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Transport Market Study of the Rail Freight Corridor Baltic-Adriatic 2020 Update

EXECUTIVE SUMMARY

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Glossary of abbreviations

BCP	Border Crossing Point
CIP	Corridor Information Platform
CT	Combined Transport
ERTMS	European Rail Traffic Management System
EU	European Union
EU28	European Union (28 countries)
GA	General Assembly
GDP	Gross Domestic Product
IM	Infrastructure Manager
MB	Management Board
NUTS	Nomenclature of territorial units for statistics (Nomenclature des Unités Territoriales Statistiques)
PEST	Political, Economic, Social and Technological analysis
PMO	Permanent Management Office
RFC BA	Rail Freight Corridor Baltic Adriatic
TMS	Transport Market Study
TEN-T	Trans-European Network-Transport
TIS	Train Information System

Country codes after ISO 3166

AT	Austria
CZ	Czech Republic
IT	Italy
PL	Poland
SI	Slovenia
SK	Slovak Republic

1 SCOPE AND OBJECTIVES OF THE STUDY

The Regulation (EU) 913/2010 mandates the implementation of EU-wide rail freight corridors and a package of measures to improve the competitiveness of rail freight transport on these corridors. On this basis, the Rail Freight Corridor Baltic-Adriatic (RFC BA) was established in November 2015. An essential part of the implementation plan for the RFC BA was the Transport Market Study (TMS), which was finalised in 2014.

To comply with the obligation arising from Article 9.3 of the Regulation (EU) 913/2010, the General Assembly (GA)[1] of the RFC BA decided to update the 2014 TMS, focusing on the origin/destination (O/D) analysis for the existing corridor lines. Considering the decision of the MB of the RFC BA, the following aims and expected results were defined:

- Fulfilling the requirements from Regulations (EU) 913/2010 and 1316/2013;
- Analysing the current situation of freight traffic/volumes on the RFC BA routes;
- Providing an updated knowledge base and recommendations for the development of the rail market on the RFC BA, with a specific focus on infrastructure development and support of train operations.

2 THE CORRIDOR AND ITS CATCHMENT AREA

The Infrastructure Managers and the Permanent Management Office (PMO) provided the primary input for the exact definition of the corridor alignment and the characterisation of sections, lines and nodes, based on the data available in the Corridor Information Platform (CIP)[2]. The key information drawn from the analysis of the study area are:

- The total length of the RFC BA is 5,200 km. Nearly 1,900 km, corresponding to more than one-third of the total, are located in Poland, followed by Austria, Italy, the Czech Republic, Slovenia and the Slovak Republic;
- Almost 79% of the length of the corridor consists of principal lines, equal to about 4,100 km. The diversionary lines cover 12.3% of the corridor length, while the remaining 8.7% regards connecting and expected lines;
- 11 border crossing points, displayed in figure and listed in the table in the next page, are identifiable along the corridor alignment over the country borders;
- 67 terminals, validated by the IMs, were recognised as part of the RFC BA. 32 of them are located in Poland, while the remaining 35 are evenly distributed among the other RFC BA Member States.

