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**Co-financed by the European Union**  
Connecting Europe Facility

**MEMORANDUM OF UNDERSTANDING**

**between the Ministries responsible for Transport of**

**Poland,  
the Slovak Republic,  
Hungary,  
and the Republic of Slovenia**

**on the establishment of the Executive Board of the  
Amber Rail Freight Corridor**

Considering the following general objectives:

The implementation of a European rail freight network is one of the objectives of the European transport policy. In this policy framework, the goal is to encourage the gradual development of trans-European corridors for competitive rail freight transport, thus enabling higher usage of the railway system with positive effects on modal shift. The gradual establishment of corridors giving a higher level of quality to rail freight transport has to be achieved notably through improvements in capacity, including the upgrading and the rehabilitation of infrastructure, in coordination of the capacity offer and coordination of works, or through the development of traffic management systems and better access to the terminals of the corridor. The improved level of quality offered by rail infrastructure services should make it possible to further develop rail freight services or create new ones.

Commission Implementing Decision (EU) No 2017/177 (hereinafter referred to as 'the Decision') on the compliance with Article 5 of Regulation (EU) No 913/2010 of the European Parliament and of the Council (hereinafter referred to as 'the Regulation') of the joint proposal to establish the 'Amber' rail freight corridor was adopted on 31st January 2017.

The Regulation lays down rules for the establishment and organisation of European rail freight corridors with a view to the development of a European rail network for competitive freight. It sets out rules for the selection, organisation, management and indicative investment planning of freight corridors. The Regulation applies to the management and the use of railway infrastructure included in rail freight corridors.

The Decision provides the legal basis for setting up the Amber Rail Freight Corridor (RFC 11) as a further rail freight corridor in accordance with Article 5 of the Regulation. In line with the provisions of the Regulation, it has to be operational within two years after the Decision (31<sup>st</sup> January 2019).

Memorandum of Understanding - Executive Board  
of the Amber Rail Freight Corridor

In order to implement the provisions of the Regulation, the Member States concerned set up an Executive Board, composed of their representatives of the Ministries responsible for Transport.

The Ministries responsible for transport of Poland, the Slovak Republic, Hungary and the Republic of Slovenia:

- recognise the contribution of rail freight to Europe's socio-economic development and to the environment;
- stress the high potential of rail freight corridors to utilise in a more efficient and effective way the rail infrastructure of the TEN-T Core Network and beyond;
- stress the high potential of the rail freight corridors in terms of multimodality and their benefits for the global transport, including in particular for relations with Asia;
- share the ambition to continue to work together to develop a network of rail freight corridors through managing and developing the corridors as well as managing their interconnections, but also by improving interoperability, removing bottlenecks, harmonising operational rules and capacity management;
- wish to increase the involvement of the business community in developing the rail freight corridors;
- consider that the present Memorandum of Understanding is without prejudice to the competence of the Member States regarding planning and funding of the rail infrastructure on their territory;
- encourage the regulatory bodies and national safety authorities to improve their cooperation along the rail freight corridor;
- promote the modal shift from road to rail by facilitating the interconnectivity of the rail freight transport across the borders and providing alternative routes to ensure smooth traffic flow even under unexpected circumstances;

With regards to the above and in order to comply with the provisions laid down in Article 8(1) of the Regulation, the Ministries hereby establish the Executive Board of the Amber Rail Freight Corridor which is responsible for defining the general objectives of the rail freight corridor, supervising and taking the measures as expressly provided for in Article 8(1) of the Regulation.

The functioning of the ExBo shall be governed by the internal rules of procedure to be adopted by the ExBo.

Done at Brussels on 5<sup>th</sup> December 2017 in four original copies in English.



Memorandum of Understanding - Executive Board  
of the Amber Rail Freight Corridor

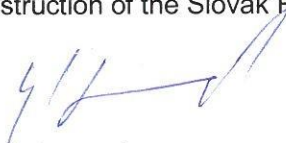
For the Ministry of Infrastructure and Construction of Poland



Andrzej Adamczyk

Minister of Infrastructure and Construction

For the Ministry of Transport and Construction of the Slovak Republic



Mr. Árpád Érsek

Minister of Transport and Construction

For the Ministry of National Development of Hungary



Mr. Róbert Homolya dr.

Minister of State for Transport Policy

For the Ministry of Infrastructure of the Republic of Slovenia



Peter Gašperšič

Minister of Infrastructure



## **Memorandum of Understanding**

between

Railway Infrastructure Managers of Slovenia, Hungary,  
Slovakia and Poland and Allocation Body of Hungary

**to establish the Management Board  
of the Amber Rail Freight Corridor**

**“Koper – Ljubljana –/ Zalaszentiván – Sopron/Csorna – /  
(Hungarian-Serbian border) – Kelebia – Budapest - / -  
Komárom – Leopoldov/Rajka – Bratislava – Žilina –  
Katowice/Kraków – Warszawa/Łuków – Terespol – (Polish-  
Belarusian border)”**

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**Memorandum of Understanding**

**between**

**Railway Infrastructure Managers of Slovenia, Hungary, Slovakia and Poland and**

**Allocation Body of Hungary**

**to establish the Management Board**

**of the Amber Rail Freight Corridor**

**"Koper – Ljubljana –/ Zalaszentiván – Sopron/Csorna – / (Hungarian-Serbian border) – Kelebia –  
Budapest - / - Komárom – Leopoldov/Rajka – Bratislava – Žilina – Katowice/Kraków –  
Warszawa/Łuków – Terespol – (Polish-Belarusian border)"**

The below parties to this Memorandum of Understanding:

*Name of organization: SŽ – Infrastruktura, d. o. o.*

*Seated at: Kolodvorska ulica 11, SI – 1000 Ljubljana*

*Court of registration: District court in Ljubljana*

*Registration no. of the organization: 60171770000*

*Represented by: Mr Matjaž Kranjc, Director*

*from Slovenia*

*Name of organization: MÁV Hungarian State Railways Private Company Limited by Shares*

*Seated at: H-1087 Budapest, 54-60 Könyves Kálmán krt.*

*Court of registration: Company Registry Court of Budapest – Capital Regional Court*

*Registration no. of the organization: Cg. 01-10-042272*

*Represented by: Ms Ilona Dávid, President-Director General*

*from Hungary*

*Name of organization: Győr-Sopron-Ebenfurti Railways Private Company Limited by Shares*

*Seated at: H-9400 Sopron, 19 Mátyás Király St.*

*Court of registration: Court of Győr-Moson-Sopron County as the Court of Registration*

*Registration no. of the organization: Cg. 08-10-001787*

*Represented by: Mr Szilárd Kövesdi, Director General*

*from Hungary*

**Name of organization: VPE – Hungarian Rail Capacity Allocation Office**

**Seated at: H-1054 Budapest, 48 Bajcsy Zsilinsky St.**

**Court of registration: Company Registry Court of Budapest – Capital Regional Court**

**Registration no. of the organization: Cg. 01-09-725271**

**Represented by: Ms Réka Németh, Managing Director  
from Hungary**

**Name of organization: Železnice Slovenskej republiky, Bratislava v skrátenej forme "ŽSR"**

**Seated at: Klemensova 8, 813 61 Bratislava**

**Court of registration: Okresný súd Bratislava I, oddiel Po, vložka číslo 312/B**

**Registration no. of the organization: 31 364 501**

**Represented by: Mr Martin Erdössy, Director General  
from Slovakia**

**Name of organization: PKP Polskie Linie Kolejowe Spółka Akcyjna**

**Seated at: ul. Targowa 74, 03-374 Warszawa**

**Court of registration: Court for the capital city of Warsaw, XII Commercial Division of the National Court Register, NIP PL 113-23-16-427, share capital PLN 16.696.577.000,00 paid in total**

**Registration no. of the organization: 0000037568**

**Represented by: (names, positions)**

*Mr. Krzysztof Merchel, President of the Management Board*

**and**

*Mr. Stanisław Ziurka, Member of the Management Board*

**from Poland**

having regard to

- the Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight (hereinafter: Regulation (EU) No 913/2010);
- Commission Implementing Decision (EU) 2017/177 of 31 January 2017 on the compliance with Article 5 of Regulation (EU) No 913/2010 of the European Parliament and of the Council of the joint proposal to establish the 'Amber' rail freight corridor;
- the Letter of Support to the establishment of the Amber Rail Freight Corridor No. 11 that was signed by the abovementioned Parties;
- the aim of increase the railway transport's share on the freight transport market;



- the aim of attraction new transport business for rail among current and new customers using the routes of the corridor through specific new procedures;

hereby establish the Management Board of Amber Rail Freight Corridor according to Article 8 of Regulation (EU) No 913/2010.

#### **I. Appointment of Management Board**

The Railway Infrastructure Managers and Allocation Body appoint the following Management Board members, and their substitutes, where applicable, of Amber Rail Freight Corridor:

*Name of organization: **SŽ – Infrastruktura, d. o. o.***  
*Name of Management Board member: **Mr Franc Klobučar***  
*Address: **Kolodvorska ulica 11, SI – 1000 Ljubljana***  
*Telephone no.: **+386-1-29-14-126***  
*E-mail address: **franc.klobucar@slo-zeleznice.si***  
***from Slovenia***

*Name of organization: **MÁV Hungarian State Railways Private Company Limited by Shares***  
*Name of Management Board member: **Mr Lőrinc Czako***  
*Address: **H-1087 Budapest, 54-60 Könyves Kálmán krt.***  
*Telephone no.: **+36-1-511-3880***  
*E-mail address: **czako.lorinc@mav.hu***  
***from Hungary***

*Name of organization: **Győr-Sopron-Ebenfurti Railways Private Company Limited by Shares***  
*Name of Management Board member: **Ms Andrea Mosóczi***  
*Address: **H-9400 Sopron, 19 Mátyás Király St.***  
*Telephone no.: **+36-1-224-5824***  
*E-mail address: **amosoczi@gysev.hu***  
***from Hungary***

*Name of organization: **VPE – Hungarian Rail Capacity Allocation Office***  
*Name of Management Board member: **Ms Réka Németh***  
*Address: **H-1054 Budapest, 48 Bajcsy Zsilinsky St.***  
*Telephone no.: **+36-1-301-9928***  
*E-mail address: **nemethr@vpe.hu***  
***from Hungary***



**Name of organization: Železnice Slovenskej republiky, Bratislava v skratenej forme "ŽSR"**

**Name of Management Board member: Ing. Miroslav Matúšek**

**Address: Klemensova 8, 813 61 Bratislava**

**Telephone no.: + 421 2 2029 7360**

**E-mail address: [matusek.miroslav@zsr.sk](mailto:matusek.miroslav@zsr.sk)  
from Slovakia**

**Name of organization: PKP Polskie Linie Kolejowe Spółka Akcyjna**

**Name of Management Board member: Mr Maarten Gutt**

**Address: ul. Targowa 74, 03-374 Warszawa**

**Telephone no.: +48 22 47 333 78**

**E-mail address: [maarten.gutt@plk-sa.pl](mailto:maarten.gutt@plk-sa.pl)**

**Name of substitute member: Mr Krzysztof Jamrozik**

**Address: ul. Targowa 74, 03-374 Warszawa**

**Telephone no.: +48 22 47 324 77**

**E-mail address: [krzysztof.jamrozik@plk-sa.pl](mailto:krzysztof.jamrozik@plk-sa.pl)  
from Poland**

The future changes of Management Board members and their substitutes shall be made in compliance with Amber Rail Freight Corridor Internal Rules and Procedures and, until they are adopted, by written decisions of the parties which will be annexed to this Memorandum of Understanding.

## **II. The Management Board shall be responsible for:**

- fulfilment of all Management Board tasks defined in Regulation (EU) No. 913/2010
- determination of the legal form of the Amber Rail Freight Corridor
- fulfilment of other tasks defined by decisions of the Management Board and Internal Rules and Procedures of the corridor, including adoption of the latter
- ensuring organizational, technical and operational conditions to make Amber Rail Freight Corridor operational on time
- management of whole Amber Rail Freight Corridor structure
- seeking good co-operation with the Executive Board of the Amber Rail Freight Corridor, with the Advisory Groups and customers of the corridor and with the Management Boards of other RFCs
- implementation of new specific procedures with the aim to attract new transport business for railways,

## **III. Final provisions**

Present Memorandum of Understanding enters into force on the date when it is signed by every Signatory, and shall be effective for an undetermined period.

Present Memorandum of Understanding may be modified at any time by written agreement of the Infrastructure Managers and Allocation Body.

The Regulation (EU) No. 913/2010 is decisive for the interpretation of this MoU.

On behalf of SŽ – Infrastruktúra, d. o. o.

Ljubljana, 06. 03. 2017  
Date



[Signature]  
Signature

On behalf of MÁV Hungarian State Railways Private Company Limited by Shares

Budapest, 14. 03. 2017  
Date



[Signature]  
Signature

On behalf of Győr-Sopron-Ebenfurti Railways Private Company Limited by Shares

Sopron, 13. 03. 2017  
Date

Győr-Sopron-Ebenfurti Vasút Zrt.

[Signature]  
Signature

On behalf of VPE – Hungarian Rail Capacity Allocation Office

Budapest, 09. 03. 2017  
Date

VPE  
Vasúti Pályakapacitás-elosztó Kft.  
1054 Budapest, Bajcsy-Zs. út 46.  
Adószám: 13239990-2-41  
Cg.01-09-725271

[Signature]  
Signature

On behalf of Železnice Slovenskej republiky, Bratislava v skratenej forme "ŽSR"

Bratislava, 13. 3. 2017  
Date

[Signature]  
Signature

On behalf of PKP Polskie Linie Kolejowe Spółka Akcyjna

Warszawa, 06/04/2017  
Date

[Signature]  
Signature

2017. 04. 05.  
Date

[Signature]  
Signature

**Decision of the Executive Board of Amber Rail Freight Corridor**  
adopting the Framework for capacity allocation  
on the Rail Freight Corridor

(updated harmonised framework capacity allocation, elaborated by the Network of Executive Boards, version 31.10.2018, adopted on 19<sup>th</sup> November 2018)



Having regard to

- Regulation (EU) No 913/2010 of the European Parliament and of the Council and in particular Article 14 thereof;
- Directive 2012/34/EU of the European Parliament and of the Council and in particular Chapter IV (Section 3) thereof;

Whereas:

- Directive 2012/34/EU provides the general conditions and objectives of infrastructure capacity allocation;
- Article 14 of Regulation (EU) No 913/2010 provides the particular conditions applicable in the context of rail freight corridors;
- Article 14(1) of Regulation (EU) No 913/2010 requires the Executive Board to define the framework for the allocation of infrastructure capacity on the rail freight corridor;
- Articles 14(2) to (10) of Regulation (EU) No 913/2010 establish the procedures to be followed by the Management Board, Infrastructure Managers and Allocation Bodies, with reference to the general rules contained in Directive 2012/34/EU;
- The Executive Board invites the Management Board to cooperate with the other Management Boards in order to harmonise as far as possible the time limit mentioned in Article 14(5) of Regulation (EU) No 913/2010;
- The Executive Board invites the Management Board to cooperate with the relevant stakeholders in order to harmonise the conditions for capacity allocated but ultimately not used, taking into account Article 14(7) of Regulation (EU) No 913/2010.

Acting in accordance with its internal rules of procedure,

**THE EXECUTIVE BOARD HAS ADOPTED THIS DECISION:**

## Chapter I

### PURPOSE, SCOPE AND CHARACTER OF THE FRAMEWORK

#### *Article 1*

1. This framework for the allocation of infrastructure capacity on the rail freight corridor (“Corridor Framework”) concerns the allocation of pre-arranged paths as defined according to Article 14(3) of Regulation (EU) No 913/2010 (“the Regulation”), and of reserve capacity as defined according to Article 14(5) of the Regulation, displayed by the Corridor One-Stop-Shop (“C-OSS”) for freight trains crossing at least one border on a rail freight corridor. It describes the key activities of the C-OSS and Management Board in this respect, and also identifies the responsibilities of the Regulatory Bodies in accordance with Article 20 of the Regulation.
2. The scope of application of the Corridor Framework is the railway network defined in the rail freight corridor implementation plan where principal, diversionary and connecting lines are designated.
3. The Executive Board may decide to allow specific rules within this Corridor Framework for networks which are applying the provisions permitted in accordance with Article 2(6) of Directive 2012/34/EU.
4. In addition, specific rules and terms on capacity allocation may be applicable on parts of the rail freight corridor for the timetable periods 2020 to 2024. These rules and terms are described and defined in Annex 4.

#### *Article 2*

The document to be published by the Management Board in accordance with Article 18 of the Regulation – hereinafter referred to as the Corridor Information Document (“CID”) – shall reflect the processes in this Corridor Framework.

## Chapter II

### PRINCIPLES FOR THE OFFER OF PRE-ARRANGED PATHS AND RESERVE CAPACITY

#### *Article 3*

1. The offer displayed by the C-OSS contains pre-arranged paths and reserve capacity. The pre-arranged paths and reserve capacity are jointly defined and organised by the IMs/ABs in accordance with Article 14 of the Regulation. In addition, they shall take into account as appropriate:
  - recommendations from the C-OSS based on its experience;
  - customer feedback concerning previous years (e.g. received from the Railway Undertaking Advisory Group);
  - customer expectations and forecast (e.g. received from the Railway Undertaking Advisory Group);
  - results from the annual users satisfaction survey of the rail freight corridor;
  - findings of any investigation conducted by the Regulatory Body in the previous year;

2. The infrastructure managers and allocation bodies (IMs/ABs) shall ensure that the pre-arranged path catalogue and reserve capacity are appropriately published. Before publication of the pre-arranged path catalogue and reserve capacity, the Management Board shall inform the Executive Board about the offer and its preparation.
3. Upon request of the Regulatory Bodies and in accordance with Articles 20(3) and 20(6) of the Regulation, IMs/ABs shall provide all relevant information allowing Regulatory Bodies to assess the non-discriminatory designation and offer of pre-arranged paths and reserve capacity and the rules applying to them.

#### *Article 4*

1. The pre-arranged paths shall be handed over to the C-OSS for exclusive management at the latest by X-11<sup>1</sup>, and reserve capacity at the latest by X-2. The Management Board is required to decide whether, and if so to what extent, unused pre-arranged paths are to be returned by the C-OSS to the relevant IMs/ABs at X-7.5 or kept by the C-OSS after X-7.5 in order to accept late requests, taking into account the need for sufficient reserve capacity. The Management Board shall publish in the CID the principles on which it will base its decision.

#### *Article 5*

1. The pre-arranged paths managed by the C-OSS for allocation in the annual timetable and the reserve capacity are dedicated solely to the rail freight corridor. Therefore, it is essential that the displayed dedicated capacity is protected between its publication in the pre-arranged path catalogue and the allocation decision by the C-OSS at X-7.5 against unilateral modification by the IMs/ABs.
2. Following the allocation decision by the C-OSS at X-7.5, an IM/AB and an applicant may agree to minor modifications of the allocated capacity that do not impact the results of the allocation decision. In that case, the modified capacity shall have the same level of protection as that applied to the original capacity.

#### *Article 6*

1. Certain pre-arranged paths may be designated by the Management Board for the application of the network pre-arranged path priority rule “Network PaP rule” (defined in Annex 1) aimed at better matching traffic demand and best use of available capacity, especially for capacity requests involving more than one rail freight corridor. The Network PaP rule may apply to pre-arranged path sections linked together within one single or across several rail freight corridors. These sections are designated to promote the optimal use of infrastructure capacity available on rail freight corridors. A pre-arranged path on which the Network PaP rule applies is called “Network PaP”.
2. The designation of Network PaPs, in terms of origin and destination and quantity should take into account the following as appropriate:
  - scarcity of capacity;
  - the number and characteristics of conflicting requests as observed in previous years;
  - number of requests involving more than one rail freight corridor as observed in previous years;

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<sup>1</sup> X indicates the date of the timetable change; figures refer to months. Therefore X-11 is 11 months before the timetable change etc.

- number of requests not satisfied, etc. as observed in previous years.
- 3. Explanations for the designation of Network PaPs, the rail freight corridor sections to be covered by Network PaPs and an indicative share of Network PaPs as a proportion of all pre-arranged paths offered on the rail freight corridor shall be published in the CID.
- 4. Where Network PaPs relate to more than one rail freight corridor, the Management Board shall cooperate with the Management Board(s) of the other relevant rail freight corridor(s) to engage the IMs/ABs in the designation process. If one rail freight corridor identifies a need for Network PaPs on several rail freight corridors, the other rail freight corridor(s) involved should if possible meet the request. These Network PaPs can only be designated if the Management Boards of all relevant rail freight corridors agree.

### Chapter III

#### PRINCIPLES OF ALLOCATION OF PRE-ARRANGED PATHS AND RESERVE CAPACITY

##### *Article 7*

1. The decision on the allocation of pre-arranged paths and reserve capacity on the rail freight corridor shall be taken by the C-OSS, in accordance with Article 13 of the Regulation.

The activities under the timetabling processes concerning pre-arranged paths and reserve capacity are set out in Annex 2.

#### III-A GENERAL PRINCIPLES RELATED TO THE FUNCTIONING OF THE C-OSS

##### *Article 8*

1. The CID to be published by the Management Board shall describe at least the competences, the form of organisation, the responsibilities vis-à-vis applicants and the mode of functioning of the C-OSS and its conditions of use.
2. The corridor capacity shall be published and allocated via an international path request coordination system, which is as far as possible harmonised with the other rail freight corridors.

#### III-B PRINCIPLES OF ALLOCATION

##### *Article 9*

1. The C-OSS is responsible for the allocation of pre-arranged paths and reserve capacity on its own rail freight corridor.
2. An applicant requesting pre-arranged paths or reserve capacity covering more than one rail freight corridor may select one C-OSS to act as a single point of contact to co-ordinate its request, but that C-OSS remains responsible for the allocation of capacity on its own rail freight corridor only.
3. Where the same pre-arranged paths are jointly offered by more than one rail freight corridor, the Management Board shall coordinate with the other Management Board(s) concerned to designate the C-OSS responsible for allocating those paths and publish this in the CID.



### *Article 10*

1. After receipt of all path requests for pre-arranged paths at X-8 (standard deadline for submitting path requests for the annual timetable) the C-OSS shall decide on the - allocation of pre-arranged paths by X-7.5 and indicate the allocation in the path register accordingly.
2. Requests for pre-arranged paths that cannot be met pursuant to Article 13(3) of the Regulation and that are forwarded to the competent IMs / ABs in accordance with Article 13(4) are to be considered by IMs/ABs as having been submitted before the X-8 deadline. The IMs/ABs shall take their decision and inform the C-OSS within the timescales set out in Annex VII of Directive 2012/34/EU and described in Annex 2 of this Corridor Framework. The C-OSS shall complete the processing of the request and inform the applicant of the decision as soon as possible after receiving the decision from the competent IMs/ABs.
3. The Management Board is invited to decide the deadline for submitting requests for reserve capacity to the C-OSS in a harmonised way at 30 days before the running date.
4. Without prejudice to Article 48(1) of Directive 2012/34/EU, the C-OSS shall endeavour to provide a first response to requests for reserve capacity within five calendar days of receiving the path request.

## III-C PRINCIPLES OF FAIRNESS AND INDEPENDENCE

### *Article 11*

1. The C-OSS shall respect the commercial confidentiality of information provided to it.
2. In the context of the rail freight corridor, and consequently from the point of view of international cooperation, C-OSS staff shall, within their mandate, work independently of their IMs/ABs in taking allocation decisions for pre-arranged paths and reserve capacity on a rail freight corridor. However, the C-OSS staff should work with the IMs/ABs for the purpose of coordinating the allocation of pre-arranged paths and reserve capacity with the allocation of feeder/outflow national paths.

## III-D PRIORITIES TO BE APPLIED BY THE C-OSS IN CASE OF CONFLICTING REQUESTS

### *Article 12*

1. In the event of conflicting requests, the C-OSS may seek resolution through consultation as a first step, if the following criteria are met:
  - The conflict is only on a single rail freight corridor;
  - Suitable alternative pre-arranged paths are available.
2. Where consultation is undertaken, the C-OSS shall address the applicants and propose a solution. If the applicants agree to the proposed solution, the consultation process ends.
3. If for any reason the consultation process does not lead to an agreement between all parties by X-7.5 the priority rules described in Annex 1 apply.

### *Article 13*

1. Where consultation under Article 12 is not undertaken, the C-OSS shall apply the priority rules and the process described in Annex 1 immediately.
2. The priority rules concern only pre-arranged paths and are applied only between X-8 and X-7.5 in the event of conflicting applications.
3. Once the allocation decision is made for requests received by X-8, the C-OSS shall propose suitable alternative pre-arranged paths, if available, to the applicant(s) with the lower priority ratings or, in the absence of suitable alternative pre-arranged paths, shall without any delay forward the requests to the competent IMs/ABs in accordance with Article 13(4) of the Regulation. These path requests are to be considered by IMs/ABs as having been submitted before the X-8 deadline.
4. Experience of the conflict resolution process should be assessed by the Management Board and taken into consideration for the pre-arranged path planning process in following timetable periods, in order to reduce the number of conflicts in following years.

#### *Article 14*

With regard to requests placed after X-8, the principle “first come, first served” shall apply.

### Chapter IV APPLICANTS

#### *Article 15*

1. An applicant may apply directly to the C-OSS for the allocation of pre-arranged paths or reserve capacity.
2. Applicants shall accept the rail freight corridor’s general terms and conditions as laid down in the CID in order to place requests for pre-arranged path and reserve capacity. A copy of these general terms and conditions shall be provided free of charge upon request. The applicant shall confirm that:
  - it accepts the conditions relating to the procedures of allocation as described in the CID,
  - it is able to place path requests via the system referred to in Article 8,
  - it is able to provide all data required for the path requests.The conditions shall be non-discriminatory and transparent.
3. The allocation of pre-arranged paths and reserve capacity by the C-OSS to an applicant is without prejudice to the national administrative provisions for the use of capacity.
4. Once the pre-arranged path/reserve capacity is allocated by the C-OSS, the applicant shall appoint the railway undertaking(s) which will use the train path/reserve capacity on its behalf and shall inform the C-OSS and the IMs / ABs accordingly. If this appointment is not provided by the applicant by 30 days before the running day at the latest, regardless of whether it is a prearranged path or reserve capacity, the allocated path shall be considered as cancelled.
5. The CID shall describe the rights and obligations of applicants vis-à-vis the C-OSS, in particular where no undertaking has yet been appointed.

## Chapter V

### REGULATORY CONTROL

#### *Article 16*

1. The application of this Corridor Framework on the annual allocation of capacity shall be subject to the control of the Regulatory Bodies.
2. Article 20 of the Regulation requires the relevant Regulatory Body in each rail freight corridor to collaborate with other relevant Regulatory Bodies. The Executive Board invites the Regulatory Bodies involved on the corridor to set out the way in which they intend to cooperate on regulatory control of the C-OSS, by developing and publishing a cooperation agreement defining how complaints regarding the allocation process of the C- OSS are to be filed and how decisions following a complaint are to be taken. The Executive Board also invites the Regulatory Bodies to set out the procedures they envisage for co-operation across rail freight corridors.
3. Where a cooperation agreement has been developed and published, the CID should provide a link to it.

## Chapter VI

### FINAL PROVISIONS

#### *Article 17*

The Management Board shall inform the Executive Board on an annual basis, using the indicators identified in Annex 3, of the quantitative and qualitative development of pre-arranged paths and reserve capacity, in accordance with Article 9(1)c and 19(2) of the Regulation. On this basis, the Executive Board shall evaluate the functioning of the Corridor Framework annually and exchange the findings with the other rail freight corridors applying this Corridor Framework. The Regulatory Bodies may inform the Executive Board of their own observations on the monitoring of the relevant freight corridor.

#### *Article 18*

1. The Executive Board has taken this Decision on the basis of mutual consent of the representatives of the authorities of all its participating States, in accordance with the provisions of Article 14(1) of the Regulation. This Decision is legally binding on its addressees and shall be published.
2. This Corridor Framework replaces any previous Corridor Framework. It shall come into force on 14 December 2019 for the timetable period 2020.
3. Changes to this Corridor Framework can be made but only after consultation with the Management Board and with all rail freight corridors' Executive Boards and Regulatory Bodies.

#### *Article 19*

1. The priority rule and the process described in Annex 1, which are based on frequency and distance criteria, shall be evaluated by the rail freight corridor at the latest in the second half of 2021. This evaluation shall be based on a general assessment undertaken by the rail freight corridor taking into account its experience in terms of allocation. The evaluation

shall also take into account the experiences from the specific rules and terms as referred to in Article 1(4).

- 2 In accordance with the results of the evaluation of the priority rule, as described above, any potential modification would take effect for the timetable period 2023 and onwards.

#### *Article 20*

A reference to this Corridor Framework will be included in the CID and in the network statements of the IMs/ABs.

#### *Article 21*

This Decision is addressed to the IMs/ABs and the Management Board of the rail freight corridor.

*Approved by the Executive Board of Amber Rail Freight Corridor with mutual consent, decision entering into force 14<sup>th</sup> December 2018*

## ANNEXES

1. Description of the priority rule at X-8 in the event of conflicting requests for pre-arranged paths
2. Activities within the timetabling processes concerning pre-arranged paths and reserve capacity
3. Evaluation of the allocation process.
4. Specific rules and terms on capacity allocation applicable on parts of the rail freight corridor according to Art. 1(4)

## ANNEX 1

### **Description of the priority rule at X-8 in the event of conflicting requests for pre- arranged paths.**

For the purpose of this Annex, a request comprises a train run from origin to destination, including sections on one or more rail freight corridors as well as feeder and/or outflow paths, on all of its running days. In certain cases, which are due to technical limitations of the IT system used, a request may have to be submitted in the form of more than one dossier. These cases must be described in the CID.

#### **If no “Network PaP” is involved in the conflicting requests**

The priority is calculated according to this formula:

$$K = (L^{PaP} + L^{F/O}) \times Y^{RD}$$

$L^{PaP}$  = Total requested length of all PaP sections on all involved RFCs included in one request.

$L^{F/O}$  = Total requested length of the feeder/outflow path(s) included in one request; for the sake of practicality, is assumed to be the distance as the crow flies.

$Y^{RD}$  = Number of requested running days for the timetable period. A running day will only be taken into account for the priority calculation if it refers to a date with a published PaP offer for the given section.

K = The rate for priority

All lengths are counted in kilometres.

The method of applying this formula is:

in a first step the priority value (K) is calculated using only the total requested length of pre-arranged path ( $L^{PaP}$ ) multiplied by the Number of requested running days ( $Y^{RD}$ );

- if the requests cannot be separated in this way, the priority value (K) is calculated using the total length of the complete paths ( $L^{PaP} + L^{F/O}$ ) multiplied by the number of requested running days ( $Y^{RD}$ ) in order to separate the requests;
- if the requests cannot be separated in this way, a random selection is used to separate the requests. This random selection shall be defined in the CID.

#### **If a “Network PaP” is involved in at least one of the conflicting requests:**

- If the conflict is not on a “Network PaP”, the priority rule described above applies
- If the conflict is on a “Network PaP”, the priority is calculated according to the following formula:

$$K = (L^{\text{NetPAP}} + L^{\text{Other PAP}} + L^{\text{F/O}}) \times Y^{\text{RD}}$$

K = Priority value

$L^{\text{NetPAP}}$  = Total requested length (in kilometres) of the PaP defined as “Network PaP” on either RFC included in one request.

$L^{\text{Other PAP}}$  = Total requested length (in kilometres) of the PaP (not defined as “Network PaP”) on either RFC included in one request.

$L^{\text{F/O}}$  = Total requested length of the feeder/outflow path(s) included in one request; for the sake of practicality, is assumed to be the distance as the crow flies.

$Y^{\text{RD}}$  = Number of requested running days for the timetable period. A running day will only be taken into account for the priority calculation if it refers to a date with a published PaP offer for the given section.

The method of applying this formula is:

- in a first step the priority value (K) is calculated using only the total requested length of the “Network PaP” ( $L^{\text{NetPAP}}$ ) multiplied by the Number of requested running days ( $Y^{\text{RD}}$ )
- if the requests cannot be separated in this way, the priority value (K) is calculated using the total length of all requested “Network PaP” sections and other PaP sections ( $L^{\text{NetPAP}} + L^{\text{Other PAP}}$ ) multiplied by the Number of requested running days ( $Y^{\text{RD}}$ ) in order to separate the requests
- if the requests cannot be separated in this way, the priority value (K) is calculated using the total length of the complete paths ( $L^{\text{NetPAP}} + L^{\text{Other PAP}} + L^{\text{F/O}}$ ) multiplied by the Number of requested running days ( $Y^{\text{RD}}$ ) in order to separate the requests

If the requests cannot be separated in this way, a random selection is used to separate the requests. This random selection shall be defined in the CID.

## ANNEX 2

### Activities under the timetabling processes concerning pre-arranged paths and reserve capacity.

| Date/period   | Activity  |
|---------------|---|
| X-19 – X-16   | Preparation phase   |
| X-16 – X-12   | Construction phase  |
| X-12 – X-11   | Approval and publication  |
| X-11          | Publication of pre-arranged paths provided by the IMs/ABs and identification among them of the designated Network PaPs  |
| X-11 – X-8    | Application for the Annual Timetable  |
| X-8           | Deadline for submitting path requests   |
| X-8 – X-7.5   | Pre-booking phase   |
| X-7.5         | Forwarding requests with “flexible approaches” (e.g. Feeder/Outflow) “special treatments” and requests where the applicant has neither received the requested pre-arranged path nor accepted – if applicable – an appropriate alternative pre-arranged path to IMs/ABs  |
| X-7.5         | Possible return of some remaining (unused) pre-arranged paths to the competent IMs/ABs – based on the decision of the rail freight corridor Management Board – for use during the elaboration of the annual timetable by the IMs/ABs  |
| X-7.5 – X-5.5 | Path construction phase for the “flexible approaches”   |
| X-5.5         | Finalisation of path construction for requested “flexible approaches” by the IMs/ABs and delivering of the results to C-OSS for information and development of the draft timetable  |
| X-5           | Publication of the draft timetable for pre-arranged paths – including sections provided by the IMs/ABs for requested “flexible approaches” by the C-OSS - and for tailor-made alternatives in case the applicant has neither received the requested pre-arranged path nor accepted – if applicable – an appropriate alternative pre-arranged path |
| X-5 – X-4     | Observations from applicants  |
| X-4 – X-3.5   | Post-processing and final allocation  |
| X-7.5 – X-2   | Late path request application phase   |
| X-4 – X-1     | Late path request allocation phase  |
| X-4 – X-2     | Planning (production) reserve capacity for ad-hoc traffic   |
| X-2           | Publication reserve capacity for ad-hoc traffic   |
| X-2 – X+12    | Application and allocation phase for ad hoc path requests   |
| X+12 – X+15   | Evaluation phase  |



## ANNEX 3

### Evaluation of the allocation process

The process of capacity allocation on the rail freight corridor shall be evaluated throughout the allocation process, with a focus on continuous improvement of the working of the C-OSS. The evaluation shall take place after the major deadlines:

X-11: Publication of PaPs

X-8: Deadline for submitting path requests in the annual timetabling process

X-7.5: Deadline for treatment of PaP requests for the annual timetable by the C-OSS

X-2: Publication of reserve capacity for ad-hoc traffic

The evaluation shall be undertaken by the Management Board. Furthermore, the Management Board shall compile an annual evaluation report which includes recommendations for improvements of the capacity allocation process. The Annual report shall be addressed to the Executive Board.

The results of the monitoring shall be published by the Management Board, and to be included in the reporting as referred to in Article 19 of the Regulation.

The following basic indicators shall at least be evaluated using the methodology outlined below:

| Indicator                              | Calculation formula   | Timing          |
|--|---|-----------------|
| Volume of offered capacity             | Km*days offered   | At X-11 and X-2 |
| Volume of requested capacity           | Km*days requested   | At X-8          |
| Volume of requests                     | Number of requests  | At X-8          |
| Volume of capacity (pre-booking phase) | Km*days -(pre-booking phase)  | At X-7.5        |
| Number of conflicts                    | Number of requests submitted to the C-OSS which are in conflict with at least one other request | At X-8          |

## ANNEX 4

### **Specific rules and terms on capacity allocation applicable on parts of the rail freight corridor according to Art. 1(4)**

This Annex will apply on the following parts of the rail freight corridor:

- Rotterdam-Antwerp, on the RFC “North Sea-Mediterranean”
- Mannheim-Miranda de Ebro, on the RFC “Atlantic”
- Munich-Verona, on the RFC “Scandinavian-Mediterranean”

For additional routes, the Management Board shall make a proposal to the Executive Board for approval.

The decision shall be published by the Management Board in accordance with Article 18 of the Regulation.

The timeline of Annex 2 shall be adapted as follows for the reserve capacity provided in accordance to Article 1(4):

- [X-4 – X-2: Planning (production) reserve capacity for ad-hoc traffic] shall be replaced by [Until X-11: Planning (production) reserve capacity]
- [X-2: Publication reserve capacity for ad-hoc traffic” shall be replaced by [X-11: Publication of reserve capacity]
- [X-2 – X+12: Application and allocation phase for ad hoc path requests] shall be replaced by [M-4 – M-1: Application for reserve capacity and start of allocation phase]

In its request, the applicant has to indicate the timetable period of the request. If one or several operation days (following the first day of operation) are part of subsequent timetable periods, the applicant may announce this in its request. The request may not exceed a period of 36 months.

The C-OSS must consider the request in all timetable periods concerned:

- For the first timetable period, the C-OSS has to allocate a path, if available;
- For subsequent timetable periods, the concerned IMs may conclude a framework agreement in compliance with Article 42 of Directive 2012/34/EU and Commission Implementing Regulation (EU) 2016/545 where possible.

