FORUM TRAIN EUROPE

Freight Terminals Report

From the research on
Integration of service facilities into the capacity management process

DRAFT version 0.3

Versioning

Version	Responsible	Date	Description
0.0	Giuseppe Miccoli	18 July 2023	First draft based on interviews and desk research.
0.1	Sebastian Carek	31 August 2023	Review of the draft, incorporation of further data collected and input from the FTE WG Freight.
0.2	Radovan Tegdes Meret Dörflinger	18 November 2024	Review of the draft, minor adjustments.
0.3	Sebastian Carek	23 December 2024	Review of the document, incorporation of data from further interviews and draft publication.

Important notices

Disclaimer: This draft research report is a collection of evidence from railway stakeholders and independent desk research. FTE does not take any responsibility for the correctness and accuracy of the input provided by the stakeholders, especially in the conducted interviews. This document also does not represent an officially endorsed document by FTE statutory bodies, same as the indicated suggestions do not represent the opinion of all FTE members.

Acknowledgement: The FTE community would like to express many thanks to all volunteers from the Railway Undertakings, Infrastructure Managers, Rail Freight Corridors and Service Facility Operators for their contribution and ongoing cooperation in the research.

Management summary

Freight terminals (hereafter terminals) are currently not well integrated and aligned with the rail capacity management processes and thus pose many challenges that have far not been sufficiently tackled by the railway sector, with negative consequences on the terminals, Railway Undertakings (RUs), Multimodal Transport Operators (MTO) and Freight Forwarders (FF). This has been recognised by the EC and partially reflected in the proposed new Regulation on the Use of Rail Infrastructure. The FTE members initiated research to map the gaps and best practices, to support the sectoral standardisation which reflects the market needs. This document is a first draft report from this research (research to be continued) with a focus on the terminals. The report highlights namely:

- suggestion to better involve terminals´ needs into the long-term planning of the IMs of the infrastructure investments, Temporary Capacity Restrictions, but also planing railway capacity/paths from/to the terminal in a balanced way and in market attractive times.
- need to improve the reliability and availability of information from the relevant terminals that are important for the planning and production purposes of RUs and MTO/FFs.
- need for better coordination of rail paths and terminal slots allocation between the IMs and relevant terminals, including digitalisation.
- the low interest in an integrated terminal and path offer, caused by the fact that different stakeholders are predominantly requesting the rail paths (RUs) and terminal slots (MTO).
- Annual Timetable process when paths are requested 8 to 20 months prior to the train run is too rigid for the market needs. It is difficult to align realistic paths/slots that much in advance, especially since customers and other modes of transport such as ships

require much more flexible schedules. More innovative and market-responsive process in railways is needed – more in the ad hoc mode.

- Role of shunting from the last IM´s station to the terminal, and the importance of internalisation or better coordination of the shunting by the terminals.

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1. Aim and scope of the research

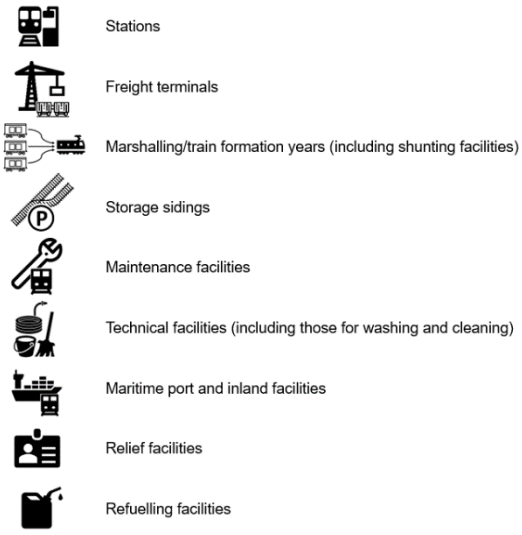
In the beginning of 2023, the FTE Working Groups *Passenger* and *Freight* encouraged the research on the Service Facilities, since their coordination and integration into the capacity management processes is needed for the future to increase the quality of rail services and their competitiveness. Service Facilities (hereafter SF) are certainly inseparable elements from the production planning and rail transport operation.

The topic of SF is a very complex one and desires long-lasting research, followed by a higher EU-wide standardisation based on the detected best practices. Higher integration of SF into the capacity management is prescribed in the proposed EU Regulation on *Use of Railway Capacity* (hereafter Capacity regulation*)*. Nevertheless, the level of detail in the regulation is very low, leaving high freedom to the sector to define its own standards. This FTE research aims to contribute to the envisaged standard definition by analysing SF from different angles, detecting market needs and providing suggestions.

The first published version of the report (v0.3), is based on the desk-research and several semi-structured interviews conducted with railway stakeholders. Due to the topic's complexity, we focused first on stakeholders active in Italy and Slovenia. We were also directed by the interviewees to some issues and best practices from other countries, however, this limitation must be considered by the readers. The freight terminal report is the second after the storage which is published. Once the resources are available, we aim to extend the research to other SF types and existing ones with experience from more countries. You can track updates on the research development on the FTE dedicated page: https://www.forumtraineurope.eu/services/capacity-activities/service-facilities.

2. Types of service facilities

There are numerous types of rail-connected service facilities (note also alternative term: rail-connected facilities), each with its own relevance for passenger and/or freight undertakings. Below, some of the most important rail-connected facilities as defined by the European Union in the Single European Railway Area (SERA) Directive are listed:



3. Research report on freight terminals

"Freight Terminal" (hereafter shortened to "terminal") service facility type is crucial for the business of freight RUs. A typical rail freight transport starts and ends at terminals they connect rail with other transport modes, such as road or maritime and they are used to (un)load goods.