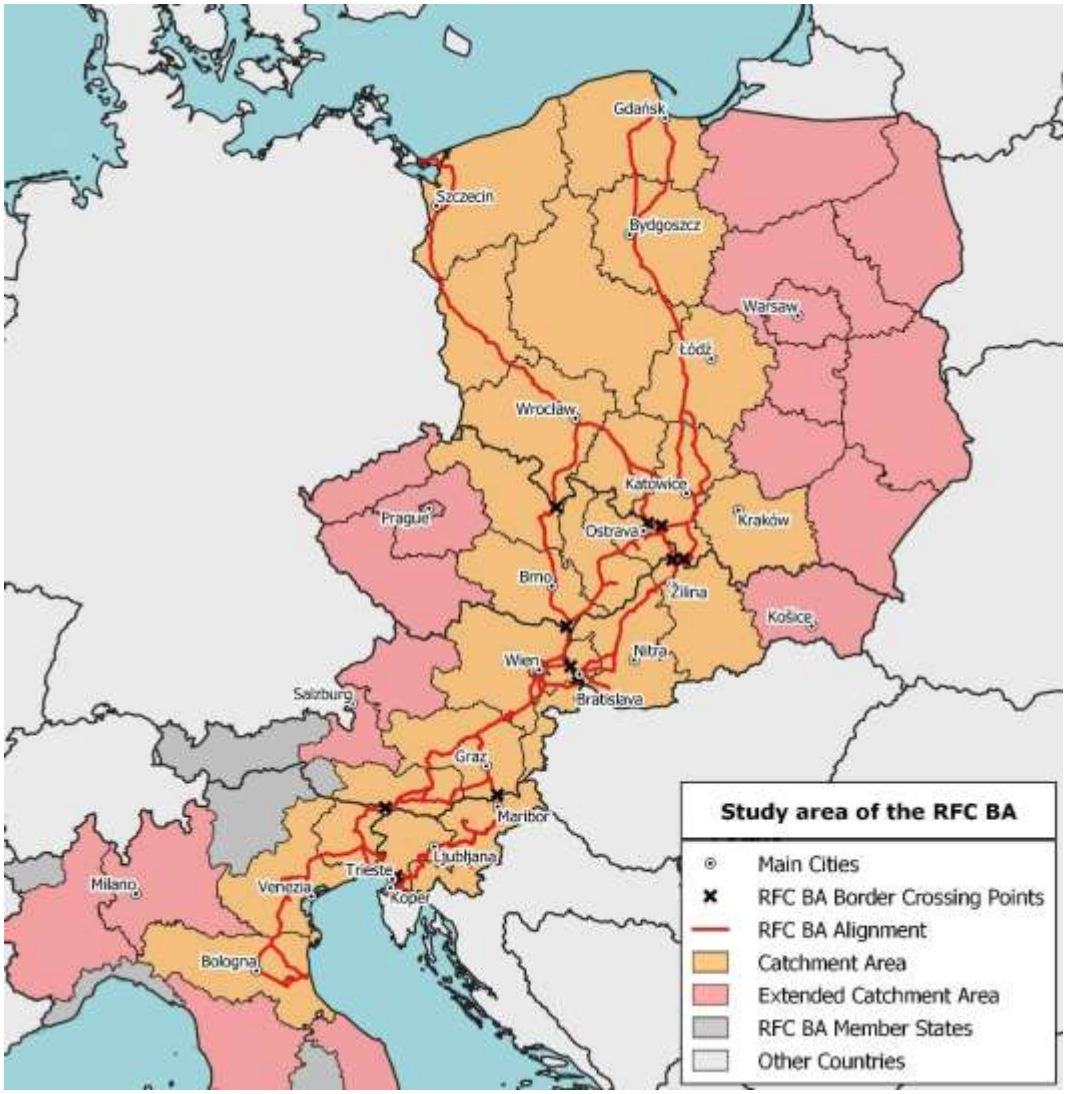
The **catchment area** of the corridor was built at regional (NUTS 2) level to define the geographic scope of the TMS update. The catchment area was firstly shaped by identifying the territories that are crossed by the RFC BA, totalling 27 NUTS 2 regions. Afterwards, in consideration of the potential region-to-region trade relations that might affect the transport volumes on the RFC BA, an **extended catchment** area was

[1] With the establishment of the European Economic Interest Grouping (EEIG) for the Rail Freight Corridor Baltic-Adriatic RFC 5 in 2016, the General Assembly of the Baltic-Adriatic RFC took over the functions of the Management Board envisaged by the EU Regulation 913/2010

[2] CIP is an interactive platform developed and managed by the Rail Freight Corridors under the umbrella of Rail Net Europe. Access is open at this link

defined, including other 18 NUTS 2 regions. Eventually, the geographic scope of analysis consists of 45 NUTS 2 regions.

