UNIFE Feedback to Call for Evidence Military Mobility Package

The European Rail Supply Industry stands ready to deliver enhanced military mobility across Europe

October 2025

ABOUT UNIFE

UNIFE, the European Rail Supply Industry Association, operating in Brussels since 1992, represents over 120 European train builders and rail equipment suppliers, involved in designing, manufacturing, maintaining and refurbishing rail systems, subsystems and related equipment. UNIFE also brings together national rail industry associations from 12 European countries.

With the EU's goal of carbon neutrality by 2050, decarbonising transport is urgent, and the rail sector offers significant potential for achieving this. With annual growth of 3.0% and a projected global market volume of €240.8 billion by 2029, the European rail supply industry is a global leader in the design, manufacturing and maintenance of railway systems and products, generating €45.8 billion in sales, reinvesting 3.6% of its annual revenue to R&I activities and providing 650,000 jobs across Europe.

Introduction

The European Rail Supply Industry stands ready to supply needed products

The European Rail Supply Industry stands ready to support the advancement of military mobility across the European Union. With the products the industry delivers – from rolling stock, infrastructure to signalling systems – we offer the necessary means to ensure a fast and rapid transport of military freight and military staff across Europe. The industry is shaping the future and designs products corresponding to the market needs of operators such as railway undertakings and infrastructure managers. To successfully ensure that the industry can provide the needed technologies and build the appropriate industrial capacities, a clear set of requirements regarding technologies, as well as clear rules of public procurement in favour of European preference is needed.

The European Rail Supply Industry stands ready to boost harmonisation

The European rail supply industry stands also ready to support the enhanced preparedness and resilience of the European railway network. This shall be supported by a clear regulatory framework, harmonising national rules, procedures and requirements, while utilising strategic investments to remove critical barriers along military corridors, being of benefit for both military and civilian mobility operations (freight and passenger). In this regard, the European Union must increasingly act as a driver of harmonisation and thus, ensuring EU-wide efficient and seamless military mobility at speed and scale to increase defence readiness.

The European Rail Supply Industry stands ready to support dual use

The European rail supply industry would like to emphasise the added value of dual use railway assets. Dual use means expanding the civilian railway system so that military mobility can benefit accordingly and tap into capacities of civilian transport for military use. Overcoming and addressing gaps in optimal use of existing assets of the civilian rail system will therefore undoubtedly also have a positive impact on military mobility by delivering and maintaining a resilient and efficient dual use railway network ready to be used for military purpose at any moment.

The European Rail Supply Industry stands ready to actively contribute

UNIFE supports the objectives set out by the European Commission to support Member States in their efforts to achieve EU-wide efficient and seamless military mobility at speed and scale to increase defence readiness and contribute to deterrence. We welcome the call for evidence to identify and overcome the many barriers to military mobility which remain throughout the EU, hindering the movement of military forces by regulatory, infrastructure and capabilities gaps. In contribution to these objectives, UNIFE has identified a set of recommendations and actions to address the existing barriers and gaps seen from the view of European rail supply industry within the following areas:

- Regulatory aspects;
- Limited and vulnerable infrastructure;
- Limited available assets and gaps in optimal use of existing assets.

UNIFE Solutions to Regulatory Aspects

Military Mobility is currently challenged by regulatory fragmentation and inconsistencies. The European Rail Supply Industry thus suggests the following actions related to regulatory aspects to advance at a faster pace.

