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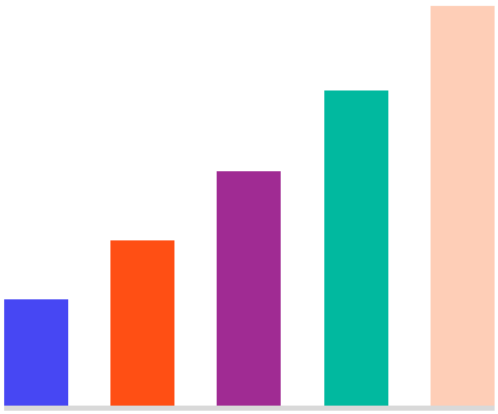

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Economic Study on the European Rail Freight Sector

Report commissioned by:

CER

Economic Study on the European Rail Freight Sector

Final Report · September 2026

Report commissioned by the Community of European Railway and Infrastructure Companies (CER)

Prepared by Rel-I SRL (lead) · Ecorys · Prof. Oliviero Baccelli

About the authors

This report was commissioned by the Community of European Railway and Infrastructure Companies (CER) and was prepared by Rel-I, a Brussels-based economic research and public policy consultancy, as project leader, with the support of Ecorys and Prof. Oliviero Baccelli.

Rel-I specialises in EU impact assessments, regulatory cost analysis, evaluation methodologies and competitiveness analyses. It was founded on the principle of quality without compromise, and its name, a deliberate play on “Artificial Intelligence”, reflects its mission to deliver Reliable Intelligence: data-driven, AI-enhanced, and human-centred analysis that public institutions can trust. Rel-I was founded by senior consultants with more than 15 years of experience advising the European Commission, the European Parliament, the European Investment Bank, and other public and private institutions, with a broad range of experience spanning the Single Market, energy, taxation, and EU fund issues to transport policy. To further strengthen the railways expertise, Rel-I was supported in this study by Professor Oliviero Baccelli (Bocconi University) and Ecorys.

Ecorys has extensive experience in the European railway sector, supporting both the European Commission and the European Parliament on a wide range of transport policy and research initiatives. This includes studies on rolling stock supply, rail labour market developments, rail connectivity, cross-border rail transport, and the revision of railway legislation. Through these assignments, Ecorys has developed a strong understanding of railway infrastructure, operations, regulation, and market dynamics, complemented by an extensive network of stakeholders across the European rail sector. Combining rigorous policy analysis, stakeholder engagement, and impact assessment expertise, Ecorys is well positioned to translate complex technical findings into practical, evidence-based recommendations for the rail sector.

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A delivery gap, not an ambition gap

Rail freight can be fixed with instruments that already exist — starting now

16.6%
share of EU inland freight, down from 18.8% in 2014

+50%
EU target by 2030 — and ×2 by 2050

1 in 3
ordered train paths are never run

RELIABILITY IS THE COMMERCIAL WOUND

Infrastructure works
renewals peak to 2030

Capacity allocation
20–25% of requests survive

Price
+10–20% vs road

Terminals
≤10% port share vs 30% goal

Tech & workforce
ETCS on ~10% of TEN-T

WHAT FIXES IT FIRST — TOP 4 OF THE SURVEY

53%
Accelerated permitting
€1.3–25bn /yr

49%
Capacity Regulation
€2.9–59.5bn

48%
Works planning & diversions
€3.1–58.5bn

46%
TEN-T parameters
+10–15% for <€1bn

THE PATHWAY

2026–27 · Act now
Rules, permitting, charges

2028–30 · Readiness
Terminals & capacity products

2030+ · Capital decade
TEN-T · ERTMS · DAC

NO NEW EU LAW IS NEEDED TO START

One addition requested: permitting for diversionary & feeder routes · framework due Dec 2027

Executive summary

Europe's policymakers ask more of rail freight than of almost any other sector: a 50% traffic increase by 2030; and a doubling by 2050. At the same time, the sector's trajectory points the other way: rail's share of EU inland freight has fallen from 18.8% in 2014 to 16.6% in 2024. It has fallen in 20 of the 25 Member States with a rail network, and volumes in 2024 stood below their 2022 level. The decline breaks down into distinct movements: across the reporting Member States, tonnes lifted fell by around 12% between 2014 and 2024, while tonne-km were broadly flat, as the average haul lengthened from roughly 255 to 290 kilometres (less cargo, carried further). Three Baltic Member States alone lost some 27 billion tonne-km of Russia-linked transit (more than the aggregate's entire net decline of around 3 billion); the remaining Member States together grew by some 24 billion tonne-km, while still losing tonnage. And the share fell even where rail grew, because road grew faster. This study, commissioned by the Community of European Railway and Infrastructure Companies (CER), asked why this development is happening and what could be done to reverse it. The answers rest on a literature review, a survey of 45 organisations across eleven stakeholder categories, interviews across the rail freight sector, case evidence, and a series of workshops, with assessments quantified as far as the evidence credibly allows. The figures used throughout estimate the economic scale of the problems each measure targets; they are not expected savings, net benefits or fiscal returns. The study is accordingly an economic assessment and prioritisation of measures, not an ex-ante impact assessment or cost-benefit analysis.

One integrated story of separate clusters of problems

Reliability is rail freight's biggest commercial weakness: customers leave not primarily because of price, but because the sector too often fails to deliver when it says it will. Five clusters of problems drive this:

1. The causes the study estimates as most costly are **uncoordinated infrastructure works**, inadequate diversion routes, and late, inconsistent communication of capacity restrictions, in a period of exceptionally intensive renewal works that runs to 2030.
2. Sub-optimal allocation then turns scarce capacity into unreliable service. Around one third of paths ordered for the annual timetable are never run, while only an estimated 20–25% of capacity requests survive unchanged to the train that finally runs.
3. **Price matters at the margins**, where road and rail offers are otherwise close: track access charges make up roughly a fifth of a freight train's production cost and often change unpredictably from year to year. Rail is also reported to remain 10–20% more expensive than road door-to-door.
4. The quality of **terminals and last-mile interfaces influence whether the customer can reach the network** at all: rail's share of containerised hinterland transport remains at or below 10% in several major ports, against the 30% CER has called for.
5. **Technology files**, together with the availability and skills of the rail workforce, **decide whether any of it is still operable in the 2030s**: ETCS covers only around 10% of the TEN-T network, retrofit costs are conservatively estimated at EUR 0.35–1.0 million per locomotive, varying widely by fleet and configuration, and full DAC migration is priced at some EUR 10.6 billion.

No new horizontal EU law is needed to start

The Capacity Regulation is adopted and in force; the TEN-T parameters and the permitting Directive are binding law; a modernised State-aid framework for rail and multimodal transport has applied since March 2026; the DAC has a published investment plan. The single piece of new

legislation this study recommends is narrow and targeted: widening the permitting Directive's scope so that its streamlined approval procedures also cover the diversionary and feeder routes on which network resilience depends. Everywhere else the constraint is implementation, and implementation has a deadline problem: the new framework's allocation and works protections first govern the timetable starting on 14 December 2030, while the disruption is happening now. The drafting window is short: the European Framework for Capacity Management, which will determine how far freight's needs are built into the system's design, must be adopted by December 2027.

Four measures top the survey under every reading of its scale, and all four belong to the first two of the five clusters outlined above (infrastructure works, capacity allocation).

- **Accelerated permitting leads** (credited with 53% of the problems it targets; addressable cost of some EUR 1.3–25.2 billion per year): it is the delivery layer everything else waits on, already law, with five Member States under infringement.
- **Implementation of the Capacity Regulation follows** (49%; EUR 2.9–59.5 billion), resting on the study's largest evidence base and among its highest feasibility ratings (the remaining work is implementation — governance, IT systems, processes and operational practice rather than new legislation, and the sector considers it effective and deliverable).
- **Coordinated planning of works with guaranteed diversion capacity** (48%; EUR 3.1–58.5 billion) addresses the sector's most expensive problem — a single major closure (Rastatt, 2017) caused an estimated loss of EUR 40 million per day in economy-wide gross value added, itself a deliberate lower-bound estimate.
- **Delivery of the TEN-T parameters** (46%) represents the capital layer, with a fast lane of targeted small investments (passing loops, parking tracks, gauge clearances) that could release 10–15% additional capacity for under EUR 1 billion per country.

Behind these four, the price measures are cheap and administrative; the terminals package builds on the State-aid framework in force since March 2026; and the technology files need funding models more than they need rankings.

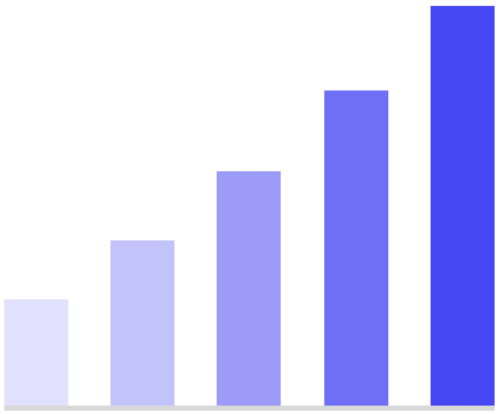
The pathway is sequenced by when each policy window opens

- **In 2026–2027, everything that matters is administrative and open now**: write freight's needs into the capacity-management framework and the works-coordination rules; apply the permitting Directive as it stands; put charge predictability into the multi-annual contractual agreements between States and their infrastructure managers; enforce the road rules already in force; and use the new State-aid framework for start-up aid, single wagonload, terminal support and intermodal transport.
- **In 2028–2030, readiness**: capacity products ordered, terminal and intermodal-interface deficits addressed before they materialise (rail freight competes as one link in a multimodal logistics chain, not door-to-door on its own), the permitting amendment legislated, and infrastructure managers resourced — they carry some 77% of the implementation cost of the new framework.
- **From 2030, the capital decade**: TEN-T parameters, ERTMS with costs and benefits of migration aligned, DAC under a funded strategy, and a workforce renewed by recruitment and training rather than awaited automation.

Better delivery could bring the EU targets back within reach

Shiftable demand exists: major industrial customers interviewed for this study (anchored by chemical-industry shippers, for whom 13–15% of road tonnes travel more than 500 km yet represent about half of their road tonne-km) state they would move double-digit shares of their

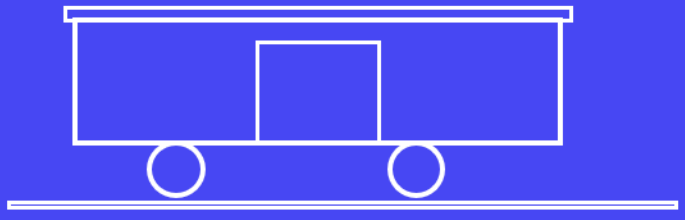
own road volumes to rail if reliability, connectivity between terminals and the rail network, and transit-time conditions were met. The shares refer to individual companies' flows, not a market-wide estimate. With the implementation agenda delivered, the decline can be halted this decade, and the official growth targets come back within reach. The sector asked whether rail freight's competitiveness problem can be fixed. The answer is a conditional yes: the necessary instruments and evidence are in place, and the window to act is still open — provided the implementation agenda set out in this report is delivered.



SECTION 1

1 Introduction and context

This chapter frames the study: why rail freight's competitiveness has become a first-order policy question, what the EU expects of the sector, and what has changed in the legal landscape. Its central observation is that the principal obstacle has shifted from legislation to implementation — the Capacity Regulation, the TEN-T requirements and a modernised State-aid framework are in force, while delivery lags. A case study on Ukraine shows why freight reliability and military mobility are increasingly the same agenda, and the chapter closes with the study's approach and evidence base.



This study was commissioned in May 2026 by the Community of European Railway and Infrastructure Companies (CER) and carried out through September 2026. Its mandate was to establish an evidence-based diagnosis of why rail freight is losing ground, assess the economic weight of the obstacles it faces, and identify concrete, prioritised measures to restore its competitiveness.

The study starts with a paradox: Europe needs more rail freight, yet has less of it every year. Rail's share of EU inland freight has fallen over the past decade, and its volumes have fallen for three consecutive years, while the EU's mobility strategy calls for rail freight traffic to increase by 50% by 2030 and to double by 2050.[1,2,3] Behind the aggregate numbers, the consequences reach beyond the sector itself. Every tonne that moves from rail to road adds congestion, accidents and emissions, and weakens the transport backbone on which the EU's decarbonisation goals, industrial competitiveness and (increasingly) military mobility depend.

1.1 Legal and political context

The EU rail freight regulatory framework has undergone major reform in recent years. The revised TEN-T Regulation, the new railway capacity management Regulation (EU) 2026/1184, and updated State aid frameworks have substantially reshaped the policy and regulatory environment. The sector's main challenge is now **implementation and delivery rather than legislative gaps**, although the framework is not complete: targeted legislative, funding, technical and physical constraints remain and are identified in chapter 3. Key issues now include timely execution of infrastructure investments, effective cross-border coordination, adoption of new capacity management processes, and completion of a limited number of ongoing regulatory initiatives.

The EU adopted Regulation (EU) 2026/1184 on the use of railway infrastructure capacity, repealing the Rail Freight Corridor Regulation (913/2010), introducing a new European framework for capacity planning, allocation, traffic management and performance management, and establishing new mechanisms for cross-border coordination and digitalisation of capacity management. The regulation has been in force since 11 June 2026, but most operative provisions apply from the December 2030/31 timetables. This transition window is where this study's measures are situated.[4] Regulation 913/2010 remains applicable until 14 December 2030; its corridor structures and the corridor one-stop shop are expected to be replaced under a transition culminating in December 2030.[5] A substantial implementation pipeline remains. Key elements include the development of delegated and implementing acts, further specification of Annex I provisions, particularly regarding temporary capacity restrictions, and the preparation of the ENIM European Frameworks for Capacity Management, Traffic Management and Performance Review.[6] The regulation's impact assessment projects ~4% higher rail traffic than the baseline by

[1] Eurostat, Modal split of inland freight transport (tran_hv_frmod), 2014–2024. Member State count: Rel-I calculations based on the same dataset. Cyprus and Malta have no rail network.
[2] Eurostat, Railway freight transport statistics (rail_go_total), 2024. The EU27 aggregate excludes Belgium, whose data are confidential.
[3] European Commission, Sustainable and Smart Mobility Strategy, COM(2020) 789 final, 9 December 2020, milestones.
[4] Regulation (EU) 2026/1184 of the European Parliament and of the Council of 20 May 2026 on the use of railway infrastructure capacity in the single European railway area, amending Directive 2012/34/EU and repealing Regulation (EU) No 913/2010. EUR-Lex.
[5] Regulation (EU) 2026/1184, cited above.
[6] Regulation (EU) 2026/1184, cited above.

2050 (≈250m train-km), with benefits of EUR 13.5bn against costs of EUR 2.1bn (present value, 2025–2050).[7]

Regulation (EU) 2024/1679 establishes updated TEN-T requirements, including key freight standards and binding deadlines for network completion. Here too, the constraint is delivery rather than legislation.[8] The European Court of Auditors found in 2026 that the eight TEN-T megaprojects reviewed had experienced an aggregate real cost increase of 82% against original estimates, with the five projects for which comparable scheduling data was available running, on average, 17 years behind their original schedules.[9] Although Directive (EU) 2021/1187 seeks to streamline permitting for certain TEN-T projects, delivery challenges related to permitting, project governance, construction, financing and cross-border coordination remain significant.[10] CER is currently consulting its members on a permitting-related position paper; this work remains ongoing, and no agreed stakeholder position has yet been adopted.

ERTMS illustrates the growing gap between regulatory obligations and implementation. According to the Third ERTMS Work Plan, ETCS was operational on approximately 12,400 km of railway infrastructure at the end of 2024, corresponding to around 10% of the TEN-T network and roughly 17% of the TEN-T core network.[11] At the same time, Regulation (EU) 2024/1679 requires progressive deployment of ERTMS across the TEN-T network and the phase-out of national Class B signalling systems, including decommissioning on the core network by 2040.[12]

The State aid framework for rail freight was fundamentally modernised in 2026. Since 30 March 2026, the Transport Block Exemption Regulation (TBER)[13] and the Land and Multimodal Transport Guidelines (LMTG)[14] have provided the primary legal framework for public support to rail, inland waterway and sustainable multimodal transport. Together, these instruments broaden the range of eligible support measures and simplify approval procedures for many forms of aid. For rail freight, the framework creates clear legal pathways for measures such as single wagonload support, ETCS deployment, Digital Automatic Coupling (DAC), terminal investments, interoperability upgrades and other initiatives aimed at improving transport coordination and encouraging modal shift from road to rail.

Several legislative files relevant to rail freight remain unresolved and should be monitored, but not treated as part of the current regulatory baseline. These include the ongoing revision of the Weights and Dimensions Directive (COM(2023) 445), which could influence competitive dynamics between road and rail transport[15]; the proposed revision of the Combined Transport

[7] European Commission, Executive summary of the impact assessment accompanying COM(2023) 443, SWD(2023) 444 final, 11 July 2023. Train-kilometre equivalent (~250 million) as reported in European Parliamentary Research Service, Briefing PE 754.599, 2023.
[8] Regulation (EU) 2024/1679 of the European Parliament and of the Council of 13 June 2024 on Union guidelines for the development of the trans-European transport network.
[9] European Court of Auditors, Special Report 2026-02: TEN-T megaprojects review, 2026.
[10] Directive (EU) 2021/1187 of the European Parliament and of the Council of 7 July 2021 on streamlining measures for advancing the realisation of the trans-European transport network.
[11] Third ERTMS Work Plan of the European Coordinator, European Commission, 23 February 2026, Table 2 (ETCS in operation, TEN-T lines, status end-2024).
[12] Regulation (EU) 2024/1679, cited above.
[13] Commission Regulation (EU) 2026/562 of 16 March 2026 declaring certain categories of aid in the rail, inland waterways and multimodal transport sector compatible with the internal market in application of Articles 93, 107 and 108 of the Treaty on the Functioning of the European Union. Official Journal of the European Union, OJ L 2026/562, 30 March 2026.
[14] European Commission. Communication from the Commission: Guidelines on State Aid for Land and Multimodal Transport (C/2026/1656). Official Journal of the European Union, OJ C 2026/1656, 30 March 2026.
[15] Proposal COM(2023) 445 amending Directive 96/53/EC (weights and dimensions), under interinstitutional negotiation.

Directive (COM(2023) 702), whose legislative future remains uncertain[16]; the recast Energy Taxation Directive (COM(2021) 563), which has yet to secure Council agreement[17]; and the forthcoming revision of the Train Drivers Directive, expected to address issues such as language requirements, certification procedures and cross-border driver mobility[18].

The EU's own policy objectives provide the benchmark against which progress should be assessed. Under the Sustainable and Smart Mobility Strategy, rail freight traffic is expected to increase by 50% by 2030 and to double by 2050.[19] In this context, the central policy question is no longer whether rail freight should grow, but whether current implementation efforts are sufficient to achieve these targets. At the same time, political expectations towards the sector have increased. First, decarbonisation objectives have intensified pressure to deliver a substantial modal shift from road to rail as part of the EU's broader climate and transport agenda. Second, the strategic importance of rail freight has expanded beyond climate policy. Military mobility and infrastructure resilience have become increasingly prominent policy drivers, reinforcing the importance of cross-border rail capacity, interoperability and network reliability (see Military Mobility Case Study).

Table 1 Overview of recent legislation relevant to rail freight

Instrument	Status	What does it change for rail freight
Regulation (EU) 2026/1184 — railway infrastructure capacity	In force since 11 June 2026; main provisions apply from the December 2030/31 timetables	Replaces Regulation 913/2010 and the Rail Freight Corridor governance model, introducing a new European framework for capacity planning, allocation, traffic management and performance management. Implementation depends on a pipeline of ENIM frameworks, delegated acts and implementing acts.
Regulation (EU) 2024/1679 — TEN-T guidelines	In force; deadlines 2030 (core) / 2040 (extended core); delivery lagging	740 m train length, 22.5 t axle load, ERTMS obligations are binding law; the P400 semi-trailer gauge applies to selected freight lines of the European Transport Corridors by 2040[20]. The constraint is delivery: across eight audited TEN-T megaprojects, costs rose 82% in aggregate, and the five projects with comparable data average 17 years delay.
Directive (EU) 2021/1187 — smart TEN-T permitting	In force; narrow scope; uneven application	Maximum permitting timelines and a single contact point, but only for pre-identified cross-border links and missing links, and for other core-network-corridor projects above EUR 300 million. Implementation remains uneven, and the Commission has launched infringement procedures against Member States.
ERTMS deployment obligations (via TEN-T Regulation)	In force; deployment far behind	ETCS was in operation on 12,400 km at the end of 2024 — 10% of the TEN-T network (17% of the core); Class B legacy systems to be decommissioned on the core network by 2040. Funding and financing arrangements for large-scale onboard retrofitting remain a major implementation challenge.
New Transport Block Exemption Regulation + Land	In force since 30 March 2026	The principal sector-specific State aid framework for the support measures in this report, including single

[16] Status per August 2026.
[17] Proposal COM(2021) 563 for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast).
[18] Expected timing per August 2026.
[19] European Commission, Sustainable and Smart Mobility Strategy, COM(2020) 789 final, 9 December 2020, milestones.
[20] Subject to exemptions.

Instrument	Status	What does it change for rail freight
and Multimodal Transport Guidelines		wagonload support and funding of ETCS on-board units and digital automatic coupling. Some measures may instead fall under other State aid rules, EU funding rules or no-aid arrangements.
Weights & Dimensions Directive — revision	In negotiation (trilogue)	Heavier and longer lorries would shift the road-rail cost balance.
Combined Transport Directive — revision	Proposed; listed for possible withdrawal — timing uncertain	Would recast the support framework for combined transport. Given the uncertainty, this report references the file's objectives, not its provisions.
Energy Taxation Directive — recast	Proposed in 2021; not agreed	Until agreed, the tax treatment of electricity (rail traction) relative to diesel (road) varies across Member States, often to rail's disadvantage.
Train Drivers Directive — revision	Revision under preparation (expected 2026)	Would ease the language and certification requirements that today constrain the cross-border deployment of train drivers — a recurring cost and flexibility barrier for international freight.
Sustainable and Smart Mobility Strategy	Adopted policy target (2020)	The yardstick this report measures reality against: rail freight traffic to grow 50% by 2030 and to double by 2050.
Military Mobility Regulation	Proposed — under negotiation	Proposal for a Regulation on military mobility; would set requirements and funding relevant to dual-use rail corridors, capacity resilience and cross-border operations, with direct effects on rail freight operators (see the Military Mobility case study).

Status shading: green = in force · amber = in motion (negotiation, proposal or expected revision) · light green = policy target. Everything in the report is assessed against the status shown here; files in motion are referenced for their objectives only.

Case study – Importance of rail freight for military mobility

The war in Ukraine has highlighted the strategic importance of railways as critical national infrastructure. Ukrainian Railways (Ukrzaliznytsia) has played a central role in maintaining economic activity, supporting exports, delivering fuel and humanitarian supplies, and sustaining military logistics. The railway network has therefore become a practical demonstration of how rail freight contributes simultaneously to economic resilience and defence readiness, particularly when other transport routes are disrupted or exposed to attack. Rail carries some 63% of the country's freight, operates the third-largest railway network in Europe with around 165,000 employees, and has evacuated more than 4 million people since 2022.[21]

The EU-Ukraine Solidarity Lanes have demonstrated rail freight's strategic value in crisis at scale. Established in response to disruptions to maritime transport routes, the initiative (spanning rail, road, and the Danube) relied heavily on rail corridors linking Ukraine with EU Member States. Beyond supporting agricultural exports, the corridors facilitated imports essential for economic functioning, including fuel, vehicles, humanitarian assistance, and military-related supplies. The initiative highlighted the importance of resilient rail connections, adequate terminal capacity, interoperable technical systems, efficient cross-border operations, and sufficient transhipment capacity at the interface between the 1520 mm and 1435 mm gauge systems.[22] Since May 2022, the Lanes have carried some 209 million tonnes of Ukrainian exports (including around 90 million tonnes of grain and oilseeds) and 95 million tonnes of imports; by late 2025 they were carrying around 80% of Ukraine's imports and 80% of its non-agricultural exports, with a total trade value in the order of EUR 260 billion.[23]

Recent EU and EBRD support for Ukrzaliznytsia illustrates the growing recognition of railways as strategic infrastructure. A EUR 248 million package announced in April 2026 (an EBRD loan of EUR 180 million with EU and UK grants) finances up to 200 MW of decentralised power generation at railway sites, intended to maintain operations even under sustained attacks on the power system. Such measures strengthen economic resilience and the rail network's capacity to support emergency logistics and military mobility. The funding therefore reflects a broader shift towards viewing rail freight infrastructure as a key component of societal and defence resilience.[24]

Rail freight possesses several characteristics that make it particularly valuable in times of crisis. Compared with road transport, rail can move substantially larger volumes of goods, heavy and oversized military equipment and fuel over long distances while requiring less energy and personnel. Investments in freight rail infrastructure therefore generate dual-use benefits by supporting both economic objectives and defence preparedness. The Commission's Military Mobility Package of November 2025 (a Joint Communication and a proposed Regulation) explicitly recognises the need for interoperable rail networks, adequate freight rolling stock for heavy military equipment, strengthened cross-border operations, and resilient multimodal

[21] CER & JSC Ukrainian Railways (Ukrzaliznytsia) (2026). Preparedness and Resilience: What European Railways Can Learn from Ukraine. CER-JSC Joint Special Report, Brussels, June 2026.
[22] European Commission. EU-Ukraine Solidarity Lanes. https://commission.europa.eu/topics/eu-solidarity-ukraine/eu-assistance-ukraine/eu-ukraine-solidarity-lanes_en.
[23] European Commission, Solidarity Lanes: latest figures – December 2025 (published February 2026). Cumulative figures since May 2022; the Lanes span rail, road and the Danube.
[24] EBRD (2026). EBRD and EU scale up support for Ukrainian Railways. Press release, 28 April 2026: EBRD loan of EUR 180 million, EU grant of EUR 44 million, UK contribution of GBP 20 million; up to 200 MW of decentralised generation at Ukrzaliznytsia sites.

logistics chains.[25] These requirements largely overlap with the infrastructure and operational improvements required for a competitive civilian rail freight sector.

Evidence from Ukrainian Railways demonstrates that rail freight's contribution extends well beyond commercial transport. Wartime operations have shown the importance of network redundancy, alternative routing options and the ability to continue operating under severe disruption. Resilience depends on infrastructure protection, but also on preparedness, organisational flexibility, and the ability to rapidly adapt operations when infrastructure is damaged. Ukraine's experience suggests that rail freight should increasingly be regarded as critical resilience infrastructure, capable of supporting strategic mobility and continuity of essential services under extreme conditions.[26]

The Ukrainian experience also points to the value of rapid restoration capabilities. Given the scale of wartime attacks, fully protecting infrastructure assets was often unrealistic. Instead, Ukrzaliznytsia focused on restoring safe operational functionality as quickly as possible through dedicated recovery teams and contingency management, supported by effective governance (pre-tested procedures, regional autonomy and vertical integration). This approach ensured continuity of freight and passenger services despite repeated disruptions. The findings suggest that restoration capability should be considered a core component of military mobility and transport resilience policy alongside investment in physical infrastructure.[27]

A central lesson emerging from Ukraine is that resilience and efficiency are not always aligned. Highly optimised transport systems may maximise performance under normal conditions but can become vulnerable during major disruptions. Ukrainian Railways emphasised the importance of maintaining reserve capacity, backup routes, operational redundancy and contingency planning.[28] These findings are directly relevant to European discussions on rail freight competitiveness: investments that improve reliability, network flexibility, **and operational resilience enhance commercial performance and strengthen Europe's ability to support military mobility and crisis response**.