## GLOSSARY OF ABBREVIATIONS

- **AB:** Allocation Body
- **IM:** Infrastructure Manager
- **C-OSS:** Corridor One Stop Shop
- **PaP:** Pre-arranged path
- **X:** Starting date of a timetable
- **F/O:** Feeder / Outflow
- **RD:** Running days
- **RFC:** Rail Freight Corridor
- **Network PaP:** Pre-arranged path on which the “Network PaP rule” applies.
- **CID:** Corridor Information Document
- **TCRs:** Planned Temporary Capacity Restrictions
- **M-x:** x Months prior to first day of operation



## **Letter of Intent**

**of the Management Board to establish the Advisory Group of  
Railway Undertakings  
of Rail Freight Corridor Amber No.11**

**“Koper – Ljubljana – Zalaszentiván – Sopron/Csorna – / (Hungarian-  
Serbian border) – Kelebia – Budapest - / - Komárom – Leopoldov / Rajka–  
Bratislava – Žilina – Katowice / Kraków – Warszawa / Łuków – Terespol –  
(Polish-Belarusian border)”**

in accordance with Regulation (EU) 913/2010

**Warsaw 12 December 2017**

According to article 8 paragraph 8 of Regulation (EU) 913/2010, the Management Board of the above-mentioned Rail Freight Corridor Amber No.11 shall set up an Advisory Group of Railway Undertakings, which

- may issue an opinion on any proposal by the Management Board which has consequences for these undertakings;
- may issue own-initiative opinions.

The Management Board shall take any of these opinions into account.

Participation in the Advisory Group is on a voluntary basis. Railway Undertakings may become members or resign their memberships of the Advisory Group at will.

The purpose of this Letter of Intent is to identify a framework for cooperation and partnership between the Management Board and Railway Undertakings and their representative organizations in the context of the above-mentioned Advisory Group and with the aim to ensure that the development of the corridor and the services provided along the corridor meet the demands of Railway Undertakings as much as possible.

In case of intention to become a member of the Advisory Group of Railway Undertakings of Rail Freight Corridor Amber No.11 the below presented “*Confirmation of Intent*” shall duly be filled.

Done at \_\_\_\_\_, \_\_\_\_\_ 2018

.....

Chairperson of RFC Amber No.11

**Confirmation of Intent**

**to become a member of the Advisory Group of Railway Undertakings of Rail**

**Freight Corridor Amber No.11**

The undersigned hereby confirm that the organizations they represent intend to cooperate with the Management Board of Rail Freight Corridor Amber No.11 in the framework of the Advisory Group of Railway Undertakings, in accordance with Regulation (EU) 913/2010 and the Rules of Consultation annexed to this Letter of Intent. The Rules of Consultation are laid down in a separate document due to the fact that they intend to provide guidance based on common principles for the regulation of exchange between the Management Board and the Advisory Groups. The undersigned organizations reserve the right to resign their memberships at will.

In case new members aim to join the Advisory Group the current confirmation shall duly be updated.

The opinions of the Group (including majority and minority opinions, if applicable) shall be communicated to the Management Board by one Member of the Railway Advisory Group (RAG Spokesperson).

Done at \_\_\_\_\_, \_\_\_\_\_ 2018

| Contact Person | Name of company<br>(Member) | Address of<br>company | Signature |
|----------------|-----------------------------|-----------------------|-----------|
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## **Letter of Intent**

**of the Management Board to establish the Advisory Group of  
Terminal Managers and Terminal Owners  
of Rail Freight Corridor Amber No.11**

**“Koper – Ljubljana – Zalaszentiván – Sopron/Csorna – / (Hungarian-  
Serbian border) – Kelebia – Budapest - / - Komárom – Leopoldov / Rajka–  
Bratislava – Žilina – Katowice / Kraków – Warszawa / Łuków – Terespol –  
(Polish-Belarusian border)”**

in accordance with Regulation (EU) 913/2010

**Warsaw, 12 December 2017**



According to article 8 paragraph 7 of Regulation (EU) 913/2010, the Management Board of the above-mentioned Rail Freight Corridor Amber No.11 shall set up an Advisory Group made up of managers and owners of the Terminals of the freight corridor, which

- may issue an opinion on any proposal by the Management Board which has consequences for investment and the management of terminals;
- may issue own-initiative opinions.

The Management Board shall take any of these opinions into account.

Participation in the Advisory Group is on a voluntary basis. Managers of Terminals and Owners of the Terminals of the rail freight corridor may become members or resign their memberships of the Advisory Group at will.

The purpose of this Letter of Intent is to identify a framework for cooperation and partnership between the Management Board and the managers and owners of Terminals and their representative organizations in the context of the above-mentioned Advisory Group and with the aim to ensure that the development of the corridor and the services provided along the corridor meet the demands of managers and owners of Terminals as much as possible.

In case of intention to become a member of the Advisory Group of Managers of Terminals and Owners of the Terminals of Rail Freight Corridor Amber No.11 the below presented “*Confirmation of Intent*” shall duly be filled.

Done at \_\_\_\_\_, \_\_\_\_\_ 2018

.....

Chairperson of RFC Amber No.11

### **Confirmation of Intent**

**to become a member of the Advisory Group of Managers of Terminals and Owners  
of the Terminals of Rail Freight Corridor Amber No.11**

The undersigned hereby confirm that the organizations they represent intend to cooperate with the Management Board of Rail Freight Corridor Amber No.11 in the framework of the Advisory Group of Terminal Managers and Owners, in accordance with Regulation (EU) 913/2010 and the Rules of Consultation annexed to this Letter of Intent. The Rules of Consultation are laid down in a separate document due to the fact that they intend to provide guidance based on common principles for the regulation of exchange between the Management Board and the Advisory Groups.

The undersigned organizations reserve the right to resign their memberships at will.

In case new members aim to join the Advisory Group the current confirmation shall duly be updated.

The opinions of the Group (including majority and minority opinions, if applicable) shall be communicated to the Management Board by one Member of the Terminal Advisory Group (TAG Spokesperson).

Done at \_\_\_\_\_, \_\_\_\_\_ 2018

| Contact person | Name of company<br>(Member) | Address of<br>Company | Signature |
|----------------|-----------------------------|-----------------------|-----------|
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## **Rules of Consultation between the Management Board and the Advisory Groups of RFC Amber No.11**

**in line with Regulation (EU) No. 913/2010**

### **I. Basic provisions**

1. The Management Board (hereinafter referred to as 'MB') sets up one Advisory Group (hereinafter referred to as 'AG') made up of managers and owners of the terminals of Amber Rail Freight Corridor (hereinafter referred to as 'Amber RFC').
2. The MB sets up one further AG made up of railway undertakings (hereinafter referred to as 'RUs') interested in the use of Amber RFC.
3. Participation in the AGs is on a voluntary basis.
4. The AGs may issue an opinion on any proposal by the MB which has direct consequences for AG Members. The AGs may also issue own-initiative opinions. The MB shall take any of the opinions of the AGs into account.
5. The MB is responsible for organization and financing of at least one regular AG meeting per year per AG and of consultation between MB and AGs. The MB and the AG may jointly decide about additional meetings if necessary.
6. Meetings of the AGs are financed by the AG Members themselves. Members of the AGs will not be reimbursed by the corridor organization for their expenses.
7. The MB defines only the rules applicable between the MB and the AGs, but the MB does not define the process of communication and the procedure for opinion-making inside the AGs.

### **II. Formulation and representation of the opinions of the AGs**

8. Each AG elects its own representative (hereinafter referred to as 'Spokesperson') for a defined time period, and informs the Secretariat of the Amber RFC (hereinafter referred to as 'Secretariat') and the responsible MB Member in charge of management of AGs of Amber RFC about the name and contact details of the AG Spokespersons. The Spokespersons of the AGs collect the opinions of AG Member companies, and communicate the opinion of the AGs to the MB.

9. A sole opinion of an AG shall be communicated to the MB, and not individual opinions of AG Members.

10. The possibility for joining and leaving both AGs shall always be open. The Secretariat and the responsible MB Member in charge of management of AGs shall be informed by the Spokesperson of names and contact details of newly joined and/or leaving AG Members.

### **III. Procedure of consultation between MB and AGs**

11. The MB prefers to communicate with the AGs via the Spokespersons of the AGs. This shall, however, not exclude the possibility of direct communication of any AG member with the MB if needed.

12. For the AGs the contact point on the side of the MB is the Secretariat whose contact details are to be found below as well as on the website of the corridor. Therefore, the AG and further external Parties should address the Secretariat in written form in case of sending the opinion of the AG, asking for clarifications, etc. Every written initiative has to be answered by the MB in written form via the Secretariat. In case of change in the contact details of the Secretariat it is the responsibility of the MB to communicate that towards the AGs in written form.

13. The Secretariat shall always be put in copy of any communication with the responsible MB Member in charge of management of AGs.

Contact details of the Secretariat:

#### **Amber RFC Secretariat**

Address: VPE Rail Capacity Allocation Office Ltd.  
H-1054 Budapest, Bajcsy-Zsilinszky út 48.  
Hungary  
Phone: + 36 30 184 7884  
E-mail: [amberrfc-secretariat@vpe.hu](mailto:amberrfc-secretariat@vpe.hu)

14. The Secretariat circulates the documents for consultation by sending them to each AG Member by e-mail but receives the opinions of the AGs only from the Spokespersons of the AGs.

15. The language of communication between the MB and the AGs shall be English.

16. Forms of communication between Advisory Group members and the Management Board are:

- E-mail communication (Amber RFC website with dedicated area),
- National conferences,
- Amber RFC RAG/TAG international conferences with AG members organized by MB.

17. Regular meetings of the AGs are held at least once per year. The MB and the AG may jointly decide about additional meetings, if necessary. Regular meetings are organized by the Secretariat in cooperation with the hosting IM. .

18. AG Members and their experts, MB Members and their experts, Executive Board Members and their experts and representatives of the European Commission may take part in the AG meetings depending on the items on the agenda.

The AGs may decide to invite further persons to an AG meeting depending on the items on the agenda.

#### **IV. Utilization of opinions of the AGs**

19. The MB takes any opinion of the AGs into account.

20. If the MB cannot meet the requests or expectations expressed by an AG opinion, the MB gives an explanation to the AG, and continues consultation with the aim to reach agreement.

21. In the event of disagreement between the MB and an AG, the latter may refer the matter to the EB. The EB shall act as an intermediary and provide its opinion in due time. The final decision however shall be taken by the MB.

# TRANSPORT MARKET STUDY

2018



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SK



HU



Slovenske železnice  
SŽ-infrastruktura, d. o. o.

SI



## Client

|  |   |  |
|--|---|--|
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## GLOSSARY/ABBREVIATIONS

| Glossary/<br>abbreviations | Definition  |
|----------------------------|---|
| <b>AB</b>                  | Allocation Body   |
| <b>AGTC</b>                | European Agreement on Important International Combined Transport Lines and Related Installations  |
| <b>AT</b>                  | Republic of Austria   |
| <b>BCh</b>                 | Беларуская чыгунка (Belarusian Railway – national railway company)  |
| <b>BSC</b>                 | Balanced scorecard (BSC) is a visual tool used to measure the effectiveness of an activity against the strategic plans of a company. Balanced scorecards are often used during strategic planning to make sure the company's efforts are aligned with overall strategy and vision.  |
| <b>BY</b>                  | Belarus   |
| <b>CFR</b>                 | Compania Națională de Căi Ferate (Manager of infrastructure in Romania)   |
| <b>CNC</b>                 | The Core Network Corridors  |
| <b>C-OSS</b>               | Corridor One Stop Shop<br>A joint body designated or set up by the RFC organizations for applicants to request and to receive answers, in a single place and in a single operation, regarding infrastructure capacity for freight trains crossing at least one border along the Freight Corridor (EU Regulation No. 913/ 2010, Art. 13).  |
| <b>CZ</b>                  | Czech Republic  |
| <b>DB Netz</b>             | DB Netz AG (German railway infrastructure manager company)  |
| <b>DE</b>                  | Federal Republic of Germany   |
| <b>EC</b>                  | European Commission   |
| <b>ERTMS</b>               | European Railway Traffic Management System<br>ERTMS is a major industrial project being implemented by the European Union, which will serve to make rail transport safer and more competitive. It is made up of all the train-borne, trackside and lineside equipment necessary for supervising and controlling, in real-time, train operation according to the traffic conditions based on the appropriate Level of Application. |
| <b>ETCS</b>                | European Train Control System<br>This component of ERTMS guarantees a common standard that enables trains to cross national borders and enhances safety. It is a signalling and control system designed to replace the several incompatible safety  |

|                  |  |
|------------------|--|
|                  | systems currently used by European railways. As a subset of ERTMS, it provides a level of protection against overspeed and overrun depending upon the capability of the line side infrastructure.  |
| <b>EU</b>        | European Union   |
| <b>GCI</b>       | The Global Competitiveness Index   |
| <b>GDP</b>       | Gross Domestic Product   |
| <b>GYSEV</b>     | GYSEV Raaberbahn (Austrian – Hungarian railway company)  |
| <b>HDI</b>       | Human Development Index  |
| <b>HR</b>        | Croatia  |
| <b>HU</b>        | Hungary  |
| <b>HŽ</b>        | Hrvatske Željeznice (Croatian Railways)  |
| <b>IEF</b>       | Index of Economy Freedom   |
| <b>IM</b>        | Infrastructure Manager   |
| <b>INF TSI</b>   | Infrastructure - Technical specification for interoperability relating to the infrastructure subsystem of the rail system in the European Union<br><br>Commission regulation (EU) No 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the ‘infrastructure’ subsystem of the rail system in the European Union.             |
| <b>IT</b>        | Italy  |
| <b>ITT</b>       | Intermodal transport terminal rail-road, rail-water  |
| <b>LG</b>        | Lietuvos geležinkeliai (Railway Infrastructure Directorate of SC “Lithuanian Railways“)  |
| <b>LT</b>        | Lithuania  |
| <b>MÁV Zrt.</b>  | Magyar Államvasutak (Hungarian State railways)   |
| <b>N/A</b>       | Not Available  |
| <b>ÖBB INFRA</b> | Österreichische Bundesbahnen (The Austrian Federal Railways)   |
| <b>PaPs</b>      | Pre- Arranged Paths  |
| <b>PCS</b>       | The Path Coordination System (PCS) is an international path request coordination system for path applicants, e.g. Railway Undertakings (RUs), Infrastructure Managers (IMs) and Allocation Bodies (ABs). The internet-based application optimises international path coordination by ensuring that path requests and path offers are harmonised by all involved parties. |

|                |   |
|----------------|---|
| <b>PLK</b>     | Polskie Linie Kolejowe (Infrastructure manager in Poland)   |
| <b>RC</b>      | Reserve Capacity  |
| <b>RFI</b>     | Rete Ferroviaria Italiana (Italian railways manager of infrastructure)  |
| <b>RNE</b>     | Rail Net Europe   |
| <b>RO</b>      | Romania   |
| <b>RS</b>      | Serbia  |
| <b>RU</b>      | Railway Undertaking   |
| <b>RUS</b>     | Russian Federation  |
| <b>RŽD</b>     | Российские железные дороги (Russian Railways)   |
| <b>SI</b>      | Slovenia  |
| <b>SK</b>      | Slovak Republic   |
| <b>SŽ-I</b>    | Slovenske Železnice - Infrastruktura (Infrastructure manager in Slovenia)   |
| <b>SŽDC</b>    | Správa železniční dopravní cesty (Manager of infrastructure in Czech Republic)  |
| <b>TAF TSI</b> | <p>Telematics application for freight service – Technical specification for interoperability relating to the telematics applications for freight subsystem of the rail system in the European Union</p> <p>Commission regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the rail system in the European Union</p> <p>Telematics application for passenger service – Technical specification for interoperability relating to the subsystem ‘telematics applications for passenger services’ of the trans-European rail system</p> |
| <b>TAP TSI</b> | <p>Commission Regulation (EU) No 527/2016 amending Commission Regulation (EU) No 454/2011</p> <p>The Trans-European Transport Network (TEN-T) is a European Commission policy directed towards the implementation and development of a Europe-wide network of roads, railway lines, inland waterways, maritime shipping routes, ports, airports and rail-road terminals.</p>  |
| <b>TEN-T</b>   |   |

|            |  |
|------------|--|
| <b>TEU</b> | TEU - Twenty- foot Equivalent Unit (a measure used for capacity in container transportation) |
| <b>TMS</b> | Transport market study   |
| <b>UA</b>  | Ukraine  |
| <b>UŽ</b>  | Укрзалізниця (Ukrainian Railways)  |
| <b>VPE</b> | Vasúti Pályakapacitás-elosztó Kft. (Rail Capacity Allocation Body)                           |
| <b>ŽS</b>  | Železnice Srbije (Serbian Railways)  |
| <b>ŽSR</b> | Železnice Slovenskej republiky (Infrastructure manager in Slovakia)                          |

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## **INTRODUCTION**

The current economic development in EU countries has an impact on continuous increase in demand for transport services. The continuous increase in demand for transport services results from a higher consumption of EU population and a higher production of manufacturing enterprises. The demand is directly influenced also by the need to transport the final products and the intermediate products from Asia to Europe and vice versa. Several European companies cooperate with the companies in Asia and their trading income, level of innovations and social benefits depend on their cooperation. This demand then creates an offer that results in a market for transport services. There are many offers from several modes of transport in this market where each mode of transport has its advantages and disadvantages for the transport process, the customer, the society and the environment.

Rail freight is considered to be the most environmentally friendly mode of transport of goods, with an important role in the freight transport market. It contributes to the development of human society and combines economic and social progress while respecting the environment. Due to exogenous (e.g. entry of competition in road and air transport, technological innovations oriented to other modes of transport, change in transport requirements) and endogenous (e.g. inefficiency, overemployment, low level of innovations and modernization, technological lag) factors, rail freight lost the competitiveness in the transport services market resulting in decrease in the transport performances of rail sector. At the same time a shift of transport performances to other more environmentally demanding modes of transport has occurred. This shift leads to a higher production of the negative external costs of transport and need for higher state subsidies to the transport infrastructure from public funds. This unfavourable state has to be addressed by individual states and EU.

EU, to promote the competitiveness of rail freight transport, in particular in the field of infrastructure quality, safety, time and administrative effectiveness, international cooperation, has established the European Rail Freight Corridors. The establishment of the European Rail Freight Corridors should bring, in particular, better, more complete, more reliable and less expensive services to railway undertakings. Such services of the single European railway infrastructure consequently contribute to the better services of the railway undertakings providing freight services. Increased commercial activity, reliable, fast, safe and cost competitive service lead to a shift of transport performances from more environmentally demanding modes of transport to rail freight transport. In addition to its environmental advantage, rail freight transport can provide more reliable, safer, less expensive and faster transport service in case of harmonizing the transport and technological processes in comparison with other modes of transport. The shift of transport

performances to rail leads to overall decrease in social costs (infrastructure owner costs, carrier costs and negative external costs of transport) generated by transport.

Increasing requirements on quality and availability of rail freight service led to intention to establish the new European rail freight corridor Amber. The corridor establishment brings the connection between Adriatic seaports in the Republic of Slovenia and inland ports on the Danube and terminals in Hungary and the Slovak Republic and Poland, but it brings also the perspective of railway transport development with Serbia and the improvement of the railway transport in Europe – Asia direction. The perspective, quality and efficiency of the new corridor need to be assessed and subsequently, based on the assessment, to take measures to increase competitiveness and growth of the overall efficiency of the corridor. The proposed strategy is developed based on acquisition, processing and subsequent evaluation of technical, technological, transport and economic indicators obtained from various sources.

Based on the above mentioned facts, it is necessary to elaborate a Transport Market Study (TMS) for the Amber RFC which will evaluate the objective current situation, the perspectives and the effectiveness of the corridor. At the same time, it is necessary to propose the strategic measures leading to a higher effectiveness of the corridor based on the evaluations of individual parts of the study.

## **1 OBJECTIVE OF TRANSPORT MARKET STUDY**

The establishment of European rail freight corridors at EU level should contribute to the shift of transport performances from more environmentally demanding transport modes to less environmentally demanding rail freight transport, decreasing of non-investment state subsidies to the railway infrastructure, promoting investment state subsidies in the railway infrastructure, ensuring good economic conditions for railway undertakings and meeting the needs of customers. These corridors ensure, in particular, equal, non-discriminatory and easier conditions of access to the whole railway infrastructure of individual Member States for all railway undertakings. Harmonisation and synergy between particular railway infrastructures contribute to better quality, more available, more comprehensive and cost-effective services provided to railway undertakings. Cost effective services motivate railway undertakings to higher acquisition activity, thus more suitable modal split will be ensured for the whole society.

The chapter is aimed at the interpretation of basic objectives and effects of establishing the eleventh European rail freight corridor. At the same time, the chapter defines the main objective of TMS and the resulting partial objectives.

### **1.1 Aspects of establishing the Amber RFC**

The main objectives of establishing the rail freight corridors, defined by the European Commission (hereinafter referred to as EC) are:

1. Strengthening competitiveness of rail freight transport compared with other modes of transport.
2. Effective modal split with an emphasis on environmentally friendly rail freight transport.
3. Coordination of investment in more qualitative railway infrastructure with possibility of financial support from EU funds.
4. Harmonisation and synergy between national rail systems.
5. Strengthening cooperation in allocation of railway infrastructure capacity to international freight trains between single infrastructure managers.
6. Conformity with existing objectives of other specific RFC corridors.

The establishment of the Amber RFC is to lead to the fulfilment of the partial objectives that can be summarized in the following points:

1. General growth of transit rail freight performances.
2. General growth of international rail freight performances (import, export).

3. General growth of intermodal transport performances.
4. Improve the interconnection of the main intermodal transport terminals in the Member States and allow for direct freight routes across the eastern part of the Alps.
5. Facilitate the interconnection between the Adriatic Sea Port in the Republic of Slovenia and the inland ports on the Danube in Hungary and the Slovak Republic.
6. Promote the railway transport development with Serbia.
7. Improve, potentially, the railway transport across EU Eastern border and on the land bridge between Europe and Asia.
8. Connection to the sea ports in the Republic of Poland.
9. Better services of infrastructure managers provided to railway undertakings.
10. Better services provided by railway undertakings to customers.
11. Shift of transport performances from environmentally demanding modes to rail freight – change in modal split in favour of rail freight.
12. Increase in reliability and decrease in transport time.
13. Decrease in railway undertaking costs.

In addition to the partial objectives mentioned above, the establishment of the Amber RFC also brings particular benefits to railway undertakings and terminals:

1. Making an offer of capacity on the whole route within the corridor in one place.
2. Overview concerning the railway infrastructure capacity included in the corridor, including the capacity provided with priority (the management board shall promote coordination of priority rules relating to capacity allocation on the freight corridor).
3. Better services in terms of transit time, regularity, reliability and information.
4. Strengthening customer approach.
5. Information on investment projects in railway infrastructure between railway administrations.
6. Reduction of operating restrictions.
7. Harmonization of infrastructure technical and transport parameters.
8. Harmonization of track possessions between individual railway infrastructure managers.
9. Possibility of improving the infrastructure included in the corridor, including connecting lines to terminals.
10. Eliminate bottlenecks.

11. Chance to strengthen priority rules in operative traffic control for freight trains carrying out transport performances on the corridor.
12. Possibility to express the opinion of railway undertakings on the quality of infrastructure manager services and the Amber RFC.

The defined objectives and benefits of the Amber RFC establishment are, in particular, to increase the competitiveness of rail freight services compared with other modes of freight transport, especially road goods transport. The benefits are better, more reliable and more available rail freight services and the reduction of operating and technological costs of railway undertakings. The fulfilment of corridor's objectives requires the cooperation of all stakeholders – transport policy (state, government), ministries concerned, infrastructure managers, intermodal operators, carriers and external suppliers of the railway sector.

## 1.2 Structure of TMS objectives

**The main objective of TMS:** is to provide a clear understanding of the current conditions of the multimodal freight market along the Corridor together with short and long term freight traffic forecast consequent to the implementation of the corridor at the beginning of year 2019, and also to propose a measurement of the expected modal shift from road to rail. Based on the elaboration of the transport market study, evaluate the current state, perspective, prognosis and opportunities of the new corridor. In accordance with the findings of these analyses, propose a strategy which will lead to the development of the Amber RFC and provision quality services of the EU railway systems.

**The TMS main objective justification:** To fulfil the main objectives of establishing the new European rail freight corridor Amber, mentioned in subchapter 1.1, it is necessary to examine and evaluate the current state of the transport and technical situation within the countries participating in the Amber RFC. The establishment of each rail freight corridor requires, based on an analysis of current state, the development of strategic direction in order to fulfil the basic objectives.

**In order to achieve the TMS main objective of the Amber RFC, the following structure was set:**

1. Introduction to issues.
2. Objectives of the transport market study.
3. Methodology of the study.
4. Corridor characteristics – legislative structure, corridor structure, graphical representation of the corridor in individual countries, technical parameters of corridor lines, capacity analysis,



- comprehensive basic comparison of RFC infrastructures, description of EU TEN-T corridor concerned, summary of obtained data.
5. Analysis of economic indicators – GDP analysis and prognosis, purchasing power parity, human development index, index of competitiveness of economies, index of economic freedom, analysis of significant industrial areas, summary of obtained data.
  6. Analysis of transport indicators – analysis of investment and non-investment subsidies, analysis of selected economic indicators of transport infrastructure, analysis of intended investment in transport infrastructure, analysis of transport performances (train km, gross tkm, number of trains) on corridor lines and on the whole network, modal split, summary of obtained data.
  7. Prognosis of transport performances: pessimistic, realistic and optimistic scenarios, results of prognosis.
  8. Comparative analysis of rail and road freight transport within the corridor.
  9. Analysis of strategic opportunities of the corridor – possibilities of cooperation with other corridors, transport opportunities from countries outside the EU.
  10. Last mile: overview of sidings, intermodal terminals, ports, loading and unloading facilities.
  11. Socio-economic benefits of the corridor.
  12. SWOT analysis – draft of strategy based on SWOT.
  13. Draft of marketing strategy – external environment analysis, internal environment analysis, draft of marketing strategy.
  14. Strategic map of the corridor.
  15. Conclusion and recommendations.

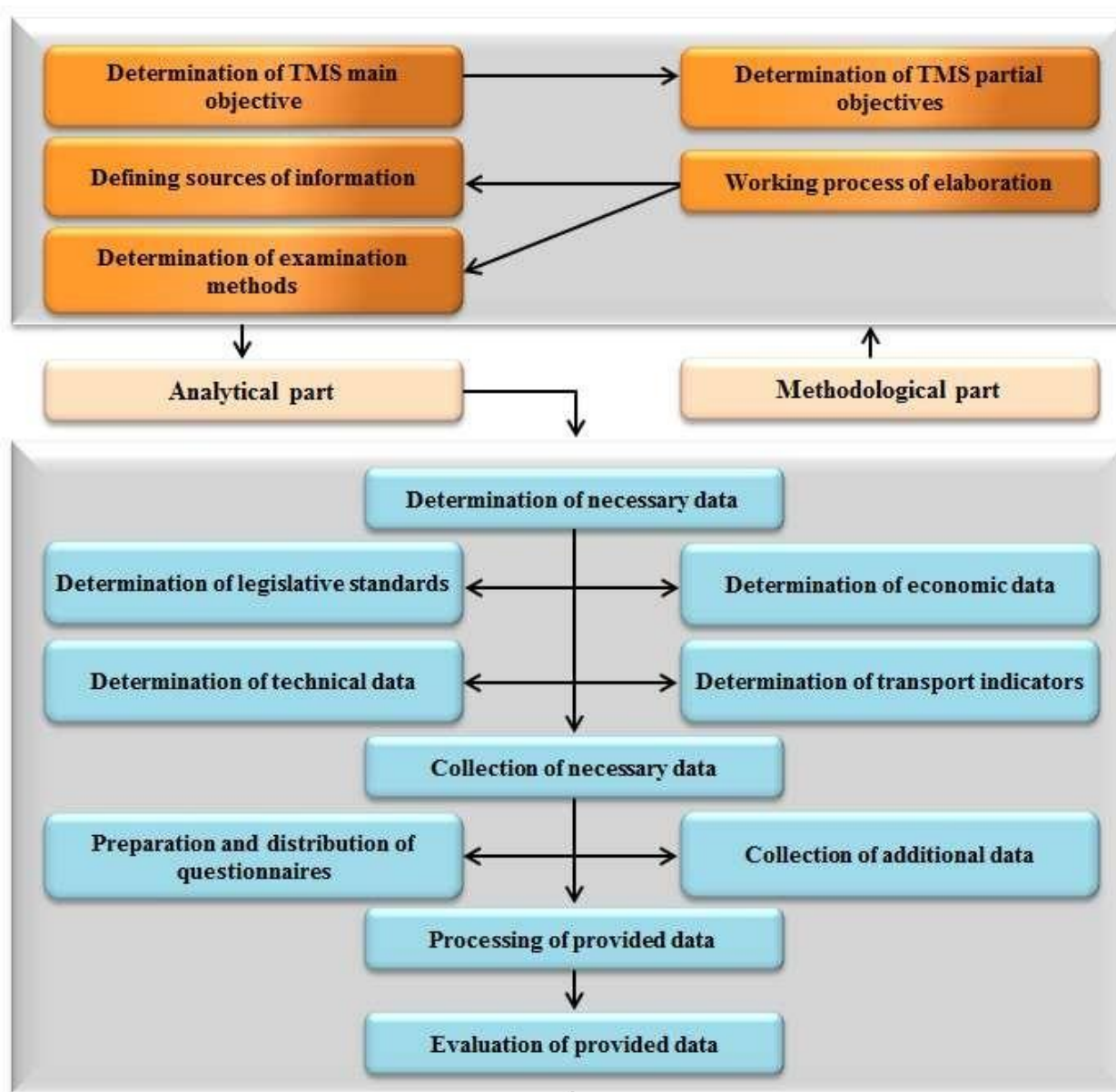
The processing of all these partial objectives is necessary to fulfil the main objective of the TMS of the new rail freight corridor Amber.

## 2 METODOLOGY OF WORK AND METHODS OF INVESTIGATION

The chapter in the first part graphically represents the selected working process of elaborating the TMS of the Amber RFC. Subsequently, the chapter provides sources of information necessary for elaborating the primary and secondary objectives. Based on the working process, the used methods necessary for elaborating the particular partial objectives of TMS are listed in the chapter.

### 2.1 Working process of TMS elaboration

For the elaboration of TMS, based on determining the main objective and resulting partial objectives, the methodological working process, shown in Fig. 1, was chosen.



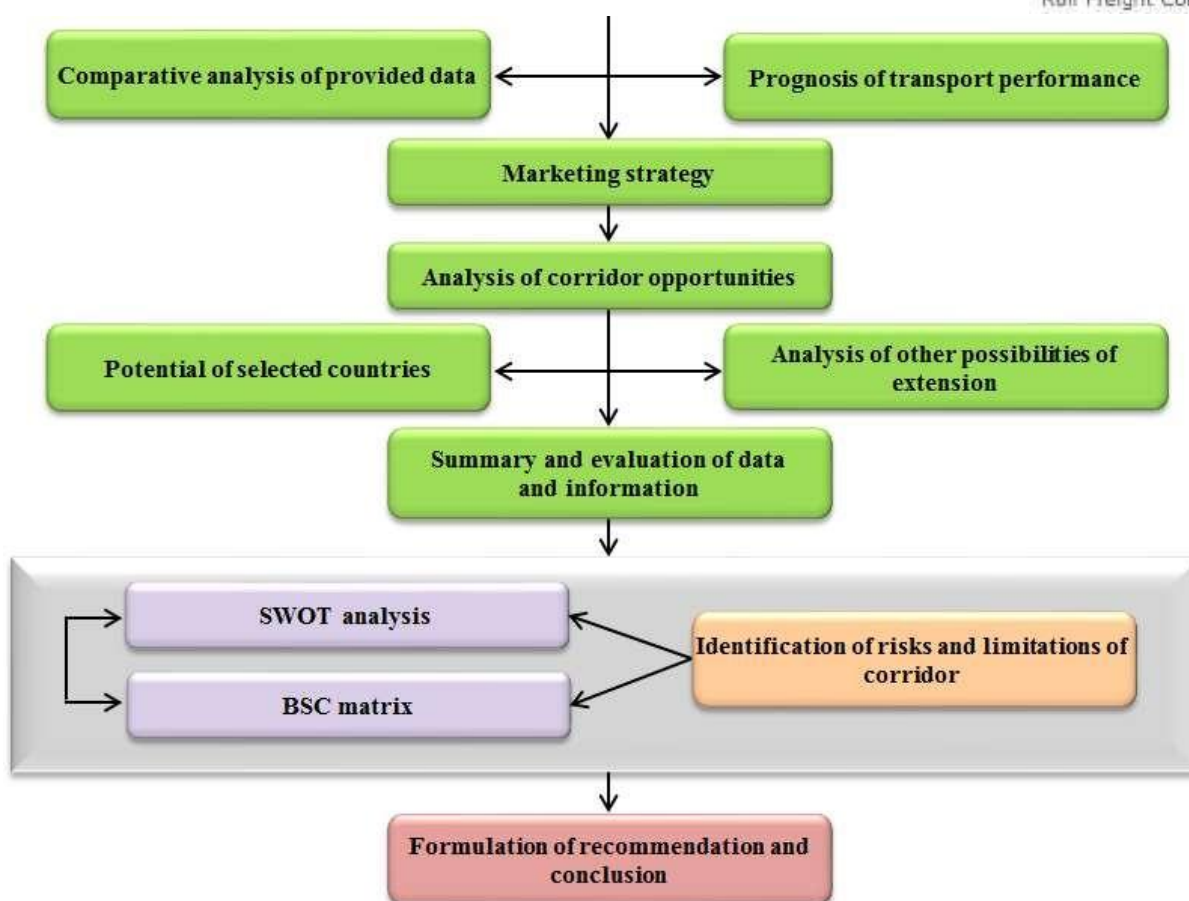


Figure 1: Graphical representation of methodical working process of TMS  
(Source: ŽSR, VVÚŽ)

## 2.2 Baselines for the TMS elaboration

The elaboration of all TMS tasks, listed in subchapter 1.2, requires the analysis and processing of various technical, capacity and economic indicators. This requires a wide range of statistical and analytical information stemming from several sources:

- EU legislation, modifications and standards of the member states of corridor,
- annual reports of infrastructure managers and allocation bodies of corridor member states,
- network statements of infrastructure managers and allocation bodies of corridor member states,
- traffic and transport performances provided by corridor infrastructure managers,
- traffic and transport performances from statistical offices of corridor member states,
- data of Eurostat,
- data of International Monetary Fund,
- data of Organization for Economic Cooperation and Development,

- data of World Bank,
- economic indicators provided by statistical offices of corridor member states,
- reports and studies of TEN-T Core Network Corridors,
- other available economic, traffic and transport information necessary for study elaboration,
- data from questionnaires sent to infrastructure managers,
- Manual Update of the Handbook on External Costs of Transport“ (final report for the European Commission - 2014),
- sector publications (articles, reports, press releases, etc. with relevance for RFC corridors),
- scientific literature.

The statistical and analytical data require for elaborating the individual parts of TMS of the Amber RFC, with which it was possible to elaborate the individual parts of the study and then to propose the optimal strategy, are shown in Table 1.

*Table 1: Statistical and analytical indicators monitored in TMS*

| Scope                           | Indicator   |
|---------------------------------|---|
| <b>Technical parameters</b>     | Maximum length of train, class of line, signalling equipment, electrification system, loading gauge, average speed of train, speed limits, profile  |
| <b>Transport performances</b>   | Development of transport performances on corridor lines (national transport and international transport)<br>Development of transport performances on all lines of member state (national transport and international transport) |
| <b>General indicators</b>       | Population, industry (the most important industry areas in countries of Amber RFC), transport infrastructure  |
| <b>Macroeconomic indicators</b> | GDP development and prognosis in member states, GDP per capita in purchasing power parity, Human development index, Index of competitiveness of economies, Index of economic freedom  |
| <b>Microeconomic indicators</b> | Level of infrastructure charges for type trains<br>Transit time   |
| <b>Modal Split</b>              | Development of modal split between individual modes of transport (freight and passenger transport on national territories)  |
| <b>Capacity analysis</b>        | Development of transport capacity utilization of individual lines<br>Development of transport capacity utilization of individual corridor lines   |
| <b>Other indicators</b>         | Investment, technical and technological measures, proposal of extension of lines and terminals, etc.  |
| <b>Corridor indicators</b>      | Corridor benefits and opportunities   |

## 2.3 Methods used in TMS elaboration

**The individual partial objectives of TMS of the Amber RFC were worked out using the following methods:**

- method of investigating written sources used for selecting appropriate literature for processing the theoretical and legislative part of TMS,
- method of scientific abstraction – in examining the basic theoretical and legislative basis for establishment of the European freight corridors,
- method of information gathering and processing – used for information collection and its subsequent processing,
- benchmarking – in comparison of some transport and technical statistical data,
- method of analysis – in processing and searching required transport and technical statistical data,
- method of graphic representation – used for graphic and visual layout of acquired and processed statistical data and other results of the study,
- method of comparative analysis – comparison in analytical part,
- method of synthesis – for summarizing information and data obtained,
- method of induction and deduction – used in all parts of TMS, in creating logical judgements based on theoretical, legislative and empirical knowledge,
- brainstorming – consultations with practitioners,
- methods of statistical analysis – used in searching and processing required transport, technical and economical statistical data,
- prognostic method – used in development of TMS prognostic scenarios.

### **3 CHARACTERISTICS OF AMBER RAIL FREIGHT CORRIDOR**

The third part of TMS is aimed at the precise technical characteristics of the Amber RFC. The first part defines the legislative aspects of the establishment of the corridor in question. Consequently, the corridor routing in the individual railway infrastructures of the member states is graphically represented. An important part of the chapter is a description of technical parameters of the lines included in the corridor.

#### **3.1 Legislative aspects of Amber RFC establishment**

The Amber rail freight corridor No 11 is being established based on Commission Implementing Decision (EU) no. 2017/177 of 31 January 2017, that was issued on the basis of “Letter of Intent” as request of 4 Ministries competent for Rail Transport of Hungary, Republic of Poland, Slovak Republic and Republic of Slovenia.

The establishment of Amber rail freight corridor is on the compliance with Article 5 of Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight. This Regulation lays down rules for the establishment and organisation of international rail freight corridors with a view to the development of a European rail network for competitive freight.

The implementation of international RFCs forming a European rail network for competitive freight is conducted in a manner consistent with the trans-European Transport Network (TEN-T) according to Regulation (EU) No 1315/2013 of the European Parliament and of the council of 11 December 2013 on Union guidelines for the development of the Trans-European Transport Network and repealing Decision No 661/2010/EU.

In order to speed up TEN-T investments and strengthening public and private sector financing, while increasing legal certainty and respecting the principle of technological neutrality, REGULATION (EU) No 1316/2013 of the European Parliament and of the council decision of 11 December 2013 establishing the instrument of Connecting Europe and amending Regulation (EU) No (EC) No 913/2010 and repealing Regulations (EC) 680/2007 and (EC) no. 67/2010.