Figure 2-1 - Alignment, catchment area and BCPs of the RFC BA



Source: own elaboration based on data provided by the Infrastructure Managers

3 KEY FINDINGS OF THE PEST ANALYSIS

Based on official public sources, the TMS developed a detailed Political, Economic, Social and Technological analysis (PEST) analysis of the critical determinants of freight transport demand in the corridor catchment area. This PEST analysis highlighted some general features of the corridor catchment area and its economic specialisation:

- In 2016 the corridor catchment area hosted 18.4% of the total EU28 population and 18.1% of the employment. In the same year, the GDP of the RFC BA extended catchment area represented 13.6% of the total GDP of the EU28;
- **The corridor regions show a distinctive economic specialisation in the industrial sector**, with a significant concentration of manufacturing employment in the cluster of bordering regions between Poland, Czech Republic and the Slovak Republic, but also in other regions of the corridor catchment area.

Industrial employment in the RFC BA extended catchment area was about 10 million persons in 2016, corresponding to 23.7% of the total non-financial business economy workforce in the region – significantly higher than the corresponding value in the EU28 (15.7%);

- Also, a **significant specialisation in mining and quarrying activities exists primarily in Southern Poland** and in the Czech Republic – which is also very relevant under the perspective of rail freight transport. Indeed, the region of Śląskie in southern Poland recorded the highest number of persons employed, across NUTS level 2 regions within the EU28, for the mining and quarrying sector.

The rail corridor infrastructure is quite varied in terms of technical parameters, mainly because the design standards of the rail network were originally defined independently at the national level. Also, the lack of proper maintenance in the last decades of the past millennium contributed to partly deteriorate the performance of the rail system in the former communist countries. The joint efforts of the national and European institutions towards the development of a fully interoperable European rail network have already contributed to a recent renewal and modernisation of the main lines; however, some gaps remain, hampering the performance of the rail system. On the RFC BA, in percentage terms, the most significant gap concerns signalling: ERTMS technology (i.e. ETCS L2) results to be implemented on 13.2% of the network only, corresponding to 688 km. However, **the main infrastructural limitations currently affecting the corridor performance appear to be maximum train length and maximum operating speed**. More in detail, regular operation of 740 m long trains without special permission is possible at present only on 17.6% of the corridor. Moreover, although freight trains can run at speed higher than 100 km/h over 58.0% of the corridor length, there are still long stretches along the main sections where trains have to reduce their speed below 100 km/h.

4 KEY FINDINGS OF THE MARKET ANALYSIS

The TMS includes a detailed analysis of multimodal (rail and road) transport and rail traffic on the RFC BA. Rail transport data shows that **nearly 38 million tonnes were transported between the member states of the RFC BA by rail in 2018.** The largest exporting Member State was Poland with about 10,700 thousand tonnes, covering 28.0% of the total rail transport volume between the member states of the RFC BA. Austria is the leading player in terms of import volumes, reaching about 13,000 thousand tonnes, corresponding to 34.1% of the total.