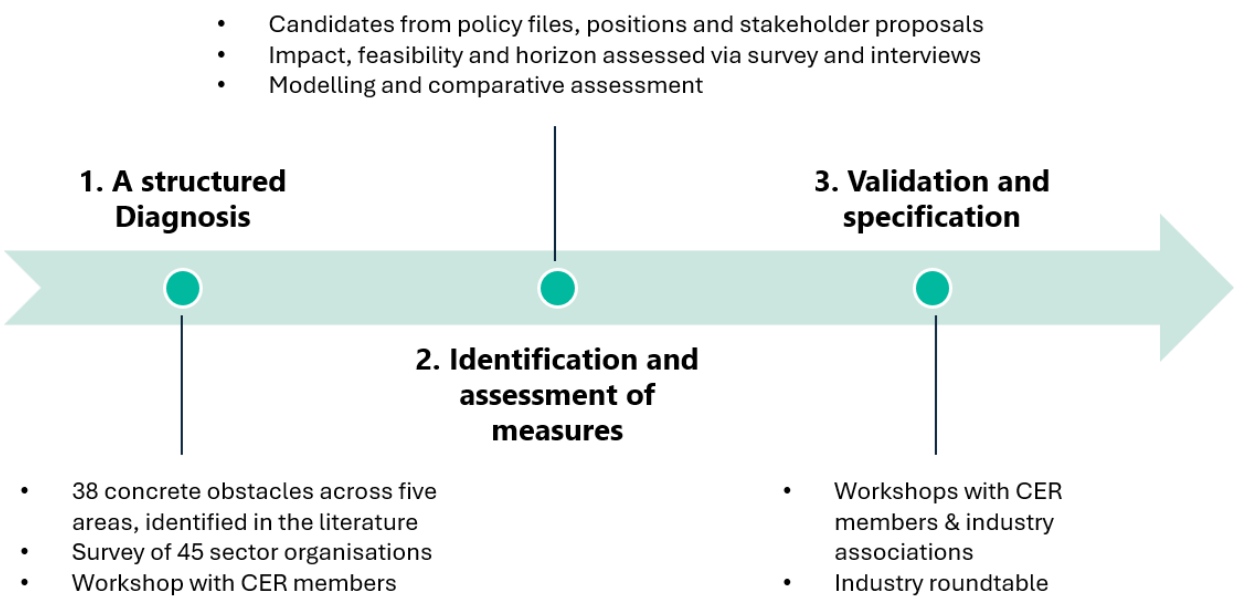
The Ukrainian experience demonstrates that the distinction between freight reliability and military mobility is often artificial. The same characteristics that support reliable freight operations, including network redundancy, alternative routes, contingency planning, rapid recovery capabilities, and operational flexibility, also determine the ability of railways to support military mobility and emergency logistics during crises.[29] Consequently, many of the measures identified elsewhere in this report to improve freight reliability, such as reducing delays, strengthening international coordination, improving infrastructure condition, accelerating temporary capacity restriction management, and enhancing cross-border interoperability, would also contribute directly to military mobility objectives.

[25] European Commission and High Representative, Military Mobility Package, November 2025 (Joint Communication and proposal for a Regulation). The CER–Ukrzaliznytsia Joint Special Report (footnote 21) calls for its adoption.
[26] CER & JSC Ukrainian Railways (Ukrzaliznytsia) (2026), cited above.
[27] CER & JSC Ukrainian Railways (Ukrzaliznytsia) (2026), cited above.
[28] CER & JSC Ukrainian Railways (Ukrzaliznytsia) (2026), cited above.
[29] CER & JSC Ukrainian Railways (Ukrzaliznytsia) (2026), cited above.

1.2 Approach and evidence base

The study was implemented in **three phases**:

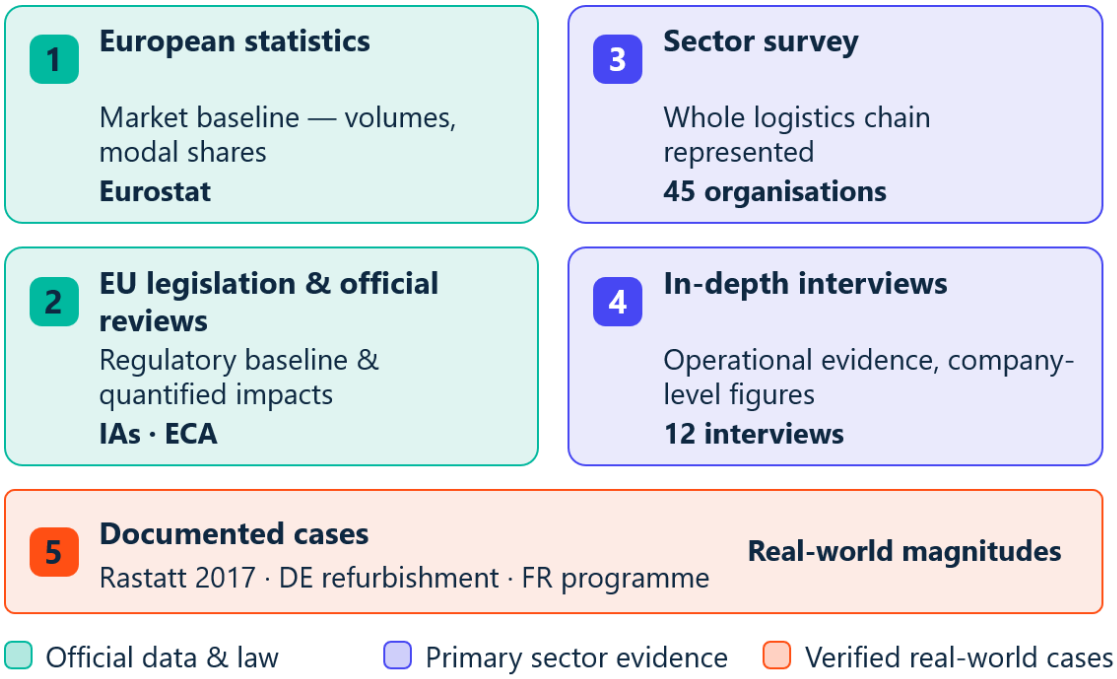
Figure 1 Study approach



Source: Rel-I

The report draws on **five bodies of evidence**:

Figure 2 Study's bodies of evidence



Rel-I
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Four limitations should be borne in mind:

1. The survey reflects the assessment of 45 organisations, hence it is a structured expert judgement of the sector, not a statistically representative sample. The sample comprises 18 freight railway undertakings, 9 infrastructure managers, 4 customers of rail freight services, 3 combined-transport operators, 3 terminal owners and operators, 2 industry associations and 2 port authorities, with one response each from a wagon keeper / leasing company, an allocation body, a railway research organisation and a stakeholder representing multiple roles (45 respondents, of whom 41 completed the questionnaire). Railway undertakings and infrastructure managers together account for almost two-thirds of the sample; where a finding rests primarily on their responses, we flag it.
2. Effectiveness estimates are stated expectations of practitioners, not measured outcomes, which is why they are reported as ranges.
3. Published statistics have gaps of their own (some national figures are suppressed for confidentiality, and no consistent EU-wide series exists for key operational indicators such as freight punctuality).
4. The regulatory framework also shifted while the study was underway: several relevant EU instruments entered into force or were revised in 2026, and the analysis reflects their status as of early August 2026.

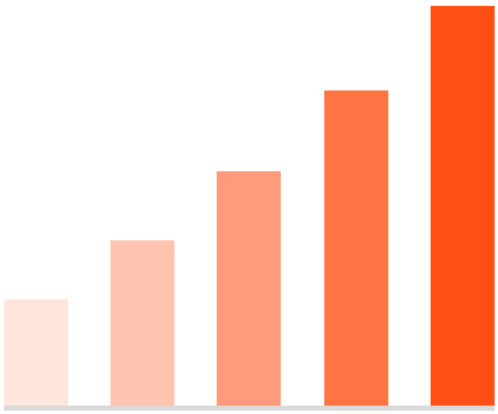
The quantifications presented in this study follow a tiered logic, chosen to avoid overstating what the evidence can support:

- **Level 1: published statistics and survey results** describe the problems in percentages (how many respondents rate an obstacle as severe, and how much improvement they expect from its removal).

- **Level 2: the survey's effectiveness ratings are converted into an estimate** of how much of a given problem each measure could address, always reported as a range across defensible readings of the survey scale.

- **Level 3: for the seven measures where the evidence chain passes a pre-defined test, shares are translated into monetised orders of magnitude** (with the test fixed before any results were computed, so that the selection could not follow the numbers). Where aggregate quantification would require stacking assumptions beyond credibility, the report works with documented cases instead.

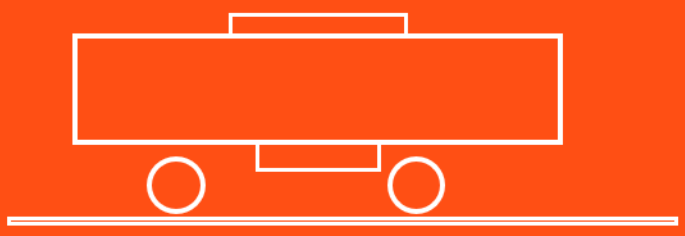
Three reporting rules apply throughout: estimates are always shown with their ranges, never summed across measures, and measures are ranked only where the evidence can genuinely separate them. Every figure in this report traces back to a documented source or an explicitly stated assumption. The methodology, calibration parameters, and assumption register are set out in Annex A.



SECTION 2

2 Status quo and future trends

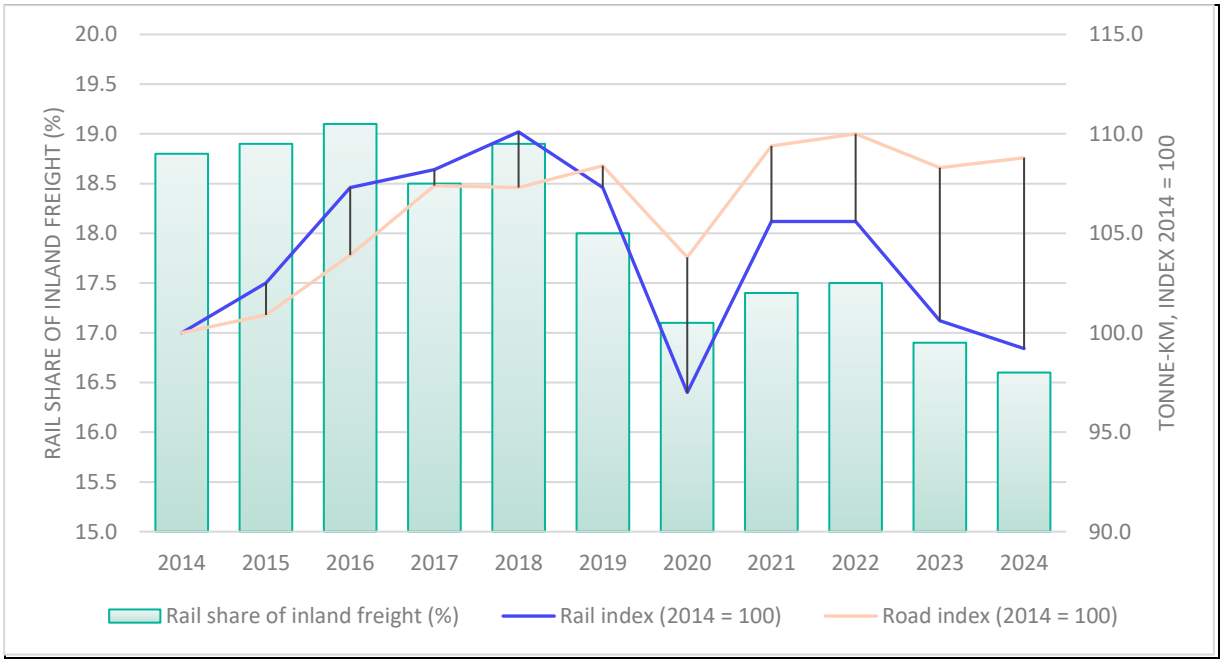
This chapter establishes the baseline. Rail's share of EU inland freight fell from 18.8% to 16.6% over 2014–2024, while road grew by about 18% — rail lost ground in a growing market, though the EU average blends very different national stories. The chapter examines rail freight's production systems and their economics, a demand outlook in which growth is expected where rail meets the logistics chain rather than in captive flows, and a US benchmark whose lessons on scale and terminal integration apply, albeit with clear structural limits.



2.1 Modal-shares and economic development

Rail freight enters this study from a decade of retreat. In 2014, rail carried 18.8% of EU inland freight, while in 2024 it was at 16.6%.[30] The decline was not steady: the share held close to 19% until 2016, fell sharply between 2017 and 2020, recovered briefly after the pandemic, and has fallen again in each of the last two years. Volumes tell the same story in absolute terms (rail freight peaked at 410 billion tonne-km in 2018 and stood at 375 billion in 2024, its third consecutive annual decline).[31]

Figure 3 Rail share of EU27 inland freight transport (bars, left axis) and rail versus road freight performance, tonne-km indexed to 2014 (lines, right axis), 2014–2024



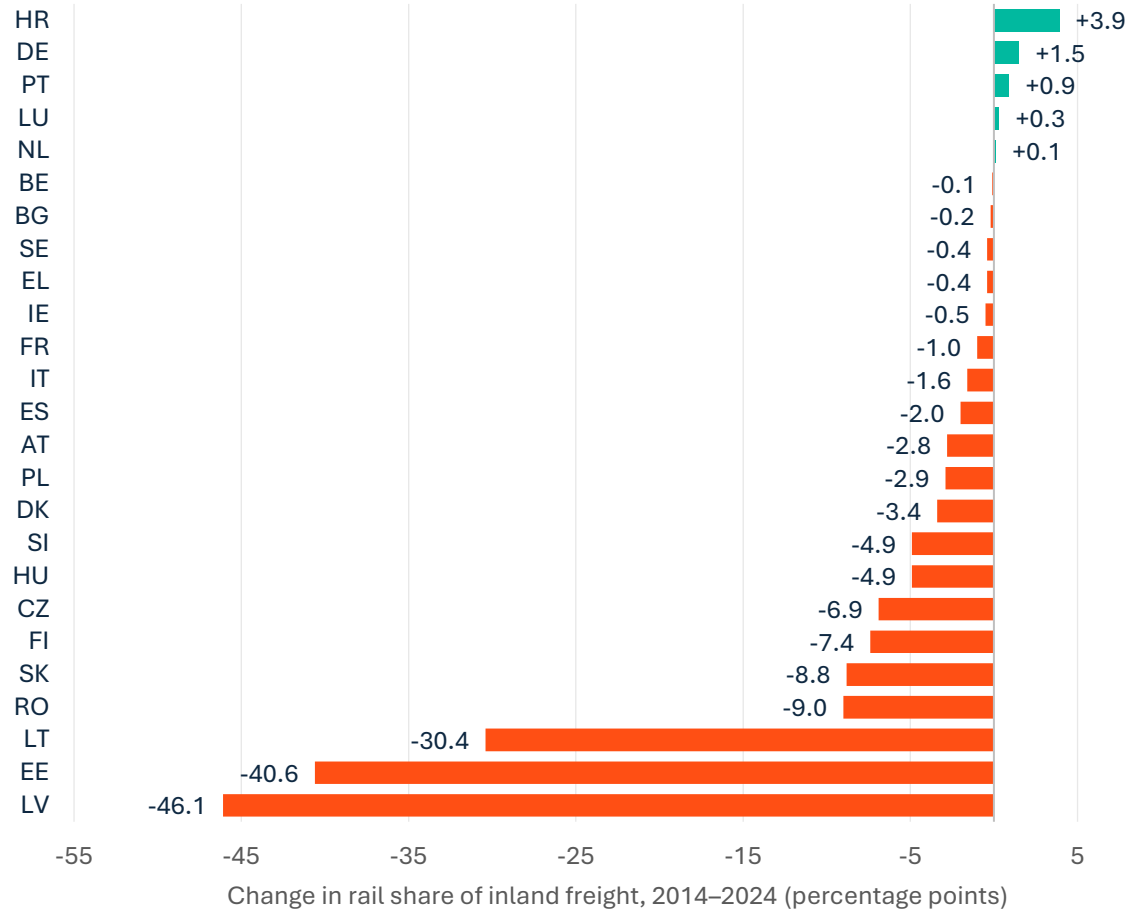
Source: Rel-I based on Eurostat (tran_hv_frmod; rail_go_total; road_go_ta_tott). Modal share: EU27 (Eurostat estimates). Indexed lines: rail tonne-km are the sum of the 23 consistently reporting Member States (Belgium and Greece excluded for confidentiality); road tonne-km are the EU27 total — the coverage of the two lines therefore differs slightly. The two vertical axes are independent scales.

What makes these numbers evidence of a relative competitiveness problem is the comparison with road, where over the same decade, road freight grew from roughly 1,584 to 1,869 billion tonne-km (about 18%).[32] Hence, rail did not lose ground in a shrinking market. The EU average, however, blends three very different stories: the largest declines are in the three Baltic states, driven by geopolitical factors, where they lost between 30 and 46 percentage points of modal share as east–west transit collapsed (Latvia's rail volumes fell from 19.4 to 3.5 billion tonne-km over the decade).[33] In parallel, the two heavyweight markets moved in opposite directions for different reasons: Germany's rail freight grew in volume (112.6 to 127.0 billion tonne-km) and gained 1.5 points of share, although this aggregate development does not isolate the effects of the country's substantial construction-related disruption, while Poland's rail volumes also grew (50.1 to 58.0 billion tonne-km) yet its share fell (because Polish road freight grew by 47% in the

[30] Eurostat, Modal split of inland freight transport (tran_hv_frmod), 2014–2024. Inland freight covers rail, road and inland waterways.
[31] Eurostat, Railway freight transport statistics (rail_go_total), 2024. The EU27 aggregate excludes Belgium, whose data are confidential.
[32] Rel-I calculations based on Eurostat (road_go_ta_tott), sum of reporting Member States 2014 vs the official EU27 aggregate 2024. Road figures are reported by country of vehicle registration, not by territory.
[33] Rel-I calculations based on Eurostat (tran_hv_frmod; rail_go_total), 2014–2024.

same period). Overall, five Member States (Croatia, Germany, Portugal, Luxembourg and the Netherlands) show that share gains are possible.

Figure 4 Change in rail share of inland freight by Member State, 2014–2024 (percentage points)



Source: Rel-I based on Eurostat (tran_hv_frmod).

Economically, rail freight is a compact sector carrying a disproportionate load: around EUR 24 billion of net turnover (2023) and some 125,000 persons employed across the EU27,[34] moving about a sixth of the Union's inland freight. Its fortunes are tied to Europe's heavy industry, and that base is weakening. Industrial production in rail's core customer sectors is well below its earlier peaks (basic metals and motor vehicles peaked in 2017–2018, while chemicals reached a further peak in 2021):

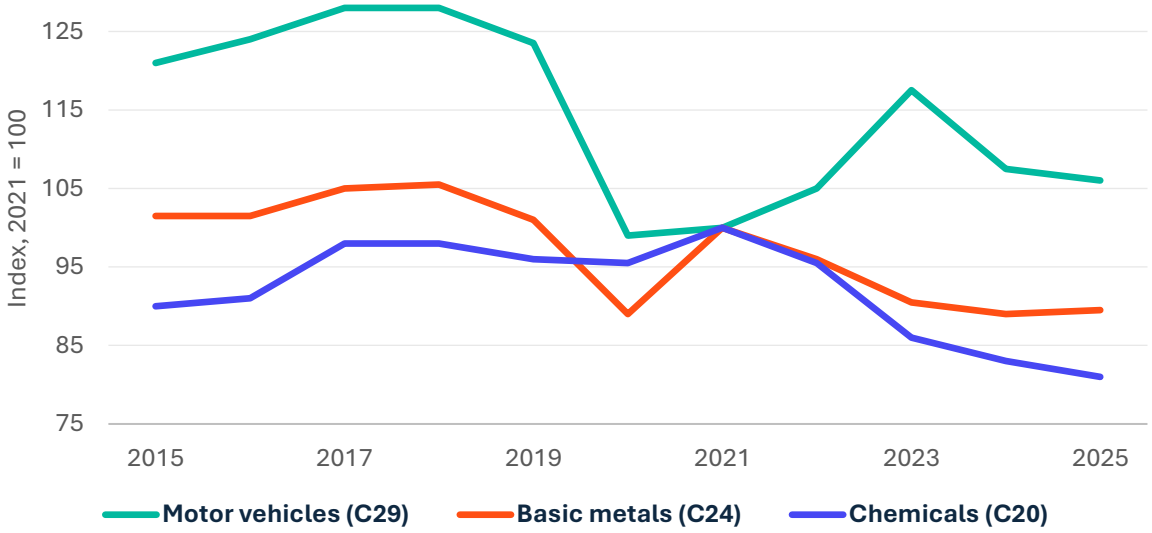
- chemicals output in 2024 was about 17% below its 2021 peak,
- basic metals about 16%, and
- motor vehicle production, after a partial recovery in 2023, remains well below its 2017–2018 level (Figure 5).[35]

[34] Eurostat, Structural business statistics (sbs_ovw_act), NACE H49.2.0, 2023. Figures for some Member States are suppressed for confidentiality; the published French figure is affected by entity reclassification and is not used.
[35] Eurostat, Production in industry (sts_inpr_a), EU27, NACE C20, C24, C29, calendar-adjusted index 2021=100, 2015–2025. Peak-to-2024 changes: Rel-I calculations based on the same dataset.

Rel-I Reliable Intelligence

Part of rail's volume loss is therefore demand-side and structural (a point the outlook in section 2.3 returns to).

Figure 5 Industrial production in rail freight's core customer sectors, EU27 (index 2021 = 100)



Source: Rel-I based on Eurostat (sts_inpr_a).

Adjacent transport markets corroborate the structural component: Eurostat's short-sea-shipping statistics show stagnant overall cargo volumes in recent years, with growth confined to containers — and since rail carries a share of port traffic, flat port throughput feeds directly into flat rail-freight demand. For Italy, for example, the Fermerci 2026 annual report points in the same direction.[36] Demand alone, however, does not explain a falling share in a growing freight market. The sector's own customers point to the other half of the story: in the study's survey, rail freight's current performance is rated 2.6 out of 5 overall (survey mean across performance dimensions, five-point scale, n = 38–39 per dimension), with transit time and reliability rated worst.[37]

GDP alone is an imperfect proxy for rail-relevant freight demand. The table below therefore decomposes each Member State's rail freight performance between 2014 and 2024 into tonnes lifted and average haul length (Eurostat, rail_go_total; 2024 provisional; Belgium and Greece confidential). Three patterns emerge:

1. **a geopolitical-structural loss**: Latvia, Estonia and Lithuania lost between 59% and 82% of their tonne-km as Russia-linked transit collapsed (some 27 billion tonne-km, more than the reporting aggregate's entire net decline of around 3 billion) and Finland shows the same signature.
2. **distance-masked tonnage erosion**: in Germany and Poland tonne-km grew by 13–16% while tonnes lifted fell, as average hauls lengthened by almost a fifth with short-haul bulk giving way to longer-distance flows; France, Slovakia, Spain, Portugal and Romania lost tonnage outright, only partly offset by longer hauls, while in Czechia and Hungary longer hauls fully offset the tonnage losses.
3. **genuine growth in a minority** (Italy, Croatia, Bulgaria, Slovenia). Set against industrial production in rail's customer sectors, the tonnage decline tracks the post-2021 contraction of energy-intensive output; set against road's growth, the share decline appears even where rail volumes grew. Port throughput and trade patterns reinforce this

[36] Eurostat, Maritime transport statistics — short sea shipping of goods (Statistics Explained); Fermerci, Rapporto annuale sul trasporto ferroviario merci italiano 2026.
[37] Rel-I/Ecorys, CER rail freight sector survey, June 2026 (45 responding organisations).

picture qualitatively; a systematic port-by-port series lies beyond the study's data window.

Table 2Rail freight 2014–2024: tonne-km, tonnes lifted and average haul, selected Member States

Member State	Rail tonne-km, Mtkm (Δ)	Tonnes lifted Δ	Average haul, km (Δ)	Reading
Germany	112,629 → 127,006 (+12.8%)	−5.6%	309 → 370 (+19%)	Growth in tonne-km, driven by longer hauls; tonnage falling
Poland	50,073 → 57,992 (+15.8%)	−2.2%	220 → 260 (+19%)	Growth in tkm, distance-driven; tonnage flat-to-falling
France	32,596 → 32,249 (−1.1%)	−13.8%	359 → 412 (+15%)	Tonnage erosion masked by longer hauls
Sweden	21,296 → 21,789 (+2.3%)	−3.1%	313 → 331 (+6%)	Broadly flat
Austria	20,746 → 20,997 (+1.2%)	−5.8%	207 → 222 (+8%)	Broadly flat; tonnage falling
Italy	20,157 → 22,933 (+13.8%)	+4.1%	222 → 242 (+9%)	Genuine growth related only to international intermodal services
Czechia	14,575 → 14,853 (+1.9%)	−12.2%	159 → 185 (+16%)	Tonnage erosion masked by longer hauls
Romania	12,264 → 11,432 (−6.8%)	−15.2%	242 → 266 (+10%)	Tonnage-driven decline
Spain	10,385 → 9,349 (−10.0%)	−23.2%	365 → 428 (+17%)	Tonnage-driven decline
Hungary	10,158 → 10,397 (+2.4%)	−9.7%	201 → 227 (+13%)	Distance-compensated
Finland	9,597 → 8,226 (−14.3%)	−28.0%	259 → 309 (+19%)	Tonnage-driven (Russia-linked flows)
Slovakia	8,829 → 8,113 (−8.1%)	−13.2%	173 → 183 (+6%)	Tonnage-driven decline
Portugal	2,434 → 2,214 (−9.0%)	−23.5%	237 → 282 (+19%)	Tonnage-driven decline
Lithuania	14,307 → 5,905 (−58.7%)	−47.6%	292 → 230 (−21%)	Transit collapse
Latvia	19,441 → 3,509 (−82.0%)	−80.5%	341 → 316 (−7%)	Transit collapse
Estonia	3,256 → 595 (−81.7%)	−81.3%	90 → 88 (−2%)	Transit collapse
23 reporting MS	381,341 → 378,151 (−0.8%)	−12.3%	255 → 288 (+13%)	Less cargo, carried further
— of which excl. LT/LV/EE	344,337 → 368,142 (+6.9%)	−6.3%	—	Growth outside the transit collapse — with tonnage still falling

Source: Rel-I based on Eurostat, rail_go_total. 2024 provisional; BE and EL confidential; average haul = tonne-km / tonnes.

Read together, the evidence supports the following attribution (stated qualitatively, because the components interact and the data do not permit a precise numerical split):

- Structural demand and commodity effects (the decline of coal and other bulk, the loss of Baltic transit, the shift towards lighter, longer-haul flows) are the largest single

component and carry high confidence: they are directly visible in the tonnage and haul-length decomposition above.

- Macroeconomic and cyclical effects (industrial production in rail's customer sectors still below its 2021 peak) are material but partly temporary (medium confidence).
- Rail-specific competitiveness effects cannot be isolated statistically, but three observations give their direction high confidence even though their magnitude remains unquantified:
    - the share fell in 20 of 25 Member States, including where freight markets grew;
    - customers state in interviews that they would shift double-digit shares of their own road volumes if service conditions were met; and
    - the survey rates reliability and transit time as rail's worst-performing dimensions.

The policy conclusion does not depend on a precise numerical split: structural and cyclical developments are largely outside the sector's direct control, although operators can adapt to them, while the measures in chapter 3 address specific rail-related barriers within the identified competitiveness component.

2.2 Business models of rail freight

Rail freight is not a homogeneous market, and the barriers affecting competitiveness vary substantially across different business models and production systems. This report adopts a business-model lens that distinguishes between **production systems** and **commodity or customer markets**. The analysis, therefore, focuses on the main rail freight production systems, namely intermodal or combined transport, block trains and single wagonload (SWL), while also considering important business contexts such as port-hinterland traffic and dedicated industrial flows.[38] Production systems describe how services are organised and delivered; commodity groups (chemicals, steel, agriculture, automotive, bulk) describe what is transported. The same commodity may move through very different production systems depending on shipment volumes, service frequency, customer requirements, and access to terminals or private sidings. Bulk commodities, for example, may move in dedicated block trains but can also be transported via SWL when individual customers or destinations do not generate sufficient volumes for full-train operations.

