FOSTERING THE RAILWAY SECTOR THROUGH THE EUROPEAN GREEN DEAL

EUROPEAN UNION AGENCY FOR RAILWAYS

REPORT
RAIL-PORT SYNERGIES

Report

FOSTERING THE RAILWAY SECTOR THROUGH THE EUROPEAN GREEN DEAL: RAIL-PORT SYNERGIES

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EXECUTIVE SUMMARY

The 2020 Sustainable and Smart Mobility Strategy has set as a modal shift objective the doubling of rail freight traffic by 2050. Improving the modal share of rail depends on a multitude of factors, but one key element is the link between ports and rail with efficient hinterland transport of goods. Ports are increasingly becoming multimodal hubs through which the railway sector can increase its market share.

Through desk research, a survey and stakeholders' interviews, the EU Agency for Railways explored with this report the relationship between the railway sector and ports with a focus on different aspects concerning freight transport:
- A snapshot of European ports' rail connectivity and rail modal share for the hinterland transport of goods.
- Stakeholders' view on infrastructure level, regulatory framework, digitalisation and barriers affecting rail modal share and hindering the full exploitation of the rail potential.
- Identification of best practices and measures which could improve the position of rail in ports.
- Case studies for two maritime ports.

The current level of rail connection to the ports and inside the ports is on average rather good. It is hiding a large variation between ports with a modern infrastructure and those with an ageing infrastructure with important investment needs to modernize it. Many ports consider that their competitiveness will increasingly be judged by their railway connectivity. Therefore, most of the ports are investing to increase their rail capacity and rail modal share through the development of the railway infrastructure. The diversification of the hinterland transport is seen as main commercial driver for the ports.

Digitalisation, new technologies, management of rail operations inside the ports and the correlative decarbonation and rail service offers are among the other topics analysed in this report.

This report can inform decision makers on measures to improve the relationship between the railway sector and the ports, to increase the rail modal share of the hinterland transport of goods and thus to help facilitating the modal shift objectives in the freight sector.

INTRODUCTION

The European Commission's European Green Deal iterated the 2011 modal shift ambitions[1] for rail. The 2020 Sustainable and Smart Mobility Strategy[2] specified this modal shift objective as the doubling of rail freight traffic by 2050[3]. These goals are tremendously challenging to achieve considering what has occurred in the past.

Although the volume of freight traffic has increased significantly in the past few decades, this increase was mostly true for the road sector which holds a share of about 75%. Rail freight showed a decrease of 7% in tonnes-kilometres in 2020 compared to 2019[4] and the modal share is approximately 18.7%[5]. This faltering modal share of rail has substantial economic and environmental consequences.

Improving the modal share of rail depends on a multitude of factors, but one key element is the link between ports and rail. The maritime sector is vital for global and European trade. In 2019, about 77% of goods imported/exported to/from the EU transited through a European port with cargo volumes in constant growth[6]. According to UNCTAD global maritime traffic suffered less from the pandemic situation than initially feared and the rebound is faster than in previous recessions. In the EU, there are approximately 300 TEN-T maritime ports[7] and about 250 inland ports part of a 20.000 km network of waterways.

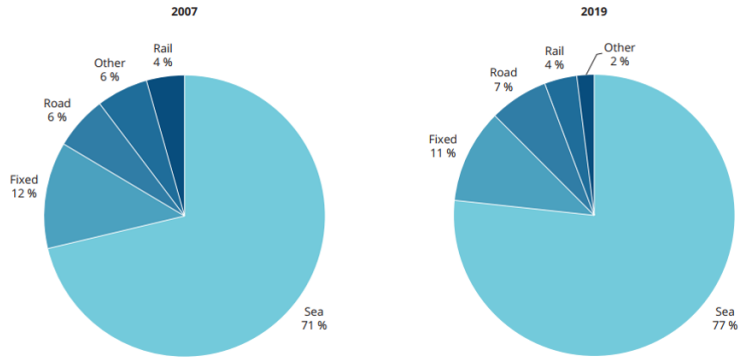


Figure 1: Mode of transport (%) used by goods traded to and from the EU in 2007 and 2019 - 2020, Eurostat

[1] EUR-Lex - 52011DC0144 - EN - EUR-Lex (europa.eu)
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789
[3] Meaning from approximately 385 billion tkm transported by rail in 2015 to 770 billion tkm in 2050 with an intermediate step to transport 575 billion tkm by 2030 (+50% in rail freight traffic) while 455 billion tkm was transported by rail in 2019.
[4] Report on railway safety and interoperability in the EU, 2022 - Publications Office of the EU (europa.eu)
[5] https://ec.europa.eu/transport/sites/transport/files/com20210005-7th-rmms-report.pdf
[6] UNCTAD projects shipping volumes to grow 2.4% annually over the 2022-2026 while containerized trade is expected to grow twice as much.
[7] ports2013_brochure_lowres.pdf (europa.eu)

European ports are faced with congestion[8] and the efficiency of hinterland transport connections is of paramount importance. To achieve the rail modal shift objective, it is essential to ensure the highest degree of synergy between ports and the railway sector. Doing so will not only contribute to the decarbonization of the EU economy, but also reinforce the energy independence of the European Union as rail is and will remain substantially more energy efficient than road transport.

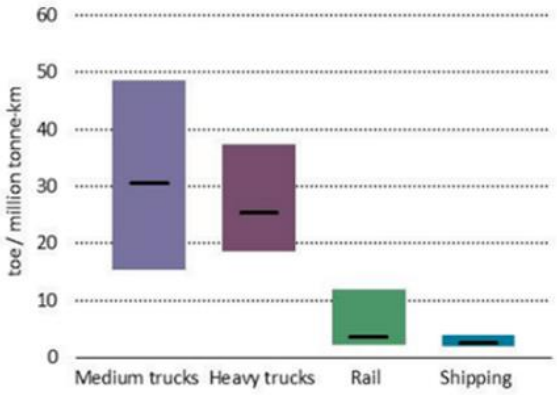


Figure 2: Energy intensity of different modes of transport, 2017 - 2019, The Future of rail, International Energy Agency

With the large amount of goods transiting through European ports, they play a crucial role in the multimodal logistic chains and will play an even more important role in ensuring the modal shift. Especially in the last years, ports have evolved from their traditional role of loading/unloading to clusters of industry/logistics, intermodal terminals, energy providers integrated in the so-called "blue economy". Ports are increasingly becoming multimodal hubs through which the railway sector can increase its market share.

The aim of this report is to give a snapshot on rail-ports synergies and the related challenges hampering the growth of the rail modal share in alignment with the latest EU policy objectives. In fact, given the large freight volumes, a higher modal share of rail in ports is a key lever to increase the share of rail freight in hinterland transport.

Through desk research, a survey and stakeholders' interviews, the EU Agency for Railways explores with this report in detail the relationship between the railway and waterborne sectors with a focus on the following aspects concerning freight transport:

➔ Level of current rail connectivity of European ports and rail modal share for the hinterland transport of goods.
➔ Stakeholders' views on infrastructure level, regulatory framework and barriers affecting rail modal share and hindering the full exploitation of the rail potential.
➔ Identification of best practices and measures which could improve the position of rail in ports.
➔ Case studies for two maritime ports.

[8] The congestion can be due to multiple factors such as peak volumes due to large vessels, availability of staff during these peaks, decreased vessel reliability, lack of truck drivers, storage capacity maxed out, etc.

In addition to these four main contributions, this report also investigates the decarbonisation strategies of rail operations themselves in ports and the interest of ports in using TAF TSI[9] considering its latest developments[10]. In fact, it is expected that in 2022 the TAF TSI will be revised to include ports and terminals in the scope of digital messaging exchanges of RUs/IMs.

This report can inform decision makers on measures to improve the relationship between the railway and waterborne sectors, to increase the rail modal share of the hinterland transport of goods and thus to help facilitating the modal shift objectives in the freight sector.

[9] TAF TSI stands for Technical Specification for Interoperability relating to the telematics applications for freight subsystem: EUR-Lex - 32021R0541 - EN - EUR-Lex (europa.eu)

[10] Three additional types of information are needed by the Port Authority (as terminal manager or service facility operator): consignment order, train composition and wagon movement which will be included in the future release of TAF TSI.

I. Status of rail-port connectivity

➔ The importance of ports for European and global trade

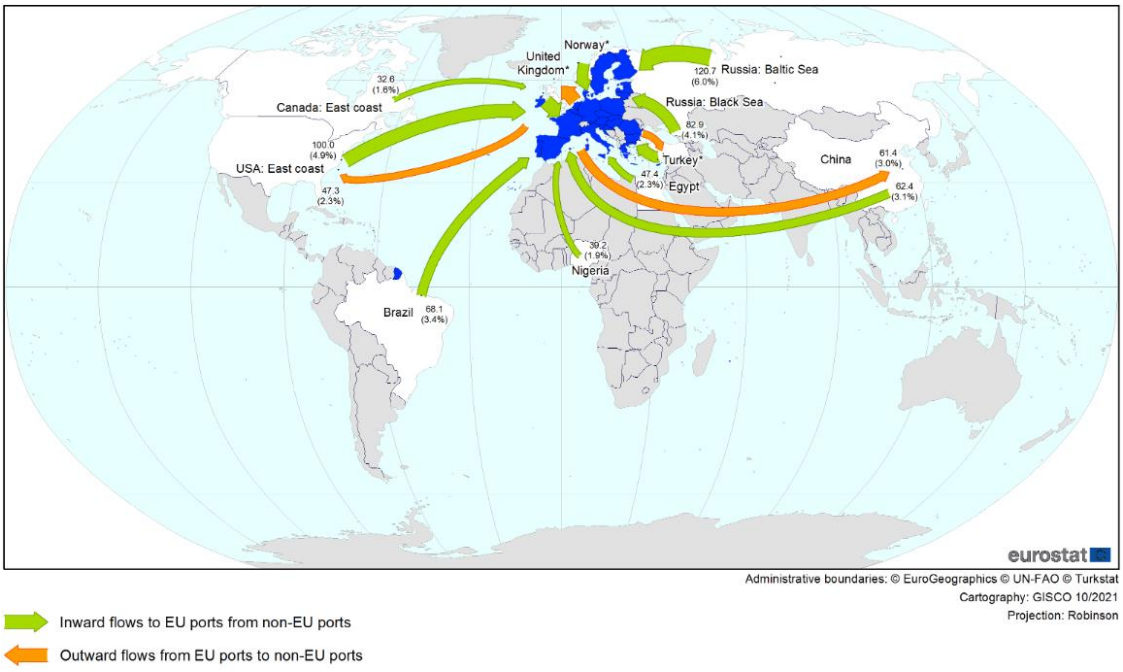


Figure 3: Main extra EU flows by gross weight of freight handled in main EU ports - 2020, Eurostat

The main ports in terms of port call activity in Europe are Rotterdam, Antwerp, Algeciras and Piraeus, while in terms of gross weight of goods handled, Rotterdam, Antwerp and Hamburg remained the top three ports in Europe in 2019. Eighteen ports in the EU (~ 6% of total) account for more than a quarter (26.7 %) of the port call activity.

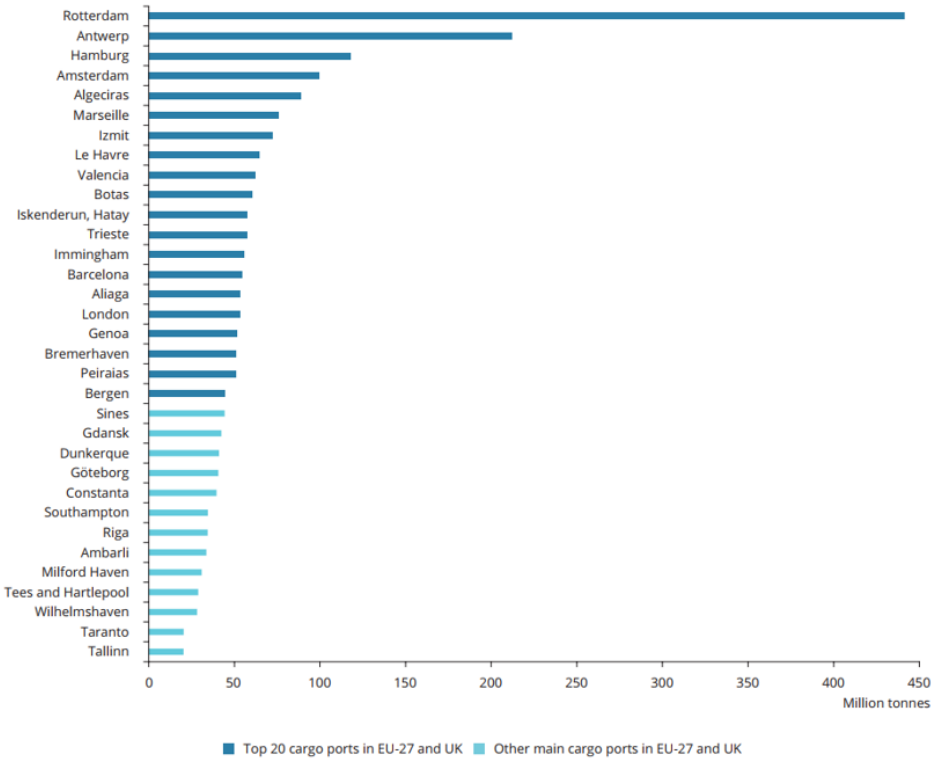


Figure 4: Top 20 cargo ports and other main cargo ports in the EU in 2018 based on gross weight of goods handled - 2019, Eurostat

Cruise ship		Oil tanker		Ro-pax ship		Gas carriers		Container ship	
Barcelona	3.5 %	Piraeus	6.4 %	Messina	3.6 %	Antwerp	15.2 %	Rotterdam	13.0 %
Civitavecchia	3.2 %	Antwerp	5.8 %	Algeciras	3.1 %	Honningsvag	6.8 %	Hamburg	7.9 %
Dubrovnik	2.8 %	Gothenburg	5.1 %	Calais	2.6 %	Rotterdam	4.9 %	Antwerp	6.8 %
Piraeus	2.8 %	Algeciras	4.6 %	Patras	2.1 %	Augusta	3.8 %	Algeciras	4.2 %
Palma	2.6 %	Rotterdam	4.1 %	Rodbyhavn	1.9 %	Terneuzen	3.4 %	Piraeus	3.8 %
Bulk carriers		**Ro-ro cargo ship**		**General cargo ship**		**Chemical tanker**		**Ferries**	
Costantza	4.0 %	Zeebrugge	8.5 %	Karmsund	3.5 %	Antwerp	11.8 %	Naples	6.1 %
Rotterdam	3.9 %	Rotterdam	6.4 %	Antwerp	3.3 %	Rotterdam	11.1 %	Stavanger	5.5 %
Antwerp	3.6 %	Antwerp	6.2 %	Rotterdam	3.3 %	Augusta	4.2 %	Ibiza	5.4 %
Augusta	3.5 %	Dublin	3.6 %	Hamburg	1.7 %	Amsterdam	2.7 %	Lisbon	4.5 %
Volos	2.5 %	Livorno	3.5 %	Klaipeda	1.5 %	Le Havre	2.2 %	Oslo	3.4 %

Figure 5: The five main EU ports by port calls from different ship types in 2019 - 2021, European Maritime Transport Environmental Report

Today, the main goods transported by rail are metal products, which represent 43% of the goods transported followed by raw materials (29%), chemicals (14%), agricultural products and forestry (8%) and food and drinks (6%). It is clear from this structure of goods transported by rail that the

focus is on heavy materials and dangerous goods. However, segments of the market such as steel but also petroleum products and especially coal are slowing down. In the case of coal, the decreasing demand is the main factor explaining the decrease of the rail modal share. On the other hand, the intermodal transport of goods grew over the past decades and it remains the most important driver for the rail market growth.

The type of goods has also changed with a strong growth of containers globally and for the EU following the increasing importance of trade flows with Asia for manufactured goods. Containers will continue to be the focus for the increase of the rail modal share, hence the importance to improve rail-ports connections. The reefer segment of the market is particularly dynamic for the transport of fresh products, wines/spirits and pharmaceutical products.

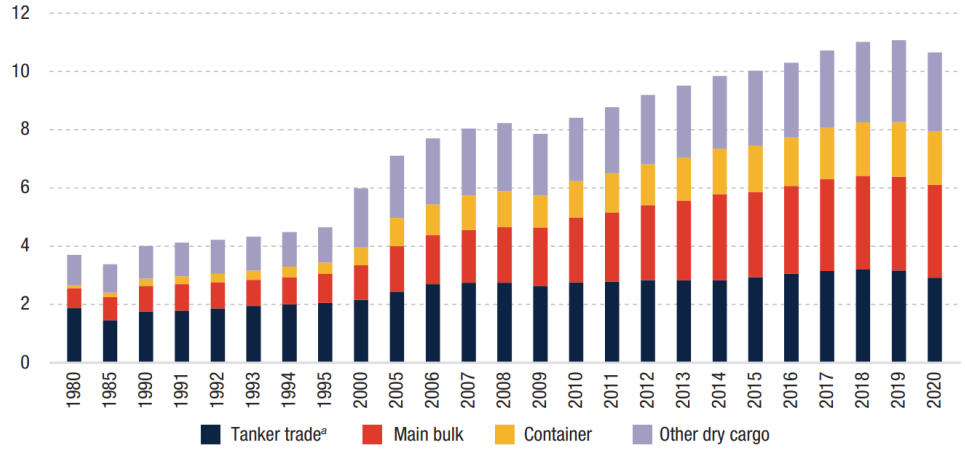


Figure 6: International maritime trade by cargo type, selected years (millions of tons loaded) - 2021, UNCTAD Review of Maritime Transport

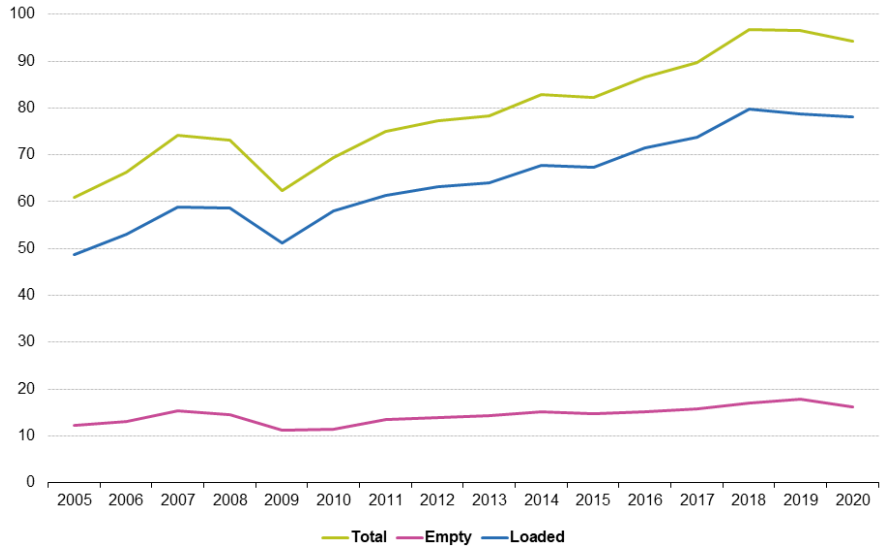


Figure 7: Volume of containers handled in main ports in the EU - 2005-2020, Eurostat

Market growth for goods with a low affinity to rail, especially grouped goods, are proceeding strongly while goods with a high rail affinity, like metal products, are showing a negative trend. Thus, goods with low rail affinity typically share specific characteristics: small shipment sizes, time-sensitive goods, as well as availability of last mile access to the rail track network at both ends of the transport chain.

The same trends are visible also in the maritime sector with for instance coal being less transported than it used to be. However, recently, some ports have noticed an increase in agriculture products, especially cereals, products with an important affinity to rail.