All the above mentioned legal acts are in line with Directive 2012/34/ EU of the European Parliament and of the Council of 21 November 2012 on the establishment of a single European railway area.

In order to establish and support the European railway network as regards freight transport, some technical and operational initiatives have been launched. These are, for example:

- development of interoperability through the technical specification of interoperability relating to the infrastructure subsystem of the rail system in European Union (INF TSI),
- development of interoperability through the technical specification of interoperability relating to Traffic Operation and Management (TOM TSI) and TSI relating to Telematics Applications for Freight Services (TAF TSI), and Telematics Applications for Passenger Services (TAP TSI).

### 3.2 Amber RFC governance structure

For proper functioning of the European rail freight corridors, control and management mechanisms in the form of bodies have been introduced for each corridor. At the same time, the coordination of established bodies contributes to meeting the basic objectives of RFC corridors and responds to the challenges of effective daily operation and the provision of the best possible services to customers.

#### **RFC bodies:**

**Executive Board** – made up of representatives of the authorities of the Member States concerned.

**Management Board** – made up of the representatives of the infrastructure managers and Allocation Body

**Railway Advisory Group (RAG)** – made up of railway undertakings interested in the use of the freight corridor.

**Terminal Advisory Group (TAG)** – made up of managers and owners of the terminals of the freight corridor including, sea and inland waterway ports.

**Corridor One Stop Shop (C-OSS)** – will be established by the corridor launching according to Commission Implementing Regulation No 2017/177 of 31 January 2017.

#### **Amber RFC Working Groups:**

- Traffic management, Train Performance and Operations,
- Marketing,
- Timetable and One Stop Shop,
- Temporary Capacity restrictions,
- Infrastructure, Interoperability and ERTMS,



- Legal Task Force.

Organizational support, coordination of activities and review of documents elaborated by Working Groups are provided by the Coordination Group. Administrative part is ensured by the RFC Secretariat.



Figure 2: *Organizational structure of Amber RFC*  
(Source: marketing Amber)

**Excerpt of the tasks of Executive Board:**

- is responsible for defining the corridor main objectives, supervises and takes measures,
- determines the framework for infrastructure capacity allocation within the corridor,
- approves documents and plans elaborated by the Management Board,
- periodically analyses the corridor implementation plan,
- submits to the European Commission a report on the results of executing the implementation plan every two years starting from the corridor establishment.



**Excerpt of the tasks of Management Board:**

- fulfilment of all Management Board tasks defined in Regulation (EU) No 913/2010,
- determination of the legal form of the Amber RFC,
- fulfilment of other tasks defined by decisions of the Management Board and Internal rules and procedures of the corridor,
- ensuring organisational, technical and operational conditions to make the Amber RFC operational on time,
- management of whole Amber RFC organizational structure,
- seeking good co-operation with the Executive Board of the Amber RFC, with the Advisory Groups and customers of the corridor and with the management boards of other RFCs.

The Management Board monitors the performance and quality of rail freight services within the corridor and once a year publishes the results on the web site of the corridor together with the results of the satisfaction survey of corridor users. In order to ensure a non-discriminatory access to railway infrastructure and fair economic competition it cooperates with regulatory bodies of member states, at the same time it performs the task of the Regulatory Body.

**Main tasks of Corridor One Stop Shop (C-OSS):** the C-OSS is the only body where applicants may request and receive infrastructure capacity for international freight trains on Amber RFC. The handling of the requests takes place in a single place and a single operation. The C-OSS is responsible for performing the handling of capacity requests for international freight trains and for the publication and allocation decision with regard to requests for PaPs and RC (Reserve Capacity) on behalf of the IMs / ABs concerned.

**RFC Amber routing:** Koper – Ljubljana/Zalaszentiván – Sopron/Csorna/(Hungarian-Serbian border) – Kelebia – Budapest – Komárom – Leopoldov/Rajka – Bratislava – Žilina – Katowice/Kraków – Warszawa/Łuków – Terespol – (Polish-Belarusian border) as the principal route for the Amber rail freight corridor.

**Member states:** Poland, Slovakia, Hungary, Slovenia

**Deadline for making Amber RFC operational:** by 30.01.2019

**Seat of Corridor One Stop Shop (C-OSS):** Poland

### 3.3 RFC graphical representation of proposed routing

The routing of the Amber RFC is based on the document Letter of intent concerning the establishment of the Amber Rail Freight Corridor No 11 by the Ministries competent for Rail Transport and subsequently on Commission implementing decision (EU) 2017/177 of 31 January 2017. The graphical representation of the proposed routing according to given documents is shown in the following Figure.



Figure 3: Graphical representation of Amber RFC routing  
(Source: ŽSR, VVÚŽ)

For more detailed representation, the graphical representation of the proposed routing within the railway infrastructure of individual participated countries is shown in Fig. 4 - Fig. 7.



Figure 4: Graphical representation of Amber RFC routes on PKP PLK network  
(Source: ŽSR, VVÚŽ)



Figure 5: Graphical representation of Amber RFC routes on ŽSR network  
(Source: ŽSR, VVÚŽ)



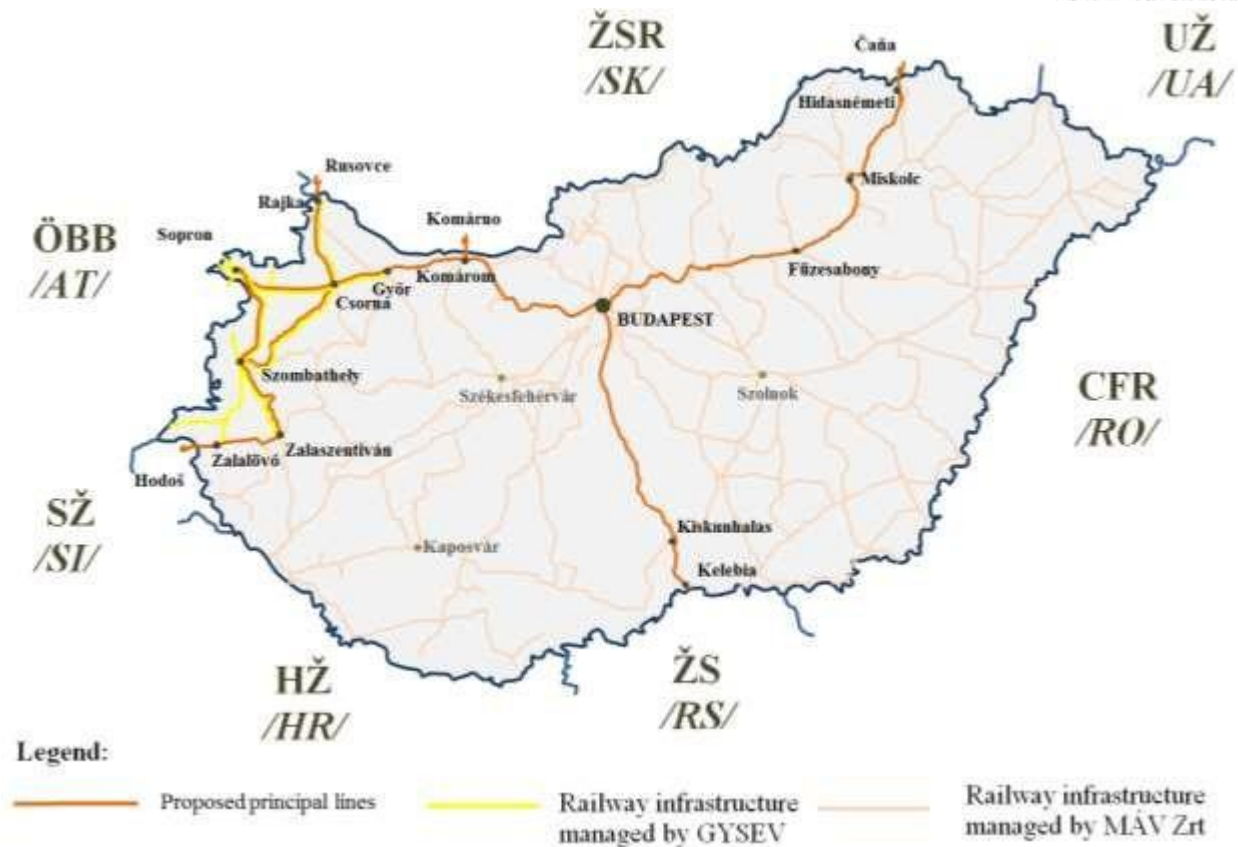


Figure 6: Graphical representation of Amber RFC routes on MÁV and GYSEV network  
(Source: ŽSR, VVÚŽ)



Figure 7: Graphical representation of Amber RFC routes on SŽ-I network  
(Source: ŽSR, VVÚŽ)

## 4 ECONOMIC ANALYSIS

The chapter is focused on the characterization and the subsequent analysis of selected economic indicators that influence the demand for transport services. An important part is the graphical analysis of important industrial areas located in the territories of countries under consideration.

### 4.1 Basic general characteristics of the countries of the Amber RFC

The aim of the subchapter is to provide basic general data on all countries participating in the Amber RFC.

#### **Republic of Poland**

**Capital:** Warsaw

**Area:** 312 679 km<sup>2</sup> (69th place in the world) of which water 8 220 km<sup>2</sup> (3,07 %)

**Population:** 38 116 000, census in 2017

**Official language:** Polish

**Administrative division:** 16 regions, 373 counties

**Currency:** Polish zloty =100 grosz (PLN)

**Neighbouring countries:** the Slovak Republic, the Republic of Lithuania, the Russian Federation, the Czech Republic, the Federal Republic of Germany, the Republic of Belarus, Ukraine.

**Geographical location:** Central Europe

Figure 8 is a graphical representation of the geographical location of the Republic of Poland with marked borders and significant cities. The geographical location of the country is particularly advantageous from the transport point of view in the direction from the Baltic Sea and the eastern part of Europe. The area of country, industry and tourism directly create increased demands for quality, safe, reliable and available transport services.



Figure 8: *Geographical representation of the Republic of Poland*  
(Source: ŽSR, VVÚŽ)

### **Slovak Republic**

**Capital:** Bratislava

**Area:** 49 036 km<sup>2</sup> (127th place in the world) of which water 931 km<sup>2</sup> (1.9 %)

**Population:** 5 435 343, estimate 2016

**Official language:** Slovak

**Administrative division:** 8 self-governing regions, 79 districts

**Currency:** Euro = 100 cents (EUR)

**Neighbouring countries:** the Czech Republic, the Republic of Poland, the Republic of Austria, Hungary, Ukraine.

**Geographical location:** Central Europe

Figure 9 is a graphical representation of the geographical location of the Slovak Republic with marked borders and significant cities. By its location, the country creates the appropriate conditions for rail transit traffic, mainly in the direction east (Asia) – west (Western Europe). The geographical location and available transport infrastructure in the country directly contribute to the direction of foreign investment that creates demand for transport services.



Figure 9: *Geographical representation of the Slovak Republic*

(Source: ŽSR, VVÚŽ)

## **Hungary**

**Capital:** Budapest

**Area:** 93 030 km<sup>2</sup> (108th place in the world) of which water 1 685 km<sup>2</sup> (~ 2 %)

**Population:** 9 830 485, estimate 2016

**Official language:** Hungarian

**Administrative division:** 7 regions, 19 counties and Budapest



**Currency:** Hungarian Forint = 100 fillér (HUF)

**Neighbouring countries:** the Republic of Austria, the Slovak Republic, Romania, the Republic of Serbia, the Republic of Croatia, the Republic of Slovenia, Ukraine.

**Geographical location:** Central Europe

Figure 10 is a graphical representation of the geographical location of Hungary with marked borders and some of significant cities. By its location, the country creates the appropriate conditions for rail transit traffic, mainly in the direction south – west and north of Europe. The transport infrastructure of Hungary has the potential to realize a significant part of transportations from countries outside the EU and the Republic of Turkey to the countries of Western Europe.



Figure 10: Geographical representation of Hungary

(Source: ŽSR, VVÚŽ)

**Republic of Slovenia**

**Capital:** Ljubljana

**Area:** 20 273 km<sup>2</sup> (154th place in the world) of which water 122 km<sup>2</sup> (0,7 %)



**Population:** 2 065 895, estimate 2016

**Official language:** Slovenian

**Administrative division:** 212 municipalities (občine)

**Currency:** Euro = 100 cents (EUR)

**Neighbouring countries:** the Republic of Austria, Hungary, the Republic of Croatia, the Republic of Italy

**Geographical location:** Central Europe

Figure 11 is a graphical representation of the geographical location of the Republic of Slovenia with marked borders and significant cities. The Republic of Slovenia is one of the important gateways for the goods incoming from Asia to Europe. The requirements for the continuation of the transport of goods from Asia continuously increase and create great opportunities for rail freight transport.



Figure 11: *Geographical representation of the Republic of Slovenia*

(Source: ŽSR, VVÚŽ)

## 4.2 Economic indicators

Within the economic indicators, the indicators: GDP, GDP per capita in purchasing power parity and HDI, GCI, IEF indices for the individual countries of Amber RFC, are analysed in the following sections. At the same time, the analysed indicators are briefly characterized.

### GDP – Gross domestic product

Gross Domestic Product (GDP) is defined as the value of all final products and services produced by all units of the national accounting of the monitored territory over the given period. Within the above GDP indicator, the following table shows GDP growth rate in % for the individual states included in the Amber RFC, including the forecast for 2018 - 2020.

Table 2: Real GDP growth rate and prognosis in %

| Description | Real GDP growth rate (%) |      |      |      |      |      |      |      | Prognosis of GDP (%) |      |      |
|-------------|--------------------------|------|------|------|------|------|------|------|----------------------|------|------|
| Year        | 2010                     | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018                 | 2019 | 2020 |
| Poland      | 3,6                      | 5,0  | 1,6  | 1,4  | 3,3  | 3,8  | 2,9  | 4,2  | 3,8                  | 3,4  | 3,6  |
| Slovakia    | 5,0                      | 2,8  | 1,7  | 1,5  | 2,8  | 3,9  | 3,3  | 3,3  | 3,8                  | 4,0  | 4,0  |
| Hungary     | 0,7                      | 1,7  | -1,6 | 2,1  | 4,2  | 3,4  | 2,2  | 3,7  | 3,6                  | 3,1  | 3,1  |
| Slovenia    | 1,2                      | 0,6  | -2,7 | -1,1 | 3,0  | 2,3  | 3,1  | 4,7  | 4,0                  | 3,3  | 3,2  |

Source: Eurostat

From the above-mentioned analysis of GDP growth rate, we can confirm the slowdown in economic growth in 2012 and 2013 in all analysed countries. GDP growth revival has been recorded since 2014. The GDP growth rate forecasts a positive growth trend above 3 % in 2018 as well as in 2019 and 2020 for all monitored countries.

### GDP per capita in purchasing power parity

Table 3 shows the trend of index of GDP per capita in purchasing power parity in relation to the average of EU 28 that is equal to 100 for the period 2010 – 2016. If the index of a country is higher than 100, the level of GDP per capita in the country under consideration is higher than EU average and vice versa. The basic data are expressed in purchasing power parity, i.e. common currency that eliminates differences in price levels between countries allowing meaningful volume comparisons of GDP between countries.

Table 3: GDP per capita in purchasing power standards

| Description | GDP per capita in Purchasing Power Standards (PPS) |      |      |      |      |      |      |
|-------------|--|------|------|------|------|------|------|
| Year        | 2010   | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| EU28        | 100  | 100  | 100  | 100  | 100  | 100  | 100  |
| Poland      | 62   | 65   | 67   | 67   | 67   | 68   | 68   |
| Slovakia    | 74   | 75   | 76   | 77   | 77   | 77   | 77   |
| Hungary     | 65   | 66   | 66   | 67   | 68   | 68   | 67   |
| Slovenia    | 83   | 83   | 82   | 82   | 82   | 82   | 83   |

Source: Eurostat

The highest index of GDP per capita in PPS among member states of the Amber RFC reached Slovenia at the level 83 in 2016. The Republic of Poland recorded a steady trend in 2012 – 2014 and then increased degree in the period 2015 – 2016. In Hungary, there was a slight decline in 2016 at the level 67 compared to the previous year. GDP per capita in PPS on the territory of the Slovak Republic is stable since 2013. A steady trend of GDP per capita in purchasing power parity confirms price stability in the analysed countries.

### **IEF – Index of Economy Freedom**

This index belongs to indicators aimed at measuring the economic freedom in relation to the overall performance of the economy. More than 50 world institutions are involved in the creation of the index, which analyse the indicators in the areas of impact of state interventions in the economy, the protection of property rights, the interventions in conditions of entry into business. Based on the long-term monitoring of this index, it is confirmed that countries with a higher level of economic freedom achieve higher performance of the economy, higher GDP growth rates and higher GDP per capita compared to countries with low level of economic freedom. The scale of values of index of economic freedom creates the Heritage Foundation, which covers 180 countries in the world with scores from 0 to 100, with 100 being the highest value of the economic freedom index.

### **GCI – The Global Competitiveness Index**

According to the Global Competitiveness Index, it is possible to express how the quality of business environment contributes to increasing the performance of economy and it is assessed according to four basic areas. These areas include economic growth, government efficiency, business environment efficiency, infrastructure efficiency. The World Economic Forum Global Competitiveness Index assesses 137 countries in the world with scores ranging from 1 to 7, with 7 being the highest value of the global competitiveness index.

### **HDI – Human Development Index**

The index is currently used most often to compare the level of human development. It is considered to be the most comprehensive indicator of quality of life. The Human Development Index assesses health and life expectancy, education and living standards. The index is also used by the United Nations Development Programme (UNPD). It is assessed within 188 countries ranging from 0 to 1, with the value of human development index being higher.

Table 4 analyses the above-described IEF, GCI, HDI indicators separately for each country of the Amber RFC.

Table 4: Overview of analysed indexes in countries of Amber RFC

| Index (Year) | IEF (2017) |          | GCI (2017 – 2018) |          | HDI (2015) |          |
|--------------|------------|----------|-------------------|----------|------------|----------|
| Country      | score      | Rank/180 | score             | Rank/137 | score      | Rank/188 |
| Poland       | 68,3       | 45       | 4,59              | 39       | 0,855      | 36       |
| Slovakia     | 65,7       | 57       | 4,33              | 59       | 0,845      | 40       |
| Hungary      | 65,8       | 56       | 4,33              | 60       | 0,836      | 43       |
| Slovenia     | 59,2       | 97       | 4,48              | 48       | 0,890      | 25       |

Source: The Heritage Foundation, World Economic Forum, United Nations Development Programme

From the mentioned values of Economic Freedom Index and Global Competitiveness Index, the Republic of Poland achieved the best rating among the analysed countries. Poland ranked in 45th place in comparison with the Economic Freedom Index values and in 39th place in comparison of values of the Global Competitiveness Index. The best ranking within the Human Development Index among countries was achieved by Slovenia which ranked in 25th place in 2015. Overall, based on the date in Table 4, it is possible to confirm sufficiently appropriate macro environment in all analysed countries for investment, business and innovations which contribute to the economic development and subsequent demand for transport services. The results also confirm the competitiveness of the economies of the analysed countries towards the other evaluated countries of the world.

### ETI – Enabling Trade Index

The index is created by the World Economic Forum in cooperation with the World Bank and various national institutions which ensure the completion of necessary data. The index is made up of four sub-indexes:

- Market access,
- Border administration,
- Transport and communications infrastructure,
- Business Environment.

Each of these sub-indexes is divided into pillars ranging from 1 to 7, composed of basic indicators (55 in total) as well as indicators that are specific for given range. There are 136 countries in ranking, where the countries with the ranking closest to 7 are ranked the best. The rank of the best ranked countries goes upwards from 1 to the worst ranked countries up to 136.

Table 5: Overview of ETI index and individual sub-indexes for Amber RFC countries

| Country  | Rank/136 (2016) | Score | Subindex scores |                       |   |                      |
|----------|-----------------|-------|-----------------|-----------------------|---|----------------------|
|          |                 |       | Market Access   | Border Administration | Transport and communications Infrastructure | Business Environment |
| Poland   | 31              | 5,0   | 5,0             | 5,7                   | 4,6   | 4,5                  |
| Slovakia | 34              | 4,9   | 4,9             | 5,6                   | 4,6   | 4,6                  |
| Hungary  | 38              | 4,9   | 4,9             | 5,7                   | 4,5   | 4,5                  |
| Slovenia | 32              | 5,0   | 5,0             | 5,8                   | 4,6   | 4,5                  |

Source: World Economic Forum, World Bank, National statistics office

Based on the ETI index, we can confirm the above-average ranking of countries in terms of enabling business activities, while at the same time the above-average value of sub-index in the area of transport and communications infrastructure has been demonstrated. Appropriate measures of EU, individual member states in the field of transport infrastructure and transport infrastructure managers will again be reflected in ranking of analysed countries, whereby the overall value of ETI index will be increased.

Table 6 analyses the share of GDP within primary, secondary and tertiary spheres of the national economy for the period 2010 – 2016 for the countries of the Amber RFC.

Table 6: Analysis of GDP share

| Country  | Item/ Year                             | 2010 | 2012 | 2014 | 2015 | 2016 |
|----------|--|------|------|------|------|------|
| Poland   | Agriculture, value added (% of GDP)    | 2,9  | 3,0  | 2,9  | 2,5  | 2,7  |
|          | Industry, value added (% of GDP)       | 33,2 | 33,6 | 33,2 | 34,1 | 33,7 |
|          | Services, etc., value added (% of GDP) | 63,9 | 63,4 | 63,9 | 63,4 | 63,6 |
| Slovakia | Agriculture, value added (% of GDP)    | 2,8  | 3,5  | 4,4  | 3,8  | 3,7  |
|          | Industry, value added (% of GDP)       | 35,2 | 35,4 | 34,6 | 34,5 | 34,8 |
|          | Services, etc., value added (% of GDP) | 62,0 | 61,1 | 61,0 | 61,7 | 61,5 |
| Hungary  | Agriculture, value added (% of GDP)    | 3,5  | 4,6  | 4,7  | 4,4  | 4,4  |
|          | Industry, value added (% of GDP)       | 29,9 | 30,0 | 30,6 | 31,7 | 30,5 |
|          | Services, etc., value added (% of GDP) | 66,6 | 65,4 | 64,7 | 63,9 | 65,1 |
| Slovenia | Agriculture, value added (% of GDP)    | 2,0  | 2,0  | 2,3  | 2,3  | 2,2  |
|          | Industry, value added (% of GDP)       | 30,6 | 31,7 | 32,8 | 32,6 | 32,3 |
|          | Services, etc., value added (% of GDP) | 67,4 | 66,3 | 64,9 | 65,1 | 65,5 |

Source: The World Bank, Data

On the basis of the data analysed in Table 6, we can confirm the high share of the tertiary sphere of the national economy in the total GDP of the surveyed countries. The data document the high development of countries and the potential for sustainable development, as the tertiary sphere of the national economy is less harmful to the environment.

### 4.3 Industry

The transport services market is different in the individual countries. Differences are mainly influenced by the geographical location of the country, by the deployment of industrial and logistics centers as well as the main sectors of the economy.



### The most important industries in the Republic of Poland:

Extractive industries – rich sources of mineral resources, black coal, brown coal, oil and natural gas, lead, zinc, copper, rock salt.

Metallurgical industry – rolled material and sheets for cars, processing of copper, zinc, lead.

Mechanical engineering and automotive industry – means of transport, cars, especially for export, railway sets and sea vessels.

Chemical industry, pharmaceutical industry and food industry.

Figure 12 illustrates the most important industrial areas in the Republic of Poland.

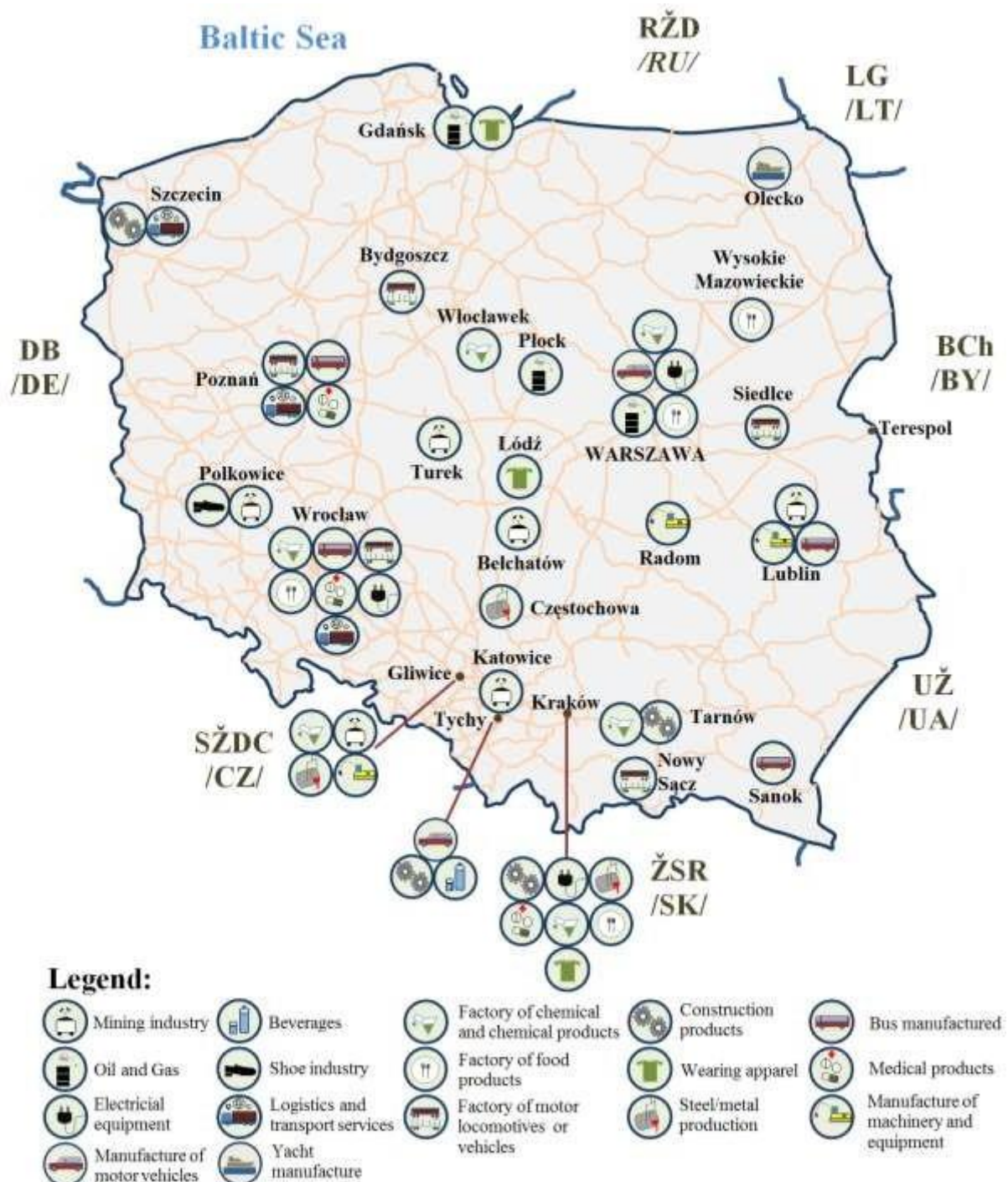


Figure 12: The most important industrial areas in the Republic of Poland  
(Source: General information on industry in Poland)

### The most important industries in the Slovak Republic:

Metallurgical industry – rolled material and sheets for automobiles, pipe and tube production.

Mechanical engineering – manufacturing of bearings, automobile components.

Automotive industry – four car factories.

Electrotechnical industry – manufacturing of screens, televisions, home appliances.

Tourism – especially the area of the High and Low Tatras, Bratislava, national parks.

Chemical industry and food industry.

Figure 13 illustrates the most important industrial areas in the Slovak Republic.

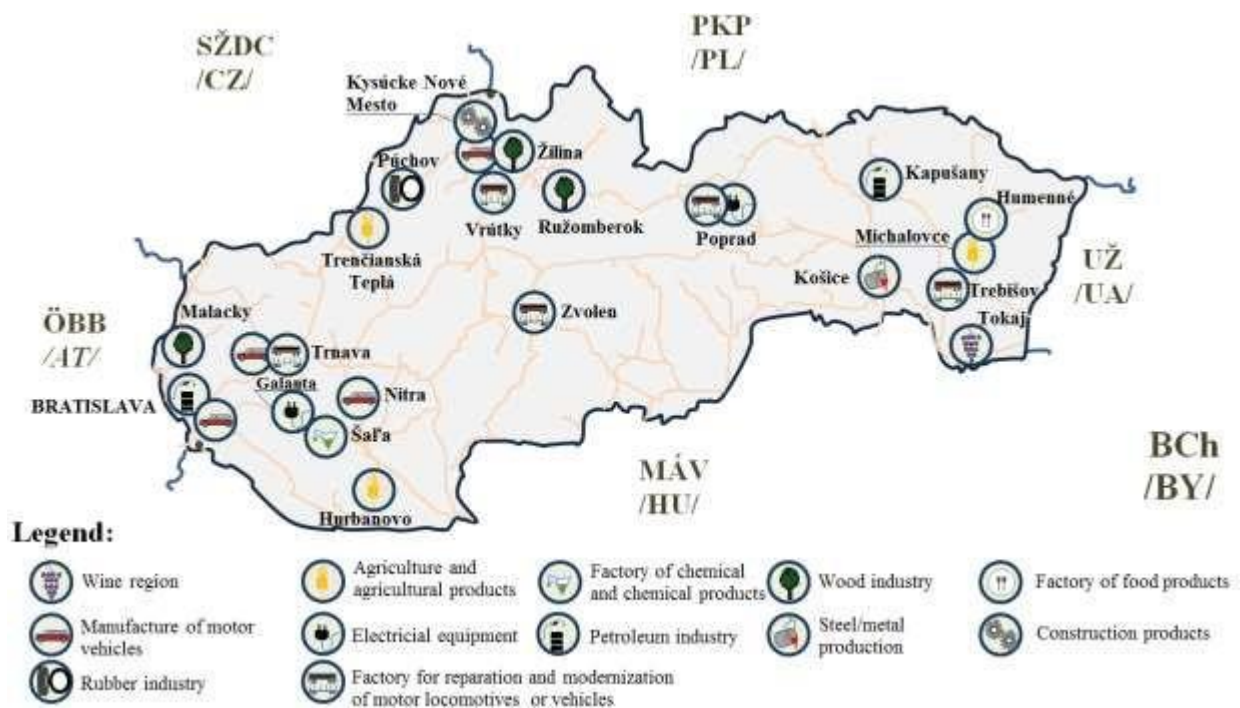


Figure 13: *The most important industrial areas in the Slovak Republic*

(Source: General information on industry in Slovakia)

### The most important industries in Hungary:

Mechanical engineering – mainly production of means of transport.

Chemical industry – mainly petroleum processing.

Textile production – especially furriery and work clothes.

Tourism – especially the area around Balaton, Budapest.

Food and agriculture – major exporter of meat, poultry, cereals and wines.

Figure 14 illustrates the most important industrial areas in Hungary.

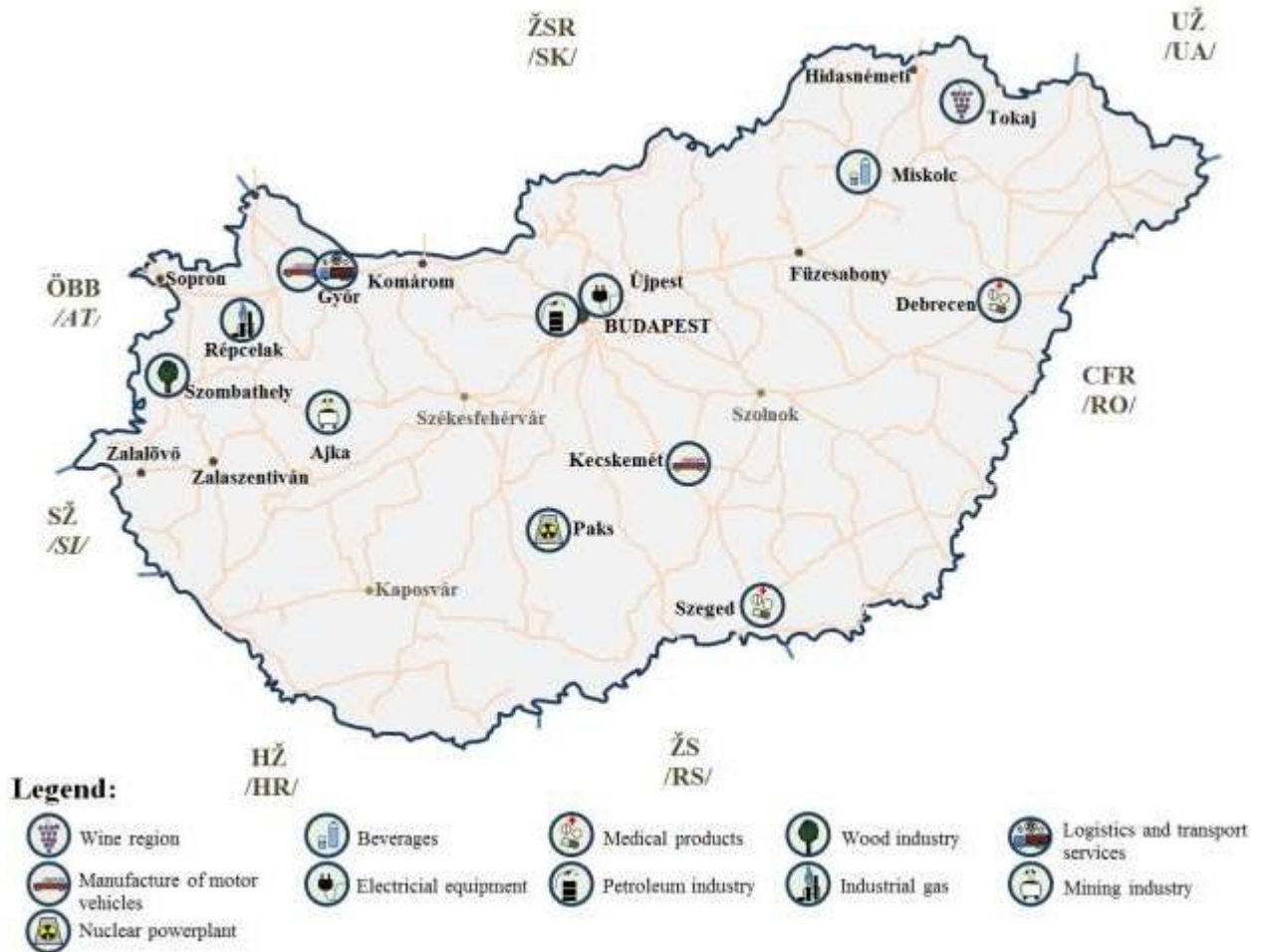


Figure 14: *The most important industrial areas in Hungary*  
(Source: General information on industry in Hungary)

### The most important industries in the Republic of Slovenia:

Mining industry – ferrous ores and metals, and other mining(lead and zin ores) and quarrying products.

Metallurgical industry – non-ferrous metals.

Mechanical engineering – means of transport, tools, home appliances.

Textile and pharmaceutical industries.

Furniture industry – important export goods of the country.

Tourism – especially in seaside areas.



Figure 15 illustrates the most important industrial areas in the Republic of Slovenia.