The economics of rail freight differ significantly across production systems. Published Dutch cost benchmarks (KiM/Panteia cost figures, 2026 update) illustrate these differences. For 2024, container shuttle services were estimated at approximately EUR 20.7 per train-kilometre, while wagonload services were estimated at approximately EUR 58.6 per train-kilometre. Wagonload costs were therefore approximately 2.8 times the container-shuttle benchmark and substantially higher than the published block-train cost benchmarks. These higher costs are largely explained by the operational complexity of SWL, which requires collecting, sorting, marshalling, and distributing individual wagons or wagon groups. Since 2018, the benchmark cost of wagonload services has risen further from around EUR 43 per train-kilometre, reflecting the sharp rise in energy-related operating costs affecting the rail sector during this period.[39]

These cost differences help explain why measures aimed at improving rail freight competitiveness affect different business models in different ways. Measures that improve the economics of high-volume corridor traffic may benefit block trains and intermodal services, but may have a more limited effect on SWL operations. Conversely, support for marshalling yards,

[38] European Commission, Ninth Monitoring Report on the Development of the Rail Market, COM(2025) 439 final.
[39] Panteia/KiM, Kostenkengetallen voor het goederenvervoer 2023 – Spoorvervoer annex, 2018 benchmark values for container shuttles and wagonload transport.

private sidings, last-mile connections or wagonload operations may be essential for SWL and industrial traffic but less relevant for large-volume intermodal corridors. For this reason, the business-model lens is carried throughout both the diagnosis of barriers and the assessment of competitiveness measures.

A key implication of this approach is that **SWL should not be characterised as a legacy or declining segment of lesser strategic relevance**. Stakeholder feedback consistently emphasised that SWL remains essential for many industrial customers and regions and continues to contribute to broader modal-shift objectives. CER describes SWL as a production system that consolidates individual wagons or small groups of wagons from multiple customers into train services, enabling rail transport for flows that do not generate sufficient volumes for dedicated block trains.[40] The model continues to serve sectors such as steel, chemicals, paper and pulp, agriculture, and automotive manufacturing.

The strategic importance of SWL is also reflected in recent public support schemes. In Germany, the European Commission approved a EUR 1.7 billion state aid scheme to support single-wagonload and wagon-group transport until 2029. The Commission recognised that SWL faces particular economic challenges due to the switching and shunting operations required, while also acknowledging its role in connecting industrial sites, supporting logistics chains, and facilitating modal shift from road to rail.[41] Support mechanisms also exist in other countries, including Austria and France, although their design, scope and budgets differ. In France, wagonload traffic continues to account for approximately one quarter of rail freight volumes, representing around 8 to 8.5 billion tonne-km annually, despite ongoing concerns regarding the long-term viability of some services.[42]

At the same time, SWL faces significant structural pressures. As stakeholders noted during the consultation process, many industrial customers now require smaller shipment sizes delivered more frequently, reducing economies of scale and increasing production costs per wagon. Where traffic volumes decline below critical thresholds, the fixed costs associated with marshalling yards, local collection services and network operations become increasingly difficult to recover. In this context, the challenge is not simply whether SWL can continue to operate under existing conditions, but how targeted measures can improve its efficiency and preserve rail access for customers whose transport needs cannot be served economically through block trains alone.

Intermodal and combined transport represent a different business model and have generally been the most dynamic segment of European rail freight in recent years. National data show strong growth in container-based rail transport in several Member States, with strong variation between countries (e.g. in tonne-km of containers and swap bodies, Poland +154% and Germany +13% between 2015 and 2025). Regulators in France identify combined transport as the principal driver of rail freight expansion over the past decade.[43] Intermodal services benefit from combining rail's efficiency over long distances with the flexibility of road transport for first- and last-mile operations. However, this market is also highly volatile. Intermodal transport remains highly sensitive to changes in the relative costs of road and rail transport, as well as to reliability, transit times and service quality. Increasing rail energy costs and persistent network disruptions have

[40] CER, Single Wagonload Non-Paper, June 2024.
[41] European Commission Decision SA.108800 (2024/N), Support for rail freight transport (single wagon load and wagon group transport trains) in Germany.
[42] SNCF Réseau, Tri à la gravité : un coup d'accélérateur pour le fret ferroviaire (2025); Autorité de Régulation des Transports, Marché du fret ferroviaire 2017-2022.
[43] Autorité de Régulation des Transports, Marché du fret ferroviaire 2017-2022.

negatively affected competitiveness, while, as operators interviewed for this study report, periods of lower diesel prices can encourage a shift of transport demand back to road haulage.[44]

Port-hinterland traffic and dedicated industrial traffic cut across these production systems. Port-hinterland flows may be organised through container shuttles, dedicated block trains, or wagonload services, depending on demand patterns, terminal infrastructure, and corridor characteristics. Similarly, industrial traffic may rely on full-train operations where volumes are sufficiently concentrated, while dispersed industrial customers frequently depend on SWL services connected to private sidings or regional freight nodes.

For the analysis that follows, each production system carries a distinct economic profile:

- **Intermodal and combined transport** is driven by terminal density and transshipment cost and is contracted into time-sensitive logistics chains; it is most exposed to the reliability, terminal-capacity and price problems addressed in sections 3.1, 3.4 and 3.3, and is proxied in published statistics by container and intermodal tonne-km, which capture volumes but not door-to-door performance.
- **Block trains** are driven by trainload volumes and asset utilisation and carry the fewest interfaces; they are most sensitive to path quality and charges (sections 3.2 and 3.3) and are only partially separable in published statistics, where they sit inside commodity aggregates.
- **Single wagonload** depends on network density, marshalling and first- and last-mile assets and carries the highest cost base (approximately 2.8 times the container-shuttle benchmark on the Dutch figures cited above); it is most exposed to price volatility and to terminal and siding decline (sections 3.3 and 3.4), and no harmonised EU statistic isolates it (national scheme data are the closest proxy).
- **Port-hinterland and dedicated industrial flows** combine these systems and depend on port rail access, rail shunting costs in the port areas and private sidings, which is why the port and siding measures in section 3.4 address them directly.

These profiles, and the limits of the available statistical proxies, should be borne in mind when reading the barrier assessments in chapter 3 against individual business models.

2.3 Demand outlook and emerging trends

Official projections expect the freight market to keep growing. The European Commission's baseline scenario projects inland freight activity to grow by 33% between 2015 and 2030, with rail freight growing by 40% to 2030 and 81% to 2050;[45] more recently the Commission has worked with overall freight growth of around 25% by 2030 and 50% by 2050 (a different scope and modelling vintage, not directly comparable with the 2020 rail-specific projections).[46] On either measure, reality is running far below these paths: rail freight volumes in 2024 were below their 2015 level. Within the sector, expectations are more modest but positive: one major European rail logistics group interviewed for this study expects market growth of around 2.3–2.4% per year, with roughly 70% of it in intermodal traffic[47] (a continuation of the composition shift already visible in the data (section 2.1)). Growth, in other words, is expected where rail meets the logistics chain, not in its traditional captive flows.

[44] Study interview programme, July 2026.
[45] European Commission, SWD(2020) 331 final (impact assessment accompanying the Sustainable and Smart Mobility Strategy), Baseline scenario: "Freight transport activity for inland modes… would increase by just 33% between 2015 and 2030… Rail freight activity would grow by 40% by 2030 and 81% during 2015-2050." Projections pre-date the pandemic; the EU Reference Scenario 2020 embeds a similar trajectory.
[46] European Commission, DG MOVE, 'Greening freight transport', 11 July 2023.
[47] Study interview programme, July 2026; expectation stated by a major European rail logistics group (company-level attribution).

The outlook balances structural headwinds against conditional tailwinds. On the demand side, the industrial base that generates rail's core traffic is contracting, fossil-fuel flows are winding down, and the study's baseline assumes no recovery of the lost Baltic transit flows. Against this, decarbonisation pressure on shippers creates measurable shift potential: in the chemical industry (a customer segment with a strong structural affinity to rail), a rail customer consulted for this study reports that 13–15% of road tonnes travel more than 500 km but represent about half of road tonne-km, and judges a shift of 10–15% of road tonne-km realistic.[48] According to the same interviewee, that potential comes with conditions attached, and they are operational rather than commercial: roughly 95% reliability at the customer's site, terminals within about 50 kilometres, and transit times within a day of road. Demand for rail freight exists; it is conditional on performance levels the network does not currently deliver. Two further developments frame the outlook: The pending revision of road vehicle weights and dimensions (an industry-commissioned modelling scenario puts the traffic at risk from heavier and longer lorries at up to 4.9 billion tonne-km by 2030)[49] challenging the level playing field on the one hand and the topic of military mobility and supply-chain resilience as emerging demand drivers, not yet quantified in additional volumes, that place a premium on exactly the attribute customers already rank first (reliability), as the case study in chapter 1 sets out, on the other.

The outlook for total freight demand must be distinguished from the demand realistically contestable for rail. The table below summarises the main flows: their direction, the production system they map to, the supporting evidence, and the principal conditions for rail to capture the traffic. A full quantification of contestable demand would be a study in its own right; this assessment, however, gives the expected direction and conditions.

Table 3 Contestable demand by main flow — expected direction, rail business model, evidence and conditions for capture

Flow	Direction	Main production system	Evidence	Conditions for rail to capture
Coal and solid fossil fuels	Structural decline	Block trains	Commodity statistics; demand outlook	None — replacement traffic must come from other segments
Chemicals	Below 2021 peak; recovery uncertain	Block + single wagonload	Industrial-production series; customer interviews	Reliability at site, terminal proximity; strong structural affinity to rail
Steel and metals	Under structural pressure	Block + single wagonload	Industrial-production series	Energy-cost relief; reliability
Containerised / intermodal consumer flows	Growing	Intermodal	Intermodal volume growth; haul-length shift	Punctuality, terminal capacity, port access, shunting costs reductions, loading gauge for semi-trailers — the 30% port ambition
Construction materials	Broadly stable	Block trains	Demand outlook	Corridor-specific; short hauls limit rail's reach

[48] Study interview programme, July 2026.
[49] d-fine for CER, 2024.

Flow	Direction	Main production system	Evidence	Conditions for rail to capture
Automotive	Cyclical	Block + single wagonload	Demand outlook	Reliability in tightly timed chains
Baltic transit	Lost	Block trains	Decomposition in section 2.1	Baseline assumes no recovery
Dual-use / military mobility	Emerging	Block + intermodal	Military Mobility case study	Capacity resilience; adequate loading gauge, dual-use investment

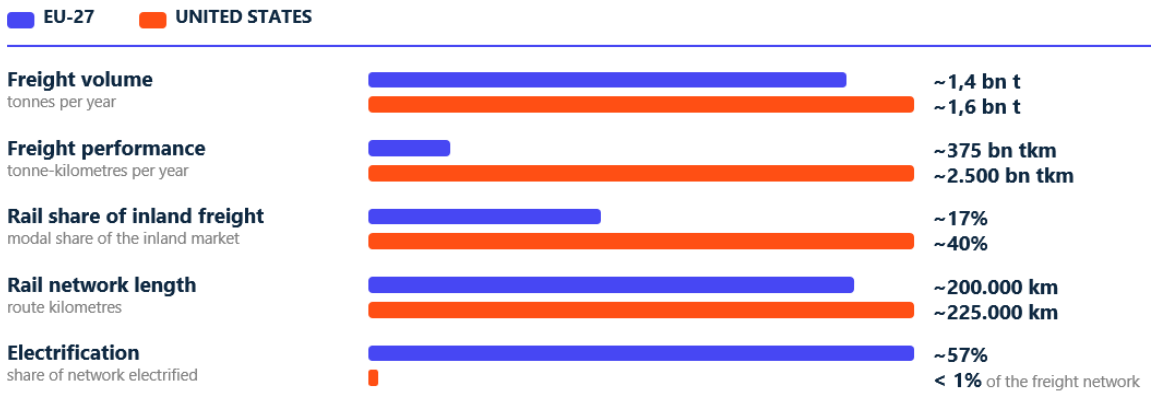
Source: Rel-I

Contextual benchmark – the US experience

1. Structural overview: Two divergent freight rail paradigms

This benchmark compares the freight rail systems of the US and the EU, two fundamentally different models of market structure, regulation, infrastructure and operations. The US rail freight industry generates over six times the freight performance of the EU railway sector. The main differences are not due to network length (EU: ~200,000 km; US: ~225,000 km), but to economies of scale enabled by the US system's technical and organisational characteristics.

Figure 6 Key freight rail indicators



Source: Rel-I based on European Commission Statistical Pocketbook; Eurostat; Association of American Railroads (AAR).

2. Vertical integration as the foundation of US rail efficiency

The US freight rail market is dominated by a small number of privately owned, vertically integrated Class I railroads[50] which collectively hold ~91% of the market. These own and manage the entire logistics chain: infrastructure, terminals, rolling stock, dispatching, maintenance, commercial services. This model can facilitate: a) rapid investment decisions, b) tight coordination between infrastructure and operations, c) high asset utilisation, d) lower unit costs, e) end-to-end logistics integration, f) terminal ownership and management, and g) long-term strategic planning within a predominantly privately financed infrastructure model. The recent Union Pacific–Norfolk Southern merger, accepted by the Surface Transportation Board on 28 May 2026, will create the first fully integrated transcontinental freight railway in North America, with 50,000 route-miles and connections to ~100 ports. This reinforces the US model of network consolidation and vertical integration, reducing interchange movements and improving operational coordination.

Figure 7 US largest operators

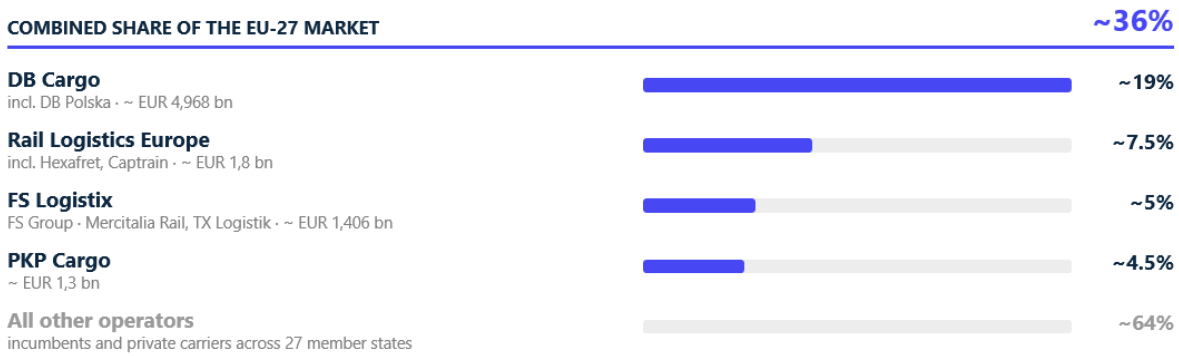
Source: Rel-I based on Association of American Railroads (AAR), 2025.

In contrast, the EU-27 operates under a legally mandated system of vertical separation between infrastructure managers (IMs) and railway undertakings (RUs). More than 700 licensed freight

[50] The largest US freight carriers, defined by the Surface Transportation Board as those exceeding an inflation-adjusted annual-revenue threshold (approximately USD 1 billion).

operators compete across the Single European Railway Area, but in major market incumbent state-owned companies remain dominant. The structural separation in Europe ensures open access and promotes intra-modal competition but introduces complex coordination challenges between infrastructure managers and railway undertakings. In general, European operators face: a) cross-border interoperability constraints, b) limited economies of scale, c) fragmented terminal management, d) high track access charges and e) lower financial margins. Major European operators generate significantly lower revenues than their US counterparts.

Figure 8 EU27 largest operators



Source: Rel-I based on annual reports of the different operators (2025).

The top four operators hold ~36% of the market, compared with ~91% in the US.

3. Technical Parameters: The physical limits to European scale

The US network benefits from engineering standards that support heavy-haul, long-distance freight, while the EU network is constrained by historical passenger-oriented design.

Figure 9 Engineering and technical parameter matrix

PARAMETER	United States Freight network · STB / AREMA	European Union Core corridors · RNE / TEN-T
Electrification	< 1% Diesel-electric dominant	> 65% Multi-system: 25 kV AC, 15 kV AC, 3 kV DC
Standard axle load	32,4 t Standard Class I	22,5 t TEN-T target
Loading gauge / clearance	Plate H · 6,15 m Double-stack containers	GC / P400 · ≤ 4,32 m Single-stack only
Standard train length	2.500 – 3.600+ m Up to five times the EU maximum	600 – 740 m Limited by passing loops and terminals
Coupler / braking	AAR knuckle coupler Automatic air brake	UIC screw coupler UIC air brake — digital automatic coupling under trial
Network geometry	Long, flat or optimised ruling gradients across vast plains	Severe alpine gradients and historic urban bottlenecks

Source: Rel-I based on Association of American Railroads (AAR), Surface Transportation Board (STB), American Railway Engineering and Maintenance-of-Way Association (AREMA), RailNetEurope (RNE).

The US system's superior performance stems from longer trains (2,500–3,600 m), higher axle loads (32.4 t), double-stack capability, and vertically integrated corporate structures that optimise operations and investments, making US freight rail far more cost-efficient.

4. Operational Models: Unit trains vs Single wagonload

The commodity mix and operational strategies further differentiate the two systems. US Class I railroads rely heavily on unit trains—homogeneous blocks of 100+ cars moving point-to-point without intermediate classification. This model maximises efficiency and minimises handling costs. Europe maintains a more diverse production structure comprising block trains, intermodal or combined transport, and Single wagonload.

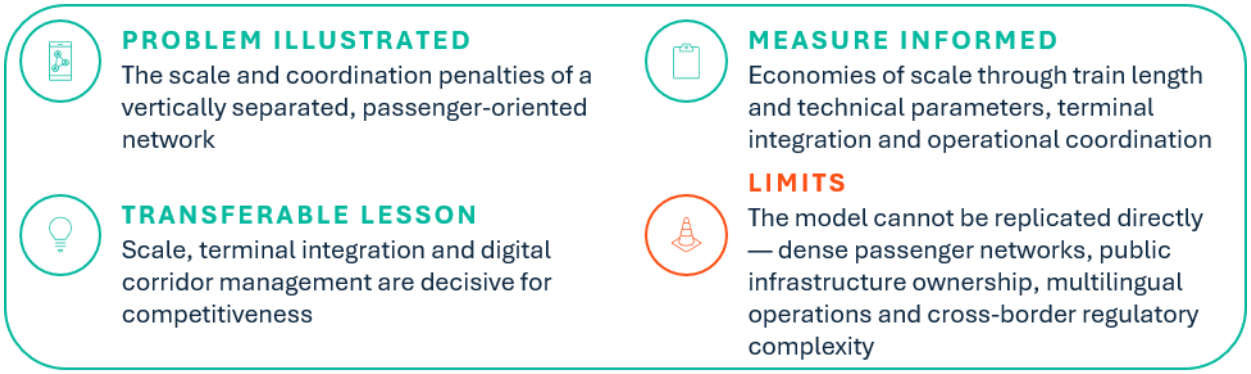
SWL requires collecting individual wagons from multiple sidings, assembling them in classification yards, and redistributing them at destination. While crucial for supporting complex industrial supply chains, SWL is inherently labour-intensive, requires substantial switching infrastructure, and is less reliable and more costly to operate — a labour-intensity the EU's Digital Automatic Coupling programme is intended, over time, to reduce.

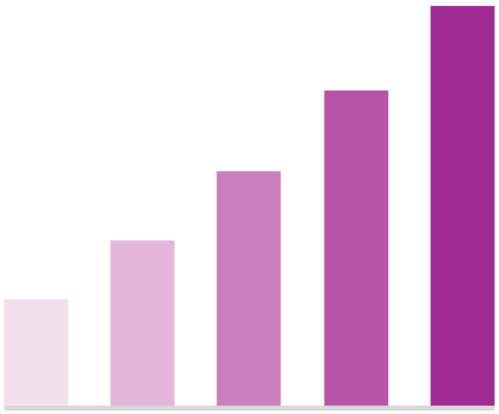
5. Intermodal freight: Terminal integration as a competitive lever

Intermodal transport is the fastest-growing segment in both regions, but the organisational models differ sharply. In US Class I railroads: a) own/manage terminals, b) coordinate train operations, c) negotiate directly with shipping lines, d) invest strategically based on freight demand and e) operate double-stack corridors. In 2024, US railroads moved 13.8m intermodal units (+9.3% vs 2023). European intermodal terminals involve multiple actors: infrastructure managers, railway undertakings, terminal operators, freight forwarders, port authorities.

6. Conclusions and policy implications for Europe

The US model cannot be directly replicated in Europe due to structural constraints: dense passenger networks, public infrastructure ownership, multilingual operations, and cross-border regulatory complexity. However, the US experience offers valuable lessons: economies of scale are decisive for rail competitiveness; vertical integration enhances efficiency, reliability, and investment capacity; terminal integration is essential for intermodal growth; operational coordination is a critical bottleneck in Europe; digital corridor management will be increasingly important.



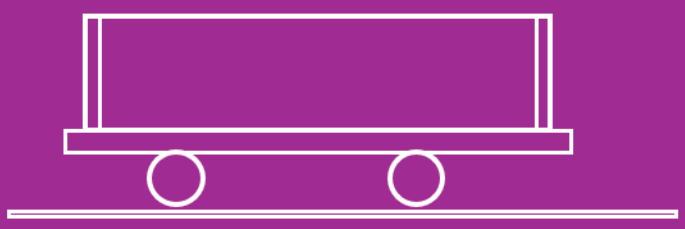


SECTION 3

3 From challenges to measures: enhancing rail freight competitiveness

Five thematic sections:

- Works-related disruption is addressed through coordinated planning with guaranteed diversion capacity, accelerated permitting and targeted capacity investment
- capacity allocation through implementation of the Capacity Regulation for freight before its 2030 protections arrive
- the price margin through charge predictability and enforcement of road rules already in force
- terminals, the last mile and ports through data integration, start-up aid and the State-aid framework in force since March 2026
- ERTMS through synchronised migration with funding that follows the costs



This chapter assesses the key challenges of rail freight in Europe and identifies and assesses a set of measures to address them. The table below provides an overview of the identified measures, including key indicators: the annual cost pool of the problems it targets, the share of those problems respondents credit it with addressing, the expected effect reported in the survey, and the implementation costs documented in official sources. It is an assembly of the study's evidence, not a cost-benefit analysis: the pools are upper-bound (ceiling) readings, the same underlying costs can be targeted by several measures and must never be summed, and the interpretation box in the methodology annex applies in full.

Table 4 Overview of measures and key data identified and assessed in this chapter that enhance the economic impact of rail freight in Europe

Package (section)	Measure	Annual cost of targeted problems (ceiling)	Survey-credited share*	Expected effect (survey)	Documented implementation cost
Disruption-proofing the network (3.1)	**Coordinated TCR planning with minimum-bypass**	EUR 3.1–58.5 bn/yr	40–59%	≈14% transit-time improvement from the TCR fix; works cost today 4–5% of production cost	Coordination frameworks (staff time); digital works tool ≈ EUR 1.85m/yr vs EUR 94.5m admin savings; French works-protection precedent EUR 600m to 2030
	Accelerated permitting framework	EUR 1.3–25.2 bn/yr	46–64%	Earlier delivery; EUR 5.1 bn user-cost savings (impact assessment)	Net administrative saving of EUR 153m (impact assessment) — negative cost
	Accelerated TEN-T parameter upgrade	(within Package 1 pools)	37–57%	≈10–15% capacity from the small-investment fast lane	Fast lane under EUR 1 bn per country; megaprojects separate (audited overruns 82%)
Freight safeguards in capacity allocation (3.2)	**Capacity Regulation implementation**	EUR 2.9–59.5 bn/yr	41–60%	≈10% cost/time from cross-border coordination; 10–11% from real-time traffic management and information	EUR 2.1 bn present value 2025–2050 (impact assessment; ≈77% on IMs) against EUR 13.5 bn benefits (6:1)
Level playing field on price (3.3)	**Multi-annual charge stabilisation**	EUR 0.2–14.9 bn/yr	24–39%	≈10% cost effect — a pure margin lever	Timing-risk absorption, not subsidy; precedents: DE part-funding since mid-2018, FR half-coverage costed at EUR 120–130m/yr
	W&D synchronisation + road enforcement	EUR 0.3–18.1 bn/yr	31–45%	≈9%; counted as reverse modal shift avoided	Enforcement is administrative
Terminals, last-mile and	**Data and ETA integration**	EUR 1.9 bn/yr (ETA, data integration and	Middle band in the survey (no	End-to-end visibility; path–terminal slot	Not monetised — builds on Rail Data, TAF TSI and

Package (section)	Measure	Annual cost of targeted problems (ceiling)	Survey-credited share*	Expected effect (survey)	Documented implementation cost
rail-port interface (3.4)		customer information driver)	separate share)	booking as one transaction	existing sector platforms rather than new regulation
	Cross-border intermodal start-up aid	(within the terminal and interface pools of Package 4)	Not survey-tested (developed after the survey stage)	Market entry of new cross-border intermodal services; degressive, time-limited	Not monetised — uses the LMTG/TBER State-aid framework in force since March 2026
	Single wagonload (SWL) support	EUR 3.3 bn/yr (SWL economics); last-mile sidings EUR 3.9 bn/yr	Lower band in the survey (defensive measure)	Preserves traffic at risk (FR: ≈19% of the market, ≈7 bn tkm, if yards are not maintained)	Precedents: DE scheme EUR 1.7 bn (2024); FR Ulysse Fret EUR 1,097m for terminals
Making ERTMS pay for freight (3.5)	**ERTMS synchronised migration**	(technology pools)	41% (37–50)	Unlocks ≈ EUR 1.1 bn/yr infrastructure savings from Class B phase-out	On-board fleet cost EUR 10–15 bn (≈ EUR 0.35–1.0m per locomotive); DE rolling-stock programme EUR 1.7 bn (July 2026; distinct from the 2024 SWL scheme of the same size)
Other challenges and opportunities (3.6)	**DAC migration**	(technology pools)	rated difficult	Yard and train-formation productivity	≈ EUR 8.5 bn migration fund (sector estimate)
	Energy taxation and price predictability	Not separately monetised (part of the price problem in section 3.3)	≈ one third of targeted problems; feasibility rated low	Structure and predictability of taxes, levies and grid charges on traction electricity	No implementation cost identified — ETD recast proposed, not agreed
	Driver language and certification	Not monetised	≈30% of targeted problems; feasibility among the better ones	Removes border friction on cross-border runs	Cheap to pilot; illustrative compliance cost today EUR 424.5m for one group
	Workforce and skills	EUR 0.9–10.0 bn/yr (central ≈ EUR 3.5 bn)	No candidate measure in the survey; driver rated High/Critical by 66%	Published demographics series; EU skills package from existing instruments	Uses existing EU training and mobility instruments; not separately costed

Amounts are in euro: bn = billion, m = million, /yr = per year, tkm = tonne-km. Entries marked "not monetised" or "not survey-tested" rest on qualitative evidence from chapter 3 only. Section-by-section detail follows in the cluster analyses.

**Survey respondents were asked how effective they expect a measure to be in addressing the problem. The 'survey-credited share' is based on this assessment where possible*

3.1 Disruption-proofing the network

Disruption is rail freight's most expensive problem, and fixing it needs no new EU law.