- **Ensure European Technological Sovereignty through Public Procurement:** Strategic public procurement is a crucial lever to achieve the objective of enhancing the resilience of the European railway system. Investment in rail should make the system fit to the challenge of Military Mobility but should also bolster Europe's manufacturing base and support the competitiveness of the European Rail Supply Industry vis-à-vis third country competitors, guaranteeing the reliability and the security of the system. More generally, joint public procurement initiatives for rolling stock or infrastructure can increase purchase efficiency, ensure economy of scale and ultimately facilitate the timely supply of technologies.
  Recommended Actions:
  - **Rail as Critical Infrastructure:** Rail should be considered as critical and military relevant infrastructure, and more generally as strategic sector, in the forthcoming revision of the EU public procurement law (in particular Directive 2014/25/EU).
  - **Exclusion of Third-Country Bidders:** When it comes to critical and strategic technologies (e.g. ERTMS), third-country bidders from countries with which the EU has no agreement on public procurement should be systematically excluded from public and private procurement procedures.
  - **European Preference:** Promote specific requirements for European preference on manufacturing for rail projects, ensuring that critical components and systems are procured from suppliers established within the European Union or countries with which the EU has commitments on public procurement, in line with EU objectives for technological sovereignty and supply chain security.
  - **Most Economically Advantageous Tender (MEAT) and Resilience Criteria:** Make the application of the MEAT criteria, including supply chain resilience, mandatory in evaluation criteria of rail tenders.
  - **Strategic Suppliers:** There should be clear qualification requirements for suppliers who wish to participate in public procurement procedures and to enhance European resilience, it must be ensured that critical components of military mobility are sourced from reliable European suppliers. Based on the current Defence Directive 2009/81/EC, criteria for strategic suppliers (of strategic/key components or subsystems or systems) could be established. In crisis situations, risky or less reliable suppliers might fail to supply, and thus cause delays in deliveries, interrupted operation, or even rail mobility collapse. Having reliable EU suppliers for military mobility related deliveries will ensure quality supplies and strengthen the EU strategic autonomy and sovereignty.
  - **Customer Requirements:** Reduce customer specific requirements, especially for ERTMS, to avoid an increase of various system variants being deployed.
  - **Partnerships:** Foster industry and innovation partnerships rather than mere supply contracts.
  - **Joint public procurement:** Initiatives at EU level but also between multiple EU Member States. When procuring, sharing and pooling strategic dual-use transport assets, fully harmonised, interoperable and standardised assets shall be preferred.
  - **Strategic information exchange:** Establish a strategic information link between military supplies (defence technologies, people, supplies…) and military mobility to facilitate smooth movement. Rail industry will profit by higher predictability of the mobility needs and thus support the EU defence.

- **Simplify Rail Vehicle Authorisation:** The ability of Member States' armed forces to swiftly move troops and equipment across the EU rail network is dependant of the availability of the necessary rail vehicles and their authorisation/ability to traverse the routes required. The current technical framework outlining the requirements for the design and authorisation of rail vehicles under the Fourth Railway Package still presents significant technical and administrative barriers for the rapid and efficient deployment of military and dual-use vehicles across the full EU rail network.
  Recommended Actions:
  - **Extended Use of Existing Vehicles in Emergency Situations:** under a 'crisis/transport emergency situation' where there is an urgent need for mobilisation of existing rolling stock to additional regions outside its existing authorised area of use, the extension of the area of use and operation of such vehicles should be possible with only a route compatibility check performed under the responsibility of the involved railway undertakings and infrastructure managers. This should be made possible in the legal framework without the need for involvement and reauthorisation by the authorising entities

(The European Union Agency for Railways (ERA) and National Safety Authorities (NSAs)) and third-party assessors.