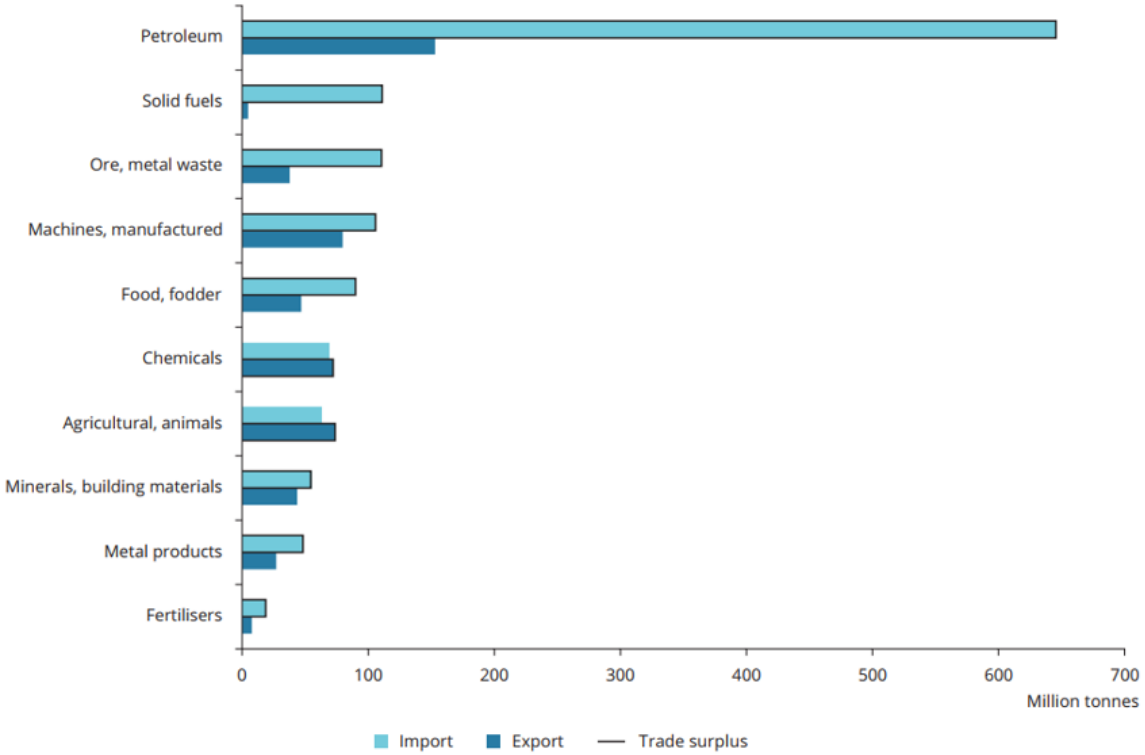


Figure 8: Types of imported and exported goods (by tonnage) shipped by sea in 2019 - 2019, Eurostat

➔ Ports unequally but well-connected to the railway network: survey results

In their joint position paper, the European Sea Ports Organisation (ESPO) and the European Federation of Inland Ports (EFIP) indicated that "European ports' efficacy relies on their ability **to optimize water, road and railway transport links** across the entire transport network. Efficient rail operations and links to and from the ports, as well as within the port, are essential to maximize the use of rail as a sustainable transport mode and to comply with the priorities set in the TEN-T legislation"[11].

[11] Ports in the European Rail system, joint position paper of ESPO and EFIP, 2019.

To understand the level of rail connectivity of European ports, ERA sent a survey questionnaire to the European ports with the support of EFIP and ESPO. 37 ports[12] have replied with a good geographical spread, a good diversity between large, medium and small ports and between inland and maritime ports.

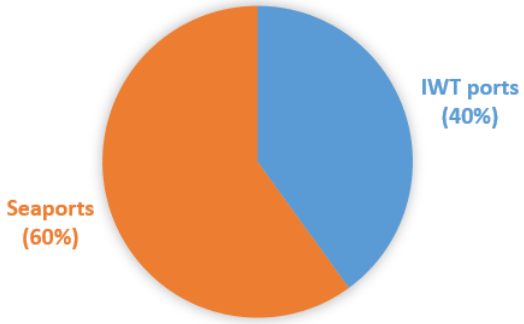


Figure 9: Types of ports replying to EU survey - 2022, ERA

Amongst the respondents, more than 75% of the port authorities manage the rail infrastructure in the port (like in Hamburg or the Spanish ports) or at least have a role to play (e.g. in the light maintenance of the infrastructure). In other cases, it is the national infrastructure manager which is managing the rail infrastructure.

An important note is that many private companies are involved in the management of rail infrastructure. However, this is mostly true for the rail infrastructure inside the terminals (e.g. in the port of Valencia terminals are not under the responsibility of the port authority but are managed by terminal operators, including the circulation/manoeuvring of trains inside them). Generally, terminal operators are managing the rail infrastructure inside the terminals in close coordination either with the port authorities or with the national infrastructure manager.

The diversity of models of rail operations management in ports is often linked to the national context and the specificities of the rail infrastructure inside the ports. The different models have their pros and cons and will be further analysed in section 2.

[12] See list of respondents in Annex 1.

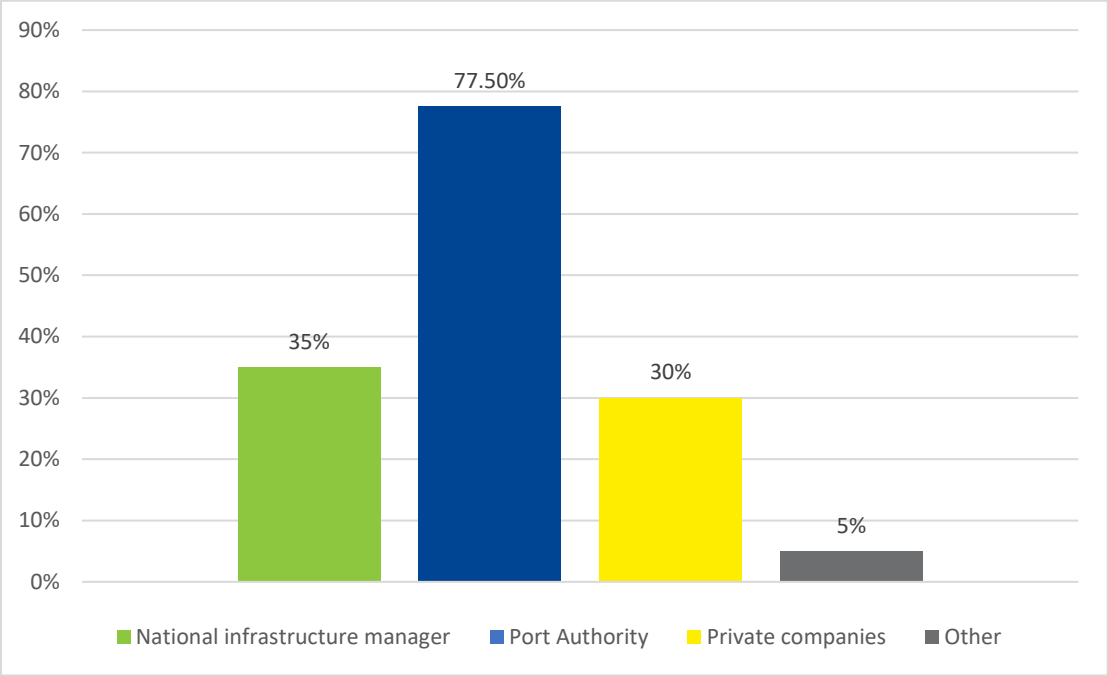


Figure 10: Organisation managing the port's railway infrastructure - 2022, ERA (multiple choice question)

All respondents to the survey questionnaire have railway infrastructure in the port of which 32 have direct access to the national rail network. It is interesting to note that most of the rail sidings are not electrified. Besides, 70% of the respondents have rail on piers for direct ship/train transfer.

If the level of rail connection seems on average to be rather good inside the ports, it is hiding a large variation between ports with a modern infrastructure and those with an ageing infrastructure with important investment needs to modernize it.

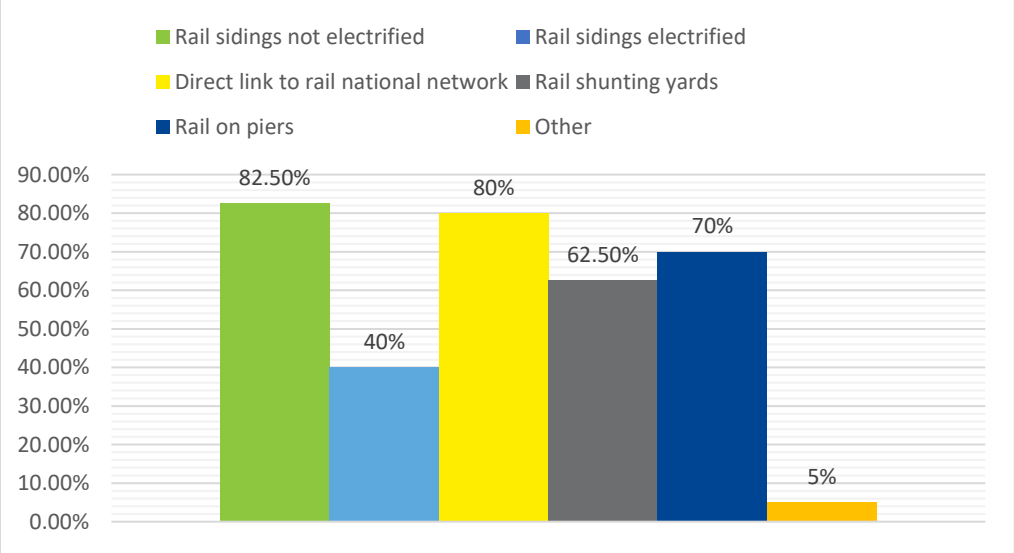


Figure 11: rail infrastructure in the port - 2022, ERA

➔ Ports' rail strategy

Many ports consider that their competitiveness will be judged by their railway connectivity. It is one reason explaining why most of the ports have a plan to improve their rail modal share. For instance, in its annual report[13] from 2020, the Port of Koper indicates that if the railway lines to the port reach its maximum capacity, large shippers, especially for containerised goods, would divert cargo elsewhere. The report adds that "when logistic operators are choosing ports, the key decision-making is the railway connection with the hinterland […]. Nowadays, competition between ports is taking place on the railway".

The few ports which do not see rail as an asset are usually in a specific situation such as the Dublin Port Company; Ireland being an island with a large part of the population close to the Dublin port, rail is not considered an appropriate solution for relatively short distance freight movements.

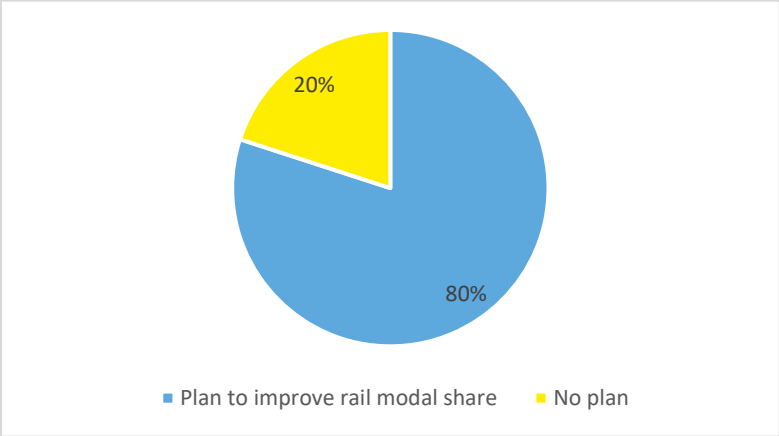


Figure 12: Ports with plan to improve the rail modal share - 2022, ERA

Most of the ports consider that the best way to increase their capacity and rail modal share is through the development of the railway infrastructure. Ports mentioned a large number of infrastructure improvements which should positively impact the rail modal share, including:

- building new links (and/or improving the existing connections) to the national railway network,
- extension of tracks and yards to allow 740m long trains,
- upgrading the infrastructure to accommodate the expected growth,
- elimination of bottlenecks (whether inside the port or in the hinterland) through the creation of additional operating capacities,
- creating of bypasses for urban agglomeration,
- additional direct links between station sections to increase flexibility and capacity,
- development of rail infrastructure for block trains,
- construction of infrastructure to facilitate the access to ports platforms,
- construction of intermodal terminals,

[13] Annual report 2020 – Port of Koper (luka-kp.si)

- electrification of tracks and sidings wherever possible, and/or
- new rail buffer sidings.

The figure below provides an overview of the respondents, split by sea and inland ports, with their current modal share, whether there is an upwards or downwards trend in the modal share of rail. The colour codes indicate whether the port has a clear objective to increase the modal share of rail.

This figure illustrates that overall ports witness either a stable share or an increase in the modal share of rail. Almost all the ports are explicit in their objective to increase the modal share of rail. However, only a few are explicit in what this share should exactly be.

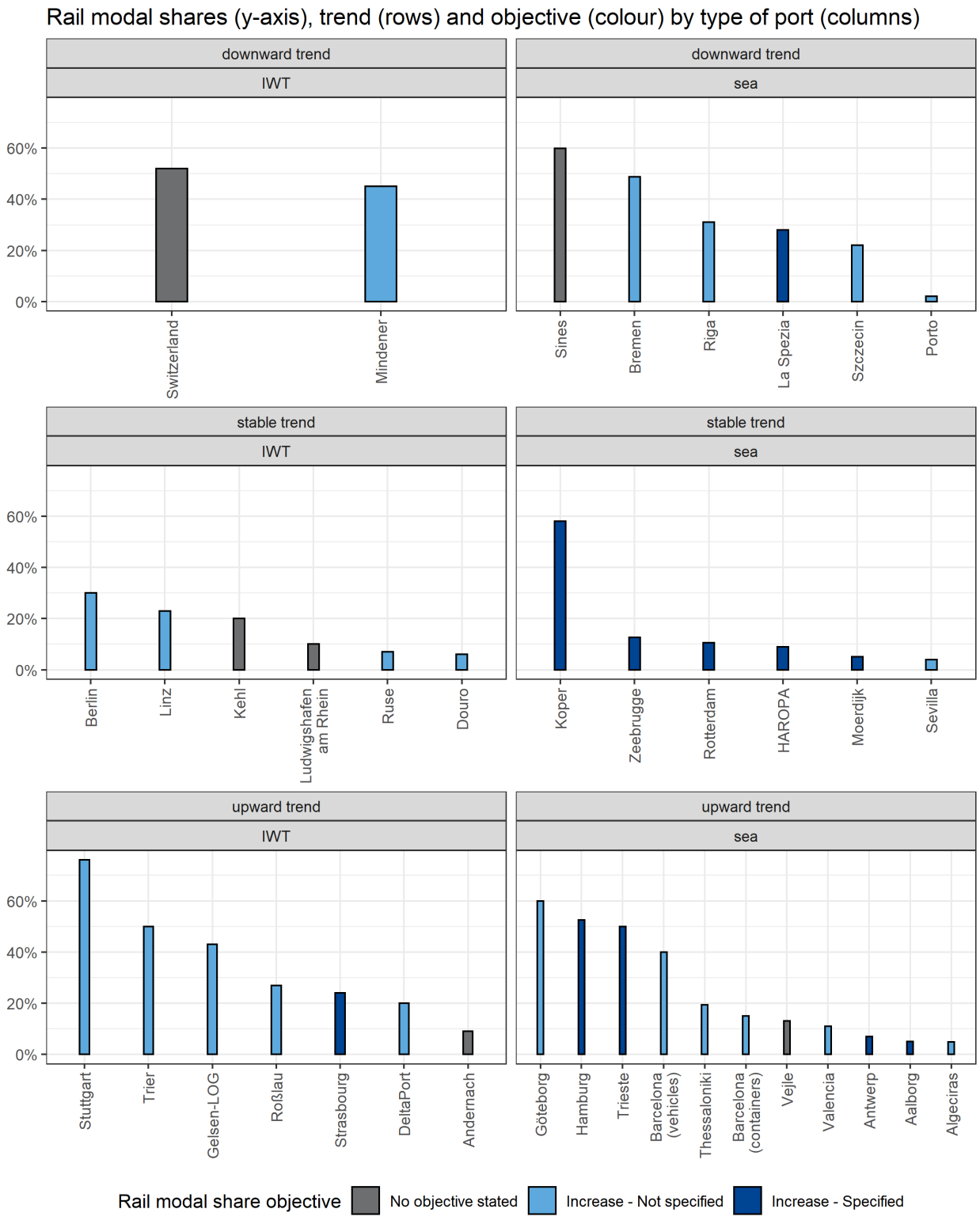


Figure 13: Rail modal shares, trends and objectives by type of port - ERA, 2022[14]

HAROPA and Antwerp: examples of rail strategy

One of the main issues of the ports to increase the share of goods transported by rail is not only the cost but also the reliability of the railway services. Despite those issues, many ports are willing to increase the share of goods transported by rail with own initiatives.

Sea ports authorities are often interested in developing rail or barge connection because the ports are usually fully integrated in urban areas. Reducing road congestion through rail and barge transport is therefore also a societal imperative.

For example, the objective for Le Havre-Rouen-Paris (HAROPA) ports is to have 20% of the goods transported by train in 2025 through the improvement on the railway line Normandie-Ile de France, going around the North of Paris and improving the urban logistics with partners such as Sogaris. This is a steep increase from the current 4% rail modal share.

Another interesting example is the Port of Antwerp, Europe's second largest port, whose main driver of growth over the past 20 years has been maritime container transport. To accommodate this growth, important investments will need to be channelled into new terminals and additional capacity. This includes investments into new rail infrastructure, as well as the building and re-building of terminals.

Currently, 7% of the containers are transported by rail with the objective to reach 15% by 2030. The regional government of Flanders supports the sustainable development of the port while at the same time wanting it to reduce its impacts on road congestion.

It is in this context that the Port of Antwerp, Infrabel and Railport announced their joint plans to increase the port's share of goods transported by rail in the end of March 2021 with a strategy containing seven pillars. These pillars are covering the various aspects to increase the rail modal share from parking policy to smart investments, and from regulatory framework to the development of a digital platform for the mutual exchange of data.

[14] See Annex 3 on overview on modal share, trends and objectives

II. Strengthening the potential of rail in ports

From an operational and investments point of view, the ports cannot be treated like any other kind of infrastructure on the European railway network. To increase the share of freight transported by rail, rail-port connectivity must be optimized.

The ports participating to the Agency survey and to the structured interviews expressed their views on the barriers to the development of rail and on the future opportunities. ERA asked about the stakeholders' views on the following specific topics:

- Infrastructure development inside and outside the port including last mile connections.
- Digitalisation including TAF TSI and operational issues.
- Rail governance model.
- Rail related services offer, market evolution and combined transport.
- Rail charging model.
- Regulatory framework and policy incentives.

The ports with highest throughput in the EU have been targeted for inquiry. However, geographical location and other characteristics, such as TEU handled and a good mix between maritime and inland ports, were considered when sampling ports for analysis.

Figure 14 (Barriers) and Figure 15 (Initiatives) on the next page validate the view that the ports consider infrastructure investments as a key factor to develop further their capacity and the rail modal share for the hinterland transport of goods. Indeed, most of the participants to the survey agreed to state that the most important initiatives influencing the rail performance are the level of infrastructure investments especially regarding the last mile connections inside and outside the port.

They also pointed out the importance of strengthening the digitalization and data exchange between stakeholders. Most of the ports have a digitalization strategy for their own operations including rail operations. Infrastructure developments and digitalisation are thus considered the most important aspect for the future development of the ports.