3.1. Definitions and stakeholder relations

3.1.1.Logistic operator

In the topic of terminals, it is crucial to highlight the role of the logistic operators. This category includes the Multimodal Transport Operator (MTO) and the Freight Forwarder (FF). Both MTO and FF facilitate the movement of goods and the difference is not always strict. In general, MTOs take on greater responsibility for the entire transport process across multiple modes under a single contract including full responsibility for the goods. Whereas FFs primarily act as intermediaries to arrange transportation services via multiple logistic service providers without ownership of any transportation assets and with only limited liability for the goods. For the purpose of this research, the difference is not relevant, thus the word 'MTO' will be used for both.

Key information about MTO:

- Is the actor with the broadest view of freight transport in the chain.
- Has relations with most of the actors involved.
- For most of the traffic, the MTO is the head of transport planning.
- Organises the transport with the different actors involved and is the actor mainly dealing with terminals.
- Is the actor who finances the transport, and the one who deals with the final (non-rail) customer.

3.1.2.IMs final station

In ultimate number of cases, the train paths are allocated to RUs by IMs from/to the IMs final station (also referred to "IM´s terminal"). These final stations are:

- Are usually not in or just next to the terminals, the usual difference is a few kms.
- Are the place where the responsibility shifts between actors. For instance, the shunting company takes over the train/wagons for the last miles to the terminal.
- Are often used as storage siding in case of a mismatch (time difference) between the rail path and the terminal slot. More typically this is not in the planned timetable but caused in operation (e.g., delay).

Some RUs reported encountering considerable difficulties in gaining access to IM´s final stations because of:

- Shortage of capacity availability.
- Lack of IMs ability to competently manage the capacity (on top of the already existing shortage of capacity).

3.1.3. Shunting company

The role and importance of shunting companies has been stated by actors in numerous interviews. The shunting company is the actor which takes over the train/wagons from the IM´s final station to the terminal and back. The shunting company can be:

- External: An independent company that organises shunting services for instance for bigger terminals.
- Internal: The shunting company owned by the terminal operator.

3.2. Long-term planning

3.2.1. Ownership

Terminals are owned by various entities, including RUs, holding companies (also including the IM and incumbent RUs), regional entities, and private actors. There is a certain relationship between the size of the terminal and ownership with the level of involvement into the capacity management processes.

The RU-owned terminals are supposedly open to other RUs; however, they are often utilized exclusively by the owning RU.

3.2.2. Terminals involvement in the IM long-term planning

The competitiveness of the terminal is heavily influenced by its connection to the railway network and the possibility of acquiring suitable rail paths. The lack of capacity or interrupted connection to the network might result into extensive negative economic impact on the terminal and lost investments.

The cooperation between terminals and IMs is necessary, in order that the IMs´ network to develop and expand in a way, to offer sufficient capacity on the tracks to reach the terminal. While the terminals shall share their plans and predictions with the IMs, the IM shall react and adjust their investment plans in case non-terminal traffic (e.g. passenger traffic) grows and endangers the quantity and quality of the capacity for freight trains running to the terminal.

A negative illustrative example is the terminal of the company Metrans in Dunajská Streda (Slovakia). The intermodal terminal was opened in 1999, and it is connected with the RFC line via mostly single-track network with limited sufficiently long passing loops. Since 2013, the demand for the regional passenger traffic on the feeding line has significantly increased, which limits the needed capacity for the freight trains, and has displaced the available train paths to unsuitable times (affecting the costs of the terminal). Despite this, as of 2024, the IM has not initiated the upgrade of the infrastructure to serve the needs.

Where relevant, the coordination with the terminals is needed at the international level, not only national level. For instance, when the Port of Antwerp announced its vision and investment plan in 2021 for 2030, it is necessary that not only the IM in Belgium reacts, but also the IM in the Netherlands.

Most of the interviewed actors stated that the involvement of the terminals into the long-term planning of the IM is limited, not structured, and happens only in specific situations and upon the IMs´ demand. It was observed that the stronger position have the terminals owned by the

RUs, because in many countries the RUs are informed/consulted on IMs´ plan, and the RUs can represent the needs of the terminal.

When long-term planning occurs	
Italy	Terminals are considered in case of: • Creation of a new terminal that must be connected to the national infrastructure. • A significant upgrade of the terminal. When terminals would like to safeguard multi-annual priority in allocation of capacity, they might enter with the IM to a Framework Agreement. It happens that an MTO, which also has terminals, to preserve their business, agrees with the IM through a framework agreement. This is useful as terminals can plan capacity in a several-years-time-horizon.

3.2.3.Terminals and TCR planning

Terminals and Temporary Capacity Restriction planning	
Italy	There is a regular exchange between IM and RUs between January and March. Currently, terminals are not involved (their needs are brought up by RUs or MTOs), but the IM stated the plan to also involve them in the future. With this involvement, terminals will be able to provide input and feedback in the planning of TCRs, for instance, to plan track maintenance in summer when the demand for terminals is lower.
Slovenia	Since 2022, the IM has organised meetings once or twice per year with terminals (but without MTOs) to discuss long-term TCR planning with a time horizon of one or two years. The main advantage of these discussions is the alignment with the market, including the terminals' needs. This allows the IM to receive prediction when less cargo is expected at the terminal, to plan TCRs in this period.

3.2.4.Multi-annual capacity allocation

Formally, there are no multi-annual contracts for the slots at the terminal, same as train paths are assigned to RUs for one timetable period.

