalent, such as Low Traffic Neighborhoods (LTNs) and traffic filters, there will potentially be an increased need for human oversight to manage these systems effectively. This implies that while automation and technological advancements are on the rise, **the human element remains indispensable** in ensuring the smooth operations.

Research – Skills and awareness

This section presents the top skills which employers are looking for in the hiring process for ITS activities. It also sheds light on the skill gaps within the workforce as identified by ERTICO's research partners. Given the critical role that research institutions play in pioneering ITS advancements, it is important that they can overcome any challenges that they are facing as regard to employment. The below therefore examines skills-related questions prevalent within research organisations.

Critical skills and competencies require to optimise ITS deployment

1. Adaptability and willingness to learn new technologies and emerging trends
2. Domain knowledge in specific areas such as traffic management, public transportation, or logistics
3. Familiarity with regulatory and compliance requirements in the transportation industry

Reasons for hiring

Implementing strategic initiatives, projects, or policy developments related to ITS		Addressing skill gaps or shortages in the organisation's ITS capabilities
Replacing employees who have left or are retiring from ITS-related positions	Expanding operations in the ITS sector	Upgrading the skills and capabilities of the ITS workforce

Addressing gaps in the current workforce capabilities

AI and machine learning literacy & Programming and technical skills
Lack in knowledge and skills related to AI, machine learning and technical activities

- ✓ *Implementing internal training and education for the existing workforce, including training on new emerging technologies to maintain a leading edge in research.*
- ✓ *Restructuring internal teams to allocate technical resources, potentially creating specialised roles.*
- ✓ *Developing universities partnerships to support specific master's degree programme that align with the organisation's research and technology focus.*
- ✓ *Opening up positions to international researchers to bring in diverse skills and to address local skill shortages.*

Key strategies to retain qualified or skilled employees

Attraction sectors other than research & Competition with the industry
Talented graduates often attracted to more financially-appealing career prospects

- ✓ *Bridging the gap between education and research to facilitate the creation of curricula and new career paths that are aligned with the needs of the ITS sector.*
- ✓ *Offering incentives to employees, which could include financial bonuses, recognition programs, or career advancement opportunities.*
- ✓ *Adopting flexible working arrangements, such as hybrid remote working, to improve work-life balance and employee satisfaction.*
- ✓ *Providing continuous training opportunities to employees to enhance their skills and keep them engaged with the latest industry developments.*

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6. KEY CHALLENGES

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Navigating the challenges

Both public authorities and research organisations face challenges linked to the development or the deployment of ITS solutions. Both are primarily raising budgetary constraints which are also impacting other aspects of a successful ITS deployment, as well as regulatory and standardisation barriers. Other challenges are mentioned specifically for each of the Research and Public authorities segments.

Public authorities indicated the following barriers:

1. ***Funding and budget constraints***
2. ***Regulatory and policy barriers***
3. ***Lack of public awareness and understanding, especially regarding autonomous vehicles***

There are other **potential challenges** such as cybersecurity, technology integration into existing infrastructure and systems, talent acquisition and skills gap in emerging technologies, interoperability issues, lack of cooperation among stakeholders, etc.

Research organisations indicated the following barriers:

1. ***Funding and budget constraints***
2. ***Data accessibility and quality to test and refine ITS technologies***
3. ***Lack of data standardisation***

There are **other potential barriers** such as talent acquisition and skills gap in emerging technologies, regulatory challenges, lack of public awareness and understanding, lack of cooperation among actors of the sector.

Overall, ERTICO partners stressed that there may be a **lack of focus on the basic requirements** for the large-scale deployment of ITS solutions in some states. This includes action for standardised and uniform road markings and signs to ensure the use of these solutions.

This context sets the stage for understanding the top 3 barriers affecting the uptake of ITS solutions and services for public authorities and research organisations, which will be explained in the subsequent slides.

Challenges for Public Authorities

This subsection explores the primary obstacles that public authorities have identified as impeding the implementation of ITS solutions, as revealed during the ERTICO consultation process. These challenges are detailed with specific insights on the way that they may be addressed or alleviated, namely through policy measures or initiatives at the EU or national level, as suggested by the relevant stakeholders.