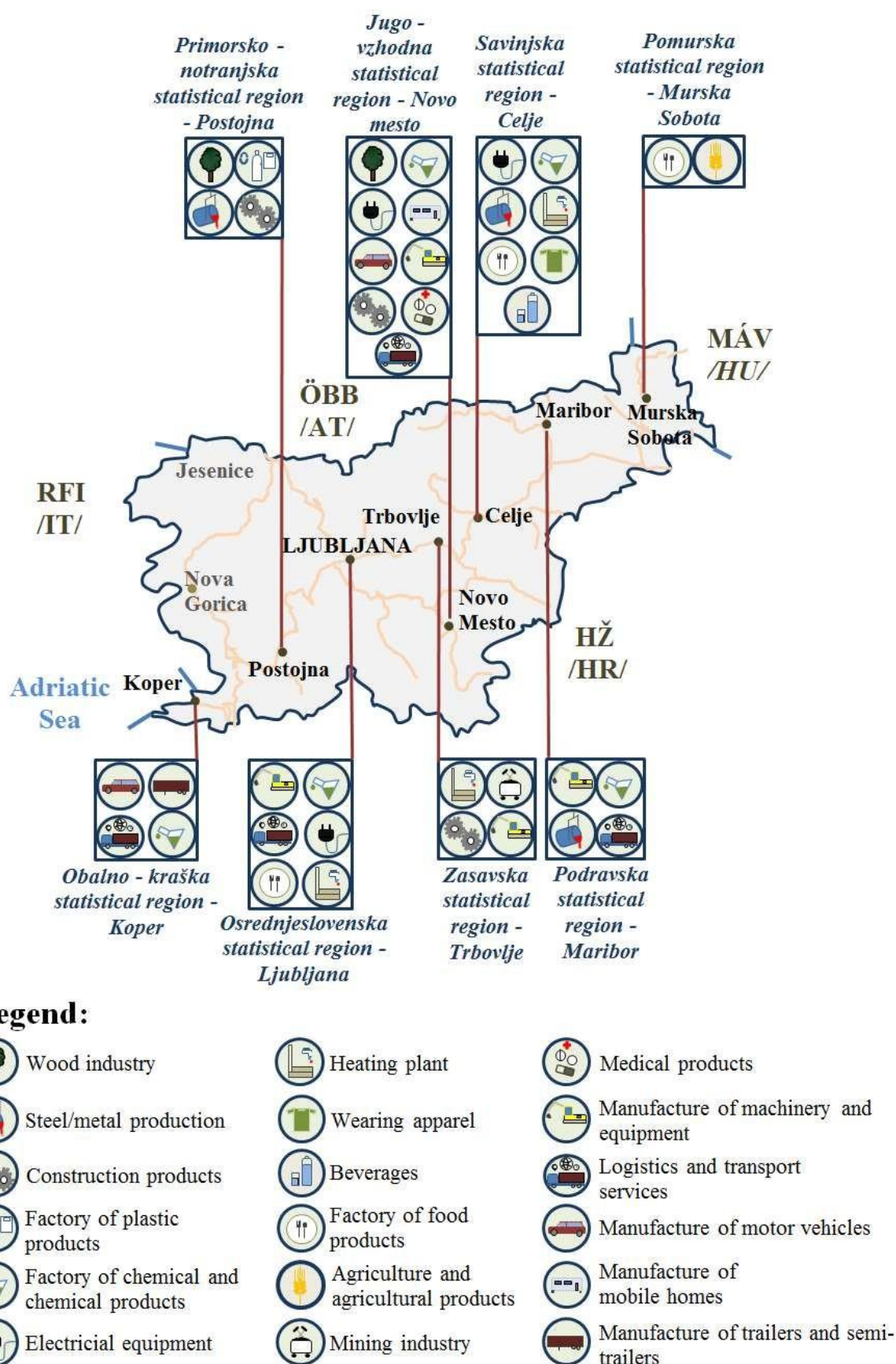


Figure 15: The most important industrial areas in the Republic of Slovenia

(Source: SURS – Statistical office of Republic of Slovenia)

#### 4.4 Results and summary of the findings of Chapter 4

On the basis of the collected and evaluated main statistical economic data in the Amber RFC countries, it is possible to conclude:

- positive economic development in the Amber RFC countries: it can be assumed based on the trend of positive GDP development in Table 2. The GDP development in the Amber RFC countries is assumed at the level of 3.1 – 4.0 %, which is more than the estimated average of GDP development in EU (2.8 – 2.9 %). Positive economic development can also be expected on the basis of the advantageous location of the Amber RFC countries within the analysed indices (Tables 4 and 5),
- increase in living standards of the population: it is assumed based on the Amber RFC countries ranking in the Human Development Index. At the same time, the positive trend of GDP development (expected based on the analysis in Table 2), the amount of foreign investments and the increase in a share of science and research in GDP contribute to increase in living standard,
- increase in industrial production: influenced by the attractive position of the Amber RFC countries within the international indices analysed in Tables 4 and 5. Industry structure, history, skilled labour force, geographic position and infrastructure of the Amber corridor countries also have a significant impact on industrial growth. These factors motivate foreign investors to direct their investment activities to the Amber RFC countries,
- increase in demand for services: the positive economic development in the Amber RFC countries (shown in Tables 2 and 3) takes a share in the consumption of services, as the purchasing power and consumer behaviour of the population are increased. This fact is confirmed in Germany and USA where an increase in demand for services due to the economic development – transition from secondary to tertiary national economy – was recorded,
- construction of industrial and logistics centres and intermodal transport terminals: results from the need to transport intermediate products, final products as well as foreign direct investment and greening transport. Increase in quality and extension of logistics services require the completion of new centres. The construction is also influenced by the attractive position of the Amber RFC countries within the Enabling Trade Index. The final products from the Amber RFC countries are worldwide distributed (e.g. production of cars in Hungary, Slovakia and Poland). Also, there is the need to distribute goods from Asia primarily by intermodal transport (e.g. goods distributed to the Amber RFC countries and other EU members from the Port of Koper in Slovenia),

- increase in demand for transport services: influenced by the positive economic development and the position of the Amber RFC countries according to the analysed indices (analysis in Tables 3, 4 and 5 – above-average position of the Amber RFC countries), the change in consumer behaviour, the population movement resulting from a higher purchasing power, higher production of final products, the need to transport intermediate products to the factories (in particular automotive, machine and metallurgical industries),
- requirements of a higher level of transport services, e.g. reliability, safety, shorter transport times, etc.: the economy in the Amber RFC countries forms primarily a secondary economic sphere (production and assembly of final products; electrical engineering, machine, metallurgical and automotive industries; Figures 12-15). This sphere requires reliable, flexible and safe transport services that are directly related to the production and logistics processes. Without the provision of high-quality transport services, the needs of customers (manufacturing companies, consumers, suppliers) cannot be satisfactory met, which could threaten the competitiveness of the business environment of the Amber RFC countries,
- pressure on transport ecology: the economic growth directly affects the consumer needs of the population, thereby the transport performances in goods and passenger road transport are still increased. The increase in these performances increases the production of negative external costs. Reduction of negative external costs (e.g. CO<sub>2</sub> production) is planned by the European Commission in the next period through the legislative measures (e.g. a Regulation of the European Parliament and of the Council setting emission performance standards for new passenger cars and for new light commercial vehicles as part of the Union's integrated approach to reduce CO<sub>2</sub> emissions from light-duty vehicles and amending Regulation (EC) No 715/2007),
- more financial resources for the transport sector: GDP growth (data in Table 2) in the Amber RFC countries will be reflected in the revenues to the state budgets in a positive way. Increase in public revenues positively influences the possibilities of state investments. Due to constantly increasing demand for high-quality transport services and better public revenues, it will be possible to assign more financial means for the transport sector.

The economic analysis carried out for the Amber RFC countries has shown sufficient potential for rail freight services. The economic growth puts increased demands on logistics and transport processes. The population mobility, purchasing power and environmental awareness, which significantly affect the demand for ecological rail transport services, are constantly increasing.

## 5 ANALYSIS OF TRANSPORT AND TRAFFIC INDICATORS

The first part of the chapter analyses the achieved level in the process of liberalization of the rail transport services market and the European Railway Performance Index. Consequently, an analysis of the transport infrastructure of the countries of the Amber RFC is carried out and graphical representation of other corridors passing through the surveyed countries can be found in Figures 19 - 22. The analysis of transport performances and selected transport indicators, which are the basis for the development of the Amber RFC strategy, are an important part of the chapter. The presented data create a comprehensive realistic view of the state of the railway system in individual countries.

### 5.1 Liberalization of rail transport services market

The market opening rate of rail transport services in EU countries was expressed by means of the liberalization index issued by IBM Germany in 2011. The index provides qualified data on the legislative and practical possibilities for the entry of new railway undertakings into the rail transport services market. The index also points to barriers and shortcomings to the entry of new railway undertakings into the rail transport services market in individual EU countries. The index was also calculated for Switzerland and Norway. The liberalization index is calculated fairly, therefore it provides a detailed view of the liberalization process in the analysed countries. The liberalization index examines, in particular, the view of new entering railway undertakings by answering questions:

- What are the legal bases for external railway undertakings in the target country?
- What are the opportunities and barriers to entry to the rail market?
- What is the dynamic and strong competition on the rail transport services market?

**The liberalization index is based on data from two types of indicators:**

1. LEX indicator – shares 20 % in the overall result of the index. It examines the organization of the rail sector, in particular the vertical separation of the infrastructure manager and the railway undertakings. An important criterion is a degree of market access control and power of market institutions. The most important part of LEX consists of the assessment and the resulting strength of the regulatory authorities of the analysed countries. Thematic areas examined in LEX:

- access to the railway market on the basis of Directive No 91/440, as amended by Directive 2001/12,
- national legislation,
- organizational classification of railway undertakings operating in the market under consideration,

- regulatory body.

2. ACCESS indicator – shares 80 % in the overall result of the index. It is focused on the analysis of conditional and complete barriers to access of new railway undertakings to the railway market. ACCESS thematic areas:

- conditions for obtaining the license and the safety certificate,
- access mode,
- access to the railway network,
- information barriers,
- system of charging for rail infrastructure and service facilities,
- access to service facilities.

The ACCESS indicator also evaluates the extent to which liberalization of the rail transport services market shares in the modal split and the development of the number of railway undertakings. In particular, the shift in transport performances in favour of rail transport is being monitored. The indicator separately assesses the segments of freight, suburban and long distance rail passenger transport. All analysed and examined areas of the liberalization index are scored and then counted, taking into account the ratios of individual countries:

- over 800 points advanced state,
- from 600 to 799 opening up the market as planned,
- from 300 to 599 points delayed state.

Figure 16 shows the liberalization index for passenger and freight rail transport in EU countries, Switzerland and Norway, issued by IBM Germany in 2011.

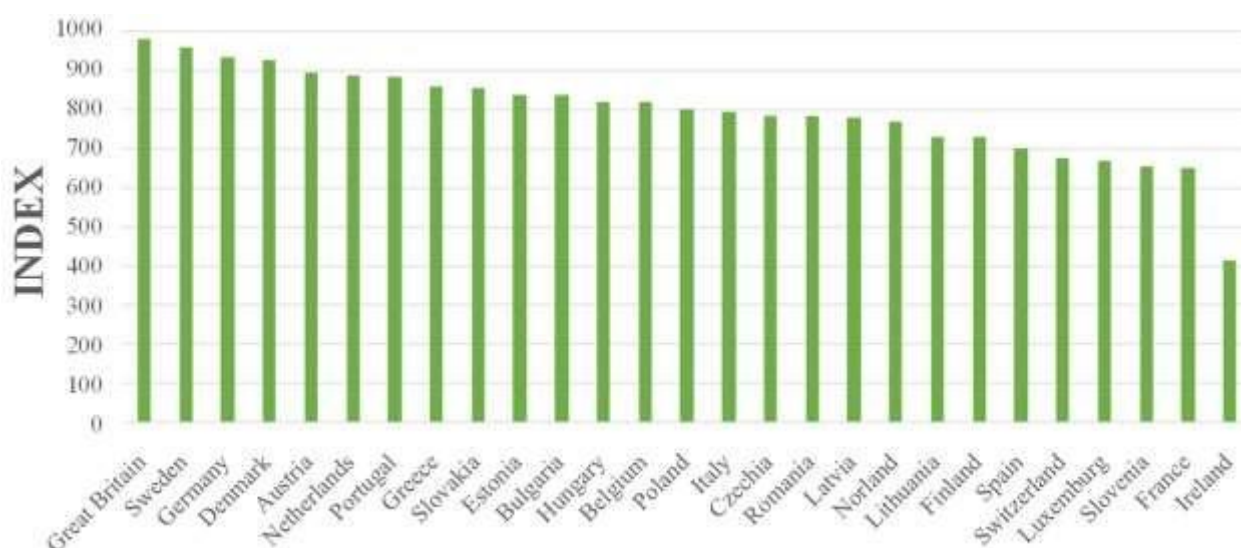


Figure 16: *Liberalization index for passenger and freight rail transport, 2011*

(Source: IBM Germany, 2011)



IBM Germany Liberalization Index, 2011 is currently the most up-to-date and the most objective tool to demonstrate the achieved level of liberalization process of rail transport services market in the evaluated countries. Figure 16 demonstrates the divergence in the level of rail transport market liberalization in EU countries due to the different implementation of EU legislative measures in the national legislation of the member states. The rail markets of the Polish, Slovak and Hungarian Republics have reached an advanced state in the market opening process. In evaluation, the Republic of Slovenia has reached the state – opening the market as planned. On the basis of the facts, we can confirm the appropriate conditions for doing business in the rail transport sector and providing transport services of the railway system in the Amber RFC countries. Based on the knowledge and experience, we can confirm the increasing level of the liberalization process in EU countries as well as in the Amber RFC countries.

## **5.2 The European Railway Performance Index**

Data on the Railway Performance Index were obtained from the website: <https://www.bcg.com/publications/2017/transportation-travel-tourism-2017-european-railway-performance-index.aspx>. Elaboration and evaluation of the study „The European Railway Performance Index” were carried out by the Boston Consulting Group.

BCG’s 2017 European Railway Performance Index (RPI) report provides insights for stakeholders seeking to answer this question. The RPI enables the most comprehensive benchmarking of European railway operations by considering the three critical components of railway performance: intensity of use, quality of service, and safety. The 2017 RPI report follows from the first two editions, published in 2012 and 2015. Over the five-year period covered by the three RPI studies, countries have generally remained within the same performance tiers.

Safety and quality of service (especially punctuality) are the most important factors underlying changes in a system’s performance. Countries experiencing a decrease in overall performance typically have seen a decrease in their safety rating, while those with improving performance have usually experienced an increase in their quality of service rating.

The RPI measures the performance of railway systems in three dimensions for both passenger and freight traffic:

- Intensity of Use: To what extent is rail transport used by passengers and freight companies?
- Quality of Service: Are the trains punctual and fast, and is rail travel -affordable?
- Safety: Does the railway system adhere to the highest safety standards?

The analysis was confined to these dimensions to create an indicator that is comprehensive yet easy to understand. Each dimension comprises at least two subdimensions, and all were given

equal weight. The data were rescaled to represent a score of 0 to 10 for each subdimension. To create the index, the -ratings for each dimension and subdimension based on their weighting were combined.

### The index's simplicity results in three methodological biases:

- Passenger performance is overweighted relative to freight performance because reliable information about the quality of service for freight operators - especially in terms of price and punctuality is unavailable. Consequently, the RPI for a particular country may not necessarily reflect high quality in the country's freight services.
- Large countries are favoured relative to smaller countries because the quality-of-service dimension takes into account the share of high-speed-rail travelers. That is significant because high-speed travel is more common in countries with railway networks that cover long distances.
- Countries in which consumers have low purchasing power are favoured - relative to those in which purchasing power is higher, because average fares were not adjusted on the basis of purchasing power parity (PPP). Never-theless, a PPP adjustment would have only a small impact on countries' - rankings, since it would mainly reinforce differences between tiers.

The following figure shows each country's performance, overall and for each of the three dimensions, as weighted in accordance with the methodology. The exhibit also shows each country's RPI ranking in 2012 and 2015, for comparison.



Figure 17: RPI ranking in 2017  
(Source: the Boston Consulting Group)

Tier One - the railways in tier one perform well in at least two dimensions, although the results were not uniform.

Tier Two - countries in tier two have high-performing railway systems overall. The similarity among their RPI ratings, however, obscures a wide range of results among the three dimensions. The highest-ranked systems have high safety scores, but low scores for quality and intensity of use.

Tier Three - the railway systems in almost all the tier three countries have poor safety ratings. One exception is Ireland: its safety rating is among the highest in the index. Slovenia, Hungary, and Slovakia are rated very good for intensity of use, while Lithuania, Latvia, and Poland are close behind with ratings of good. Portugal, Romania, and Bulgaria in addition to Ireland have poor ratings for intensity of use.

Changes in safety and quality have the greatest impact. Safety and quality of service (especially punctuality) appear to be the most important factors underlying changes in a system's performance. There were only small variations in intensity of use from year to year, and these have little impact on overall performance. A decrease in safety is typically the factor responsible for an overall decrease in performance. Countries with improving performance usually experience an increase in their quality of service rating.

The growth of the railway system effectiveness was also recorded in the countries which spend higher investments (investment and non-investment subsidies) in the railway system. Overall, as in 2012 and 2015, this year's study shows a correlation between public cost and a given railway system's performance level as measured by the RPI (Figure 18). In addition, it reveals differences in the value that countries receive in return for their public cost. Denmark, Finland, France, Germany, the Netherlands, Sweden, and Switzerland capture relatively high value for their money. These countries outperform relative to the average ratio of performance to cost for all countries. In contrast, Luxembourg, Belgium, Latvia, Slovakia, Portugal, Romania, and Bulgaria get relatively low value for their money.



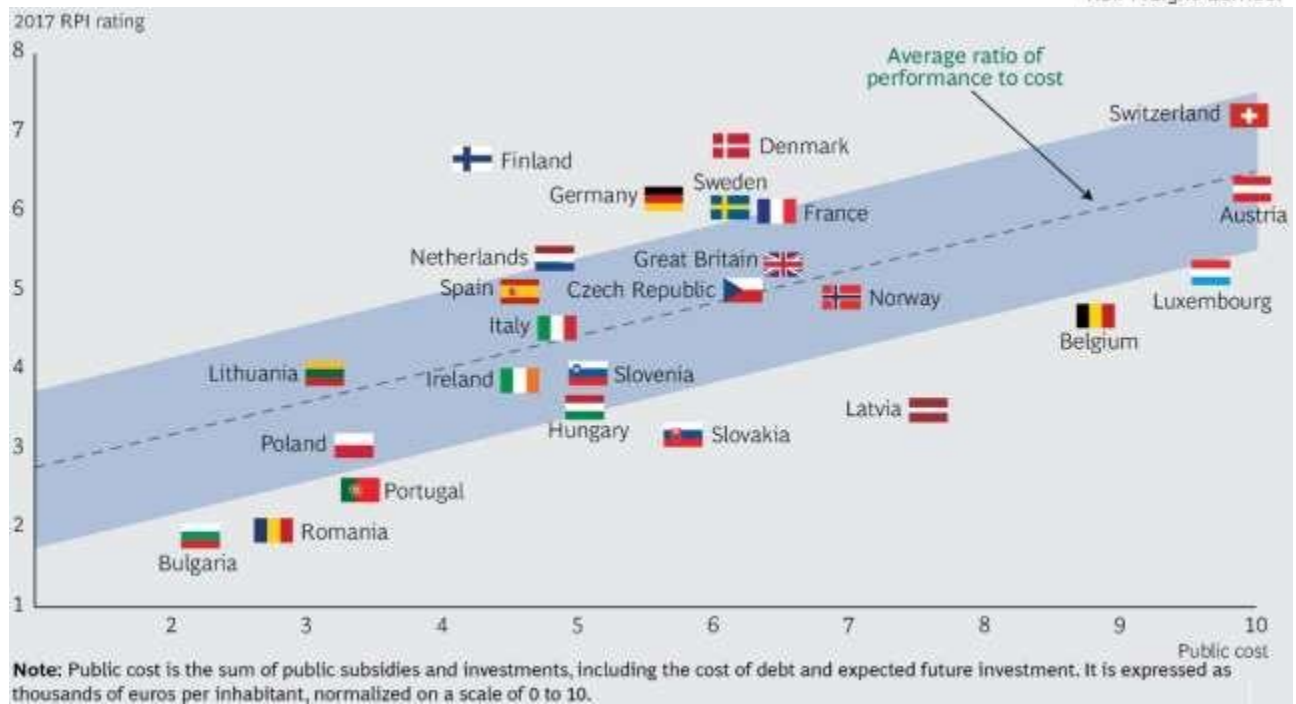


Figure 18: *Correlation between public cost and a given railway system's performance level*  
(Source: the Boston Consulting Group)

The analysis not only confirmed the correlation between public cost and performance, but also found that it applies over time. Countries that recently increased their public cost have been rewarded with the highest performance improvements (this is especially true for Finland). During the same period, stagnating levels of public cost in France and Great Britain, and decreasing levels in Italy and Sweden, have coincided with the incipient trend of declining performance.

**Based on the results of RPI, it is necessary to ensure:**

- at least to keep the level of financial resources allocated to the railway system in the countries with increasing performance,
- adapt the legislation and the transport policy of countries with a lower RPI in favour of the railway system (e.g. reduction of charges, support of intermodal transport, internalization of part of negative external costs of transport),
- increase investment and non-investment subsidies in the railway system in the countries with decrease in performance level (e.g. modernization of lines, electrification, eliminating bottlenecks),
- take measures to increase the safety and reliability of rail transport (e.g. modernization of signalling equipment, support of new IT technologies, increase of penalties for railway safety intruders, take interoperability measures),
- ensure a more efficient maintenance and management of rail transport in the countries with decrease in performance level (use innovations in the field of railway infrastructure

diagnostics, efficient management of internal processes, use of new equipment for railway infrastructure management).

### 5.3 Analysis of transport infrastructure of the Amber RFC countries

The sustainable economic development of the country depends, inter alia, on the quality, density and development of transport infrastructure as a tool necessary for the movement of goods and people. Each country manages and invests in the development and construction of its transport infrastructure. A high-quality and accessible transport infrastructure contributes to the overall development of the national economy. Tables 7-9 show an analysis of the development of rail and road infrastructure of the Amber RFC countries.

Table 7: Length of operated railway lines in km

| Country  | 1995   | 2000   | 2005   | 2010   | 2012   | 2013   | 2014   | 2015   |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Poland   | 23 986 | 22 560 | 19 507 | 19 702 | 19 617 | 18 959 | 18 942 | 18 510 |
| Slovakia | 3 665  | 3 662  | 3 658  | 3 622  | 3 631  | 3 631  | 3 627  | 3 626  |
| Hungary  | 7 714  | 8 005  | 7 950  | 7 893  | 7 877  | 7 898  | 7 892  | 7 894  |
| Slovenia | 1 201  | 1 201  | 1 228  | 1 228  | 1 209  | 1 209  | 1 209  | 1 209  |

Source: Annual reports of the relevant ministries

Table 8: Total length of motorways in km

| Country  | 1995 | 2000 | 2005 | 2010  | 2012  | 2013  | 2014  | 2015  |
|----------|------|------|------|-------|-------|-------|-------|-------|
| Poland   | 246  | 358  | 552  | 857   | 1 365 | 1 482 | 1 556 | 1 559 |
| Slovakia | 198  | 296  | 328  | 416   | 419   | 420   | 420   | 463   |
| Hungary  | 335  | 448  | 859  | 1 477 | 1 515 | 1 767 | 1 782 | 1 884 |
| Slovenia | 293  | 427  | 569  | 771   | 769   | 770   | 770   | 773   |

Source: Annual reports of the relevant ministries

Table 9: Length of other roads in km

| Country  | 1995    | 2000    | 2005    | 2010    | 2012    | 2013    | 2014    | 2015    |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| Poland   | 372 233 | 372 725 | 381 463 | 406 122 | 412 035 | 413 530 | 415 470 | 419 636 |
| Slovakia | 17 670  | 17 442  | 43 417  | 42 910  | 42 948  | 42 943  | 42 938  | 42 951  |
| Hungary  | 29 738  | 29 533  | N/A     | 198 090 | 200 426 | 203 309 | 204 057 | 202 998 |
| Slovenia | N/A     | 37 976  | 37 916  | 38 303  | 38 216  | 38 104  | 38 114  | 38 124  |

Source: Annual reports of the relevant ministries

Based on the statistical data in Tables 7-9, we can confirm the decline in the length of railway infrastructure in the monitored period in Poland and Slovakia. On the contrary, the increase in the length of the transport infrastructure is recorded on motorways. The most significant increase is recorded in the Republic of Poland. The trend of motorway construction is mainly influenced by performances in individual motoring and road goods transport.

Tables 10 and 11 provide an analysis of the development of expenditures on railway and road infrastructure maintenance in the Amber RFC countries.

*Table 10: Expenditures on railway infrastructure maintenance (mill. EUR – current prices)*

| Country         | 1995  | 2000 | 2005  | 2010  | 2012  | 2013  | 2014  | 2015  |
|-----------------|-------|------|-------|-------|-------|-------|-------|-------|
| <b>Poland</b>   | 584,8 | 59,4 | 82,3  | 212,8 | 307,3 | 387,1 | 614,2 | 578,6 |
| <b>Slovakia</b> | 60,0  | 70,9 | 90,6  | 120,4 | 80,6  | 60,9  | 70,5  | 110,5 |
| <b>Hungary</b>  | 137,8 | 78,6 | 233,9 | 439,5 | 434,9 | 418,3 | 490,1 | 473,1 |
| <b>Slovenia</b> | N/A   | 7,0  | 7,0   | 68,0  | 87,0  | 71,0  | 101,0 | 110,0 |

*Source: Annual reports of the relevant ministries*

*Table 11: Expenditures on road infrastructure maintenance (mill. EUR – current prices)*

| Country         | 1995  | 2000  | 2005    | 2010    | 2012  | 2013  | 2014  | 2015  |
|-----------------|-------|-------|---------|---------|-------|-------|-------|-------|
| <b>Poland</b>   | 286,4 | 448,6 | 1 263,5 | 2 636,5 | 428,0 | 438,1 | 383,1 | 415,4 |
| <b>Slovakia</b> | 24,6  | 66,6  | 100,3   | 174,7   | 192,6 | 203,6 | 181,2 | 201,0 |
| <b>Hungary</b>  | 96,8  | 106,8 | 283,4   | 328,5   | 295,9 | 370,3 | 272,8 | 282,1 |
| <b>Slovenia</b> | 53,0  | 79,0  | 99,0    | 137,0   | 120,0 | 123,0 | 113,0 | 126,0 |

*Source: Annual reports of the relevant ministries*

The demonstrated overall long-term trend in the growth of expenditures on the analysed transport infrastructure maintenance in the monitored period is mainly influenced by an increase in transport performances, aging of transport infrastructure and, in some cases, by neglected diagnostics which has a preventive role in transport infrastructure maintenance. Maintenance costs of transport infrastructure will continue to increase as a trend of increase in transport performances of rail and road transport is expected. The increasing trend of transport performances is influenced by the long-term economic development of the Amber RFC countries as shown in Chapter 4. The expenditures on maintenance will also be affected by the technical and technological parameters of the new and upgraded transport infrastructure that meets the conditions of a quality and safe transport infrastructure.

Figures 19-22 graphically represent the passing railway corridors for the Amber RFC countries.

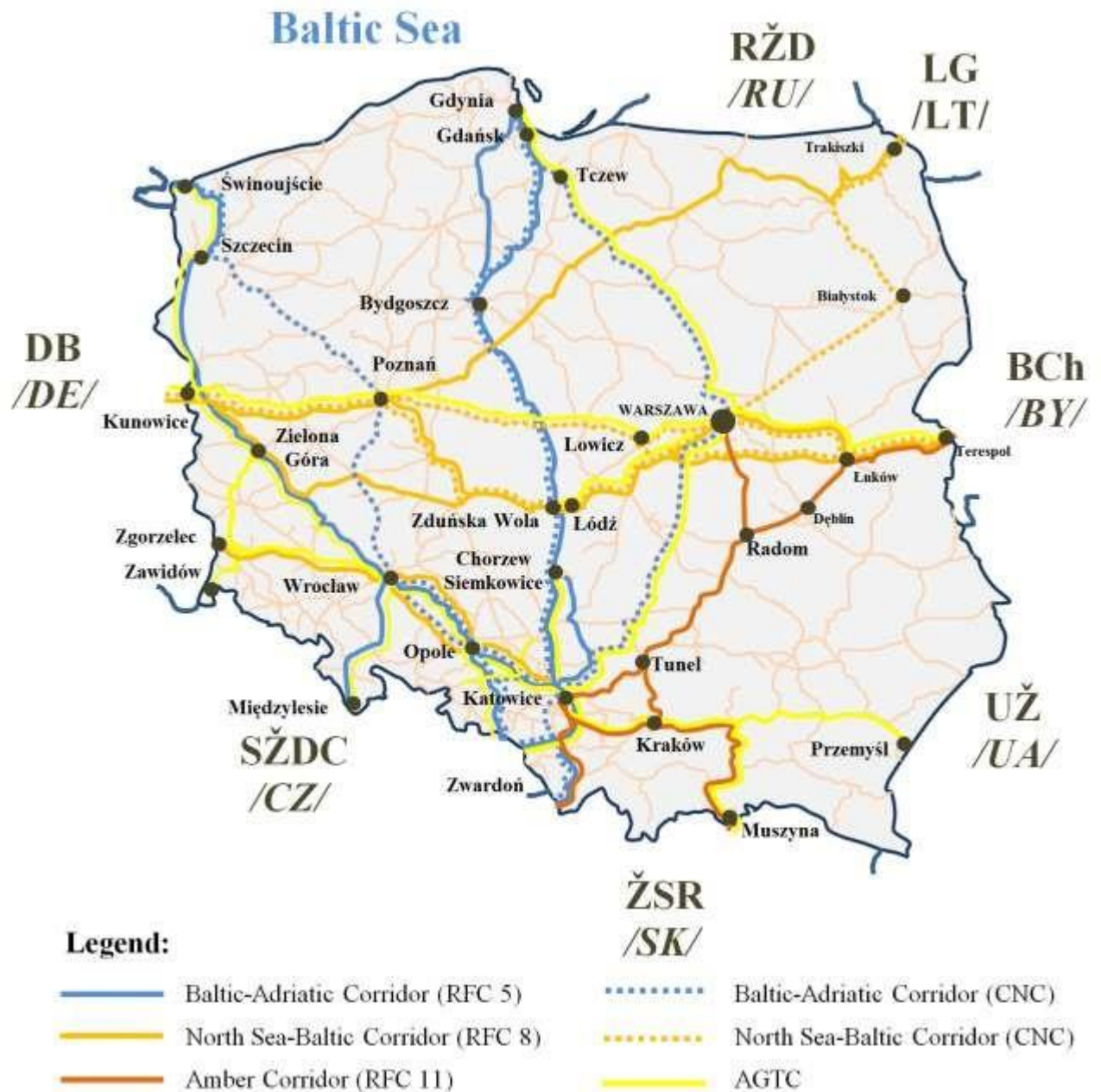


Figure 19: Railway corridors of the Republic of Poland  
(Source: ŽSR, VVÚŽ)



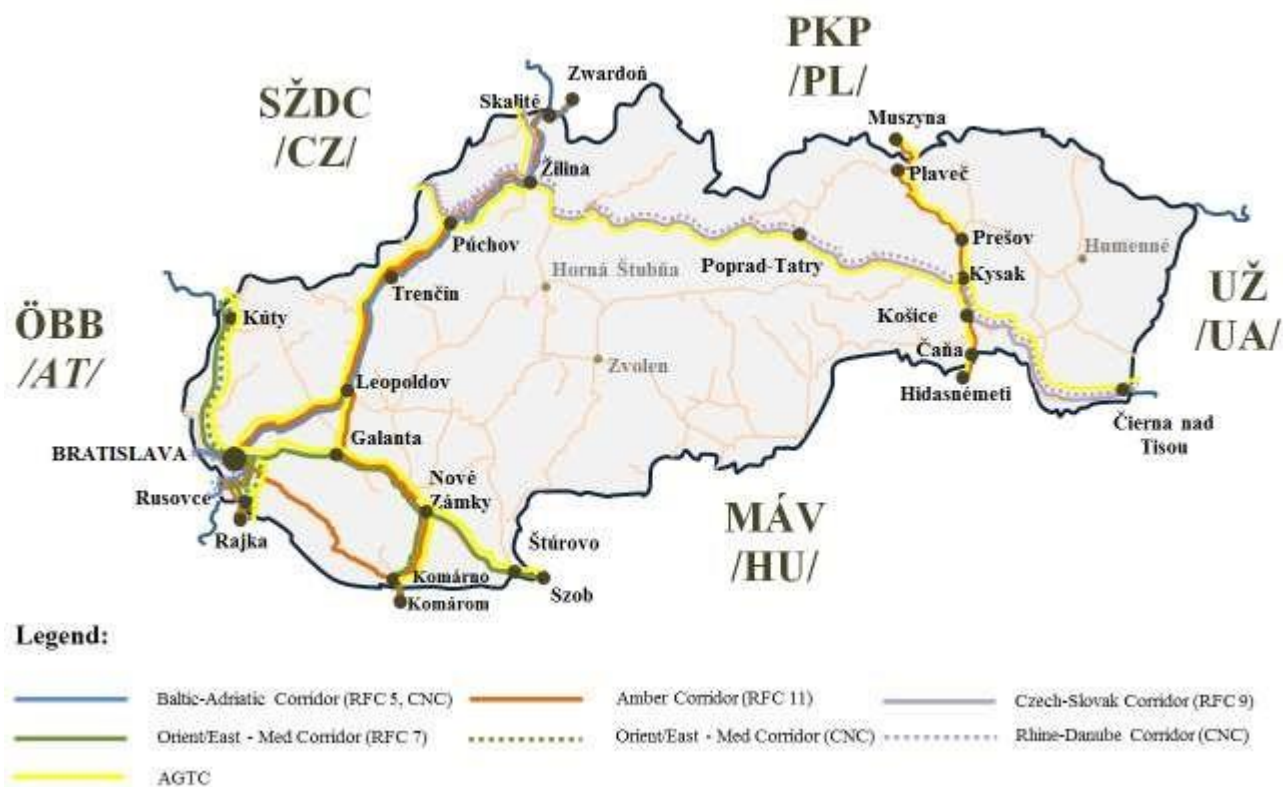


Figure 20: Railway corridors of the Slovak Republic

(Source: ŽSR, VVÚŽ)

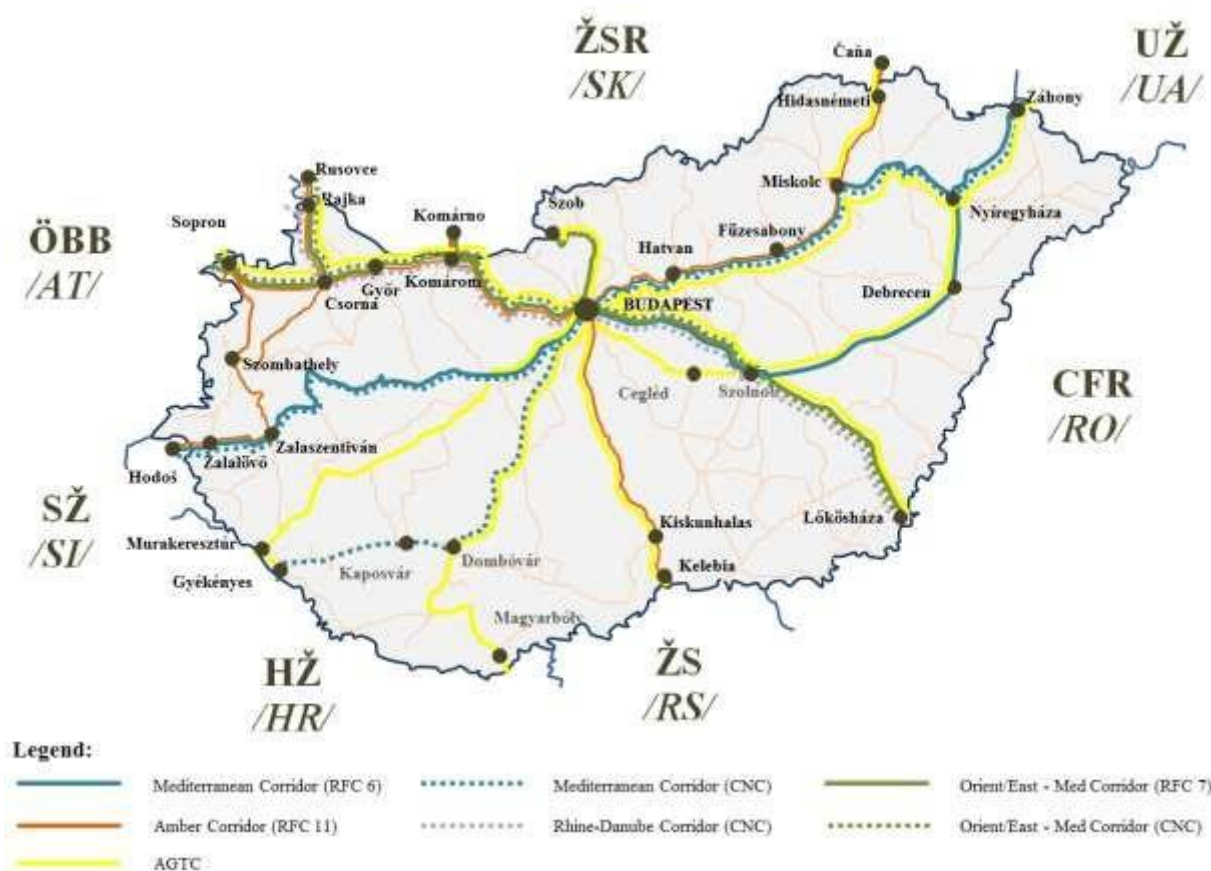


Figure 21: Railway corridors of Hungary

(Source: ŽSR, VVÚŽ)



**Legend:**

|  |                                     |  |                                       |
|--|-------------------------------------|--|---------------------------------------|
|  | Mediterranean Corridor (RFC 6, CNC) |  | Baltic-Adriatic Corridor (RFC 5, CNC) |
|  | Amber Corridor (RFC 11)             |  | AGTC                                  |
|  | Alpine-Western Balkan (RFC 10)      |  |                                       |

Figure 22: Railway corridors of the Republic of Slovenia  
(Source: ŽSR, VVÚŽ)

Table 12 provides an analysis of the most important airports, container terminals, sea and inland waterways ports located in the Amber RFC countries.

Table 12: Analysis of air and water transport infrastructure

| Country         | Airport   | Sea port  | Container terminal - Port | Inland waterways port  |
|-----------------|---|---|---------------------------|--|
| <b>Poland</b>   | Warsaw<br>Kraków<br>Gdańsk<br>Katowice<br>Wrocław<br>Poznań<br>Rzeszów<br>Szczecin<br>Bydgoszcz<br>Łódź<br>Lublin<br>Zielona Góra<br>Radom<br>Olsztyn | Szczecin<br>Świnoujście<br>Kolobrzeg<br>Darlowo<br>Władysławowo<br>Elbląg | Gdańsk<br>Gdynia          | Kraków<br>Warsaw<br>Włocławek<br>Bydgoszcz<br>Gliwice<br>Opole<br>Wrocław<br>Głogów<br>Nowa Sól<br>Szczecin<br>Poznań<br>Konin |
| <b>Slovakia</b> | Bratislava<br>Košice<br>Žilina<br>Sliač<br>Poprad<br>Piešťany   | -   | -                         | Bratislava<br>Komárno<br>Štúrovo   |
| <b>Hungary</b>  | Budapest<br>Debrecen<br>Győr<br>Pécs-Pogány<br>Fertőszentmiklós<br>Nyíregyháza<br>Siófok<br>Szeged<br>Sármellék                                       | -   | -                         | Győr<br>Komárom<br>Budapest<br>Százhalombatta<br>Dunaújváros<br>Paks<br>Fadd-Dombori<br>Baja<br>Mohács                         |
| <b>Slovenia</b> | Ljubljana<br>Maribor<br>Portorož  | Piran<br>Izola  | Koper                     | -  |

Source: maps of TEN-T

## 5.4 Rail transport analysis

The subchapter is aimed at the analysis of the most important rail data that are necessary to determine the Amber RFC routing and draft of its strategic direction. The data also serve as a basis for drafting the measures to promote rail freight transport. The subchapter also contains a modal split analysis.

### 5.4.1 Poland

All data contained in the subchapter was provided by PLK. An important indicator from the point of view of infrastructure managers is the development of transport performances in rail

passenger and freight transport. The transport performances demonstrate the utilization of railway infrastructure over time. On the basis of the above mentioned, Table 13 analyses the development of total transport performances in the Republic of Poland in the period 2013 – 2016. At the same time, Table 14 contains an analysis of the development of number of railway undertakings providing railway infrastructure services in the Republic of Poland.