EUR 40m	EUR 236m	EUR 14–16	0+
per day of closure — Rastatt 2017, calculated as a lower bound	per year — sector compensation claim for the German corridor refurbishments	extra cost per diversion-kilometre, operator-reported	new EU laws needed to start — an implementation and acceleration agenda, with one targeted amendment worth making

3.1.1 The challenges

No other problem identified in this study carries as much cost or ranks as high with stakeholders. When the 38 obstacles identified in the diagnosis are priced against the sector's cost and time base, the three most expensive are the three this theme comprises:

- uncoordinated long-duration line closures (around EUR 4.9 billion per year at stake),
- inadequate diversion routes (EUR 4.6 billion), and
- poorly coordinated temporary capacity restrictions across borders (EUR 4.4 billion).[51]

Three further drivers complete the cluster: unplanned closures after incidents, permitting delays, and chronic underinvestment in freight-specific parameters. The chain from these drivers to lost markets is short:

Behind these rankings stands simple capacity arithmetic. The Rhine axis between Mannheim/Karlsruhe and Basel for example carries around 200 freight trains a day while all available diversionary routes together offer roughly 100.[52] When such an axis closes, half the traffic has nowhere to go (and operators report that traffic lost to road during long closures is largely never recovered). Nor are closures always coordinated with their own escape routes: in 2026, for example, works were scheduled simultaneously on the Brenner axis and on the Tauern axis that serves as one of its principal diversions.[53]

The costs of coping fall in principle entirely on the operators. Based on stakeholder engagement and desk research, diverted trains are estimated to cost some EUR 14–16 per additional kilometre: the lower part of the range is reported in the interview programme, and the upper end is the rate implied by the arithmetic of the German sector's compensation claim.[54] In Austria alone, construction diversions have added about one million train-kilometres a year (roughly EUR 15 million annually, 4–5% of production cost). For the German refurbishment programme to 2030, fifteen sector organisations quantified the burden at EUR 236 million per year, and 15% of trains

[51] Rel-I estimates: survey-based improvement expectations applied to the sector's operating-cost and shipper time base; orders of magnitude with the assumption chain documented in Annex A. Figures are annual, at current traffic, and are not additive. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.
[52] Study interview programme, July 2026.
[53] Study interview programme, July 2026.
[54] Study interview programme, July 2026; operators' internal cost accounting. The German sector position paper implies EUR 16.1 per extra kilometre (EUR 132m over 8.2m diversion-kilometres) — see next footnote. A consortium study pricing diversion kilometres for the German corridor works has been requested and will be cited when received.

Rel-I Reliable Intelligence

(over a third at peak) will have no diversion at all.[55] Compensation mechanisms remain the exception, though possible (e.g., after the closure of the Beira Alta line, the Portuguese infrastructure manager had, by mid-2024, paid some EUR 3.8 million to the freight operators affected, alongside EUR 7.8 million to the incumbent passenger operator).[56]

What one uncoordinated interruption can cost was measured after the Rastatt collapse of 2017: 51 days of closure on the Rhine–Alpine corridor were estimated to lead to a loss of at least EUR 2,048 million in gross value added (about EUR 40 million per day, deliberately calculated as a lower bound).[57]

3.1.2 The solutions

The rules that would protect freight during closures largely exist but are not yet in force where they matter most. The structures that will operationalise the new Regulation's provisions on temporary capacity restrictions are being built now, but its TCR protections apply only from the December 2030 timetable, while the heaviest closure programme in the network's history runs from 2024 to 2030: the disruption decade happens before the protections arrive. Closing that gap is why the solutions below are mainly an implementation and acceleration agenda rather than a call for new law (the exception being the suggested widening of the permitting Directive's scope).

Table 5 Measures at a glance — Disruption-proofing the network (role and status, August 2026)

Measures	Role	Where it stands (August 2026)
Coordinated TCR planning with minimum-bypass requirements	Operational layer: binding cross-border coordination of temporary capacity restrictions, with a guaranteed level of usable diversionary capacity whenever a core freight axis closes.	Regulation (EU) 2026/1184 adopted; TCR provisions apply from the December 2030 timetable; Annex I (TCR schedule and requirements) is part of the adopted text, Annex I sections 3 and 8 carry over provisions from the Recast Directive and therefore already apply; the Commission is preparing a revision of these sections, with a delegated act envisaged for 2027 (Art. 11(9)).
Accelerated permitting framework	Delivery layer: faster permitting shortens works windows and accelerates every physical upgrade the package needs.	Directive (EU) 2021/1187 in force but narrow in scope and unevenly applied; five Member States under infringement.
Accelerated TEN-T parameter upgrade (740 m / P400 / 22.5 t)	Network layer: the parameters raise the capacity and redundancy that diversions depend on.	Obligations in force (Regulation (EU) 2024/1679; deadlines 2030/2040); delivery lagging.

Accelerated permitting enables the TEN-T parameter upgrade; both harden the network that coordinated TCR planning manages day-to-day.

[55] Generalsanierung 2024–2030: Bahngüterverkehr fordert Kompensation, position paper of 15 sector organisations, 22 March 2024: EUR 132m diversion costs + EUR 60m uncovered fixed costs + EUR 44m from shorter and lighter trains; 84,000 of 99,000 planned trains divertible.

[56] Officially reported compensation figures, as covered by the Portuguese business press (2024); the case was first raised in the study interview programme, July 2026.

[57] Hanseatic Transport Consultancy for ERFA, NEE and UIRR: Volkswirtschaftliche Schäden aus dem Rastatt-Unterbruch, 7 April 2018. Two thirds of planned freight trains were cancelled; only 35.5% of theoretical diversion capacity proved usable.

Measure: Coordinated TCR planning with minimum-bypass requirements

The task is to **operationalise the TCR provisions** of Regulation (EU) 2026/1184 before they apply to the December 2030 timetable. Preparatory work is already underway: infrastructure managers must apply the TCR planning logic in preparing the capacity strategies for the 2031 timetable (publication end-2027) and the capacity models (2028), and TCR planning, coordination and consultation will become visible in the European Framework for Capacity Management. The minimum-bypass floor needs a definition that can be written into the coordination frameworks under Article 11[58]: for example, a minimum share of a corridor's normal freight capacity (trains per day) that must remain available via diversionary routes during any planned closure of a core freight axis, published in the TCR plan and monitored per corridor. The floor also has a costed precedent: as early as 2020, the French sector alliance's relaunch plan demanded that no works window exceed six hours and that no line be interrupted in both directions without an available diversion route, budgeting EUR 600 million to 2030 for works protection.[59] Coordination duties should extend within countries as well as across borders and cover climate resilience; the publication and stability disciplines this implies are specified in the works-communication measure below. The capacity at stake is material: one infrastructure manager interviewed for this study estimated that improved coordination of temporary capacity restrictions could increase available capacity by approximately 10–15% under normal conditions.[60]

On enforcement, operators' design ask is simple symmetry: today a railway undertaking pays a penalty for cancelling a booked path, while in most networks an infrastructure manager pays nothing for cancelling the capacity itself (incompatible possessions on a line and its own diversion route could be considered to carry a cost for the party that caused them). The new Regulation does introduce penalty arrangements that will apply to infrastructure managers as well, but only from the December 2030 timetable, which is precisely the gap this package addresses.

Interviewees also identified the poor visibility of planned works as a coordination failure in its own right: **IT solutions that record, track and make visible planned investments and track closures across Europe** (and allow their combined effect on available capacity to be simulated) were seen as a practical way to improve the communication and planning of infrastructure investments.[61] A 2025 study for the European Commission on the management of infrastructure works concluded that consultation on temporary capacity restrictions is "not adequately supported by digital information and services": infrastructure managers publish and consult through national tools that are not connected with each other, and the existing European platform

[58] The definition can be carried into the ENIM coordination frameworks and, should the existing Annex I provisions prove insufficient, into an amendment of Annex I by delegated act — a power the Regulation already gives the Commission.
[59] 4F (Fret Ferroviaire Français du Futur), Le fret ferroviaire pour concilier relance économique et écologie, June 2020, Action 24 (EUR 400m 2021–2024 + EUR 200m 2025–2030). Sector-coalition plan; figures are sector estimates.
[60] Study interview programme, July 2026.
[61] Study interview programme, July 2026.

(the RNE TCR Tool) has not been adopted by all of them.[62] The study recommends mandatory, EU-wide adoption of a single digital tool that provides a complete, continuously updated overview of all planned restrictions, including rerouting options and the capacity available on them.[63] Its cost-benefit assessment puts the recurring cost of maintaining such a tool for infrastructure managers at about EUR 1.85 million per year, against administrative savings of EUR 94.5 million combined — a benefit-cost ratio of roughly three to one before counting any operational gains, which the study explicitly treats as understating its administrative figures.[64]

The larger prize is not administrative. The same assessment monetises the coordination that such visibility enables: **coordinated management of restrictions along key bottlenecks such as the Brenner axis is valued at around EUR 1.0 billion in avoided revenue loss for railway undertakings** (plus EUR 269.5 million for infrastructure managers); clustering minor works with major ones at EUR 952.6–1,851.3 million for railway undertakings (EUR 260–520 million for infrastructure managers); and a reliable long-term timetable of restrictions at some EUR 3.5 billion for railway undertakings (EUR 568 million for infrastructure managers) — all present values over 2025–2050.[65] A shared IT layer for planned works and investments is therefore low-cost enabling infrastructure: its direct savings alone cover it, and the coordination benefits it enables are one to two orders of magnitude larger.

Getting there takes three implementation steps, an early voluntary start, a works-communication discipline, and anchoring in the framework's own instruments:

1. **Start before 2030:** Nothing prevents willing infrastructure managers from applying the Regulation's TCR standards to the 2027–2029 timetables ahead of the legal deadline, with a published list of early adopters. Voluntary early application converts the timing-gap complaint into an offer, on the precedent of the TTR voluntary pilots. The same logic applies to coordination structures: the Brenner Axis Task Force model (staff time only, no legal basis needed) can be replicated on the two or three bottlenecks carrying the largest rail freight volumes, starting with the Rhine axis between Karlsruhe and Basel and the German refurbishment corridors.
2. **Make works communication an operating discipline:** The evidence assembled points to the specifications those early adopters would apply well before 2030: a structured, rolling update of the timetable of temporary capacity restrictions, communicated far enough ahead[66] for operators to reorganise production and to accommodate alternative paths; a defined cut-off before timetable publication after which TCRs are modified only in emergencies, so that announced capacity is stable capacity; a 'dig-once' duty clustering minor works into major TCR windows, aligning works timetables rather than multiplying interruptions; and cross-border contingency plans that are pre-agreed and exercised rather than drafted after the incident. Each of these has an assessed economic case in the Commission's 2025 works-management study cited above, and none requires new law.
3. **Write diversion capability into the capacity model and thus stability into the contracts:** Two instruments of the new framework can carry these specifications. The

[62] European Commission, Directorate-General for Mobility and Transport, Study assessing the management of infrastructure works affecting rail network capacity and relevant framework conditions — Final Report, Publications Office of the European Union, Luxembourg, 2025 (doi:10.2832/8787968), p. 78.
[63] Study assessing the management of infrastructure works affecting rail network capacity and relevant framework conditions, cited above, p. 82 (recommendation on EU-wide digital services) and Annex 10, Measure 5.
[64] Ibid., Annex 10, pp. 117–118. The study assumes tool development costs are already being incurred through RNE's TCR Tool and therefore counts only recurring maintenance (one FTE per Member State). The savings figures are cumulative present values over 2025–2050, equivalent to roughly EUR 2.9 million and EUR 2.5 million per year respectively.
[65] Ibid., pp. 78–82 and Annex 10 (Measures 4, 8 and 9). All figures are present values over 2025–2050.
[66] Interviewees suggest a horizon of two to six months.

capacity model under Article 19 and Annex I of Regulation (EU) 2026/1184 should map diversionary-route capability per corridor (usable train length, axle load, loading gauge, electrification and driver route knowledge), turning the bypass floor from a principle into a corridor-by-corridor figure. Two further design elements follow from the sector consultations:

a. The floor is commercial as well as technical: rerouting must not leave the operator worse off, which means path refunds where booked paths are withdrawn, compensation arrangements for imposed diversions, and no higher access charges on the diversion route than on the booked one.
b. Infrastructure managers need a positive incentive to preserve and market freight capacity during works — freight-capacity objectives belong in their performance frameworks and in the contractual agreements with their States, so that a preserved freight path counts as delivery rather than as a complication. The same contractual agreements, under Article 30 of Directive 2012/34/EU, should also carry stability targets for the freight capacity offer, so that the stability operators are asked to plan on is also the stability the infrastructure manager is funded, and held, to deliver.

Measure: Accelerated permitting framework

The impact assessment behind Directive (EU) 2021/1187 put the administrative burden of TEN-T permitting at EUR 1,122 million for 2018–2030 (EUR 937 million on project promoters, EUR 185 million on authorities) and found the streamlined procedure would cut promoters' costs by 18% while adding EUR 13 million for authorities (a net administrative saving of EUR 153 million, alongside user-cost savings of EUR 5.1 billion from earlier delivery).[67] What delay costs when permitting fails is equally documented: across eight audited TEN-T megaprojects, costs rose 82% in aggregate and, for the five projects where the delay could be established, the average delay is 17 years, with one core freight axis upgrade delayed by a minimum of 25 years by national procedures.[68] The first task is **full application of the Directive as it stands** (five Member States were under infringement procedures as at the Court of Auditors' 2026 review). Whether the Directive has yet produced measurable acceleration is itself an open question; the Commission is to review its implementation by August 2028, a natural checkpoint for the wider application asked for here. The second (a recommendation of this study, derived from the audit and impact-assessment evidence and from stakeholder input) is the one legislative ask under this theme: a **targeted widening of the Directive's scope**, which today covers only the pre-identified sections listed in its Annex and other core-network-corridor projects above EUR 300 million, and therefore not the diversion routes on which the bypass floor depends. Extending streamlined permitting to diversionary and feeder infrastructure would tie this measure directly into what coordinated TCR planning needs delivered.

Measure: Accelerated TEN-T parameter upgrade

The 740-metre, P400 and 22.5-tonne obligations are in force with 2030/2040 deadlines; the task is **delivery through Member State programming and CEF prioritisation**. The fast lane is **targeted small investment**: passing loops, parking tracks, gauge clearances and relay points (individual measures costing tens of millions rather than billions, of the kind one large member state funds at a couple of dozen million euros each) which the sector estimates could release 10–15% additional capacity for under EUR 1 billion per country, on the evidence of the French case.

[67] European Commission, SWD(2018) 178 final (impact assessment accompanying COM(2018) 277, which became Directive (EU) 2021/1187), Parts 1 and 2. Present values, 2018–2030.
[68] European Court of Auditors, Special Report 2026-02 (TEN-T megaprojects review). The 25-year case: study interview programme, July 2026.

Megaprojects harden the network for the 2040s; the small-investment programme creates diversion capacity within the disruption decade itself.[69]
The fast lane is an indicative investment approach, not a uniform expenditure programme or a threshold for every Member State: candidate projects should be selected by the binding operational constraint they remove, the freight traffic affected, cross-border continuity, their diversion value, and dependencies on adjacent sections. The 10–15% capacity effect is the estimate documented for the French small-investment programme and should be read as evidence of the approach's potential, not as a general coefficient for TEN-T parameter upgrades.

Box — The upgrade of the Adriatic Line in Italy
The Adriatic corridor was the first Italian infrastructure brought largely into line with the performance standards of the European Freight Train (EFT)[70]. A first major milestone was reached in 2014 with the upgrade of the Cattolica Tunnel, enabling the operation of combined transport units P/C80 between Bologna and Ancona and paving the way for the extension of gauge enhancement works towards Bari, Brindisi and Taranto. By 2017, the market had already begun to respond ahead of the corridor's completion, with the launch of the first services using pocket wagons for semi-trailers, although the maximum loading profile remained limited to PC45/P364 and P386. The real turning point came in December 2018, when several infrastructure commissioning releases, including the opening of the new Galleria dei Frentani north of Ortona, enabled trains with a maximum loading gauge of 4 metres at the corner (PC80) to operate along the entire Adriatic backbone. This made it possible to transport P400-profile semi-trailers on the Padua–Bari, Bologna–Bari and Piacenza–Bari routes, leading to the introduction of new services by several Railway Undertakings (RUs) between late 2018 and the first months of 2019. Overall, between 2018 and 2025, the Adriatic corridor recorded growth in tonne-km (tkm) of approximately +15.7%, almost three times higher than the +5.9% recorded across the rest of the network. This confirms the structural nature of the benefits achieved, despite the downturn recorded in recent years, partly attributable to disruptions from further capacity enhancement and infrastructure upgrading works. The Adriatic case is the fast lane in action: successive, individually modest gauge investments — a tunnel here, a commissioning release there — compounding into a new market.[71]

Conclusions

Survey respondents credit the accelerated permitting framework with some 46–64% of the problems it targets, coordinated TCR planning with minimum-bypass requirements with some 40–59%, and accelerated TEN-T parameter upgrade with some 37–57%.[72] Respondents expect resolving cross-border TCR coordination alone to improve transit times by around 14%.[73] Survey-weighted feasibility of the package is moderate; the binding constraint is delivery capacity and funding, not legal authority.[74] Order-of-magnitude estimates place coordinated TCR planning at EUR 3.1–58.5 billion per year of addressable competitiveness cost and accelerated permitting framework at EUR 1.3–25.2 billion.[75]

[69] Study interview programme, July 2026.
[70] The EFT performance standards correspond to the TEN-T freight parameter set used in this report: 740 m train length, P400 loading gauge, 22.5 t axle load.
[71] Rel-I based on Fermerci, Rapporto annuale sul trasporto ferroviario merci italiano 2026.
[72] Rel-I/Ecorys, CER rail freight sector survey, June 2026; conversion of effectiveness ratings into shares of the problem addressed per the method in Annex A; ranges span the defensible readings of the survey scale.
[73] Rel-I/Ecorys, CER rail freight sector survey, June 2026: expected improvement if the driver is resolved.
[74] Rel-I/Ecorys, CER rail freight sector survey, June 2026: feasibility ratings given by survey respondents.
[75] Rel-I estimates (Level 3). The measure is reported at Levels 1–2 plus the corridor case only: as an acceleration of existing obligations, it resists standalone monetisation. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.

Box — What coping costs operators could save
Beyond the per-kilometre rate, the interview programme documents the standing cost of living with disruption: one operator holds EUR 3–5 million per year in assets (reserve locomotives and crews) purely to cope with works; a single three-week total closure absorbed around EUR 4 million in emergency operations (a diesel shuttle, 40 drivers, 11 locomotives) whose organisation took three years of preparation; and published diversion timetables add up to 230 minutes to a single leg. More transparent and better planning reduces the costs of improvisation.[76]

Box — The lack of alternative routes led to the loss of 83.4% of rail freight traffic during the closure of the Fréjus tunnel between Italy and France (2023–2025)
In August 2023, a major landslide in the Maurienne Valley caused the complete closure of the Fréjus transalpine railway line between Italy and France, a key component of the TEN-T Mediterranean Corridor. The line was not reopened until March 2025. Due to loading gauge and trailing load restrictions, as well as short but frequent service disruptions caused by maintenance works and landslides, the route had already experienced a decline in annual freight volumes from 2.918 million tonnes in 2016 to 2.338 million tonnes in 2022. During the final months of 2023, railway undertakings were unable to reorganise their business models and logistics chains sufficiently quickly. As a result, all rail freight traffic previously using the Fréjus route during that period was shifted to road transport. In 2024, only an additional 389,000 tonnes were rerouted through the Ventimiglia line compared with 2022 and 2023 traffic levels. This line is constrained by more than 50 km of single-track operation, as well as loading gauge and train length limitations. The additional traffic carried via Ventimiglia represented just 16.6% of the freight volumes that had previously crossed the Alps through the Fréjus route. In summary, given the absence of viable alternative rail routes to the Fréjus line, as much as 83.4% of the freight traffic that had previously been transported by rail was diverted to road transport.[77]

An accelerated permitting framework conditions the pace of the accelerated TEN-T parameter upgrade, and both determine the physical room for manoeuvre available to coordinated TCR planning with minimum-bypass requirements. The solutions identified here also connect with those in section 3.2 Freight safeguards in good quality capacity allocation and presuppose a stable long-term infrastructure-financing framework (flagged in the interviews as the missing framework condition, with financing horizons ranging from five-to-six-year plans in some Member States to single-year budgets in others).[78] Success is measurable by monitoring the share of temporary capacity restrictions announced with the required lead time and left unchanged, the diversion-capacity ratio on core freight axes during planned works (the bypass floor, monitored); and works-related extra train-kilometres and train cancellations per year, which today cost the sector 4–5% of production cost.

Implementation comes in two stages. Earlier and more stable TCR notification, coordinated works planning and a common information tool can be advanced now, under law already in force: the immediate action for CER and its members in 2026–2027 is to carry these requirements into the capacity-strategy preparation and the European Framework for Capacity Management consultation. The bypass floor is the second stage: it still requires a common methodology, corridor-level testing, and rules for the cases where no technically viable diversion exists, and should be developed through the volunteer corridors before general application.

[76] Study interview programme, July 2026.
[77] Source: Rel-I based on Fermerci, Rapporto annuale sul trasporto ferroviario merci italiano 2026, and RFI/SNCF Réseau operational data.
[78] Study interview programme, July 2026.

3.2 Freight safeguards in good quality capacity allocation

The allocation system plans capacity nobody uses and delivers unreliably what it allocates — the law to fix it is adopted; whether it fixes it for freight is being decided now.

1 in 3	20–25%	33–51%	6 : 1
paths ordered for the annual timetable are never run	of capacity requests survive unchanged from request to train run	freight punctuality at the exits of major corridors (30-min threshold), 2023–2025	benefits over costs of the new allocation framework, on its own impact assessment

3.2.1 The challenges

Where section 3.1 Disruption-proofing the network addresses whether the network is physically available, this theme addresses how the capacity that exists is allocated and delivered and here the system fails in two mirror-image ways:

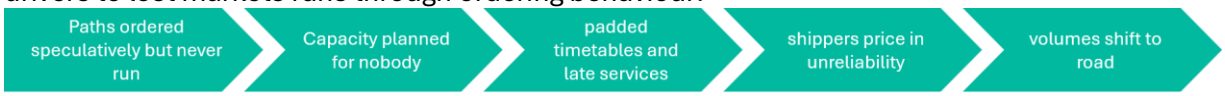
1. **Before the fact, it plans capacity nobody uses**: around one third of the paths ordered for the annual timetable are never run,[79] and the Commission's impact assessment separately reports a stakeholder estimate (a related but different measure) that only 20–25% of capacity requests remain stable between the original request and the train that finally runs.[80]

2. **After the fact, it delivers unreliably what it does allocate**: in 2020, 64.1% of domestic freight trains but only 47.4% of international ones arrived within 15 minutes of schedule (more than half of international freight trains were late[81]) and even at the corridors' more lenient 30-minute threshold, exit punctuality was around 50% on the Rhine–Alpine corridor in 2023–2024 and 33% on the North Sea–Baltic in 2025 (overall corridor punctuality 38%).[82] For an industry selling reliability into logistics chains timed in minutes, this (more than any single missing investment) is the sector's most damaging commercial weakness. And the stakes are rising with the traffic mix: intermodal volumes have grown over recent years, and the containers, semi-trailers and swap bodies they carry are tied into logistics chains markedly more time-sensitive than bulk flows.[83]

Priced against the sector's cost and time base, the capacity-allocation drivers stand immediately behind the disruption drivers of section 3.1: limited real-time traffic management and information — including reliable Estimated Time of Arrival (ETA) information — (around EUR 3.5 billion per year at stake), weak cross-border path coordination (EUR 3.3 billion), the structural priority accorded to other traffic in planning and operations (EUR 2.3 billion), scarce capacity for short-notice requests (EUR 2.3 billion) and the rigidity of annual timetabling (EUR 2.2 billion).[84] One concrete obstacle sits behind the first of these drivers: an international train changes its train number at

[79] Study interview programme, July 2026.
[80] European Commission, SWD(2023) 444 final (executive summary of the impact assessment accompanying the proposal COM(2023) 443, which became Regulation (EU) 2026/1184); full impact assessment SWD(2023) 443 final. Present values 2025–2050, 2021 prices. The 20–25% figure is reported by the Commission as a stakeholder estimate, not a comprehensive EU statistic.
[81] European Commission, 8th Rail Market Monitoring report, COM(2023) 510 (2020 data; RMMS counts a freight train as punctual if delayed by no more than 15 minutes); reproduced in SWD(2023) 443.
[82] Rail Freight Corridor annual reports (Rhine-Alpine 2023/24; North Sea–Baltic 2025) and RNE KPI reporting; 30-minute threshold. Measurement methods changed in 2024, and corridor figures are not strictly comparable with each other or with the RMMS baseline.
[83] UIRR, Road-Rail Combined Transport reports (annual); study interview programme, July 2026.
[84] Rel-I estimates: survey-based improvement expectations applied to the sector's operating-cost and shipper time base; orders of magnitude with the assumption chain documented in Annex A. Figures are annual, at current traffic, and are not additive. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.

each border, so no single identifier follows the movement in real time.[85] The chain from these drivers to lost markets runs through ordering behaviour:



Behind the averages lies a patchwork of national commercial terms that makes a cross-border path an artisanal product rather than an industrial one: what a path costs to cancel, how long it remains valid, and how much notice its holder receives before it is re-planned all change at each border (the inventory is in the box overleaf).[86] The structural setting makes allocation quality decisive: across the 23 Member States reporting the split, 92% of railway lines are shared between passenger and freight traffic and only 4.4% are dedicated to freight — virtually every freight path is negotiated on a railway that is also somebody else's.[87] Meanwhile, physical scarcity is hardening beneath the allocation problem. It is localised rather than general — concentrated in urban nodes and at pinch points where traffic types with different levels of priority converge, while elsewhere better timetabling coordination, notably for international train paths, would release capacity, as the one third of booked-but-unused paths implies. Some 2,934 km of infrastructure were reported congested in 2020 (1,816 km of them on the freight corridors), roughly triple the 2015 figure, although part of that increase reflects changed declaration practice in one large Member State rather than deterioration alone.[88] And in mid-2026, one large network began, for the first time, to cap the traffic it accepts on overloaded lines.[89]

3.2.2 The solutions

The legislative answer already exists and is broadly supported by the railway undertakings interviewed for this study. Regulation (EU) 2026/1184, in force since June 2026, keeps the annual working timetable but moves the system decisively away from its predominantly annual, national focus: it adds strategic capacity planning, rolling planning that must at minimum serve freight (with capacity reserved for requests that arrive after the annual deadline) and capacity products that specify speed, length, route and volume rather than a bare slot.[90] It also entrusts the European Network of Infrastructure Managers (ENIM) — a body in existence since the 2016 governance reform but now given substantially expanded responsibilities — with preparing the common European Framework for Capacity Management — consulting stakeholders on it, adopting it, and applying it through the network statements unless departures are duly justified.[91] The solutions identified therefore contain no call to reopen the Regulation; the focus is on making it work, and work for freight. What remains genuinely open is the layer below the Regulation: the European Framework for Capacity Management that ENIM must adopt (a first version is due for stakeholder consultation in late 2026) and the national implementation choices that translate it into practice by the December 2030 timetable.[92] That drafting window is where freight's needs either enter the system's design or do not, and it closes well before the Regulation's benefits can arrive.

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[85] Study interview programme, July 2026.
[86] Study interview programme, July 2026.
[87] Rel-I based on Eurostat (2024), as compiled in Union TLF / CLECAT, Key Figures — European Freight Transport, Edition 2026, p. 38. Belgium, the Netherlands, Sweden and Portugal do not report the split.
[88] SWD(2023) 444 final, cited above. Congestion declarations depend on national criteria and reporting practice; the Commission notes the increase was heavily affected by a change in Italy's declaration criteria.
[89] Study interview programme, July 2026.
[90] Regulation (EU) 2026/1184 (OJ L, 10 June 2026), in particular the provisions on strategic capacity planning, rolling planning (Article 35) and capacity planning objects. The annual allocation process is retained (Articles 32 and 34, Annex I Section 4) and supplemented, not replaced.
[91] ENIM was established by Article 7f of Directive 2012/34/EU (inserted by Directive (EU) 2016/2370); Regulation (EU) 2026/1184 reorganises it and assigns it the European framework task.
[92] RailNetEurope, capacity-management implementation documentation (accessed August 2026): the European Framework for Capacity Management rulebook is under development, with a first version for consultation with operational stakeholders scheduled for the last quarter of 2026.

Table 6 Measures at a glance — Freight safeguards in good quality capacity allocation (role and status, August 2026)

Measures	Role	Where it stands (August 2026)
Capacity Regulation implementation	Implementation layer: make the adopted Regulation deliver for freight — rolling-planning products sized to freight's contracting horizon, safeguarded capacity specified as a quality product, and symmetric commercial terms — through the framework drafting and national choices now underway.	Regulation (EU) 2026/1184 adopted and in force since June 2026; governance provisions apply already, the core allocation provisions to timetables from 14 December 2030. ENIM's European Framework for Capacity Management is in drafting (first version due for stakeholder consultation in late 2026), with Commission implementing acts as fallback.