However, even if digitalisation is very high on the agenda of the ports, the ports with an ageing infrastructure indicated that digitalisation could come only after the modernisation of the infrastructure considering the high costs and the urgency of the latter.

Finally, the regulatory framework and the policy incentives are also influencing the transport choices made. For instance, in Spain, a national rule foresees a 50% reduction on the port fees for the freight moved by train to promote modal shift.

The barriers on which the ports have probably less influence - the rail charging model and the contractual relation with rail operators - are not the elements which have been pointed out by

the ports. However, during the interviews, market evolutions and the role of combined transport have been mentioned in many cases.

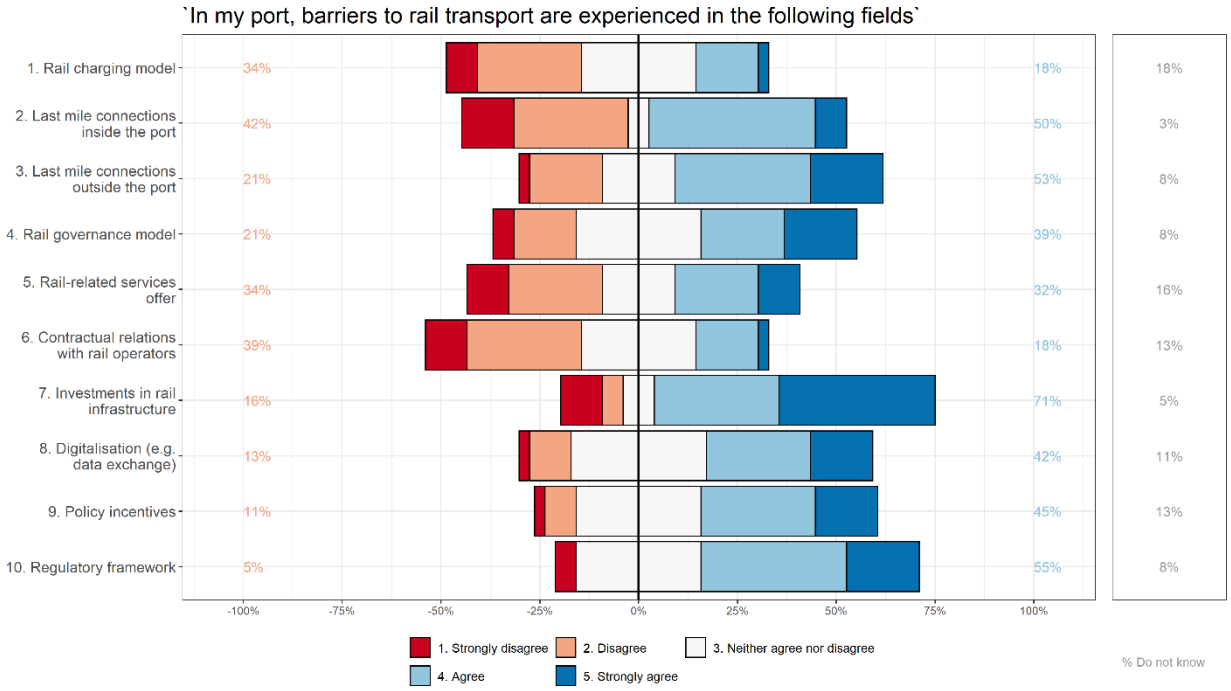


Figure 14: Ports' views on BARRIERS influencing the rail performance in the ports - 2022, ERA survey

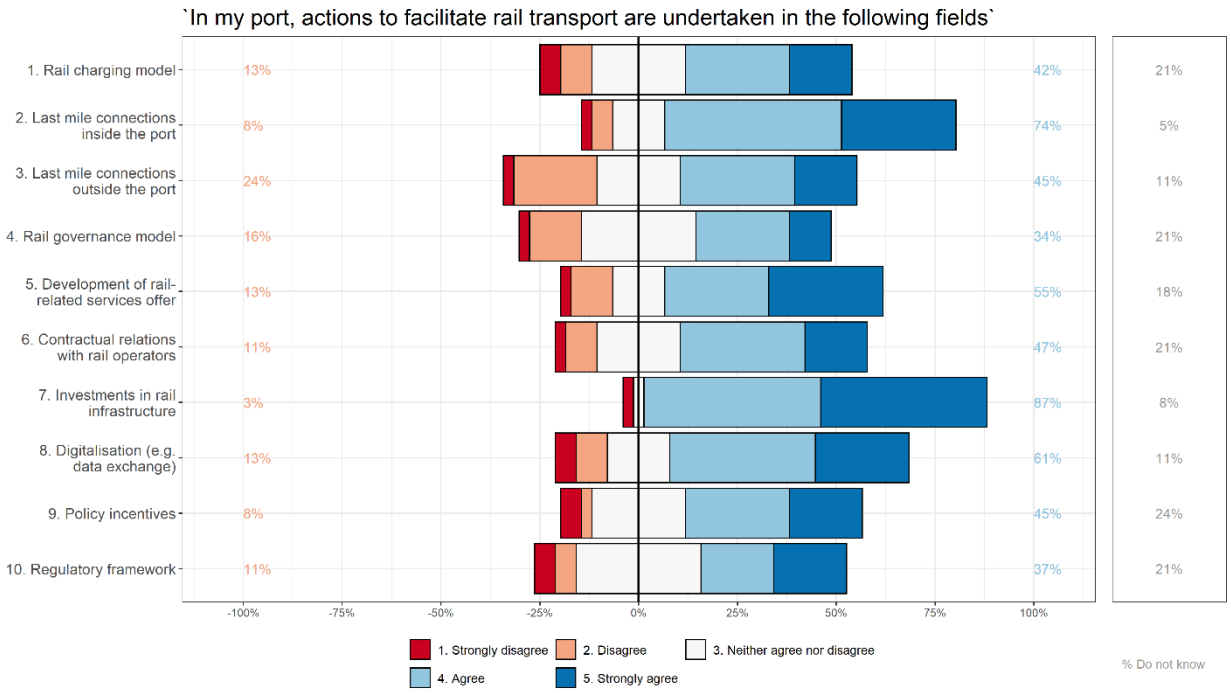


Figure 15: Ports' views on INITIATIVES influencing the rail performance in the ports - 2022, ERA survey

➔ Infrastructure development inside and outside the ports[15]

The key element to foster synergies between the railway sector and ports is clearly the state of the rail infrastructure in the port and the connection with the main network. In fact, the ports with the highest level of rail modal share like Hamburg, Göteborg, Trieste and Koper have a good infrastructure and are investing to modernize it further.

Most of the ports are defining their infrastructure needs based on their capacity (e.g. single track issues in DeltaPort) and the use of terminals. For instance, the Port of Barcelona pinpointed that the lack of terminals on short distance limit its rail performance. The Port of Thessaloniki invested in the construction of a dry port in Sofia to promote its rail development. While there is now a daily rail shuttle between the Port of Rotterdam and the ports of Strasbourg and Kehl, this rail potential between these ports could be further increased but due to capacity restrictions in Rotterdam and the last-mile handling in France and Germany, this is not possible at this stage.

The ports are also in constant negotiations with the main infrastructure manager and the national authorities to resolve infrastructure issues outside the port such as cross-border connections. An example is the connection between France and Spain for the port of Barcelona or the improvement on the Zaragoza-Teruel-Sagunto-Valencia line to better connect the Port of Valencia with its hinterland.

In many cases, as pointed out by the Port of Hamburg, revenues from track access charges cannot cover the important expenditures for the appropriate infrastructure development, public funding is necessary to realise the modernization of the network.

The identification of bottlenecks, whether inside or outside the port, is also critical to plan the future improvement works on the rail infrastructure. A major bottleneck for the hinterland transport of goods for the port of Rotterdam is the link between Emmerich in Netherlands and Oberhausen in Germany. Works for a third track are on-going and will increase capacity of the line. It should also have a positive impact on the rail modal share of the port of Rotterdam. The works are planned to be finalized by 2025.

Rail activities are considered strategic by most of the ports and competition between ports will also be in terms of rail development. The ports have a pressure to modernise the rail infrastructure deriving from both internal (e.g. municipalities do not want more congestion on their roads) and external factors (e.g. customers willing to green their logistic chain). Consequently, most of the ports are investing significantly in rail infrastructure and rail activities. These investments can be made directly by the port itself and/or with the support of public authorities (EU, the State and/or local authorities). Most of the investments are dedicated to:

[15] Annex 4 summarises the key elements noted by the different ports interviewed in relation to infrastructure developments.

- Increase capacity to allow 740m long trains (e.g. Zaragoza-Teruel-Sagunto-Valencia line for the port of Valencia);
- Upgrade from single to double track (e.g. the line Koper-Divača);
- Develop marshalling/shunting yards (e.g. in the port of Hamburg);
- Develop infrastructure in order to avoid passenger traffic (e.g. new link of 2.5 kms from ADIF network to the port of Sevilla);
- Electrification (e.g. Antwerp).

Finally, having a good network of terminals in the close vicinity of the port (up to 200-300km) is of major importance for the success of the shift from road to rail for the ports.

With a good rail infrastructure, even if this is not primarily the objective, some ports have mentioned that there is also a possibility to shift not only from road to rail but also from short sea shipping to rail especially for domestic traffic. It also depends on the vertical integration of the shippers (e.g. Sevilla-A Coruña by short sea shipping which could be done by rail).

Development of rail infrastructure inside and outside the port is important not only to possibly boost further the rail modal share, but also to maintain/keep the current transport volumes, (positive) trends and the rail competitiveness. The port of Algeciras, for example, reported to register in the last years a constant and spontaneous increase of modal share (100% per year) by rail, despite a weak condition of the rail connections. If the trend continues, the port authority foresees possible issues in satisfying the demand in next 2-3 years if the on-going railway projects (beside the already completed ones) will not be finalised. The sidings are also an important instrument to allow a better use of the rail capacity as noticed by the main Lithuanian infrastructure manager: “One way to get more freight on green trains is to build rail sidings, making it as easy as possible for businesses to use the rail network”, while explaining the project of a new track to the port of Klaipeda[16].

EU funds represented an important and efficient mean/source to finance infrastructure developments both inside and outside the port (given the high costs of these projects) for the Spanish ports while for other ports (e.g. Hamburg, HAROPA), EU funds are important but do not determine whether an investment will be made or not. Besides, the vast majority of port projects financed by the EIB have a component on rail infrastructure.

It is also important to notice that the investments in high-speed lines are usually freeing some capacities for the railway freight on the conventional lines so that any investment in high-speed passenger transportation should eventually positively impact the freight sector[17]. The Port of Kehl but also Sevilla and Algeciras indicated that the competition between passenger and freight traffic and the fact that the tracks were not separated between the two market segments were

[16] New tracks at Klaipeda port bring oil products on rail | RailFreight.com
[17] See p.16-21 of https://www.era.europa.eu/sites/default/files/events-news/docs/fostering_railway_sector_through_european_green_deal_en.pdf

detrimental to the freight traffic. The lack of available paths on the main line is an important issue together with the language burden for cross border traffic as indicated by the port of Bremen.

Many ports identified the lack of electrification of some tracks inside and outside the port as serious barrier to operate more direct trains to/from the ports. This was the case for instance for Bremen with the Strasbourg-Lauterbourg-Wörth line, for Algeciras with the line to Cordoba or for Deltaport with feeder line and for Antwerp where electrified tracks within the port are limited and mostly up to Antwerpen Noord station. Concerning the Strasbourg-Lauterbourg-Wörth line, the Swiss parliament decided to instruct the Federal Council to enter into negotiations with France to electrify this railway axis on the left bank of the Rhine and upgrade it to the corridor parameters. The expansion is to be carried out with financial support from Switzerland. The aim is to eliminate the biggest bottleneck on the TEN-T corridor Rotterdam-Genoa in a short period of time. The Swiss decision to invest in the infrastructure of other countries is quite revolutionary. The justification given by the Swiss authorities is that Switzerland might not have reached its goal of limiting the number of truck movements to a maximum of 650,000 truck in 2021 (the number of transalpine truck journeys was 860,000). This supposed failure triggered the needs for more plans and investments to reach the needed rail freight modal split, including investments outside the country.

From the infrastructure point of view, the loading gauge limitations (e.g. the port of Bremen indicated the line going towards Nancy where P400 gauge is not allowed) or high gradients (e.g. up to 24mm for the port of Algeciras) are also elements impeding to use more rail for the hinterland transport of goods. Regarding the gauge, the port of Valencia also reported the on-going development inside the port of third tracks with 1435 mm international gauge, to make by the end of 2022 the rail infrastructure inside the port fully compliant with the TEN-T requirements. The spatial constraint to build more infrastructure is very often not sufficient (e.g. DeltaPort) or there is not infrastructure to the destination customer (e.g. Gelsen-LOG).

Finally, it is important to notice that the port allowing the rail access to deep sea container ships are considered to have a competitive advantage. The port of Zeebrugge indicated that the ports offering a massification option, meaning deep seaport and a good railway and/or inland waterway connection, will have a competitive advantage to increase the use of the railway infrastructure.

Rail is the most competitive transport mode on dense routes but the first and last miles tend to be very costly, both for goods and passengers. A modal shift will not be the result of railways completely substituting other transport modes. On the contrary, goods and passengers will shift to railways as long as they are better integrated in the wider transport and mobility system. Therefore, to increase the share of the rail freight transport, it is necessary to develop a green transport logistic chain where the synergies between modes of transport are optimized. The transport of goods requires simple and efficient transfer/transhipment from road to rail, as well as from vessels to railways in ports.

Key messages on infrastructure developments

Rail activities are considered strategic by most of the ports. Some ports even considered that, in the future, the competition between ports will be about rail connectivity and capacity. Even if volumes for rail might be lower than for other modes of transport, there is pressure to modernise the railway infrastructure. This pressure is coming both from internal factors - the growth of ports should be sustained with IWW and rail because municipalities do not want more congestion on their roads - and external factors - customers want to green their logistic chains and are keen to develop their rail offer. Therefore, most of the ports are investing a lot in rail infrastructure and rail activities.

Most of the investments are dedicated to the electrification of the rail network, to increase rail capacity with 750m length of rail tracks and doubling single track and to avoid passenger traffic. For many rail projects, the access to EU funds is essential although several ports mentioned that, even without EU funds, investments would have been made. Finally, the importance to have a good network of terminals in close distance from the ports is fundamental to increase the rail modal share for the hinterland transport of goods.

In general, the ports considered that the cooperation with the main national infrastructure managers was good although projects to increase and modernize the rail infrastructure are often very slow to be decided and implemented, especially when it is a cross-border infrastructure.

➔ The key role of digitalisation (including TAF TSI) to improve operations[18]

While the development and modernization of the railway infrastructure is considered the key factor to increase the rail modal share, operational issues mostly linked to the lack of digitalisation have also been identified such as coordination mechanisms between stakeholders, high-quality slot allocation, information exchange and data sharing (movement of freight, ETA[19]).

For instance, the Port of Moerdijk clearly indicated that new IT solutions could help to optimize shunting operations. It considered also that legal changes would be needed as until now third parties are not allowed to handle others' wagons. HAROPA, on the other hand, indicated that an important barrier from an operational perspective is the maintenance works carried out at night, a period over which combined transport freight trains run over long distances. Even though those maintenance works on infrastructure are essential to ensure a good level of service for the freight trains, they have been neglected in the past years creating now a backlog. It is considered very important to ensure the highest level of coordination between stakeholders to avoid or, at least, minimize disruption of traffic. In Denmark, the objective to fully implement ERTMS and electrify

[18] Annex 5 summarises the key elements noted by the different ports interviewed in relation to digitalisation.
[19] Estimated time of arrival.

the rail network by 2030 is positive in a way as eventually it will mean an increase of the capacity on the network. However, it is also creating some important disruption of the traffic and even blockages for some weeks while the freight situation is less considered when prioritizing and organizing the infrastructure works.

The port of Antwerp explained that there is a clear lack of coordination between port operations and rail transport; the regulatory and operational framework of rail is not adapted to the needs and operational requirements of ports and their customers. Port/terminal operations must adapt to rail operations while, according to the port of Antwerp, it should be the other way around. While for other smaller ports, like the port of Aalborg, digitalization is more up to the railway operators which should then be integrated into the port's system.

Digitalisation is playing a key role in reinforcing the position of rail. It is integrated in a broader digitalisation of ports' operations themselves such as smart customs procedures, track and trace system of containers and the need for data availability and interoperability for the logistic chains in general. When asked about the need of increasing operational communication with rail, almost half of the ports considered that implementing new systems will be a key success factor to increase quality of rail transport services and increase the rail modal share.

There are also national strategic projects like the project SIMPLE lead by the Puerto del Estado in Spain. This project aims at uniting all the necessary information of the logistics chains and interoperability between the different modes of transport to optimize the efficiency of the transactions between stakeholders. The results are expected in spring 2023 so that the port of Algeciras for instance is waiting for the finalisation of this project SIMPLE to build on it once the framework will be finally defined. However, the port is already implementing a system for automatic image capturing. While some other ports are looking for solutions outside of the European Union. For instance, the port of Göteborg has liaised with the Port of Los Angeles to adopt their system of track and trace to follow the container from ship to inland terminal to the rail in all directions. Finally, some ports are developing their own system like the port of Hamburg which provides a data platform, "transPortRail", to operators for better planning possibilities of operations like checking the track assignment or transmission of dangerous goods data. The aim would be to expand this kind of platforms to provide more detailed data to operators. The port of Koper is also using an internal IT system used in conjunction with the Slovenian infrastructure manager and railway operators for the daily planning. In the last years, the port of Linz has invested a lot in digitalisation such as new camera to take pictures of the trains so that nothing is needed to be written by hand. This port is currently installing a system to have a full view on the port's activities, to see where the trains are, on which part of the infrastructure and to detect anomalies quicker to handle them better and have an overview in real time.

The ports are also exchanging information on this topic. The port of Riga considers digitalisation has a weak point in the management of the logistic chains and has connection with the port of Rotterdam to get some support and return of experience. At this stage, the port of Riga has very limited data exchange with the railway stakeholders and in an old-fashioned manner. In

particular, the port does not have information on track volumes or container types and is struggling to find ways to exchange data. This is also true between the port authority and the terminals for which a government database can be used to track information and check their validity. The port is looking at different options of tracking system of freight flows in and out of the port and information exchange with the terminal operators and railway stakeholders. This port also considers that automation of port processes will be an important factor to gain efficiency. The port of Rotterdam on the other hand has developed a first application which did not make it to its full implementation. The 'On track' system aimed at coordinating rail flows failed due to unwillingness to coordinate and align IT systems between parties across the supply chain. In the beginning of April 2022, an agreement has been signed with 19 rail stakeholders to jointly develop a new application as part of the 'Rail connected' programme. This port basis community system will integrate most of the data available to improve and increase the use of the capacity.

The port of Sevilla is very active in this field and is part in several projects:

- AIRIS II – Synchro (Synchromodality). This project focuses on the synchronisation of the Port of Sevilla between maritime and land transport, monitoring the navigation conditions and controlling the operations in the docks. AIRIS II - Synchro optimizes the control and coordination of the different modes of transport in real time and makes multi-modal planning to link up ships, trains and lorries. It integrates databases and systems extracted from the digitalization of the river traffic carried out under the first AIRIS project, using Smart Transport Systems and land terminals.
- I Rail (Interoperational capacity of the railway system). The Port Authority of Sevilla and of Valencia are taking part in the I RAIL project that will adapt railway operations to European standards through digitalization and the use of European standards for information exchange between administrators and railway operators (details of loads, trains, positions, etc.).
- Ferro Port System II (Smart railway system). The main objective of the Ferro Port System II is the development and implementation of an advanced innovative smart system to automate railway operations and management in the port, and which is fully connected with the general railway network. Enabling the exchange of information across the multi-modal logistics platform will help to make the port more efficient, accessible and secure. Its aim is to save time, lower costs and promote rail transport as a sustainable means of transport.