Table 13: Analysis of transport performances on PLK lines

| Mode of transport   | Carrier           | Transport performance/Year | 2013    | 2014    | 2015    | 2016    |
|---------------------|-------------------|----------------------------|---------|---------|---------|---------|
| Passenger transport | National carrier* | train-km in thous.         | 43 140  | 39 481  | 46 940  | 58 292  |
|                     |                   | gross tkm in mill.         | 21 445  | 16 161  | 18 459  | 21 576  |
|                     | Private carrier   | train-km in thous.         | 92 925  | 92 106  | 93 388  | 96 843  |
|                     |                   | gross tkm in mill.         | 16 740  | 15 497  | 15 359  | 16 335  |
|                     | Total             | train-km in thous.         | 136 065 | 131 587 | 140 328 | 155 135 |
|                     |                   | gross tkm in mill.         | 38 185  | 31 658  | 33 818  | 37 911  |
| Freight transport   | National carrier* | train-km in thous.         | 45 814  | 44 491  | 42 653  | 39 461  |
|                     |                   | gross tkm in mill.         | 64 445  | 63 573  | 62 730  | 56 748  |
|                     | Private carrier   | train-km in thous.         | 25 711  | 26 883  | 28 589  | 30 862  |
|                     |                   | gross tkm in mill.         | 34 427  | 35 565  | 38 302  | 42 620  |
|                     | Total             | train-km in thous.         | 71 525  | 71 374  | 71 242  | 70 323  |
|                     |                   | gross tkm in mill.         | 98 872  | 99 138  | 101 032 | 99 368  |

\*As 'national' we assumed the incumbent railway undertaking from PKP Group

Table 14: Structure of rail carriers with valid access agreement

| Number of carriers with valid access agreement/Year |          | 2013 | 2014 | 2015 | 2016 |
|---|----------|------|------|------|------|
| Passenger carrier                                   | national | 1    | 1    | 1    | 1    |
|   | private  | 13   | 14   | 14   | 15   |
| Freight carrier                                     | national | 1    | 1    | 1    | 1    |
|   | private  | 61   | 67   | 68   | 69   |
| Total   | national | 2    | 2    | 2    | 2    |
|   | private  | 74   | 81   | 82   | 84   |

The analysis of transport performances in the Republic of Poland has shown their gradual increase in rail passenger transport (Total: train-km) and freight transport (Total: gross tkm, 2013 compared to 2016). The increase in passenger transport performances is more important than in rail freight. In rail freight transport there is a significant decrease in performances of the national carrier (train-km, gross tkm). At the same time, there is a gradual increase in the number of private carriers which has been positively shown in increase in the transport performances. The noticed increase in transport performances is mainly influenced by international transit rail transport.

The analysis of rail transport in the Republic of Poland requires, for the needs of its benefits for the Amber RFC, the processing of additional data. By reason of presenting and maintaining the



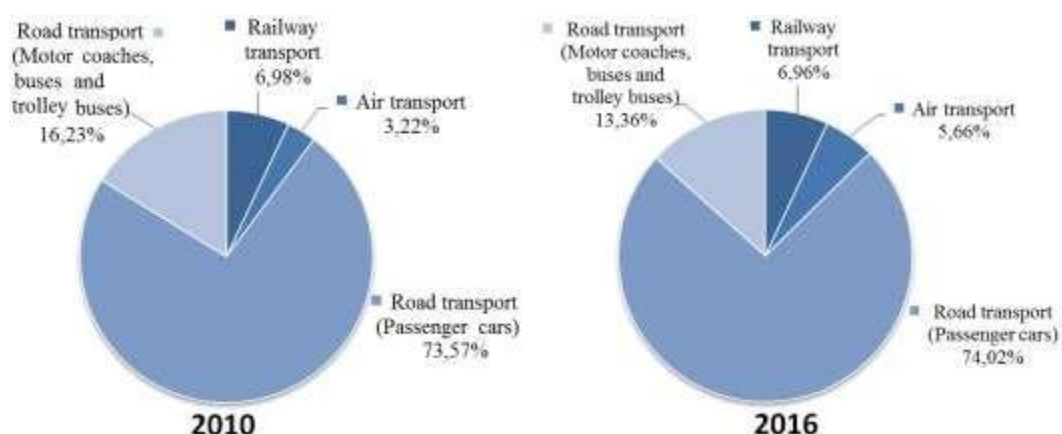
transparency and integrity of rail transport data in the Republic of Poland, the analysis of other data is carried out in Appendix A in the .xls format. The individual sheets in the Appendix contain the following data:

- technical parameters of the potential lines for the Amber RFC,
- analysis of transport base in the whole country,
- analysis of planned investments in transport infrastructure,
- analysis of charges,
- analysis of transport performances in rail passenger and freight transport on the potential lines of the Amber RFC,
- analysis of average running times on the potential lines of the Amber RFC.

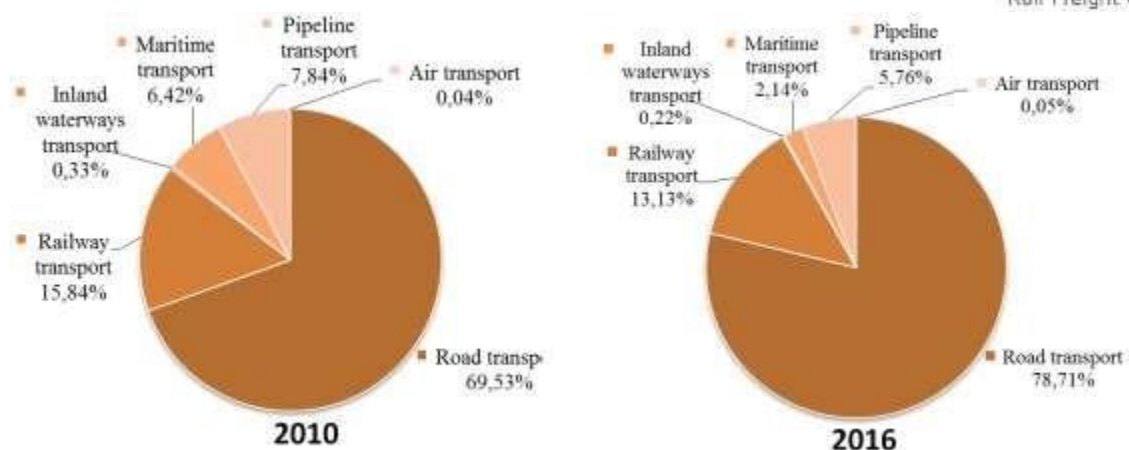
Appendix B contains the supplementary data concerning analysis of investment subsidies in the Republic of Poland.

Based on these analyses, it will be possible to decide on the inclusion of the individual lines in the Amber RFC. The results of analyses will be used to formulate the conclusions resulting from the Chapter 5. Consequently, the draft of strategy will be based on the summary results.

The graphs 1 and 2 show a graphical comparison of the modal split in the Republic of Poland in passenger transport in 2010 compared to 2016 and in freight transport in 2010 compared to 2016. The comparison is made in the band of 6 years giving a sufficient time span of the market response to the changes of modal split following the adoption of measures to support rail transport within the EU.



*Graph 1: Comparison of modal split in passenger transport in Poland  
(Source: Statistics Poland /www.stat.gov.pl/, Transport – activity results in 2016)*



Graph 2: Comparison of modal split in freight transport in Poland  
(Source: Statistics Poland /www.stat.gov.pl/, Transport – activity results in 2016)

Based on the comparison of modal split in the Republic of Poland, we can confirm the decrease in share of the transport performances in rail transport system in favour of road goods transport and individual motoring due to large investments in road infrastructure.

#### 5.4.2 Slovakia

All data contained in the subchapter were provided by ŽSR. An important indicator from the point of view of infrastructure managers is the development of transport performances in rail passenger and freight transport. The transport performances demonstrate the utilization of railway infrastructure over time. Based on the above mentioned, the analysis of total transport performances in the Slovak Republic in the period 2013-2016 is carried out in Table 15. At the same time, Table 16 contains an analysis of the development of number of railway undertakings providing railway infrastructure services in the Slovak Republic.

Table 15: Analysis of transport performances on ŽSR lines

| Mode of transport   | Carrier          | Transport performance/Year | 2013          | 2014          | 2015          | 2016          |
|---------------------|------------------|----------------------------|---------------|---------------|---------------|---------------|
| Passenger transport | National carrier | train-km in thous.         | 30 356        | 30 724        | 31 801        | 31 438        |
|                     |                  | gross tkm in mill.         | 8 371         | 8 556         | 9 373         | 9 264         |
|                     | Private carrier  | train-km in thous.         | 1 215         | 1 351         | 2 789         | 3 170         |
|                     |                  | gross tkm in mill.         | 136           | 190           | 803           | 1 089         |
|                     | Total            | train-km in thous.         | <b>31 570</b> | <b>32 075</b> | <b>34 590</b> | <b>34 608</b> |
|                     |                  | gross tkm in mill.         | <b>8 508</b>  | <b>8 746</b>  | <b>10 176</b> | <b>10 352</b> |
| Freight transport   | National carrier | train-km in thous.         | 11 557        | 11 240        | 11 436        | 11 367        |
|                     |                  | gross tkm in mill.         | 15 256        | 15 186        | 15 210        | 15 149        |
|                     | Private carrier  | train-km in thous.         | 2 518         | 2 979         | 3 237         | 3 739         |
|                     |                  | gross tkm in mill.         | 2 376         | 2 795         | 3 243         | 3 766         |
|                     | Total            | train-km in thous.         | <b>14 075</b> | <b>14 219</b> | <b>14 673</b> | <b>15 106</b> |
|                     |                  | gross tkm in mill.         | <b>17 632</b> | <b>17 981</b> | <b>18 453</b> | <b>18 915</b> |

Table 16: Structure of rail carriers with valid access agreement

| Number of carriers with valid access agreement/Year |          | 2013 | 2014 | 2015 | 2016 |
|---|----------|------|------|------|------|
| Passenger carrier                                   | national | 1    | 1    | 1    | 1    |
|   | private  | 1    | 4    | 5    | 5    |
| Freight carrier                                     | national | 1    | 1    | 1    | 1    |
|   | private  | 42   | 43   | 43   | 41   |
| Passenger and freight carrier                       | national | 1    | 1    | 1    | 1    |
|   | private  | 0    | 0    | 2    | 3    |

The analysis of transport performances in the Slovak Republic showed a successive increase in rail passenger transport (Total: train-km, gross tkm) and freight transport (Total: train-km, gross tkm). In rail freight transport, there is a slight decrease in performances of the national carrier (train- km, gross tkm: 2013 compared to 2016). The recorded increase in transport performances in rail freight transport is influenced by, in particular, international transit rail transport and the situation in the metallurgical industry and mechanical engineering in SR. Within the development of the number of carriers, there was recorded a slight decrease in 2016 compared to 2015 and 2014.

The analysis of rail transport in the Slovak Republic requires, for the needs of its benefits for the Amber RFC, the processing of additional data. By reason of presenting and maintaining the transparency and integrity of rail transport data in the Slovak Republic, the analysis of other data is carried out in Appendix A in the .xls format. The individual sheets in the Appendix contain the following data:

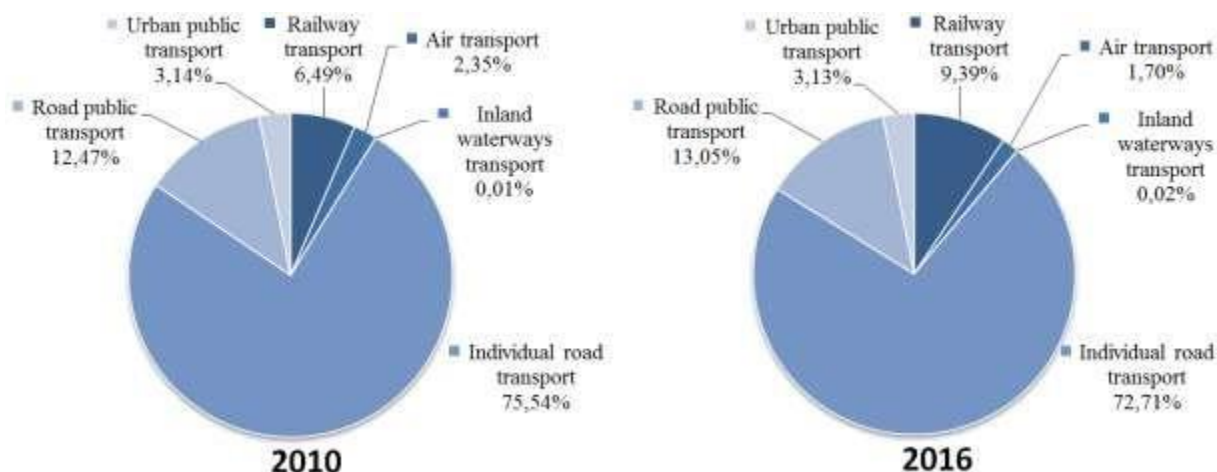
- technical parameters of the potential lines for the Amber RFC,
- analysis of transport performances in rail passenger and freight transport on the potential lines of the Amber RFC,
- analysis of average running times on the potential lines of the Amber RFC.

Supplementary data of rail transport analysis in the Slovak Republic are listed in Appendix C which contains the following data:

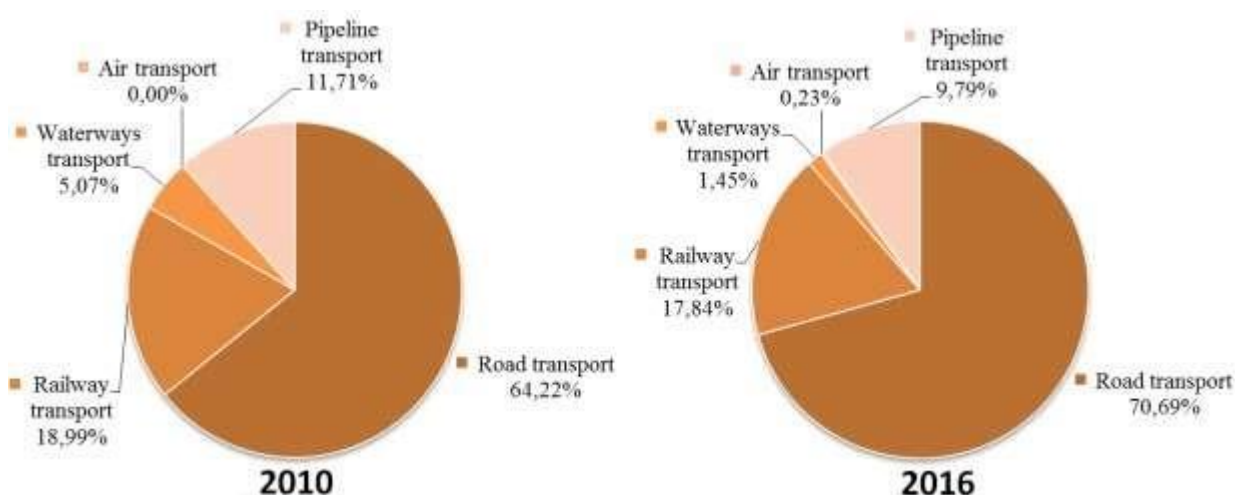
- analysis of line capacity utilization,
- analysis of average revenues,
- investments in railway infrastructure,
- average charges for railway infrastructure – rail freight transport.

Based on these analyses, it will be possible to decide on the inclusion of individual lines in the Amber RFC. The results of the analyses will be used to formulate the conclusions resulting from the Chapter 5. Consequently, the draft of strategy will be based on the summary results.

The graphs 3 and 4 show a graphical comparison of the modal split in the Slovak Republic in passenger transport in 2010 compared to 2016 and in freight transport in 2010 compared to 2016. The comparison is made in the band of 6 years giving a sufficient time span of the market response to the changes of modal split following the adoption of measures to support rail transport within the EU.



*Graph 3: Comparison of modal split in passenger transport in Slovakia  
(Source: Statistical office of the SR /www.statistics.sk/EC - Statistical pocketbook 2017)*



*Graph 4: Comparison of modal split in freight transport in Slovakia  
(Source: Statistical office of the SR /www.statistics.sk/)*

Based on the modal split comparison in the Slovak Republic, we can confirm the decrease in the share of transport performances in rail freight transport in favour of road goods transport. In passenger transport system, an increase in the share of transport performances in favour of rail passenger transport was recorded, particularly to the disadvantage of individual motoring.

### 5.4.3 Hungary

All data contained in the subchapter were provided by GYSEV Zrt, MÁV Zrt. and VPE. Tables 17 and 18 analyse the development of total transport performances in Hungary in the period 2013 – 2016. At the same time, Table 19 contains an analysis of the development of the number of railway undertakings providing railway infrastructure services in Hungary.

Table 17: Analysis of transport performances on GYSEV lines

| Mode of transport   | Carrier          | Transport performance/Year | 2013    | 2014    | 2015    | 2016    |
|---------------------|------------------|----------------------------|---------|---------|---------|---------|
| Passenger transport | National carrier | train-km in thous.         | 5 017,7 | 4 935,0 | 4 974,6 | 5 163,4 |
|                     |                  | gross tkm in mill.         | 979,3   | 928,1   | 889,1   | 886,6   |
|                     | Private carrier  | train-km in thous.         | 0,9     | 0,9     | 0,8     | 0,3     |
|                     |                  | gross tkm in mill.         | 0,4     | 0,2     | 0,5     | 0,2     |
|                     | Total            | train-km in thous.         | 5 018,6 | 4 935,9 | 4 975,4 | 5 163,8 |
|                     |                  | gross tkm in mill.         | 979,7   | 928,4   | 889,6   | 886,8   |
| Freight transport   | National carrier | train-km in thous.         | 0,0     | 0,0     | 0,0     | 0,0     |
|                     |                  | gross tkm in mill.         | 0,0     | 0,0     | 0,0     | 0,0     |
|                     | Private carrier  | train-km in thous.         | 1 028,7 | 981,7   | 919,2   | 913,9   |
|                     |                  | gross tkm in mill.         | 1 066,9 | 999,1   | 916,4   | 904,1   |
|                     | Total            | train-km in thous.         | 1 028,7 | 981,7   | 919,2   | 913,9   |
|                     |                  | gross tkm in mill.         | 1 066,9 | 999,1   | 916,4   | 904,1   |

On GYSEV infrastructure a gradual increase in rail freight transport performances (train-km, gross tkm) can be realised especially on the lines of the North-South axis of GYSEV's infrastructure of the RFC since the full electrification of lines Csorna – Szombathely – Zalaszentiván took place and freight trains of Metrans from Dunajska Streda Terminal come via GYSEV infrastructure. Increasing tendency can be shown on the field of rail passenger transport (Total: gross tkm).

Table 18: Analysis of transport performances on MÁV Zrt. lines

| Mode of transport   | Carrier          | Transport performance/Year | 2013   | 2014   | 2015   | 2016   |
|---------------------|------------------|----------------------------|--------|--------|--------|--------|
| Passenger transport | National carrier | train-km in thous.         | 73 846 | 76 478 | 76 775 | 77 020 |
|                     |                  | gross tkm in mill.         | 18 056 | 17 847 | 17 262 | 17 124 |
|                     | Private carrier  | train-km in thous.         | 9      | 22     | 17     | 15     |
|                     |                  | gross tkm in mill.         | 4      | 9      | 7      | 7      |
|                     | Total            | train-km in thous.         | 73 855 | 76 500 | 76 792 | 77 035 |
|                     |                  | gross tkm in mill.         | 18 060 | 17 856 | 17 269 | 17 131 |
| Freight transport   | National carrier | train-km in thous.         | 0      | 0      | 0      | 0      |
|                     |                  | gross tkm in mill.         | 0      | 0      | 0      | 0      |
|                     | Private carrier  | train-km in thous.         | 17 414 | 17 024 | 17 142 | 16 842 |
|                     |                  | gross tkm in mill.         | 19 723 | 20 817 | 20 904 | 20 785 |
|                     | Total            | train-km in thous.         | 17 414 | 17 024 | 17 142 | 16 842 |
|                     |                  | gross tkm in mill.         | 19 723 | 20 817 | 20 904 | 20 785 |

The analysis of transport performances carried out on MÁV Zrt. infrastructure showed an overall trend of the increase in transport performances in rail passenger transport (Total: train-km). An overall increase in transport performances is recorded in rail freight transport (Total: gross tkm, 2013 compared to 2016).

Table 19: Structure of rail carriers with valid access agreement

| Number of carriers with valid access agreement/Year |          | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|----------|------|------|------|------|------|
| Passenger carrier                                   | national | 2    | 2    | 2    | 2    | 2    |
|   | private  | 1    | 1    | 2    | 2    | 2    |
| Freight carrier                                     | national | 0    | 0    | 0    | 0    | 0    |
|   | private  | 34   | 34   | 39   | 41   | 43   |
| Passenger and freight carrier                       | national | 2    | 2    | 2    | 2    | 2    |
|   | private  | 35   | 35   | 41   | 43   | 45   |

The analysis of the development of the number of active providers of transport services in Hungary showed a gradual increase. An increase in the number of transport service providers is a sign of sufficient transport opportunities in rail transport in Hungary, particularly in transit traffic. Such an increase will positively affect the quality of railway services and the subsequent increase in transport performances.

The analysis of rail transport in Hungary requires, for the needs of its benefits for the Amber RFC, the processing of additional data. Due to presenting and maintaining the transparency and integrity of rail transport data in Hungary, the analysis of other data is carried out in Appendix A in the .xls format. The individual sheets in Appendix for the Hungarian railway infrastructure contain the following data:

- technical parameters of the potential lines for the Amber RFC,
- analysis of transport performances in rail passenger and freight transport on the potential lines of the Amber RFC,
- analysis of planned investments in transport infrastructure,
- analysis of charges,
- analysis of average running times between border stations.

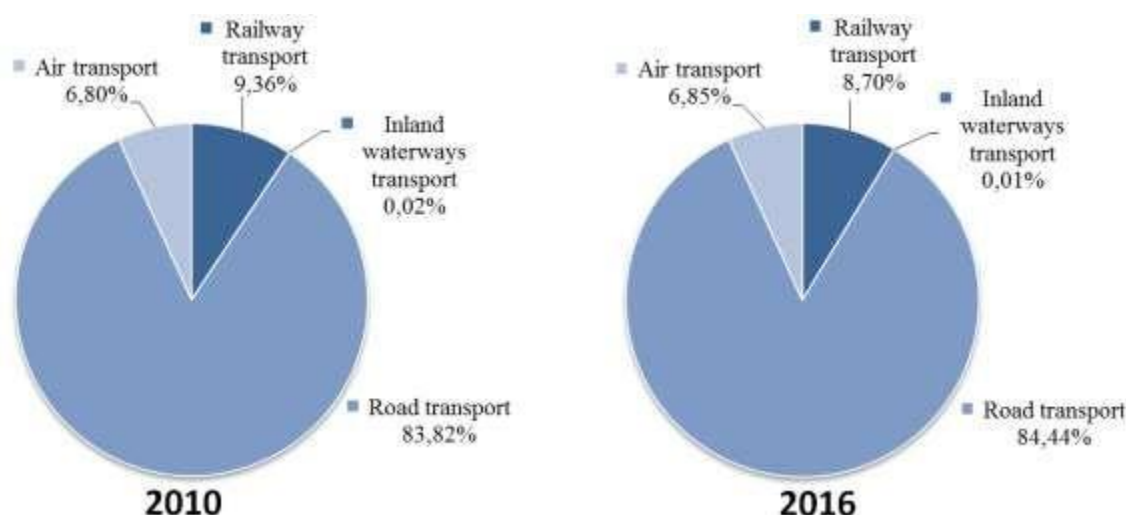
Supplementary data of rail transport analysis in Hungary are listed in Appendix D which contains the following data:

- analysis of investment subsidies focused on railway infrastructure,
- analysis of non-investment subsidies,
- analysis of selected economic indicators of transport infrastructure – GYSEV,
- analysis of selected economic indicators of transport infrastructure – MÁV Zrt.

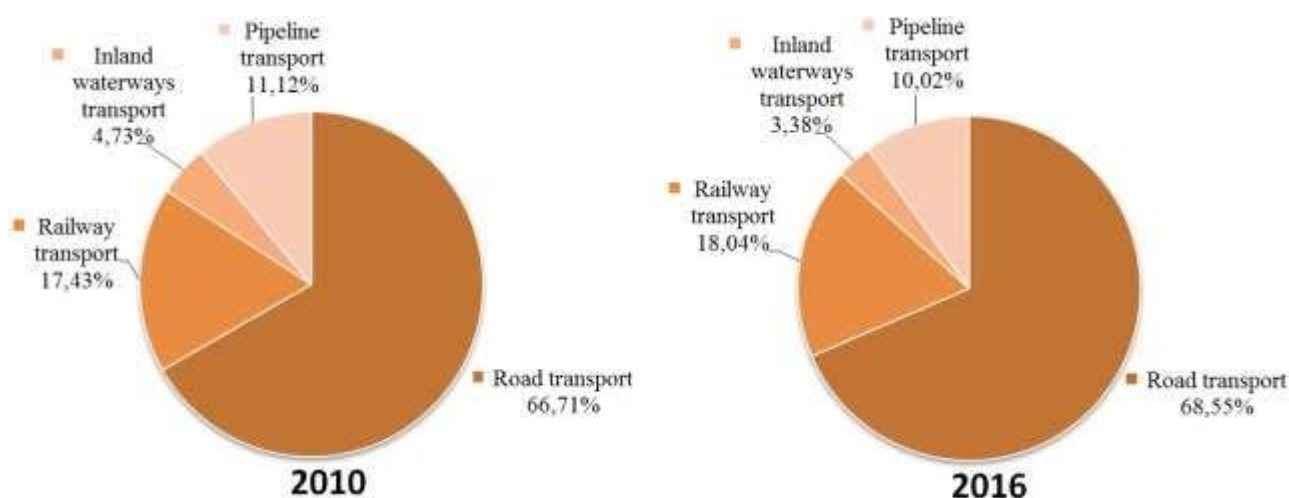
Based on these analyses, it will be possible to decide on the inclusion of the individual lines in the Amber RFC. The results of analyses will be used to formulate the conclusions resulting from Chapter 5. Consequently, the strategy draft will be based on the summary results.



Graphs 5 and 6 show a graphical comparison of modal split in Hungary in 2016 compared to 2010 in passenger transport and in 2016 compared to 2010 in freight transport. The comparison is made in the band of 6 years giving a sufficient time span of the market response to the changes of modal split following the adoption of measures to support rail transport within the EU.



*Graph 5: Comparison of modal split in passenger transport in Hungary  
(Source: Hungarian Central Statistical Office /www.ksh.hu/)*



*Graph 6: Comparison of modal split in freight transport in Hungary  
(Source: Hungarian Central Statistical Office /www.ksh.hu/, Eurostat, EC – Statistical pocketbook 2017)*

Based on the modal split comparison in Hungary, we can confirm a decrease in share of transport performances in rail passenger transport in favour of road transport. In the freight transport system, an increase in share of transport performances in favour of rail freight transport was recorded, especially on the RFC Amber's infrastructure, mainly thanks to the continuous modernisation measures of the infrastructure managers concerned. An increase was also recorded in road goods transport.



#### 5.4.4 Slovenia

All data contained in the subchapter were provided by SŽ-I. Table 20 gives an analysis of the development of total transport performances in the Republic of Slovenia in the period 2013 – 2017. At the same time, Table 21 contains an analysis of the development of the number of railway undertakings providing railway infrastructure services in the Republic of Slovenia.

Table 20: Analysis of transport performances on SŽ-I lines

| Mode of transport   | Carrier          | Transport performance/Year | 2013    | 2014    | 2015     | 2016    | 2017     |
|---------------------|------------------|----------------------------|---------|---------|----------|---------|----------|
| Passenger transport | National carrier | train-km in thous.         | 10 586  | 10 130  | 10 402   | 9 562   | 10 290   |
|                     |                  | gross tkm in mill.         | 1 491   | 1 389   | 1 288    | 1 364   | 1 424    |
|                     | Private carrier  | train-km in thous.         | 0,0     | 0,0     | 0,0      | 0,0     | 0,0      |
|                     |                  | gross tkm in mill.         | 0,0     | 0,0     | 0,0      | 0,0     | 0,0      |
|                     | Total            | train-km in thous.         | 10 586  | 10 130  | 10 402   | 9 562   | 10 290   |
|                     |                  | gross tkm in mill.         | 1 491   | 1 389   | 1 288    | 1 364   | 1 424,0  |
| Freight transport   | National carrier | train-km in thous.         | 8 351   | 8 874   | 9 696    | 8 766   | 9 494,0  |
|                     |                  | gross tkm in mill.         | 7 096   | 7 653   | 8 422    | 8 423   | 9 074,0  |
|                     | Private carrier  | train-km in thous.         | 638,4   | 630,5   | 569,7    | 735,3   | 1 433,6  |
|                     |                  | gross tkm in mill.         | 547,7   | 571,6   | 543,2    | 674,2   | 1 303,1  |
|                     | Total            | train-km in thous.         | 8 989,4 | 9 504,5 | 10 265,7 | 9 501,3 | 10 927,6 |
|                     |                  | gross tkm in mill.         | 7 643,7 | 8 224,6 | 8 965,2  | 9 097,2 | 10 377,1 |

Table 21: Structure of rail carriers with valid access agreement

| Number of carriers with valid access agreement/Year |          | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|----------|------|------|------|------|------|
| Passenger carrier                                   | national | 1    | 1    | 1    | 1    | 1    |
|   | private  | 0    | 0    | 0    | 0    | 0    |
| Freight carrier                                     | national | 1    | 1    | 1    | 1    | 1    |
|   | private  | 2    | 2    | 3    | 3    | 3    |
| Passenger and freight carrier                       | national | 0    | 0    | 0    | 0    | 0    |
|   | private  | 0    | 0    | 0    | 0    | 0    |

The analysis of the development of transport performances on SŽ-I lines showed an increase in rail freight transport performances (Total: train-km, 2013 compared to 2017) in the overall course. A significant increase in rail freight transport performances is recorded at the gross tkm indicator. In rail passenger transport there is an increase in the gross tkm indicator (Total: 2015 – 2017) as the offered capacity of passenger trains increases. On the other hand, there is a decrease in transport performances in the train-km indicator (Total: 2013 compared to 2017). The analysis of the number of railway undertakings providing rail services showed the lowest number of providers from among the countries of the Amber RFC.

The analysis of rail transport in the Republic of Slovenia requires, for the needs of its benefits for the Amber RFC, the processing of additional data. Due to presenting and maintaining the transparency and integrity of rail transport data in the Republic of Slovenia, the analysis of other

data is carried out in Appendix A in the .xls format. The individual sheets in Appendix A for the Slovenian railway infrastructure contain the following data:

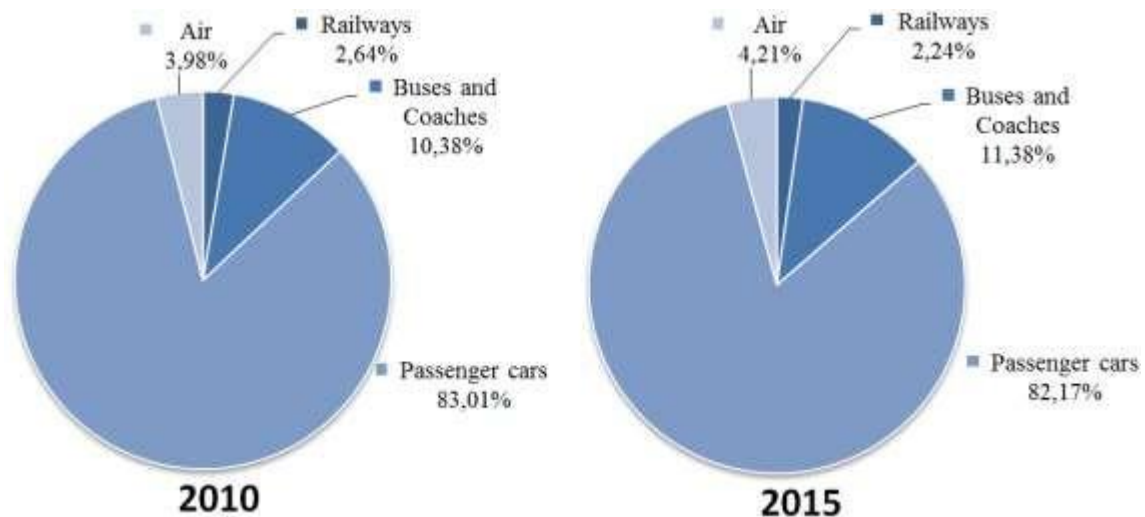
- technical parameters of the potential lines for belonging to the Amber RFC,
- analysis of transport performances in rail passenger and freight transport on the potential lines belonging of the Amber RFC,
- analysis of planned investments in transport infrastructure,
- analysis of charges,
- analysis of average running times between border stations.

Supplementary data of rail transport analysis in the Republic of Slovenia are listed in Appendix E which contains the following data:

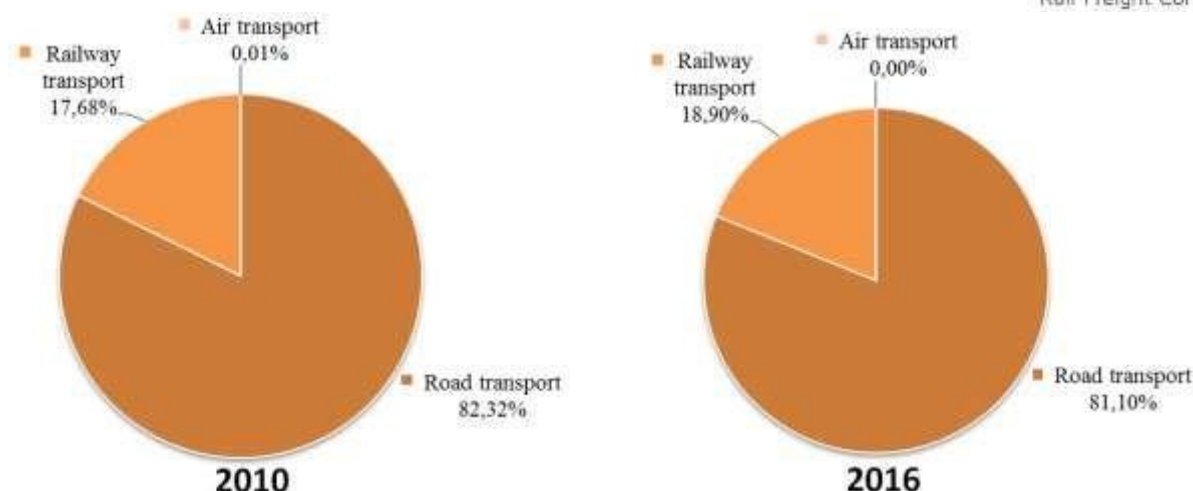
- statistical average of capacity utilization,
- analysis of investment subsidies focused on railway infrastructure,
- infrastructure access charges.

The results of analyses will be used to formulate the conclusions resulting from Chapter 5. Consequently, the strategy draft will be based on the summary results.

Graphs 7 and 8 show a graphical comparison of modal split in the Republic of Slovenia in 2015 compared to 2010 in passenger transport and in 2016 compared to 2010 in freight transport. The comparison is made in the band of 6 years giving a sufficient time span of the market response to the changes of modal split following the adoption of measures to support rail transport within the EU.



*Graph 7: Comparison of modal split in passenger transport in Slovenia  
(Source: Republika Slovenija –Statistični Urad /www.stat.si/, Eurostat, EC – Statistical pocketbook 2017)*



Graph 8: Comparison of modal split in freight transport in Slovenia  
(Source: Republika Slovenija –Statistični Urad /www.stat.si/, Eurostat)

Based on the modal split comparison in the Republic of Slovenia there is a decrease in share of transport performances in rail passenger transport. At the same time, there is a slight decrease in performances in individual motoring. In the freight transport system, an increase in share of transport performances in favour of rail freight transport to the disadvantage of road goods transport was recorded.

## 5.5 Analysis of transport indicators of the Amber RFC countries

The potential of rail freight transport is influenced by goods flows, particularly at international level. The goods flows between neighbouring countries create demand for transport services and rail freight transport is more time-efficient, cost-efficient and socially-efficient than other modes of transport. At medium and long distances, the efficiency is currently demonstrated also in single wagon load transport. Therefore, it is necessary to examine the transport potential between the individual countries of the Amber RFC and then between the neighbouring countries of the established corridor. The results of the analysis are necessary for the formulation of strategic objectives and tasks of the Amber RFC as well as for the identification of the transport potential of international rail transport between EU countries. The analysis of transport potential from countries outside the EU for the Amber RFC is addressed in Chapter 8.

Table 22 analyses the import and export of goods from/to the Republic of Poland, expressed in euro, between the Amber RFC countries and the EU countries. Subsequently, the analysis of the import and export of goods from/to the Republic of Poland, expressed in tonnes, between the Amber RFC countries and the EU countries, is carried out in Table 23.

