infront
INSTANT TRANSFORMATION

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Expert study on the state of finished vehicle logistics on rail in Europe 2025

Extension with insights into market dynamics and action fields to better link operational OEM- and Rail- ecosystem

Supported by

ECG The Association of European Vehicle Logistics

WELCOME

Introduction & Management Summary

Dear reader,

Automotive outbound logistics is regaining volume and remains an attractive transport segment for the next decades. Some fundamental changes like the speed of electrification and the import/export balance are not fully predictable today. Rail now needs to convert this momentum into execution while construction works, cross border frictions and yard constraints still test reliability. The agenda is to modernize assets, embed native visibility in OEM systems, standardize data exchange and move to earlier communication on path availability and works.

Grounded in the strategic pattern described in our study (Vol. 1 and 2) we observe rising activities of all stakeholders to refine their roles and to strengthen market position. But the overall market situation for rail transport did not improve in the current year. Therefore, we put our focus on areas where better understanding and a closer link of the business logics **could improve performance and share of rail transports.**

Together with the ECG Rail Initiative Steering Group, we identified areas with the potential to better connect OEM-System with the Rail-System: Tender structure, interface management, communication.

In addition to individual strategies and bilateral commercial relationships, we identified areas in which a higher level of collaboration and connectivity could lead to a better overall performance. We translated them into five action fields:

- infrastructure management
- operational KPI engineering,
- capacity and tender management
- wagon innovations
- connectivity.

All players intend to engage in a next level of process design and cooperation and will invest in transferring the insights into measures and results. ECG offers the platform to work for an increased rail share for the FVL industry.

Please enjoy reading.

Warm regards, the authors

STUDY OBJECTIVE

The objectives and scope of the finished vehicle study

Aligning OEM and LSP Collaboration for Predictable Finished Vehicle Rail

This study builds a shared understanding between OEMs, logistics service providers, infrastructure managers, ports, and rail undertakings on how to collaborate to unlock rail's potential in finished-vehicle logistics. It translates strategic intent into practical design rules that raise predictability, visibility, and accountability across corridors. The aim is to move from fragmented initiatives to a coordinated, product-like rail offering that leaders can plan against, invest in, and hold accountable for cost, lead time, and CO2 outcomes.

> *Rail remains an integral part of our logistics strategy.*
>
> OEM

Following a customer-centric approach we collect the OEM perspective through structured expert interviews and embedded the insights in market developments and pattern. The Market Overview establishes demand, capacity, corridor constraints, and economics as the factual baseline. The Perspective of OEMs and black boxes surfaces pain points in cost transparency, asset availability, cross-border handovers, wagon flows, and reliable ETAs.

Tender design and processes define scope, traffic design, cadence, and evaluation mechanics, showing how clear tasks and staged technical and commercial rounds could produce executable offers. Interface management specifies data standards, APIs, event messages, and ownership at handover points to make integration and liability unambiguous.

Operations & communications set the service concept and KPIs, and detail disruption playbooks and escalation paths that stabilize day-to-day performance.

Future needs outline the roadmap from stabilize to productize, including real-time capacity publication, hub-based jump-on options, trustworthy ETAs, and harmonized rules with targeted investment. The concluding action fields translate insights into prioritized framework of initiatives for a next level of collaboration between the stakeholders to improve the rail performance in the given environment and to define accountable owners, milestones, and success metrics.

AUTOMOTIVE MARKET

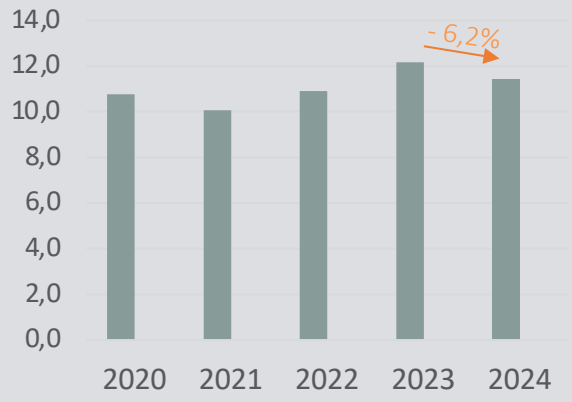
An overview of the market for finished vehicles

The market for finished vehicles is normalizing after turbulent years

EU finished-vehicle production has moved through a coherent cycle from constraint to catch-up to a more stable operating baseline (Figure 1). The series begins with 10.8 million units in 2020 and dips to 10.1 million in 2021 as semiconductor scarcity, fragile logistics and staggered shift patterns kept plants below planned utilization even while order books remained intact.