The interviewed MTOs stated that the paths are predictable and stable. One highlighted that 70% of their demanded timetables between their terminal are the same for the last 20 years, however, each year they and the contracted RUs have to request paths constructed from scratch. The MTO stated ability to predict ultimate majority of the needed path for the horizon 5-8 years. The only reported country where terminals (or MTOs) are able to secure capacity on the track is Italy, where the terminal can sign multi-annual Framework Agreement (FA) with the IM, accepting financial penalties in case of not sticking to the contracted volumes. However, the value of these FAs is undermined by the fact, that the trains mostly run between terminals in different countries, and the FA secures capacity only in Italy and not in the other countries of the train run. Moreover, if due to e.g. TCRs the consecutive national paths are not

constructed (e.g. in Switzerland, Germany), the MTO fails to order contracted capacity via FA in Italy and will have to face financial penalties despite the cause is by another IM.

3.3. Allocation of rail path and terminal capacity

3.3.1. Responsibility for the terminal slot

It has to be highlighted that the responsible entity over the slot in the terminal is often different than the entity responsible for the train path. From 7 interviewed RUs, only 1 reported that is directly in charge of terminal slots. This means that predominantly the MTO, who arranges terminal slots since it as well organises other modes of transport.

If the MTO is the planner of the traffic, the RU is only in charge of the transport on the railway line and not of the terminal slot. The information about the terminal slot (timing) is a mere input from the MTO to the RU planning.

One thing that stood out during the interviews with RUs was that the interviewees referred to the MTO as the "customer". The fact that RUs use this term for the MTO shows for this dedicated share of the traffic, the terminal slots-related processes are perceived as a requirement to satisfy, as the responsibility for the commercial traffic is in the MTO's hands, as well as the task to organise terminal slots.

Who is responsible for terminal slots?	
RU	**MTO**
• The RU is the transport leader[1] • Usually in cases when the terminal is owned by the freight RU • Typical for transport in small terminals	• The MTO is the transport planner[2] • The MTO oversees arranging also other transport modes (lorries or ships) • Typical for transport in large terminals

During the interviews, a specific question was asked: "*Do you think it might be more useful if the RU, rather than MTO, arranged the terminal slots?*"

- It is believed that it depends on the type of traffic and contract.
- Most of the RUs interviewed believe that a change in the responsibility of requesting terminal capacity might be challenging.
- If the RUs were to take on the task of requesting capacity in terminals in all cases, it would require overseeing the handling of goods including communication with the lorries, and other related tasks. This they currently do not do, despite the MTO might be a company within their ownership structure (e.g., logistic/FF sister company), being an “internal” customer.
- This shift would necessitate the inclusion of the final customer's needs in the planning process, which is presently not accounted for.

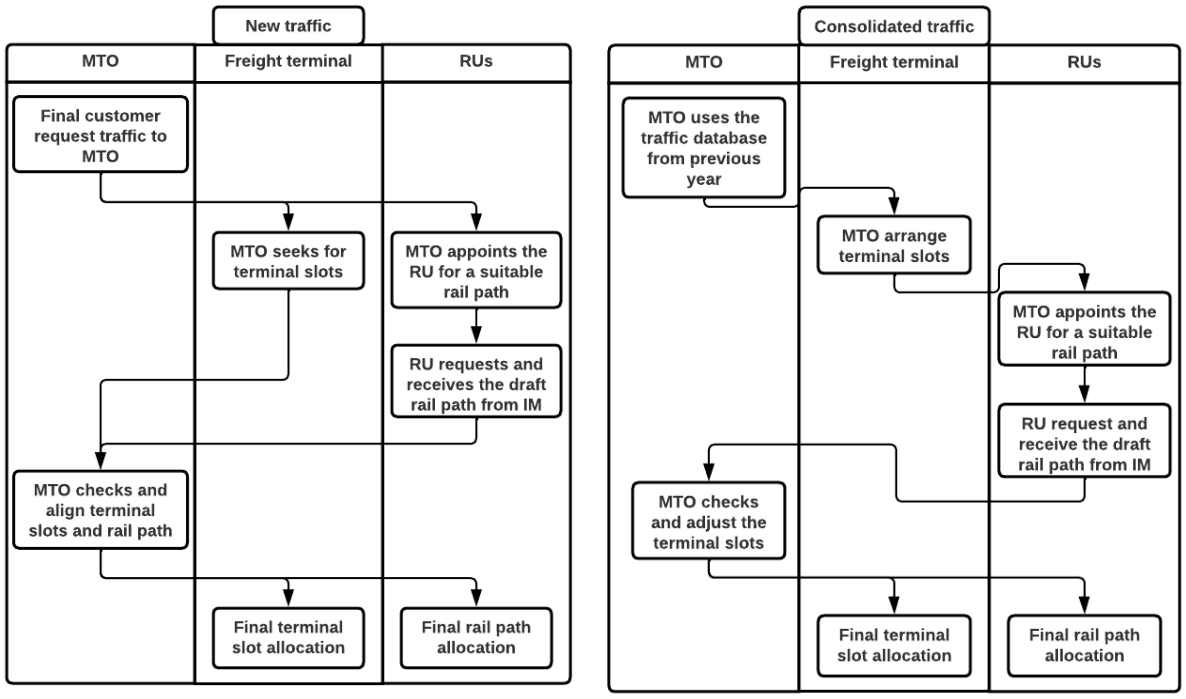
Therefore, the interviewed RU representatives call for better alignment of terminals, but they do not prefer to be directly involved in the organisation of terminal slots.