Main challenges identified	Policies or interventions to overcome the challenges
#1 **– Funding and budget constraints** Significant financial constraints are due to the difficulty in securing investment for ITS services, as the value for money and return on investment are not immediately tangible. This makes it difficult for public authorities to justify the allocation of funds to ITS over more visible infrastructure projects or other critical areas such as social services, adding up to a lack of a long-term investment strategy or plan. Additionally, high investment costs associated with ITS technologies pose a significant challenge, especially when central and local governments have to prioritise their budgets, often favouring traditional infrastructure works over ITS investments.	✓ **Developing national action plans** on digital transformation, with a clear multi-stakeholder engagement strategy and defined responsibilities, can drive ITS progress even with limited budgets. A shift towards increased and targeted funding for deployment and early adoption is now crucial for ITS, **moving beyond research** to realise the full societal benefits. ✓ **Expanding the budgets** of ITS funding and grant programmes at the EU level and ensuring a transparent and fair evaluation process for EU funds will encourage the prioritisation of ITS projects that offer significant social and economic impacts. ✓ **Fostering alliances and public-private partnerships** can offer alternative funding sources, essential for overcoming financial limitations.
#2 **– Regulatory and policy barriers** These barriers often stem from complex legal frameworks and stringent policies that must be navigated to integrate new technologies. Challenges such as ensuring environmental compliance can impede the implementation of ITS solutions.	✓ **Concerted effort** to update and harmonise regulations that support the deployment of ITS while maintaining environmental and safety standards. Emphasis should also be put on **top-down approach for policies and guidelines** starting from the EU level and targeting local areas.
#3 **– Lack of public awareness and understanding** Financial constraints were identified as being the primary barrier for the deployment of ITS solutions by public authorities as the allocation of resource or employment are also affected.	✓ Similarly to the Research sector, the lack of public awareness on benefits could be overcome with structured interventions on **raising awareness and reskilling or upskilling** the relevant public personnel. This challenge is detailed in the “Employment” section.

Challenges in Research

This section dives into the top specific challenges hindering the deployment of ITS solutions which were identified by ERTICO research partners during the consultation and gives detailed insights for each challenge. These barriers can be mitigated or overcome through EU- or national-level policies or interventions which were also provided by the concerned actors.

Main challenges identified	Policies or interventions to overcome the challenges
#1 **– Funding and budget constraints** Transportation often falls lower on the funding priority list, only gaining attention when linked to broader challenges like climate change. The difficulty of quantifying ITS benefits makes it hard to justify investment for high Technology Readiness Levels (TRL), despite the need for advanced CCAM applications for instance.	✓ **Developing a unified strategy** by forging strong university collaborations for policy assessment and shared learning among decision-makers, namely through pilot experience, by boosting public awareness about accidents or pollution and funding for ITS benefits, and by ensuring alignment with national policies for integrated support.
#2 **– Data accessibility and quality to test and refine ITS technologies** Inaccurate, incomplete or siloed data can undermine the effectiveness of ITS technologies, leading to unreliable insights and suboptimal performance. Without seamless access to high-quality data for testing and refinement, it becomes difficult to develop and scale intelligent transport solutions that meet actual transport needs.	✓ More flexibility in research practices is needed to adapt to data challenges, **enacting policies or regulations** that mandate private mobility stakeholders to share their data in exchange for access to public data, and addressing the lack of funding for cities through targeted interventions. These steps aim to ensure a robust data foundation for refining and scaling ITS solutions.
#3 **– Lack of data standardisation** Data is a common enabler for all the pillars of ITS, thus data interoperability issues obstruct ITS progress. Availability and sharing of real-time and high-quality data for ITS products and services needs to be supported by standardisation. Additionally, competition between 5G and ITS-G5 in Europe delays consensus, unlike the US, which has chosen 5G as the standard for cooperative systems.	✓ Aligning on existing data sharing initiatives like national access points and data spaces and drawing on flagship EU projects to **set common data formats and establish standardised data sharing requirements**.