Table 22: Import and Export value from/to Poland in mill. €

| Country/ Year                              | 2010          | 2012           | 2014           | 2015           | 2016           |
|--|---------------|----------------|----------------|----------------|----------------|
| <b>Import value from Poland in mill. €</b> |               |                |                |                |                |
| <b>Total EU 28 countries</b>               | <b>89 694</b> | <b>104 896</b> | <b>120 193</b> | <b>135 797</b> | <b>143 344</b> |
| Slovakia                                   | 2 672         | 3 410          | 3 804          | 4 217          | 4 432          |
| Hungary                                    | 3 472         | 3 424          | 4 079          | 4 528          | 4 632          |
| Slovenia                                   | 418           | 477            | 547            | 623            | 696            |
| <b>Total Amber RFC countries</b>           | <b>6 562</b>  | <b>7 310</b>   | <b>8 429</b>   | <b>9 369</b>   | <b>9 761</b>   |
| <b>Export value to Poland in mill. €</b>   |               |                |                |                |                |
| <b>Total EU 28 countries</b>               | <b>99 810</b> | <b>113 135</b> | <b>127 018</b> | <b>138 017</b> | <b>142 928</b> |
| Slovakia                                   | 3 650         | 5 238          | 5 515          | 5 797          | 5 400          |
| Hungary                                    | 2 646         | 3 069          | 3 262          | 3 476          | 3 907          |
| Slovenia                                   | 806           | 810            | 977            | 1 115          | 1 124          |
| <b>Total Amber RFC countries</b>           | <b>7 102</b>  | <b>9 117</b>   | <b>9 754</b>   | <b>10 387</b>  | <b>10 431</b>  |

Source: European Commission - Trade – EU Trade Helpdesk – Statistics

Table 23: Import and export quantity from/to Poland in 1000 t

| Country/ Year                                | 2010          | 2012          | 2014          | 2015          | 2016          |
|--|---------------|---------------|---------------|---------------|---------------|
| <b>Import quantity from Poland in 1000 t</b> |               |               |               |               |               |
| <b>Total EU 28 countries</b>                 | <b>63 018</b> | <b>66 935</b> | <b>78 083</b> | <b>82 889</b> | <b>85 918</b> |
| Slovakia                                     | 2 763         | 2 519         | 3 362         | 3 520         | 3 910         |
| Hungary                                      | 1 348         | 1 419         | 1 678         | 2 098         | 2 289         |
| Slovenia                                     | 185           | 187           | 213           | 235           | 268           |
| <b>Total Amber RFC countries</b>             | <b>4 296</b>  | <b>4 125</b>  | <b>5 253</b>  | <b>5 853</b>  | <b>6 466</b>  |
| <b>Export quantity to Poland in 1000 t</b>   |               |               |               |               |               |
| <b>Total EU 28 countries</b>                 | <b>63 809</b> | <b>67 053</b> | <b>70 232</b> | <b>70 844</b> | <b>72 922</b> |
| Slovakia                                     | 3 803         | 4 296         | 4 596         | 4 438         | 4 621         |
| Hungary                                      | 1 520         | 1 787         | 1 861         | 1 749         | 2 065         |
| Slovenia                                     | 279           | 300           | 327           | 308           | 332           |
| <b>Total Amber RFC countries</b>             | <b>5 603</b>  | <b>6 383</b>  | <b>6 784</b>  | <b>6 495</b>  | <b>7 018</b>  |

Source: European Commission - Trade – EU Trade Helpdesk – Statistics

The analysis of the transport flows in Tables 22 and 23 showed the increase in transport indicators in all monitored indicators and countries. On the basis of the trend of economic growth, the same trend can be assumed in the years 2018 – 2021. By this, the sufficient transport potential for rail freight transport within the European transport market has been shown within the Republic of Poland.

As the transport performance indicator in tonnes is more significant for the needs of evaluation of rail freight potential, Figure 23 illustrates the goods flows between the neighbouring countries of the Republic of Poland for 2016, including the percentage share.

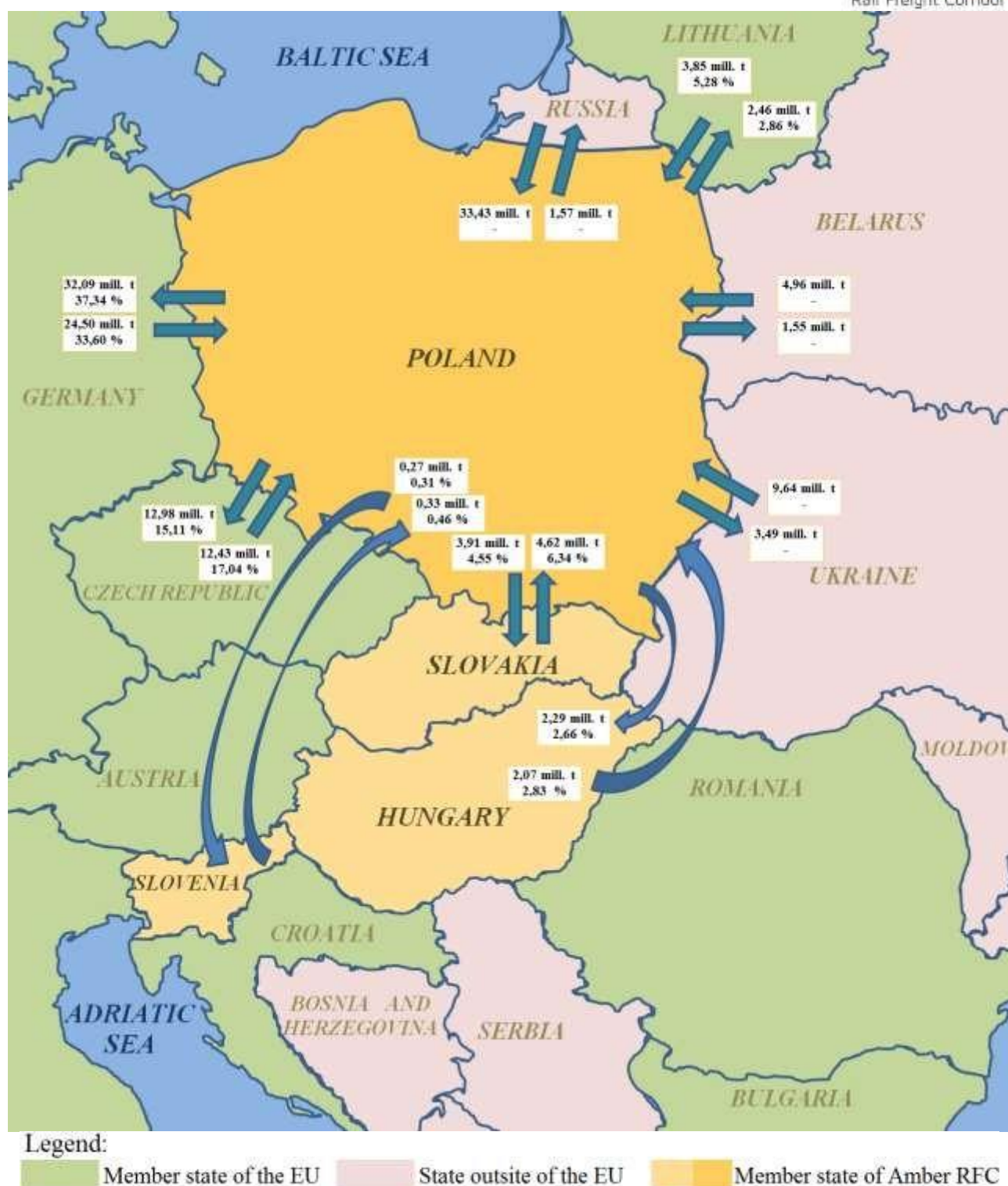


Figure 23: Graphical representation of import and export of goods in tonnes – Republic of Poland

Table 24 analyses the import and export of goods from/to the Slovak Republic, expressed in euro, between the Amber RFC countries and the EU countries. Subsequently, the analysis of import and export of goods from/to the Slovak Republic, expressed in tonnes, between the Amber RFC countries and the EU countries is carried out in Table 25.



Table 24: Import and export value from/ to Slovakia in mill. €

| Country/ Year                                | 2010          | 2012          | 2014          | 2015          | 2016          |
|--|---------------|---------------|---------------|---------------|---------------|
| <b>Import value from Slovakia in mill. €</b> |               |               |               |               |               |
| <b>Total EU 28 countries</b>                 | <b>38 606</b> | <b>47 988</b> | <b>49 770</b> | <b>53 003</b> | <b>55 798</b> |
| <b>Poland</b>                                | 3 446         | 4 400         | 4 469         | 4 611         | 4 857         |
| <b>Hungary</b>                               | 2 749         | 4 166         | 4 258         | 4 346         | 4 516         |
| <b>Slovenia</b>                              | 313           | 347           | 324           | 351           | 411           |
| <b>Total Amber RFC countries</b>             | <b>6 509</b>  | <b>8 914</b>  | <b>9 051</b>  | <b>9 308</b>  | <b>9 784</b>  |
| <b>Export value to Slovakia in mill. €</b>   |               |               |               |               |               |
| <b>Total EU 28 countries</b>                 | <b>37 019</b> | <b>45 703</b> | <b>48 166</b> | <b>53 321</b> | <b>53 633</b> |
| <b>Poland</b>                                | 3 258         | 3 745         | 4 202         | 4 611         | 4 509         |
| <b>Hungary</b>                               | 3 842         | 4 792         | 4 196         | 4 551         | 4 624         |
| <b>Slovenia</b>                              | 726           | 834           | 1 106         | 1 349         | 1 024         |
| <b>Total Amber RFC countries</b>             | <b>7 826</b>  | <b>9 370</b>  | <b>9 504</b>  | <b>10 510</b> | <b>10 157</b> |

Source: European Commission - Trade – EU Trade Helpdesk – Statistics

Table 25: Import and export quantity from/ to Slovakia in 1000 t

| Country/ Year                                  | 2010          | 2012          | 2014          | 2015          | 2016          |
|--|---------------|---------------|---------------|---------------|---------------|
| <b>Import quantity from Slovakia in 1000 t</b> |               |               |               |               |               |
| <b>Total EU 28 countries</b>                   | <b>28 075</b> | <b>28 690</b> | <b>30 131</b> | <b>31 354</b> | <b>32 540</b> |
| <b>Poland</b>                                  | 3 886         | 4 558         | 4 208         | 3 776         | 4 156         |
| <b>Hungary</b>                                 | 2 934         | 3 348         | 4 131         | 4 668         | 5 080         |
| <b>Slovenia</b>                                | 230           | 257           | 220           | 248           | 273           |
| <b>Total Amber RFC countries</b>               | <b>7 050</b>  | <b>8 164</b>  | <b>8 559</b>  | <b>8 692</b>  | <b>9 510</b>  |
| <b>Export quantity to Slovakia in 1000 t</b>   |               |               |               |               |               |
| <b>Total EU 28 countries</b>                   | <b>22 386</b> | <b>23 706</b> | <b>24 589</b> | <b>27 543</b> | <b>27 435</b> |
| <b>Poland</b>                                  | 3 430         | 3 136         | 3 687         | 4 018         | 4 125         |
| <b>Hungary</b>                                 | 3 293         | 3 706         | 3 072         | 3 381         | 3 464         |
| <b>Slovenia</b>                                | 431           | 489           | 467           | 631           | 594           |
| <b>Total Amber RFC countries</b>               | <b>7 155</b>  | <b>7 331</b>  | <b>7 226</b>  | <b>8 030</b>  | <b>8 184</b>  |

Source: European Commission - Trade – EU Trade Helpdesk – Statistics

The analysis of transport flows in Tables 24 and 25 showed, in overall comparison, increase in transport indicators with a slight fluctuating decrease. However, the increase is recorded at the indicator of transported tonnes within the Amber RFC countries. On the basis of the trend of economic growth, the upward trend in the years 2018 – 2021 can be assumed for both indicators examined. By this, the sufficient transport potential for the rail freight transport within the European transport market has been shown within the Slovak Republic and thus sufficient transport potential for the use of the Amber RFC services.

Since the transport performance indicator in tonnes is more significant for the needs of the evaluation of rail freight potential, Figure 24 shows the goods flows between the neighbouring countries of the Slovak Republic for 2016, including the percentage share.

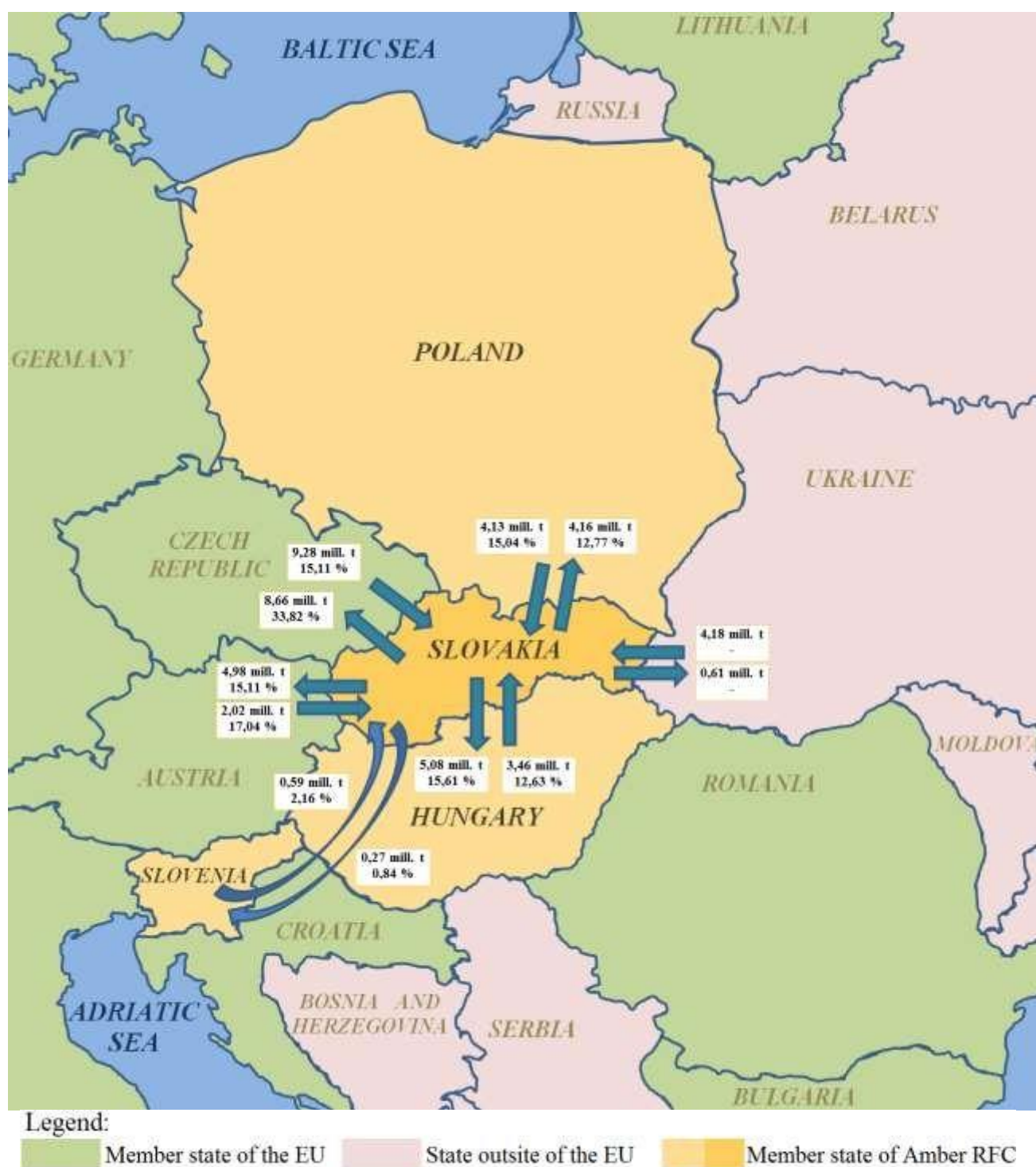


Figure 24: Graphical representation of import and export of goods in tonnes – Slovak Republic

In order to assess the Amber RFC transport potential, the analysis of import and export of goods from/to Hungary, expressed in euro, between the Amber RFC countries and the EU countries is carried out in Table 26. Subsequently, the analysis of import and export of goods from/to the



Hungary, expressed in tonnes, between the Amber RFC countries and the EU countries is carried out in Table 27.

Table 26: Import and export value from/ to Hungary in mill. €

| Country/ Year                               | 2010          | 2012          | 2014          | 2015          | 2016          |
|---|---------------|---------------|---------------|---------------|---------------|
| <b>Import value from Hungary in mill. €</b> |               |               |               |               |               |
| <b>Total EU 28 countries</b>                | <b>51 901</b> | <b>57 255</b> | <b>61 557</b> | <b>67 424</b> | <b>69 991</b> |
| <b>Poland</b>                               | 2 379         | 2 766         | 2 871         | 2 943         | 3 349         |
| <b>Slovakia</b>                             | 3 433         | 3 969         | 3 766         | 4 185         | 4 195         |
| <b>Slovenia</b>                             | 805           | 1 000         | 1 031         | 1 014         | 1 012         |
| <b>Total Amber RFC countries</b>            | <b>6 617</b>  | <b>7 735</b>  | <b>7 668</b>  | <b>8 142</b>  | <b>8 556</b>  |
| <b>Export value to Hungary in mill. €</b>   |               |               |               |               |               |
| <b>Total EU 28 countries</b>                | <b>44 005</b> | <b>50 604</b> | <b>58 338</b> | <b>63 368</b> | <b>64 935</b> |
| <b>Poland</b>                               | 3 406         | 3 488         | 4 359         | 4 774         | 4 810         |
| <b>Slovakia</b>                             | 3 364         | 4 524         | 4 074         | 3 881         | 4 001         |
| <b>Slovenia</b>                             | 914           | 929           | 1 186         | 1 255         | 1 312         |
| <b>Total Amber RFC countries</b>            | <b>7 684</b>  | <b>8 941</b>  | <b>9 619</b>  | <b>9 910</b>  | <b>10 123</b> |

Source: European Commission - Trade – EU Trade Helpdesk – Statistics

Table 27: Import and export quantity from/ to Hungary in 1000 t

| Country/ Year                                 | 2010          | 2012          | 2014          | 2015          | 2016          |
|---|---------------|---------------|---------------|---------------|---------------|
| <b>Import quantity from Hungary in 1000 t</b> |               |               |               |               |               |
| <b>Total EU 28 countries</b>                  | <b>27 624</b> | <b>29 863</b> | <b>30 220</b> | <b>31 419</b> | <b>32 243</b> |
| <b>Poland</b>                                 | 1 425         | 1 632         | 1 674         | 1 622         | 1 905         |
| <b>Slovakia</b>                               | 2 781         | 2 953         | 2 647         | 2 998         | 3 189         |
| <b>Slovenia</b>                               | 1 020         | 1 256         | 1 013         | 1 060         | 1 106         |
| <b>Total Amber RFC countries</b>              | <b>5 226</b>  | <b>5 841</b>  | <b>5 333</b>  | <b>5 681</b>  | <b>6 199</b>  |
| <b>Export quantity to Hungary in 1000 t</b>   |               |               |               |               |               |
| <b>Total EU 28 countries</b>                  | <b>22 198</b> | <b>22 763</b> | <b>26 181</b> | <b>26 410</b> | <b>27 446</b> |
| <b>Poland</b>                                 | 1 583         | 1 582         | 1 910         | 2 235         | 2 509         |
| <b>Slovakia</b>                               | 3 153         | 4 118         | 4 832         | 4 814         | 5 148         |
| <b>Slovenia</b>                               | 865           | 679           | 812           | 922           | 1 083         |
| <b>Total Amber RFC countries</b>              | <b>5 601</b>  | <b>6 379</b>  | <b>7 555</b>  | <b>7 971</b>  | <b>8 740</b>  |

Source: European Commission - Trade – EU Trade Helpdesk – Statistics

The analysis of transport flows in Tables 26 and 27 confirmed, in overall comparison, increase in the transport indicators only slightly fluctuating. On the basis of the economic growth trend, the upward trend in the years 2018 – 2021 can be assumed for both indicators examined. The total increase in transport flows in tonnes is recorded between the EU countries and Hungary, with more significant increase in goods transport recorded between Hungary and the Amber RFC countries. Moreover, the increase in value of transported goods is shown. On the basis of the facts, the sufficient transport potential for rail freight transport within the European transport market is

shown in case of Hungary and, therefore, the sufficient transport potential for the use of the Amber RFC services, too.

Since the transport performance indicator in tonnes is more significant for the needs of rail freight transport, Figure 25 shows the goods flows between the neighbouring countries of Hungary for 2016, including the percentage share.

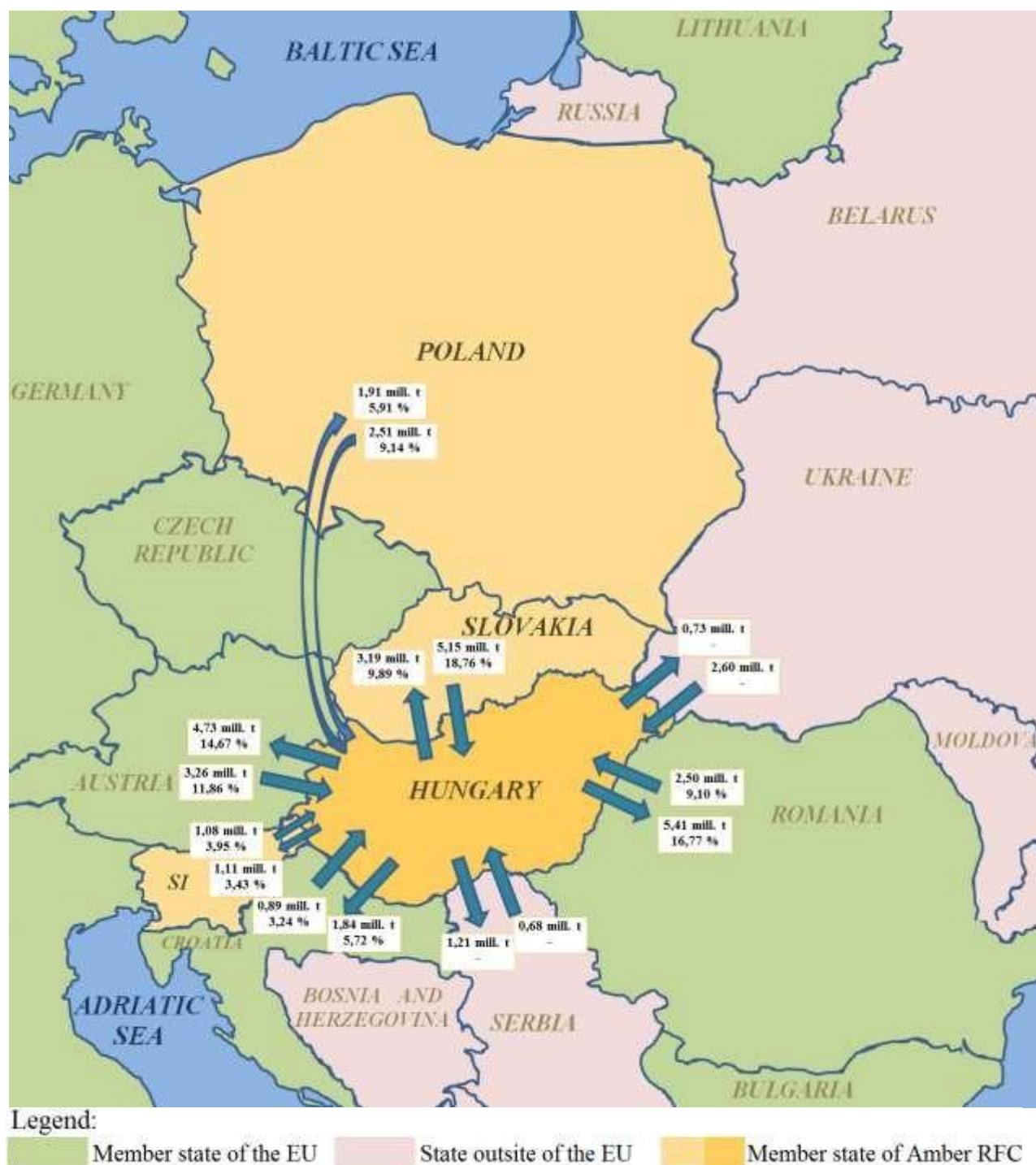


Figure 25: Graphical representation of import and export of goods in tonnes – Hungary

To determine the transport potential, Table 28 analyses the import and export of goods from/to the Republic of Slovenia, expressed in euro, between the Amber RFC countries and the EU countries. Subsequently, the analysis of import and export of goods from/to the Republic of

Slovenia, expressed in tonnes, between the Amber RFC countries and the EU countries is carried out in Table 29.

Table 28: Import and export value from/ to Slovenia in mill. €

| Country/ Year                                | 2010          | 2012          | 2014          | 2015          | 2016          |
|--|---------------|---------------|---------------|---------------|---------------|
| <b>Import value from Slovenia in mill. €</b> |               |               |               |               |               |
| <b>Total EU 28 countries</b>                 | <b>14 176</b> | <b>16 390</b> | <b>19 064</b> | <b>20 055</b> | <b>20 777</b> |
| <b>Poland</b>                                | 646           | 665           | 788           | 864           | 839           |
| <b>Slovakia</b>                              | 544           | 685           | 1 205         | 1 304         | 1 031         |
| <b>Hungary</b>                               | 654           | 794           | 1 040         | 1 124         | 1 225         |
| <b>Total Amber RFC countries</b>             | <b>1 844</b>  | <b>2 144</b>  | <b>3 032</b>  | <b>3 292</b>  | <b>3 095</b>  |
| <b>Export value to Slovenia in mill. €</b>   |               |               |               |               |               |
| <b>Total EU 28 countries</b>                 | <b>15 796</b> | <b>17 211</b> | <b>18 067</b> | <b>18 999</b> | <b>19 823</b> |
| <b>Poland</b>                                | 425           | 471           | 572           | 628           | 683           |
| <b>Slovakia</b>                              | 359           | 468           | 481           | 479           | 469           |
| <b>Hungary</b>                               | 755           | 921           | 931           | 898           | 966           |
| <b>Total Amber RFC countries</b>             | <b>1 538</b>  | <b>1 860</b>  | <b>1 984</b>  | <b>2 005</b>  | <b>2 118</b>  |

Source: European Commission - Trade – EU Trade Helpdesk – Statistics

Table 29: Import and export quantity from/ to Slovenia in 1000 t

| Country/ Year                                  | 2010          | 2012          | 2014          | 2015          | 2016          |
|--|---------------|---------------|---------------|---------------|---------------|
| <b>Import quantity from Slovenia in 1000 t</b> |               |               |               |               |               |
| <b>Total EU 28 countries</b>                   | <b>10 490</b> | <b>11 566</b> | <b>12 807</b> | <b>13 542</b> | <b>14 242</b> |
| <b>Poland</b>                                  | 249           | 288           | 321           | 278           | 280           |
| <b>Slovakia</b>                                | 250           | 394           | 500           | 487           | 457           |
| <b>Hungary</b>                                 | 499           | 560           | 683           | 819           | 960           |
| <b>Total Amber RFC countries</b>               | <b>998</b>    | <b>1 241</b>  | <b>1 505</b>  | <b>1 584</b>  | <b>1 697</b>  |
| <b>Export quantity to Slovenia in 1000 t</b>   |               |               |               |               |               |
| <b>Total EU 28 countries</b>                   | <b>12 766</b> | <b>13 557</b> | <b>14 539</b> | <b>15 236</b> | <b>16 175</b> |
| <b>Poland</b>                                  | 213           | 207           | 280           | 271           | 285           |
| <b>Slovakia</b>                                | 248           | 270           | 281           | 247           | 323           |
| <b>Hungary</b>                                 | 995           | 1 115         | 1 013         | 1 022         | 1 002         |
| <b>Total Amber RFC countries</b>               | <b>1 456</b>  | <b>1 592</b>  | <b>1 573</b>  | <b>1 539</b>  | <b>1 610</b>  |

Source: European Commission - Trade – EU Trade Helpdesk – Statistics

Based on the findings from Tables 28 and 29, we can confirm the upward trend in transport performances between the Amber RFC countries and the Republic of Slovenia. Moreover, the increase in transport performances between the EU countries and the Republic of Slovenia is confirmed for both transport indicators in overall course. Based on the expected economic growth trend, the upward trend in the years 2018 – 2021 can be assumed for both indicators. The analysis showed increase in the value of goods transported. The analysis carried out confirms the sufficient

transport potential for rail freight transport within the European transport market and, therefore, sufficient transport potential for the use of the Amber RFC services in the Republic of Slovenia, too. Within transport capacities, there is sufficient potential for transport between the Republic of Slovenia and the other countries of the Amber RFC, particularly in intermodal transport and single wagon load transport.

As the transport performance indicator in tonnes is more significant for the needs of evaluation of rail freight potential, Figure 26 illustrates the goods flows between the neighbouring countries of the Republic of Slovenia for 2016, including the percentage share.



Figure 26: Graphical representation of import and export of goods in tonnes – Republic of Slovenia



The following figure shows all registered transport flows between the Amber RFC countries and all EU countries in tonnes for the year 2016.



Figure 27: Graphical representation of import and export of goods in tonnes - summary

## 5.6 Analysis of intermodal transport terminals

The basic objectives of the transport policy of the Amber RFC countries include reducing greenhouse gas emissions and finding ways to reduce the environmental burden of transport. One way to meet these objectives is the intermodal transport. The intermodal transport is efficient, safe, reliable and cost-competitive. The provision of intermodal transport services requires, inter alia, adequate location of intermodal transport terminals and sufficient transport infrastructure (appropriate connection of terminals to road and rail infrastructure) and advanced technical equipment (wagons, unit loads and loading units).

Analysis in subchapter 5.6. was carried out on the basis of the information listed and received from the KombiConsult 2018 comprehensive source at [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu). This source does not contain information about all terminals from the list provided by the individual Infrastructure Managers.

## Poland

The following figure shows the location of intermodal transport terminals on the territory of the Republic of Poland. The terminals marked in green colour are located on the basic network of the Amber RFC.

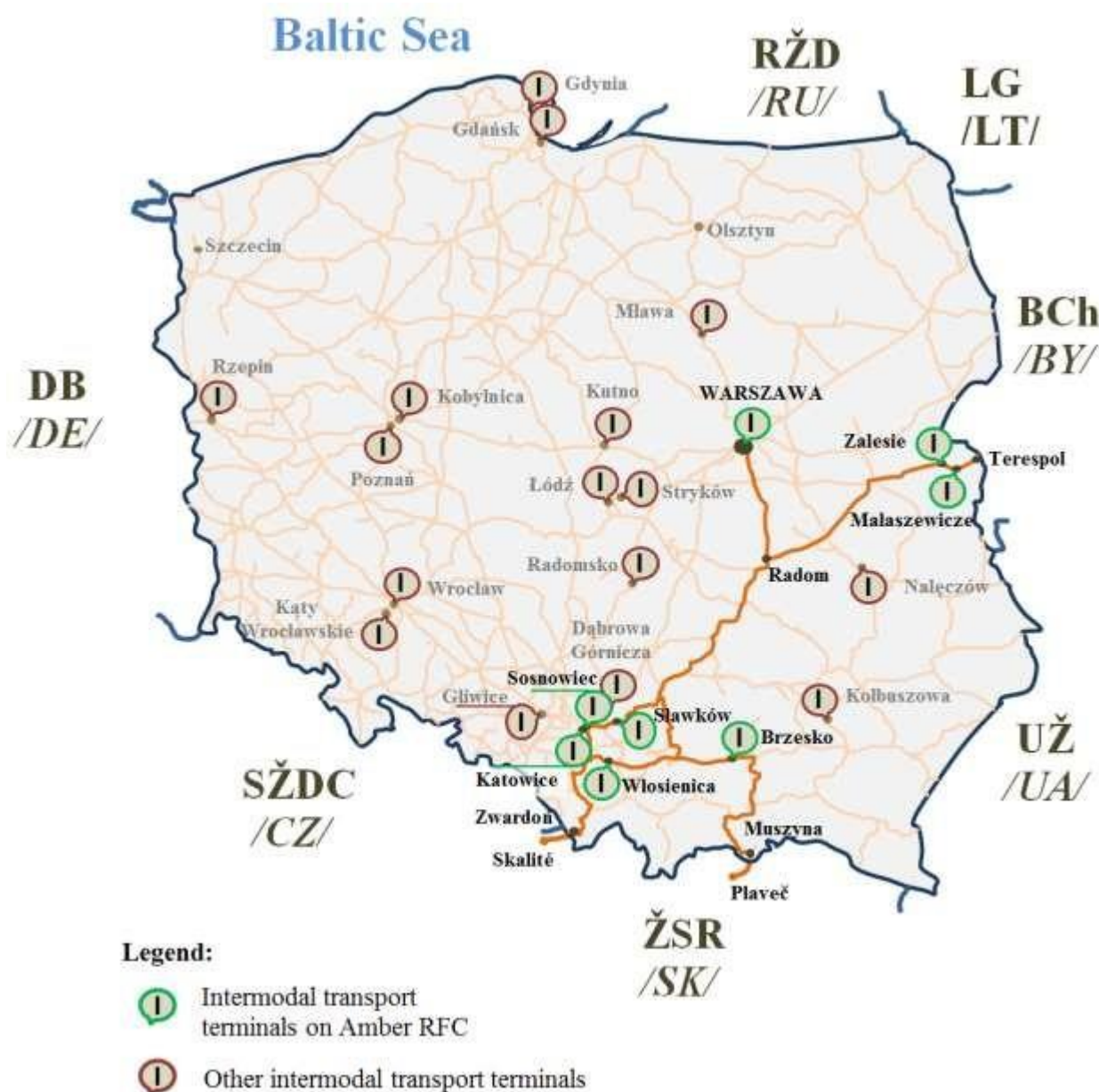


Figure 28: Terminals located on the territory of the Republic of Poland

(Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu))

## Operators of intermodal transport terminals within the basic network of the Amber RFC:

- Małaszewicze Kontenerowa: PKP Cargo Centrum Logistyczne Małaszewicze sp. Z o.o.,

- EUROPORT Małaszewicze Duże: EUROSPOORT Sp. z o.o.,
- Terminal przeładunkowy Wólka (Zalesie): PKP - Cargo Connect Sp. z o.o.,
- Transgaz S.A., Zalesie: Transgaz S.A. Terminal Gazów,
- Containerterminal Warszawa: Cargosped Sp. Z o.o.,
- Warszawa Główna Towarowa- Container Terminal: Spedcont,
- Terminal Kontenerowy Warszawa: PKP Cargo Connect Sp. z o.o.,
- Loconi Intermodal Terminal Kontenerowy Warszawa: Loconi Intermodal S.A.,
- Polzug Terminal Kontenerowy Pruszków: POLZUG Intermodal Polska Sp. z o.o.,
- Euroterminal Sławków: Euroterminal Sławków Ltd,
- Brzeski terminal kontenerowy: Karpiel sp. Z o. o.,
- Terminal kontenerowy Włosienica: Baltic Rail AS,
- Terminal Sosnowiec Południowy: Spedcont.

Tables 30 gives basic information on intermodal transport terminals located on the basic network of the Amber RFC.

*Table 30: Basic information on intermodal transport terminals in the Republic of Poland*

| Intermodal transport terminals on Amber RFC     | Connectivity* |      |       | Area (m <sup>2</sup> ) | Storage Capacity     |
|---|---------------|------|-------|------------------------|----------------------|
|   | Road          | Rail | Water |                        |                      |
| Małaszewicze Terminal Kontenerowy               |               |      |       | 40 000                 | 1 632 TEU            |
| EUROPORT Małaszewicze Duże                      |               |      |       | 86 000                 | 1 300 TEU            |
| Terminal przeładunkowy Wólka (Zalesie)          |               |      |       | 57 000                 | N/A                  |
| Transgaz S.A., Zalesie                          |               |      |       | N/A                    | 1 000 m <sup>3</sup> |
| Containerterminal Warszawa                      |               |      |       | 24 000                 | 1 200 TEU            |
| Warszawa Główna Towarowa- Container Terminal    |               |      |       | 18 600                 | 1 000 TEU            |
| Terminal Kontenerowy Warszawa                   |               |      |       | 30 000                 | N/A                  |
| Loconi Intermodal Terminal Kontenerowy Warszawa |               |      |       | 68 000                 | 2 000 TEU            |
| Polzug Terminal Kontenerowy Pruszków            |               |      |       | 44 600                 | 1 500 TEU            |
| Euroterminal Sławków                            |               |      |       | 93 000                 | 3 500 TEU            |
| Brzeski terminal kontenerowy                    |               |      |       | 100 000                | 5 000 TEU            |
| Terminal kontenerowy Włosienica                 |               |      |       | 100 000                | 780 TEU              |
| Terminal Sosnowiec Południowy                   |               |      |       | N/A                    | N/A                  |

\*Note: **YES/NO**

Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu), [www.utk.gov.pl](http://www.utk.gov.pl)



Continuation of Table 30:

| Intermodal transport terminals on Amber RFC     | Number of tracks / Usable length of tracks (m) |          | Gantry cranes (number) | Reach stacker (number) |
|---|--|----------|------------------------|------------------------|
|   | 1 520 mm                                       | 1 435 mm |                        |                        |
| Małaszewicze Terminal Kontenerowy               | 2/1 766  | 2/1 746  | 3                      | 2                      |
| EUROPORT Małaszewicze Duże                      | -/1 300  | -/1 300  | N/A                    | N/A                    |
| Terminal przeładunkowy Wólka (Zalesie)          | -/2 254  | -/3 104  | N/A                    | N/A                    |
| Transgaz S.A., Zalesie                          | -  | N/A      | N/A                    | N/A                    |
| Containerterminal Warszawa                      | -  | 1/320    | 0                      | 3                      |
| Warszawa Główna Towarowa - Container Terminal   | -  | 2/715    | 2                      | 0                      |
| Terminal Kontenerowy Warszawa                   | -  | -/3 680  | N/A                    | N/A                    |
| Loconi Intermodal Terminal Kontenerowy Warszawa | -  | 2/1 040  | 0                      | 3                      |
| Polzug Terminal Kontenerowy Pruszków            |  | -/650    | 0                      | 8                      |
| Euroterminal Sławków                            | -/17 521                                       | -/24 256 | 1                      | 4                      |
| Brzeski terminal kontenerowy                    | -  | 6/3 200  | 0                      | 1                      |
| Terminal kontenerowy Włosienica                 | -  | 1/400    | 0                      | 1                      |
| Terminal Sosnowiec Południowy                   | -  | N/A      | N/A                    | N/A                    |

Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu), [www.utk.gov.pl](http://www.utk.gov.pl)

## Slovakia

The following figure shows the location of intermodal transport terminals on the territory of the Slovak Republic. The terminals marked in green colour are located on the basic network of the Amber RFC.



Figure 29: Terminal located on the territory of the Slovak Republic

(Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu))

### Operators of intermodal transport terminals within the basic network of the Amber RFC:

- Terminal Košice – Haniska pri Košiciach: Metrans Danubia, a. s.,
- Terminal Žilina: Rail Cargo Operator,
- Terminal Žilina-Teplica,
- Bratislava ÚNS: Rail Cargo Operator,
- Bratislava Pálenisko: SPaP, a. s.,
- Rail Hub Terminal Dunajská Streda: Metrans (Danubia) a. s.

Table 31 gives the basic information on intermodal transport terminals located on the basic network of the Amber RFC.