Following a mandate given by the European Commission, ERA sent a Recommendation in January 2022 for a revision of the TAF TSI. With the proposed changes, TAF TSI will allow an integration of rail/ports and terminals stakeholders to ensure data and messages can be exchanged between stakeholders active in other modes of transport and, in particular, the port authorities. This will be done through the extension of the communication to stakeholders outside of the railway world. The proposed revision supposed to enter into force in late 2022 also contains a certain number of changes in the legal text and in technical documents with the view to reinforce multimodality.

TAF TSI[20] will see a fundamental change in its approach. Considering that the railway sector is connecting ports that are fragmented, to facilitate the exchange between those worlds, it was necessary to accept different message formats (e.g. train ready system). With the soft compliance approach, the structure of a message might be different from one stakeholder to the other while the mandatory content of the message will be the same.

At the time of the survey, a third of the respondents knew about TAF TSI. However, more than two thirds of the respondents considered that improving the communication between the different modes of transport is important to tackle the modal shift objective.

In addition, new provisions on Intermodal Loading Units (ILU) will be incorporated in TAF reference data with corresponding messages to track ILU. The references for ILU will be encoded in a dedicated database managed by UIRR. The database does not contain the maritime containers. Inclusion of maritime containers may be considered in the future. However, the container's number can be already checked through the train composition so that the information can be retrieved to a certain extent. An updated TAF TSI revision recommendation will be submitted by ERA to the Commission before summer 2022 to add the ILU reference database.

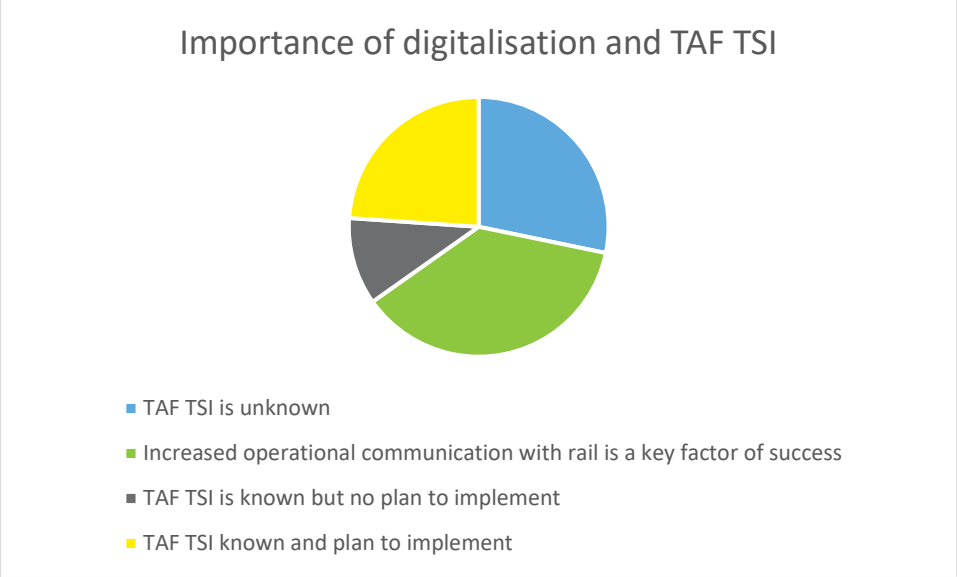


Figure 16: Importance of digitalization and TAF TSI for the ports - 2022, ERA

Dissemination on TAF TSI is important to raise awareness among stakeholders outside the railway world. UIRR is committed to support dissemination activities among the intermodal terminal operators including the ports and is planning to be involved in the development of dedicated IT

[20] Annex 6 summarises the main proposed changes in TAF TSI which could facilitate the coordination with stakeholders outside the railway sector.

infrastructure with the terminal operators. In addition, any stakeholder willing to get support in the implementation of TAF TSI can contact the National Contact Points[21].

TAF TSI has been designed until now to cover mostly "push messages" e.g. on ETA or consignment. However, nowadays, customers and stakeholders are looking for more interactive exchange of messages with, for instance, enquiry on the real positioning of the wagon through for instance TIS ITSS. The port authorities are looking for this information and this could be covered in a future revision of TAF TSI.

Key messages on digitalisation

Developing rail infrastructure appears to be the number one priority for ports but right after comes digitalisation. In the triangle between shippers, terminal operators and railway stakeholders, the port authorities play a key role of coordination. The lack of communication and data exchange is often perceived as an important barrier to develop further rail activities. This is the reason why many ports are investing in the development of specific IT tools that facilitate the coordination between different port stakeholders with the aim to speed up processes and the control of rail operations.

However, the current level of awareness of TAF TSI is rather low compared to its potential to use a harmonized system which could serve the needs of the different stakeholders. Dissemination on TAF TSI is important to raise awareness among stakeholders outside the railway world.

➔ Management of rail operations in ports[22]

Management of rail operations within ports follows different models, each of them with pros and cons. Some ports authorities are, or are planning to become, a rail infrastructure manager (e.g. Trieste). Some port authorities are owner of the rail infrastructure but entrust the national infrastructure manager for the traffic management (e.g. HAROPA which delegates the traffic management to SNCF Réseau). Some are responsible for the rail tracks within the port but are separate from the main rail infrastructure manager and are also ensuring the light maintenance of the rail infrastructure. Finally, in some ports, the national infrastructure manager owns and operates the entire port infrastructure (e.g. Infrabel in Antwerp port or ProRail in Rotterdam port). The situation is thus quite diverse.

While having the national infrastructure manager operating the rail network in the port is generally advantageous to reach a better balance between costs and revenue, the ports which

[21] ncp_taf_2021_en.pdf (europa.eu)

[22] Annex 7 summarises the key elements noted by the different ports interviewed in relation to management of rail operations in ports.

are more dependent on the national infrastructure manager are regularly suffering important delays in the implementation of railway projects, especially for the projects inside the ports. In fact, the national IMs' investment plans are usually of a national scale and investment priorities may not always include the small but important upgrades that individual ports need.

The complexity in the decision-making process to make rail investments also differs significantly from one port to another even when the rail governance model is similar. For instance, the port of Göteborg has constant discussions with Trafikverket (i.e. the Swedish IM) and investment planning is mostly proactive i.e. to cope with the future evolution of the demand. In the case of the Spanish ports, the cooperation with ADIF is good but the rail infrastructure is in more difficult conditions (e.g. 100 km of single track not electrified and with telephone block system on the line from Algeciras to Cordoba) and therefore impacts the decision on the investments which are more reactive. However, whatever the rail governance model is, the ports have globally acknowledged a very good cooperation with the national infrastructure manager. One important element is to make sure that all the stakeholders are regularly exchanging. For instance, in Denmark, there is a branch panel with terminals, operators, rail stakeholders, all the ports, meeting 4-5 times a year to discuss the evolution of the market and to share experiences.

Considering that good rail connections constitute a competitive advantage for ports, those ports having more flexibility in the investment decision-making process will probably be more agile to react to evolutions in the market and customer needs.

Regulatory elements are also impacting safety oversight and operations. In fact, there is currently a variety of approaches across ports with regards to the application of EU rail safety legislation. Some ports' rail infrastructure is not in scope while in others (e.g. Antwerp) the infrastructure is considered part of the national rail infrastructure for the purposes of applying the EU rail safety legislation, latter legislation is applicable to all operators, RUs, etc. Moreover, in Italy the NSA has signed in 2017 a framework agreement[23] with the Italian ports association clarifying that all relevant EU and national legal framework as well as train protection systems are applicable to ports infrastructure regardless if port authorities are a rail IM or if they delegate that function to another rail IM.

Finally, at this stage, there is no possibility to have an overview of ports that are infrastructure managers. Although according to Article 12(4) of the rail Safety Directive[24], NSAs are supposed to inform ERA of the safety authorisations of infrastructure managers issued, this is not done consistently. ERA has started to put in place a systematic approach to treat the information received and to publish the information in following the agreement of 8 NSAs.

[23] https://www.ansfisa.gov.it/accordi-nazionali/-/asset_publisher/TfdVoSLNsgGp/content/web-content-display-options-close-accordo-quadro-tra-ministero-delle-infrastrutture-e-trasporti-agenzia-nazionale-per-la-sicurezza-delle-ferrovie-asso

[24] Directive (EU) 2016/798.

Key messages on rail Management of rail operations in ports

The study shows very different models for the management of rail operations in ports, from a port authority being a full-fledged rail infrastructure manager to a port authority having very limited capacity to influence the developments of the rail infrastructure in the ports. Although the different models have their own advantages and disadvantages, the ports that are not too dependent on the national infrastructure manager are considerably more flexible in deciding on rail investments and the future of the rail activities within the ports. This might be an advantage in the years to come to realise the modal shift objectives, if sufficient financing is available. However, when the coordination between the different stakeholders is good, this potential lack of flexibility can be overcome.

➔ Combined transport, market and technological evolutions[25]

In 2019, combined transport operators transported 4.4 million truckloads of cargo that resulted in 80 billion tkm of output (+55% of tkm between 2009 and 2019). According to an UIC report[26], every second freight train in Europe is today an intermodal train and over 50% of rail freight tkm can be attributed to combined transport. While combined transport is developed in the whole of the EU, the North-South axis (Rotterdam-Genoa) is the most frequently used route in the last years.

Over the last decades, the competition between shippers and ports is more and more changing into a competition between logistics chains to provide customers with an end-to-end transport solution. The development of the transport of standardized maritime containers on-board the train with 62% of the market - swap bodies are representing now 21% and semi-trailers 17% of the combined transport market – is part of this change and indicates a strong need to transform the railway fleet by investing more and more on intermodal wagons.

In addition, only a small fraction of trailers used in Europe is craneable. This means that special technologies such as Modalohr[27] or Cargobeamer[28] are necessary for putting such trailers on trains.

On long-distance transport the freight forwarders are using semi-trailers for moving goods in Europe. Different techniques exist to accommodate these trailers into specialized wagons: either by adding a special device on the trailer or on the wagon. Investments are done in both systems but improvements to craneability of semi-trailers could further increase the share of combined transport.

[25] Annex 8 summarises the key elements noted by the different ports interviewed in relation to market and technological évolutions, combined transport and rail related service offers.
[26] https://uic.org/IMG/pdf/2020_report_on_combined_transport_in_europe.pdf
[27] https://lohr.fr/fr/lohr-railway-system/les-wagons-lohr-uic/
[28] https://www.cargobeamer.eu/

A recent study for the European Commission on a comparative evaluation of transhipment technologies for intermodal transport and their cost estimated that the removal of network limitations per each TEN-T corridor (especially the adaptation to P400 gauge in Spain, France and Italy) by considering both the costs of upgrading the rail network to allow the transport of semi-trailers and the costs for the upgrade and construction of new terminals would result in an investment need of about EUR 7 735 M[29].

The same study concluded that "in general, the standard vertical transhipment technologies (gantry crane/reach stacker) in combination with containers become competitive with road-only transport at distances of around 1000 km. At the same time, when looking through the lens of environmental performance, already at 600 km most intermodal transport chains would have lower external costs than road-only transport."[30]

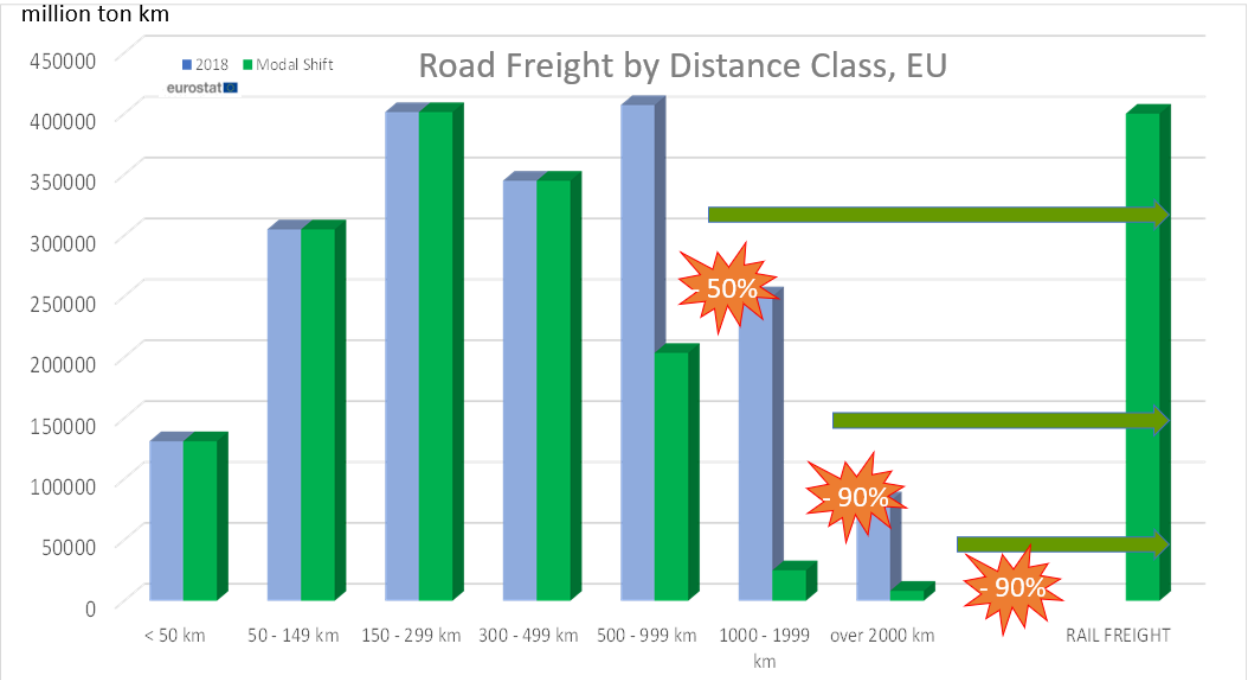


Figure 17: Potential for modal shift from road to rail - 2021, ERA

According to UIRR, in the triangle between shippers, terminal operators and railway stakeholders, the port authorities have a key role to play in coordinating those different stakeholders who are not discussing enough together and have means to impose such cooperation to be established more efficiently.

[29] Study analyses transshipment options for more competitive intermodal transport and terminal capacity on TEN-T network (europa.eu)

[30] In addition to this study, the FERRMED study should be published after the Summer 2022 providing a large overview on the network and needs of terminals.

Several ports identified a need to better anticipate the needs of the customers from rail operators and the necessity to improve the sales capacity both at the level of the rail operators and the ports to attract more customers. The port of Göteborg has a high rail modal share for the segment of containers with 60% while it is handling 52% of the containers market in Sweden. The infrastructure within the port and outside the port is considered satisfactory and improvements are made such as new signalling systems, electrification of the tracks some years ago and the construction of a double track and a tunnel to avoid residential areas. All the Ro-Ro terminals and logistics warehouses are rail connected so that no bottleneck is identified inside or outside the port. In addition, the port is about to introduce a track and trace system to follow the container from ship to inland terminal to the rail in both directions following a proven system established by the port of Los Angeles. So, according to this port, the next step to further improve the rail modal share is to improve its sales capacity. The timetabling process with the infrastructure manager only once per year makes it more complicated to attract new customers willing to use the rail system. The infrastructure managers are working on using new IT tools to further improve the timetabling process and make it more flexible and adaptative.

Ports' experience

For combined traffic with an origin or destination in a port, the market segment below 300 km can also be competitive to shift trucks onto rail. Indeed, many ports have regular rail connection to terminals within a range of 100 km distance and are very important to reduce road congestion and negative externalities in urban areas.

For instance, in Barcelona, there are 3 daily bulk trains coming from the mines in Suria, distant solely 80 km away from the port. There are also 3 daily trains from a car factory in Martorell distant 30 km from the port and daily container trains from Tarragona and Lleida which are both 100 km away from the port and other with locations within the 300 km range such as Monzón. The first intermodal corridor in Spain today is the Port of Barcelona-Zaragoza relation (300 km distance) with more than six daily container trains.

Finally, the important recent growth of Trieste port is a good example of functional integration to the so-called "retro terminals" in close distance to the port. Since 2016, the Port authority of Trieste has also the management of the port of Monfalcone which is only 30 km away from Trieste. Both ports are very well linked to the railway network - able to operate EU standards freight trains - and to two important freight villages ("interporto"), Fernetti and Cervignano del Friuli. By developing a logistics satellites concept, these two freight villages are working as extended quays of the port used to optimize the port services. In addition, since 2015 the port started to provide shunting services through its company Adriafer allowing thus a facilitation of the railway operations. Nowadays, 50% of the traffic of containers arrive to the port by train and 25% of the trucks as well with a constant growth over the last years. 200 Mio euros are planned to be invested to increase the railway capacities from 13.000/15.000 trains/years to 30.000 trains/ year in 2026-2030 but thanks to the current 10.000 trains operated, Trieste

Port gets the lead as the Top Italian Rail ports ranking. The high use of the capacity obliges to optimize the synergies between modes of transport and railway stakeholders in order to guarantee the capacity on the railway node.

ERA's survey provided an opportunity to inquire the decarbonisation strategies of rail operations in the ports. A bit less than 75% of respondents expressed intention to decarbonise rail operations in the ports but, at this stage, less than half of the ports have a clear plan. Most of the ports are still in the elaboration phase of plans as part of their sustainable strategy. For those ports that have already implemented concrete measures, it is generally the further electrification of rail operations or by decommissioning old diesel locomotives and modernize the fleet with hydrogen and battery-powered locomotives. For the moment, hydrogen and battery-powered locomotives are mostly considered as innovative pilot products studied but not yet considered in practice. In some cases, the use of sustainable fuels has been privileged.

In Italy, Adriafer, a railway company providing shunting and traction services to and from the port of Trieste has established a cooperation with the University of Trieste to implement research projects aiming at tackling environmental and energy issues to improve rail freight efficiency. The joint efforts shall engage the railway company on the path of reducing the emissions of its ports' activities through the adoption of innovative solutions and digitalized technologies.

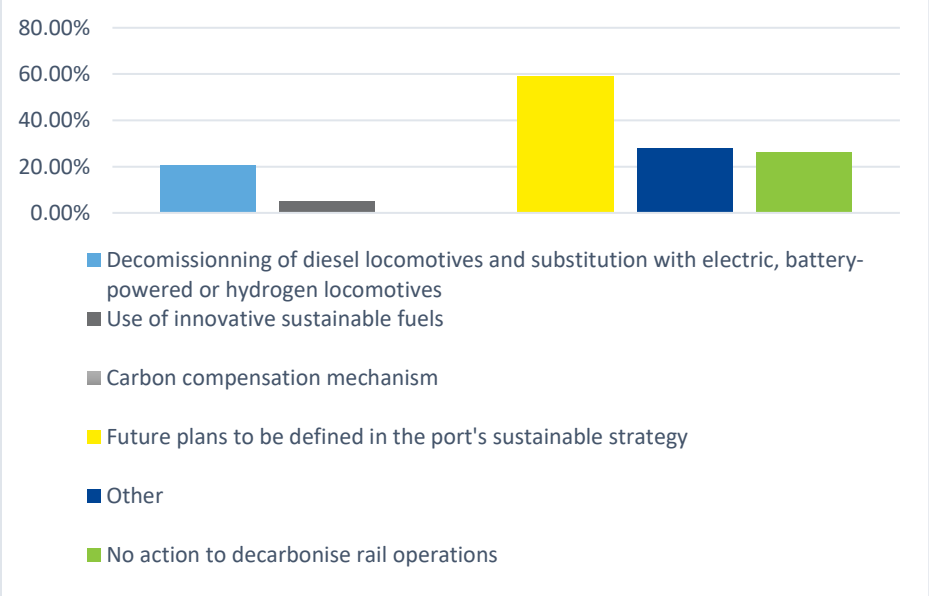


Figure 18: Decarbonisation of rail operations inside the ports - 2022, ERA

A rail manufacturer has reacted to the results of the survey. This manufacturer explained that hydrogen passenger trains already exist and have been kicked-off earlier than for shunting locomotives. The fuel cell technology is not considered mature enough at this stage to reach the necessary traction power (300 kilo Newton, 202,4 MegaWatt). Although they are confident that this technology will be used in the future, it will probably start in the USA as the locomotives are

much heavier with bigger volumes so that more fuel cell systems can be integrated. For shunting locomotives in Europe, the priority was to develop dual mode electric-diesel locomotives which can run on both electrified and non-electrified section of lines which would facilitate the operation in ports shunting yards and ports. The next step is to substitute the diesel part with high-powered battery. This would make it possible to have zero carbon emissions for shunting movement with battery which would be sufficient to perform the last mile operations. One of the advantages of this technology is its modularity. The battery cells can be placed in a modular way (physical positions and quantity) which would facilitate the standardisation. The maintenance costs would also be reduced as, currently, the maintenance of diesel engines is quite expensive. However, similarly as the automotive industry, there is a risk to be considered in accessing the raw materials to produce the battery. In addition, circular and ecological means of production will eventually have to be developed so that the electrification of the network as far as possible is still considered the most environmentally friendly solution.