Way forward and solutions for ITS development and deployment

The multiple barriers presented in the previous slides, including financial constraints, regulatory barriers, and the lack of public awareness, show that the deployment of ITS solutions and services is still a significant challenge. The recommendations previously introduced will participate in mitigating the barriers but the deployment of ITS services needs further attention from the research and public governance actors. For this, ERTICO can push ITS solutions deployment across Europe using best practices.

Drivers for ITS adoption

- ✓ **Needs and demands of ITS users** is an important driver. (e.g. inclusivity and accessibility in all forms of transportation is necessary).
- ✓ **Enhanced effectiveness** of the transport network, namely supported through energy efficiency or road capacity optimisation, which has many benefits linked to traffic safety and sustainability. This can be supported by digitalisation and more intermodal transportation.
    - ✓ **"Net Zero" objectives**, with the aim of reducing greenhouse gas emissions, in line with commitments made under EU, national or local law.
    - ✓ Improving road safety, in light of the **"Vision Zero" movement**.

Laying the groundwork for ITS deployment

To facilitate the uptake of ITS:

- ✓ Need for a **"development to long-lived deployment"** mentality, allowing the final-phase projects to be handed over to local groups, authorities or investors that can keep them operational.
- ✓ Need for constant dialogue and **cross-sectoral cooperation** among stakeholders (e.g. between private and public, automotive and telecom, public city and road infrastructure managers) to support testing and adoption of ITS solutions.
- ✓ Preparing and disseminating a **national ITS architecture** to stakeholders to achieve national integration and interoperability of ITS applications, in order to guarantee the seamless offer of products and services.
- ✓ Need to **renew and maintain existing infrastructure** before integrating ITS technologies within existing transport infrastructure, including addressing the challenges of implementing autonomous vehicles in mixed traffic environments.
- ✓ Need to align on the **legislative framework** (e.g. air mobility needs policy-making coordination between aviation and road authorities for the deployment of air mobility).
- ✓ **Showcasing the benefits** stemming from well-working ITS services to help overcome users' lack of understanding, as detailed in the "Users" section.

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7. KEY PROJECTS AND PARTNERSHIPS

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Key partnerships favouring the uptake of ITS

Establishing partnerships within ERTICO platforms, national ITS associations, and networks like EGVIA, CCAM, ASAM, and Smart Cities is crucial for advancing ITS initiatives through training and best practices exchange. Additionally, fostering cross-sectoral collaborations between public and private sectors, universities, and smart city companies, as well as engaging in EU-funded projects, can accelerate smart mobility solutions and enhance ITS technologies.

Partnerships or collaborations to advance ITS initiatives

- ✓ Establish **partnerships within ERTICO platforms, national ITS associations** (e.g. ITS Finland, ITS Türkiye, ATEC France), and **networks** like EGVIA, CCAM, ASAM, and Smart Cities for ITS advancement. These partnerships aim at harmonisation, e.g.:
  - ✓ **NAPCORE** (National Access Point Coordination Organisation for Europe) is an initiative aimed at coordinating the deployment of NAPs across Europe.
  - ✓ **C-Roads** works towards harmonizing the deployment of cooperative ITS (C-ITS) in a joint effort between authorities and road operators across Europe, aiming for interoperable cross-border C-ITS services.
- ✓ Foster **cross-sectoral collaborations** between public and private sectors, universities, and smart city companies to accelerate smart mobility solutions based on ITS technologies, including EU-funded projects.
- ✓ Participate in projects that **develop mobility data spaces**, enhancing ITS solutions and creating comprehensive transport data hubs for consistent data usage in monitoring and research.

At national level:

- ✓ **National Access Points** enable the exchange of standardised transport data between different actors, therefore enhancing national transport services (e.g. Austrian Graph Integration Platform)
- ✓ **National initiatives** such as the UK Transport Technology Forum in which national and local authorities collaborate on mobility topics through knowledge sharing activities.