The Regulation fixes the design, national implementation decides what a path is worth in the meantime, and ENIM's framework carries it across borders.

Three design priorities follow from the adopted text:

1. Make safeguarded capacity a quality product rather than a residual: Safeguarding only helps if what is safeguarded is good quality capacity that an operator can sell on the key international corridors, at competitive speed and train length, and stable across borders (the design risk to avoid is a safeguard filled with whatever other planning leaves over). The safeguard should also be specified through the Regulation's own capacity objects. The instrument for that quality standard already exists: the Regulation's capacity products specify speed, length, route and volume, and safeguarded freight capacity on the key international corridors should be specified as exactly such objects (minimum speed, 740-metre-compatible train length and cross-border continuity) rather than as a bare percentage. Short-notice reserves should be sized from observed demand, not set as token shares. And the quality requirement extends to degraded mode: a diversionary path offered during a closure should preserve, to the greatest extent possible, the operational and commercial viability of the service, taking account of network constraints during works and disruptions — the allocation-side counterpart of the bypass floor in section 3.1.
2. Size rolling-planning products to the horizon on which freight business is actually contracted (often only one to two years ahead, and frequently less). The evidence that one third of annually ordered paths never run is not proof that freight needs less capacity; it is proof that an annual timetable forces operators to order speculatively, ahead of contracts they have not yet won.[93] Capacity products that can be ordered when the business actually materialises would convert phantom demand into real demand and give infrastructure managers an honest picture of what freight requires.
3. Use the Regulation's symmetry without waiting for it: The symmetry argument made for closures in section 3.1 has, for allocation, already been accepted in law: from the December 2030 timetable, significant capacity changes by either side (infrastructure manager or applicant) carry reciprocal penalties within an EU-set band of EUR 1–8 per affected train-km before modulation.[94] There is room to apply that logic already, at the margins — not by introducing new penalty schemes ahead of the 2030 framework, which could create legal uncertainty with national arrangements, but by voluntarily converging

[93] Study interview programme, July 2026.

[94] Regulation (EU) 2026/1184, penalty provisions for significant changes to allocated capacity; reciprocal between infrastructure managers and applicants, with narrowly defined exceptions. Annex IV (EUR 1–8 per km of the affected path); Article 42 (modulation factors 0.1–2). Actual levels are set within the EU band and may vary.

existing national cancellation regimes on the Regulation's symmetric logic where legal frameworks permit; adopting path-validity rules that do not strand an international train at the border; and ensuring parity of re-planning notice between traffic types.[95]

Getting the European Framework for Capacity Management right takes the following three implementation steps:

1. **Pilot the 2030 allocation regime before 2030: Two or three volunteer** corridors should apply rolling-planning products and safeguarded freight capacity ahead of the December 2030 timetable. The precedent is even stronger here than for TCRs: the TTR programme ran such voluntary pilots for years, and RNE's implementation machinery (process handbooks, TT2028 scoping) exists to host them. The pilots could, for example, combine data-driven capacity optimisation with validated communication solutions between traffic control and train drivers (within the framework of the Train Drivers Directive) with results measured through the scorecard indicators this report proposes (Annex C) rather than pilot-specific criteria. A pilot that shows request-to-run stability improving on one corridor is worth more at the EFCM table than any position paper, and it de-risks the very implementation on which the impact assessment's EUR 13.5 billion benefit case rests.
2. **Hold the framework to its own business case: The Regulation's impact assessment** monetised what good allocation is worth: EUR 13.5 billion in benefits against EUR 2.1 billion in costs (present value 2025–2050) including EUR 658 million in punctuality gains and EUR 482.8 million in adjustment-cost savings for operators, and a network carrying around 4% more train-kilometres by 2050 than the baseline (freight +3.9%, passenger +4.0%, assuming the additional paths are allocated and met by demand).[96] Two implementation consequences follow: First, some 77% of the costs fall on infrastructure managers, and if their resourcing is not secured, the framework will be implemented slowly and minimally, and the benefit side will shrink with it.[97] Second, those figures are the yardstick against which the drafting now underway should be measured, and an implementation that cannot plausibly reach them is a design failure, not a fate.
3. **Measure the system with one ruler and publish what it shows: Implementation also needs** an evidence layer that does not yet exist. Infrastructure managers should collect and publish, per corridor and in a common format, the statistic the EU currently lacks (paths ordered versus paths actually run) together with the reasons why booked capacity is cancelled; today the one-in-three figure rests on fragmentary sources precisely because no comprehensive statistic exists. On that data should sit a harmonised, standardised set of allocation indicators (request-to-run stability, delivery rate of safeguarded capacity, cross-border path lead times) anchored in the Regulation's performance-review architecture, since Member States and infrastructure managers today collect different things and the results cannot be compared. And punctuality needs one definition: without a single freight punctuality standard (threshold and measurement points), every punctuality marker in this chapter is built on shifting sand. The standard should be anchored in existing processes — the RMMS and the ENIM KPI work are separate exercises that can complement each other — and reuse data already collected rather than duplicate reporting or add disproportionate administrative burden on infrastructure managers.

[95] Study interview programme, July 2026.

[96] European Commission, SWD(2023) 444 final (executive summary of the impact assessment accompanying the proposal COM(2023) 443, which became Regulation (EU) 2026/1184); full impact assessment SWD(2023) 443 final. Present values 2025–2050, 2021 prices. The figures describe the 2023 impact assessment's preferred option, passenger and freight together — not freight safeguards alone, and not mechanically the final adopted text; a large share of the benefits consists of reduced external costs (congestion, accidents, emissions). The freight share is being derived and documented in Annex A.

[97] SWD(2023) 444 final, cited above: EUR 1.609 billion of the EUR 2.094 billion gross cost total.

Conclusions

Three layers should be kept distinct. The Regulation already establishes the requirements for safeguarded capacity, rolling planning and reciprocal commercial conditions. The quality specifications, volumes and procedures are still to be defined through the European Framework for Capacity Management and national implementation. And the corridor pilots and early convergence of commercial terms are voluntary steps proposed by this study. The points on which railway undertakings should intervene in the forthcoming Framework consultation follow directly: the quality specification of safeguarded capacity (speed, train length, cross-border continuity), the share of capacity held for rolling planning, and TCR consultation and notification practice. The impact assessment's benefit case belongs to the Regulation as a whole and is not claimed here as the benefit of these freight-specific recommendations.

Survey respondents credit freight safeguards in good quality capacity allocation with some 41–60% of the problems it targets.[98] Its feasibility rating is among the highest in the survey: the sector considers the measure both effective and deliverable, consistent with its maturity: the Regulation is adopted and in force and the remaining work is implementation — governance, IT systems, processes and operational practice rather than new legislation.[99] Respondents expect resolving weak cross-border path coordination alone to improve costs and transit times by around 10%, and better real-time traffic management and information to improve cost, time and reliability by some 10–11% each.[100] Order-of-magnitude estimates place freight safeguards in good quality capacity allocation at EUR 2.9–59.5 bn/year of addressable competitiveness cost.[101]

Box — What unequal terms cost operators

In one large market, cancellation charges cost operators roughly EUR 0.50 per train-kilometre a year (3–4% of production cost) while the neighbouring network charges nothing for the equivalent. A path can remain valid for around two hours in one Member State and around twenty in another, so an international train that loses its slot at a border may be unplaceable abroad while still counting as on time at home. And when works force re-planning, passenger services in one market receive four months' notice against one month for freight. Each asymmetry is individually small; together they are a standing tax on exactly the cross-border traffic the EU wants to grow. Aligning them is rule-making rather than new public spending — and from December 2030 the Regulation's reciprocal penalty band will do part of the work. The ask is not to wait.[102]

The solutions identified interface directly with those in section 3.1: the same Regulation governs both works and allocation; a path is only as good as the network left open to run it; and the works-visibility IT layer proposed there would serve allocation planning equally. It presupposes adequately resourced infrastructure managers (who carry some 77% of the implementation cost) and the same stable financing framework flagged in the interviews as the missing framework condition.[103] Success is measurable by monitoring the share of capacity requests that survive unchanged from request to train run (today an estimated 20–25%), international freight punctuality (today 47.4% within 15 minutes, against 64.1% domestic), and cross-border rail freight volumes on the key corridors. The conclusion needs to be qualified: no new horizontal

[98] Rel-I/Ecorys, CER rail freight sector survey, June 2026. Conversion of effectiveness ratings into shares of the problem addressed per the method in Annex A; ranges span the defensible readings of the survey scale.
[99] Rel-I/Ecorys, CER rail freight sector survey, June 2026: feasibility ratings given by survey respondents.
[100] Rel-I/Ecorys, CER rail freight sector survey, June 2026: expected improvement if the driver is resolved.
[101] Rel-I estimates (Level 3). Modelled addressable-cost ranges, not expected savings. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted. See Annex A.
[102] Study interview programme, July 2026.
[103] Study interview programme, July 2026.

legislative framework is needed, but secondary legislation, targeted amendments and effective enforcement remain necessary.

3.3 Level playing field on price

The price problem is a margin problem: what rail pays is volatile, what road pays is incomplete, and it can be fixed by enhancing predictability and enforcement.

3.3.1 The challenges

Track access charges make up roughly a fifth of a freight train's production cost (of the order of EUR 3 out of some EUR 15 per train-kilometre[104]) against a European average charge of EUR 2.96 per freight train-kilometre in 2024, itself 4% above the year before.[105] The deeper problem beyond the level is unpredictability, with examples showing even within-year fluctuations.[106] Workshop evidence places track-access charges at some 15–20% of total operating costs for most operators, with materially higher shares reported by some cross-border operators, partly because national charging systems differ in what the charge includes (some incorporate traction energy, others do not) — an argument for the transparent, itemised billing that stabilisation should bring with it. Energy compounds the squeeze: member-reported estimations put energy and path access together at roughly a third of operating costs on average, and up to half for the most exposed operators, and rail traction electricity remains around 80% above its pre-summer-2022 level (while diesel, the competing mode's fuel, has returned to the level of a decade ago).[107]

Interview evidence points to a structural gap: on many routes, rail is reported to be 10–20% more expensive than road door-to-door, while road freight typically pays no distance-based infrastructure charge outside the tolled networks (EU law regulates road tolls where they exist, but requires no Member State to levy them).[108] Fuel taxation tilts the same way: nine Member States apply partial refunds of the diesel excise for road hauliers, putting commercial rates roughly 10–35% below what private users pay.[109,110]
Priced against the sector's cost and time base, the two drivers identified are the smallest pools in the study — the level and volatility of track access charges at around EUR 2.0 billion per year at

[104] Study interview programme, July 2026.
[105] IRG-Rail, 14th Annual Market Monitoring Report, working document (March 2026), pp. 25–26. The working document, not the main report, carries the charge tables. The main report's consistent-country sample gives EUR 3.04.
[106] See e.g. price adjustments in Germany: Bundesnetzagentur press releases of 12 December 2025 (2026 charges: network average +2.4%, freight +5.8%; application from 14 December 2025) and 22 July 2026 (12% reduction of the approved 2026 freight charges; decision on revoking and redetermining the 2025 charges to follow later in the year), following CJEU, DB InfraGO and DB RegioNetz Infrastruktur, Case C-770/24, judgment of 19 March 2026.
[107] Study interview programme, July 2026.
[108] Study interview programme, July 2026.
[109] CNR (Comité National Routier), comparison of diesel excise duties and partial refund mechanisms, March 2026, as compiled in Union TLF / CLECAT, Key Figures — European Freight Transport, Edition 2026, pp. 46–47. Refunds applied by ES, HU, HR, RO, FR, SI, BE, IT and PT.
[110] Study interview programme, July 2026. On the legal position: European Commission, road charging overview (Eurovignette framework) — tolls and user charges are regulated where introduced, but no charging scheme is mandatory.

stake, and road under-tolling with weak enforcement at EUR 1.7 billion[111]. This suggests that a level playing field on price is a margin and not a volume problem. A few percentage points on a big cost base decide contracts at the margin, which is where modal share is actually won and lost. In principle, this is a question of applying the user-pays and polluter-pays principles evenly across modes: rail pays a distance-based charge for every kilometre it runs, while road's infrastructure and external costs are only partly charged and unevenly enforced.

The downside is not hypothetical. The pending weights-and-dimensions revision would allow longer and heavier vehicle combinations to operate across borders between Member States that permit them; sector-commissioned modelling puts up to 4.9 billion tonne-km of rail freight at risk by 2030, driven by a road cost reduction of roughly 25% per cubic metre of load space.[112] For the segments already operating at the thinnest margins, a further shift in the relative price line is not a discount to match.

3.3.2 The solutions

This theme differs from the first two. Disruption-proofing the network (section 3.1) focuses on accelerating law that exists; improving capacity allocation (section 3.2) shapes implementation of law that exists; this theme however requires new asks (multi-annual charge stabilisation — no EU initiative covers it today) alongside one measure whose legislative vehicle is open (the weights-and-dimensions revision, in trilogue since December 2025). The timing logic is accordingly split: the weights-and-dimensions window closes when the trilogue does; the stabilisation instrument already exists in the contractual agreements between Member States and their infrastructure managers, which Directive 2012/34/EU requires to span at least five years — what is missing is the decision to use it for charge predictability.[113]

[111] Rel-I estimates: survey-based improvement expectations applied to the sector's operating-cost and shipper time base; orders of magnitude with the assumption chain documented in Annex A. Figures are annual, at current traffic, and are not additive. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.

[112] d-fine for CER, Modelled scenario (volume-constrained EMS case); sector-commissioned, not a Commission forecast.

[113] Directive 2012/34/EU, Article 30 and Annex V (contractual agreements between competent authorities and infrastructure managers, minimum duration five years). W&D trilogue status: Council general approach of 3 December 2025, Council document 9740/26.

Table 7 Measures at a glance — Level playing field on price (role and status, August 2026)

Measures	Role	Where it stands (August 2026)
Multi-annual stabilisation of track access charges	Predictability layer: charges for a timetable year known 12 months ahead, set multi-annually through the contractual agreements between States and infrastructure managers, with no retroactive settlement.	No EU initiative — the theme's genuinely new ask; buildable on the existing contractual-agreement instrument (Art. 30 of Directive 2012/34/EU) without necessarily reopening charging law.
Synchronised weights-and-dimensions revision plus road enforcement	Fair-competition layer: aligns the W&D revision with combined-transport rules and enforces road rules that already exist — driving and rest times, posting, cabotage, weight checks.	W&D revision in trilogue (Council general approach 3 Dec 2025; negotiations ongoing) — the one live legislative window in this package; enforcement is an implementation task under existing law.

Charge stabilisation steadies rail's own cost base; the synchronised weights-and-dimensions revision stops the competing mode's cost base from being quietly lowered. A level playing field needs both sides of the scale.

Measure: Multi-annual stabilisation of track access charges

This measure suggests making the charge a contract. It is deliberately narrow, favouring predictability rather than EU-wide harmonisation of charge levels. This can be achieved through the following design elements:

1. **charges for a timetable year known twelve months before the timetable change**, so operators can price their own contracts on known costs;
2. **multi-annual charge paths determined through the State–infrastructure-manager contractual agreements**, so the charge follows the funding framework rather than the annual budget cycle; and no retroactive settlement in either direction, so a settled year stays settled.[114] What this asks of governments is not subsidy but the absorption of timing risk they are better placed to carry than individual operators are. This is cheaper than what neighbours already do: Germany, for example, has part-funded freight track access charges since mid-2018, and the French sector alliance costed state coverage of half the charges at EUR 120–130 million per year in its 2020 relaunch plan.[115]

Evidence collected for this study also suggests going a step further. Rail is reported to remain 10–20% more expensive than road door-to-door, and modal shift cannot be expected to materialise while that gap stands. The charging framework itself may offer a lever: the Directive's default is charges set at the cost directly incurred by running the train, with mark-ups permitted only where the market can bear them. **Moving freight charges towards direct (marginal) cost, rather than loading them with contributions to fixed costs, could lower operators' cost base** within existing law. Any such move must, however, fully consider the implications for infrastructure financing and network maintenance: lower access charges can contribute to modal shift only if the resulting revenue loss is compensated through sustainable public funding of the infrastructure manager. Such a case must also be built on data: **systematic collection of charge levels, mark-up structures and their evolution across networks** (supported, as reference material, by updated rail-versus-road external-cost comparisons on the key corridors) is the precondition for justifying it.

[114] Study interview programme, July 2026.

[115] German charge support: Trassenpreisförderung for rail freight, in place since 1 July 2018 (EUR 350 million State payment to the infrastructure manager in the first year). French figures: 4F (Fret Ferroviaire Français du Futur), Le fret ferroviaire pour concilier relance économique et écologie, June 2020, p. 11 and p. 15. Sector-coalition figures.

Measure: Synchronised weights-and-dimensions revision plus road enforcement

This measure suggests synchronised revision and enforcement of what already exists. The weights-and-dimensions file should not move faster than the combined-transport rules that are meant to balance it. That ask has sharpened as the Commission has meanwhile listed the combined-transport revision itself for withdrawal, over objections from Parliament and the sector (synchronisation presupposes that the balancing file survives at all).[116] The second half of the measure requires implementation rather than legislation: enforcement of the road rules already in force (driving and rest times, posting, cabotage, weight checks) is an administrative choice. This measure is not a case for raising road's costs generally, but for road paying and complying with what is already written. Its benefit is correspondingly defensive: it is counted as reverse modal shift avoided rather than new traffic won.[117]

Operationally, the enforcement half targets the gaps most relevant to rail–road competition: driving- and rest-time compliance, illegal cabotage, and overloading on the corridors where road competes directly with rail. The competent actors are the national road-enforcement authorities, with EU-level coordination of concerted checks; the expected action is prioritised, corridor-focused enforcement using the tools already in force. Monitoring should distinguish enforcement effort (coverage and number of checks) from compliance outcomes (infringement rates): rising checks or detections signal effort, not yet improved compliance.

Conclusions

The actionable core is deliberately narrow: charges for timetable year T final twelve months before it starts, following a multiannual trajectory anchored in the contractual agreements between States and infrastructure managers, with no retroactive settlement in either direction. Any more far-reaching proposal (reducing freight charges or moving them towards direct-cost levels) is a separate discussion, conditional on sustainable public compensation for infrastructure managers, so that predictability for operators is never financed from maintenance and renewal budgets.

Survey respondents credit charge stabilisation with some 24–39% of the problems it targets and the weights-and-dimensions measure with some 31–45% (they judge these measures able to address only about a third of the price problem, because the deeper halves of that problem (energy taxation, road pricing at large) sit outside this theme's instruments).[118] Feasibility tells the other half of the story: charge stabilisation scores the highest of any core measure in the study, consistent with a cheap, administrative ask, while the weights-and-dimensions measure scores lower, reflecting its dependence on a live trilogue.[119] Respondents expect resolving charge level and volatility to lower costs by around 10% (with essentially no transit-time effect, confirming it as a pure margin driver) and resolving road under-tolling and weak enforcement by around 9%.[120] Order-of-magnitude estimates place charge stabilisation at EUR 0.2–14.9 billion per year of addressable competitiveness cost and the weights-and-dimensions measure (in its avoided-loss framing) at EUR 0.3–18.1 billion.[121]

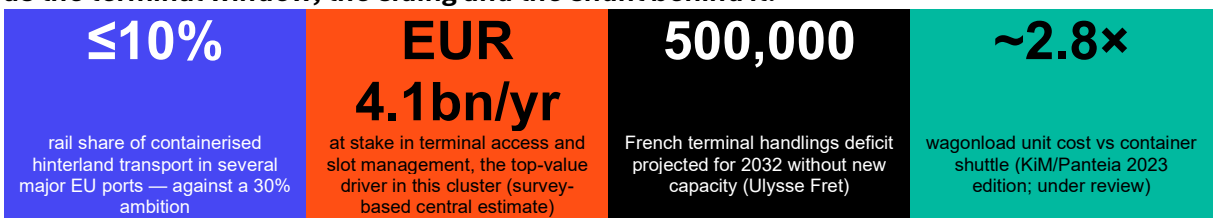
[116] Commission Work Programme 2026, proposals intended for withdrawal; formal decision still pending as of August 2026, with objections from the European Parliament and sector associations.
[117] Study interview programme, July 2026.
[118] Rel-I/Ecorys, CER rail freight sector survey, June 2026. Conversion of effectiveness ratings into shares of the problem addressed per the method in Annex A; ranges span the defensible readings of the survey scale.
[119] Rel-I/Ecorys, CER rail freight sector survey, June 2026: feasibility ratings given by survey respondents.
[120] Rel-I/Ecorys, CER rail freight sector survey, June 2026: expected improvement if the driver is resolved.
[121] Rel-I estimates (Level 3). Measure is an avoided-loss estimate: the benefit is the loss not incurred if the reverse shift does not materialise. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.

Box — Where the price screw bites first
Cost anatomy from the Netherlands illustrates which production systems the margin problem hits: shuttle and charter trains run at some EUR 15.30–20.47 per train-kilometre, while single-wagonload operations cost around EUR 36.08 (2018 values). A charge or energy shock that a shuttle operator can partially absorb lands on a wagonload system that is already roughly twice as expensive per kilometre, which is why price volatility translates first into the withdrawal of exactly the network services that are hardest to rebuild. KiM's May 2026 update points the same way, and more steeply: its 2024 values put wagonload at nearly three times the shuttle cost per train-kilometre.[122,123]

The theme's boundaries are explicit: the energy half of the margin problem (electricity taxation relative to diesel) belongs to the Energy Taxation file, which sits outside the themes, and road pricing at large belongs to the Eurovignette framework; this theme therefore claims neither. It interfaces with section 3.4 Terminals, last-mile and the rail-port interface, because the wagonload and intermodal segments in the box above are where the price screw meets the terminal-cost problems addressed there. Success can be observed in the number of networks where charges for timetable year T are final twelve months before it starts (and the disappearance of retroactive settlements), the year-on-year variance of the average charge per freight train-km, per network (the study's indicator set tracks the level; the variance is the predictability test), and road enforcement intensity (checks performed and infringements found under the existing driving-time, posting, cabotage and weight rules).[124]

3.4 Terminals, last-mile and the rail-port interface

Rail wins or loses the customer in the first and last kilometre: the main line is only as good as the terminal window, the siding and the shunt behind it.



3.4.1 The challenges

Terminals, last-mile operations and the rail-port interface form a critical competitiveness cluster because they determine whether rail freight can offer a credible door-to-door or terminal-to-terminal service, not only whether a train path exists on the main network. Internal study estimates indicate that terminal access and slot management (EUR 4.1 bn/yr), last-mile sidings and connections (EUR 3.9 bn/yr), and single-wagonload economics (EUR 3.3 bn/yr) are among the highest-value problem drivers in this cluster.[125] Two further drivers sit at the same interface: technical and cost constraints in rail yard operations in port areas (EUR 3.5 bn/yr) and organisational fragmentation across borders (3.5 EUR bn/yr) — giving the rail-port interface of this theme its own quantified weight. The study material supports the operational diagnosis: missing

[122] KiM, Bedrijfseconomische kostenkengetallen voor het goederenvervoer — update 2026, 28 May 2026, rail table (2024 values of roughly EUR 20.7 for shuttle and EUR 58.6 for wagonload per train-km, superseding the 2020 report's 2018 values).
[123] Panteia for KiM, Cost figures for freight transport, report of May 2020, rail annexes; Netherlands, 2018 values.
[124] Study interview programme, July 2026.
[125] Rel-I estimates, Level 3, based on survey expectations applied to the sector cost and time base. Central annual estimate for current traffic; not additive. The corresponding range and assumption chain are reported in Annex A. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.

private sidings and last-mile connections force road legs even where rail services are available; terminal access and slot management constrain intermodal growth; and single-wagonload remains structurally costly yet important for industrial customers that depend on dispersed wagon flows.

CER's position paper on the European port strategy shows that rail's share of containerised hinterland transport remains around or below 10% in several major European ports. At the same time, Hamburg, Bremerhaven and Gdansk show substantially higher rail shares, indicating that higher port-rail integration is achievable where infrastructure, operations and policy support are aligned. CER therefore calls for measures to raise rail's market share at ports to at least 30%.[126] No official EU-level statistics exist for this indicator; the port shares cited here are compiled from the ports' own publications, and a harmonised series would have to be assembled from port-authority data. A recent study for the European Commission (DG MOVE) on short sea shipping, which did exactly that, points the same way: for a sample of European ports, it estimated that around 20% of port traffic travels to or from the port by rail.[127]

The French Ulysse Fret programme provides a useful quantified national illustration of the scale of the challenge. It identifies, for combined transport, a 2032 requirement of 3.4 million handlings against 2.9 million available terminal capacity, leaving a deficit of 500,000 handlings to be addressed through 13 new terminals. The same programme allocates EUR 1,097m to increasing the capacity of existing combined-transport terminals and creating new ones. It also highlights the importance of lower-density access infrastructure: SNCF Réseau counts around 140 active capillary freight lines covering around 2,000 km, and estimates that failure to invest in these lines would put at risk traffic equivalent to 16% of the current French rail freight market, or about 5.5bn tonne-km. For single-wagonload, the programme estimates that abandoning investment in gravity marshalling yards would, assuming 80% of single-wagonload traffic depends on these sites, put 19% of the market at risk, or about 7bn tonne-km.[128]

Stakeholder evidence points to a further structural asymmetry at the first and last mile. Road access to industrial sites is generally embedded in standard site development, while rail access often requires separate private siding investment, administrative coordination and operational arrangements with infrastructure managers, terminal operators and shunting providers. This has direct consequences for modal choice: poor last-mile infrastructure, non-electrified access, short reception tracks, limited opening hours, high shunting costs, and weak terminal coordination can erode the economic advantage of rail haulage. A 2016 European Commission study on last-mile infrastructure similarly identifies the lack of easy and quick access to information on rail last-mile infrastructure as a barrier to efficient rail freight planning, particularly across borders, and notes that private sidings represent the largest category of rail freight access points but are also the most problematic in terms of data availability.[129]

[126] CER, European port strategy, position paper, 25 June 2025. The port examples include Rotterdam 8.9%, Antwerp-Bruges 10.0%, Valencia 8.5%, Algeciras 5.0%, Piraeus 2.0%, Gioia Tauro around 5 to 8%, HAROPA around 5 to 10%, Hamburg 50.2%, Bremerhaven 50.0% and Gdansk 35.0% rail share in containerised transport.

[127] European Commission: Directorate-General for Mobility and Transport & Ecorys. (2025). Study on short-sea shipping's contribution to the European transport network and the means to support and revitalise the sector: annex. Publications Office of the European Union. https://data.europa.eu/doi/10.2832/2912109.

[128] Programme d'investissements pour le fret ferroviaire 2023–2032 (« Ulysse fret »), 4F/DGITM/SNCF Réseau, March 2025.

[129] European Commission, User-friendly access to information about last-mile infrastructure for rail freight, Executive summary, 2016.

The solutions in this theme, therefore, need to combine operational coordination, targeted public support and digital integration, rather than rely on infrastructure investment alone. Stakeholder interviews point to a persistent gap between mainline capacity, terminal windows, and customer-facing information: railway undertakings, terminals, ports, and infrastructure managers need better alignment of train paths, terminal slots, shunting capacity, and estimated arrival times if rail is to offer a reliable end-to-end service. A rail customer consulted for this study reports customer requirements of ~95% reliability for arrival on site, terminals within ~50 km, and transit within a day of road. Interview evidence confirms that ETA data can already support day-to-day terminal planning, but also that there is no dedicated IT tool or structured process for negotiations between terminals and main-line infrastructure managers.[130] This supports three complementary measures in the following section: improving data and ETA integration through sector-led interoperable data initiatives and the eFTI/TAF framework; designing cross-border intermodal aid as temporary start-up support for new services; and using the new EU State aid framework to support single-wagonload services where these remain socially, industrially or environmentally valuable but commercially fragile.