[1] A RU is a transport leader if it plans the entire traffic.
[2] In case the MTO is the transport planner, it finances the transport, has contact with the final customer, organises all modes of transport and entrusts the RUs for the rail transport (rail path request).

3.3.2.Terminals and the annual timetable

In case the path and the terminal slots are independent, it was important to investigate what is the sequence of the process. The figure below illustrates the process diagram of how an MTO arranges terminal slots and rail paths. The sequence is different whether the traffic is of a new concept, or it had to be confirmed from the previous year (consolidated).

It is important to note that in this use case, the MTO is the sole entity responsible for arranging terminal slots in both cases. Terminal slots are the first and last pieces of information necessary for the planning process and the rail path is planned around the terminal slot's parameters.



The deadline to request rail paths in annual timetable (ATT) is currently eight months prior to the annual timetable change (X-8). Nevertheless, at this moment RUs rarely have certainty about the needed timetable, even if they already have contracts with the MTO or customer. However the rigid process forces them to place the request, to safeguard capacity for their needs, since the capacity leftovers from ATT are not of suitable quality to serve the customers. This problem is believed to change from 2030 by the new Rolling Planning process.[3]

As results, some of the IMs stated that they receive:

- Path requests that are afterwards subject to change once the terminal slot is fixed.

[3] More information available: https://forumtraineurope.eu/services/capacity-projects/multi-annual-capacity-products

- Duplicated path requests from different RUs to request rail paths for the same commercial traffic. Considering that the MOT has not selected yet which RU will be responsible for the transport.[4]

What IMs do to prevent duplicated path requests	
Italy	The IM requires rail path applicants to submit a document called a *Commercial Agreement*, in which RUs are asked to prove that the rail path has a compatible terminal slot. This document must be submitted in July/August (before the final allocation of rail paths). It states the acceptance of the RU in the terminal, proving that the RU has the right to use a slot in the terminal related to the rail path requested. If this document is not submitted within the deadline, the railway path in ATT is not allocated. A more detailed assessment of this instrument is in the annexes.
Slovenia	The freight transport in Slovenia is mainly international. Therefore, the IM also checks train paths abroad and can detect duplicate paths (for instance only consecutive path in the neighbouring network). Then, the terminals and RUs must prepare a document, which describes the technological process. It includes all the regular trains and their access to terminals, e.g. the tracks used, and the time planned in the terminal. The IM does not allow the RUs to use rail paths in ATT if RUs do not submit this document. Moreover, the rail path allocation is not affected by the capacity of terminals since the IM does not check the capacity in terminals before the allocation to RUs.

In September/October, in both countries, the RU, shunting (if an internal company), IM, MTO, and the terminal hold a meeting to discuss the timetable. The meetings aim to align the rail path requests already submitted with the needs of the shunting company and terminals (the final allocation of rail paths takes place after this meeting). If the final allocated path is incompatible with the original terminal slot, two possible solutions may be possible:

- The terminal is willing to adapt the slot according to the final allocated path.
- The paths allocated to different RUs are exchanged in order that each RU has a path compatible with the obtained terminal slot.

3.3.3.Terminals and ad hoc

The interviewed terminals expressed preference when MTOs/RUs place long-term terminal slot requests (e.g., up to one year), rather than short-lasting ones. The desired minimum time wished by terminals is 1 month in advance, as it is considered as the minimum time to effectively organise the terminal's operation and better arrangement of operations (performing capacity simulation assessments).

On the other hand, ad hoc requests for rail paths were more preferred by the interviewed RUs, with the reason of higher flexibility and simplicity.

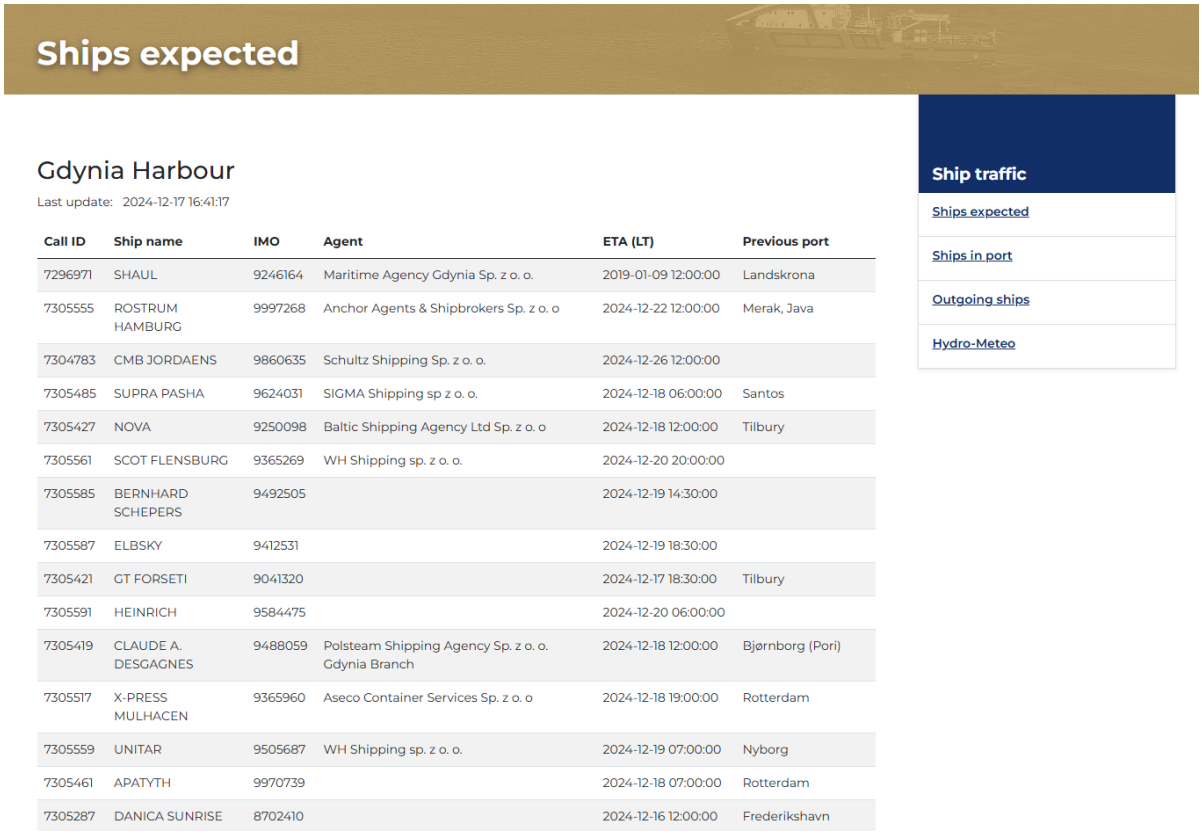
[4] This does not mean that there is an ongoing tender from the MTO, the MTO might have framework contract with several RUs and later decided which volumes are ordered from which RU at what time.