Figure 1:

Car production in the EU (million units)



Source: ACEA

As supply conditions gradually stabilized, production advanced to 10.9 million in 2022, reflecting steadier component flows, more predictable takt times and the first deliberate rebuilding of pipeline inventories. The crest arrived in 2023 at 12.16 million units, driven less by a structural upswing in end-market demand than by the systematic conversion of accumulated orders as OEMs prioritized high-turn variants and restored line efficiency. With that backlog largely processed, 2024 eased to 11.41 million units.

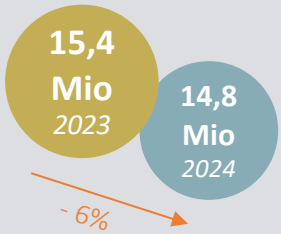
In the mid-term until 2030, a production volume between 10-11 million seems to be a realistic scenario, whereby shifts between plants and OEMs are likely to occur.

The transport demand is equally signaling a post-peak normalization

Transport demand eased by roughly 6% from 2023 to 2024, moving from about 15.77 million units to 14.83 million (Figure 2). The decline reflects two synchronized shifts: EU output fell by 6.2% to 11.4 million cars as the industry moved past the post-pandemic backlog and "catch-up" phase, and import volumes decreased by 5.2% amid softer consumer confidence.

Figure 2:

Total transport demand (in million cars)



Source: ACEA

In short, 2023 was an elevated baseline driven by inventory replenishment, whereas 2024 marked a realignment of supply to steadier demand. Looking ahead towards 2030, we expect overall transport volumes tend to stabilize in a corridor of roughly 13 to 15 million units. This reflects the combined effect of EU production levels, which are unlikely to return to pre-pandemic peaks, and the balancing role of imports and used-vehicle flows: what is no longer produced in Europe tends to be compensated by inbound shipments of new and used cars from outside the EU. As a result, even with lower EU output, transport demand remains structurally potentially supported by trade flows into and out of the region.

FVL ON RAIL PERSPECTIVE

The Perspective on Rail logistics for FVL from OEMs View

The relevance for transport strategy

For OEMs, rail is a core backbone of finished-vehicle logistics because it moves large volumes across long corridors with predictable capacity, stabilizes total landed cost in the face of driver shortages and fuel volatility, and supports credible scope-3 decarbonization. Where reliability and visibility are assured, rail becomes a relevant mode for car transportation. However, the challenges facing rail (e.g. infrastructure) mean that road transport remains the most widely used transport solution overall due to its simplicity, clear accountability and currently lower prices.

How rail is currently used

Rail is mainly deployed as plant to port (hub to hub) transport, with OEMs typically awarding an entire relation to a single provider that manages the chain end to end. Volume commitments are rare, so providers are expected to design stable concepts that work despite fluctuating order volume. The preferred model is timetable based, with protected paths, defined recovery options and early rerouting to avoid stranded vehicles. OEMs rely on providers to consolidate volumes and coordinate interfaces; co-loading is still uncommon, with only a few emerging examples.

Transparency on operational parameters and cost logic is requested, as OEMs increasingly want to learn jointly with partners how to improve rail performance. Resilience is prioritised over a maximal rail share, so credible fallback routings are embedded from the outset. Single-wagonload is seen as fragile due to its dependence on multi-shipper density, and spot-rail is rarely used because of lacking solutions in the market.

OEMs generally do not intend to own wagons; they expect logistics partners to manage traction, capacity, routing and wagon availability against clear service commitments and to integrate status information into their control towers. But OEMs start to analyse the benefits of an increased level of control for rail operating to manage efficiency and to secure critical capacities.