3.4.2 The solutions

The measures in this cluster work at the interface between main-line operations, terminals, ports and customer facilities. Rather than introducing new policy instruments, they make use of existing regulatory and funding frameworks, particularly the 2026 Land and Multimodal Transport Guidelines (LMTG) and Transport Block Exemption Regulation (TBER).

Table 8 Measures at a glance — Terminals, last-mile and the rail-port interface (role and status, August 2026)

Measures	Role	Where it stands (August 2026)
Data and ETA integration	Improve end-to-end visibility, ETA reliability, terminal slot management, customer information and coordination between railway undertakings, infrastructure managers, terminals and ports.	Partially implemented framework. The eFTI Regulation is in force, but the obligation on Member State authorities to accept electronic freight information through compliant platforms applies from 9 July 2027; it does not require operators to adopt specific digital solutions. Stakeholders favour implementation through sector-led initiatives such as Rail Data and systems compatible with the TAF TSI (recast by Implementing Regulation (EU) 2026/253) rather than additional regulatory layers.
Cross-border intermodal start-up aid	Support the launch of new cross-border intermodal services during the ramp-up phase until sufficient volumes are achieved.	Policy option enabled by existing framework. Since 30 March 2026, the LMTG and TBER explicitly allow aid for launching new commercial rail and multimodal connections, as well as aid for terminals, railway service facilities and private sidings. The measure has not yet been implemented at EU level and was not included in the survey questionnaire, so it should be assessed qualitatively.
Single wagonload (SWL) support	Support the competitiveness of SWL as a freight production system by addressing both operational costs	Framework available and already used by Member States. The new LMTG and TBER provide the legal basis for supporting rail freight services, railway service facilities, private sidings, interoperability and modernisation measures. Germany operates a EUR 1.7 billion support

[130] Study interview programme, July 2026.

Measures	Role	Where it stands (August 2026)
	(sorting, consolidation and marshalling) and supporting infrastructure (yards, sidings and last-mile connections).	scheme for single wagonload and wagon-group transport approved by the Commission in 2024. France's Ulysse Fret programme includes investments in gravity marshalling yards and related freight infrastructure. The new TBER also creates opportunities to support ETCS on-board units and DAC deployment.

Measure: Data and ETA integration

This is a measure to **improve operational visibility and coordination** across the rail freight chain rather than as a mandatory digitalisation measure. The driver it primarily addresses — end-to-end ETA, data integration and customer information — carries a central estimate of around EUR 1.9 billion per year in the study's quantification. Regulation (EU) 2020/1056 on electronic freight transport information (eFTI) will require Member State authorities, from 9 July 2027, to accept electronic regulatory freight information when it is provided through compliant platforms, but it does not impose a general obligation on operators to adopt specific digital solutions.[131,132] Instead, the measure should focus on **improving the interoperability of ETA, terminal, customer, and operational data flows** across railway undertakings, infrastructure managers, terminals, ports and logistics providers. Implementation should therefore build on existing sector initiatives — Rail Data, data exchange under the recast TAF TSI and other industry-led platforms — rather than on additional regulatory layers.[133]

The identified coordination gap invites a concrete demonstrator: **corridor pilots in which the train path and the terminal slot are requested and confirmed as one coordinated booking**, using the instruments this package already endorses (pilot design should watch the knock-on delay risk of coupling two scarce resources). The same logic should reach the capacity model itself: terminals, ports and marshalling yards, with their slot capacity, belong in the Article 19/Annex I capacity model alongside the line network — transfer nodes are monitored locally but not always modelled sufficiently by infrastructure managers, though they are essential to real freight capacity. And **design should start from the end customer**, not the railway undertaking: the requirements reported by chemical-industry shippers are one data point, and the practical next step is to establish systematically what other customer segments require (reliability at site, terminal proximity, transit time) and to specify intermodal products against that integrated value-chain perspective rather than against what the production system finds convenient.

A missing registry should also be addressed: **an open inventory of private sidings and last-mile connections** (location, status and technical parameters such as usable track length and availability) compiled by members, wagon keepers and infrastructure managers. The 2016 Commission study cited above identified private sidings as the largest and worst-documented category of access points, and nothing has been built since; the registry feeds the data layer and gives the SWL infrastructure case below its denominator, and doubles as military-mobility evidence.

Measure: Cross-border intermodal start-up aid

This measure addresses the difficulty of **establishing new cross-border intermodal services** during their market-entry phase. The measure was developed after the survey stage and should

[131] Regulation (EU) 2020/1056 of the European Parliament and of the Council of 15 July 2020 on electronic freight transport information.
[132] European Commission, The eFTI Regulation. Authorities must accept electronic freight information submitted through compliant platforms; the Regulation does not impose a general operator deployment obligation.
[133] Study interview programme, July 2026.

therefore be treated as a qualitative policy option rather than as a survey-tested intervention.[134] The **appropriate policy framework is provided by the new Land and Multimodal Transport Guidelines (LMTG) and Transport Block Exemption Regulation (TBER**), which entered into force on 30 March 2026. The framework explicitly supports the launch of new commercial rail and multimodal transport services, alongside aid for multimodal terminals, railway service facilities, and private sidings.[135,136] Rather than creating a new aid instrument, the measure would **implement the opportunities offered by this framework**.

A targeted design would consist of **temporary, degressive start-up support for new cross-border intermodal services**, with the expectation that the service becomes commercially self-sustaining after an initial ramp-up period. While the LMTG permit support for longer periods in specific cases, a shorter start-up phase may reduce dependency risks and improve incentive alignment.[137] The legal design should **account for aid cumulation rules and remain adaptable** given continuing uncertainty about the future of the Combined Transport Directive revision.[138]

Measure: Single wagonload support

This measure addresses the competitiveness challenges associated with single wagonload (SWL) traffic. SWL should be understood not as an inherently unprofitable activity, but as a freight production system whose performance depends on traffic density, network configuration and the availability of supporting infrastructure. The challenge has two interrelated dimensions: the operational costs associated with wagon sorting, consolidation and handling, and the infrastructure requirements associated with marshalling yards, sidings and other last-mile rail assets. The new **LMTG and TBER provide the appropriate State-aid framework** for addressing these challenges. Rather than revising the framework, the measure would **make use of provisions that support rail freight services, railway service facilities, private sidings, interoperability investments and modernisation measures**.[139] Support mechanisms should therefore focus on transparent implementation of the new rules, including safeguards relating to accounting separation, proportionality, transparency, non-discrimination and avoidance of overcompensation.[140]

Member States are already using State-aid instruments to support SWL-related activities. In May 2024, the European Commission approved a EUR 1.7 billion German scheme supporting single wagonload and wagon group transport, recognising the specific operational costs associated with wagon sorting and marshalling processes.[141,142] In France, the Ulysse Fret programme highlights the continued importance of gravity marshalling yards and other freight-specific assets for maintaining conventional wagonload traffic and industrial rail access: under the assumption that 80% of the SWL market depends on these sites, not investing would put at risk around 19% of the French rail freight market, or about 7bn tonne-km.[143] The new TBER also creates

[134] Study interview programme, July 2026.
[135] European Commission, Land and Multimodal Transport Guidelines (LMTG) and Transport Block Exemption Regulation (TBER), adopted 16 March 2026, applicable from 30 March 2026.
[136] European Commission, New State aid rules for land and multimodal transport, factsheet, 2026.
[137] European Commission, Guidelines on State aid for land and multimodal transport, C/2026/1656.
[138] European Parliament, Review of Directive 92/106/EEC on combined transport of goods between Member States, Legislative Train Schedule, updated 20 June 2026.
[139] European Commission, Land and Multimodal Transport Guidelines (LMTG) and Transport Block Exemption Regulation (TBER), adopted 16 March 2026, applicable from 30 March 2026.
[140] European Commission, Guidelines on State aid for land and multimodal transport, C/2026/1656.
[141] European Commission, State Aid SA.108800, Germany, Support for rail freight transport (single wagon load and wagon group transport), decision of 21 May 2024.
[142] European Commission, Commission approves €1.7 billion German State aid scheme to support rail freight transport operators providing single and group wagon transport, press release, 21 May 2024.
[143] DGITM, 4F and SNCF Réseau, Programme d'investissements pour le fret ferroviaire 2023–2032: Ulysse Fret, March 2025.

opportunities beyond direct support for SWL operations. The **framework can facilitate aid for interoperability and technological modernisation, including investments in ETCS on-board units and Digital Automatic Coupling (DAC)**.[144]

The port fence should also be reviewed: the TEN-T parameter set (740-metre-compatible tracks, P400 loading gauge and 22.5-tonne axle load) should apply to port rail infrastructure itself, where the spread in rail shares between major ports shows integration is achievable — where operationally and economically justified, consistent with the port-strategy positions CER has published and to be aligned with those still under development.

Conclusions

The State-aid framework carries three distinct applications, which should not be conflated. Support for single-wagonload operations addresses the fixed-cost base of a network production system that individual flows cannot carry: beneficiaries are wagonload operators and their industrial customers, the Member State action is a notified operating-support scheme, and the expected outcome is stabilised wagonload volumes where schemes are in place. Investment support for terminals and freight-access infrastructure addresses the last-mile capacity constraint: beneficiaries are terminal operators and connected shippers, the action is investment aid under the framework, and the outcome is added handling capacity where the deficit is identified. Temporary, degressive start-up aid for new cross-border intermodal services addresses ramp-up risk: beneficiaries are the operators of new services, and the outcome is services that survive the withdrawal of support. Existing schemes demonstrate that support is legally feasible; effectiveness is to be read from results on additional or retained traffic, which the scorecard's indicator on aided services is designed to capture.

The measure package closes the gap between the train path and the customer's dock, and its interfaces run in every direction: the measures under 3.3 determine whether the price screw crushes single wagonload and intermodal before coordination can save them; sections 3.1 and 3.2 decide whether terminal slots and train paths can actually be aligned; and the technology measures (DAC in particular) shape yard and shunting economics. Three markers will show whether the measures are working: rail's share of containerised hinterland transport at the major ports moves visibly from around or below 10% towards the 30% ambition; terminal handling capacity keeps pace with intermodal demand — on the French template, the 2032 deficit of 500,000 handlings is closed before it materialises; new cross-border intermodal services launched with start-up aid survive the withdrawal of support, and single-wagonload volumes stabilise where schemes are in place.

3.5 Making ERTMS pay for freight

Freight is asked to pay for the European signalling system before it can stop paying for the national ones: the cost of ERTMS lands on the locomotive years before the benefit arrives on the track.

~10%	EUR 0.7–8.2bn	EUR 0.8–1.0m	2040
of the TEN-T network equipped with ETCS at end-2024 (≈12,400 km; 16–17% of the Core Network) — Third ERTMS Work Plan	addressable competitiveness cost per year of on-board retrofit and vehicle unavailability, the largest quantified driver in this cluster (modelled range, not additive)	central retrofit cost per locomotive; reported averages doubled from EUR 450,000 (2018) to EUR 900,000 (2022)	binding deadline to decommission national Class B systems, while locomotives carry ETCS and legacy systems in parallel until then

[144] European Commission, Land and Multimodal Transport Guidelines (LMTG) and Transport Block Exemption Regulation (TBER), adopted 16 March 2026, applicable from 30 March 2026.

3.5.1 The challenges

Stakeholders consistently identified ERTMS deployment and rolling-stock adaptation as one of the most significant barriers within the problem cluster of technical interoperability and assets. The challenge is no longer the strategic objective of deploying ERTMS, which enjoys broad support across the sector, but the pace, cost and coordination of implementation. According to the Third ERTMS Work Plan, ETCS was operational on approximately 12,400 km of the TEN-T network at the end of 2024, corresponding to around 10% of the TEN-T network and approximately 16–17% of the Core Network. At the same time, the revised TEN-T framework foresees the progressive decommissioning of national Class B signalling systems, with a binding deadline of 2040.[145]

For railway undertakings, the principal challenge is the prolonged coexistence of ETCS and national signalling systems. International freight locomotives frequently need to carry multiple national legacy systems alongside ETCS equipment, while operators continue to bear the cost of maintaining, upgrading and authorising these systems in parallel. Stakeholder interviews highlighted recurring concerns regarding lengthy authorisation procedures, supplier capacity constraints, and the continued diversity of national implementation requirements.[146] These issues increase both direct retrofit costs and indirect costs associated with fleet downtime, delayed deployment and reduced locomotive availability.

Box — An operator's reality
An international locomotive carries 2–5 national legacy systems plus ETCS, all maintained in parallel. More than a dozen distinct ETCS requirement sets exist within a single Member State alone. Finished locomotives stand parked, awaiting homologation. An operator seeking to retrofit 500 locomotives is quoted 10 years by suppliers.

The evidence suggests that retrofit costs should not be represented by a single average value. Industry evidence indicates a central range of approximately EUR 0.8–1.0 million per locomotive, with costs varying substantially by vehicle type, fleet size, engineering complexity, and national implementation requirements. External studies show that average retrofit costs increased from around EUR 450,000 per vehicle in 2018 to approximately EUR 900,000 per vehicle in 2022, reflecting growing complexity in deployment and authorisation processes.[147] A recent fleet retrofit reported through the interview programme came in markedly lower, at around EUR 350,000 per locomotive — a reminder that costs vary widely with fleet, vehicle type and baseline, and that the desk range should be read as central, not universal. Stakeholders also emphasised that diversity in trackside implementation remains a major underlying cost driver, since differing national specifications, compatibility checks, and testing requirements reduce opportunities for standardisation and economies of scale.[148]

A related concern is the mismatch between rolling-stock obligations and trackside deployment schedules. Stakeholders reported examples in which cross-border freight operators are required to equip vehicles for ETCS operation before adjacent network sections have completed their own deployment programmes. Such timing mismatches create uncertainty regarding investment

[145] European Commission, Third ERTMS Work Plan, 23 February 2026; ERA, Third ERTMS Work Plan: deployment progressing, but further acceleration required, 24 February 2026. Deployment reached approximately 12,400 km (10% of TEN-T) by the end of 2024; Class B decommissioning is linked to the revised TEN-T framework and 2040 milestone.
[146] Study interview programme, July 2026.
[147] ERTMS Deployment Management Team, ERTMS On-Board Deployment – Analysis of Cost Drivers (2025). Retrofit costs increased from approximately €450,000 per vehicle in 2018 to approximately €900,000 per vehicle in 2022.
[148] Study interview programme, July 2026.

decisions and can prolong the period during which operators must maintain both ETCS and legacy systems.[149] This issue is reinforced by the coexistence of multiple baselines and the absence of fully synchronised migration pathways across Member States.

According to the impact model developed for this study, on-board retrofit costs and vehicle unavailability represent the largest quantified impact within the cluster: order-of-magnitude estimates place the driver at EUR 0.7–8.2 billion per year of addressable competitiveness cost — a modelled addressable-cost range resting on an assumption chain, never summed with other drivers and quoted only with its range.[150]

3.5.2 The solutions

The measures under this theme address the barriers identified above. They focus on synchronised migration planning, stable implementation pathways, targeted funding for onboard deployment and pragmatic cross-border solutions, rather than on deployment obligations alone. The DAC Migration Fund is addressed separately later in this chapter because it concerns a distinct technology transition.

Table 9 Measures at a glance — Making ERTMS pay for freight (role and status, August 2026)

Measures	Role	Where it stands (August 2026)
Synchronised Class B decommissioning and migration support	Align infrastructure and vehicle migration by combining Class B switch-off milestones with funding, baseline stability, coordinated trackside/onboard deployment and migration planning.	Partially in place. The TEN-T framework provides a 2040 deadline for decommissioning Class B systems, while the Third ERTMS Work Plan highlights the need for coordinated deployment, funding and governance. However, implementation remains uneven, and stakeholders continue to report concerns regarding retrofit costs, downtime, supplier capacity and deployment sequencing.

Measure: Synchronised Class B decommissioning and migration support

The evidence indicates that the core policy issue is not whether national Class B systems should eventually be phased out, but how the costs and benefits are distributed. The Third ERTMS Work Plan estimates that the phase-out of legacy signalling systems could generate infrastructure cost savings of approximately EUR 1.1 billion per year, while the cost of equipping rolling stock with ETCS (EUR 10–15bn) remains borne by railway undertakings, rolling-stock owners, and lessors. Stakeholder feedback therefore consistently emphasised that a decommissioning deadline without a corresponding funding and migration framework would be perceived as a burden rather than an incentive for deployment.[151,152]

The measure should therefore be framed as a **coordinated migration package** rather than as a simple decommissioning obligation. Its purpose is to align those actors bearing the investment costs with those benefiting from infrastructure savings. In practical terms, this requires synchronised planning of trackside and onboard deployment, clear migration timelines, stable technical specifications across ETCS baselines, and mechanisms to minimise retrofit downtime and authorisation delays. Stakeholders repeatedly stressed that abrupt baseline changes increase lifecycle costs and create capacity bottlenecks for workshops, suppliers and approval

[149] Study interview programme, July 2026.
[150] Rel-I impact model (Level 3), based on survey responses and sector cost assumptions. The estimate represents a scenario-based annual impact and should not be interpreted as observed market expenditure.
[151] Third ERTMS Work Plan of the European Coordinator, 23 February 2026 (status end-2024, TEN-T lines). Do not use the older figures still shown on the DG MOVE website.
[152] Study interview programme, July 2026.

authorities. One national precedent funds about a third of the on-board bill from a public fund; a large vehicle retrofit funding programme was adopted in one market in July 2026 (EUR 1.7 billion).[153]

The measure should also recognise that many operators remain focused on solving immediate cross-border interoperability problems. Stakeholder consultations repeatedly suggested that bilateral border agreements, targeted operational arrangements, and coordinated corridor-level deployment often deliver more immediate benefits than long-term harmonisation initiatives alone. Consequently, the measure should **combine the long-term objective of European system harmonisation with short-term pragmatic solutions at key cross-border interfaces**.

An additional issue raised in the interview programme is the length and complexity of the administrative process for authorising retrofits; the cost evidence points the same way, identifying authorisation complexity as a driver behind the doubling of average retrofit costs between 2018 and 2022. A standardised, type-based process at the ERA one-stop shop for fleet-identical retrofits (authorise the series design once, then conformity-check the vehicles) with published processing-time targets would attack that cost driver directly without touching the deployment obligations themselves. The trackside–on-board mismatches documented above carry a familiar lesson: like the coordination gaps in 3.1 and 3.2, they are at bottom alignment and communication failures, and **corridor-level transparency on equipage plans** (what is equipped, what is switched on, and when) belongs to the same family of low-cost coordination instruments this report recommends elsewhere.

Conclusions

The immediate steps for a coordinated migration are: align corridor-level trackside deployment and Class B decommissioning schedules (infrastructure managers and Member States, corridor by corridor); fund on-board equipment in step with those schedules (Member States and the EU, under the State-aid framework in force); stabilise technical specifications so that early adopters are not penalised (Commission and ERA); and streamline authorisation (ERA and national safety authorities). The estimated infrastructure savings from Class B decommissioning accrue to infrastructure managers over the long run, while the rolling-stock investment falls on operators now, which is why funding must follow the costs for the migration to move.

The measure Synchronised Class B decommissioning and migration support received a survey score of 41% (confidence range approximately 37–50%) and ranked sixth among all measures assessed. However, the ranking proved sensitive to methodological assumptions and should therefore be interpreted as an indication of support rather than as a definitive prioritisation.[154] Finally, the measure's benefits should not be interpreted as a conventional benefit-cost ratio. The primary purpose is to address a cost-incidence problem: infrastructure managers benefit from removing legacy systems, while operators bear most retrofit costs. The Level 3 model underpinning this study, therefore, focuses on the cost side of the equation rather than estimating a comprehensive benefit-cost relationship.[155]

[153] Study interview programme, July 2026.
[154] Rel-I/Ecorys, CER rail freight sector survey, June 2026.
[155] Rel-I estimates (Level 3): survey-based expectations applied to the sector's cost and time base; assumption chain in Annex A. Annual, current traffic, not additive; always quote with the range. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.

3.6 Other challenges and opportunities

Three measures and one structural gap sit outside the five packages — not because they matter less, but because their instruments, timelines or evidence are different in kind.

3.6.1 The challenges

A residual cluster of problems remains outside the themes above. Energy taxation and charging treat the electricity that powers most rail freight and the diesel that powers its competitor on different bases. The point is not that rail pays more tax in absolute terms (road diesel carries substantial fuel excise, and the Commission's study on transport charging found road more heavily taxed on energy overall), but that traction electricity accumulates taxes, levies, grid charges and carbon costs into a volatile price that operators can only partly manage, while neither structure reflects the modes' relative external costs[156]. Yard and train-formation work still runs on manual coupling, with its productivity limits and injury exposure. Language requirements for train drivers change at every border crossed on a single run. And beneath all of it sits the workforce: respondents rate labour and skills constraints as High or Critical more often than almost any other driver (66%), the constraint is priced at EUR 0.9–10.0 billion per year at stake[157,158], and an EU-wide shortage of around 48,000 train drivers was reported in the interview programme (an interview-based estimate referring to train drivers across the EU, not verified against official statistics, which do not yet exist at this granularity) driven by demographics and an approaching retirement wave.[159]

3.6.2 The solutions

The solutions identified are as manifold as the variety of problem drivers.

Table 10 Measures at a glance — Other challenges and opportunities (role and status, August 2026)

Measures	Role	Where it stands (August 2026)
Energy taxation and price predictability	Addresses the structure and predictability of taxes, levies and grid charges on rail's main energy carrier (electricity), and their alignment with how road energy is charged.	Stalled file. The Energy Taxation Directive recast (COM(2021) 563) was proposed in 2021 and has not secured Council agreement; treatment here is deliberately qualitative. National levers (levy and surcharge reductions on traction current) exist meanwhile and are used by several Member States.
Digital Automatic Coupler: a funded migration	The sector's platform investment for automation: replaces manual coupling, with its productivity ceiling and	Published investment plan, no funding model. The European DAC Investment Plan (EU-Rail, March 2023) prices full migration at EUR 10.6 billion for ~350,000 retrofits and 60,000 new wagons; the new TBER can block-exempt national support since 30 March 2026, but no EU deployment funding

[156] European Commission (DG MOVE), Sustainable transport infrastructure charging and internalisation of transport externalities (2019).
[157] Rel-I/Ecorys, CER rail freight sector survey, June 2026.
[158] Rel-I estimates (Level 3): survey-based improvement expectations applied to the sector's operating-cost and shipper time base; assumption chain in Annex A. Annual, at current traffic, not additive; quoted only with the range. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.
[159] Study interview programme, July 2026.

Measures	Role	Where it stands (August 2026)
	injury exposure, and provides the power and data line automated freight trains need.	decision exists. Survey scepticism is about the path, not the destination.
Driver language and certification	Removes the operational friction of language requirements changing at each border, via targeted language profiles, translation tools of the Translate4Rail type, and operational pilots — options presented without prescribing one.	Legislative vehicle announced, not yet proposed. The Train Drivers Directive revision is under preparation (expected 2026); near-term asks are framework conditions — funding and infrastructure-manager operational rules that let pilots actually run.
Workforce and skills — developing the evidence base	No candidate measure exists for the one High-or-Critical-rated driver with none attached: an EU-wide shortage of ~48,000 drivers (an interview-based estimate), before the retirement wave peaks. Named here so the diagnosis does not hide it.	Unassigned. Available levers — co-funded training and traineeship capacity, cross-border recognition docking onto the Train Drivers Directive revision, recruitment and retention framed explicitly as such — await an owner. A workforce strand should accompany whichever packages CER takes forward.

Measure: Energy taxation and price predictability

The Energy Taxation recast that would address the electricity–diesel asymmetry is proposed but not agreed. The competitiveness issue is twofold: a structural difference in how rail's main energy carrier and road's are taxed and charged, and a volatility exposure operators can only partly manage. An illustration bounds the exposure: with roughly two-thirds of traction-energy volumes hedged forward, a sustained electricity-price increase reaches about one-third of volumes within the year, and the remainder as hedges roll over (and no hedge covers a policy-driven change). The realised episode is visible in the Dutch cost benchmarks: wagonload production costs rose from about EUR 43 to EUR 58.6 per train-kilometre between 2018 and 2024, with energy-related operating costs identified as a key driver. Member-reported estimations now allow the exposure to be bounded. In CER's 2026 energy survey (23 completed responses across 15 countries), freight railway undertakings report energy-related shares of operating costs averaging around 14%, within a range of roughly 7–28% (the roughly one-quarter share cited in the study's second workshop sits toward the upper end of that range) with reported traction-electricity prices of EUR 65–192/MWh (average around EUR 139/MWh) and electricity-contract cover averaging some 20 months (12–36 months). These are member-reported estimations from a partial sample, not sector statistics; the treatment here therefore remains an illustration rather than a company-level estimate.[160,161] The measure therefore aims to **carry the rail–road energy-taxation asymmetry into whatever vehicle eventually moves**, and **use the national levers that exist** meanwhile (levy and surcharge reductions on traction current, as several Member States have done). No published dataset attributes energy-taxation effects to rail freight specifically. In the survey,

[160] CER Economic Note, Geopolitical developments, energy price volatility and implications for rail (June 2026), member survey tracker; figures are member-reported estimations. ERA's Railway System Data Inventory (Standard inputs for economic analysis in rail, v1.0, updated February 2026) provides indicative standard unit inputs (reference years 2021–2024); ERA's new data collection and IRG-Rail reporting are expected to extend this evidence base.
[161] Study interview programme, July 2026.

however, the measure is seen to address around a third of its targeted problems, while its feasibility is rated low.[162]

Measure: The Digital Automatic Coupler – a funded migration

Today's screw coupling is standardised and interoperable — the problem is not incompatibility but manual operation, with its productivity ceiling, its injury exposure, and the absence of the power and data line that any automated, sensor-equipped freight train needs. The DAC is therefore best understood as the sector's platform investment for automation, and its economics are the study's firmest cost figure: the **European DAC Investment Plan** puts full migration at EUR 10.6 billion, for a stated fleet of around 350,000 wagon retrofits and 60,000 new builds.[163] The survey results rank this measure last on effectiveness (≈ 26% of targeted problems) and last on feasibility, showing that the sector believes more in the destination than in the current path. The suggested consequence is not to drop the measure but to sequence it: **a value-chain analysis, a migration strategy with a credible funding model** (national support can be block-exempted under the new Transport Block Exemption Regulation, and CER advocates dedicated EU deployment funding), **and the occupational dimension stated openly** — fewer manual coupling operations mean less injury exposure and a genuine skills transition for yard staff. The sector is not unanimous: some operators argue that sensor-based retrofits could deliver part of the benefit at far lower cost, and interview evidence suggests the full 15–20% production-cost reduction materialises only when DAC, ATO and ERTMS are implemented together, not from any single technology.[164] Order-of-magnitude estimates place the measure at EUR 0.3–15 bn per year of addressable competitiveness cost, a modelled addressable-cost range resting on an assumption chain, never to be summed with other measures.[165]

Measure: Driver language and certification

The problem is operational, not linguistic: requirements change at each border on a single run, while today's freight drivers mostly operate near the borders they cross. The realistic objective reported by practitioners is not multilingual proficiency to level B1 but the ability to move a train safely to the next suitable relay point, where the locomotive or driver can change.[166] One group's published figure of EUR 424.5 million for complying with current language requirements illustrates what that friction costs (the cost a workable harmonisation would avoid, for one undertaking alone).[167] The option space is presented here with its trade-offs and deliberately without a recommendation: targeted 'A1-plus' language profiles for defined border sections; technical translation and communication tools of the Translate4Rail type developed by UIC and RNE; and operational pilots. The legislative vehicle (a revision of the Train Drivers Directive) is announced but not yet proposed, and should be monitored. The near-term ask is framework conditions: funding and infrastructure-manager operational rules that let more pilots actually run. Survey respondents credit the measure with around 30% of its targeted problems, but its feasibility rating is among the better ones (cheap to try, politically sensitive to mandate).[168]

[162] Rel-I/Ecorys, CER rail freight sector survey, June 2026.
[163] European DAC Investment Plan, EU-Rail, 20 March 2023 (EUR 10.6 billion; fleet denominator as stated). Higher figures circulate in sector discussion but are not used here in the absence of a citable source.
[164] Study interview programme, July 2026.
[165] Rel-I estimates (Level 3): survey-based improvement expectations applied to the sector's operating-cost and shipper time base; assumption chain in Annex A. Annual, at current traffic, not additive; quoted only with the range. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.
[166] Study interview programme, July 2026.
[167] CER Technical Documentation Compendium, 6 April 2023 (member undertakings' own reported figures; the amount is one group's cost of complying with current requirements).
[168] Rel-I/Ecorys, CER rail freight sector survey, June 2026.