When the cargo is moved between a ship and trains, the MTOs (customers of the RUs) need flexibility, even if regular ATT paths are allocated to RUs. This is due to the stability of the maritime schedule and the organisation of the work in the port terminal (loading). In general, large ports tend to fix the schedule 2-3 weeks before the (un)loading, in this horizon the ship arrival is well predictable, and in the large ports usually all the cargo on the ship is unloaded. The smaller ports seem to not be the final destination of all the cargo on the ship, thus despite the ship's arrival being known in advance, the MTO does not always know when exactly the selected cargo is ready to be loaded on trains, thus requiring changes in the very short-term.

In the ad hoc regime, most interviewed IMs expressed that have mainly no information on whether the request is coordinated with the terminals, it is left to the RU or MTO to ensure compatibility at their own risk.

Experience from Poland, Romania and Greece provides insight into other practices.

Coordination between the terminals and rail path in ad hoc	
Poland	In Poland, the MTO is responsible for securing the port terminal slot first. The terminal slots' occupation statuses (terminal timetable) are transparently available, with all MTOs visible. When an RU requests an ad hoc rail path in ATT, they must insert a mandatory code (e.g. of Picture 2: column VISIT) that affirms the competent MTO has booked the compatible terminal slot. The IM uses this code as an identification reference for the traffic, allowing them to be aware of the time of the slot, serving as the anchor point for path construction. The IM also in case of path alterations (e.g., due to TCR) aims to provide a path that allows the usage of the terminal slot. by this, they construct the rail path even if paths change. The port timetable is depending on the port available publicly or behind a login. In case more RUs are contracted to (un)load the cargo, the MTO coordinates short-time which RU takes which cargo from/to the ship. If the allocated paths do not fit the MTO plan, the RUs agree on the "exchange" of the paths between themselves first, and afterwards inform the Polish IM to make the respective re-allocation / alteration.
Greece	One of the interviewed MTOs requests the services from the RUs only on the ad hoc basis, even just a day or two after the ship´s arrival. Despite the MTO knowing the ship's arrival usually 2 to 3 weeks in advance, it cannot predict the terminal operations, so does not know the exact day (e.g. if Tuesday or Wednesday) when the train should start taking over the cargo. However, once the transport starts, there are usually up to seven days of full trains departing from the harbour. The request from MTO to the RUs is done in the short-term, but the RUs have already the paths allocated in the ATT. This is because the RUs have experience with the traffic and serve large volumes of goods over the year, thus RUs are predicting the traffic patterns and pre-booking the national path from the port in Greece already in ATT – e.g., daily path at the same time.
Romania	IT system of the IM called ICOM includes the largest port of Constanța. An RU places a request for the terminal slot and rail path together. The port is the first to assess the request, and the IM waits until the port allocates a slot. Afterwards, the IM constructs the path and does the complete allocation.



Ships expected

Gdynia Harbour

Last update: 2024-12-17 16:41:17

Call ID	Ship name	IMO	Agent	ETA (LT)	Previous port
7296971	SHAUL	9246164	Maritime Agency Gdynia Sp. z o. o.	2019-01-09 12:00:00	Landskrona
7305555	ROSTRUM HAMBURG	9997268	Anchor Agents & Shipbrokers Sp. z o. o	2024-12-22 12:00:00	Merak, Java
7304783	CMB JORDAENS	9860635	Schultz Shipping Sp. z o. o.	2024-12-26 12:00:00	
7305485	SUPRA PASHA	9624031	SIGMA Shipping sp z o. o.	2024-12-18 06:00:00	Santos
7305427	NOVA	9250098	Baltic Shipping Agency Ltd Sp. z o. o	2024-12-18 12:00:00	Tilbury
7305561	SCOT FLENSBURG	9365269	WH Shipping sp. z o. o.	2024-12-20 20:00:00	
7305585	BERNHARD SCHEPERS	9492505		2024-12-19 14:30:00	
7305587	ELBSKY	9412531		2024-12-19 18:30:00	
7305421	GT FORSETI	9041320		2024-12-17 18:30:00	Tilbury
7305591	HEINRICH	9584475		2024-12-20 06:00:00	
7305419	CLAUDE A. DESGAGNES	9488059	Polsteam Shipping Agency Sp. z o. o. Gdynia Branch	2024-12-18 12:00:00	Bjørnborg (Pori)
7305517	X-PRESS MULHACEN	9365960	Aseco Container Services Sp. z o. o	2024-12-18 19:00:00	Rotterdam
7305559	UNITAR	9505687	WH Shipping sp. z o. o.	2024-12-19 07:00:00	Nyborg
7305461	APATYTH	9970739		2024-12-18 07:00:00	Rotterdam
7305287	DANICA SUNRISE	8702410		2024-12-16 12:00:00	Frederikshavn