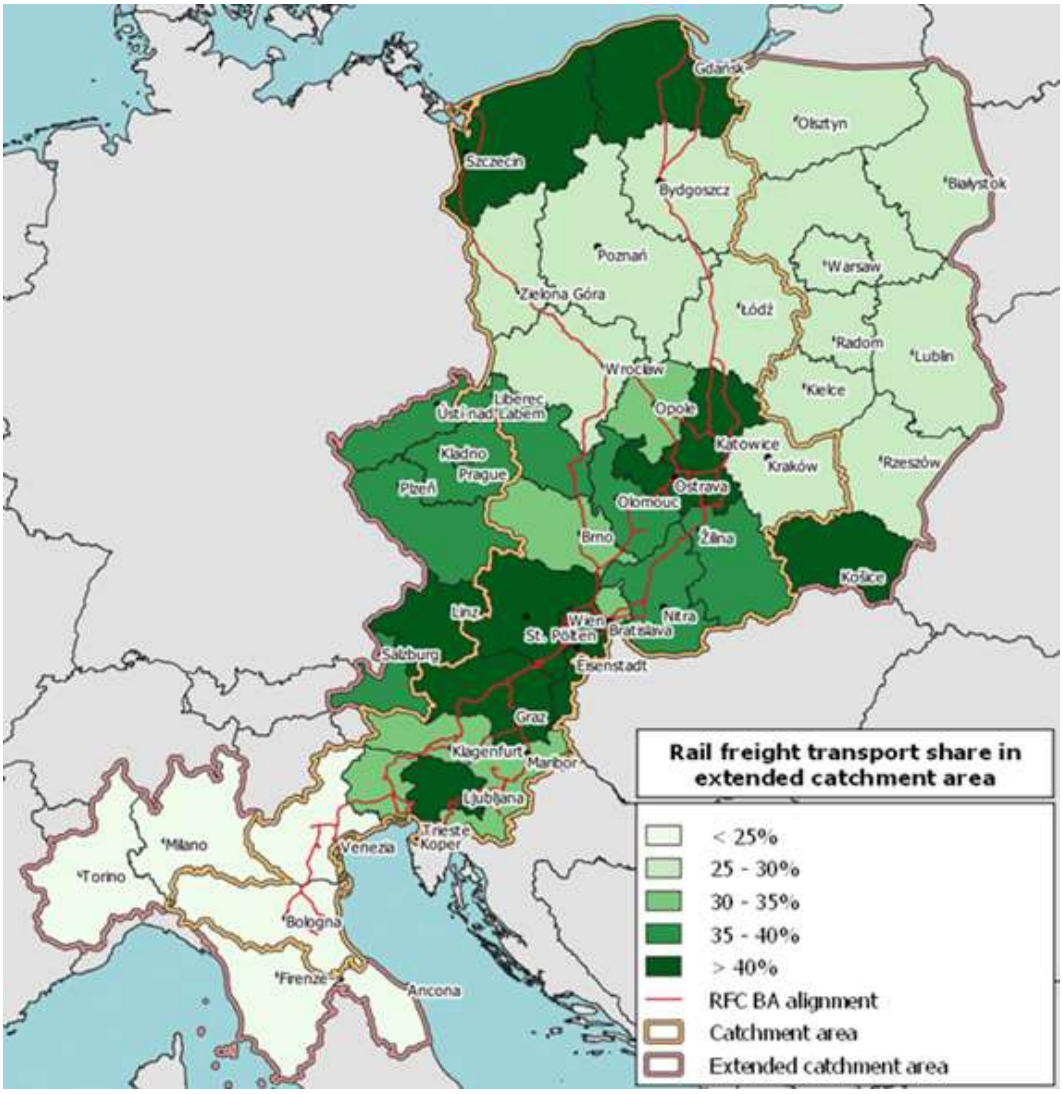
The overall rail market share of international transport between the six corridor countries was approximately 33% in 2018. Although the share slightly decreased over a 10-year period (the rail share was slightly below 40% in 2008), **this rail share is still comparatively high.** In the same year, indeed, the average rail share for total (national and international) freight transport in the EU (27 countries) was 18.7% according to Eurostat.

Table 4-1 - 2018 Rail freight transport O/D matrix between the member states of the RFC BA (`000 tonnes)

O/D	PL	CZ	SK	AT	SI	IT	Total	%
PL	-	5,776	2,697	1,895	35	314	10,717	28.0%
CZ	2,217	-	-	2,942	647	745	6,551	17.1%
SK	1,122	-	-	1,826	944	188	4,080	10.7%
AT	546	2,259	331	-	2,144	3,110	8,390	21.9%
SI	53	360	816	5,068	-	212	6,509	17.0%
IT	253	310	104	1,340	40	-	2,047	5.3%
Total	4,191	8,705	3,948	13,071	3,810	4,569	**38,294**	**100.0%**
%	10.9%	22.7%	10.3%	34.1%	9.9%	11.9%		

Source: own elaboration based on EUROSTAT. Note: the transport relation between the Czech Republic (CZ) and the Slovak Republic (SK) was excluded, to reduce overlapping with markets of other RFCs, the Rhine-Danube RFC primarily