Key messages on rail services, technological developments and market evolutions

In terms of rail services, although they are generally reliable and environmentally friendly, they suffer from a lack of flexibility, especially in responding quickly to new demand of services. The improvement of sales capacity by railway operators is considered an important element to further increase the rail modal share. In a context of lack of truck drivers and increase in diesel prices, the rail is often perceived as a mode of transport having the potential to overcome these issues. Especially, if new technologies such as Digital Automatic Coupling are implemented.
Considering market evolutions, the volumes of coal and metal ores transported are decreasing.[31] They are partially substituted by other products, but the containers' trend will accentuate.
Finally, the ports are conscious about decarbonization objectives but are mostly focusing on the port activities rather than rail operations although some projects are on-going.

➔ Regulatory framework, policy incentives and rail charging model[32]

Many ports acknowledged that the commercial offers by the rail providers are not as flexible as the ones from road haulers (e.g. Gelsen-LOG, Vejle, Zeebrugge, Antwerp). Besides that, there is a lack of knowledge among the potential customers of the rail offer and some ports indicated that the rail service providers are not enough active to attract new customers. The cost of the railway offer is also regularly considered higher than road although the increase in the fuel costs

[31] Considering the war in Ukraine and the reopening of coal power plants. The trend on coal transport might temporarily change.
[32] Annex 9 summarises the key elements noted by the different ports interviewed in relation to regulatory framework, policy incentives and rail charging model.

combined with the lack of truck drivers are currently balancing the competitiveness between the two modes of transport. However, regular difficulties in the economic model of rail freight transport are experienced (e.g. HAROPA) due to the costs involving breaks in load (change of mode of transport) for combined transport, as well as the fees for booking train paths and electricity charges borne by railway undertakings. According to the port of Antwerp, the main issue is more inside the port as on average 15% of the rail transport costs are due to the last mile operations in ports and can sometimes be prohibitive for the modal shift to rail[33]. Cost reduction for the rail operations inside the ports is thus considered essential for this port. According to CER, the reduction in the track access charges to cope with the covid-19 crisis' effects have improved rail freight competitiveness. However, despite this measure, the current traffic is still approximately 10% lower compared to pre-covid time. In addition, not all infrastructure managers have received compensations for the decrease of revenues due to the reduction in track access charges.

In Spain, there is a national rule foreseeing a discount of 50% on the fees due to the port in case of movements/transport ships-trains to promote the railway sector. However, the effect of this rule on the improvement of the rail modal share has not been studied at this stage. With the growth in size of the ships, the number of port calls will probably decrease in the future so that a part of the ports' revenue might also decrease.

Even if rail can be perceived cheaper by market players, the railway sector's image suffers from a lack of reliability. "You know when your good enters the railway system but you do not know when it will get out" and a lack of flexibility, "after one hour, you can get a transport offer from a truck company while this is not the case with rail" are sentences that you often hear from customers. The Belgian rail freight forum, a group uniting railway stakeholders and policy makers, has elaborated a plan to increase rail modal share. According to Thierry Vanelslander, Professor at the Department of Transport and Regional Economics at the University of Antwerp, the conclusions are straightforward: there is a need of drastic measures composed of infrastructure investments, pricing scheme and regulatory improvements. In terms of pricing measures, a level playing field between modes of transport needs to be finally established. For instance, in Belgium, all modes of transport are heavily subsidised: trains transporting containers are subsidised, trucks are massively subsidised with a special tax regime on red diesel instead of applying standard excise and IWW is subsidised through a Flemish rebate for using this mode of transport. In the end, the externalities produced by the different modes of transport are not paid while subsidies are thrown away without a coherent approach. In a more transparent system, the rail sector would be better off than the other modes of transport.

Among the most important shipping companies, some have decided to invest in rail freight operators or even to set up new ones. For instance, MSC has acquired the former national Portuguese rail freight operator CP Cargo which became Medway. This rail operator was mostly

[33] Sea Ports, Rail Transport and State aid: Some Reflections on the Way Forward - Florence School of Regulation (eui.eu)

active in Portugal, Spain and Italy but has recently started to extend its activities to Belgium, Germany and the Netherlands. While CMA CGM acquired in 2021 continental rail, one of the main private operators in the Spanish peninsula. This situation is becoming more common with the idea of ensuring vertical integration of the market, optimizing the supply chain and allowing to offer door-to-door and all-in-one solutions for customers. This is also putting the light on a cultural shift in the mindset of significant shippers who are now more and more looking at alternative ways of transport instead of road haulage.

The price of the transport is obviously an important factor orienting the choice of the customers. However, more and more customers are willing to green their logistics chains. A simple and quick possibility to do so is to shift from road to rail. For instance, in Valencia, a partnership between Maersk and IKEA has been set up for a rail service on short distance. This is also true for Inditex in Algeciras. Indeed, many companies also have environmental goals to become climate neutral or even climate positive by a set date, decarbonizing their logistics being one part of the objective.

One of the most important aspect regularly mentioned and linked to the rail charging model is the fair competition between modes of transport. For rail to be chosen more frequently for the hinterland transport of goods, a level playing field with road transport shall be finally achieved. The port of Hamburg clearly indicated that pricing should reflect the actual proportions of pollution of road traffic compared to rail meaning that the external costs should be internalized. At this stage, the port of Hamburg considers that funding and financing options, regulations and costs are not ensuring a fair competition between modes of transport hindering the further development of rail.

Another key element is the funding to launch rail investments. Many ports consider the EU funding as a bonus but will not necessarily play a decisive role in the decision-making process. Even if most of the ports are trying to get their projects co-funded by the EU, EU funds are not always considered as a reliable source of funding due to the uncertainty in getting them or not. For instance, Hamburg port authority has identified 2 funding schemes eligible:

- EU funds and in particular CEF which represent 20 to 30% of the investment needs however without clear visibility from one year to the other.
- Federal Republic of Germany funds – the whole funding per year is 25 million euro. The amount provided is relatively low but reliable.

In addition, the current regulatory framework is not fully designed to boost cooperation between modes of transport. For instance, the rail related investment needs account for up to 20% of the ports' total needs[34]. However, there is no legislative initiative aiming at eliminating the administrative burdens impeding to work efficiently between modes of transport. There is also no framework for multimodal digitalisation. Most of the ports have their own digitalisation strategy but it is usually independent from the digitalisation of rail operations. For instance,

[34] Ports investment study, 2018, ESPO.

Freeport of Riga complained about the lack of data availability from supply chain, while the port of Seville mentioned the project AIRIS II – Synchro (Synchro-modality), focusing on the synchronization between maritime and land transport. The project was looking at ways to optimize the control and coordination of the different forms of transport in real time and makes multimodal planning to link up ships, trains and lorries.

Finally, one of the critical problems is the priority given to rail passenger traffic from both investments and operational activities. This is impacting rail competitiveness in the freight sector. According to UIRR, the development of night train services could be made at the expense of the freight sector as night schedules are traditionally used by freight trains. In 2020, for example, an independent report found that over the past fifteen years, ProRail, the Dutch railway infrastructure manager, has prioritized the passenger network over freight operation, reducing over the year the freight efficiency on the Dutch network. The network needs more maintenance impacting the traffic of freight trains and creating frequent disruptions of traffic. ProRail is now reacting but will have to catch-up from years of disinvestment on maintenance destinated at rail freight. This situation is comparable in many different EU Member States.

Key messages on regulatory framework, policy incentives and rail charging model

If for some ports the EU funds are not determining the rail investments, for many other ports, the EU contribution is considered vital to finance the projects. EU funds is then capital to develop the rail infrastructure, the key element to increase the rail modal share. However, another major aspect to reach the modal shift objective is the fair competition between modes of transport. To increase rail's competitiveness, a level playing field with road transport shall be finally achieved in terms of tax policies as well as charging schemes. Finally, the priority given to passenger traffic from both operational and investments perspective diminish the rail's attractiveness.

III. Case studies

➔ HAROPA

HAROPA port is the entity that came from the merging of two inland ports, Rouen and Paris, and one maritime port, Le Havre, on the Seine River, effective since the 1st of June 2021. With this merging, HAROPA port is now considered the fifth port of the Hamburg-Le Havre range and the first French port for global trade. In 2019, HAROPA port transhipped 93Mt of maritime traffic and 29Mt of river traffic with 2.9M TEU and 60Mt of solid and liquid bulk. Being the port of the Paris area, it has the potential to serve approximately 25M consumers, one of the largest markets in the European Union. Le Havre is a deep seaport allowing the largest ships to access the terminals in Port 2000.

Figure 19: Unloading a container ship in one of the maritime terminals in port 2000 - 2022, ERA

HAROPA port, with the support of the French State, will invest massively during the period until 2027 to modernise the port infrastructures and to favour modal shift to rail and inland waterways. Currently, the port has 4 multimodal terminals in Le Havre, Rouen, Gennevilliers and Bonneuil-sur-Marne.

Figure 20: LH2T, Multimodal terminal in Le Havre port - 2022, ERA

At this stage, 60 weekly railway connections are operated from/to the port with the aim to further develop combined transport. One of the major elements to foster the modal shift to rail was the modernisation of the railway line Serqueux-Gisors which has been finalised in March 2021. The works performed had a double objective:

- ⇨ To create a new alternative railway route to increase the railway capacity in Le Havre port; and
- ⇨ To offer additional capacity for freight trains going to and from the ports of Normandy and Paris area considering the congestion on the line to Mantes-la-Jolie.

Figure 21: Le Havre

The works have been financed through the subsidy of the French State (90M€), the Normandy Region (90M€) and the European Union with the CEF (66M€) for a total of 246M€. The line has been electrified with 2000 catenary poles installed, a new connection of 1,3km has been created and 9 level crossings have been suppressed. These works have increased the capacity to 12 daily connections, 25 new daily train paths, to be utilised by railway operators with the potential to take out from the roads approximately 6000 trucks per week.

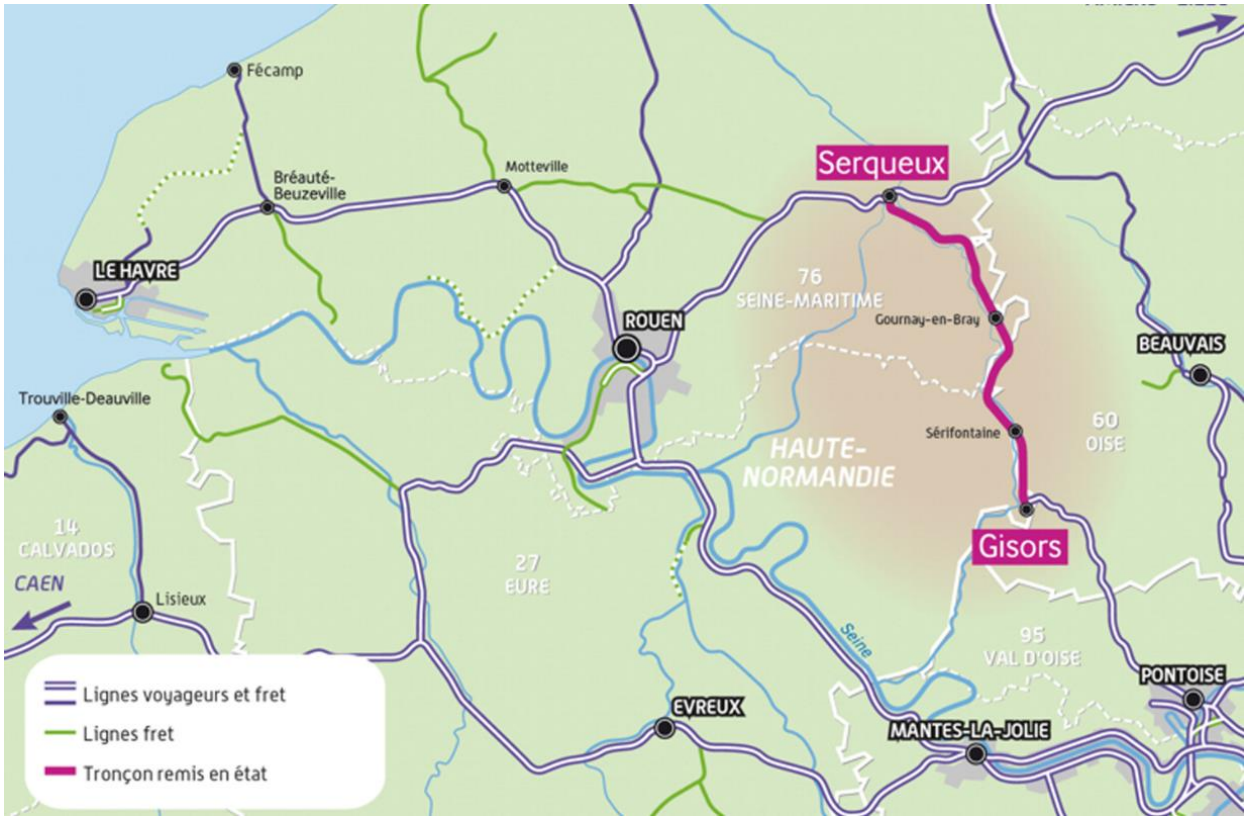


Figure 22: Railway line Serqueux-Gisors - 2021, Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) Normandie

The port railway network of Le Havre is composed of 160km of tracks of which 40km are electrified and has three points of interconnection with the national railway network. Since 2008, the ownership of the port railway infrastructure has been transferred from SNCF Réseau to the port. The port autonome de Paris/HAROPA received a safety authorisation as rail infrastructure manager on the 1st of July 2022 valid until the 1st of July 2027. In practice, HAROPA port has delegated to SNCF Réseau the traffic management of approximately 3500 trains running on this network, with 60% of trains transporting chemical products and 40% containers e.g. cement in isotank to the terminal of Gennevilliers. 7 railway undertakings are operating in the ports and one specific railway operator dedicated for shunting services. The inland port of Rouen has a railway network of 80km and manages approximately 2200 trains per year, 60% of them transporting cereals.

Anticipating the works that are on-going along the development of the Greater Paris area, a new port on the Seine River in the West of the French capital will be built. It should be partially placed in service in 2025 with the aim to be exclusively dedicated to the building industry. When fully operational around 2040, it should accelerate the modal shift to inland waterways and rail for the hinterland transport of building materials.

Since the transfer of the port railway network, HAROPA port has developed the railway infrastructure inside Le Havre port. 23,5km of new railway tracks have been built to increase the

capacity in Port 2000 area, a new railway connection to the multimodal terminal and a new signal box to better manage the railway capacity. The maintenance of the railway infrastructure is also considered more flexible since the transfer.

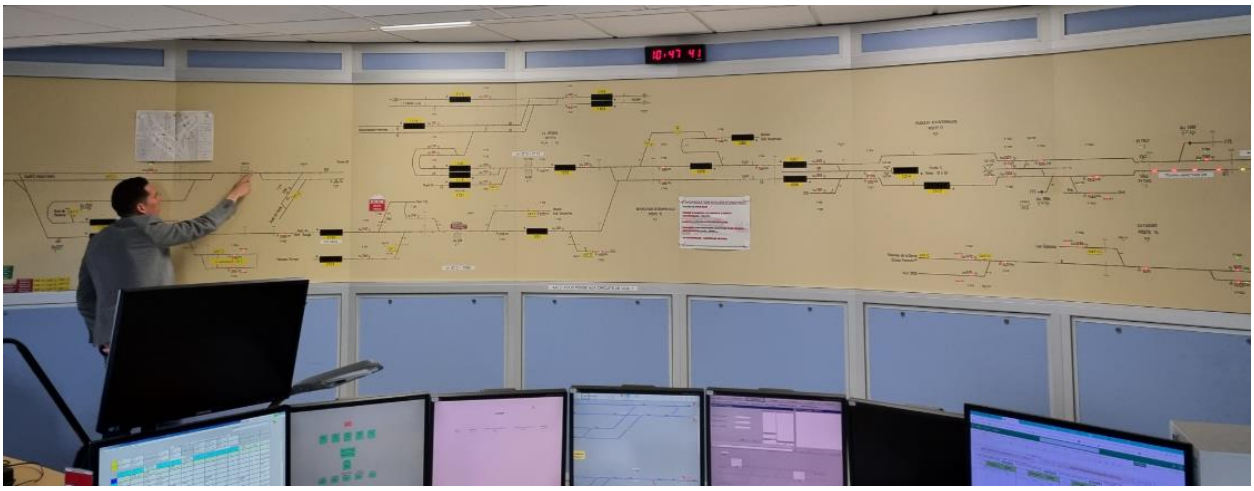


Figure 23: Main operational railway control center of the port railway network in Le Havre - 2022, ERA

Considering the investments made on the rail infrastructure inside and outside the ports, HAROPA has set an ambitious objective to reach 20% of the goods transported by train in 2025.

➔ Port of Antwerp

With currently 290 million tonnes of cargo, including 12 million TEU handled, the port of Antwerp is the second largest port in Europe and a key gateway to more than 800 destinations globally. The port handles all type of traffic from containers to dry, break and liquid bulk and since May 2022, following a merger, a single port authority is managing both the port of Antwerp and the port of Bruges. Within the enormous 12000 hectares of the port of Antwerp area, larger than the city of Antwerp itself, the port has six deep sea container terminals, refineries, seven intermodal terminals and several bulk terminals with a leading role for liquid bulk, mostly chemicals and oil.

The hinterland transport of cargo is primarily towards Germany and the Benelux and the rail modal share of containerised goods is currently only 7%. In fact, a large part of cargo is transported by pipeline, inland waterways and more than 50% by road generating severe congestion of the motorways across Belgium and associated externalities.