Ship traffic

- Ships expected
- Ships in port
- Outgoing ships
- Hydro-Meteo

Picture 1: Port of Gdynia - expected ships

Train calendar

Data | Train calendar last updated: 22.12.2024 14:59

VISIT	ETA	ETD	SERVICE
SA02W51-24_IMP	21.12.2024 00:01	21.12.2024 06:00	ATC CARGO
SA02W51-24_EXP	21.12.2024 00:01	21.12.2024 06:00	ATC CARGO
SA06W51-24_EXP	21.12.2024 06:00	21.12.2024 12:00	LOCONI - Radomsko
SA06W51-24_IMP	21.12.2024 06:00	21.12.2024 12:00	LOCONI - Radomsko
SA05W51-24_EXP	21.12.2024 06:00	21.12.2024 12:00	SPEDCONT
SA04W51-24_EXP	21.12.2024 06:00	21.12.2024 12:00	PCC

Picture 2: Port of Gdańsk, booked terminal slots with MTOs for trains

3.3.4. TICO (Terminal Integrated Capacity Offer)

TICO is a product offered by the Scandinavian Mediterranean Rail Freight Corridor, which aims to integrate freight terminal slots into the rail path allocation process on the RFC in Europe[5]. The main concept is that the RU can request:

- For some terminals the free terminal slots from the RFC
- For some terminals the coordinated rail path (Pre-arrange path - PaP) and a compatible terminal slot together in one IT platform.

The RFC confirmed that the usage of TICO was at the moment of the interview negligible and started to investigate the reasons. The question on TICO was included in the interviews with RUs active on the particular RFC. The results were that only 7% of rail actors knew what TICO is and only 20% heard the word before.

The concept of TICO caught the interest of most of the interviewed RUs/MTOs. RUs stated they rarely oversee the request for the terminal slot. Two options (not mutually excluding themselves) were mentioned and can be investigated:

- Option 1: The MTO may be the applicant of TICO, when it is the head planner of transport.
- Option 2: RUs request TICO and sell the complete product as a service to MTOs. However, this would be possible only if TICO includes traction, shunting, and handling of goods to/from the terminal.

3.3.5. Alignment of the shunting services

To have a seamless transport it is necessary to align not only the rail path with the terminal slot but also to safeguard the shunting company that will move the train/wagons between the IMs' final station and the terminal. In case the shunting company is not available at the given time, the business experiences negative economic impacts (RU´s resources wasted) and the scarce capacity of the terminals and IMs´ final stations are not used in an optimal way.

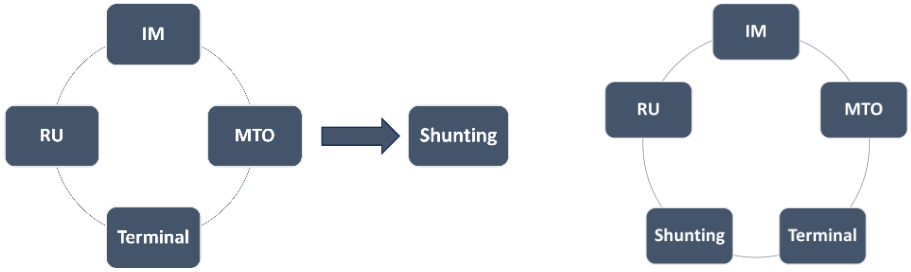
It was reported that the shunting company is the chain actor that is the most sensitive to train delays and which usually organises itself in the shortest planning time horizon. This does not match with the planning in ATT. The RUs reported that it might be almost impossible to have a contractual confirmation of shunting availability in April of the year preceding the transport (X-8). This is considered an additional obstacle for ATT planning because the rail path and the terminal slots can be compatible, but the shunting company in the end may lack the resources to place a request. This is particularly critical in large terminals and terminals with limited parking capacities.

Two different types of shunting companies and patterns were identified in the interviews:

- External shunting
  - The company usually has no access to the planning until upstream stakeholders reach a final agreement.
  - The availability of the shunting company is only considered after the other stakeholders reach a consensus.
  - A new agreement needs to be found if the shunting is not available at the planned moment – causing also short-term changes.

[5] More information about TICO on this website: RFC 3 - TICO

- Internal shunting – For instance owned by the terminal. The company is involved in the planning from the beginning.



External shunting *Internal shunting*

Italy	Most of the interviewed terminals in Italy reported a proactive role of the terminal. There are meetings (round tables) that take place to discuss the feasibility and alignment of commercial traffic involving IM, SF, RU, MTO, and shunting. Thus, shunting is involved from the beginning and in most cases also internal.

In the interviews, the MTOs and RUs were asked why not to include the external shunting in the coordination from the beginning. While MTOs would predominantly support their integration, the RUs are predominantly of the opposite opinion. The reason is that if they are part of the coordination, it increases their power to influence the overall timetables. The coordination of the international freight paths and even the alignment with the terminal slots is already considered very difficult. The RUs with this opinion highlighted that they would not prefer that the shunting companies responsible over the last mile jeopardise the long international rail paths.

3.4. Operation and after-allocation processes

3.4.1. The processes and communication on the running day

The interviewed stakeholders had the opportunity to raise any issues they face in the operation.