The main barriers for rail transport

Scaling finished-vehicle rail depends on predictable infrastructure windows and disciplined and managed handovers that keep operations stable and protect quality. Ongoing construction works across borders, recurring incidents and speed restrictions erode the reliability of planned paths, and when announcements arrive late the resulting diversions bunch traffic and create backlogs that tie up locomotives and crews. Where freight is not consistently prioritized, even small timetable shifts propagate into terminals and plant sidings and reduce the value of advance planning.

At the interfaces, limited yard capacity and uneven coordination turn disturbance into dwell. Shunting and staging must cope with tight track space and staffing, while paths are ordered far in advance and alternative routings are not always ready when disruption occurs. Idle trains and repeated replanning then ripple across borders and disturb wagon positioning.

Service quality outcomes follow the same pattern. Longer dwell and unplanned handling steps raise damage exposure, loading and securing practices vary across hubs, and battery electric vehicles require wagon features and clearances that are not always available. Clearer records at each handover, earlier cross-border communication on path availability, and tighter yard control that preserves buffers restore the usefulness of planned paths.

FVL ON RAIL PERSPECTIVE

Opening OEMs ´ black boxes of rail transport to restore predictability

Improving transparency across the rail value chain offers a major opportunity to strengthen confidence in rail and enable faster, better-founded decisions. Yet three clusters of black boxes still challenge predictability: unclear operating levers, limited wagon visibility, and diffuse responsibility at interfaces. These gaps blur the link between service and cost, but all can be improved through clearer data, defined ownership and more open information flows. Bringing light into these areas not only reduces uncertainty but also makes rail a more dependable and competitive option in outbound logistics.

Operations levers: Pricing and operational design often remain opaque. OEMs see a total rate but not the cost logic behind reroutings, detours, penalties or energy consumption. Train paths and cancellation fees are presented as fixed facts rather than parameters that can be understood and influenced. Capacity statements lack context, making it difficult to distinguish structural availability from day-to-day improvisation. Cross-border routing is handled largely by providers, with little visibility into alternatives or trade offs. Contingency plans exist, but triggers, lead times and responsibilities are rarely transparent. As a result, OEMs struggle to judge how operations work and how they can be improved, which reinforces the perception of an unpredictable service even when assets are available. An improved joint understanding could help.

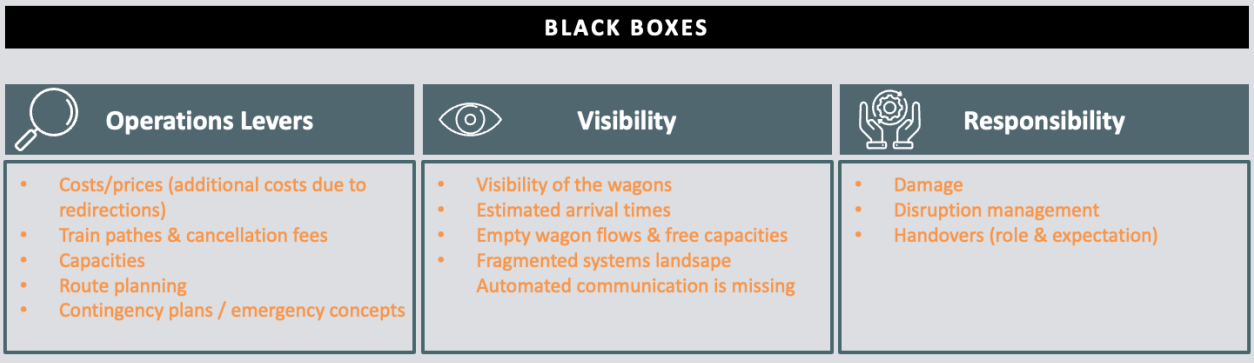
Wagon visibility: Wagons are not consistently visible end to end and estimated arrival times vary in quality across corridors. Empty wagon flows and free capacities are only partially known, which weakens planning and makes recovery slower than it needs to be. The systems landscape is fragmented and automated communication is missing at key points. Data often sits in portals that are not connected to OEM systems, so exception handling depends on calls and emails. Without continuous tracking and predictive ETA inside OEM control towers, performance management remains reactive and KPIs lose integrity.