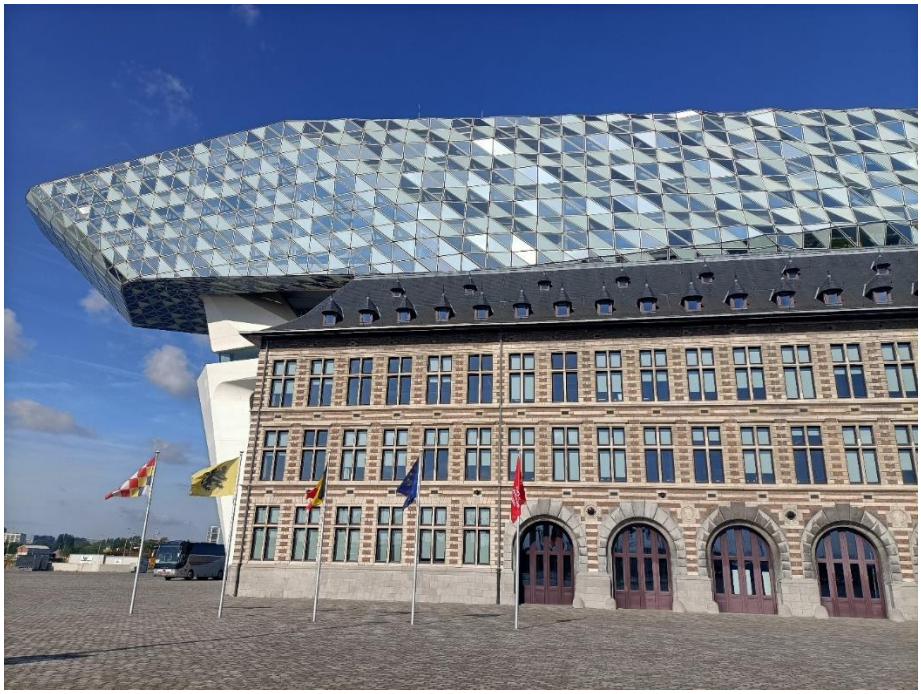


Figure 24: The Havenhuis, Port of Antwerp-Bruges headquarters - 2022, ERA

The railway network within the port area measures more than 1000 km of tracks (largely not electrified, red lines in the map below) with more than 20 sidings and more than 70 private rail connections serving all sorts of terminals and piers.

The shunting facility of 'Antwerpen Noord' is the sole single wagon load terminal in Belgium and a key infrastructure to handle more than 100 trains a day. The port authority is only the landowner and in charge of groundworks and marine-related infrastructure and operations, while Infrabel, the national Belgian rail infrastructure manager, oversees the entire rail network within the port and traffic management.

There are about 10 railway undertakings and several intermodal operators active in the port, with Lineas (the former State-owned incumbent railway operator) having a leading market share with regards to traction and especially shunting operations. Lineas is the sole undertaking that provides single wagon load operations at Antwerpen Noord.

Figure 25: Port of Antwerp rail network - 2022, Port of Antwerp-Bruges

There are currently 250 weekly intermodal trains to 70 destinations over 20 countries served by rail and 50% of all freight trains running in Belgium have origin/destination at the port of Antwerp. However, rail operations are currently suffering several issues which contribute to cap the growth of rail modal share. The most important issues are:

- **Infrastructure:** the port rail network is largely non-electrified and this is not only a concern for emissions but also an important limitation with regards to direct trains to final destinations originating at the port terminals. In fact, due to the need to use diesel traction, trains need to be shunted and composed to allow a locomotive change since most of the main line operations are using electric locomotives. Due to the size of Belgium, often locomotives need to be changed again quite close to the port to cross the country's borders. In fact, Belgium's rail network is powered with a 3 kV system contrary to the neighbouring countries. Few RUs own multi-system locomotives that can cross borders by switching the traction power system.

Antwerpen Noord is a key shunting node for the port and for single wagon load the hump is currently underutilised due to complexity and the need for locomotives to have installed an on-board IT system compatible with the facility. Currently only Lineas has such a system. Due to the installation cost other RUs do not see a business case to perform single wagon load shunting in Antwerpen Noord.

Moreover, due to the geographic configuration of the port of Antwerp, rail tracks are often deployed along roads and trains need to share the use of drawbridges with trucks thus reducing capacity of the rail network.

Figure 26: Shunting yard of Antwerpen Noord - 2022, ERA

- **Governance:** Infrabel is managing and maintaining the entire port rail network up until a few meters from the entry of terminals where private sidings are installed. The national network statement, charging policy, paths allocation, safety, operational and interoperability rules applicable across the Belgian network are also applicable within the port. Infrabel is a state-owned company controlled by the Belgian federal government while the port authority is controlled by the municipalities of Antwerp and Bruges. Within the governance structure of Belgium, the regional government of Flanders is responsible for ports policy as well as most of road infrastructure around and within the port, while railways are a federal competence. This generates an additional level of governance complexity.

The port authority cooperates with Infrabel on day-to-day issues, however the port authority has no formal ownership of the port's rail network. Compared to the road network the coordination on rail issues is more indirect due to the different levels of government involved. Infrabel management is accountable to the federal government on rail infrastructure management across the whole Belgium, both freight and passengers, and therefore the port of Antwerp is considered as part of the network without a dedicated governance structure involving the port authority.

- **Investments planning and financing:** As a result of the governance structure, investments on the port's rail network are a responsibility of Infrabel and of the federal government. As landowner, the port authority is only financing groundworks for hard infrastructure but the investment planning for the port's network is done within the national plans of Infrabel. Therefore, beside the long timing of the investment cycle which may not match with the current port's needs, projects within the federal level are to be budgeted in a balanced manner between Belgium's regions. This situation adds uncertainty and inflexibility towards investments within the port's rail network. According to the port authority, there are also legal constraints that would not allow the port to provide funding to Infrabel even if it wished so.

- **Traffic management and operations:** Infrabel performs traffic management and path allocation within the port's rail network. The current design of the infrastructure with a leading role for the Antwerpen Noord shunting yard and a largely non-electrified network makes traffic management complex. For example, paths allocated by rail freight corridors are only originating at Antwerpen Noord and trains are often routed there even if they are not related to maritime traffic but just due to the importance of that facility for Belgium's rail freight operations.

  There are capacity constraints and given the large number of competing RUs operating in the port, path allocation is not optimal. Often shunting requires very short train runs across the port with trains moving just few wagons from the same terminals for similar customers.

  Traffic management follows the normal rules of the national rail network and therefore priorities set for different trains are not necessarily aligned with the immediate needs of terminals and maritime operations. The entire port's rail network is also not operational every week from Saturday afternoon till Sunday evening due to maintenance works by Infrabel. This closure is done for simplicity of the maintenance planning but results in restricting the use also of tracks which may not be under maintenance every week.

  Eventually even for shunting between terminals, RUs and their drivers operating in the port must be certified according to EU requirements similarly to rail transport operations across Belgium. There are also no parking fees for wagons and the port's network is often used as a free-of-charge siding by RUs.

- **Digitalisation:** Trucks and especially barges have digital solutions that allow an integrated data exchange with terminals and maritime operations. Rail operations are not yet digitalised and integrated resulting in slow and manual processes for handling trains, wagon loading and shunting. Even liquid bulk terminals with recurrent customers are handling orders via email and Excel files. Reliability and predictability of trains' schedule are not optimal and terminals cannot properly manage their capacity based on the estimated time of arrival of ships versus trains. This in turn leads to the inefficient management of (over)capacity.

At the end of 2019 Infrabel and the Port of Antwerp-Bruges have signed a cooperation agreement then announced in March 2021 with the 'Sustainable Rail Vision for the port of Antwerp'. This important engagement has the goal of increasing the rail modal share for containerised goods at the Antwerp port from the current 7% share to 15% by 2030. The Rail Vision is based on seven pillars that are paramount for the improvement of rail connectivity and competitiveness in Antwerp:

1. Optimum management of traffic flows at the port across the entire logistics chain.
2. High-performance parking policy for efficient use of available rail capacity.
3. Operating Antwerpen Noord mashalling yard in a neutral manner, with combined volumes and higher utilisation.
4. Targeted investments in various port areas with the highest growth potential.
5. Efficient use of rail infrastructure.
6. Separate framework for regulation and port-specific rail policy.
7. Common digital platform for the mutual exchange of information in compliance with competition law.

The Rail Vision is a policy initiative connected with the general goals of greening freight transport to achieve carbon neutrality by 2050 within the port but it is also important for the Extra Container capacity Antwerp (ECA) project. This is a new tidal dock to be built in the west side of the port aimed at increasing container capacity by 7.2 million TEU. The Connecting Europe Facility provided in 2021 10 million EUR funding for studies and the ECA project is currently undergoing the permitting procedures to start soon construction. Increasing the rail modal share is in fact a key element for local authorities and communities given that the Antwerp area is already suffering severe congestion of roads.

The target of 15% modal share by 2030 risks to remain an ambition if additional engagement is not foreseen by involving further federal and regional authorities as well as terminal operators and shipping companies. The involvement of authorities to ensure action with regards to the regulatory framework for rail as well as with the alignment on investments on the rail network outside the port is critical. For example, across Belgium limitations continue to exist in terms of maximum axle load, train length and traffic management conflicts with passenger trains which are given priority. Hinterland connectivity and cross-border bottlenecks remain another critical issue to resolve. Moreover, the current statistics of rail modal share are to be improved given that figures are calculated by matching port's handling statistics with number of trains.

Some elements of the Rail Vision are developing though. The port authority is investing in a digital system called Rail Traffic System (RTS), currently in testing phase, which aims at connecting railway operators, terminals and third parties to plan and process the transportation of trains or railcars. All parties involved would also track routes and view the real-time positions of trains and railcars. The RTS is to be compliant with TAF-TSI.

CONCLUSIONS

'*We already have the transport of the future as each time rail is used to transport goods, we are in 2050'*, Antoine Berbain, Delegated General Director Paris, HAROPA Port.

Improving the synergy between ports and the rail sector is a way to increase the modal share of rail. The modal shift to rail will not only contribute to the decarbonization of the EU economy, but also reinforce its energy independence as rail is and will remain substantially more energy efficient than road transport. This modal shift to rail is not only important for the railway sector but also for the port and maritime ones. The massification of the transport that offers the large vessels brings opportunities to reduce the cost of transport while reducing the ecological impact of transport. However, it brings also challenges as if all the flows go on road, congestion is guaranteed.

Many ports consider that their competitiveness will be judged by their railway connectivity. Therefore, most of the ports are investing to increase their rail capacity and rail modal share through the development of the railway infrastructure. The diversification of the hinterland transport is seen as a main commercial driver for the ports. EIB indicated that in the most recent years, all the ports' projects appraised included a component on enhancement of the rail activity.

While infrastructure is the priority number one, the lack of communication and data exchange is often perceived as an important barrier to develop further rail activities. In the triangle between shippers, terminal operators and railway stakeholders, the port authorities play a key role of coordination. This is the reason why many ports are also investing in the development of specific IT tools which facilitate the coordination between different port stakeholders with the aim to speed up processes and the integration of rail operations. Dissemination on TAF TSI in this context is important to raise awareness among stakeholders outside the railway world.

Besides the recent positive evolutions in infrastructure development and digitalization, another important aspect is the management of rail operations within ports. Rail ports' operations are quite specific compared to the rail operations on the main network and there is a need of clarification regarding the legal framework applicable on rail safety and interoperability. Currently, Member States are applying EU railway laws in diverse ways within their ports and the applicable legal framework is important to ensure certainty as well as avoiding the risk of overregulation within ports or, on the contrary, deregulation of safety-critical rail operations. Very different models are followed, each of them with their own advantages but currently a patchwork situation is experienced with very diverse interpretation of EU rules between Member States. Further analysis on the scope of application of the Fourth Railway Package legislation within ports would be needed.

"*The battle of the ports will be on land*", Stéphane Raison, HAROPA Port General Director. The Rail sector and the ports are already closely working together. The ports are willing to improve

the rail attractivity and with a good mix of investments, regulatory measures and political willingness, the ports' traffic flow could provide a sensible contribution to the modal shift to rail and the increase of the rail modal share of hinterland transport as a whole.

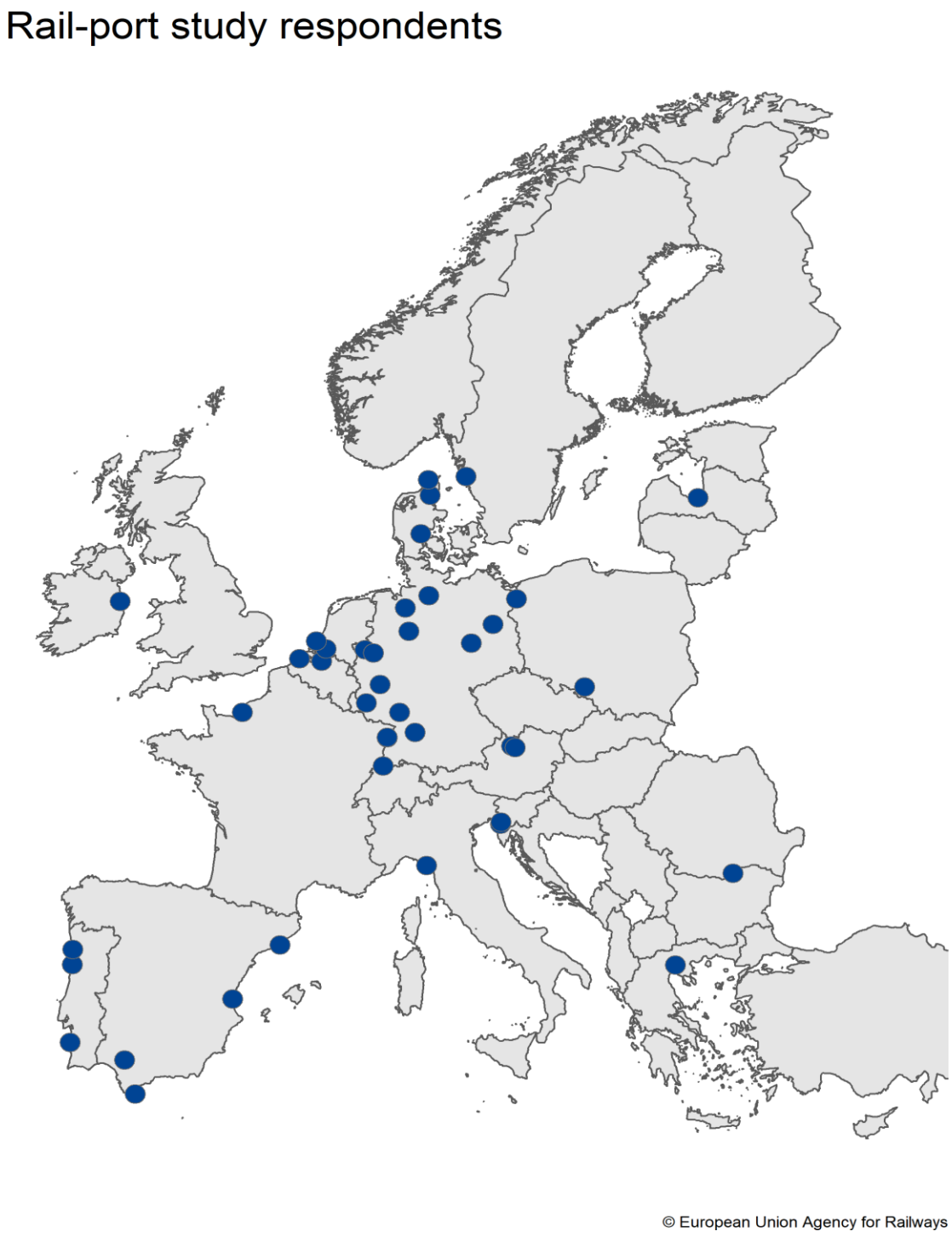
ANNEX

Annex 1 List of ports participating to EU Survey[35]

1. Port of Aalborg, Denmark
2. Algeciras Bay port Authority
3. Stadtwerke Andernach GmbH
4. Port of Antwerp
5. Port of Barcelona
6. Berliner Hafen- und Lagerhausgesellschaft mbH
7. Bremen, Ministry of Science and Ports
8. DeltaPort GmbH & Co. KG
9. APDL – Administração dos Portos do Douro, Leixões e Viana do Castelo, S.A.
10. Gelsen-LOG
11. Dublin Port Company
12. Hamburg Port Authority AöR
13. Grand Port fluvio-maritime de l'axe Seine – HAROPA Port
14. Hafenbetriebe Ludwigshafen am Rhein GmbH
15. Hafenverwaltung Kehl KdöR
16. Port of Hirtshals
17. Kedzierzyn-Kozle Terminale S.A.
18. Port of Koper
19. Linz Service GmbH – Bereich Hafen
20. Mindener Hafen GmbH
21. Port of Moerdijk
22. APA – Administração do Porto de Aveiro, S.A.
23. Freeport of Riga Authority
24. Industriehafen Roßlau GmbH
25. Port of Rotterdam
26. Port Complex Ruse JSC
27. Port Authority of Sevilla
28. Port of Sines and the Algarve Authority
29. Autorità di Sistema Portuale del Mar Ligure Orientale (La Spezia)
30. Port of Strasbourg
31. Hafen Stuttgart GmbH
32. Port of Switzerland
33. Szczecin and Swinoujście Seaports Authority S.A.
34. Thessaloniki Port Authority SA
35. Hafen Trier
36. Port of Vejle, Denmark

[35] EUSurvey - Survey (europa.eu)

37. Port of Zeebrugge



Annex 2 List of ports participating to structured interviews[36]

1. Port Authority of Sevilla
2. Port Authority of Valencia
3. Ennshafen port
4. Hamburg Port Authority AöR
5. Algeciras Bay port Authority
6. Göteborgs Hamn
7. Autorità di Sistema Portuale del Mar Ligure Orientale (La Spezia)
8. Thessaloniki Port Authority SA
9. Hafenverwaltung Kehl KdöR
10. Port of Strasbourg
11. Linz Service GmbH – Bereich Hafen
12. Autorità di Sistema Portuale del Mare Adriatico Orientale, Porti di Trieste e Monfalcone
13. Port of Koper
14. Port of Rotterdam
15. Port of Aalborg, Denmark
16. Szczecin and Swinoujście Seaports Authority S.A.
17. Freeport of Riga Authority
18. Grand Port fluvio-maritime de l'axe Seine – HAROPA Port
19. Port of Antwerp

[36] By chronological order of the interviews.

Annex 3 Overview of modal shares, trends and goals

Port	Country	Current rail modal share (latest data available)	Trend[37]	Objective of the port	Target date
Aalborg	DK	5%	↗	To increase with new container traffic	2022
Andernach	DE	9%	↗	No objective	N.A.
Berlin	DE	30%	=	To increase but no specific objective	No specific date
DeltaPort	DE	20%	↗	To increase but no specific objective	No specific date
Douro	PT	6%	=	To increase but no specific objective	No specific date
Gelsen-LOG	DE	43%	↗	To increase but no specific objective	No specific date
Ludwigshafen am Rhein	DE	10%	=	No objective	N.A.
Kehl	DE	20%	=	No objective	N.A.
Hirtshals	DK	0%	=	10-15%	2025
Kedzierzyn-Kozle	PL	0%	↘	Negotiations to connect the port to the main national network	N.A.
Linz	AT	23%	=	To increase but no specific objective	No specific date
Mindener	DE	45%	↘	To increase but no specific objective	No specific date
Roßlau	DE	27%	↗	To increase but no specific objective	No specific date
Ruse	BG	7%	=	To increase but no specific objective	No specific date
Sevilla	ES	4%	=	To increase but no specific objective	No specific date
Strasbourg	FR	24%	↗	Double rail traffic volume	2030
Stuttgart	DE	76%	↗	To increase but no specific objective	No specific date
Port of Switzerland	CH	52%	↘	No objective	N.A.
Trier	DE	50%	↗	To increase but no specific objective	No specific date

Table 1: Rail modal share and objective for selected inland ports – 2022, ERA

[37] Trend of the rail modal share over the last three years 2019, 2020 and 2021.