Examples of partnerships in collaboration with ERTICO to reach a climate-neutral and environmentally-friendly urban mobility

- Zero emission road transport (**2ZERO**): boosting the uptake of electric buses supporting public transport in cities and regions.
- Connected and automated driving (**CCAM**): demonstration of innovative connected, automated and shared mobility services in cities.
- Driving Urban Transition (**DUT**) with the 15-Minute City Transition Pathway that aims to foster sustainable transitions in urban mobility and city planning through creating accessibility and connectivity.
- Batteries (**BATT4EU**): creating a competitive, innovative and sustainable battery eco-system in Europe to support the EU's ambitions for zero-emission mobility and energy storage.

Innovation platforms & ERTICO initiatives (examples, full list available on www.ertico.com)

TN-ITS

Transport Network ITS Spatial Data Deployment is an ERTICO multi-stakeholder innovation platform that governs a data chain mechanism for trusted authoritative spatial road data changes between road authorities and map makers and service providers. The platform enhances road safety, transport efficiency, automation and applications such as MaaS, Smart Parking or Cycling. TN-ITS maintains and develops a CEN Technical Specification for the exchange of static road attributes which is now a basis for static data exchange within Regulation RTTI DR 2022/670. Additionally, TN-ITS encompasses the National Access Point Coordination Organisation for Europe (NAPCORE).

Data for Road Safety (DFRS)

DFRS is an ERTICO platform enhancing road safety through public-private collaboration. It has created a Safety-Related Traffic Information (SRTI) ecosystem for data sharing and safety warnings based on the principle of reciprocity. Public authorities, vehicle manufacturers, suppliers, and service providers collaborate for large-scale use of safety-relevant data, aligning with Regulation 886/2013 on SRTI.

TM 2.0

The TM 2.0 Innovation Platform unites public and private organisations to develop advanced interactive traffic management solutions, based on co-opetition and trust. It aims to enhance the value chain for consistent traffic management and mobility services by enabling vehicle interaction with traffic systems. Deployed at a pan-European scale in FENIX, it integrates systems linked to TEN-T corridors, connecting infrastructure components to a central control center. This optimizes traffic flows, reduces congestion, and improves road safety with dynamic strategies like adaptive signal control and incident detection.

ERTICO City Moonshot

Engaging, inspiring and empowering cities around the world

City Moonshot engages cities to understand their mobility and transport needs through a global survey of 300 city representatives. Nearly 200 cities have been interviewed. The collected data is analysed in a comprehensive report highlighting cities' main concerns and priorities. City Moonshot also gathers studies, projects, new technologies, and best practices to support efficient, inclusive, and sustainable urban mobility.

Phase I focused on data exchange, MaaS, and sustainability policies, while Phase II adds e-mobility and Urban Air Mobility (UAM). Findings will be detailed in a report, with webinars fostering engagement and knowledge exchange.

ERTICO Academy

Sharing knowledge for tomorrow's journey

ERTICO Academy is a unique ITS and mobility training programme tailored for public authorities and their stakeholders. It offers workshops by ERTICO experts and international partners to upskill for smart mobility and transport systems, aiming to increase mobility literacy and deployment readiness, including the latest innovations.

In 2023, it adopted a four-level hands-on learning approach to enhance accessibility of training. ERTICO Academy continues to engage with public authorities to provide in-person local training and free online courses on its website.

Key projects (examples, full list available on www.ertico.com)

SHOW

SHOW is Europe's leading real-life CCAV urban demonstration for sustainable mobility, focusing on automated transport modes like Public Transport, Demand-Responsive Transport, Mobility as a Service, and Logistics as a Service. The project has a strong consortium of 70 partners and boosts collaboration throughout the EU and beyond.

SHOW has made great strides in identifying priority use cases for automation, developing new business models, establishing a common system architecture, improving vehicle functionality, and demonstration fleets with connected services and infrastructure. Its 16 European sites test various use cases and business models in real-world conditions, from residential areas to complex urban settings. SHOW's findings support replications and advance the EU roadmap on shared automated mobility.

metaCCAZE

metaCCAZE aims to accelerate the deployment deployment of smart systems that combine electric, automated and connected mobility and related infrastructure by developing flexible technologies adapted to current and evolving sustainable urban mobility needs. The objective is to develop and infuse technologies with user-centric approaches to zero-emission shared mobility services for passengers and goods.