- **Streamlined Processes for Military Purpose Vehicles:** For vehicles designed or modified for the specific purpose of military operation, either newly manufactured or following modification of an existing vehicle, the applicable essential requirements of the Interoperability Directive (EU) 2016/797 and subsequent technical requirements should be limited to only those concerning Safety and Technical Compatibility to streamline their design, production and authorisation. The legal framework should be adapted to facilitate this, for example via a streamlined derogation process.
- **Targeted Investments on Removal of Non-TSI Compliant Train Detection Systems and Infrastructure Exemptions :** In order to ensure the readiness of an efficient dual use railway network, a focus on removing or reducing technical barriers and restrictions related to non-TSI compliant train detection systems (e.g. non-TSI compliant axle counters) and infrastructure exemptions will greatly facilitate the circulation and EU-wide authorisation of all types of rolling stock, including for military use. This should be made a priority for the identified military corridors with targeted investments made to remove non-TSI compliant train detection systems and other National infrastructure specificities.
- **Unique Vehicle Authorisation:** Expand on the simplified, faster and more streamlined "unique vehicle authorisation" concept (one vehicle authorisation covering all EU-member states) within the EU technical framework to facilitate efficient vehicle authorisation and decision making for operation of miliary rolling stock across the EU network.
- **Eliminate redundant Notified National Technical Rules:** The European Commission must pursue the simplification of Notified National Technical Rules (NNTRs) by eliminating the remaining redundant and rejected NNTRs and ensure they are do not reappear elsewhere at National level. This will establish a clear assessment framework, leading to reduced lead times for the commencement of operations and a more cost-efficient conformity assessment process.
- **Streamlined Vehicle Authorisation Process:** review and significantly simplify the European vehicle authorisation process established by the Fourth Railway Package and in operation since June 2019, including where needed amendments to the Interoperability Directive (EU) 2016/797, ERA Regulation (EU) 2016/796 and practical arrangements for the railway vehicle authorisation (EU) 2018/545. This shall reduce process-related bureaucratic burdens that have not been proven to be beneficial or are regarded as unnecessary duplication of work, thereby leading to faster, cheaper and more agile vehicle production and authorisation for all vehicle types including those for dual-mode. Example areas to address:
  - Simplified authorisation process for massive retrofit programmes across different vehicle types
  - Simplified authorisation process for TEN GE/ WAG TSI (including App. “C”) & NOI TSI compliant freight wagon types, with reduced timeframe for type approval form 1+5 months to 1+2months.
  - Simplification or removal of the conformity to type authorisation process of Article 25 if Interoperability Directive 2016/797.
  - Removal of requirements captures according to Article 13 of EU regulation 2018/545 and need for third party assessment for a process under the responsibility of the applicant.
  - Reduction of documentation requested within each application and double assessment of documents already assessed by the conformity assessment bodies.
  - Removal of trackside approval according to Article 19 of the Interoperability Directive (2016/797) or removal of quality management system approval by notified bodies as per EU decision 2010/713).
  - Limitation of authorisation requirements to CCS for vehicle retrofitting or upgrading ERTMS on-board systems, provided that the vehicle's area of use will not change.
  - Simplification of on-board and trackside CCS subsystem verification (e.g. reduction of the involvement of conformity assessment bodies at subsystem level and prioritization of safe integration).

- **Securing Rail Research & Innovation in the next Horizon Europe:** A coordinated European approach to R&I is vital to accelerate the overcoming of the historic and obstructive fragmentation in the rail system and to deliver harmonised European-wide solutions, making the European rail system more agile, innovative, resilient, capacity-performant, achieve the goals of the Single European Railway Area (SERA) and Trans-European Transport Network (TEN-T, including the comprehensive network) and make Europe more competitive. The European Rail Supply Industry depends on its research & innovation capabilities to remain at the forefront of transportation needs and overcome our industry's competitive challenges as

global market leaders. As such, the continued activities and deployment of European innovative technologies stemming from today's Europe's Rail Joint Undertaking (EU-RAIL) under Horizon Europe remains of key importance for the sector. UNIFE and our sector partners call on the European Institutions to ensure a successor to EU-RAIL in the next European Research Framework Programme.