Responsibility: At handover points the role and expectations for each party are not always explicitely synchronized. Completly implemented and executed end-to-end responsibility is required. In this context, vehicle damage is the most sensitive area. On open wagons liability between loader, rail undertaking and wagon owner can be diffuse, which leads to disputes and slow resolution. Disruption management suffers from similar ambiguity, as detection, decision-making, communication and cost responsibility are not defined in a way that all parties recognize at the same moment. Clear protocols for joint inspection, standardized reporting at key interfaces and a visible escalation process reduce conflict and speed recovery.

Addressing these three main black boxes, illustrated in Figure 3, creates a direct path to better performance. Transparent operating levers link cost to action. Full visibility restores confidence in plans and ETAs. Clear responsibility at handovers turns exceptions into manageable events rather than prolonged disputes.

Figure 3:

OEMs ´ black boxes for FVL on rail



OPERATIONAL BUSINESS

Tender processes could become more synchronized

Coordinate and standardize tenders to unlock scale

Tendering works best when each request turns strategy into a concrete rail product that providers can price and plan with confidence. The decision lens is consistent across OEMs: price, lead time and CO2. Yet processes still differ, fragmenting demand and limiting achievable overall scale. Stronger synchronization across tender timing and corridor priorities could help the whole system to deliver more and bundle easier. A closer alignment could improve traction planning and increase efficiency, e.g. through better addressing imbalanced flows and submit sharper offers.

Figure 4 sets out tender systematics by design parameter. Structure is defined by transport scope and traffic design. While some OEMs explicitly only issue rail tenders, others integrate all transport carriers together – for single relations, clusters or the entire network.

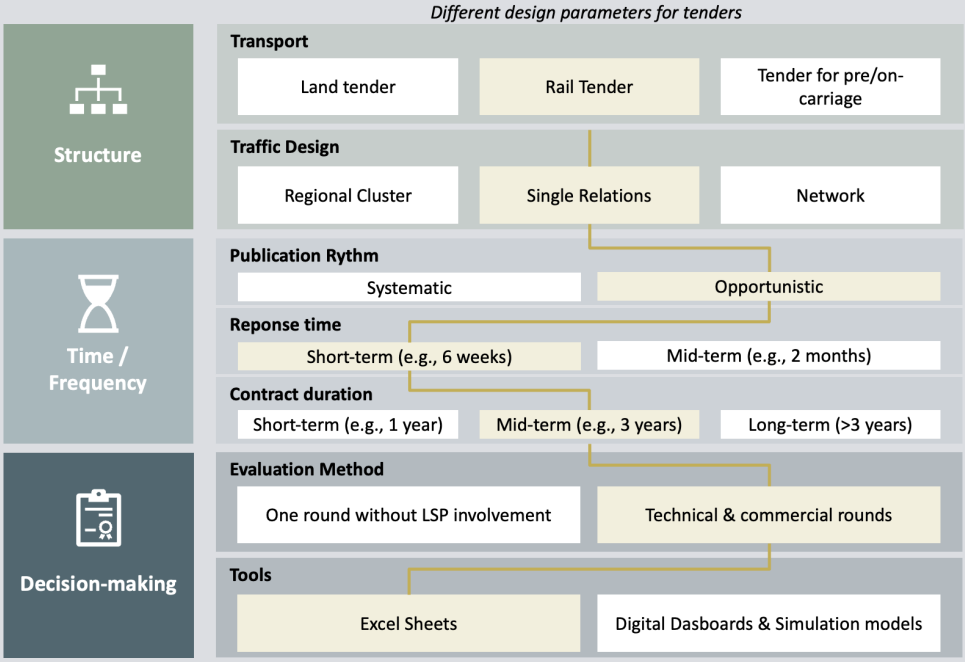
Effective tenders also state the operating concept, for example scheduled hub shuttles, and define flexibility windows and contingencies for peaks.