Port	Country	Current rail modal share (latest data available)	Trend	Objective of the port	Target date
Algeciras	ES	4,82%	↗	To increase but no specific objective	No specific date
Antwerp[38]	BE	7% (for containers)	↗	Double rail modal share	2030
Barcelona	ES	15% (for containers) 40% (vehicles)	↗	To increase but no specific objective	No specific date
Bremen	DE	48,7% (for containers)	↘	To increase but no specific objective	No specific date
Dublin	IE	0%	=	No objective	N.A.
Göteborg	SE	60% (for containers)	↗	To increase but no specific objective	No specific date
Hamburg	DE	52,5%	↗	65% rail modal share	2040
Le Havre[39]	FR	4%	=	20%	2025
La Spezia[40]	IT	28%	=	50% rail modal share	2025
Koper	SI	58%	=	70%	2025
Moerdijk	NL	5%	=	+25% rail traffic volume	2025
Porto	PT	2%	↘	To increase but no specific objective	No specific date
Riga	LV	31%	↘	To increase but no specific objective	No specific date
Rotterdam	NL	10,5%	=	20% rail modal share	2035
Sines	PT	59,85%	↘	No objective	N.A.
Szczecin	PL	22%	↘	To increase but no specific objective	No specific date
Thessaloniki	EL	19,4%	↗	To increase but no specific objective	No specific date
Trieste[41]	IT	50% (for containers)	↗	Double rail traffic volume	N.A.
Valencia	ES	11%	↗	To increase but no specific objective	No specific date
Vejle	DK	13%	↗	No objective	N.A.
Zeebrugge	BE	12,7%	=	Merging with Antwerp will require more rail movements	2022

Table 2: Rail modal share and objective for selected maritime ports – 2022, ERA

[38] The city of Antwerp and the city of Bruges have agreed to merge their respective ports in February 2021. On 22nd of April 2022, the port of Antwerp and the port of Zeebrugge have officially merged and the unified organisation is now operating under the name "Port of Antwerp-Bruges". This report only partially considers this new reality and focuses mostly on the Antwerp port.

[39] The port of Le Havre is managed by the HAROPA port authority which includes Le Havre, Rouen and Paris. This report only partially considers this recent reality and focusses on the seaport of Le Havre.

[40] The maritime port of La Spezia is managed by the Port Authority of the Eastern Ligurian Sea which also includes the maritime port of Marina di Carrara. In this report, only the port of La Spezia is considered.

[41] The maritime port of Trieste is managed by the System Port Authority of the Eastern Adriatic Sea which also includes the seaport of Monfalcone. In this report, only the port of Trieste is considered.

Annex 4 Key elements noted by the different ports interviewed in relation to infrastructure developments

Port	Key elements noted in relation to infrastructure developments
Aalborg	- 17km of own railway infrastructure and 7 terminals located outside of the city. - 7M€ invested since 2009 to develop rail activities with no subsidy. - New logistics center of 150.000 m2 with a new terminal and new tracks together with the old terminals to create better infrastructure to move the goods. - New terminal with 800m long tracks in the next couple of years.
Algeciras	- Plan to build new rail infrastructure in the port. In design phase, works should start in 2024. - There are 3 terminals in the port. The main one is where most of the activity is carried out, with a second one used when needed (it will be used more with the development of the Rolling Motorway). The 3rd one is not used at all. - Main problem is the last mile outside the port: lack of electrification, signalling (telephone-block system) and no sidings where to cross. 4 sidings are foreseen already in 4 areas; going to Madrid at least 9 sidings will be needed (for 750m long trains). - High geographical constraints due to the port being surrounded by a natural park.
Ennshafen	- 32 km railway km of lines free of congestion. - Some enlargement is foreseen but also noise protection (e.g. protection wall and anticipating the need for additional tracks).
Göteborg	- All terminals Ro-Ro, energy ports, logistic warehouses are rail connected. - New traffic signal systems has been installed to work trains closer to each train. - Track electrified a couple of years ago and now a double track is being constructed and will be finalised by 2023/2024. This will avoid congestion on the rail infrastructure. - A new route through tunnels instead of residential areas is under construction. This will increase significantly the quality of the rail service.
Hamburg	- 300km port railway network – the western area is more used compared to the eastern area. - 4 container terminals, 3 are in the west part: the CTA, built in 2002, has a high automation level and is the biggest railway terminal in Europe (almost 1 million TEU per year by rail). The port can make 16 million TEU per year and now it makes 9 TEU.

	- A bridge has been built to bring the heavy traffic from the west port area to the east side. - DB Netz is building a tunnel so that the trains going out of the port area reach the east side. - Plan to build a new marshalling yard in the west port area (Planning starts in 2023, Completion early 2030s), and a bypass to get the traffic from the 2 big container terminals on the west. - Bigger ships can be a challenge in the future. Ports will have to adapt with extra costs (more tracks, capacity, adaptation of the infrastructure according to the peaks expected).
Koper	- Doubling the track between Koper and Divaca to be finalized by 2026/2027 together with works on many sections of the Slovenian network will reinforce the rail capacity to and from the port. - Some capacity limits in the shunting station outside the port which will be enlarged in the light of the second track to be constructed. - Inside the port, 740m long trains can be operated. This was the last investments made in the container and car terminal. However, in the shunting yard, only 6 tracks are available for 700m long trains. Besides, the maximum train length is in fact 525m due to constraints on the Slovenian rail network. But on-going modernisation of the Slovenian network, step by step to 600m and then 740m.
La Spezia	- In 2022-2023, important investments on the infrastructure. - Modernisation of the rail connections to the port with a new station with tracks for 750 m long trains. - New rail yard within the container terminal with 5 tracks for 600m long trains under cranes.
Linz	- Port connected to the main railway network located in industrial area of the city free of congestion. - The 4-lane expansion of the "Gleisgruppe G" to block train length (740 meters) was completed in January 2022. After successfully completing trial operation, the fully electrified "Gleisgruppe G" has been available to customers since mid-March 2022. In May 2022, the expansion and electrification of the "Gleisgruppe K" has begun. After completion in the Summer 2022, the entire area will be completely electrified. - The construction of a new Container Terminal Ingates is also planned by the end of 2023.
Riga	- By 2026, it is planned to start construction to connect the Freeport of Riga with Rail Baltica. In the changing geopolitical environment, for Freeport of Riga to be competitive with western seaports, it needs to be connected to TEN-T rail infrastructure. - In times when the port was handling important volumes with 40M TEU, the port suffered from bottlenecks and lack of capacity in the terminals.

	The bottlenecks were developing with the wagons standing to get unloaded so there was a need for new tracks for shunting purposes. However, in the 4-5years, the volume has decreased. - Nowadays, investment is more needed for the modernisation of the railway rather than increasing the capacity.
Rotterdam	- New rail yard at the Maasvlakte area is planned to be built in 2024-2026. - The electrification is going very slow and it is still under discussions for subsidies. - Last November 2021, a new rail infrastructure has been constructed to avoid a bridge. - Large issues related to the maintenance in the port railway lines from Prorail. Prorail set out a maintenance programme which should improve the situation in the next years but the problem might be the lack of capacity inside the port and on the national network. - Adaptation of the infrastructure to operate 740m long train would be beneficial but important investments are needed.
Sevilla	- Railway lines run around the perimeter of the Port to facilitate land transport between the terminals and the public docks (project which was co-financed by the EU). It is connected to the main routes through the south of the peninsula and has a railway terminal on the container dock that can handle 750m long trains. - Currently the link between ADIF network and the port is not efficient enough, with a big travel around and with points of intersection/conflict with the passenger services (with priority). - A new link of 2.5 kms from the ADIF network to the port (to avoid longer route and conflicts with passenger services) will be built together with a new and bigger rail yard.
Strasbourg	- Investments in the framework of “Contrat de plan Etat-Région” are foreseen for the electrification of the tracks and to allow 750m long trains to operate. - Project to increase the capacity of the container terminal to offer more hinterland traffic. Extension of the South terminal between 2023 to 2026 with a study co-financed with CEF funds.
Szczecin/ Swinoujscie	- The ports of Szczecin and Swinoujscie are connected to the national railway network infrastructure with the lines E-59 and CE-59. - The modernisation of rail infrastructure within both ports was completed in the years 2011-2014 when 36 km of tracks and 134 junctions were rebuilt. - The modernisation of last mile railway access to the ports are in progress with completion planned for 2025. In Szczecin: construction of a viaduct over Gdanska Street and a rail bridge across Parnica River, modernisation of rail configuration, electrification. In Świnoujście: construction of a

	second track between the passenger and cargo stations thus eliminating a bottleneck. - The construction of a deep-water container terminal in the external port in Świnoujście will have a significant impact on the increase in the share of rail transport from / to the hinterland of the port in Swinoujscie.
Thessaloniki	- Electrification along the Thessaloniki – Strymonas – Promachon line towards Sofia, localised interventions for the improvement of the line and railway stations in the section, as well as the installation of Automatic Level Crossing Systems. - Finalisation of construction of a new line (deviation) in the section Polykastro-Eidomeni, approximately 21 km long, of the Thessaloniki-Eidomeni line, with signalling, telecommunications and electrification, installation of a modern telecommunications and signalling ETCS level I system in the greater section Thessaloniki-Polykastro-Eidomeni, with a total length of 80 km. - Numerous missing links remain with most of the multimodal connections between Hungary, Bulgaria, Romania and Greece yet to be constructed or substantially upgraded. - Inside the port, 3.5km for a new line and studies on electrification/station in the port.
Trieste	- Revitalisation of Villa Opicina station in 2021 only for containers for the moment. - With the NextGenerationEU fund, a new railway station in Servola will be created by 2026, 10 tracks for 750m long trains. It is one of the 10 strategic actions of the NCP.
Valencia	- There are three main ports (Segunto, Valencia and Gandia) with three main terminals (two containers and one ro-ro) connected by rail. - Inside the port area, level crossings are eliminating, a third track with standard gauge is developed and ensuring length of tracks for 750m long trains. By the end of 2022, the port rail infrastructure should be fully compliant with the TEN-T requirements. - Improvements to the Zaragoza-Teruel-Sagunto-Valencia line: electrification works are undergoing and with investments made to allow 750m trains all along the path.

Annex 5 Key elements noted by the different ports interviewed in relation to digitalisation

Port	Key elements noted in relation to digitalisation
Aalborg	- Heavy disruptions in the freight traffic with the implementation of ERTMS on the Danish rail network. - Digitalisation is more up to railway operators which could then be integrated into the port's system.
Algeciras	- The port is waiting for the results of the national project SIMPLE by Puerto del Estado which is targeting the digitalisation of processes inside all Spanish ports (including railway activities).
Ennshafen	- By the end of 2024, the aim is to digitalise most of port's operations, not only linked to railway activities. Especially, for what regards rail operations, the goal is to improve communication between stakeholders and to increase the velocity of path allocation.
Göteborg	- A track and trace system is about to be introduced where you can follow the container from ship to inland terminal to the rail in both directions. - Port optimizer by GE.
Hamburg	- Provision of data platforms (like the "transPortRail" platform) to operators for better planning possibilities of operations. Expansion of these platforms to provide more detailed data for operators. - The custom declaration is connected to the HPA software system (operational digital solution). - Need for a clearer EU legislation on who is the owner of the dataset.
Koper	- TAF TSI is not used yet. There is an IT system between the port and the Slovenian railway operators for the daily planning.
La Spezia	- In 2015, fast corridor and fast custom procedures has been implemented, first port in Italy to implement this system.
Linz	- In the last years, lots of investment in digitalisation such as camera to photograph the trains so nothing must be written by hand. - Currently, the port is installing a system to have an overview of rail operations inside the port in real time, to see where the trains are, on which part of the infrastructure, to detect anomalies quickly so that the rail infrastructure can be better managed. - Digital rail gate was operating last year.
Riga	- Lack of data availability on the supply chain and low data exchange in general. - The port is working on a tracking system of cargo flow in and out of the port and then data exchange between the port and the terminals and with the railway stakeholders.

Rotterdam	- Lack of good communication and planning between all parties involved. - The port is leading a project to enhance digital exchange of information between all parties involved in the handling of trains in the port area, to speed up processes and improve competitiveness. Agreement with 19 rail stakeholders to develop together.
Sevilla	- Plan to adapt to TAF TSI standards, automation of rail processes and synchronization with other modes of transport. - Several on-going projects/investments mainly co-financed by the EU.
Thessaloniki	- The only digitalised service for the moment is a truck appointment system. - The next service to be developed is a procedure for picking up the containers from the port. - Digitalisation is an effort and priority given the current limited use of ICT.
Trieste	- The port is developing its port community system with the aim to mostly facilitate custom procedures.
Valencia	- Valencia port has a tightly linked Port Community, due to innovative elements such as its Quality Mark and the valenciaportpcs.net technology platform and comprising all public and private economic agents providing services through the ports of Valencia, Sagunto and Gandía. - To reduce the issues with custom they are implementing OCR – Automatic optical recognition. - Adaptation to TAF TSI through the I-Rail Project.

Annex 6 Summary of proposed changes in TAF TSI which would facilitate coordination with stakeholders outside the railway sector

Through the TAF TSI revision activity, ERA has also treated key change requests (CR) which facilitate the integration of the railway stakeholders with the ports. CR 429 was triggered by the European Sea Ports Organisation following a position of Hamburg Port Authority. This CR will ensure that when exchanging information on consignment order, train composition or train readiness and wagon events, the messages can also reach the last mile operators and in particular, the port authorities. CR 317, on the other hand, will allow to link real time data and train data through a multimodal perspective. CR 366 will facilitate combined transport by providing the ETA not only to railway stakeholders but also for last mile operators, especially the port authorities. Besides, a new annex IV will be included in the TSI to harmonise the definition of timeliness of a transport with the final to increase its quality. CR 438 will allow to combine all modes of transport when issuing consignment order with the possibility to exchange information following eFTI Regulation[42]. Finally, CR382 will include new definitions in TAF TSI glossaries to cover more precisely combined transport and ports' activities. The number of stakeholders (companies) having the possibility to engage in this framework will be drastically increased with the change of the codification system from numeric to alphanumeric system. This will allow to enlarge the scope from the sole RUs, IMs and wagon keepers to other stakeholders outside the railway system.

ERA submitted its recommendation to the European Commission in January 2022 and an adoption of the revised TAF TSI regulation is expected in late 2022.

[42] Regulation (EU) 2020/1056 on electronic Freight Transport information EUR-Lex - 32020R1056 - EN - EUR-Lex (europa.eu)

Annex 7 Key elements noted by the different ports interviewed in relation to management of rail operations in ports

Port	Key elements noted in relation to rail governance
Aalborg	- The tracks were belonging to the municipality. Agreement that the port should buy the tracks and the terminals. The tracks were bought for a low price but the port committed to invest. - The main tracks to the port are managed by BD, the terminals and 17 km of port rail infrastructure are handled by the port. - There is a branch panel: an organization to meet 4-5 times a year with terminals, operators, rail stakeholders and all the ports to exchange experience.
Algeciras	- The ports of Algeciras Bay and Tarifa is a public organization that belongs to the Ministry of Transport, Mobility and Urban Agenda. - The port authority manages the rail infrastructure in the port. - Private terminals operators only carry out the loading/unloading but all manoeuvres/traffic is handled by the port authority.
Ennshafen	- The port is a private-public partnership. The port works in close partnership with transhipment and terminal operators. - For what concerns railway operation, the port is the second private railway system in Austria and operates as feeder lines to the main railway system. - The port has very close relationship with ÖBB infrastructure.
Göteborg	- Three private operators are responsible for the tracks within the terminal (for Ro-Ro), the main IM is responsible for the state-owned infrastructure. - The port is responsible to ensure coordination between stakeholders, for the marshalling between the state-owned rail infrastructure and the terminals and for the maintenance in close coordination with the State and the private operators.
Hamburg	- The port of Hamburg owns and manages 290km of tracks and there are 77 private sidings, tracks on terminal areas (additional 130km of tracks). 3 connection points with DB Netz network.
Koper	- The port is responsible for shunting operations within the port's area. The shunting station outside the port is managed by the national company and cooperation daily. - Concession agreement for the railway activities within the port agreement.

La Spezia	- The port ensures the maintenance of the rail infrastructure from the port until the station La Spezia Maritima, RFI manages the maintenance between La Spezia Marittima and the other stations of the La Spezia railway system (La Spezia Migliarina, Santo Stefano Magra). A unique operator composed by two operators (MIST – Mercitalia Shunting and Terminals and LSSR – La Spezia Shunting Railways) is in charge of shunting operations in the last mile connections.
Linz	- The port is responsible for the maintenance and the investments. - ÖBB manages the operations and the transport of the wagons while the management of the rail infrastructure is for the port.
Riga	- Within the port, the tracks are owned by the port, private companies and Latvian railway. Three different entities and each entity are responsible for their own track maintenance. - For the infrastructure maintained by the port, a daughter company of the port is in charge.
Rotterdam	- Prorail is in charge of the rail activities within the port of Rotterdam.
Sevilla	- The port authority is the public body responsible for managing the state-run port of Sevilla; it also manages the rail infrastructure in the port (investments, maintenance, operations).
Strasbourg	- The port has delegated the heavy maintenance and management of the rail infrastructure to SNCF Réseau while taking care of the light maintenance.
Szczecin/ Swinoujscie	- The port authority is responsible for: construction, expansion, modernization, maintenance and management of port infrastructure (including rail tracks within the ports area). - The railway operations within the ports are conducted by rail operators and port terminal operators depending on their mutual agreements/contracts
Thessaloniki	- Since 2018, the Port of Thessaloniki is operated by an investor consortium, under a concession agreement with the Greek state; ThPA SA is the sole operator of the port. - ThPA SA also operates a dry port in Sofia, Bulgaria.
Trieste	- The port has applied for a safety authorisation to become an independent infrastructure manager.
Valencia	- The port owns the land and is the IM inside the port meaning that the port invests and maintains the rail infrastructure and manage the traffic. The terminals are out of their scope of competence in terms of operation.

Annex 8 Key elements noted by the different ports interviewed in relation to rail services, technology and market evolution

Port	Key elements noted in relation to rail services, technology and market evolution
Aalborg	- Transport of coal is decreasing and will disappear. Transport of plastic fragments is increasing. - Huge potential for containers. - Key selling point for rail is reliability and when there is local storage, buffer stock locally so that the production does not break down if the products are not there. It is not just in time, it is safer.
Algeciras	- The Zaragoza-Algeciras route is important in continuing with cargo to Northern Africa since the route can extend via short-sea to Morocco. ADIF has plans to launch a rolling highway between the two destinations. - Agricultural products from Morocco arrive constantly which is a huge potential for rail. - Railway was not expected to raise but it is increasing, and with the same trend as over the last 3 years, the port could have some issues to satisfy the demand in 2-3 years' time without important infrastructure works. - The port is considering locomotives with battery especially for the terminal 2 (when it will serve the Rolling Motorway).
Ennshafen	- The network being fully electrified, the next pillar in the decarbonisation strategy will be to fully stop conventional fuel. - Inland waterways can free some capacity for the railway infrastructure so it is important to make the best use of the capacity of inland waterways as well.
Göteborg	- The schedule process with Trafikverket on a yearly is not enough flexible to attract new customers and potentiate the use of rail. - Trailers on rail is increasing due to the lack of truck drivers, the increase in diesel prices, good environmental of rail and the improvements in craneability. - The rail performance is good. Most of the rail services are not more than 8h trip. Punctuality above 90% for just in time for the trains. - All the tracks are electrified so that the only distance with diesel locomotive is between the marshalling yard and the ports area. There are plans to electrify the 500-600m remaining tracks and the connection between the tracks and the intermodal terminals to get rid of the diesel locomotives.