Recommended Actions:

- **Secure Rail R&I Funding:** Secure 3bn EUR R&I funding and 15bn pre-deployment funding for the successor to EU-RAIL in the Regulation establishing Horizon Europe for the period 2028-2034 (COM(2025) 543/final 2 and Regulation establishing European Competitive Fund (COM(2025) 555 final/2)
- **Pre-Deployment:** We suggest continuing and accelerating rail R&I and pre-deployment (in existing and future EU R&I programs such as FP10) to enhance the interoperability and harmonisation of the railway system of the European Union. For example, the continuation of the research in the satellite's technologies use for safe train positioning and inclusion into the future ERTMS specification will reduce the number of balises easing the ERTMS deployment and maintenance.
- **Military Mobility R&I**: Consider the needs of military mobility when establishing the successor of EU-RAIL under FP10 to define European target rail system, e.g. harmonise operational rules and continued ERTMS developments, the advancement of satellite technologies, special military purpose vehicles and requirements, energy storage solutions for military purposes, increased vehicle resilience.

- **Define Clear Military Requirements:** Definition of commonly understood set of infrastructure and rolling stock requirements for military mobility across the EU would complement the on-going work for the harmonisation of the requirements, operational rules, working processes and deployment of interoperable solutions and infrastructure across the Single European Railway Area (SERA) and TEN-T networks.

- **Establish Common Definitions:** Common definitions of e.g. "military mobility" and "transport emergency situation" are needed to support faster decisions and to clarify mission profiles and conditions under which technical systems will be operated. Such definitions should target alignment and simplification of rules between countries and allow companies to set-up internal rules and procedures to better prepare for emergency situations. Definitions could be e.g. differed between normal situation where military trains fit into the normal system, and degraded situation in which normal traffic is reduced and during which general transport emergency rules apply everywhere in Europe. Common definitions will also ensure clarity in times of crisis as well as avoid the abuse of exceptions in times of crisis. In addition to the definition of different situation, it is necessary to agree on common geographical focus areas.

UNIFE Solutions to Limited and Vulnerable Infrastructure

There is a need to upgrade and adapt dual-use infrastructure to reduce the risk of disruption of the rail system and overcome bottlenecks and corridors and make rail infrastructure more reliable. The European Rail Supply Industry thus suggests the following actions related to limited and vulnerable infrastructures.

- **Accelerate Harmonised Operation and ERTMS Deployment:** UNIFE calls for an accelerated deployment of harmonised operational rules and related technologies such as ERTMS. ERTMS deployment should be sped up as it facilitates and speeds up movement of trains by harmonising signalling and train control (i.e. harmonisation of operational rules), enhances safety, interoperability, efficiency, speed, tracking in military transport networks. A specific focus should be put on ERTMS-deployment at border crossings and corridors. It is also important to create the technology and infrastructure that allows the automation of the information flow, the automation of the control and supervision and the integration of ERTMS and other control and traffic management systems with military supervision and control centres.
  Recommended Actions:
  - **Accelerate Deployment Projects:** Launch EU-funded pilot projects for accelerated ERTMS deployment on key military mobility corridors, with participation from multiple OEMs and infrastructure managers, to demonstrate interoperability and dual-use readiness.
  - **ERTMS Deployment Funding:** Allocate dedicated funding for a decisive and coordinated roll-out of ERTMS across Europe, accompanied by clear and binding deadlines to achieve full operational capability. This approach will facilitate the establishment of a unified European Train Control System, replacing the current landscape of multiple national control systems. The deployment of ERTMS will enable harmonised operations both within and across the borders of Member States, while also streamlining the engineering of trackside and onboard Control, Command, and Signalling subsystems.
  - **ERTMS & Military:** Promote the development of ERTMS functionalities specifically adapted to military requirements (e.g. secure communications, rapid re-routing), ensuring these are included in future Technical Specifications for Interoperability (TSI) revisions.
  - **ERTMS harmonisation:** Pursue further harmonisation of operational procedures for ERTMS and harmonisation of trackside engineering rules for ERTMS.