These innovations will be tested in 10 Mission Cities across Europe, including Amsterdam, Munich, and Paris. metaCCAZE will organise MetaDesign activities with stakeholders to develop shared zero-emission mobility use cases and collaborative business models. The goal is to transfer knowledge and policy recommendations to help any city implement smart, shared, and zero-emission mobility systems.

REALLOCATE

Under the CIVITAS Initiative, REALLOCATE aims to create climate-neutral, safe, inclusive, and smart European cities through innovative urban mobility solutions that address diverse community needs and rebalance street space. The project supports 10 twinned Mission Cities (e.g., Gothenburg-Tampere, Barcelona-Bologna) by providing expertise to develop a local innovation ecosystem for the deployment of zero-emission, shared, inclusive, and human-centred mobility interventions. The cities of Braga (Portugal), Brașov (Romania), Lviv (Ukraine), Sarajevo (Bosnia and Herzegovina) and the Ljubljana Urban Region (Slovenia) will test the replicability of REALLOCATE's mobility measures.

The consortium worked on several activities, including study visits, webinars for knowledge exchange between REALLOCATE cities and project partners, and thematic workshops on safe and sustainable school areas, concepts for space reallocation, data for safety, and digital integration for accessibility.

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ANNEXES

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Annex 1: ERTICO Market Report methodology

Commissioned by ERTICO, the ITS Market Report focused specifically on public authorities and research, with a brand-new section on users. Building on the last issue, the structure and the content of the report was based on **diverse data sources and consultation tools**, ensuring a comprehensive and balanced overview of the current Intelligent Transportation Systems ecosystem.

- A review of relevant EU acts, communications, reports, and online resources was conducted to establish a foundational understanding of the ITS landscape. Conducting **desk research** allowed to identify emerging trends, challenges, market updates, and other pertinent information.
- The creation of a **survey** composed of specific questions for public authorities and research organisations was key to collect quantitative information as well as explanatory insights. This allowed to establish gaps in the collection of data which were then complemented by the interview phase.
- As a last step, **interviews** were performed to validate or contradict the findings of the survey as well as to gather further insights on the report's sections, i.e. ITS trends, barriers to adoption, deployment recommendations, etc.

Trough these different consultation tools, the broader context of the ITS ecosystem was determined for the research sector, public authorities and users.

Survey

A total of 28 organisations surveyed, among which 11 public authorities, 15 research organisations, and 2 entities involved in both sectors, all members of the ERTICO network.

Geographical distribution:

AT	CY	DK	ES	FI	FR	GB	GR	IE	IT	LU	NL	PT	TR
2	1	1	2	2	2	2	5	1	5	1	1	1	2

Interviews

To validate most quantitative inputs from the survey and get more detailed insights on the specific questions and topics, the following stakeholders were consulted during one-to-one interviews:

- ✓ 3 Research organisations
- ✓ 2 Public authorities
- ✓ 1 User

Annex 2: List of acronyms

ADAS	Advanced Driver-Assistance System
AI	Artificial Intelligence
CCAM	Connected, Cooperative, and Automated Mobility
CEF	Connecting European Facility
C-ITS	Cooperative ITS
EU	European Union
EV	Electric Vehicle
GIP	(Austrian) Graph Integration Platform
IoT	Internet of Things
ITS	Intelligent Transportation Systems
MaaS	Mobility-as-a-Service
NAPCORE	National Access Point Coordination Organisation for Europe
R&I	Research and Innovation
TEN-T	Trans-European Transport Network
TRL	Technology Readiness Levels
UN	United Nations
US	United-States of America
V2I	Vehicle-to-Infrastructure
V2N	Vehicle-to-Networks
V2V	Vehicle-to-Vehicle
V2X	Vehicle-to-Everything
5G/6G	Fifth/Sixth generation network