Time and frequency set cadence and commitment. Publication can be systematic harmonized, for example annual windows, or opportunistic when volumes shift. Response times typically range from six weeks to about two months. Contract duration spans one year for pilots, three years for stable lanes, and longer where asset cycles and path security warrant.

Decision-making determines depth and quality. A single commercial round with Excel is fast but shallow. Separate technical and commercial rounds, supported by digital dashboards and simulation models, validate timetable feasibility, rerouting, and winterization before price. Standardized data and interfaces, including wagon GPS, predictive ETAs in OEM systems, and agreed event messages, make visibility and disruption handling contractual.

Figure 4:

Typical Tender design parameters



Source: Infront expert interviews

OPERATIONAL BUSINESS

Interface management from hub (plant) to hub (port) safeguards reliability

Performance through clear, synchronized handovers

A better and complete end-to-end coordination can materially improve performance. The process spans multiple systems and owners from plant to shunting, loading, unloading, compounds, yards and ultimately ports or retail. The transport leg in between remains a black box for many OEMs due to limited information and visibility. Each interface creates latency and risk when responsibilities are not linked and information arrives late. Clear responsibility and tighter synchronization at every handover point increase throughput and stabilize paths across borders.

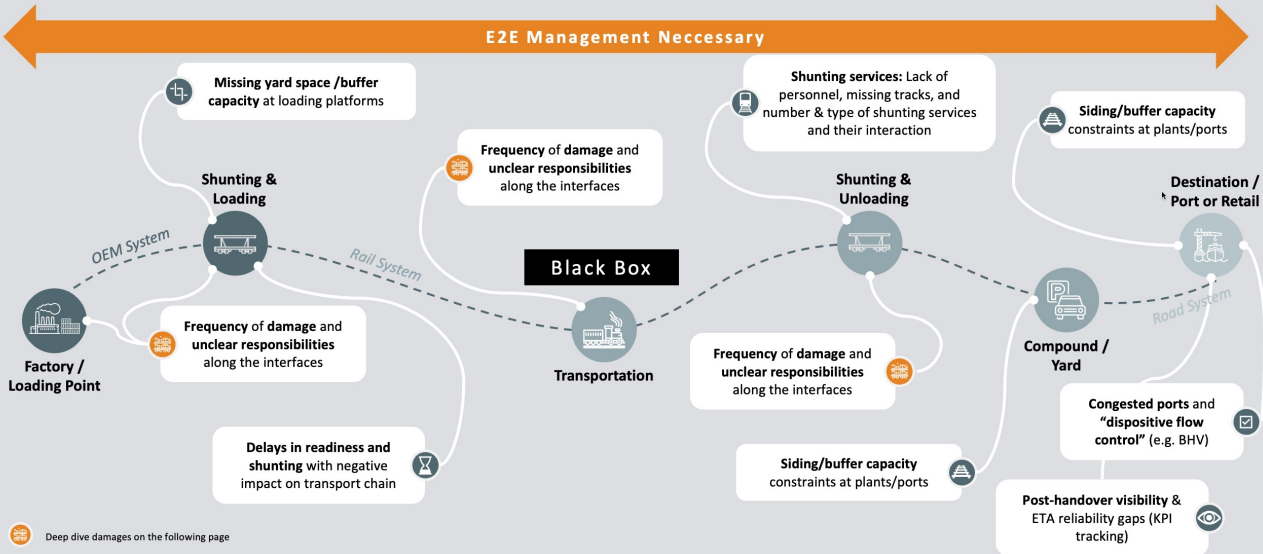
A persistent pain point is vehicle damage and the question of liability, with damage rates on rail up to ten times higher than on road. Handover protocols must therefore be unambiguous and consistently applied. Joint inspections with photographic evidence and time-stamped digital checklists would significantly reduce handling incidents.

In addition, standardised damage classification avoids disputes over responsibilities and liability issues. Responsibilities for detection, reporting, root-cause analysis and cost allocation must be defined up front and visible to all parties. Standardized reporting at key interfaces ensures exceptions are captured once and propagated cleanly through all systems.