- **Coordinate FRMCS for Enhanced Security:** FRMCS is the next-generation communication system for railways, designed to replace the existing 2G GSM-R network. FRMCS aims to support the increasing data demands of modern digital railways, including advanced safety systems. FRMCS is based on the 5G standards thereby benefiting from the latest 5G security requirements in addition the mission critical service layer. This increases the resilience and makes the railway communication system more reliable, secure and faster for civilian and military purposes and its coordinated deployment is necessary for the enhanced security and interoperability of the railway system.
  Recommended Actions:
  - **Coordinated FRMCS Deployment:** Coordinate the deployment of FRMCS across Member States, ensuring full interoperability with ERTMS and facilitating the introduction of FRMCS on existing fleets.

- **Advance Satellite Technologies:** Integration of secure satellite-based voice and data communication into the railway infrastructure will provide resilient and encrypted voice and data exchange and will provide a valid alternative or safe fall-back solution for terrestrial network FRMCS. These systems would enable real-time coordination of military logistics across borders, provide redundant communication channels in case of cyberattacks or terrestrial network failures and support command and control operations during emergencies or conflict scenarios. Application of existing technologies as well as investigation of others such as the use of LEO (Low Earth Orbit) which improve latency, coverage, positioning accuracy and resilience to failures should be considered.
  Recommended Actions:
  - **Satellite Backup Systems:** Require that critical assets (signalling, telecommunications, control centres) are equipped with satellite backup systems to ensure operational continuity in case of attacks or emergencies. If needed, amend the European Technical Specifications for Interoperability (TSI) regulations to include specific requirements for satellite integration in military operations.

- **Dual Use Access:** Support secure and prioritised access of dual use technologies and backup systems to EU satellite infrastructure (Galileo, IRIS²), ensuring redundancy for civil railway networks and military operations.

- **Address Bottlenecks on Key Corridors:** Once a common set of technical requirements for military mobility for infrastructure and rolling stock are defined, this will allow to identify and then focus investments and efforts on the removal of bottlenecks across specific corridors (e.g. military corridors, freight corridors, incl. harbours) or networks, as well as accelerate the construction of necessary infrastructure (including last-mile, sidings, harbours) and roll-out of market-ready solutions (e.g. ERTMS, railway checkpoints). Along corridors only European wide harmonised technologies should be rolled out, consequently expanding to the linked national networks, supporting the harmonisation of the European railway system and the improvement of maintenance.

- **Secure Resilient Infrastructure:** In crisis situations, all critical infrastructure is at risk – to prevent disruption of military logistics, more resilient infrastructure (power supply, signalling systems and connectivity) and digital protection (traffic management and train operation) is needed. Investment in back-up systems to ensure the movement of military trains in case of sabotage is recommended, including separate EU-cloud with battery-powered systems to control signals and switches, as well as EU satellite communication. Ensure critical assets protection by safeguarding strategic railway infrastructure from Cyber threats, physical attacks, or emerging threats (e.g., drone incursions). Solutions could include AI-powered surveillance, anti-drone systems, cybersecurity protocols, and adoption and adaptation of military technologies as well as implementation of post-quantum encryption systems for communication and critical data storage.

  Recommended Actions:

  - **Cybersecurity**: Ensure railway systems compliance with cybersecurity legislation and maintain an agile process for cybersecurity updates decoupled from the vehicle authorisation process.
  - **Digitalization:** Continue digitalization of the rail infrastructure to ensure quick problem analysis and problem resolution; digitization is the enabler for the quick identification of critical spare parts incl. emergency stock keeping.
  - **Resilient power supply:** Investigate measures to ensure a robust and resilient electric railway power supply with a particular focus on protection against sabotage and targeted attacks. The objective is to maintain energy supply security for train operation even under exceptional stress or threat scenarios.

- **Define Fall-back Solutions:** Fall-back scenarios need to be considered, and an effective military mobility response must strike a balance between innovation and resilience. Recognising availability, repairability, redundancy, and readiness are critical, especially under crisis conditions. This includes also creating enough resilience (energy, telecommunications, dual-mode) for the system, and leveraging innovative technologies, like digital twins and AI, for effective military planning (e.g. simulating fall-back scenarios, assessing systemic risks and interdependencies across different types of infrastructure, etc.). In addition, critical infrastructure needs to be identified and defined, including the set-up of quality and technical state checks.

