

# A railway fit for a digital future

Across Europe, COVID-19 measures are lifting – hopefully, signifying the end of an era marked by lockdowns, travel restrictions and impediments to “normal life”. As the European Union enters a period of greater freedom of movement, rail will be in even greater demand, moving goods and citizens across over long distances and cross borders, within Member States and even throughout cities. With the European Commission seeking to double passenger and freight rail in the coming decades due to its energy efficiency and large capacities, an effort led by Transport Commissioner **Adina Vălean**, it is essential that rail incorporate more and more emerging technologies throughout the network to meet this goal. Railway digitalisation is key to increasing capacity, reliability, performance and comfort, while maintaining the EU’s leadership in rail transport equipment manufacturing and services. By accepting the digital revolution with open arms, the EU can improve our industry’s global competitiveness. Counter to some misconceptions, Europe’s rail supply industry has been on the forefront of these innovations.



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As you read this, these professionals are utilising new tools such as artificial intelligence, digital twins and Internet of Things (IoT) to design, craft and deploy next generation rail assets needed to achieve transport decarbonisation, continued economic growth, increased interconnectivity and greater reliability. To achieve the aforementioned shift to rail, these technologies working in conjunction with widespread usage of the **European Rail Traffic Management System (ERTMS)** and data usage that permits accurate real-time multimodal trip planning by passengers will incentivise Europeans to prioritise sustainable transport options. To initiate the so-called “digital leap”, the rail supply industry has identified critically important technologies, the “game changers”, that it believes will permit the EU to achieve the twin digital and green transitions.

First, our sector believes that digitalisation and automation are key drivers for the development of a technology-driven rail transport system that connects Europe. These cutting-edge tools are essential enablers of the European rail sector’s vision, as depicted in the prescient strategic documents published by the **European Rail Research Advisory Council (ERRAC)**. Our long-term vision for rail mobility, as presented in the earlier **ERRAC Rail 2050 Vision**, sought to establish our mode of transportation as the backbone of future, multimodal mobility. The sector proposed a set of time-focused concrete plans that would transform this vision into reality, answering key questions for ten-year time periods leading up to the Commission’s 2050 carbon neutrality deadline. With the recent launch

of **Europe’s Rail Joint Undertaking** hosted by the **French Presidency of the Council in Paris** this past February by its Executive Director **Carlo Borghini**, many of these ideas have become sector-wide digitalisation goals.



In late 2020, ERRAC formulated and released **The Strategic Rail Research and Innovation Agenda (SRIA)** to provide a focused proposal for the way in which these innovations could be developed under what was then the untitled **Shift2Rail** successor and create a rail renaissance that put the mode at the centre of the mobility ecosystem and modern European life itself. The document sought to establish a new programme devoted to technical and operational innovations that can transform Europe’s railways’ contribution to mobility across the Union and address the needs of its users, the wider economy and society. Ushering in these changes would allow rail to contribute to efforts to protect natural resources and the



wider environment and provide a technological pathway that would have riders associate rail transport with freedom, flexibility and comfort.

Already shaping the design of future networks, digital solutions like **autonomous vehicles**, the **Internet of Things (IoT)** and **artificial intelligence (AI)** enhance the value experienced by rail customers by optimising the existing system use and increasing both capacity and flexibility. An intelligent transport landscape is made by focusing on new telecommunications infrastructure that makes the best use of 5G technology and modern satellite communication applications being developed across the entire rail industry. To this end, the Digitalisation Research & Innovation (R&I) priorities identified in the SRIA have been incorporated into Europe's Rail to make rail the backbone of the transportation system.

With digitalisation at its core, the new Joint Undertaking represents a novel approach by establishing two workstreams: the **System** and **Innovation Pillars**. The Innovation Pillar aims at developing and demonstrating new technologies and services built upon Shift2Rail outputs in areas like notably "Digital & Automated up to Autonomous Train Operations", "Intelligent & Integrated asset management" and "Sustainable Competitive Digital Green Rail Freight Services". The System Pillar aims at defining a reference railway system architecture that accelerates the market uptake of new digital innovations coming from the innovation pillar. Founding this new rail

programme is a priority for both UNIFE and the sector as it will ensure a faster digital transformation of rail and allow the delivery of new services, optimisation of operations and create new capabilities through innovative assets. It will also reinforce the competitiveness of the European rail supply industry and maintain the European leadership in a fierce international competition context.

These efforts are particularly salient at this moment as the EU is appearing to exit the pandemic and mobilise the vast **Recovery and Resiliency Funds** intended to both jumpstart the continent's disrupted economy and fuel the emergence of "Europe fit for the digital age". By UNIFE's assessment, Member States have elected to utilise approximately €55 billion euros, or 8%, of the total €672.5 billion package for rail investments in infrastructure, rolling stock, digitalisation, urban transport and more. With €85 billion set aside just for sustainable transport, National Recovery Plans illustrate how they have overwhelmingly placed their confidence in our mode. They are using this opportunity to expand and accelerate ERTMS deployment, revitalise infrastructure on chief **Trans European Network – Transport (TEN-T)** lines along the Mediterranean and the Atlantic corridors and modernising metros, commuter lines, regional networks and more. We are at the beginning of a rail renaissance that requires greater – and continued – investments to permit swift market uptake of the technologies described earlier. Doing so will inspire a shift to long distance passenger and



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freight rail and cross border rail as called for in the recent Action Plan, improve quality of life in cities suffering from urbanisation and promote our industry's competitiveness as Europe enters a period of economic recovery and potentially protracted inaccessibility to foreign markets.

The adoption of these tools can also be jeopardised by poor practices in public procurement. Often, purchasing authorities will assess tenders based on the price tag alone, while failing to consider the bid holistically and evaluating lifecycle costs and the strategic, socio-economic, sustainability and other factors that could make an offer attractive. This latter method – known as the **Most Economically Advantageous Tender (MEAT)** principle – helps purchasers avoid substandard products provided at artificially low prices by State-owned and subsidised enterprises in favour of superior quality rail solutions that make use of cutting-edge technical solutions compatible with Europe's 21st century rail system and values. UNIFE applauds the European Council's recent agreement – under the auspice of the French Presidency – on the **International Procurement Instrument (IPI)**, a tool needed to ensure this market uptake is replicated globally. Lastly, these efforts will require a skilled and digitally savvy workforce to achieve. Unfortunately, the European railway sector is currently facing a labour squeeze as its employees age out to retirement and suffer from a lack of familiarity with emerging technologies. To address this concern, stakeholders have banded together under **STAFFER**, the ERASMUS+ funded Blueprint for skills in rail. The project aims to assess existing academic and

vocational training curricula, propose reforms and ensure their implementation beyond the consortium's four-year lifespan. By succeeding, the 32 partners representing operators, suppliers, schools, universities, governments and others can help students, transitioning professionals and current rail experts expand their competencies as needed to pursue a fulfilling career in our industry – which will require familiarity with the above-mentioned digital tools.



**STAFFER**  
EUROPEAN RAIL SKILLS ALLIANCE

Designing and actualising a truly digital Single European Rail Area is no small undertaking. It will require stakeholders from across the Member States and the sector to cooperate with one another to direct resources to both research and innovation initiatives and implementation processes over an extended period of time. The European Rail Supply Industry is convinced that adopting these emerging technologies across the rail system is central to both retaining Europe's global competitiveness in an increasingly digital market and decarbonising transportation as we collectively fight climate change. Through our concerted efforts, we can build an interoperable, sustainable and reliable digital railway system for all of Europe.