Closing the visibility gap is the operational backbone of these controls. Wagons require full GPS coverage so that geofenced handovers trigger automatic milestones and potentially reliable ETAs in OEM systems. Connectivity must shift from bespoke portals to harmonized interfaces that automatically share events in a common format. Early cross-border communication on works, disruptions, path availability and timetable changes allows yards and shunting services to plan capacity before issues materialize. With clear ownership at handovers and timely, integrated data, damage decreases, dwell times shrink and rail delivers predictable, repeatable performance.

Figure 5:

Finished vehicle rail logistic handover points



Source: Infront expert interviews

OPERATIONAL BUSINESS

Align operations & communications through systems connectivity

Reliability through full visibility

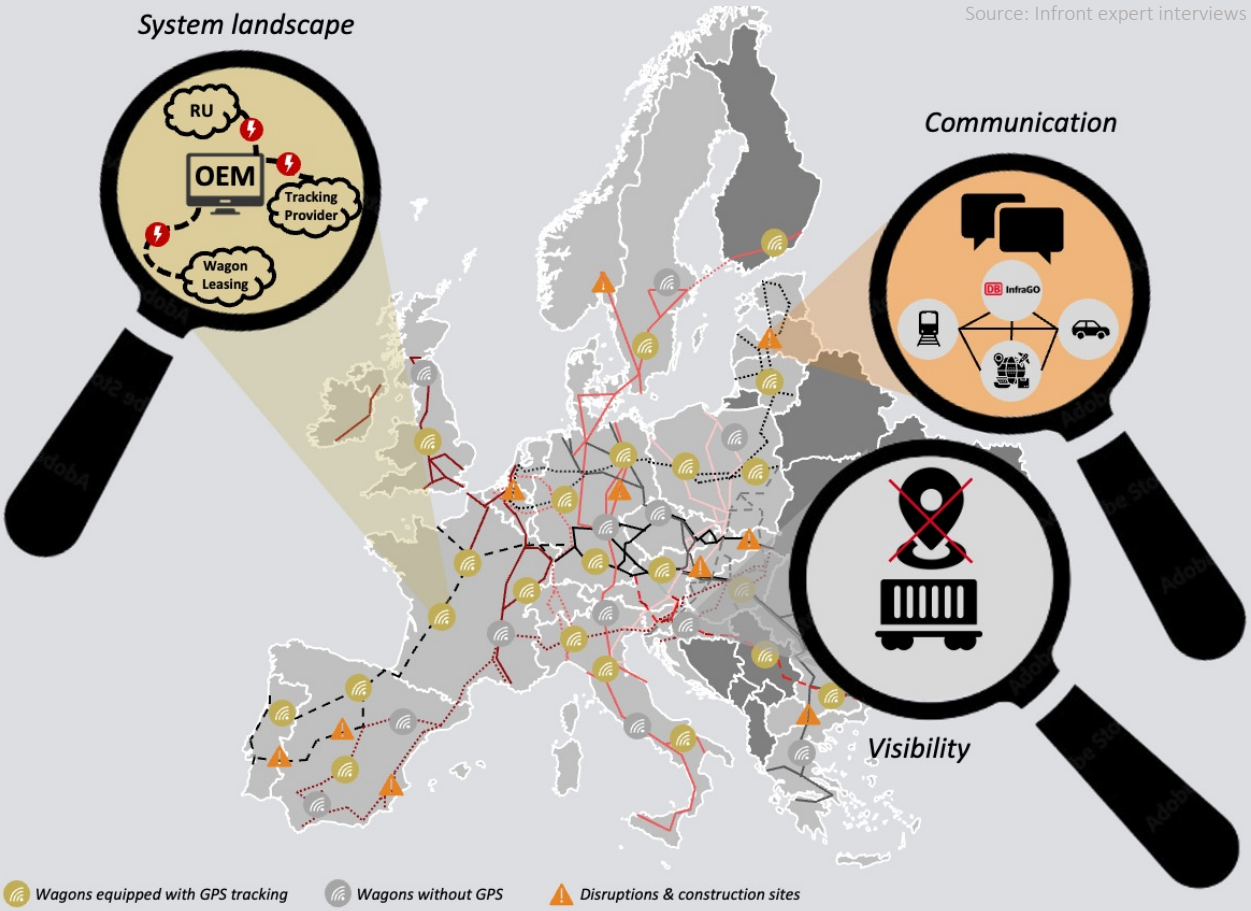
Operational reliability in European Finished Vehicle Rail is anchored in three fixable gaps. The first one is visibility. Not all wagons are trackable end to end, which creates a mainline blind spot. All wagons must be retrofitted with GPS tracking and GPS data must be directly integratable into OEM systems through open APIs. The second gap is connectivity/ the unconnected system landscape. Interfaces across OEMs, RUs and LSPs remain bespoke and brittle, fragmenting the network view and slowing decisions. Standardization and harmonization of IT interfaces are required to deliver consistent cross-network connectivity.