  Recommended Actions:

  - **Minimum Requirements & Military Movement Rules:** Define minimum requirements for fall-back solutions in a military environment. Define specific rules facilitating military movement ready to use in case of a transport emergency situation (in terms of infrastructure, technology, procedures…).
  - **Fall-back Scenarios:** Describe plausible what-if scenarios (no radio, no electricity, hacked systems, etc. and combined malfunction scenarios) and define procedures for quick repair/recovery to assess anticipated materiel/machinery availability, workforce, spare part stocks, etc.
  - **ERTMS:** Define a minimum ERTMS core functionalities and include in ERTMS regulation a “fallback operational configuration” that ensures minimum viable railway operations, maintaining essential communication and signalling functions under constrained conditions (limited connectivity, partial system failures etc). The degraded mode should enable safe train movements using simplified protocols, reduced automation, and alternative communication channels -such as secure satellite communications or rapidly deployable fallback command and control solutions.

- **EU-level Training:** Support the creation of EU-level training and simulation platforms for crisis response, involving all relevant stakeholders. Promote the use of digital technologies for an efficient harmonisation of practices along different countries.
- **Strategic Reserves:** Establish national strategic technological reserves for Military Mobility (e.g. by contracts with local suppliers in their premises) of minimum state reserve by the EU member states with focus on spare parts and key components.

UNIFE Solutions to limited Available Assets and Gaps in Optimal Use of Existing Assets

Insufficient availability of rail transport assets affects the transportation capacity in the EU and limits Member States´ ability to effectively move people and goods. The European Rail Supply Industry thus suggests the following actions related to limited available assets and gaps in optimal use of existing assets.

- **Safeguard Funding:** To fulfil the actions of the Military Pledge 2024[1] and enhance military mobility across the EU, adequate financial resources are requested to boost rail investments and speed-up projects such as the deployment of ERTMS as established in the TEN-T Regulation. In this sense, sufficient funding needs to be secured in the next Multiannual Financial Framework, notably through the Connecting Europe Facility (CEF). In addition, the future European Competitiveness Fund, should support military mobility investments including construction and maintenance infrastructure, rolling stock and interoperable technologies. In addition, the EIB should be given a prominent role in miliary mobility investments and leverage the proposed new InvestEU guarantee under the next MFF. Thus, complementing the European Commission's "ReArm Europe" plan, while fostering synergies with national authorities, EU institutions and bodies, national promotional banks, the private sector, and other key stakeholders.
  Recommended Actions:
  - **Provide Support for Modernization, Refurbishment and Maintenance:**
    - **Modernization:** Supporting the modernisation of EU rail vehicles' fleets by creating incentives to enable the railway operating community to renew their rolling stock fleets and accelerate modernisation and deployment of dual-use and/or multi-modal technologies in the EU.
    - **Refurbishment:** Establishing EU-supported refurbishment programmes for rolling stock, prioritising ERTMS upgrades and retrofitting as well as other interoperable systems. Furthermore, EU-supported refurbishment schemes for military-use rolling stock including evacuation and medical train sets are also needed.
    - **Maintenance:** Establishing EU-supported programmes to ensure the maintaining capacity of existing railway components such as infrastructure, rolling stock, switches, transformers, catenary. Enabling technologies in this sense include condition based/predictive maintenance technologies, digital twins, railway checkpoints and drones. Rapid repair teams supported by mobile tools, spare part stocks and assessment technologies need to be set-up and equipped.
  - **Military Mobility Projects in the new CEF:** In the future CEF, military mobility project evaluation and selection criteria should incentivise accelerated execution and robust approaches to risk mitigation including through digital technologies. For example, calculating tunnel clearances, assessing the structural integrity of bridges, and upgrading ports and airports with dual-use rail infrastructure, among other needs, can be greatly accelerated with smart technologies, thereby ensuring that urgently needed upgrades are delivered on time and on budget.
  - **Criteria for dual-use EU funding:** To maximise the use of EU funding, the Commission CEF Implementing Regulation 2021/1328 of 10 August 2021 specifying the infrastructure requirements applicable to certain categories of dual-use infrastructure actions pursuant to CEF Regulation (EU) 2021/1153 should be amended to widen the scope of eligible projects that can be funded to include rolling stock and ERTMS signalling technology.
  - **Providing Funding for Technical Standards:** Multimodal and dual-use technologies in Military Mobility require adjustments in technical standards and cooperation of the civil and defense sectors´ experts. In this sense, financial support is needed to support the development of adequate standards.
  - **Mobilising national Funding:** Adjusting State Aid rules to allow Member States to invest more in dual-use transport infrastructure, rolling stock and interoperable technologies such as ERTMS without lengthy approval processes should be considered. In this sense, particular attention should be given