	- Some alternative locomotives are studied and following the development and when there will be good alternatives, there will be investments on new technologies.
Hamburg	- Bigger ships can be a challenge in the future as ports will have to adapt with extra costs (more tracks, capacity, adaptation of the infrastructure according to the peaks expected). - Germany is expected to exit coal by 2030 so that the transport of coal will decrease and disappear. In 2023, the port of Hamburg will lose up to 1 million tons of volumes for coal which could be substituted with cement, sand, rocks, wheat. - The construction of solar systems is planned in some rail related locations where the solar system can be reasonably installed and operated. - Decommissioning of diesel loco for Hydrogen ones is considered.
Koper	- All kinds of commodities can go on trains: containers, cars, dry bulk cargo, liquids. Cars are more transported by trucks; container is 50/50 while ores are fully transported by rail. - Koper-Budapest is between 20-24h. Locomotive is changed at the border. ERA must work on cross-border issues because it is a big loss of time. - Electric cranes are bought.
La Spezia	- Vertical integration of the logistic chain depends on investments made with big players such as COSCO, Maersk or MSC in rail operators.
Linz	- DAC will be important to automatise and a huge benefit for rail operations. - Difficult to capture the future evolutions on the transport of liquid bulk.
Riga	- The Baltic states are a gateway for Russian energy (coal, oil, fertilizer) and especially Latvia. When the Russian started to develop their own port, this cargo volume started to decrease. With the war, the volume of goods handled has dropped from 40M tons of cargo to 16M. - Baltic ports are in close contact with Ukrainian authorities for the transport of cereals. - The port is also trying to develop alternative routes for Chinese block trains (containers train). - Offshore wind energy is also a possibility. - Electrification of the port of Riga would be very difficult so that Hydrogen/battery locomotives are more interesting.
Sevilla	- The port of Sevilla started a project to get funds to start/test a prototype for hydrogen locomotives and maybe also with battery to be used in the port area (since electrification is not an option). The project is under development.
Strasbourg	- All new projects are linked to waste management and transport.
Szczecin/ Swinoujscie	- The decrease in the rail share results from a change in the structure of transhipments of mass groups of goods, such as coal and metal ores.

	These decreases were, respectively (2019) 9% for coal and as much as 30% for metal ores. 2020 was another year with a decrease in the transhipment of metal ores by another 26% (compared to 2019) and 18.3% for coal. In 2021, the trend was stopped and the share of rail transport slightly increased (to 22.3%).
Thessaloniki	- Greek companies OSE/TrainOse should address manning and working schedule, companies must be adequately staffed to provide service 24/7, which is not the case currently. - OSE/TrainOse need to obtain and deploy new 80-foot wagons (currently, mostly 60-foot wagons are in operation). Global market trend is to transport more of 40-foot containers, while the share of 20 containers is gradually decreasing, which reduces the utilization rate and increases costs per 1 TEU transported and, as a result, makes the connection less competitive. - Piloting the use of advanced biofuel for rail transport in waterborne multimodal hubs. Gain at least 60% CO2 reduction per liter used, thanks to biofuel use and to avoid 270 tons of CO2 with biofuel compared to diesel, over 18 months of tests, for 2 locomotives.
Trieste	- The shunting operator, Adriafer, is studying the possibility of using hydrogen locomotives.
Valencia	- The port of Valencia is the base for Maersk's trains carrying the goods of Ikea to its Spanish distribution centre. - The port has green projects for its activities but not really focusing on the rail part/operations (like electrification or hydrogen locomotives).

Annex 9 Key elements noted by the different ports interviewed in relation to regulatory framework, policy incentives and rail charging model

Port	Key elements noted in relation to regulatory framework, policy incentives and rail charging model
Aalborg	- Prioritisation of passenger investment over freight is a problem especially as freight was not mentioned at all in the new planned investments. - The port is pushing to be a part of the infrastructure being electrified within 2030. - Private sidings on the corridors could be created as an incentive to use rail.
Algeciras	- National rule foresees a reduction on the port fees/taxes for freight moving through rail.
Göteborg	- Rail development without subsidies (no bonification, no incentives, no rebate).
Hamburg	- The port of Hamburg experienced a difficult situation with DG Competition in 2018. Port railways is financed by track access charges and public funding but according to DG Competition, no public funding is possible as the port of Hamburg is not part of the main rail infrastructure.
Koper	- Prioritisation of passengers over freight is a problem. - Coordination mechanisms at the border are often not efficient enough.
La Spezia	- The port of La Spezia is planning to put in place some incentives to perform railway short-range transport for 7km to the dry port of Santo Stefano Magra. - The port of La Spezia is investing in IT platform helping modal shift thanks to EU funds/projects.
Sevilla	- It is difficult to estimate possible increase of rail modal share due to investments/measures, mainly due to the tough competition in Spain between trucks and trains but also the priority rules favouring passenger over freight transport. - Investments are usually using the EU funds (given the high costs) with a partial financial participation of the port itself.
Strasbourg	- CEF funds are vital for the development of the rail infrastructure. - The border stations and the conditions to access to them are not well defined.
Thessaloniki	- Regulatory framework differs from country to country, or is subject to change, representatives of the port are in contact with the various relevant authorities.

Valencia	- The port is massively investing thanks to EU funds/projects (co-financed by EU). Besides the financial contributions, the participation in EU calls helps in better planning the projects.

Annex 10 Programme and summary of the Multimodal freight conference

Conference organised by ERA and HAROPA port authority in Le Havre, France on 22 June 2022

09:00-09:15	Opening Speech	Jean-Baptiste Gastinne, Deputy-Mayor of Le Havre and Vice-President of Le Havre-Seine Metropole
09:15-09:55	Introduction	Josef Doppelbauer, ERA Executive Director Stéphane Raison, HAROPA Port General Director
09:55-10:00	Video message	Ralf-Charley Schultze, President International Union for Road-Rail Combined Transport (UIRR)
10:00-11:00	Experts Panel I – Rail-ports connectivity	Moderation: Idriss Pagand, ERA Speakers: Laurence Zenner, CEO, CFL Cargo Group Laurent Cébulski, Director-General, French National Rail Safety Authority (EPSF) Eric Champeyrol, Director-General, Naviland-Cargo Daniel Mansholt, Head of Railway Development, Hamburg Port Authority
11:15-12:30	Experts Panel II - Reinforcing the synergies between the railway sector and the ports	Moderation: Cédric Virciglio, HAROPA port Speakers: Conor Feighan, Secretary General, European Rail Freight Association (ERFA) José Rino, Transport Division, European Investment Bank (EIB) Enno Wiebe, Technical Director, Community of European Railway and Infrastructure Companies (CER) Koen Cuypers, Mobility Expert, Port of Antwerp-Bruges
14:00-15:00	Experts Panel III – Combined transport	Moderation: Tommaso Spanevello, HAROPA port Speakers: Turi Fiorito, Director, European Federation of Inland Ports (EFIP) Eric Feyen, Technical Director, UIRR Mickael Varga, Project Manager TAF TSI, ERA Mitchell van Balen, Economist, ERA
15:00-15:45	Conclusions	Karima Delli, MEP, Chair of TRAN Committee Antoine Berbain, Delegated General Director Paris, HAROPA Port Josef Doppelbauer, ERA Executive Director

Opening Speech

Jean-Baptiste Gastinne, Deputy-Mayor of Le Havre and Vice-President of Le Havre-Seine Metropole, opened the conference by indicating that the topic of multimodal freight was an excellent and important topic. Organising it in Le Havre was also a good idea as it is a harbour opened to Europe and a good example of integrated harbour to the city. However, the weakness is the connection to the railway as the transfer from the sea to the railway is not optimal. A new railway connection, funded partially by the European Union with 17M€, was inaugurated 15 months ago which should allow to foster the rail modal share.

Introduction

Josef Doppelbauer, ERA Executive Director, reminded the role of ERA and in particular its role of authority with the implementation of the 4th railway package. He explained the reason to organise such a conference following the one organised in Brussels in 2019. The objective of 90% reduction of CO_2 emissions by 2050 in the transport sector, energy efficiency, resilience of the transport are important topics for which actions are needed. Investments in infrastructure, digitalisation, combined transport will be needed to reach our common objectives. Multimodality, while not new, is clearly one of the challenges of the next years and decades.

Stéphane Raison, HAROPA Port General Director, introduced his speech by saying that the port battle will be won on land. He also mentioned the constant exchanges between ports in Europe and in the world and took the case of Hamburg as an example with more than 1000 trains per week. He reminded the current rail modal share of 4% in Le Havre which is not considered enough. Progress is necessary in this respect because the volume of containers transported is increasing, +13% in 2021, which implies a huge challenge on massification of the transport. If everything goes on road, congestion is guaranteed. He reminded the work done on merging the ports of Le Havre, Rouen and Paris to make one of the first maritime-river port in Europe. Massification is important to reduce the cost of transport while reducing the ecological impact of transport. Modernisation of the infrastructure, bypassing Paris, conflict between freight and passenger trains, combined transport platforms will be the challenges for the years to come.

Video Message

Ralf-Charley Schultze, President International Union for Road-Rail Combined Transport (UIRR), reminded that the evolution of volumes transport by combined transport is positive with an increase of 11% tkm in 2021 and 8,5% of jobs created. The French government has an ambitious plan to increase rail freight with the modernisation and adaptation of the French infrastructure. Multimodality shall be pushed with the internalisation of external costs, energy savings certificate and the development of terminals for both continental and maritime traffic. For UIRR, the objective is to reach zero carbon combined transport to reach the targets of the European Green Deal.

Experts panel I - Rail-ports connectivity

Laurence Zenner, CEO, CFL Cargo Group, briefly introduced CFL Cargo group with 6 companies in different countries (Luxembourg, France, Germany, Denmark and Sweden), many intermodal trains are passing through Bettembourg and the CFL Cargo Sweden is working closely with the port of Göteborg. She explained the difference between the market of the trailers and the market of the containers. CFL Cargo is also particularly working with the ports of Kiel, Rostock and Trieste. To reinforce the links with the harbours, the key factor of success is the network capacity and the optimisation of the management of this capacity with a good coordination at European level. Another important aspect is the craneability of the trailers considering that most of them are not craneable. Consequently, it is often much easier for a customer to choose road only transport. Finally, unexpected events must be managed efficiently. Rail companies must work to convince customers about the advantages of rail transport.

Laurent Cébulski, Director-General, French National Rail Safety Authority (EPSF), explained the French situation for the management of rail operations in ports. In 2007, a rule was developed integrating 7 French ports and two autonomous ports (Dunkerque, Rouen, Le Havre, Saint-Nazaire, La Rochelle, Marseille, Bordeaux, Paris and Strasbourg) to apply the European legal framework. The railway networks in the ports were considered comparable network to the French national network. The ports needed to have the safety authorisation and these 9 ports became infrastructure managers representing approximately 820km of network. All ports were not in the same situation in terms of railway infrastructure but all faced the same rules. During the following controls made by the NSA, it was common to find non-compliances creating frustrations for the ports and the authority. With the 4th railway package, a certain number of exclusions were made possible. A new legal framework adapted to the situation of the ports has been developed simplifying the authorisation process for the ports with the “préfets”, national authorities at local level. This new approach is better adapted and no breach in safety has been detected.

Eric Champeyrol, Director-General, Naviland-Cargo, presented the company active in both the rail and the road markets and the most important statistics. In particular, he estimated to 70M km of road transport avoided thanks to the rail activity of Naviland-Cargo. The road market has actually allowed to develop further the rail activity of the company in a multimodal approach. 80% of the activity is related to the transport of containers and therefore connected with ports’ activities. Road connections are established which can be then switched to rail as a way to attract new customers on rail. The challenge to double rail freight is the capacity of the network so that the infrastructure needs to be prepared to allow increase in rail traffic. This is the right moment to do it considering the low emissions of rail and the price level of fuel. Orléans in France is a good example as it has a huge potential to divert traffic to rail but there is no terminal. The other important aspect is the lack of maintenance and the time it takes to make the appropriate decisions. Another aspect to consider is the work amplitude while a ship will be taken care on 24/7 basis, a train will be with 2 shifts, 5 days per week, leaving a lot of capacity production unexploited. Finally, the difficulty to cross borders is still important despite all the work on

interoperability. It is not reasonable to extend a safety certificate just for one train crossing a border.

Daniel Mansholt, Head of Railway Development, Hamburg Port Authority (HPA), explained how port railway works in Germany. Hamburg port authority is the landlord in the port area and has two contracts with terminal operators: one is to lease the land and the second one is on the connection between the rail infrastructure of the port and the private sidings of the terminals. 160 employees out of 1800 are working for the railway activities in the port. HPA is managing the rail infrastructure with the support on some parts of the activity from DB Netz's staff working on behalf of HPA. In average, the port manages 210 trains daily over an infrastructure of 290 km of tracks and with a rail modal share of hinterland container transport of 51%. With bigger vessels which can generates 40 to 50 trains, the challenge is to manage peak of workload and on the rail capacity. The growth of the rail traffic is sustained through infrastructure developments. Digitalisation is nice but infrastructure is more important. HPA has built parking lots for the locomotives, a locomotive workshop and a diesel and sand filling stations and has a rail port community system with "transPORT rail". Finally, the charging model is key as well with parking charges which have increased and categorisation of the tracks for the charging system with 4h for free to try to keep the turnaround time as short as possible. The rail modal share has increased from 21% to 51% over the last 15 years with important investments and focusing on the customers.

Experts panel II - Reinforcing the synergies between the railway sector and the ports

Conor Feighan, Secretary General, European Rail Freight Association (ERFA), explained that the success of rail freight will depend on its level of synergies with other modes of transport. He made an overview of the state of the rail freight market today with a very diverse and competitive market. He pointed out the fact that among the international new entrants, several are not originally from the railway market like Metrans which is a company from a terminal operator active in the port of Hamburg or Medway which is owned by MSC, a large shipping company. One of the biggest trends is the intermodal traffic originating from ports with a growth level that is quite promising. The rail modal share is relatively low and Hamburg is quite an exception but the potential is there considering those trends. The larger vessels are bringing opportunities for massification. Improving the interoperability of the system, improving the cross-border capacity management and giving the responsibility and planning of operations in the ports' area.

José Rino, Transport Division, European Investment Bank (EIB), informed about the role of the EIB as a public bank of the European Union. The projects Directorate is assessing projects from a technical, economic and environmental perspective. EIB is financing projects both on rail and maritime sectors. The support is generally provided through loans or more complicated structure like guarantees and blending mechanisms (loans with grants from the EU). A large part of the financing is going to rail in the last years. Some years ago, it was on new ports and expansion while now it is more on reorganisation, enhancement of terminals and small expansions as part of green port investments with decarbonisation efforts. The diversification of the hinterland

transport is seen as a main commercial driver for the ports. Most of the ports appraising in the recent years include almost always a component on enhancement of the rail activity. Rail connections to the hinterland are seen as a main differentiator of the ports.

Enno Wiebe, Technical Director, Community of European Railway and Infrastructure Companies (CER), pointed out the direct and indirect impact of the war in Ukraine and Covid 19 pandemics on European ports' activity: volatility of energy prices, cost increase of raw materials and perturbation of the logistic chains. Ports are also more congested with a risk of saturation when the Chinese traffic will recover. The solidarity corridors with Ukraine have also been evocated and the challenge for rail operators to transport Ukrainian grains to European ports and the risk to transfer the congestion even more from the rail network to the ports. In order for the rail network to be able to face those challenges, some technical investments on the network must be done such as adaptation of the network to 740m long train, electrification, new lines and sidings, infrastructure to access ports' terminals and building of intermodal terminals.

Koen Cuypers, Mobility Expert, Port of Antwerp-Bruges, reminded the objective of the port to reach a 15% rail modal share by 2030 while it is currently 7%. Trucks traffic is creating congestion issues in the city of Antwerp and new development in the harbour is considered with suspicion by the local population. Therefore, it must be guaranteed that the development of the port will not generate additional congestion issues. End of 2019, an agreement has been signed between the port of Antwerp, Railport and Infrabel to set the path for reaching the modal share objective. It was explained that in Belgium, the port's rail infrastructure was managed by the national infrastructure manager, Infrabel contrary to what is happening in Germany or in France. The agreement was on 7 pillars: traffic management, tracks capacity, marshalling yards, targeted investments, future proof infrastructure, service facilities with simplified procedures and IT platform.

<u>Experts panel III – Combined transport</u>

Eric Feyen, Technical Director, UIRR, presented UIRR, association of combined transport operators with 45 members. He indicated that tripling combined transport would require a 7-8% annual growth rate which was already achieved between the mid-90's and 2008. Currently, the growth of combined transport is rather positive with +8,15% in total number of consignments and +10,94% in total tkm. UIRR has launched a campaign CT4EU to promote combined transport as an effective solution to decarbonisation, reduction of pollution and congestion, energy independence and to mitigate the shortage of truck drivers in Europe. The situation of combined transport has been assessed and showing that combined transport is 40 to 70% more energy efficient than unimodal trucking alternative and has a 60 to 90% smaller carbon footprint with technologies that are available today. The revision of the combined transport Directive will be a key enabler to support the combined transport development.

Mickael Varga, Project Manager TAF TSI, ERA, presented the EU Regulation of TAF TSI with the standardisation of communication processes and exchange of data and, eventually, to facilitate

the interactions between the different stakeholders on the rail market. The idea is to avoid creating a patchwork of own processed. The level of implementation of the different functions in the Member States has been presented such as company code and train composition.

Mitchell van Balen, Economist, ERA, explained the Agency's contributions in the latest TSI Revision package to overcome interoperability barriers, particularly in the field of combined transport. The measurement and codification of wagons, lines and intermodal loading units is today rather complex because of different norms and practices among Member States and organisations. Because of these different practices, combined transport is often considered exceptional transport which brings an additional administrative burden. The TSI Revision makes that broadly accepted practices and codifications shall be embedded in the EU legal framework, leading to greater harmonisation. By doing so, rules can be set when to consider combined transport exceptional and when not. Finally, a new mechanism to provide information in RINF on combined transport gauges will be developed and an application guide will be produced to clearly explain the impact of these changes for the sector.

Turi Fiorito, Director, European Federation of Inland Ports (EFIP), reminded that inland ports are always at the crossroad between road, inland waterways and railway so multimodality is a core activity of an inland port. The goal is to prepare the European transport network to keep it competitive and to make it more sustainable. The system has faced a lot of shock in the last 2-3 years between droughts making navigation more difficult, Covid and the war in Ukraine. An important aspect that is worth mentioning in this context is the resilience of the transport system. The best way to make any system resilient is to multiple the fallback options and multimodality is then key. On the revision of the combined transport Directive, there are two major points. The impact of a multimodal chain shall be considered from a holistic perspective. The combined transport Directive scope could be extended to cover the full scope of multimodality.

Conclusions

Antoine Berbain, Delegated General Director Paris, HAROPA Port, affirmed that we already have the transport of the future as each time rail is used to transport goods, we already are in 2050. Developing multimodality is really harbours' priority. All authorities whether local, national or European and all stakeholders will have to work together to achieve the European objectives. Renovating and modernising the infrastructure, developing multimodal terminals, management of rail paths are among the important tasks that will need to be undertaken in the years to come.

Josef Doppelbauer, ERA Executive Director, on the road to zero-carbon transport, stressed that actions are needed now as we cannot lose any more time. The case of Hamburg demonstrates that it is possible to achieve a high rail modal share. In our context, the infrastructure development is the most important action to take considering the need of technical and operational interoperability and resilience.

Karima Delli, MEP, Chair of TRAN Committee, informed about the mini-plenary session on Fit for

55 package at the European Parliament. The objectives of neutral carbon economy have been reminded while the transport sector is the only sector seeing its emissions increasing. Rail freight emits much less than road freight which is one of the reasons to promote it. A joint declaration has been signed by 16 Member States to increase the rail modal share. It is more than time to change our model in a pragmatic way. Now, the political willingness and commitment of Member States is needed. We need more than 16 Member States, all the other Member States are needed. Clear and ambitious objectives are needed with 30% of rail freight modal share by 2030. Major investments favouring rail are needed and Member States need to act.

The full conference is available on ERA's YouTube channel: Conférence sur le fret multimodal - 22 Juin 2022 and the presentations of the different speakers on ERA's website: Multimodal Freight Conference.