- Train delays e.g. due to IMs (TCRs): A delayed train arrives at IM's final station but because of the delay, the terminal slot is missed. The next slot does not allow the RU to use the allocated path from the terminal (because the cargo will not be loaded at that time) and to reach the next day the border (interchange-point) to hand-over the wagons. Negative impacts include:
  - Path cancellation fee, in case the RU decides to wait for the slot and then requests a new path in ad hoc. IMs should consider the associations between the train paths, and the fact that the associated path is cancelled because of the delay compared to the first path.
  - Parking fees, in case the RU must park the train at IMs´ sidings until the next slot.
  - Extra costs and undesired single loco runs. The next port slot available might be in a few days. The RU already planned to have the cargo brought to the border (interchange point) to hand-over the wagons to another RU. Thus, it is expected that the loco will be able to pick up another set of wagons from other

transport. In this situation, the RU must run an extra single loco to the interchange point to pick up the goods, that should have been originally taken over by the planned transport.

- Missing live position: Some IMs do not provide the live position of trains. The RUs have to solve the problem by installing of own GPS locators on the wagons.
- Difference between the plan and operation: the stakeholders experience significant differences between planned and operation timetables. The Railway Market Monitoring[6] states that 47.4% of freight trains arrive with a delay of under 15 mins. However, the MTOs and RUs reported very long delays, depending on the length of the train path and involved countries. One of the MTOs stated that the median delay of the freight trains they order from RUs is 14 hours.

4. Recommendations

4.1. Suggestions for detected issues

The preliminary suggestions for international standards are listed in this chapter. Note that some of them would require more discussion within the dedicated working groups and/or further research. Some of the suggestions come directly from the interviewed stakeholders and might not be discussed in depth in this report.

Long-term planning	
Problem	**Suggestion**
The rail paths to terminals are not balanced.[7]	Plan as many balanced rail paths as possible. This would promote efficient terminal operations.
The terminals are not always involved in the investment and TCR planning.	Regular involvement of terminals, so that they can provide input and feedback in the planning of TCRs and investment.
Many TCRs affect negatively the economics of the MTOs and RUs.	The IMs when planning TCR should also consider the impact of the TCR on MTOs and RUs.

Further suggestions from a comprehensive point of view:

- Some terminals stated that their tasks can be performed in less than 12 hours (receiving, unloading, loading, and departure). Currently, terminals do not operate two different trains per track each day (which is desired) because RUs are not able to get suitable rail paths. Therefore, for busy lines, it might be investigated the importance of symmetric rail paths for freight RUs e.g., every 12 hours.

Capacity Request and Production Planning

[6] Eighth monitoring report on the development of the rail market under Article 15(4) of Directive 2012/34/EU of the European Parliament and of the Council: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023DC0510

[7] A balanced rail route is the scenario where the rolling stock always travels between the same two destinations, e.g. Rotterdam <–> Cologne.

Problem	Suggestion
Some IMs publish catalogue paths too late (e.g., in March). This is too late for the MTOs to analyse them and discuss the traffic concepts with contracted RUs ahead of the ATT path request deadline.	European rules and regulatory oversight over the IMs that the Capacity Supply Plan is published at the latest in January of the preceding year.
RUs are pushed to plan rail paths already 8 to 20 months ahead, while other stakeholders do not have to and are more flexible.	Increase the flexibility of railways by reservation of capacity of sufficient quality to serve later needs.
Inefficiency and the need for many employees at the terminal, due to extensive manual and paperwork.	Need for digitalisation especially at the relevant terminals and available funds to afford the digitalisation of terminal processes and requests towards the terminals.
Unavailability and or unreliability of the information published by the terminals that is important for the planning.	Need for digitalisation especially at the relevant terminals and available funds to afford the digitalisation of terminal processes and requests towards the terminals. Stronger regulatory oversight on the relevant terminals e.g., by the Regulatory Bodies.

Further suggestions from a comprehensive point of view:

- It is important to effectively define the terminals which shall be obliged to provide and regularly update the information. A bureaucratical burden shall not be exposed on e.g. small terminals rarely used or used by a single (even in the same ownership) RU. The FTE Working Group Freight suggests an obligation to publish and keep up to date the information by:
    - Terminals owned by the IMs
    - Terminals used by more than 5 trains per day

Capacity allocation	
Problem	**Suggestion**
IMs mostly include the availability of only the IM's final station in the rail path allocation.	IM should include relevant terminals in the coordination and the path allocation, this could reduce the later changes or allocation of incompatible paths.
The constraints of the terminals are represented towards the IMs only through the RUs or MTOs.	Relevant terminals should be involved into the path coordination and allocation process. The processes shall be digitalised.
If the shunting company is external, their necessities are included in the planning too late.	The closer integration of the shunting company with the terminal (not necessarily from the ownership point of view).

Further suggestions from a comprehensive point of view:

- Shunting companies and freight terminals must work closer together since their work is interconnected. Misalignment between the terminal and shunting must be solved internally and their feedback for traffic must be provided together. Moreover, in round tables for alignment of traffic, they should be represented by the same actor, to provide

unified feedback. The closer cooperation between terminals and shunting would force the shunting company to plan more in the long-term, satisfying the suggestions from the interviews that the shunting company's planning time horizon is too short.