Figure 4-1 – 2018 International rail freight transport share within the extended catchment area (loaded and unloaded tonnes)



Source: own elaboration

The rail market share increases to 36% when focusing the analysis on the international transport between the NUTS 2 regions of the **RFC BA extended catchment area**, corresponding to about 30 million tonnes. Figure 4-1 reveals that the highest concentration of regions with very high rail modal share (>35%) concerns the central corridor Member States (i.e. the Czech Republic, the Slovak Republic, Austria and Slovenia), whereas a weaker concentration results in Poland, with the noticeable exception of Pomorskie, Zachdnio-Pomorskie and Śląskie (above 40% of rail market share), and especially in Italy, where most of the NUTS 2 regions are characterised by a rail market share below 25%.

The corridor rail modal share is even higher if the analysis is restricted to the NUTS2 regions within the **RFC BA catchment area** (excluding the non-corridor flows): out of the 44 million tonnes transported in 2018, slightly above 17 million were carried by rail, corresponding to a modal share of 39%.

Table 4-2 – International rail market share by bidirectional transport relation within the RFC BA catchment area in 2018

TRADE LANE	TOTAL TRANSPORT (Thousand tonnes)	RAIL TRANSPORT (Thousand tonnes)	RAIL MARKET SHARE (%)
Poland – Czech Republic	8,340	3,252	39%
Austria – Slovenia	6,567	3,644	55%
Poland – Slovak Republic	5,828	2,032	35%
Czech Republic – Austria	4,484	1,772	40%
Slovak Republic – Austria	3,938	1,070	27%
Austria – Italy	3,166	1,120	35%
Poland – Austria	3,057	1,740	57%
Slovenia – Italy	2,689	191	7%
Slovak Republic – Slovenia	1,929	1,364	71%
Poland – Italy	1,322	154	12%
Czech Republic – Slovenia	943	558	59%
Poland – Slovenia	676	63	9%
Czech Republic – Italy	539	222	41%
Slovak Republic – Italy	481	127	26%
Total RFC BA	**43,960**	**17,306**	**39%**

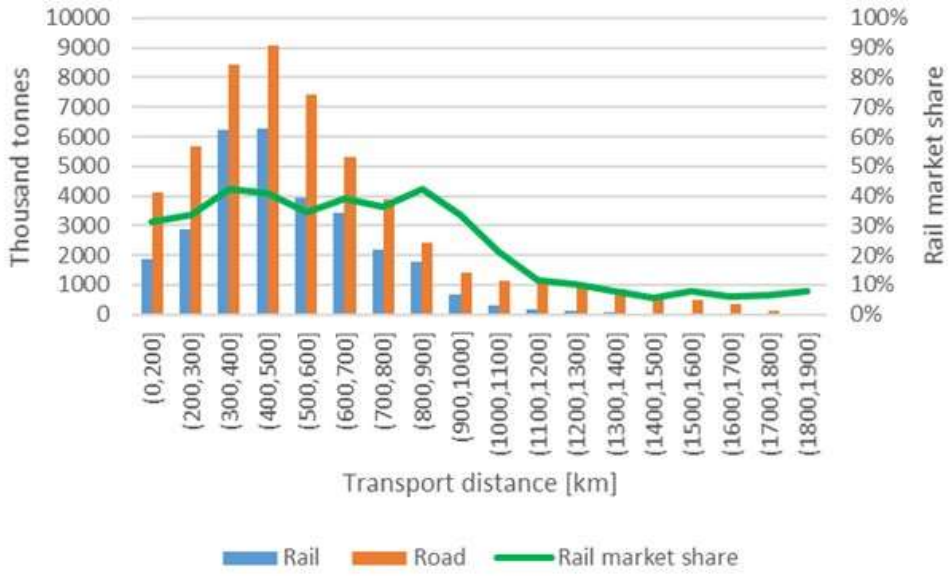
Source: own elaboration

As shown in Table 4-2, the performance of the rail mode and the market characteristics (inland versus port hinterland traffic, transport distances and size) is quite varied in the trade lanes within the corridor catchment area. Three indicative categories were identified in the analysis:

- A prevailing set of trade lanes is aligned to the average characteristic of the corridor, with a relevant rail market share (above 30%);
- On four trade lanes, the rail transport performance is outstanding: three of these include a relevant component of port hinterland traffic between the port of Koper and the landlocked corridor countries (Czech Republic, Slovak Republic, Austria). The fourth trade lane encompasses (mostly inland) transit flows through the Czech Republic, interconnecting Poland and Austria;
- On the opposite side, five international trade lanes exhibit poor rail market performance. Out of them, three trade lanes (Poland – Slovenia; Poland – Italy; Slovak Republic – Italy) are long-distance routes but with a low freight demand intensity. In such cases, transport demand is geographically dispersed over a wide area, and few relationships have the size required to implement financially viable point-to-point rail services. The other two trade lanes (Slovak Republic – Austria; Slovenia – Italy) are instead characterised by very short-distance cross-border transport, where rail transport is presumably not a viable and competitive option.

As a result of the performance of the trade lanes, the distribution of international freight transport by distance within the corridor catchment area shows that **the share of rail freight transport for short-medium distances (400-900 km) is about 45%, significantly higher than the one of longer distances, which is below 10%.**

Figure 4-2 –2018 International rail and road freight transport volume and modal share by distance class



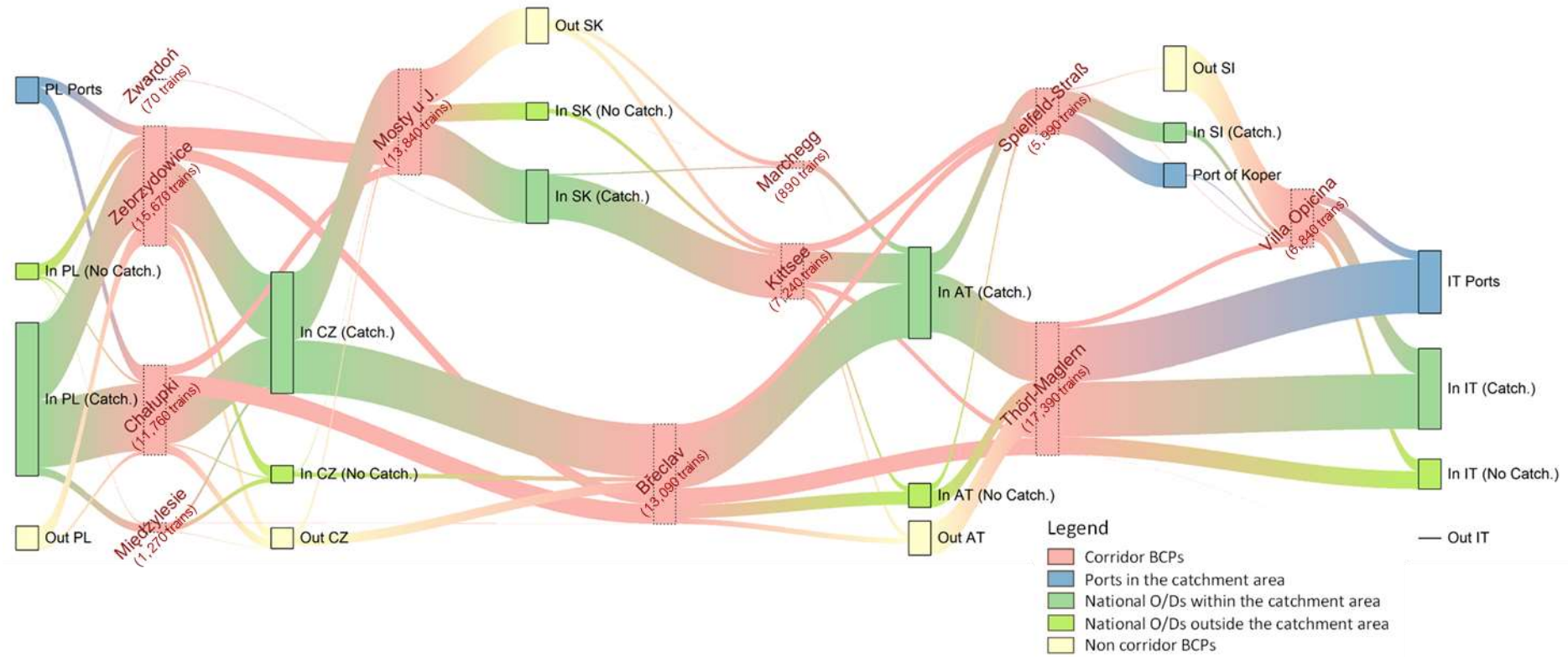
Source: own elaboration

Despite some limitations in the available data, the analysis of the international rail traffic crossing the corridor BCPs sheds additional light on the characteristics of the RFC BA rail market**. Out of the almost 80 thousand international corridor freight trains, a large majority (around 82%) are classified as conventional trains – either block trains or trains dedicated to single wagon transport**. Conventional rail transport includes a relevant component of hinterland traffic to and from the corridor seaports in Poland, Slovenia and Italy. This component corresponds to around 9 thousand corridor trains per year – about 14% of the corridor conventional rail traffic and 11% of the total corridor rail traffic. The Port of Koper is the main corridor seaport for the corridor conventional maritime traffic - including a relevant component of automotive transport. Conventional traffic also has the lion's share of the long-distance transit flows between pairs of RFC BA Member States, which include: traffic between Poland and Austria, through the Czech Republic (4,200 trains, almost entirely dedicated to wagonload transport), traffic between Poland and the Slovak Republic, through the Czech Republic (3,900 trains, also mostly for wagonload transport). These two transit flows correspond to 56% of the total corridor transit flows; other relevant transit flows are those through Austria (Czech Republic – Italy, Czech Republic – Slovenia and Slovak Republic – Slovenia).