The third issue is early and proactive warning. Communication regarding construction sites is often short term and reactive, which erodes path discipline during works and disruptions. OEMs call for early and cross-border communication about construction sites, disruptions, path availability and timetable changes, supported by corridor-wide notice SLAs and routine cross-border calls. With these measures in place, cancellations fall, binding days shrink and decisions become evidence-based. Figure 6 shows the three challenges in operational reliability.

Figure 6:

Connective system landscape in Europe's rail network

Source: Infront expert interviews



FUTURE NEEDS & ACTION FIELDS

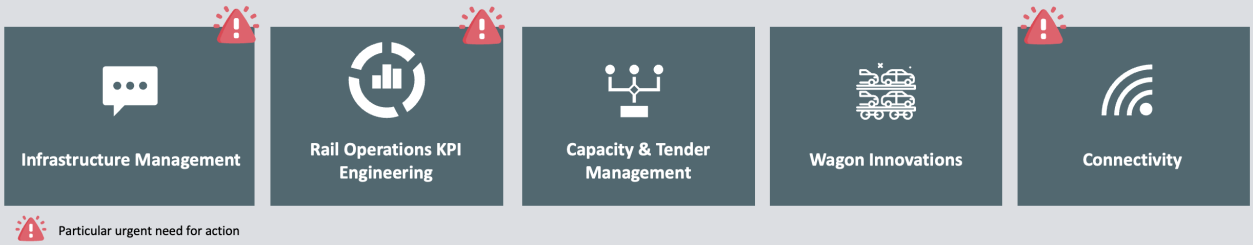
Future needs and five action fields for all stakeholders

More reliable rail flows would emerge when five action fields operate as one system with synchronized planning, shared data standards and clear ownership at every handover. Closer alignment between OEM operations and the rail operating system strengthens collaboration and lifts overall network performance.

1. Infrastructure management shows how OEMs demand a holistic view of volumes, paths, works and yard capacity. Synchronized cross-border alignment and early communication from rail undertakings and infrastructure managers keep plans credible. Clear contingency plans and proactive disruption alerts give plants, compounds and ports enough time to prepare.
2. Rail operations KPI Engineering provides a fact base for decisions. Transparency on the cost logic of rail undertakings, including cancellation fees, train paths and detours, links service and cost and highlights optimization levers. Visibility events anchor measurement so that lead time, binding days, utilization and damage reporting time are trusted and comparable, enabling joint performance improvement.
3. Capacity and tender management translates insight into scale. Better utilization becomes possible when OEM volumes are bundled and milestones synchronized so that logistics service providers are able to optimize. Harmonized tender dates and design parameters improve contestability and long-term planning, while wagonload options keep the system responsive and strengthen cooperative capacity planning.
4. Wagon innovations increase product protection and availability. New wagon models meet higher requirements for handling speed and damage prevention. Pooling concepts and shared wagon management could raise effective capacity and clarify service levels and cost allocation, supporting coordinated network operations.
5. Connectivity is the integrator across all fields. GPS-equipped wagons enable track and trace with predictive ETA and allow geofenced milestones to update OEM systems directly. Standardized IT and data interfaces, including common EDI standards like ITSS 1.2, replace portal silos with a shared language for events and exceptions. When these fields work together and collaboration deepens, visibility improves, cross-border communication becomes earlier, disputes decline and rail delivers predictable performance at scale.