[1] https://data.consilium.europa.eu/doc/document/ST-9225-2024-INIT/en/pdf

to the future EU Railway Guidelines, to be replaced by the upcoming Transport Block Exemption Regulation. In this sense, close coordination between industry and national governments should be promoted to find optimal and efficient project finance structures.

- **Invest in Rail Freight Technologies:** Continue the integration of rail freight digitalization, including automatic cargo inspection and information exchange across borders, between infrastructure managers and with ports and military bases. A better integration of different transport modes and the support of military equipment containerization of container wagons for easier transport should be considered. In addition, (pre)deployment projects for Digital Automatic Coupling need to be sped up.

Abbreviations

- **Command, Control, and Signalling (CCS):** In railway systems, refers to technologies, processes, and infrastructure used to control as well as manage the safe operations of trains and infrastructure.
- **European Rail Traffic Management System (ERTMS):** An innovative technical solution designed to support increasing demand and improve railway capacity. With more than 100,000 km of contracted tracks – more than 50% outside of Europe – it has established itself as a global standard. In contrast to "Class B systems", which refer to national, legacy train protection and voice radio systems, ERTMS is a unified system, which is non- specific to individual countries or regions and allows for interoperable train operations.
- **European Train Control System (ETCS):** A train protection system designed to replace the many incompatible systems used by European railways, and railways outside of Europe.
- **Future Railway Mobile Communication System (FRMCS):** A priority technology for the future railway system. The need for FRMCS implementation is not only driven by the impending obsolescence of the Global System for Mobile Communications – Railway (GSM-R) and its associated challenges from 2030 onwards, but also due to the significant opportunities FRMCS will provide to enable and support railways' digitalisation. FRMCS will support existing applications such as ETCS and voice, as well as enable new applications.
- **Infrastructure Manager (IM):** Any undertaking responsible for establishing, managing and maintaining railway infrastructure, including traffic management and control-command and signalling. The functions of the IMs on a network or part of a network may be allocated to different bodies or firms.
- **Original Equipment Manufacturer (OEM):** Describing companies (e.g. rail supply industry) that produce components or products that are sold to other companies (e.g. railway undertakings, infrastructure managers) to be integrated into their own products.
- **Railway Undertaking (RU):** Any public or private undertaking, the principal business of which is to provide services for the transport of goods and/or passengers by rail with a requirement that the undertaking ensure traction; this also includes undertakings which provide traction only.
- **Technical Specifications for Interoperability (TSIs):** define the technical and operational standards which must be met by each subsystem or part of subsystem in order to meet the essential requirements and ensure the interoperability of the railway system of the European Union.
- **Dual-mode:** a dual-mode engine operates on two different modes of propulsion (e.g. diesel and battery). It allows locomotives to e.g. use of non-electrified railway lines.