Workforce and skills: developing the evidence base

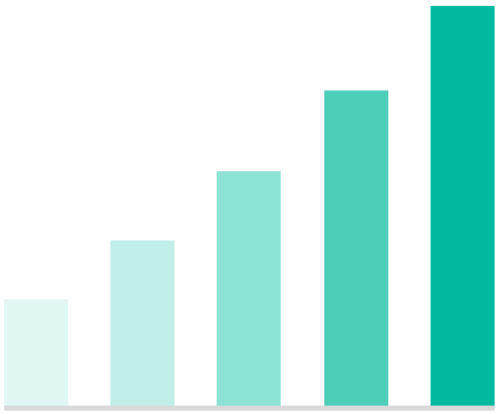
This is the one High-or-Critical-rated driver with no candidate measure attached, and the honest conclusion is that the sector's measure list has a blind spot where its people are. The shortage reported in the interviews (around 48,000 drivers EU-wide, before the retirement wave peaks) constrains every theme in this chapter: reliability programmes, rolling planning, and terminal upgrades all presuppose staff to run them.[169] Two boundaries frame what the report can responsibly say. First, automation is not the answer to this decade's shortage: DAC and ATO change tasks over a twenty-year migration, while the retirements happen now — presenting technology as a substitute for recruitment would be both wrong and corrosive to the social partnership the transition depends on. Second, the EU level is not empty-handed: training support through existing EU instruments, recognition and mobility of certifications, and co-funded traineeship capacity are all available levers, and a workforce strand should accompany whichever packages CER takes forward. The study diagnosis estimates that some EUR 3.5 billion per year are at stake, rated critical by two-thirds of the sector.[170] The issue was identified as important but not developed or validated in sufficient detail during the study's consultations to support a fully specified measure; it is therefore presented as an area requiring further evidence and dedicated member discussion rather than as an established EU skills package. Two candidate avenues for that discussion follow:

- **Publish the statistic**: an annual, published series of driver and train crew demographics, vacancies and the retirement curve, market by market, compiled from the HR data the sector already holds (converting a shortage figure that today rests on interview evidence alone into citable, fundable fact, and creating the precondition for any response at scale).
- **Assemble an EU rail freight skills package from instruments that already exist**: co-funded training and traineeship capacity,[171] cross-border recognition of driver certifications docking onto the announced revision of the Train Drivers Directive, and a deliberate effort to make the profession more attractive — framed explicitly as recruitment and retention, not automation.

[169] Study interview programme, July 2026.

[170] Rel-I/Ecorys, CER rail freight sector survey, June 2026.

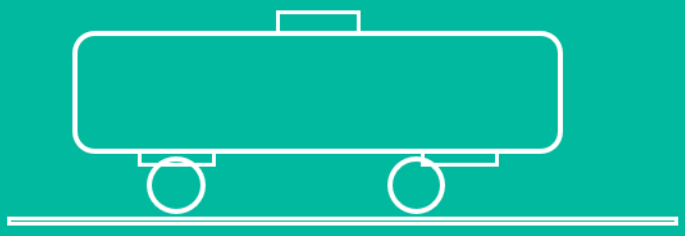
[171] See in particular STAFFER (Skill Training Alliance for the Future European Rail System), the Erasmus+ blueprint partnership on rail skills, whose 2024 final report proposed inter alia a 'Rail Erasmus' mobility scheme; CER was a project partner.



SECTION 4

4 Conclusions and recommendations

The evidence adds up to one story: reliability is rail freight's biggest commercial weakness, and no new horizontal EU law is needed to treat it (one targeted permitting amendment aside). The chapter separates what the sector can start itself from what only legislators, Member States and funders can supply, identifies the four measures whose top ranking holds under every reading of the survey, and sets out a sequenced pathway: the 2026–27 drafting window, readiness by 2030, and the capital decade beyond. Its closing message:
While structural and market developments also shape the trajectory, the gap between EU targets and rail's current performance increasingly reflects a delivery gap rather than a lack of policy ambition.



The legal framework for Europe's rail freight needs is largely in place. What decides the next decade is whether it is implemented for freight, in time, and whether the sector's own delivery problems are fixed while the protections are still being written.

4.1 What the evidence adds up to

The first key finding of this study is that the evidence tells one integrated story rather than a set of separate problems. Across a survey of the sector, an interview programme, case evidence and the published record, the same conclusion recurs: reliability is rail freight's central commercial weakness. Rail freight loses customers because it too often fails to deliver on the commitments it makes:

- The cluster of causes the study's modelled estimates price highest (uncoordinated closures, inadequate diversion routes, poorly coordinated capacity restrictions) is targeted under the measure package disruption-proofing the network.[172,173]
- Sub-optimal allocation of the available infrastructure turns scarce capacity into unreliable service for customers (around one third of paths ordered for the annual timetable are never run, an under-use of capacity whose correction is a shared responsibility of infrastructure managers and railway undertakings).
- Price acts at the margin: rail's cost position rarely wins or loses traffic on its own, but it decides contracts where road and rail offers are otherwise close.
- The quality of terminals and last-mile interfaces strongly influences whether customers can reach the network at all.
- The technology files, together with the availability and skills of the rail workforce, determine whether any of it is still operable in the 2030s.

The second key study finding is that **no new horizontal EU act is required to begin implementation of competitiveness measures**:

- The Capacity Regulation is adopted;
- the TEN-T parameters and permitting Directive are in force;
- the new State-aid framework took effect in March 2026;
- the DAC has a published investment plan.

The single piece of new legislation this study recommends is widening the scope of the permitting Directive so its streamlined approval procedures also cover the diversionary and feeder routes on which the rest of the agenda depends. Everywhere else, the constraint is implementation — and implementation has a deadline problem: the Capacity Regulation is already in force, and its governance work has begun, but its timetable-facing allocation, rolling-planning and capacity-restriction provisions first govern the working timetable starting on 14 December 2030, while a period of exceptionally intensive renewal and modernisation works across major networks runs to 2030. Closing that gap (through the coordination frameworks, delegated processes and national choices now being drafted) is one of the highest-value near-term actions available to the

[172] Rel-I/Ecorys, CER rail freight sector survey, June 2026. Conversion of effectiveness ratings into shares of the problem addressed per the method in Annex A; ranges span the defensible readings of the survey scale.

[173] Rel-I estimates (Level 3): modelled addressable-cost ranges, survey-based expectations applied to the sector's operating-cost and shipper time base; assumption chain in Annex A. Annual, at current traffic, never summed across measures, quoted only with the range. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.

sector and its Member States, alongside the infrastructure delivery and stable financing on which it depends.[174]

4.2 Priorities across the packages

Before ranking the packages, one read-across is worth making explicit: the solutions divide by who can act.

One group of measures is **internal to the sector** and needs no legislator:

- coordination and communication disciplines (rolling works-communication, task-force coordination on the most loaded bottlenecks),
- voluntary pilots that apply the 2030 rules early (TCR standards on the 2027–2029 timetables, corridor pilots of rolling planning and safeguarded capacity), and
- a common evidence layer of published, comparable statistics — paths ordered against paths run, a single punctuality ruler, ETA data shared along the logistics chain.

Their common function is to close the timing gap: they generate protection and proof in the years before the Regulation's provisions apply.

A second group can only **come from outside the sector**:

- legal scope where it is missing (the targeted permitting-scope amendment; the weights-and-dimensions file in trilogue),
- Member State decisions (charge predictability in the contractual agreements, aid schemes and budgets under the March 2026 State-aid framework, enforcement of road rules already in force, resourcing of the infrastructure managers), and
- capital (the TEN-T parameters, ERTMS onboard funding, the DAC migration fund).

Between the two sits the **drafting of adopted law** (the European Framework for Capacity Management and the TCR coordination frameworks) **where the sector supplies the design asks and the institutions decide what enters the text**. The division doubles as a sequencing rule: what can be done internally should start now, and the record it produces is the strongest evidence for the external asks.

Four measures top the survey under every reading of its scale, and all four belong to the first two packages: disruption-proofing the network and freight safeguards in good quality capacity allocation.[175] The four measures form the consistently highest-rated group. Their ordering within the group reflects respondents' expected effectiveness against the specific problems each targets, and its stability across the alternative survey-scale mappings; it is not a statistically significant ranking of overall importance or net value.

Table 11 Ranking of the measures — share of targeted problems, maturity and addressable cost

Measure (rank firm under every survey reading)	Share of targeted problems (central, range)	Maturity	Addressable cost, EUR bn/yr (central, range)*
1. Accelerated permitting	53% (46–64)	In force; 5 MS under infringement (ECA, 2026)	1.3–25.2

[174] See Chapter 3, sections 3.1–3.2; Regulation (EU) 2026/1184 (in force 11 June 2026; most timetable-facing provisions apply to working timetables entering into force on or after 14 December 2030); Directive (EU) 2021/1187; Regulation (EU) 2024/1679; LMTG (C/2026/1656) and TBER (Regulation (EU) 2026/562), applicable from 30 March 2026.
[175] Rel-I/Ecorys, CER rail freight sector survey, June 2026. Survey-based effectiveness shares, feasibility ratings and expected improvements, as reported in chapter 3; ranking, banding and sensitivity rules in Annex A.

Measure (rank firm under every survey reading)	Share of targeted problems (central, range)	Maturity	Addressable cost, EUR bn/yr (central, range)*
2. Capacity Regulation implementation	49% (41–60)	In force; timetable provisions from 14 Dec 2030	2.9–59.5
3. Coordinated TCR planning with minimum-bypass requirements	48% (40–59)	TCR duties enacted; bypass floor proposed, not yet in law	3.1–58.5
4. TEN-T parameter delivery	46% (37–57)	In force; staged 2030/2040/2050	(within Package 1 pools)

** Modelled addressable-cost ranges — what the problems the measure addresses cost the sector annually, not expected savings; never additive across measures. Each range combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading.*

Measure ranked #1 in the survey: Accelerated permitting: Respondents credit it with 53% of the problems it targets, the highest score in the study, because it is the delivery layer everything else waits on: the economics are documented (the permitting Directive's own impact assessment found EUR 5.1 billion in user-cost savings from earlier delivery), the failure mode is documented (one core freight axis delayed a minimum of 25 years by national procedures), and the instrument is already law, with five Member States under infringement for not applying it.[176]

Measure ranked #2 in the survey: Capacity Regulation implementation: Rests on the largest evidence base of any measure and carries one of the highest feasibility ratings in the survey. The sector considers it both effective and deliverable, because the Regulation is adopted and the remaining work is implementation — governance, IT systems, processes and operational practice rather than new legislation. Its urgency is a deadline: the European Framework for Capacity Management must be adopted by December 2027, and what freight does not write into that framework it will operate without until well into the 2030s.[177]

Measure ranked #3 in the survey: Coordinated TCR planning: Prices the sector's most expensive problem (works-related disruption, at EUR 40 million per day of lost economy-wide value added in the Rastatt case and EUR 236 million per year in the German sector's compensation claim) and respondents expect resolving cross-border TCR coordination alone to improve transit times by around 14%.[178] The route to that improvement is organisational rather than legal: regular, structured communication among infrastructure managers, and between infrastructure managers and railway undertakings, giving early and consistent notice of adjustments. This discipline matters more for freight than for passenger traffic, because international freight demand arrives as short-notice spot requests rather than following a clock-face timetable.

Measure ranked #4 in the survey: TEN-T parameter delivery: With a fast lane the evidence prices attractively: targeted small investments (passing loops, parking tracks, gauge clearances)

[176] European Commission, SWD(2018) 178 final (impact assessment accompanying what became Directive (EU) 2021/1187), present values 2018–2030; European Court of Auditors, Special Report 02/2026; the 25-year case: study interview programme, July 2026. All as cited in section 3.1.
[177] Rel-I/Ecorys, CER rail freight sector survey, June 2026; Regulation (EU) 2026/1184 (EFCM: final draft to the ENRRB by 12 June 2027, adoption by 12 December 2027). As cited in section 3.2.
[178] Rastatt lower-bound and compensation-claim figures as sourced in section 3.1; expected transit-time improvement: Rel-I/Ecorys, CER rail freight sector survey, June 2026.

that the sector estimates could release 10–15% additional capacity for under EUR 1 billion per country, ahead of the megaprojects that harden the network for the 2040s.[179]

Behind these four, the remaining measures separate into bands rather than ranks:

- A middle group — data and ETA integration, synchronised Class B decommissioning (the coordinated switch-off of legacy national signalling systems as ERTMS coverage grows), and the revision of the road weights-and-dimensions rules — shifts order with survey assumptions but stays consistently relevant.
- A lower group (energy taxation, single-wagonload support, charge stabilisation, driver language and the Digital Automatic Coupler) scores lower not because the problems are small but because the available instrument is stalled at EU level, essentially defensive (protecting the traffic rail already carries rather than winning new traffic), or long-term by nature.

Feasibility should temper the reading in both directions: the sector's most feasible asks (charge predictability, the Capacity Regulation's implementation work, use of the March 2026 State-aid framework) are cheap and administrative and should simply be done, while its least feasible (the Digital Automatic Coupler and the TEN-T capital programme) are precisely the ones whose constraint is money: what they need is an agreed funding model, not a higher place in a priority list.[180]

The priority, in short:

1. **lead with disruption-proofing the network** (fewer, better-coordinated line closures, with guaranteed diversion capacity) and with capacity allocation (implementing the new Regulation so that freight can book usable, stable paths, supported by regular and consistent communication between infrastructure managers and railway undertakings) — these carry the biggest cost pools, the firmest evidence, and the one implementation window that is closing;
2. **carry the price package's asks alongside** — charge predictability and enforcement of the road rules already in force, both low-cost and administrative;
3. **build the terminals package** on the State-aid framework in force since March 2026; and
4. **sequence the technology files** (ERTMS migration and the Digital Automatic Coupler) honestly rather than promising them early.[181]

[179] Study interview programme, July 2026, on the evidence of the French case; as cited in section 3.1.
[180] Rel-I/Ecorys, CER rail freight sector survey, June 2026. Survey-based effectiveness shares, feasibility ratings and expected improvements, as reported in chapter 3; ranking, banding and sensitivity rules in Annex A.
[181] Rel-I estimates (Level 3): modelled addressable-cost ranges, survey-based expectations applied to the sector's operating-cost and shipper time base; assumption chain in Annex A. Annual, at current traffic, never summed across measures, quoted only with the range. The quoted figure combines the operator-cost and shipper-time components and is an upper-bound (ceiling) reading of the addressable pool: the overlap between the two streams cannot be netted.

4.3 A sequenced pathway

Table 12 A sequenced pathway 2026/2027 to 2028/2029/2030 and 2030–2040

What needs to be done?	Who is in the lead?
Quick wins, 2026–2027 – the drafting window Everything in this block is administrative and open now, none of these waits for a legislature.	
• write freight's needs into the European Framework for Capacity Management — RNE has announced a first version for stakeholder consultation in late 2026, and the Regulation requires the final draft to reach the ENRRB by 12 June 2027 and adoption by 12 December 2027 — and into the TCR coordination frameworks, including a defined bypass floor	infrastructure managers and their European network; railway undertakings and CER members contribute through the consultation
• apply the permitting Directive as it stands	Member States
• put charge predictability into the State–infrastructure-manager contractual agreements — and, where Member States choose to go further, charges closer to direct cost, a political decision with fiscal rather than regulatory implications (see section 3.3)	Member States with infrastructure managers, at contractual-agreement renewals
• enforce the road rules already in force	Member States
• use the new LMTG/TBER for start-up aid, single wagonload and terminal support — noting that the framework enables aid but does not grant it: Member States must establish compliant schemes and budgets	Member States; operators apply
• fund language-tool and border pilots	Railway undertakings and infrastructure managers on cross-border corridors, with Commission and ERA support
The pivot, 2028–2030 The timetable of 14 December 2030 is the hinge of the decade: rolling planning, safeguarded capacity, the change penalties applicable to either party, and the TCR protections all first apply to it.	
• Ensure readiness — capacity products ordered, terminal deficits addressed before they materialise	Railway sector
• The targeted permitting amendment legislated so diversion routes are buildable	EU institutions — Commission (proposal), Parliament and Council (adoption); railway sector role: advocacy only.
• Resourcing the infrastructure managers, who account for approximately 77% of the estimated gross present-value implementation costs to 2050 in the Commission's impact assessment[182]	Member States
Structural, 2030–2040 The capital decade. The measures of this block succeed or fail in this decade's budgets, not in that one's.	
• TEN-T parameters delivered through Member State programming	Member States, with CEF support
• ERTMS deployment accelerated and Class B systems progressively decommissioned against the TEN-T's staged 2030/2040/2050 milestones, with the costs and benefits of migration aligned	Member States and infrastructure managers with ERA; funding frameworks: Commission and Member States
• DAC deployed under a funded migration strategy	Commission and sector, under a funded migration strategy
• a workforce renewed by recruitment and training rather than awaited automation	The sector, with EU programme support

[182] SWD(2023) 444 final, cited in section 3.2: EUR 1.609 billion of EUR 2.094 billion gross costs, present values 2025–2050 relative to the baseline — an incidence statement, not an annual funding requirement.

Lead and supporting actors with further specification for every measure are consolidated in an implementation table in Annex D.

4.4 Ambition against trajectory — the closing message

Europe's stated ambitions for rail freight are unambiguous:

- the Sustainable and Smart Mobility Strategy calls for rail freight traffic to increase by 50% by 2030 and to double by 2050;
- the Commission's baseline scenarios foresee rail growing by around 40% to 2030 and just over 80% to 2050;
- the sector's own coalition has argued for a 30% modal share.[183]

The trajectory points the other way: rail's share of EU inland freight fell from 18.8% in 2014 to 16.6% in 2024, it fell in 20 of the 25 Member States with a rail network, and volumes in 2024 stood below their 2022 level.[184] This report's closing message is that the distance between the two is a **delivery gap, not an ambition gap**. The shiftable demand exists — long-distance flows account for a large share of road tonne-km, and major industrial customers state in interviews that they would shift double-digit shares of their road volumes if reliability, connectivity between terminals and the rail network, and transit-time conditions were met.[185] Those conditions are the content of the packages in chapter 3. The realistic promise is therefore: **with the implementation agenda delivered** — the disruption decade managed, the 2030 framework written for freight, the margin stabilised and the terminals built — **decline can be halted this decade and the official growth targets become a trajectory rather than a slogan** — with the caveat that achievement also depends on structural demand and market developments outside the sector's control (section 2.3).

4.5 What CER should do next

The advocacy calendar follows from the findings. In the coming twelve months, CER should:

- **equip and mobilise its members to shape the EFCM consultation and the TCR coordination frameworks**: CER itself is an observer, but its member railway undertakings are consulted on the Framework and will sit in the future European Railway Platform — the bypass floor will only be included if they argue for it, with CER coordinating the case;
- **defend the combined-transport file** (through its retention on the Commission work programme, with Parliament and Council support) or secure its substance by another route, notably through the weights-and-dimensions file and the implementation of the new State-aid framework;
- **carry the charge-predictability ask into Member State contractual-agreement renewals**; and
- **table the permitting-scope amendment** while the evidence is fresh.[186]

Alongside the calendar, three standing practices would multiply the study's value:

1. **Adopt the monitoring indicators defined at the end of each solutions section in chapter 3** — a dozen 'success markers', all trackable from published or industry data —

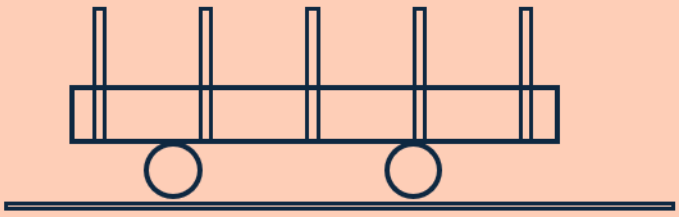
[183] COM(2020) 789 final (Sustainable and Smart Mobility Strategy), milestone verbatim; SWD(2020) 331 final (baseline scenario relative to 2015: rail +40% to 2030, +81% to 2050 — projections, not targets; a later Commission baseline gives +41% and +91%); Rail Freight Forward, 30 by 2030 (sector coalition ambition).
[184] Rel-I based on Eurostat (tran_hv_frmod; rail_go_total), 2014–2024. Chapter 2, Figure 3 and Figure 4.
[185] Study interview programme, July 2026. See sections 2.3 and 3.4; the modal-shift potential figures are reported with their conditions attached.
[186] Sections 3.1–3.3; EFCM: first version announced by RNE for consultation in late 2026, final draft due to the ENRRB by 12 June 2027, adoption by 12 December 2027 (Regulation (EU) 2026/1184).

as an annual public scorecard, ideally brought together in a single overview table: publicly tracked indicators are harder to ignore in negotiations. The scorecard is developed in full in Annex C: an EU-level table for CER's monitoring and advocacy, and a national and company-level table covering what railway-undertaking and, where relevant, infrastructure-manager chief executives can take responsibility for delivering. Each indicator is specified with its definition, baseline, data source, reporting frequency, direction of travel or target, and responsible and co-responsible actor, distinguishing indicators for public reporting from those for internal management.

2. **Keep the study's evidence discipline in advocacy**: ranges, not points; sources, not assertions; and the honest labels (estimate, scenario, interview evidence) that made the diagnosis credible in the first place.

3. **Own the workforce gap**: it is the one critical problem with no fully specified measure attached: the issue was identified as important but not developed or validated in sufficient detail during the study's consultations to support one. The recommendation is therefore procedural — develop the evidence base and establish a dedicated CER workstream on workforce and skills, so that a validated measure can be brought forward.

Annexes



A

Annex A – Methodology note

How to read the study's quantified estimates
(1) Addressable cost is not expected saving: the ranges size the problems a measure targets; they do not forecast benefits. (2) Estimates cannot be added across measures: several measures can target the same underlying costs. (3) Survey effectiveness ratings are stated expectations of practitioners, not observed causal effects. (4) EU-wide exposure assumptions may overstate corridor-specific effects. (5) Operator and shipper impacts may overlap and are not additive. (6) All monetised estimates are upper-bound (ceiling) readings and are quoted only as ranges.

This annex documents the study's methods end to end: how challenges were identified and clustered, how the survey and interview programmes were designed, how measures were identified and grouped, how the study's quantified estimates were built, the assumptions they rest on, and the rules under which they may be quoted.

A.1 Identification of challenges

The identification of challenges affecting the competitiveness of European rail freight was based on a mixed-methods approach combining a stakeholder survey and a programme of semi-structured interviews. The objective was not only to identify and prioritise the most important barriers to rail freight competitiveness, but also to understand their underlying causes, their effects on competitiveness, and the extent to which potential policy measures could address them. The survey and interview programme were designed around a common analytical framework to ensure consistency and enable triangulation of findings. The survey explicitly aimed to validate, prioritise and assess the most important problem drivers affecting rail freight competitiveness and their impact on key competitiveness dimensions.

A.1.1 Analytical framework

To ensure a structured and transparent diagnosis, all identified challenges were classified using a common barrier taxonomy that was applied consistently throughout the evidence-gathering and analysis process. This taxonomy distinguished between:

- External/systemic barriers and internal/sector-specific barriers;
- Operational, cyclical, and structural challenges;
- Cross-border and domestic barriers;
- Challenges affecting rail-road competition and those affecting sea-rail/intermodal operations.

The taxonomy served two purposes. First, it provided respondents and interviewees with a common language for discussing rail freight competitiveness. Second, it allowed the study team to move beyond individual examples and organise evidence into comparable categories that could be assessed across stakeholder groups and countries.

A.1.2 Problem-driver clustering

Building on the desk research conducted during the inception phase, individual barriers were grouped into five overarching problem-driver clusters representing the main sources of competitive disadvantage for rail freight:

A. **Infrastructure capacity and bottlenecks:** Including network congestion, temporary capacity restrictions, infrastructure works, bottlenecks at borders, ports and terminals, and limitations affecting train length, axle load or operational flexibility.

B. **Capacity allocation and traffic management:** Including freight path allocation, international coordination of capacity management, priority rules between passenger and freight services, timetable flexibility, and traffic management during disruptions.
C. **Level playing field and pricing:** Including track access charges, energy prices, taxation, charging asymmetries between transport modes, external cost internalisation, and regulatory factors affecting modal competition.
D. **Technical interoperability and assets:** Including vehicle authorisation, ERTMS deployment, interoperability requirements, rolling stock availability, locomotive and wagon constraints, and other technical or administrative barriers to cross-border operations.
E. **Operations, terminals and customer interface:** Including service reliability, information provision, terminal performance, last-mile access, intermodal interfaces, customer information systems, and overall service quality.

The clustering was used as the backbone of both the survey questionnaire and the interview guide, ensuring that evidence from different sources could be aggregated and compared systematically.

A.1.3 Stakeholder survey

The survey was distributed to CER members and a broader group of rail freight stakeholders, including railway undertakings, infrastructure managers, rail freight customers, terminal operators, logistics providers, regulators and industry associations. The survey was explicitly designed to identify and prioritise problem drivers, assess their impacts on competitiveness, and collect stakeholder views regarding possible solutions.

The survey combined several question types:

- Ranking and scoring questions to assess the relative importance of problem drivers;
- Questions assessing the dominant nature of each challenge (operational, structural or cyclical);
- Questions on competitiveness impacts, including effects on cost, reliability, transit time, flexibility, train length and payload;
- Open-ended questions allowing respondents to identify additional barriers not covered by the predefined framework;
- Stakeholder-specific questions tailored to the role of the respondent within the rail freight value chain.

This approach generated both quantitative evidence on the relative importance of barriers and qualitative insights explaining why particular challenges matter in practice.

A.1.4 Semi-structured interviews

The survey findings were complemented by a programme of semi-structured interviews with representatives from across the rail freight sector, including railway undertakings, infrastructure managers, customers, and industry associations. Interview discussions were organised around the same challenge clusters and potential measure packages used in the survey, thereby ensuring methodological consistency across evidence sources. Examples from interviews highlighted issues such as temporary capacity restrictions, cross-border coordination failures, pricing asymmetries, interoperability challenges, reliability problems and customer-facing operational shortcomings.

Interviews served four main purposes:

- To validate survey findings and test whether highly ranked barriers reflected operational reality;
- To obtain detailed explanations of the mechanisms through which barriers affect competitiveness;
- To identify interactions and dependencies between barriers;
- To collect practical examples, case studies and implementation considerations that could not be captured through survey data alone.

Case studies serve the causal analysis and the practical design of measures; they are not representative European evidence, and no EU-wide impacts are derived from them unless separately stated. Each case is read through four questions: the problem it illustrates, the measure it informs, the transferable lesson, and the limits to transferability.

A.1.5 Triangulation and synthesis

The final challenge assessment was based on the triangulation of evidence from the survey, interviews and supporting literature. Challenges were considered particularly robust where similar concerns emerged consistently across different stakeholder groups and evidence sources.

This process allowed the study team to distinguish between:

- Widely shared, structural barriers affecting the sector as a whole;
- Context-specific operational challenges affecting particular corridors, countries or market segments;
- Challenges primarily related to competition with road transport;
- Challenges linked to international rail operations and cross-border interoperability.

The resulting challenge framework formed the basis for the subsequent assessment of policy measures and the development of recommendations aimed at improving the competitiveness of European rail freight.

A.2 Measure identification and grouping

Candidate measures were identified from three directions: the solutions proposed by survey respondents and interviewees; the measures already on the EU policy agenda whose implementation the evidence shows to be decisive; and the study team's own analysis of where the diagnosed problems have no measure attached. Each candidate was assessed against a common prioritisation framework (expected impact on the diagnosed problems, feasibility, implementation horizon, and the actor responsible) and mapped to one of five measure packages mirroring the five problem-driver clusters, with three files (energy taxation, the Digital Automatic Coupler and driver language requirements) treated outside the packages because their instruments, timelines or evidence are different in kind. External policy measures and internal sector measures were handled in one integrated workstream, the latter designed to be fully compliant with EU competition law. Ranking is presented within each package; cross-package prioritisation is drawn together in the conclusions chapter, and where the survey evidence cannot statistically separate measures, the report presents bands rather than false-precision ranks.