Figure 7:

Five important Action Fields for reliable Rail Operations



Source: Infront expert interviews

STUDY SUMMARY

Study objective. Building upon the state of finished vehicle logistics on rail in Europe and the identified market dynamics, structural bottlenecks and actionable trends of the study volumes 1 and 2 we focused on improvement potential by better linking the operational processes of OEM with the Rail system

Method. We combined our market insights with structured expert interviews (logistics planner and purchasing executives) of leading automotive OEM to understand and display their perspective and as an input to increase the performance of rail within the given market circumstances

Results. Demand is normalizing, but infrastructure works and node congestion keep execution fragile. Rail remains the backbone for high volume corridors, and performance improves when five actions are industrialized: connectivity with predictive ETA, a shared KPI language, capacity and process aligned tendering, fit for purpose wagons, and constraint-based infrastructure management. Together these steps close the main black boxes in pathing, visibility, liability, commercial transparency and capacity signaling.

Study background & objective

Automotive outbound logistics is regaining volume, yet prolonged works, congested ports and compounds, and frictions across borders keep execution fragile. Rail remains the backbone for high volume corridors, but reliability often breaks in pathing, interface responsibility and end to end visibility.

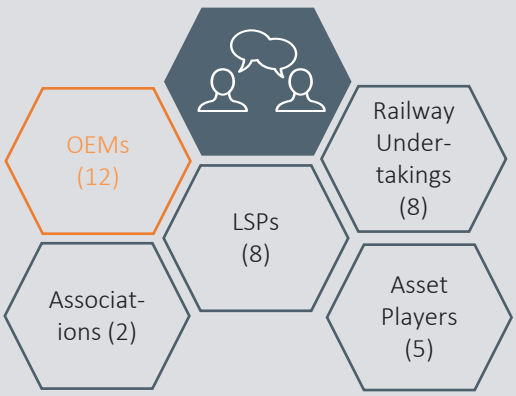
> *Clearer responsibility across the chain would unlock our full ambition for rail, as it would give us the confidence to develop the mode further.*
>
> OEM

The objective of this edition is to enrich market statistics with an evidence-based perspective of the OEM´s how rail performance could be improved in the current market environment and restrictions of the rail system. How flows are produced and where they fail, and to make the main black boxes for the stakeholders explicit. We translate these findings into areas to accelerate together with relevant ecosystem players like LSP and RU, showing through which fields rail performance can be improved and providing a basis for improvement of tender design, interface management and communications. The findings now need to be operationalized into measures and KPIs to demonstrate that improvements are possible within the given environment.

Study structure & participants

The study is structured in three parts. We begin with the rail-based FVL market, describing normalizing demand alongside persistent constraints and the continued role of rail as the backbone for high-volume corridors. We then move into operational business, covering the tender landscape, the interface management from plant to port, and the weekly operating rhythm with shared KPIs. We then bring together the key requirements for improving performance and translate them into five actionable fields that shape an executable operating loop for all players in the ecosystem. Throughout, we combine targeted desk research with intensive conversations with OEMs, whose perspective forms the primary focus of this study and anchors the evidence base.

Study participants



THANK YOU!

We would like to take this opportunity to thank all our interviewees. We enjoyed the conversations with you very much. Thank you for your time and intriguing insights. We are looking forward to your feedback on the study at any time.

INFRONT CONSULTING AND MANAGEMENT GMBH

Infront is a leading strategy and management consultancy focused on market-centric and digital transformation. In our key industries we advise on all management topics, in particular business model strategies, innovation ecosystems & core business transformation. In association with KPS AG, Infront provides the strategic and cross-functional foundation for the immediately effective, customized and market differentiating digital transformation of your business.

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WE ARE LOOKING FORWARD TO YOUR FEEDBACK!

We condensed all analyzed information into a few pages – yet there is much more to talk about. As challenges in the market tend to be individual, we are curious about your perspectives and thoughts. Please feel free to contact us at any time.

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