*Table 31: Basic information on intermodal transport terminals in the Slovak Republic*

| Intermodal transport terminals on Amber RFC | Connectivity* |      |       | Area (m <sup>2</sup> ) | Storage Capacity (TEU) |
|---|---------------|------|-------|------------------------|------------------------|
|   | Road          | Rail | Water |                        |                        |
| Terminal Košice                             |               |      |       | 25 000                 | 3 000                  |
| Terminal Žilina                             |               |      |       | 16 000                 | N/A                    |
| Bratislava ÚNS                              |               |      |       | 34 500                 | N/A                    |
| Bratislava Pálenisko                        |               |      |       | 24 000                 | 1 400                  |
| Rail Hub Terminal Dunajská Streda           |               |      |       | 280 000                | 25 000                 |

\*Note: **YES/NO**

Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu)

Continuation of Table 31:

| Intermodal transport terminals on Amber RFC | Number of tracks | Usable length of tracks (m) | Gantry cranes (number) | Reach stacker (number) |
|---|------------------|-----------------------------|------------------------|------------------------|
| Terminal Košice                             | 2                | 300                         | 2                      | 2                      |
| Terminal Žilina                             | 4                | 1 520                       | 0                      | 3                      |
| Bratislava ÚNS                              | 3                | 912                         | 1                      | 1                      |
| Bratislava Pálenisko                        | 2                | 450                         | 3                      | 3                      |
| Rail Hub Terminal Dunajská Streda           | 9                | 5 450                       | 4                      | 6                      |

Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu)

### Hungary

The following figure shows the location of intermodal transport terminals on the territory of Hungary. The terminals marked in green colour are located on the basic network of the Amber RFC.

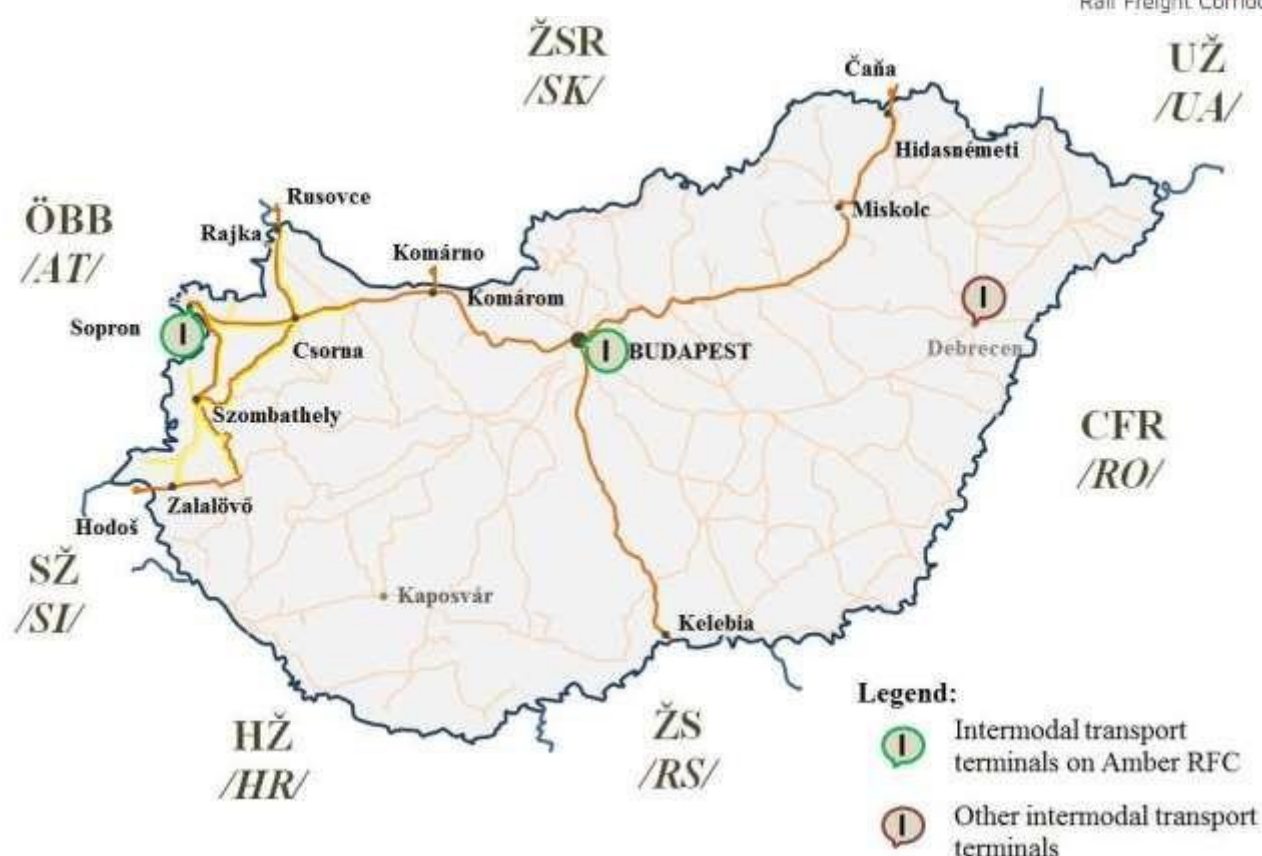


Figure 30: Terminals located on the territory of Hungary

(Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu))

#### Operators of intermodal transport terminals within the basic network of the Amber RFC:

- Sopron Container Terminal: GYSEV Cargo Zrt.,
- Kombiterminál Törökbálint: Törökbálint Container Terminal Kft.,
- Budapest BILK: Budapest BILK Co. Ltd.,
- Mahart Container Center, Budapest: MAHART Container Center Ltd.

Table 32 gives the basic information on intermodal transport terminals located on the basic network of the Amber RFC.

Table 32: Basic information on intermodal transport terminals in Hungary

| Intermodal transport terminals on Amber RFC | Connectivity* |      |       | Area (m <sup>2</sup> ) | Storage Capacity (TEU) |
|---|---------------|------|-------|------------------------|------------------------|
|   | Road          | Rail | Water |                        |                        |
| Sopron container terminal                   |               |      |       | 40 500                 | 1 500                  |
| Kombiterminál Törökbálint                   |               |      |       | 35 000                 | 6 000                  |
| Budapest BILK                               |               |      |       | 223 000                | 220 000                |
| Mahart Container Center, Budapest           |               |      |       | 105 000                | 5 800                  |

\*Note: **YES/NO**

Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu)

Continuation of Table 32:

| Intermodal transport terminals on Amber RFC | Number of tracks (m) | Usable length of tracks (m) | Gantry cranes (number) | Reach stacker (number) |
|---|----------------------|-----------------------------|------------------------|------------------------|
| Sopron container terminal                   | 6                    | 1 960                       | 2                      | 2                      |
| Kombiterminál Törökbálint                   | 3                    | 600                         | N/A                    | 3                      |
| Budapest BILK                               | 11                   | 6 800                       | 2                      | 8                      |
| Mahart Container Center, Budapest           | 5                    | 2 120                       | N/A                    | 9                      |

Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu)

## Slovenia

The following figure shows the location of intermodal transport terminals on the territory of Slovenia. The terminals marked in green colour are located on the basic network of the Amber RFC.

Figure 31: Terminals located on the territory of Slovenia



(Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu))

## Operators of intermodal transport terminals within the basic network of the Amber RFC:

- Koper Luka KT: Luka Koper D.D – Port of Koper PLC,
- Ljubljana Moste: Slovenske železnice - Tovorni promet, d.o.o.,
- Celje: Slovenske železnice - Tovorni promet, d.o.o.

Table 33 gives the basic information on intermodal transport terminals located on the basic network of the Amber RFC.

Table 33: Basic information on intermodal transport terminals in Slovenia

| Intermodal transport terminals on Amber RFC | Connectivity* |      |       | Area (m <sup>2</sup> ) | Storage Capacity (TEU) |
|---|---------------|------|-------|------------------------|------------------------|
|   | Road          | Rail | Water |                        |                        |
| Koper Luka KT                               |               |      |       | 270 000                | 19 130                 |
| Ljubljana Moste                             |               |      |       | 99 250                 | 1 270                  |
| Celje                                       |               |      |       | 6 500                  | 80                     |

\*Note: **YES/NO**

Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu)

Continuation of Table 33:

| Intermodal transport terminals on Amber RFC | Number of tracks (m)/ | Usable length of tracks (m) | Gantry cranes (number) | Reach stacker (number) |
|---|-----------------------|-----------------------------|------------------------|------------------------|
| Koper Luka KT                               | 9                     | 4 640                       | 3                      | 8                      |
| Ljubljana Moste                             | 4                     | 2 000                       | 1                      | 2                      |
| Celje                                       | 20                    | 5 000                       | 0                      | 1                      |

Source: Internet domains of individual terminals, KombiConsult 2018, [www.intermodal-terminals.eu](http://www.intermodal-terminals.eu)

#### Analysis of intermodal transport terminals within the Amber RFC countries showed:

- appropriate location of terminals within the Amber RFC rail network,
- significant part of intermodal transport terminals located in the Amber RFC countries is connected with the Amber RFC infrastructure,
- potential of increase in the transport performances of intermodal transport trains on the Amber RFC lines,
- sufficient technical base of intermodal transport terminals,
- sufficient capacity to handle TEU,
- perspective of cooperation between the Amber RFC and intermodal transport terminals.

## 5.7 Results and summary of the findings of Chapter 5

Based on the data presented in the individual subchapters of the fifth part of TMS, we can state determine:

- realised process of liberalization of rail transport services market in the Amber RFC countries: confirmed by Liberalization Index (Figure 16),
- potential for cooperation between RFCs network: results from the geographic connection of individual RFC corridors, some common line sections and strategic objectives of the corridors,
- general overall increase in rail freight transport performances in the Amber RFC countries: shown by the analysis of transport performances in the individual countries of the Amber RFC,
- general overall increase in rail passenger transport performances in the Amber RFC countries: shown by the analysis of transport performances in the individual countries of the Amber RFC and increasing demand of passengers influenced by a higher quality of services, a higher offer of transport services, poor technical condition of road infrastructure and congestions,
- general increase in rail freight transport performances on the lines considered to be included in the Amber RFC in the Polish, Slovak and Slovenian Republics: shown by the analysis of transport performances in rail freight transport on the lines to be included in the Amber RFC. Increase in performances will be affected by the Amber RFC services, its strategic routing, increasing quality of transport services (influenced by the liberalization process) and economic development (described in Chapter 4),
- general increase in rail passenger transport performances on the lines considered to be included in the Amber RFC in the Polish, Slovak and Slovenian Republics: shown by the analysis of transport performances in rail passenger transport on the lines to be included in the Amber RFC. Increase in performances will be affected by the increasing quality of transport services (influenced by the liberalization process) and economic development (described in Chapter 4),
- change of modal split in favour of rail freight transport in Hungary and the Republic of Slovenia (road transport increased in Republic of Poland, Slovak republic and Hungary): affected by higher quality of transport services, RFC corridor services, investments in the railway system and higher demand (higher demand for rail freight services results also from the conclusions of Chapter 4),
- change of modal split in favour of rail passenger transport in the Slovak Republic (road transport increase in the Republic of Poland and Hungary): affected by higher quality of



transport services, higher offer of transport services, investments in the railway system and higher demand (higher demand for rail passenger services results also from the conclusions of Chapter 4),

- intention of all Amber RFC infrastructure managers and ministries involved to invest in the lines considered for the Amber RFC: results from the transport policy of individual countries, the EU's objectives in the development and modernization of the European rail network and operational needs (increase in transport performances, cost reduction, shortening of travel time),
- general reduction of the railway infrastructure charges for rail freight services: on the basis of the implementation of Directive 2012/34/EU of the European Parliament and of the Council establishing a single European railway area, and the harmonization of transport infrastructure charging,
- overall increase of providers of rail transport services: can be assumed based on the analysis of development of number of carriers in the Amber RFC countries, at the same time, it is affected by the achieved level of the liberalization process (Figure 16) and the higher interest in business in railway transport. An increase in business interest is due to higher demand and the results of the economic analysis carried out in Chapter 4,
- transport potential for the Amber RFC services between the Amber RFC countries and the EU countries: due to the increasing trade between the Amber RFC countries and the other EU member states, graphically shown in Figure 27,
- growth in demand for transport services within the Amber RFC countries: due to the increasing trade between the Amber RFC countries, graphically shown in Figures 23-26,
- potential for the development of intermodal transport: affected by the location of intermodal transport terminals within the Amber RFC, the higher quality of services provided, the system measures of the EU and member states designed to support intermodal transport, the investments of intermodal operators, the growth of transport requirements from the Port of Koper to Central and Western Europe,
- potential for the development of single wagon load transport in international traffic: increasing number of business entities, dense railway network of the Amber RFC countries, the construction of new sidings, measures to support sidings by the countries.

On the basis of the facts listed, the strategic tools and measures to support rail freight services, to support the growth in demand for rail services and the Amber RFC services will be proposed in the final chapter of the TMS.

## 6 PROGNOSIS OF TRANSPORT PERFORMANCE DEVELOPMENT

Several aspects affecting infrastructure, quality of services and external costs result from transport performances. Therefore, it is necessary to know the development of transport performances in order to form the objectives and the subsequent strategy of the Amber RFC. The development of transport performances is assumed on the basis of the prognosis that includes three scenarios for the Amber RFC: realistic, optimistic and pessimistic.

Forecasting deals with prediction of the future development of organization, society, economy, transport, environment, etc. The aim is to get an idea of the future state which is based on rational ways of prediction. The forecasts obtained are of great importance for strategic management, risk management and planning.

### **Forecasting has connection with:**

- planning,
- targeting,
- organizing,
- decision-making.

### **Forecast creation process:**

1. Problem formulation.
2. Formulation and definition of necessary information and data.
3. Data collection.
4. Data reduction and condensation.
5. Forecast model creation.
6. Forecast generation using the selected algorithm and using GDP.
7. Forecast evaluation.

### **Bases for forecast:**

1. Model used for forecast: AAA algorithm with exponential alignment.
2. Confidence interval: 95 %.
3. Time span of forecast: 2019 – 2026 (8 years).
4. Examined indicator: transport performances in rail passenger and freight traffic.
5. Input data: provided by individual infrastructure managers, annual reports.
6. Presentation of results:
  - in tabular form for each scenario separately,
  - overall comparison of individual forecast scenarios in the form of graph.
7. It is a long-term forecast in terms of time.

8. Forecast was created using an appropriate forecasting software.

**Forecast risks:**

1. Economic cycle – recession, period of crisis during forecasted period.
2. Inaccuracy of provided data.
3. Insufficient interval of data provided.
4. Low level of investment in railway infrastructure – inadequate state of railway infrastructure required by customers (e.g. capacity, frequent possessions).
5. Change in transport infrastructure charging – increase in rail charges and decrease in charges for other modes of transport.
6. Significant shift of transport performances to other modes of transport.

The forecast was elaborated based on the available information on rail transport performances and using the AAA algorithm. It calculates or predicts a future value based on existing (historical) values by using the AAA version of the Exponential Smoothing algorithm. The predicted value is a continuation of the historical values in the specified target date, which should be a continuation of the timeline. This prognosis method does not take into account e.g. major changes in the infrastructure (e.g. new construction of lines, changes of infrastructure parameters, such as longer trains, etc.) nor major changes in the competition between modes. You can use this function to predict future sales, transport performances, inventory requirements, or consumer trends.

**Arguments used within the forecast:**

**Target date** Required. The data point for which you want to predict a value. Target date can be date/time or numeric – the period 2019-2026.

**Values** Required. Values are the historical values, for which you want to forecast the next points – transport performances of passenger and freight trains (gross tkm, train-km) on the railway infrastructure of the Amber RFC countries (2015-2017), forecast of GDP development in individual corridor member states (in %, the period 2019-2026, forecast of the European Commission and the European Central Bank).

**Timeline** Required. The independent array or range of numeric data. The dates in the timeline must have a consistent step between them and can't be zero – the period 2015-2017.

**Seasonality** Optional. A numeric value. The default value of 1 means program detects seasonality automatically for the forecast and uses positive, whole numbers for the length of the seasonal pattern. 0 indicates no seasonality, meaning the prediction will be linear – the used value 1 based on which the algorithm calculated seasonality.

**Table description:**

Table 34 – realistic scenario, prognosis of the development of total transport performances of rail system in individual countries and on lines included in the Amber RFC.

Table 35 – optimistic scenario, prognosis of the development of total transport performances of rail system in individual countries and on lines included in the Amber RFC.

Table 36 – pessimistic scenario, prognosis of the development of total transport performances of rail system in individual countries and on lines included in the Amber RFC.

The difference between the individual prognosis scenarios is due to setting the input parameters of deviation and sensitivity for individual scenarios. For processing the prognosis, the mean degree of deviation was selected at the level of 5 points – most frequently used for traffic forecasting. Subsequently, the software and algorithm used calculated the outputs for individual prognosis scenarios, listed in Tables 34, 35 and 36.

Table 34: Prognosis – Realistic scenario

| IM               | Mode of transport   | Scope  | Transport performance/ Year | 2019    | 2020    | 2021    | 2022    | 2023    | 2024    | 2025    | 2026    |
|------------------|---------------------|--------|-----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| PLK              | Passenger transport | total  | train-km in thous.          | 170 740 | 177 667 | 184 594 | 191 521 | 198 448 | 205 375 | 212 302 | 219 229 |
|                  |                     |        | gross tkm in mill.          | 41 606  | 43 050  | 44 494  | 45 939  | 47 383  | 48 828  | 50 272  | 51 716  |
|                  |                     | on RFC | train-km in thous.          | 14 572  | 14 854  | 15 136  | 15 418  | 15 699  | 15 981  | 16 263  | 16 545  |
|                  |                     |        | gross tkm in mill.          | 3 978   | 4 093   | 4 208   | 4 323   | 4 438   | 4 552   | 4 667   | 4 782   |
|                  | Freight transport   | total  | train-km in thous.          | 83 443  | 85 572  | 87 701  | 89 830  | 91 959  | 94 088  | 96 217  | 98 345  |
|                  |                     |        | gross tkm in mill.          | 119 977 | 123 705 | 127 433 | 131 160 | 134 888 | 138 616 | 142 344 | 146 071 |
|                  |                     | on RFC | train-km in thous.          | 9 495   | 9 906   | 10 318  | 10 729  | 11 141  | 11 553  | 11 964  | 12 376  |
|                  |                     |        | gross tkm in mill.          | 14 013  | 14 699  | 15 384  | 16 070  | 16 756  | 17 442  | 18 128  | 18 813  |
| ŽSR              | Passenger transport | total  | train-km in thous.          | 37 205  | 38 377  | 39 549  | 40 721  | 41 892  | 43 064  | 43 064  | 45 408  |
|                  |                     |        | gross tkm in mill.          | 11 590  | 12 297  | 13 004  | 13 710  | 14 417  | 15 124  | 15 831  | 15 830  |
|                  |                     | on RFC | train-km in thous.          | 11 654  | 12 050  | 12 446  | 12 842  | 13 238  | 13 633  | 14 029  | 14 425  |
|                  |                     |        | gross tkm in mill.          | 4 429   | 4 682   | 4 934   | 5 187   | 5 439   | 5 691   | 5 944   | 6 196   |
|                  | Freight transport   | total  | train-km in thous.          | 15 908  | 16 277  | 16 646  | 17 015  | 17 384  | 17 753  | 18 122  | 18 491  |
|                  |                     |        | gross tkm in mill.          | 19 922  | 20 369  | 20 815  | 21 262  | 21 709  | 22 155  | 22 602  | 23 049  |
|                  |                     | on RFC | train-km in thous.          | 5 480   | 5 785   | 6 090   | 6 395   | 6 701   | 7 006   | 7 311   | 7 616   |
|                  |                     |        | gross tkm in mill.          | 6 488   | 6 844   | 7 201   | 7 557   | 7 914   | 8 270   | 8 627   | 8 983   |
| MAV Zrt. + GYSEV | Passenger transport | total  | train-km in thous.          | 85 850  | 86 883  | 87 915  | 88 948  | 89 981  | 91 014  | 92 047  | 93 080  |
|                  |                     |        | gross tkm in mill.          | 18 111  | 18 264  | 18 571  | 18 826  | 19 212  | 19 736  | 19 998  | 20 157  |
|                  |                     | on RFC | train-km in thous.          | 22 216  | 22 684  | 23 098  | 23 415  | 23 821  | 24 189  | 24 608  | 24 891  |
|                  |                     |        | gross tkm in mill.          | 5 212   | 5 424   | 5 616   | 5 931   | 6 187   | 6 442   | 6 887   | 7 184   |
|                  | Freight transport   | total  | train-km in thous.          | 18 086  | 18 234  | 18 621  | 19 148  | 19 823  | 20 184  | 20 531  | 21 038  |
|                  |                     |        | gross tkm in mill.          | 22 707  | 23 158  | 23 800  | 24 485  | 25 012  | 25 354  | 25 700  | 26 053  |
|                  |                     | on RFC | train-km in thous.          | 7 752   | 7 952   | 8 255   | 8 878   | 9 101   | 9 601   | 10 015  | 10 858  |
|                  |                     |        | gross tkm in mill.          | 9 235   | 10 158  | 10 800  | 11 425  | 11 980  | 12 357  | 12 977  | 13 324  |
| SŽ-I             | Passenger transport | total  | train-km in thous.          | 9 695   | 9 393   | 9 121   | 8 962   | 8 797   | 8 536   | 8 342   | 8 123   |
|                  |                     |        | gross tkm in mill.          | 1 324   | 1 278   | 1 232   | 1 203   | 1 197   | 1 176   | 1 141   | 1 109   |
|                  |                     | on RFC | train-km in thous.          | 6 895   | 6 939   | 6 982   | 7 026   | 7 070   | 7 114   | 7 158   | 7 202   |
|                  |                     |        | gross tkm in mill.          | 746     | 713     | 701     | 697     | 683     | 675     | 669     | 654     |
|                  | Freight transport   | total  | train-km in thous.          | 10 279  | 10 486  | 10 693  | 10 900  | 11 108  | 11 315  | 11 522  | 11 730  |
|                  |                     |        | gross tkm in mill.          | 9 970   | 10 485  | 10 999  | 11 514  | 12 029  | 12 543  | 13 058  | 13 572  |
|                  |                     | on RFC | train-km in thous.          | 8 093   | 8 404   | 8 716   | 9 027   | 9 339   | 9 650   | 9 962   | 10 273  |
|                  |                     |        | gross tkm in mill.          | 8 067   | 8 444   | 8 822   | 9 199   | 9 577   | 9 955   | 10 332  | 10 710  |
| Total            | Passenger transport | total  | train-km in thous.          | 303 490 | 312 320 | 321 179 | 330 152 | 339 118 | 347 989 | 355 755 | 365 840 |
|                  |                     |        | gross tkm in mill.          | 72 631  | 74 889  | 77 301  | 79 678  | 82 209  | 84 864  | 87 242  | 88 812  |
|                  |                     | on RFC | train-km in thous.          | 55 337  | 56 527  | 57 662  | 58 701  | 59 828  | 60 917  | 62 058  | 63 063  |
|                  |                     |        | gross tkm in mill.          | 14 365  | 14 912  | 15 459  | 16 138  | 16 747  | 17 360  | 18 167  | 18 816  |
|                  | Freight transport   | total  | train-km in thous.          | 127 716 | 130 569 | 133 661 | 136 893 | 140 274 | 143 340 | 146 392 | 149 604 |
|                  |                     |        | gross tkm in mill.          | 172 576 | 177 717 | 183 047 | 188 421 | 193 638 | 198 668 | 203 704 | 208 745 |
|                  |                     | on RFC | train-km in thous.          | 30 820  | 32 047  | 33 379  | 35 029  | 36 282  | 37 810  | 39 252  | 41 123  |
|                  |                     |        | gross tkm in mill.          | 37 803  | 40 145  | 42 207  | 44 251  | 46 227  | 48 024  | 50 064  | 51 830  |

*Table 35: Prognosis – Optimistic scenario*

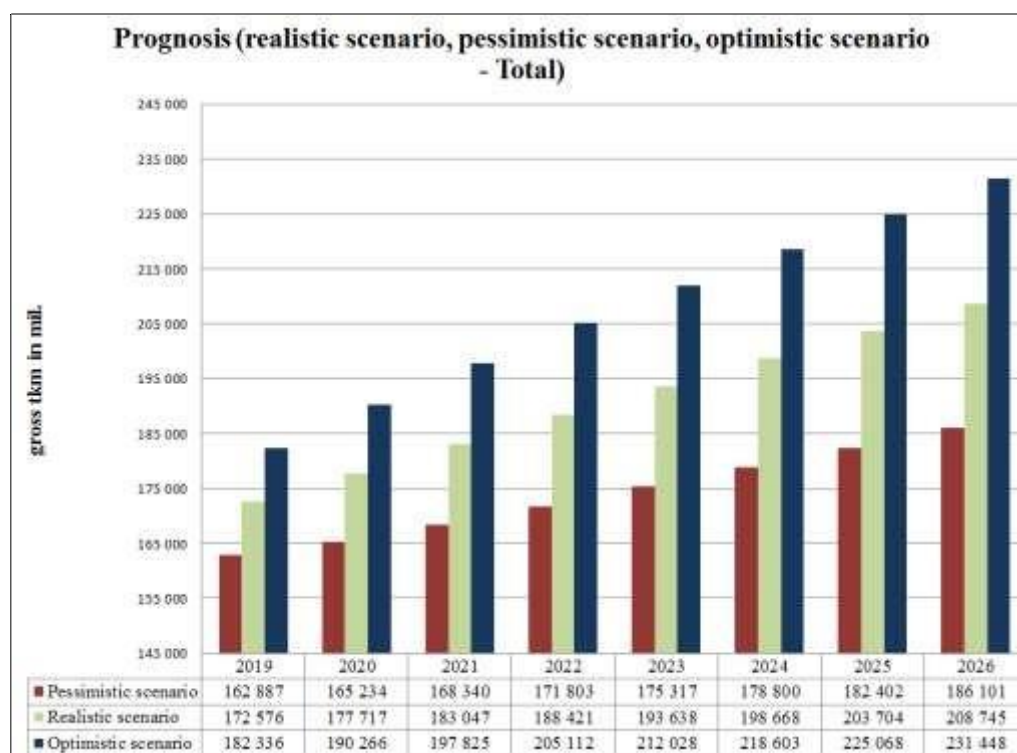
| IM                     | Mode of transport   | Scope  | Transport performance/Year | 2019    | 2020    | 2021    | 2022    | 2023    | 2024    | 2025    | 2026    |
|------------------------|---------------------|--------|----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| PLK                    | Passenger transport | total  | train-km in thous.         | 181 941 | 190 196 | 198 327 | 206 365 | 214 329 | 222 234 | 230 088 | 237 900 |
|                        |                     |        | gross tkm in mill.         | 48 355  | 51 491  | 54 344  | 57 023  | 59 580  | 62 046  | 64 441  | 66 779  |
|                        |                     | on RFC | train-km in thous.         | 15 919  | 16 538  | 17 101  | 17 629  | 18 133  | 18 619  | 19 090  | 19 550  |
|                        |                     |        | gross tkm in mill.         | 4 656   | 5 006   | 5 307   | 5 581   | 5 838   | 6 082   | 6 315   | 6 542   |
|                        | Freight transport   | total  | train-km in thous.         | 88 977  | 93 021  | 96 668  | 100 096 | 103 379 | 106 558 | 109 657 | 112 693 |
|                        |                     |        | gross tkm in mill.         | 127 925 | 134 402 | 140 310 | 145 903 | 151 288 | 156 523 | 161 645 | 166 674 |
|                        |                     | on RFC | train-km in thous.         | 10 358  | 10 769  | 11 181  | 11 593  | 12 004  | 12 416  | 12 828  | 13 239  |
|                        |                     |        | gross tkm in mill.         | 15 327  | 16 013  | 16 699  | 17 384  | 18 070  | 18 756  | 19 442  | 20 128  |
| ŽSR                    | Passenger transport | total  | train-km in thous.         | 39 005  | 40 200  | 41 394  | 42 589  | 43 784  | 44 979  | 46 173  | 47 368  |
|                        |                     |        | gross tkm in mill.         | 12 410  | 13 131  | 13 851  | 14 572  | 15 292  | 16 013  | 16 734  | 17 454  |
|                        |                     | on RFC | train-km in thous.         | 12 427  | 12 831  | 13 234  | 13 638  | 14 042  | 14 445  | 14 849  | 15 252  |
|                        |                     |        | gross tkm in mill.         | 4 791   | 5 048   | 5 305   | 5 563   | 5 820   | 6 077   | 6 335   | 6 592   |
|                        | Freight transport   | total  | train-km in thous.         | 16 450  | 16 834  | 17 217  | 17 600  | 17 983  | 18 366  | 18 748  | 19 131  |
|                        |                     |        | gross tkm in mill.         | 20 400  | 20 858  | 21 317  | 21 775  | 22 233  | 22 691  | 23 149  | 23 607  |
|                        |                     | on RFC | train-km in thous.         | 5 754   | 6 070   | 6 386   | 6 703   | 7 019   | 7 334   | 7 650   | 7 966   |
|                        |                     |        | gross tkm in mill.         | 6 767   | 7 135   | 7 503   | 7 871   | 8 239   | 8 607   | 8 975   | 9 343   |
| MAV<br>Zrt. +<br>GYSEV | Passenger transport | total  | train-km in thous.         | 90 143  | 91 227  | 92 311  | 93 395  | 94 480  | 95 565  | 96 649  | 97 734  |
|                        |                     |        | gross tkm in mill.         | 18 745  | 18 903  | 19 221  | 19 485  | 19 884  | 20 427  | 20 698  | 20 862  |
|                        |                     | on RFC | train-km in thous.         | 23 327  | 23 818  | 24 253  | 24 586  | 25 012  | 25 398  | 25 838  | 26 136  |
|                        |                     |        | gross tkm in mill.         | 5 394   | 5 614   | 5 813   | 6 139   | 6 404   | 6 667   | 7 128   | 7 435   |
|                        | Freight transport   | total  | train-km in thous.         | 18 990  | 19 146  | 19 552  | 20 105  | 20 814  | 21 193  | 21 558  | 22 090  |
|                        |                     |        | gross tkm in mill.         | 23 502  | 23 969  | 24 633  | 25 342  | 25 887  | 26 241  | 26 600  | 26 965  |
|                        |                     | on RFC | train-km in thous.         | 8 140   | 8 350   | 8 668   | 9 322   | 9 556   | 10 081  | 10 516  | 11 401  |
|                        |                     |        | gross tkm in mill.         | 9 697   | 10 666  | 11 340  | 11 996  | 12 579  | 12 975  | 13 626  | 13 990  |
| SŽ - I                 | Passenger transport | total  | train-km in thous.         | 10 241  | 10 187  | 10 063  | 9 899   | 9 821   | 9 934   | 10 164  | 10 289  |
|                        |                     |        | gross tkm in mill.         | 1 477   | 1 434   | 1 406   | 1 384   | 1 372   | 1 389   | 1 426   | 1 483   |
|                        |                     | on RFC | train-km in thous.         | 7 324   | 7 378   | 7 432   | 7 486   | 7 539   | 7 592   | 7 645   | 7 698   |
|                        |                     |        | gross tkm in mill.         | 846     | 804     | 796     | 783     | 792     | 813     | 839     | 852     |
|                        | Freight transport   | total  | train-km in thous.         | 11 437  | 11 678  | 11 919  | 12 159  | 12 398  | 12 637  | 12 875  | 13 113  |
|                        |                     |        | gross tkm in mill.         | 10 510  | 11 037  | 11 565  | 12 092  | 12 620  | 13 147  | 13 675  | 14 202  |
|                        |                     | on RFC | train-km in thous.         | 8 635   | 8 952   | 9 270   | 9 587   | 9 905   | 10 223  | 10 540  | 10 858  |
|                        |                     |        | gross tkm in mill.         | 8 486   | 8 871   | 9 256   | 9 641   | 10 026  | 10 411  | 10 796  | 11 180  |
| Total                  | Passenger transport | total  | train-km in thous.         | 321 330 | 331 810 | 342 094 | 352 248 | 362 414 | 372 711 | 383 074 | 393 291 |
|                        |                     |        | gross tkm in mill.         | 80 987  | 84 960  | 88 822  | 92 464  | 96 128  | 99 875  | 103 299 | 106 578 |
|                        |                     | on RFC | train-km in thous.         | 58 997  | 60 566  | 62 020  | 63 339  | 64 726  | 66 054  | 67 423  | 68 636  |
|                        |                     |        | gross tkm in mill.         | 15 688  | 16 472  | 17 221  | 18 066  | 18 853  | 19 639  | 20 618  | 21 421  |
|                        | Freight transport   | total  | train-km in thous.         | 135 855 | 140 679 | 145 356 | 149 960 | 154 574 | 158 754 | 162 838 | 167 027 |
|                        |                     |        | gross tkm in mill.         | 182 336 | 190 266 | 197 825 | 205 112 | 212 028 | 218 603 | 225 068 | 231 448 |
|                        |                     | on RFC | train-km in thous.         | 32 886  | 34 141  | 35 505  | 37 205  | 38 484  | 40 054  | 41 533  | 43 464  |
|                        |                     |        | gross tkm in mill.         | 40 277  | 42 685  | 44 798  | 46 893  | 48 914  | 50 749  | 52 839  | 54 641  |



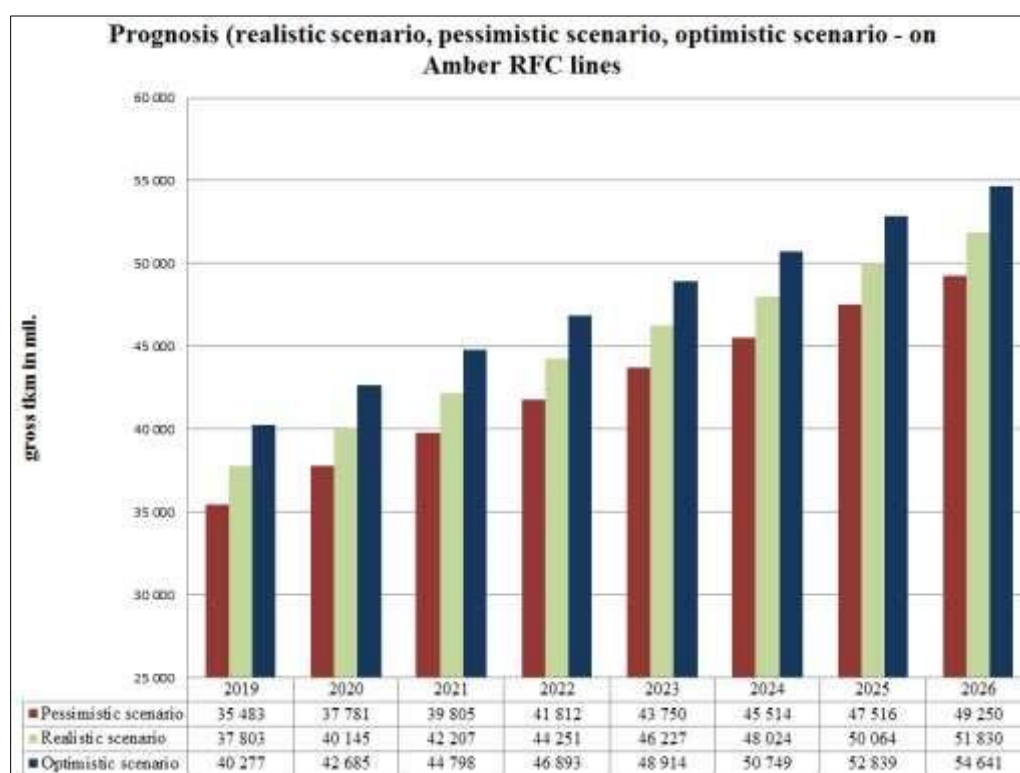
*Table 36: Prognosis – Pessimistic scenario*

| IM               | Mode of transport   | Scope  | Transport performance/Year | 2019    | 2020    | 2021    | 2022    | 2023    | 2024    | 2025    | 2026    |
|------------------|---------------------|--------|----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| PLK              | Passenger transport | total  | train-km in thous.         | 159 538 | 165 138 | 170 861 | 176 677 | 182 567 | 188 517 | 194 517 | 200 559 |
|                  |                     |        | gross tkm in mill.         | 34 856  | 34 609  | 34 644  | 34 855  | 35 187  | 35 609  | 36 103  | 36 654  |
|                  |                     | on RFC | train-km in thous.         | 13 225  | 13 170  | 13 170  | 13 206  | 13 266  | 13 344  | 13 436  | 13 539  |
|                  |                     |        | gross tkm in mill.         | 3 299   | 3 179   | 3 108   | 3 064   | 3 037   | 3 023   | 3 019   | 3 023   |
|                  | Freight transport   | total  | train-km in thous.         | 77 909  | 78 122  | 78 733  | 79 564  | 80 539  | 81 617  | 82 776  | 83 998  |
|                  |                     |        | gross tkm in mill.         | 112 030 | 113 007 | 114 555 | 116 418 | 118 489 | 120 708 | 123 043 | 125 468 |
|                  |                     | on RFC | train-km in thous.         | 8 631   | 9 043   | 9 455   | 9 866   | 10 278  | 10 690  | 11 101  | 11 513  |
|                  |                     |        | gross tkm in mill.         | 12 699  | 13 385  | 14 070  | 14 756  | 15 442  | 16 128  | 16 813  | 17 499  |
| ŽSR              | Passenger transport | total  | train-km in thous.         | 35 095  | 36 232  | 37 370  | 38 508  | 39 646  | 40 783  | 41 921  | 43 059  |
|                  |                     |        | gross tkm in mill.         | 10 686  | 11 372  | 12 058  | 12 744  | 13 431  | 14 117  | 14 803  | 15 489  |
|                  |                     | on RFC | train-km in thous.         | 10 794  | 11 178  | 11 562  | 11 947  | 12 331  | 12 715  | 13 100  | 13 484  |
|                  |                     |        | gross tkm in mill.         | 4 038   | 4 283   | 4 528   | 4 773   | 5 018   | 5 263   | 5 508   | 5 754   |
|                  | Freight transport   | total  | train-km in thous.         | 15 223  | 15 574  | 15 926  | 16 278  | 16 630  | 16 981  | 17 333  | 17 686  |
|                  |                     |        | gross tkm in mill.         | 19 254  | 19 685  | 20 117  | 20 548  | 20 979  | 21 410  | 21 841  | 22 273  |
|                  |                     | on RFC | train-km in thous.         | 5 161   | 5 452   | 5 743   | 6 035   | 6 326   | 6 618   | 6 910   | 7 202   |
|                  |                     |        | gross tkm in mill.         | 6 153   | 6 494   | 6 836   | 7 178   | 7 520   | 7 862   | 8 204   | 8 546   |
| MAV Zrt. + GYSEV | Passenger transport | total  | train-km in thous.         | 84 133  | 85 145  | 86 157  | 87 169  | 88 181  | 89 194  | 90 206  | 91 218  |
|                  |                     |        | gross tkm in mill.         | 17 749  | 17 899  | 18 200  | 18 449  | 18 828  | 19 341  | 19 598  | 19 754  |
|                  |                     | on RFC | train-km in thous.         | 21 772  | 22 230  | 22 636  | 22 947  | 23 345  | 23 705  | 24 116  | 24 393  |
|                  |                     |        | gross tkm in mill.         | 5 108   | 5 316   | 5 504   | 5 812   | 6 063   | 6 313   | 6 749   | 7 040   |
|                  | Freight transport   | total  | train-km in thous.         | 17 634  | 17 778  | 18 155  | 18 669  | 19 327  | 19 679  | 20 018  | 20 512  |
|                  |                     |        | gross tkm in mill.         | 22 253  | 22 695  | 23 324  | 23 995  | 24 512  | 24 847  | 25 186  | 25 532  |
|                  |                     | on RFC | train-km in thous.         | 7 558   | 7 753   | 8 049   | 8 656   | 8 873   | 9 361   | 9 765   | 10 587  |
|                  |                     |        | gross tkm in mill.         | 9 050   | 9 955   | 10 584  | 11 197  | 11 740  | 12 110  | 12 717  | 13 058  |
| SŽ - I           | Passenger transport | total  | train-km in thous.         | 8 964   | 8 840   | 8 726   | 8 576   | 8 398   | 8 297   | 8 164   | 7 964   |
|                  |                     |        | gross tkm in mill.         | 1 164   | 1 135   | 1 101   | 1 094   | 1063    | 1048    | 1016    | 984     |
|                  |                     | on RFC | train-km in thous.         | 6 412   | 6 446   | 6 480   | 6 514   | 6 548   | 6 583   | 6 617   | 6 652   |
|                  |                     |        | gross tkm in mill.         | 642     | 631     | 619     | 603     | 587     | 571     | 549     | 536     |
|                  | Freight transport   | total  | train-km in thous.         | 9 066   | 9 238   | 9 412   | 9 586   | 9 761   | 9 936   | 10 111  | 10 287  |
|                  |                     |        | gross tkm in mill.         | 9 350   | 9 847   | 10 344  | 10 841  | 11 338  | 11 835  | 12 332  | 12 828  |
|                  |                     | on RFC | train-km in thous.         | 7 490   | 7 793   | 8 095   | 8 398   | 8 700   | 9 002   | 9 305   | 9 607   |
|                  |                     |        | gross tkm in mill.         | 7 581   | 7 948   | 8 315   | 8 681   | 9 048   | 9 414   | 9 781   | 10 147  |
| Total            | Passenger transport | total  | train-km in thous.         | 287 730 | 295 355 | 303 114 | 310 930 | 318 792 | 326 790 | 334 808 | 342 800 |
|                  |                     |        | gross tkm in mill.         | 64 454  | 65 014  | 66 003  | 67 142  | 68 508  | 70 115  | 71 520  | 72 881  |
|                  |                     | on RFC | train-km in thous.         | 52 203  | 53 024  | 53 848  | 54 614  | 55 489  | 56 347  | 57 268  | 58 068  |
|                  |                     |        | gross tkm in mill.         | 13 087  | 13 409  | 13 759  | 14 252  | 14 705  | 15 170  | 15 826  | 16 353  |
|                  | Freight transport   | total  | train-km in thous.         | 119 831 | 120 713 | 122 227 | 124 097 | 126 257 | 128 214 | 130 238 | 132 483 |
|                  |                     |        | gross tkm in mill.         | 162 887 | 165 234 | 168 340 | 171 803 | 175 317 | 178 800 | 182 402 | 186 101 |
|                  |                     | on RFC | train-km in thous.         | 28 841  | 30 041  | 31 341  | 32 955  | 34 177  | 35 671  | 37 081  | 38 908  |
|                  |                     |        | gross tkm in mill.         | 35 483  | 37 781  | 39 805  | 41 812  | 43 750  | 45 514  | 47 516  | 49 250  |

Graph 9 for graphical comparison shows the overall prognosis of the development of rail freight transport performances in the Amber RFC countries for all scenarios. Subsequently, graph 10 for graphical comparison shows the overall development of rail freight transport performances forecasted on the lines included in the Amber RFC for all scenarios.