A.3 Quantification methodology (three evidence levels)

Every quantified statement in this report belongs to one of three evidence levels:

- **Level 1** is descriptive evidence read directly from published sources: modal shares, volumes, punctuality rates, charge levels. It is quoted with source and vintage.
- **Level 2** is survey-based effectiveness evidence: how large a share of its targeted problems the sector credits each measure with addressing, converted from the survey's rating scale under the mapping in the assumptions log and reported with the range that the alternative mappings span.
- **Level 3** is modelled monetisation: the study's own order-of-magnitude estimates of what each problem costs the sector annually, built by applying the survey's expected improvements to two calibrated pools (the shipper time value of the traffic base and the operating cost of running the trains) and allocating driver-level amounts to measures through the survey's overlap-capped effectiveness shares. A selection gate determines which measures may carry a Level 3 band at all: of the thirteen candidate measures, seven pass; the rest are reported at Levels 1–2, with the reason stated (an instrument that resists standalone monetisation, a missing denominator, or a benefit that is an incidence question rather than a flow). Level 3 figures are heroic by design and labelled accordingly: the low–high span is a factor of 15 to 50, because the bands multiply the uncertainty of the mapping, the survey improvement ranges and the calibration parameters through the whole chain. They are quoted only with their full range, never summed across measures, and always as addressable cost (what the problems cost the sector at current traffic) not as expected savings from any intervention.

A.4 Assumptions log

The log below summarises the assumptions that carry the quantified estimates and states, for each, how results should be read in its light.

Table 13 Assumptions log

#	Assumption	Choice in use (central and band)	How to read the results in its light
1	Rail traffic base	375,000 million tkm (EU27, 2024; Eurostat, Belgium excluded for confidentiality). High reading 378,151 — our 23-Member-State sum.	Low/central versus high are geographical coverage readings, not statistical bounds; a true EU27 value lies between them.
2	Train-km base	655.9 million freight train-km (sum of 23 Member States; BE and EL unavailable). High reading 774 million (IRG-Rail, 31 countries).	Same logic: coverage scenarios bracketing EU27, not confidence bounds.
3	Average commercial speed	30 km/h (band 20–50). Team assumption — no official EU average exists; anchored to the ECA's 'around 18 km/h on many international routes'.	Converts the tonne-km base into cargo-hours for the time pool; the band is deliberately wide.
4	Freight value of time	EUR 1.20 per tonne-hour (band 0.72–1.70), from the appraisal literature (HEATCO 2006; de Jong et al. 2014).	Source price levels are 2002/2010 against 2024 cost data — kept as sourced and therefore conservative: updating prices would raise the time pool within the reported band.
5	Operating cost per train-km	EUR 26.7 (band 15–40), from average operator revenue, interview-bounded at the low end.	A proxy, not an upper bound on cost — subsidies, margins and ancillary revenue cut both ways; block trains sit below the average, wagonload above.

#	Assumption	Choice in use (central and band)	How to read the results in its light
6	The two benefit pools	Time pool ≈ EUR 15.0 billion per year (tkm × value of time at average speed); cost pool ≈ EUR 17.5 billion per year (train-km × operating cost).	Everything monetised in this study is a share of these two pools; no figure can exceed them.
7	Exposure	Survey improvement percentages apply to the whole EU traffic base, including for corridor-specific drivers.	A deliberate ceiling convention; no corridor-exposure factors are invented.
8	Effectiveness mapping	Survey ratings converted to shares of the problem addressed via bracket midpoints (87.5 / 62.5 / 37.5 / 12.5 / 0%); two alternative mappings carried as sensitivity.	An ordinal-to-cardinal convention, not an observed impact coefficient — outputs are scenario estimates; ranks are quoted only where identical under all three mappings ('rank firm' = mapping-stable, not sampling-error tested; 45-respondent base).
9	Overlap between measures	Where several measures address one driver, their shares are capped so no driver's total exceeds 100%.	Prevents double-counting a driver across measures.
10	Combining time and cost	Driver and measure figures add the shipper-time and operator-cost streams; the overlap between the two cannot be netted.	Every combined figure is therefore an upper-bound (ceiling) reading of the addressable pool; the two components are reported separately in the master database and in this annex's underlying workbook.
11	Reporting rules	EUR per year at current traffic; no discounting, growth or present value; never summed across measures; quoted only with the full range; no grand total.	The figures are addressable-cost bands — what the problems cost, not expected savings.
12	Evidence gates	Survey cells require n ≥ 20 valid responses and a 'do not know' share ≤ 40% to be quoted without flag; four impact cells sit at n = 19 and are used flagged.	The thresholds are disclosure flags, not exclusion rules; results relying on flagged cells carry wider uncertainty than the bands alone express.

A.5 Limitations

Five limitations bound what the evidence can support:

1. Reproducibility: survey micro-data and interview records are confidential; external readers can verify aggregates and the published anchors, but reproduction of internally generated evidence requires access to the confidential survey and interview data.
2. Statistical inference: with 45 cleaned respondents, results are reported as mapping-stable rankings and bands, not as statistically significant orderings; no sampling-error intervals are computed.
3. Coverage: EU27 aggregates for the traffic bases are bracketed rather than exact, because Belgium and Greece are confidentiality-suppressed in the underlying Eurostat datasets.
4. Secondary sources: a small number of load-bearing figures rest on sector-commissioned or compiled sources (flagged on every use), and the study labels them as such rather than presenting them as official statistics.

5. The study does not systematically quantify implementation and transition costs, the timing or distribution of benefits, or net present values, and therefore does not provide benefit-cost ratios.

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Annex C – The annual public scorecard

The monitoring indicators defined at the end of each solutions section in chapter 3 are brought together here as an annual public scorecard: what gets measured visibly gets negotiated seriously. It has two layers. The EU-level scorecard (Table A) that can be published annually by CER and tracks whether the system is moving — network availability, allocation quality, price predictability, the terminal interface, technology and people. The national and company-level scorecard (Table B) covers what railway-undertaking chief executives, and where relevant infrastructure-manager chief executives, can take responsibility for delivering; its internal indicators support management and feed the public aggregates without exposing commercially sensitive detail. Three data preconditions are themselves scorecard items, because they do not exist today: the paths-ordered-versus-run statistic in a common format, a single EU freight punctuality definition anchored in the RMMS/ENIM KPI framework, and the published workforce series. For these, the first year's success measure is that the number exists at all.

Core set for 2027

CER may not be able to report the full indicator set from the first year. Therefore, the core set below comprises the indicators CER is recommended to (at least) report in 2027, prioritising established public data and limiting new data requests to members; every other EU-level indicator is classified beneath the table as a future extension with the trigger that unlocks it, and the company-level indicators of Table B are internal management indicators whose collection can begin after 2027.

Core indicator (2027)	2027 data source	Baseline	Data provider	2027 status
EU-1 — Rail share of EU inland freight (tonne-km)	Eurostat tran_hv_frmod	16.6% (2024)	CER secretariat from Eurostat	Ready
EU-2 — Share of TCRs announced with the required lead time and left unchanged	IM/RNE TCR publications, CER-compiled	Not yet measured — year 1 sets the baseline	IMs via RNE; CER compiles	Year-1 baseline
EU-6 — International freight punctuality at a single EU definition	RMMS / ENIM KPI framework (separate, complementary processes)	Year 1 = definition delivered + first measurement	ENIM/Commission; CER monitors	Year-1 baseline (enabling deliverable)
EU-7 — Cross-border rail freight volumes on the key corridors	Eurostat international rail series; RNE corridor statistics	2024 values	CER secretariat from Eurostat/RNE	Ready
EU-8 — Networks with charges for year T final 12 months ahead; retroactive settlements	Published network statements; IRG-Rail	First count from the 2027 network statements	CER secretariat from public documents	Ready (first count = baseline)
EU-9 — Year-on-year variance of average charge per freight train-km, per network	IRG-Rail market monitoring; network statements	Computed from 2024–2026 published charges	CER secretariat from IRG-Rail	Ready
EU-11 — Rail share of containerised hinterland transport at the major ports	Port authority reports (published modal-split figures)	Partial coverage in year 1 — a series worth starting	CER with port associations	Year-1 baseline (new collection)

Core indicator (2027)	2027 data source	Baseline	Data provider	2027 status
		despite gaps in existing statistics		
EU-13 — ETCS infrastructure equipage (share of TEN-T Core Network in service)	ERA ERTMS deployment reporting / RMMS	≈16–17% Core Network (≈10% full network)	CER secretariat from ERA data	Ready
EU-14 — ETCS fleet equipage versus plan, per corridor	ERA deployment plans + member corridor input	Not yet measured — year 1 sets the baseline	CER members via corridor plans	Year-1 baseline

Future extensions, each with its trigger:

- EU-3 (diversion-capacity ratio — once the bypass-floor methodology is defined through the coordination frameworks);
- EU-4 (works-related extra train-km — once IM reporting through the ENIM KPIs is available);
- EU-5 (request-to-run stability — once the Capacity Regulation's data flows operate, from the 2028 capacity models);
- EU-10 (road enforcement intensity — subject to coordination with national enforcement authorities on data availability);
- EU-12 (survival of aided services — once schemes have run long enough to observe outcomes);
- EU-15 (retrofit unit cost — subject to member data feasibility); EU-16 (workforce — see below).

The company-level indicators (RU-1 to RU-6, IM-1 to IM-6) are internal management indicators by design and are never published at company level; their collection can begin after 2027.

Table A — EU-level scorecard (to be published annually by CER)

ID	Indicator and definition	Baseline (study evidence)	Data source	Freq.	Trend to date	Target / direction	Responsible → co-responsible	Reporting
Headline								
EU-1	Rail share of EU land freight (tonne-km).	16.6% (2024)	Eurostat	Annual	Falling — 18.8% (2014) to 16.6% (2024)	Rising	Commission / Member States → sector	Public
Package 1 — Disruption-proofing the network								
EU-2	Share of TCRs announced with the required lead time and left unchanged thereafter.	Not yet measured — year 1 sets the baseline	RNE TCR tool / IM publications	Annual	n/a — new series	Rising	IMs (via RNE) → ENIM	Public
EU-3	Diversion-capacity ratio on core freight axes during planned works (the bypass floor, per corridor).	Not yet measured — year 1 sets the baseline (evidence: in one market 15% of trains have no diversion)	TCR plans; corridor monitoring	Annual	n/a — new series	≥ agreed floor on every corridor	IMs → Member States	Public
EU-4	works-related extra train-km and train cancellations per year.	4–5% of production cost (study estimate)	RU data aggregated by CER	Annual	Rising through the renewal decade	Falling	IMs → RUs (data), CER (aggregation)	Public (aggregate)
Package 2 — Freight safeguards in capacity allocation								
EU-5	Request-to-run stability: share of capacity requests unchanged from request to train run; paths ordered vs actually run, per corridor, common format.	20–25% survive unchanged; ~1 in 3 annual paths never runs	IM publication (to be created — the statistic the EU lacks)	Annual	n/a — series to be created	Rising	IMs → regulatory bodies / ENIM	Public
EU-6	International rail freight punctuality at a single EU	47.4% within 15 min international	Existing processes — RMMS and ENIM KPIs (separate,	Annual	Persistently low	Rising; converging on domestic	IMs / ENIM → RUs	Public

ID	Indicator and definition	Baseline (study evidence)	Data source	Freq.	Trend to date	Target / direction	Responsible → co-responsible	Reporting
	definition (threshold + measurement points).	vs 64.1% domestic (2020)	complementary; reuse data already collected)					
EU-7	Cross-border rail freight volumes on the key corridors.	Study corridor set	RMMS / corridor statistics	Annual	To be tracked	Rising	IMs / corridor bodies → CER	Public
Package 3 — Level playing field on price								
EU-8	Number of networks where charges for timetable year T are final 12 months ahead; retroactive settlements recorded.	Not yet measured — year 1 sets the baseline	Regulatory-body reports / IRG-Rail	Annual	n/a — new count	Rising count; zero retroactive settlements	Member States + IMs → regulatory bodies	Public
EU-9	Year-on-year variance of average charge per freight train-km, per network (level tracked alongside).	Level ≈ EUR 2.96/train-km (IRG-Rail); variance = the predictability test	IRG-Rail market monitoring	Annual	Volatile	Variance falling	IMs → Member States / RBs	Public
EU-10	Road enforcement intensity: checks performed and infringements found (driving/rest times, posting, cabotage, weights).	Not yet measured — year 1 sets the baseline (from national statistics)	National enforcement statistics / Commission reporting	Annual	n/a — new series	Rising intensity	Member States → Commission	Public
Package 4 — Terminals, last mile and ports								
EU-11	Rail share of containerised hinterland transport at the major ports.	Around or below 10% at several major ports; best-in-class ≈ 50%	Port authorities / study indicator set	Annual	Flat at a low level	Moving visibly towards the 30% ambition	Port authorities → IMs / RUs	Public
EU-12	Survival of aided cross-border intermodal services after support ends; single-wagonload volumes where	Schemes in force since 30 Mar 2026 (LMTG/TBER); DE SWL scheme 2024	Member State scheme reporting	Annual	n/a — schemes new	Services survive; SWL volumes stabilise	Member States → operators	Public

ID	Indicator and definition	Baseline (study evidence)	Data source	Freq.	Trend to date	Target / direction	Responsible → co-responsible	Reporting
	schemes are in place.							
Package 5 — Technology (ERTMS)								
EU-13	ETCS infrastructure equipage: share of the TEN-T Core Network with ETCS in service (full-network share tracked alongside).	≈16–17% of the TEN-T Core Network (≈10% of the full TEN-T network)	ERA deployment statistics	Annual	Rising slowly	Work-Plan milestones	IMs / Member States → Commission / ERA	Public
EU-14	ETCS fleet equipage: corridor-level equipage vs plan — what is equipped, what is switched on, and when.	Not yet published — corridor equipage transparency to be created	Corridor equipage plans; sector reporting	Annual	n/a — new series	On plan	RUs, keepers, lessors → IMs / ERA	Public
EU-15	ERTMS retrofit unit cost and authorisation lead time (fleet-identical retrofits).	≈ EUR 0.35–1.0m per locomotive (stakeholder range ≈ 0.4–1.0m+); costs doubled 2018–2022	ERA one-stop shop; sector reporting	Annual	Rising — doubled 2018–2022	Both falling	ERA → suppliers / RUs	Public (aggregate)
Workforce								
EU-16	Workforce statistic: driver and traincrew demographics, vacancies and retirement curve, market by market.	None exists — today interview evidence only; year 1 = feasibility assessment (see core set above)	Sector HR data compiled by CER	Annual	Worsening (interview evidence)	Year 1 (2027): feasibility assessment of a comparable member data exercise on driver and traincrew demographics, vacancies and retirement profile; data collection begins only once feasibility and	CER + members → social partners	Public (aggregate)

ID	Indicator and definition	Baseline (study evidence)	Data source	Freq.	Trend to date	Target / direction	Responsible → co-responsible	Reporting
						proportionality are established.		

Table B — National / company-level scorecard (CEO responsibility)

ID	Indicator and definition	Baseline (study evidence)	Data source	Freq.	Trend to date	Target / direction	Responsible → co-responsible	Reporting
Railway undertakings								
RU-1	Request-to-run stability of own trains: paths booked vs run, with cancellation causes attributed (own / IM / other).	Company records; study: 20–25% sector-wide	Own operations data	Quarterly	Own baseline, year 1	Rising; causes visible	RU CEO → IM account managers	Internal; feeds EU-5
RU-2	Punctuality of own international services at agreed measurement points, single definition.	Sector: 47.4% intl (2020)	Own TMS data, corridor points	Quarterly	Own baseline, year 1	Rising	RU CEO → IMs on route	Internal; feeds EU-6
RU-3	Cost of coping with disruption: works-related extra costs and reserve assets held, as % of production cost.	Sector estimate 4–5% of production cost; one operator EUR 3–5m/yr in reserve locomotives and crews	Own controlling	Annual	Own baseline, year 1	Falling	RU CEO → CFO	Internal; feeds EU-4
RU-4	Share of own traffic contracted on charges known 12 months ahead.	Not yet measured — year 1 sets the baseline	Own commercial data	Annual	Own baseline, year 1	Rising	RU CEO → commercial director	Internal
RU-5	Fleet ETCS equipage vs corridor plan; retrofit downtime per vehicle.	Fleet-specific; sector unit cost ≈ EUR 0.35–1.0m per locomotive	Own fleet register	Annual	Own baseline, year 1	On plan; downtime falling	RU CEO → keepers / lessors / workshops	Internal; feeds EU-14

ID	Indicator and definition	Baseline (study evidence)	Data source	Freq.	Trend to date	Target / direction	Responsible → co-responsible	Reporting
RU-6	Own workforce: driver vacancies, age profile, hires vs departures, time-to-fill.	Company records	Own HR data	Annual	Own baseline, year 1	Vacancies and time-to-fill falling	RU CEO → HR director	Internal; feeds EU-16
Infrastructure managers								
IM-1	TCRs on own network announced with required lead time and left unchanged.	Not yet measured — year 1 sets the baseline	Own TCR planning / RNE tool	Annual	n/a — new series	Rising	IM CEO → RNE / neighbouring IMs	Public
IM-2	Diversion capacity actually offered during closures vs the agreed floor, per corridor; diversionary paths preserving, to the greatest extent possible, the viability of the service replaced.	Not yet measured — year 1 sets the baseline	Own TCR plans	Annual	n/a — new series	≥ floor, every closure	IM CEO → Member State	Public
IM-3	Publication of paths-ordered-vs-run on own network, per corridor, in the common format, with cancellation reasons.	Not published today	Own allocation systems	Annual	n/a — new series	Published (year 1); stability rising thereafter	IM CEO → regulatory body	Public
IM-4	Charges for timetable year T final 12 months ahead (yes/no); retroactive settlements (count).	Network-specific	Own charging documents / network statement	Annual	Own baseline, year 1	Yes; zero	IM CEO → ministry, regulatory body	Public
IM-5	Capacity-offer stability targets and multi-annual funding written into	Contract-specific; horizons today range 5–6 years to single-year	Contractual agreement	At renewal	Mixed across networks	In place	IM CEO → ministry	Public

ID	Indicator and definition	Baseline (study evidence)	Data source	Freq.	Trend to date	Target / direction	Responsible → co-responsible	Reporting
	the Art. 30 contractual agreement (in place yes/no).							
IM-6	Terminals, ports and marshalling yards covered in the Art. 19 / Annex I capacity model of own network.	Transfer nodes today monitored locally, not always modelled	Own capacity model	Annual	Partial coverage	Coverage rising to full	IM CEO → terminals / ports	Internal, then public

Implementation notes

Phase-in
Indicators marked “year 1 sets the baseline” (EU-2, EU-3, EU-8, EU-10, IM-1, IM-2) are reported first as baselines, with trend assessed from year 2. The four enabling series (the EU-5 publication, the EU-6 single definition, EU-14 equipage transparency and, for EU-16, the feasibility assessment of a comparable member workforce data exercise) are counted as delivered / not delivered in year 1. The core set for 2027 at the start of this annex identifies which of these indicators CER reports from the first year.

Sensitivity rule
Company-level cost and commercial indicators (RU-1 to RU-6) are never published individually; CER publishes only aggregates with at least three contributors, consistent with the study's confidentiality protocol.

Sources discipline
Where an indicator relies on data that does not yet exist, the scorecard says so rather than substituting a weaker proxy.

Annex D – Consolidated implementation table

This annex consolidates, for each measure in chapter 3, the immediate action, lead and supporting actors, instrument, decision window, funding requirement, key dependency and monitoring indicator. The fourteen measures follow the order of Table 4 and chapter 3; the four priority measures carry full entries, the others shorter ones. It is the operational counterpart to the sequenced pathway in section 4.3 and to the scorecard in Annex C. This annex tracks implementation actions; outcomes are tracked by the scorecard in Annex C.

Table 14 Consolidated implementation table — actions, owners, instruments and monitoring per measure

Measure	*Immediate action*	*Lead actor*	*Supporting actor*	*Instrument*	*Decision window*	*Funding requirement*	*Key dependency*	*Monitoring indicator*
Coordinated TCR planning with minimum-bypass requirements	Write the diversion floor into the Article 11 coordination frameworks; publish an early-adopter list for the 2027–29 timetables; adopt a single EU-wide digital works tool	Infrastructure managers (via RNE)	Member States; European network of infrastructure managers	Article 11 coordination frameworks; RNE TCR tool	Before timetable-2031 preparation (capacity strategies end-2027)	Tool approximately EUR 1.85 million per year; works-protection budgets	Cross-IM agreement on the floor definition	TCR lead-time discipline; diversion-capacity ratio (scorecard)
Accelerated permitting framework	Apply Directive (EU) 2021/1187 in full; table the scope amendment covering diversionary and feeder routes	Member States (application); EU institutions — Commission (proposal), Parliament and Council (adoption) (amendment); railway sector role: advocacy only	CER and sector (evidence, advocacy)	Infringement follow-up; targeted amendment of the Directive	Commission implementation review due by August 2028	Administrative	Political window for the amendment	Infringements closed; permitting durations (scorecard)
Accelerated TEN-T parameter upgrade	Small-investment fast lane in national programmes; CEF prioritisation	Member States	European Commission (CEF); infrastructure managers	National programming; CEF calls	Current programming period	Fast lane under EUR 1 billion per country	Multi-annual financing condition	Parameter coverage; capacity released (scorecard)
Freight safeguards in capacity allocation	Write freight's needs into the EFCM; volunteer	European network of infrastructure managers and IMs	Railway undertakings via the consultation	EFCM (final draft to the ENRRB by 12 June 2027;	Consultation late 2026 through 2027	IM implementation resourcing	IM resourcing secured	Request-to-run stability; international

Measure	*Immediate action*	*Lead actor*	*Supporting actor*	*Instrument*	*Decision window*	*Funding requirement*	*Key dependency*	*Monitoring indicator*
	corridor pilots on the 2027–29 timetables		and the European Railway Platform; CER members	adoption by 12 December 2027); capacity strategies and models		(roughly 77% of framework costs)		punctuality (scorecard)
Charge stabilisation	CER members table charge-predictability clauses (charges final 12 months ahead; multiannual trajectory; no retroactive settlement) in the upcoming renewals of the contractual agreements between States and infrastructure managers.	Member States (transport and finance ministries) and infrastructure managers, at each Article 30 contractual-agreement renewal	Regulatory bodies (oversight); CER (coordination).	Contractual agreements under Article 30 of Directive 2012/34/EU; network statements.	National agreement renewal cycles 2026–2028.	State absorption of timing risk — compensation to the infrastructure manager where stabilisation creates a revenue gap; depends on stable multiannual infrastructure funding (Package 1 condition).	Stable multiannual infrastructure funding (Package 1 condition).	EU-8 (networks with charges final 12 months ahead; retroactive settlements) and EU-9 (year-on-year charge variance).
Weights-and-dimensions synchronisation and road enforcement	Sector position in the live weights-and-dimensions trilogue for entry into force synchronised with the combined-transport rules; Member States task enforcement	European Commission and co-legislators (synchronisation); national road-enforcement authorities, with EU-coordinated concerted checks (enforcement).	Member States (tasking of enforcement authorities); CER (sector position).	Weights-and-dimensions revision (in trilogue); driving-time, cabotage and weight rules already in force.	Trilogue 2026–2027; enforcement immediate.	Administrative — enforcement within existing national budgets.	Synchronisation: trilogue outcome; enforcement: none — immediate under existing law.	EU-10 — enforcement effort (coverage and number of checks) reported separately from compliance outcomes (infringement rates); more checks or

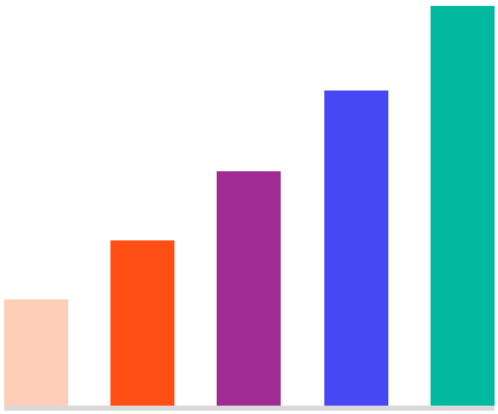
Measure	*Immediate action*	*Lead actor*	*Supporting actor*	*Instrument*	*Decision window*	*Funding requirement*	*Key dependency*	*Monitoring indicator*
	authorities with prioritised checks (driving and rest times, cabotage, weights) on rail-competing corridors.							detections signal effort, not yet improved compliance.
Data and ETA integration	Extend ETA and disruption-data exchange to terminals on the TAF-TSI/eFTI basis; supported web services or apps so that smaller railway undertakings can provide and receive ETA data	Sector (railway undertakings, infrastructure managers, terminals) through the Rail Data and TAF-TSI bodies	European Commission (eFTI/TAF framework); CER	TAF TSI; Regulation (EU) 2020/1056 (eFTI); sector-led data initiatives; targeted support for small-operator access	2026–2028	Modest — pilots and small-operator web-service support	Participation of smaller railway undertakings (one-third to one-half of the market)	Share of freight trains with ETA shared with terminals
Cross-border intermodal start-up aid	Design and notify temporary, degressive start-up schemes for new cross-border intermodal services	Member States	European Commission (State-aid assessment); CER (scheme template)	LMTG (C/2026/1656); TBER (Regulation (EU) 2026/562)	Framework applicable since 30 March 2026	National aid budgets; degressive and time-limited	Outcome of the Combined Transport Directive revision; aid-cumulation rules	New cross-border intermodal services launched and retained after the ramp-up period
Single wagonload (SWL) support	Operating and infrastructure support for SWL under the State-aid	Member States	European Commission; infrastructure managers (marshalling	LMTG/TBER; national schemes (DE EUR 1.7 bn; FR Ulysse Fret)	Current programming period	National; scale of existing precedents	Continued investment in yards and sidings	SWL traffic retained; wagonload unit cost

Measure	*Immediate action*	*Lead actor*	*Supporting actor*	*Instrument*	*Decision window*	*Funding requirement*	*Key dependency*	*Monitoring indicator*
	framework, following the German and French precedents		yards, sidings, last-mile connections)					relative to shuttle
ERTMS migration	—	Member States, infrastructure managers and ERA, with funded on-board support	—	—	—	—	—	Equipage and retrofit unit cost
DAC	—	Commission and sector under a funded migration strategy	—	—	—	—	—	—
Energy taxation and price predictability	Document and spread best practice under existing national frameworks (electricity levies, grid charges, crisis-smoothing support); maintain the sector position on the Energy Taxation Directive recast	Member States (national frameworks); Council (ETD recast)	European Commission; CER (member energy survey)	National electricity charging arrangements; ETD recast (proposed, not agreed)	ETD recast pending; national measures annually	National budgets where relief is granted	Political agreement on the ETD recast	Energy share of operating costs and contract cover (CER member survey)
Driver language and certification	Requires further development — evidence base and member	Commission via the TSI OPE and the Train Drivers Directive revision	Requires further development — evidence base and member discussion first.	Requires further development — evidence base and member discussion first.	Requires further development — evidence base and member discussion first.	Requires further development — evidence base and member discussion first.	Requires further development — evidence base and member discussion first.	—

Measure	*Immediate action*	*Lead actor*	*Supporting actor*	*Instrument*	*Decision window*	*Funding requirement*	*Key dependency*	*Monitoring indicator*
	discussion first.							
Workforce	Requires further development — evidence base and member discussion first.	CER and members	Requires further development — evidence base and member discussion first.	Requires further development — evidence base and member discussion first.	Requires further development — evidence base and member discussion first.	Requires further development — evidence base and member discussion first.	Requires further development — evidence base and member discussion first.	EU-16 — year 1 (2027): feasibility assessment of a comparable member data exercise

Rel-i

Reliable Intelligence



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