Conversely, **combined transport (CT) only serves less than 20% of the rail transport along the corridor**, and it is mainly composed of a few successful niche services and market segments. These include the seaport hinterland connections, especially to/from the Port of Trieste, being the major port of the RFC BA catchment area with almost 5,500 of incoming and outgoing combined trains only; the long-distance trans-European services to Russia and Belarus; or the RoLa services between Wels and Maribor. On the contrary, inland CT market share is relatively low in the corridor, as especially semi-trailer and swap bodies transport between inland terminals is not well developed, even for long-distance corridor trade lanes.

A significant barrier to the development of these CT rail services is the geographic distribution of the demand, which hinders reaching the critical mass required for a competitive rail freight offer with direct connections. Given this, the most commonly applied option for CT is the development of a network of gateway and antenna services, integrated with the already existing services at the main rail hubs. However, owing to rail-rail transhipments, this service structure increases terminal handling costs, the impact of which can be relevant and at least partially explain the currently low competitiveness of inland CT rail transport.

Figure 4-3 - 2018 train flows along the RFC BA crossing at least one corridor BCP



Annual number of RFC BA corridor trains	Cross-country transit traffic (BCP to BCP)	Corridor seaport hinterland traffic	Number of trains by type of transport
79,550	Number of annual trains: 14,500 Share of total traffic: 18.2%	Number of annual trains: 14,900 Share of total traffic: 18.7%	Conventional: 81.6% Combined: 18.4%

Source: own elaboration based on 2018 data provided by the Infrastructure Managers and TIS data. Note: relations with a train frequency lower than 100 trains per year are not plotted

5 RECOMMENDATIONS FOR THE CORRIDOR DEVELOPMENT

Taking into consideration that the RFC BA includes as its main stakeholders the Infrastructure Managers and the National Governments, the recommendations elaborated in the TMS are limited to actions under the direct or indirect influence of these entities. Therefore, other relevant issues, exclusively related to the organisation of rail operations by the RUs or the logistics operations by the shippers, which also affect the performance of the entire logistic chain, are not covered by the study. Therefore, it shall be noted that the suggested actions often require cooperation with other co-responsible stakeholders to be realised.