- It is important to effectively define the terminals which shall coordinate with the IMs the capacity allocation process. There is no need that small terminals to maintain the relationship and have to integrate IT solutions. The FTE Working Group Freight suggests an obligation to cooperate with the IMs on the capacity allocation for:
    - Terminals owned by the IMs
    - Terminals used by more than 15 trains per day

IT tool

The RUs and IMs interviewed stated that there is a need for digital communication that enables to get the relevant information from the terminals:

- Information must be up to date, and updated frequently. If not, the tool will be perceived as incomplete and unreliable and not used by the stakeholders (as it is for Rail Facility Portal).
- Not only the static information (type of terminals, the number of tracks) but also the scheduled occupation of tracks (e.g., occupation for the next two months), including planned maintenance work that will impact the availability of slots in the terminals.
- For operational needs, the IT tool must also include the availability of real-time capacity in the terminal, e.g., a traffic light representing the capacity available in terminals.
- A transparent live location of every train moving on the infrastructure. If the IMs are not able to provide it, then GPSs must be installed on all trains.

4.2. Suggestions for further research

Here is a list of problems that can be tackled more in-depth in the future:

- TCR and long-term planning. Especially, how the IM can effectively involve the freight terminals' needs in TCR planning and in long-term infrastructure development.
- The most of the interviewed RUs/MTOs were selected based on the fact whether they have traffic either in Italy and or Slovenia. Despite they stated examples also from other countries, further European countries should be examined, since they can have different freight terminal processes and potentially new examples of best practices
- Obtaining additional feedback from terminals, particularly ports that handle maritime transport, can be valuable. This is particularly important because these ports are often identified as having a higher number of associated issues or challenges.

5. Annexes

5.1. Table of abbreviations

ATT	Annual Timetable
FF	Freight Forwarder
IM	Infrastructure Manager
MTO	Multimodal Transport Operator
NS	Network Statement
PaP	Pre-arranged Path
RFC	Rail Freight Corridor

RFP	Rail Facility Portal
RNE	Rail Net Europe
RU	Railway Undertaking
SF	Service Facility
TCR	Temporary Capacity Restriction
TICO	Terminal Integrated Capacity Offer
TT	TT TimeTable

5.2. Interviews

The railway stakeholders were interviewed to gather the necessary input and experience. The table below shows the number of interviews conducted per stakeholder type.

Topic	RU Freight	RU Passenger	Terminal	MTO	IM	RFC
Freight Terminal	10	/	5	3	5	2

In the second step, the findings were discussed with the FTE Working Groups Freight (19 representatives of FTE members), who provided further input.

5.1. References

- EU EUR-Lex: Eighth monitoring report on the development of the rail market under Article 15(4) of Directive 2012/34/EU of the European Parliament and of the Council: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023DC0510
- EU EUR-Lex: Proposal for a Regulation of the EP and the Council on the use of railway infrastructure capacity in the single European railway area, amending Directive 2012/34/EU and repealing Regulation (EU) No 913/2010: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023PC0443
- Independent Regulators' Group – Rail (2023). Guidelines Service Facilities Description.
- Network Statements and website of IMs
- Port of Gdańsk: Terminal slot overview: https://baltichub.com/dla-klienta/kalendarz-pociagow
- RFC 3 Scanmed: "Terminal Integrated Capacity Offer (TICO): https://www.scanmedfreight.eu/scanmedrfc/services/capacity-offer/tico/

5.2. RFI (IT) Commercial Agreement

In Italy, the IM considers terminals in rail path allocation through the "Commercial Agreement". This document must be submitted in July/August (before the final allocation of rail paths). It states the acceptance of the RU in the terminal, proving that the RU has the right to use a slot in the terminal related to the rail path requested. If this document is not submitted within the deadline, the path is not allocated.
This document is the way the Italian IM currently integrates the terminals into the train path allocation, asking only for confirmation of what the RUs require. The table below describes the comments towards this institute from different stakeholders.

Commercial agreement in Italy	RU's comment	MTO's comment	IM's comment
Timing of document	- It is asked at a time when the RU does not yet have a definitive timetable. - RU's commercial contracts are not signed yet in July, but usually in October or November. - It is not feasible for the IM to force the RUs to finalize the commercial contracts in April or in July/August, it does not stick to the market.	It is wished that IM requires this document alongside the rail path request in April. By doing so, an RU is forced to check the availability of terminals earlier and if there are problems there could be still time to place another rail path request in the ATT.	The IM requires this document later during the year (not in April) to give RUs more time flexibility.
Lack of information	- The RUs rarely agree on the specific timing (e.g. arrival time) of the terminal slots, but they agree on the general number of trains per week. - This is a consequence of the lack of information due to the lack of signed contracts. - Therefore, it could cause insufficient information to correctly assess the availability of terminals.	Terminals using external shunting companies do not have all the information to correctly assess the feasibility of the request in July. However, terminals are forced to issue this document, otherwise, the RU will lose their path. Therefore, the acceptance of terminals may be only temporary.	The document is required to avoid rail paths that are unrealistic or duplicated for the same commercial traffic. From IM's point of view, this document is the only means of obtaining information about terminal slots.
Possible changes to the terminal slot	Before April, when the MTO requests slots in the terminal, there may be delays in receiving a prompt response. During this time, the MTO relies on the RU to request a rail path from the IM that aligns with the desired terminal slot. However, the terminal can discover that the MTO's request is not feasible due to various reasons. As a result, in July, when the RU requests the document from the terminal after the initial draft rail path allocation, the request may be rejected, resulting in the loss of the rail path.	The acceptance that the terminals issue to the RU is based only on the draft of the rail paths. This implies that the final allocation of rail paths may differ from the draft due to various reasons, including changes triggered by the shunting company.	The IM would rarely modify the rail paths draft published to RUs. Most modifications are made by the RUs for their commercial purposes and not for IM's necessities.