Also, the recommendations do not reflect the impact of the on-going COVID-19 pandemic, as its effects on the logistic industry – and on rail freight transport – are still unclear, both in quantitative and qualitative terms. **Market monitoring is strongly recommended to evaluate the medium-term impacts of the COVID-19 emergency and afterwards adjust the RFC BA market strategy accordingly.**

A first general set of recommendations concern the **development of the rail corridor infrastructure**. First of all, **the planned infrastructure and technological projects on the rail sections and nodes shall be timely completed**. Indeed, the level of service of the existing corridor is still unsatisfactory, if looking at the main corridor infrastructure parameters. However, significant infrastructural and technological investments are on-going and planned, such as the completion of the rail section Graz – Klagenfurt and the Semmering tunnel in Austria, the upgrade of the rail connection to the Port of Koper, the upgrading of last-mile connections and the progressive modernisation of the existing rail sections, many of which aiming at achieving compliance to the TEN-T standards (in particular to ERTMS and maximum operating speed and permitted train length). Also, specific **support should be given to the maintenance and development of the operational and last-mile rail infrastructure.** Taking into account the high share of conventional rail transport, this includes first of all the rail infrastructure needed for wagonload transport, such as public and private sidings, rail logistics centres and regional shunting infrastructure. Similarly, investments in the development of CT terminals is also relevant to support the further development of this transport mode.

Besides, **support should be allocated to investments in innovative technologies** aimed at transport efficiency and competitiveness, including more comprehensive digitalisation in rail freight, innovative traffic management and information systems at international level and in favour of the entire RFC BA (as at national level different initiatives are already ongoing in this regard). Also, the technological developments allowing easier and quicker wagon handling processes for conventional transport should be monitored in consideration of their potential deployment on selected pilot cases, such as the most relevant international corridor trade lanes.

The **second set of recommendations relates to rail price competitiveness**, which is critical to ensure an increasing market share, and in particular the development of combined transport.

In this respect, **the RFC BA should support measures to allow optimisation of operating costs** as much as possible:

- The costs for employing operational resources (locomotives, wagons and staff) are a significant cost component for RUs and other logistics operators and depend on train running and operational time as well as the cost efficiency of the RUs themselves. While these costs are not under the direct control of the RFC BA, some supporting actions could contribute to enhancing the allocation of resources by the operators:
    - **Enhancing the regulations about interfaces** (change of locos and drivers and procedures at BCPs) with the joint cooperation of RUs with a focus on increased rail productivity;
    - **Assigning a share of high-quality train paths to rail freight services, and especially to CT trains**. Those train paths are characterised by a minimum of operational stops, at best synchronised with stops required for change of locos or staff, and a high level of reliability. Especially for CT transport, these quality paths shall ensure road-competitive slot times in departure and arrival as well as reliability of these services.

A final stream of actions should be specifically dedicated to the **development of CT along the corridor, also for inland services**, where the current market share is marginal. This development may be strategical for the corridor rail market, especially in the event the economic specialisation of the corridor regions evolves towards a less rail-oriented mix of products. In this scenario, the higher flexibility of CT should allow, under certain conditions, higher competitiveness with road transport and therefore a substitution of conventional rail transport with CT services. However, given the structure of the market, the current low rail market share and the high competition of a multitude of road hauliers, the development of CT transport on the RFC BA long-distance trade lanes should not be taken for granted. **A proactive attitude should be adopted, identifying specific actions to develop this market segment**. Also, in consideration of the major infrastructure projects on the corridor, which should reduce cross-alpine rail transport costs, and the need to evaluate the viability of different service options carefully, preliminary studies shall be undertaken to identify the potential market for CT. The studies should aim at: a) fill the knowledge gap on the existing road transport demand based on the analysis of surveys and observed data on truck movements; b) assess the rail transport cost competitiveness under different service options and identify the success factors; c) identify the key market players and evaluate their willingness to enter this new market; d) propose a set of actions to be undertaken by IMs and national authorities to promote the development of new services.