*Graph 9: Comparison of prognosis scenarios of total freight transport performances*



*Graph 10: Comparison of prognosis scenarios of freight transport performances on the Amber RFC lines*

Based on the graphical representation of the prognosis of the development of total rail freight transport performances, we can conclude in both comparisons the forecasted linear increase in transport performances in all scenarios. The prognosis shows a more significant difference between the pessimistic and the realistic scenario, mainly influenced by the risks of the forecast model and the input data.

**Based on the findings from the forecast, we can conclude:**

- increase in transport performances in rail freight transport system,
- higher increase in rail freight transport performances on the lines included in the Amber RFC,
- general increase in rail passenger transport performances (total: gross tkm, train-km),
- increase in transport performances and resulting savings in negative social costs generated by transport,
- increased demands on capacity and technical parameters of lines included in the Amber RFC,
- requirements for modernization, reconstruction and optimization of the Amber RFC railway infrastructure and related rail, road, water and intermodal infrastructure,
- higher quality of communication and information technologies required,
- pressure on higher reliability of the rail system,
- requirement to meet the technical specifications for interoperability in rail passenger and freight transport,
- increase in international rail freight transport performances by approximately 3 – 6 % per year,
- pressure on the harmonisation of charges between rail and road freight transport,
- development of transport performances below the pessimistic scenario in the event of a significant impact of defined forecast risks.

## 7 ANALYSIS OF PORT OF KOPER IN THE REPUBLIC OF SLOVENIA

The Port of Koper lies in the Republic of Slovenia, in the northern part of the Adriatic Sea. Due to its exceptional location, it connects the Central and Eastern Europe with the Mediterranean. It is currently one of the most important seaports in the Southern Europe. It is also an important intermodal centre connected to the Trans-European Transport Network.

**Vision until 2030:** the Port of Koper (Luka Koper) wants to be the leading operator of port services between the seaports in the Southern Europe and the global provider of logistics solutions for the region of Central and Eastern Europe.

**Mission:** provide a reliable port system, development and support of global logistics solutions to the heart of Europe according to the demands of the economy and the most demanding clients.

### **Basic objectives resulting from the vision and mission:**

- Flexible, modern and competitive port provider,
- Reliable and efficient contractor of quality port services,
- A successful business system of long-term stability,
- Promoter of complete logistics solutions,
- Optimal use of a single track railway: on average 82 freight trains per day, i.e. 14.2 million tonnes of cargo by rail,
- Diligent institutionalised stakeholder of sustainable development.

Due to its location, the Port of Koper is connected to the following major European transport networks and corridors:

#### 1. CNC corridors:

- Baltic – Adriatic Corridor,
- Mediterranean Corridor.

#### 2. Rail Freight Corridors (RFCs) :

- **RFC 5 (Baltic – Adriatic):** Gdynia – Katowice – Ostrava / Žilina – Bratislava / Vienna / Klagenfurt – Udine – Venice / Trieste/ Bologna / Ravenna / Graz – Maribor – Ljubljana – **Koper** / Trieste,
- **RFC 6 (Mediterranean):** Almería – Valencia / Madrid – Zaragoza / Barcelona – Marseille – Lyon – Turin – Milan – Verona – Padua / Venice – Trieste / **Koper** – Ljubljana – Budapest – Zahony (Hungarian – Ukrainian border),

- **RFC 10 (Alpine-Western Balkan):** Salzburg – Villach – Ljubljana –/ Wels/Linz – Graz – Maribor – Zagreb – Vinkovci/Vukovar – Tovarnik – Beograd – Sofia – Svilengrad (Bulgarian-Turkish border),
  - **RFC 11 (Amber): Koper** – Ljubljana/Zalaszentivan – Sopron/Csorna/(Hungarian – Serbian border) – Kelebia – Budapest – Komárom – Leopoldov/Rajka – Bratislava – Žilina – Katowice/Kraków – Warszawa/Łuków – Terespol – (Polish – Belarusian border)
3. Transport networks according to the European agreement on important international combined transport lines and related installations.

## 7.1 Basic information about the Port of Koper

The Port of Koper is managed and developed by Luka Koper d. d., a public limited company (in 2016 there were 886 employees). It is responsible for maintaining the high level of shipping and cargo traffic operations in the Port of Koper. The services are available day and night, 365 days a year. The Port of Koper includes 12 terminals with a total quay length of 3 300 meters designed for handling and storing the part load consignments, oversize loads, containers, RO-RO technology, cars and dry bulk and liquid cargoes.

The Port of Koper is part of the North Adriatic Ports Association (NAPA), which also includes the ports of Trieste, Venice, Ravenna and Rijeka. The combination of these ports represents the most inexpensive waterway connecting the Europe with the Far East (<http://www.portsofnapa.com/about-napa>). It is a multimodal gateway created for major European markets. The Association also deals with coordinated planning of road, rail and maritime infrastructures as well as harmonization of regulations and procedures in the field of port services provision.

The Port of Koper, with its significant position in the Southern Europe, is the member of the following international organization:

1. ESPO (The European Sea Ports Organisation) represents the port authorities, port associations and port administrations of the seaports of 23 Member States of the European Union and Norway at EU political level.
2. MedCruise (The Association of Mediterranean Cruise ports) has 72 members representing more than 100 Mediterranean ports, including the area of the Black Sea, the Red Sea and the Near Atlantic, as well as 32 associated members representing other associations.
3. FEPORT (The Federation of European Private Port Companies and Terminals) was established in 1993 and represents the interests of a large variety of terminal operators and stevedoring companies performing operation in the ports. It currently includes more than 400 terminals in the seaports of the European Union and more than 1200 companies.

**Basic technical characteristics of the Port of Koper:**

|                            |                          |
|----------------------------|--------------------------|
| Total port area:           | 2 800 000 m <sup>2</sup> |
| Enclosed warehousing area: | 247 000 m <sup>2</sup>   |
| Covered storage area:      | 76 000 m <sup>2</sup>    |
| Open storage area:         | 900 000 m <sup>2</sup>   |
| Pier total length:         | 3 300 m                  |
| Maximum sea depth:         | 18 m                     |

**Basic technical characteristics of the container terminal:**

|  |                                 |
|--|---------------------------------|
| Total terminal area:                   | 270 000 m <sup>2</sup>          |
| Stacking area:                         | 180 000 m <sup>2</sup>          |
| Pier length:                           | 596 m                           |
| Railway tracks (number x length in m): | 5 x 700 m, 2 x 270 m, 2 x 300 m |
| Storage capacity – marine terminal:    | 19 130 TEU                      |
| Storage capacity – empty containers:   | 9 547 TEU                       |

**Equipment**

**Lift capacity (ton)**

|                                      |   |
|--------------------------------------|---|
| 3 STS panamax cranes                 | 40 (40 feet)/ 45 (2 x 20 feet) under spreader |
| 4 STS post-panamax cranes            | 51 (40 feet)/ 65 (2 x 20 feet) under spreader |
| 4 STS Super post-panamax cranes      | 51 (40 feet)/ 65 (2 x 20 feet) under spreader |
| 22 Rubber – Tyred G/C (storage area) | 40 t  |
| 3 Rail Mounted Gantries (railway)    | 40 t  |
| 12 Reach Stackers                    | 42 – 45 t                                     |
| 8 ECH – empty container handler      | 7 – 9 t                                       |

The basic port activity is carried out at specialised terminals, which are technically and organisationally suitable for handling and warehousing of specific cargo groups. The port has a railway and road connection, production facilities, workshops, garages and other necessary complementary facilities.

In addition to basic services, the additional services are provided in the port (e.g. stripping and stuffing of containers, dewaxing and waxing of vehicles, mechanical, painting and body repair services, bananas palletization, wood protection against mould and pests etc.).



**The Port of Koper has 12 specialized terminals:**

- Container Terminal
- Car and Ro-Ro terminal
- General cargo terminal
- Reefer terminal
- Timber terminal
- Dry bulk terminal
- Silo terminal
- Alumina terminal
- Iron ore and coal terminal
- Liquid cargoes terminal
- Livestock terminal
- Cruise terminal

The following figure shows the structure of the Port of Koper. The white line indicates the main road infrastructure and the black line indicates the railway infrastructure network.



Figure 32: Individual terminals and their location within the Port of Koper  
(Source: <http://www.portsofnapa.com/port-of-koper>)

The railway infrastructure within the Port of Koper ensures the efficiency and broad possibilities of transporting all goods handled in all twelve terminals of the port. The infrastructure also provides necessary transport services for Central and Eastern Europe.

The following table shows the individual scheduled routes including their frequency from the Port of Koper.

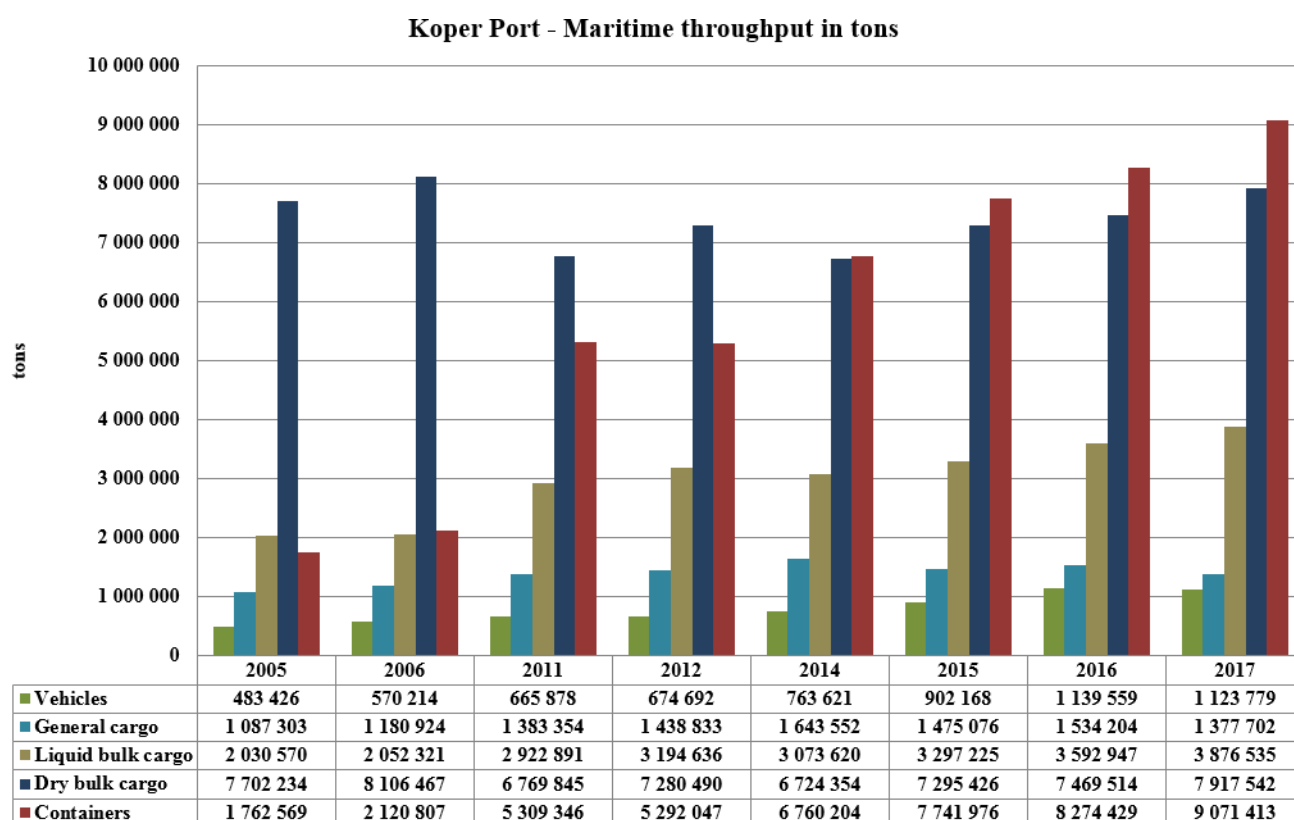
*Table 37: Overview of scheduled routes from Port of Koper*

| Country               | Route  | Frequency                     |
|-----------------------|--|-------------------------------|
| <b>Austria</b>        | Koper – Graz (Adria Transport)   | 10 x weekly                   |
|                       | Koper – Villach – antenna to Viena, Linz, Salzburg, Wolfurt (RCO/ Adria Kombi) | up to 5 trains/ week          |
|                       | Koper – Enns (Mettrans)  | 2 x weekly (via Ybbs – Krems) |
| <b>Hungary</b>        | Koper – Budapest BILK (Adria Kombi)  | 7 trains weekly               |
|                       | Koper – Budapest Mahart (Mettrans)   | Up to 14 trains/ week         |
|                       | Koper – Budapest Törökbálint (Integrail)                                       | 3 trains/ week                |
|                       | Koper – Budapest Mahart (Integrail)  | 2 x weekly                    |
|                       | Koper – Budapest Mahart (EP Cargo)   | 2 x weekly                    |
| <b>Slovakia</b>       | Koper – Bratislava (Adria Kombi)   | 4 trains/ week                |
|                       | Koper – Dunajská Streda – various destinations (Mettrans)                      | Up to 14 trains/ week         |
|                       | Koper – Žilina –KIA (Mettrans)   | Up to 7 trains/ week          |
| <b>Czech republic</b> | Koper – Dobruška (Adria Kombi – dedicated)                                     | 4 trains/ week                |
|                       | Koper – Ostrava (Mettrans)   | 2 x weekly                    |
|                       | Koper – Paskov (AWT dedicated)   | 1 x weekly                    |
|                       | Koper – Dunajská Streda – Zlin – Prague (Mettrans – via Dunajská Streda)       | Daily                         |
| <b>Poland</b>         | Koper – Wrocław (Siechnice) – Ostrava – Koper (Baltic Rail)                    | 2 trains/ week                |
| <b>Germany</b>        | Koper – Ljubljana – München (Adria Kombi)                                      | 5 trains/ week                |
|                       | Koper – München (Adria Kombi)  | 3 x weekly (direct service)   |
| <b>Slovenia</b>       | Koper – Ljubljana – Celje – Maribor (Adria Kombi)                              | 2 trains/ day                 |
| <b>Bulgaria</b>       | Koper – Sofia (Adria Kombi)  | Spot train                    |
| <b>Romania</b>        | Koper – Arad (Adria Transport)   | 1 train/ week                 |
| <b>Italy</b>          | Koper – Padova (Adria Kombi dedicated)   | 1 train/ week                 |
| <b>Serbia</b>         | Koper – Novi Sad (via Budapest) (Adria Kombi/ Transagent d.o.o.)               | Weekly service                |
|                       | Koper – Ljubljana – Beograd (Adria Kombi)                                      | 2 x weekly                    |
| <b>Croatia</b>        | Koper – Ljubljana – Zagreb (Adria Kombi)                                       | 2 x weekly                    |

Source: [www.luka-kp.si](http://www.luka-kp.si)

## 7.2 Analysis of the Port of Koper throughput

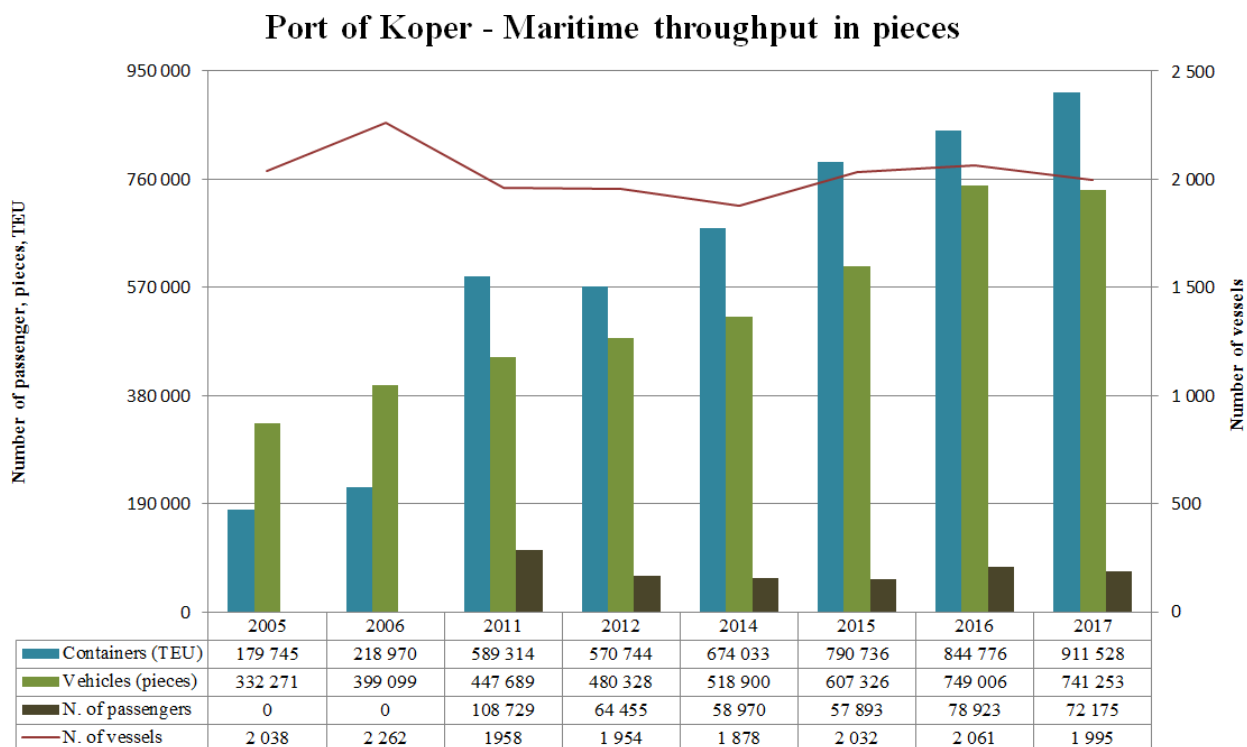
The significant location and the technical and technological facilities of the Port of Koper have a favourable effect on the demand for the services provided. The interest in the services of the Port of Koper by the transport operators can be determined using the analysis of the reached throughput. Based on the need to determine the demand for the port services provided and demonstrate strategic importance for the Amber corridor, the following graph analyses the throughput reached in the Port of Koper in the period 2005 – 2017. The analysis is focused on the throughput of goods handled in tons.



*Graph 11: Overview of achieved throughputs in tons in Port of Koper  
(Source: Annual reports of Luka Koper, Port of Koper)*

The analysis showed the overall increase in throughput over the analysed period. In total, 23 366 959 tons of goods were handled in 2017 (by 6% more than in 2016) which represents an increase of 78.84 % in comparison with 2005. During 2014 – 2017 there was an increase in all monitored goods except for General cargo, where a fluctuating trend was recorded. The most significant increase among the surveyed goods was achieved in the container transport. In 2017, container throughput accounted for 38.8 % of total throughput, while in 2005, it accounted for only 13.5 %. Based on these facts, we can deduce potential for increase in container transport in the coming years.

The following graph shows the progress of the reached throughput in number of pieces, TEU, and passengers in the period 2005 - 2017.



*Graph 12: Overview of reached throughput in quantified amount in the Port of Koper  
(Source: Annual reports of Luka Koper, Port of Koper)*

Based on the figures in the graph, we can confirm an increase of throughput in the number of containers and vehicles. On the contrary, the number of passengers has a decreasing trend and the number of vessels has a fluctuating trend. In 2017, 911 528 TEU were handled in the Port of Koper, which is by 731 783 TEU more than in 2005. With the throughput of TEU the Port of Koper is now classified as the first in the Adriatic region. In the case of the number of pieces of vehicles handled, there is increase by 123.1 % in 2017 compared to 2005.

Investments are necessary to maintain the current state and the subsequent development of the Port of Koper within the competitive fight. The following table shows the development of investments in real estate, machinery and equipment in the Port of Koper.

*Table 38: Investment development in Port of Koper in 2012 - 2016*

| Year                   | 2012       | 2013       | 2014       | 2015       | 2016       |
|------------------------|------------|------------|------------|------------|------------|
| Luka Koper, d. d.      | 17 768 219 | 14 522 369 | 28 485 811 | 36 871 798 | 60 313 916 |
| Luka Koper Group TOTAL | 18 639 095 | 14 825 864 | 29 958 975 | 37 402 753 | 61 781 064 |

*Source: Annual Report of Luka Koper*

Investments have a generally increasing trend. The Luka Koper, d.d. made investments in the amount of EUR 60 313 916 EUR in 2016, what is by 23 442 118 EUR more than in the previous year. In 2016, Luka Koper, d.d. invested EUR 18.1 million in the ordered 12 new high-capacity

cranes. From the point of view of increasing competitiveness and capacity, it is the most effective valuation of investment resources with planning for the future. Within the container terminal, the funds have been invested in the new RMG technology that allows simultaneous handling of five train sets as well as the use of cranes for large container handling (capacity 20 000 TEU). By 2020, the capacity of the container terminal is planned to increase to 1.3 million TEU per year.

**The important facts and opportunities for the Amber corridor:**

- nearly two thirds of the cargo arrives to and leaves the port by rail,
- the Hungarian railway operating company Integrail will establish a new container block train connection between the Port of Koper container terminal and the Budapest Mahart Container Center terminal. The service runs from 15 March 2018 through two trains a week.
- the Slovenian railway operator Adria Kombi introduced a new direct railway service between Luka Koper Container Terminal and DUSS-Terminal München-Riem. The service runs from March 6, 2018 three times per week in both directions. The Germany represent an important market for the Port of Koper, from the fruit and vegetable supplies from the Mediterranean countries to the transport of Volkswagen vehicles. The Bavaria is one of the most developed and the export-oriented Germany regions that represent a big potential for the Port of Koper.
- in September, 2017, the Czech railway operator, EP Logistics started a new direct block train connection between Luka Koper Container Terminal to Budapest Mahart Terminal.

On the basis of the presented facts about the Port of Koper, which concerned the location, division, technical and technological equipment and demand for its services, we can confirm its strategic importance for the Amber corridor. The port is an important gateway especially for the goods transported in TEU from Asia to the European hinterland, mainly to Central and Eastern Europe. This creates the possibilities to get transportations for the Amber corridor, as an increase in the intermodal transport performances can be expected in the next period. The development of the port, its services and the resulting demand from transport operators create a perspective for effective and efficient cooperation between the Port of Koper and the Amber corridor. Within the cooperation, it will be possible to provide better intermodal transport and logistics services, which will lead to higher rail freight performances. The transportations for the automotive and machine industries are a great opportunity for cooperation between the Port of Koper and the Amber corridor. An increased need for transport of mineral resources, mainly gasses and iron ore is expected in the future. This implies the need for the necessary cooperation (strategic partnership) between the Port of Koper and the Amber corridor, which can also contribute to an increase in the port throughput and its overall development and position.

## 8 TRANSPORT POTENTIAL OF SELECTED COUNTRIES

Worldwide growth in international trade, including trade between EU countries and selected countries, directly creates demand for transport services. Continuously increasing demand for transport services, particularly in the international transport of goods, creates a number of possibilities for the provision of rail transport services. The opportunity to acquire a significant share in the transport market is mainly due to the requirements for long and medium distance transport in international transport. Many suppliers from selected countries currently prefer and require the high quality, reliable and cost-effective transport services. For the described reasons and the geographical routing of the Amber RFC, it is necessary to examine the transport potential of the selected countries, on the basis of which the measures for support of rail freight services can be identified. An examination of the transport potential is carried out for the following countries:

- China,
- Russia,
- Belarus,
- Serbia,
- Turkey,
- Ukraine

The selection of countries was based on the geographical location of the Amber RFC, the current trade in international trend and possible cooperation between countries.

Table 39 contains a summary of the basic data on selected analysed countries.

*Table 39: Overview of basic information on countries under consideration*

| Country                               | China         | Russia      | Belarus   | Serbia    | Turkey     | Ukraine    |
|---------------------------------------|---------------|-------------|-----------|-----------|------------|------------|
| Population (2016)                     | 1 379 000 000 | 144 342 396 | 9 507 120 | 7 057 412 | 79 512 426 | 45 004 645 |
| Area (km <sup>2</sup> )               | 9 596 961     | 17 075 200  | 207 595   | 88 361    | 783 356    | 603 628    |
| Length of operated railway lines (km) | 121 000       | 86 000      | 5 470     | 3 809     | 12 532     | 21 640     |
| Length of motorway (km)               | 136 000       | 806         | -         | 782       | 2 289      | 199        |
| Road length (km)                      | 4 696 300     | 1 396 000   | 86 900    | 44 637    | 426 906    | 169 496    |

*Source: Eurostat, National statistics office*

The economic growth directly affects the production of final products and services in individual countries. This production consequently creates demand for transport services which is important for the provision of rail transport services. Table 40 therefore analyses the GDP development in the analysed countries in the period 2010 – 2016.



Table 40: Analysis of GDP development in individual countries under consideration

| Country        | Measure/ Year                       | 2010    | 2012    | 2014    | 2015    | 2016    |
|----------------|-------------------------------------|---------|---------|---------|---------|---------|
| <b>China</b>   | GDP growth (annual %)               | 10,6    | 7,8     | 7,3     | 6,9     | 6,7     |
|                | GDP (current US \$) in trillion     | 6,101   | 8,561   | 10,482  | 11,065  | 11,199  |
| <b>Russia</b>  | GDP growth (annual %)               | 4,5     | 3,6     | 0,7     | -2,8    | -0,2    |
|                | GDP (current US \$) in trillion     | 1,525   | 2,210   | 2,064   | 1,366   | 1,283   |
| <b>Belarus</b> | Real GDP growth rate-volume         | 7,8     | 1,7     | 1,7     | -3,8    | -2,6    |
|                | GDP in million EUR, current prices* | -       | -       | -       | -       | -       |
| <b>Serbia</b>  | Real GDP growth rate-volume         | 0,6     | -1,0    | -1,8    | 0,8     | 2,8     |
|                | GDP in million EUR, current prices* | 29 766  | 31 683  | 33 319  | 33 491  | 34 617  |
| <b>Turkey</b>  | GDP growth (annual %)               | 8,5     | 4,8     | 5,2     | 6,1     | 3,2     |
|                | GDP (current US \$) in billion      | 771,877 | 873,982 | 934,168 | 859,794 | 863,712 |
| <b>Ukraine</b> | GDP growth (annual %)               | 4,2     | 0,2     | -6,5    | -9,8    | 2,3     |
|                | GDP (current US \$) in billion      | 136,013 | 175,781 | 133,503 | 91,031  | 93,27   |

\*GDP and main components (output, expenditure and income)

Source: Eurostat, World Bank national accounts data, OECD National Accounts data files

The GDP analysis in Table 40 showed an upward trend in the countries concerned, except Russia and Ukraine. The highest GDP was recorded in the China and Russia, while the lowest in Serbia. The GDP growth rate was highest in China and Turkey. The lowest growth rate was recorded in Belarus and Russia. Based on the analysis carried out, it is possible to assume the GDP growth in individual countries with different growth rates, with possible negative development, too.

Table 41 analyses the import and export of goods in total value (in euros) to/from the EU countries and specifically from/to the Amber RFC countries and from/to selected countries in the period 2010 – 2016.

Table 41: Import and export value from/ to the EU in mill. €

| Country                                    | Country/ Year             | 2010    | 2012    | 2014    | 2015    | 2016    |
|--|---------------------------|---------|---------|---------|---------|---------|
| <b>Import value from the EU in mill. €</b> |                           |         |         |         |         |         |
| <b>China</b>                               | Total EU 28 countries     | 283 931 | 292 122 | 302 518 | 350 847 | 344 915 |
|  | Total Amber RFC countries | 16 443  | 16 794  | 18 978  | 22 416  | 23 837  |
| <b>Russia</b>                              | Total EU 28 countries     | 162 079 | 215 131 | 182 384 | 136 388 | 118 892 |
|  | Total Amber RFC countries | 23 817  | 34 334  | 27 672  | 19 590  | 15 551  |
| <b>Turkey</b>                              | Total EU 28 countries     | 43 062  | 48 822  | 54 415  | 61 663  | 66 765  |
|  | Total Amber RFC countries | 2 471   | 2 809   | 3 415   | 4 290   | 4 355   |
| <b>Belarus</b>                             | Total EU 28 countries     | 2 672   | 4 619   | 3 444   | 3 725   | 2 948   |
|  | Total Amber RFC countries | 175     | 225     | 203     | 233     | 227     |
| <b>Serbia</b>                              | Total EU 28 countries     | 4 349   | 5 053   | 7 110   | 7 879   | 8 739   |
|  | Total Amber RFC countries | 988     | 1 125   | 1 406   | 1 584   | 1 920   |
| <b>Ukraine</b>                             | Total EU 28 countries     | 11 547  | 14 647  | 13 734  | 12 844  | 13 159  |
|  | Total Amber RFC countries | 2 489   | 3 779   | 3 496   | 3 018   | 3 377   |
| <b>Export value to the EU in mill. €</b>   |                           |         |         |         |         |         |
| <b>China</b>                               | Total EU 28 countries     | 113 454 | 144 227 | 164 623 | 170 357 | 169 664 |
|  | Total Amber RFC countries | 3 488   | 4 279   | 4 681   | 4 395   | 4 741   |
| <b>Russia</b>                              | Total EU 28 countries     | 86 308  | 123 469 | 103 225 | 73 745  | 72 338  |
|  | Total Amber RFC countries | 10 311  | 14 078  | 12 335  | 9 011   | 8 879   |
| <b>Turkey</b>                              | Total EU 28 countries     | 61 929  | 75 491  | 74 719  | 78 962  | 77 890  |
|  | Total Amber RFC countries | 4 205   | 4 722   | 4 662   | 5 429   | 5 434   |
| <b>Belarus</b>                             | Total EU 28 countries     | 6 631   | 7 847   | 7 458   | 5 704   | 4 983   |
|  | Total Amber RFC countries | 305     | 309     | 339     | 267     | 230     |
| <b>Serbia</b>                              | Total EU 28 countries     | 7 881   | 9 660   | 10 357  | 11 155  | 11 664  |
|  | Total Amber RFC countries | 2 225   | 2 750   | 3 136   | 3 206   | 3 424   |
| <b>Ukraine</b>                             | Total EU 28 countries     | 17 413  | 23 866  | 16 988  | 14 033  | 16 565  |
|  | Total Amber RFC countries | 5 034   | 6 647   | 5 282   | 4 713   | 5 369   |

Source: European Commission – Trade – EU Trade Helpdesk – Statistics

The analysis carried out in Table 41 showed the value increase in import of goods from China, Turkey, Serbia, Ukraine to the EU countries and the Amber RFC countries. On the contrary, the decrease in import was recorded from Russia and Belarus. This negative trend is highly influenced by EU sanctions against Russia. Export of goods from the Amber RFC countries and the EU countries to the analysed countries showed a directional inequality. The highest export was made to the China, while the lowest one to Belarus.

Table 42 analyses the import and export of goods in total weight (in tonnes) to/from the EU countries and specifically from/to the Amber RFC countries and from/to analysed countries in the period 2010 – 2010 – 2016.

Table 42: Import and export quantity from/to the EU in 1000 t

| Country                                      | Country/ Year             | 2010    | 2012    | 2014    | 2015    | 2016    |
|--|---------------------------|---------|---------|---------|---------|---------|
| <b>Import quantity from the EU in 1000 t</b> |                           |         |         |         |         |         |
| <b>China</b>                                 | Total EU 28 countries     | 54 040  | 49 275  | 59 161  | 59 311  | 59 571  |
|  | Total Amber RFC countries | 2 666   | 2 816   | 3 606   | 3 550   | 4 081   |
| <b>Russia</b>                                | Total EU 28 countries     | 402 496 | 393 610 | 403 956 | 404 071 | 425 812 |
|  | Total Amber RFC countries | 61 072  | 59 410  | 57 737  | 54 833  | 54 939  |
| <b>Turkey</b>                                | Total EU 28 countries     | 24 363  | 22 451  | 24 885  | 27 239  | 29 738  |
|  | Total Amber RFC countries | 968     | 1 097   | 1 244   | 1 373   | 1 421   |
| <b>Belarus</b>                               | Total EU 28 countries     | 8 749   | 10 889  | 10 805  | 12 900  | 13 148  |
|  | Total Amber RFC countries | 321     | 284     | 267     | 401     | 604     |
| <b>Serbia</b>                                | Total EU 28 countries     | 5 261   | 4 505   | 5 636   | 6 012   | 7 516   |
|  | Total Amber RFC countries | 1 145   | 918     | 1 492   | 1 353   | 1 839   |
| <b>Ukraine</b>                               | Total EU 28 countries     | 46 407  | 51 882  | 56 513  | 54 656  | 54 975  |
|  | Total Amber RFC countries | 15 172  | 16 478  | 16 829  | 15 764  | 16 468  |
| <b>Export quantity to the EU in 1000 t</b>   |                           |         |         |         |         |         |
| <b>China</b>                                 | Total EU 28 countries     | 33 228  | 40 892  | 43 338  | 46 142  | 49 407  |
|  | Total Amber RFC countries | 654     | 766     | 1 026   | 1 103   | 1 254   |
| <b>Russia</b>                                | Total EU 28 countries     | 24 436  | 29 325  | 24 928  | 16 649  | 15 115  |
|  | Total Amber RFC countries | 3 341   | 4 301   | 3 949   | 2 397   | 2 170   |
| <b>Turkey</b>                                | Total EU 28 countries     | 39 523  | 45 715  | 47 050  | 44 839  | 46 874  |
|  | Total Amber RFC countries | 1 754   | 1 677   | 1 504   | 1 369   | 1 846   |
| <b>Belarus</b>                               | Total EU 28 countries     | 2 484   | 3 040   | 3 297   | 3 350   | 3 034   |
|  | Total Amber RFC countries | 87      | 84      | 79      | 60      | 57      |
| <b>Serbia</b>                                | Total EU 28 countries     | 5 444   | 5 480   | 5 627   | 6 821   | 6 796   |
|  | Total Amber RFC countries | 2 017   | 1 606   | 1 891   | 2 012   | 2 336   |
| <b>Ukraine</b>                               | Total EU 28 countries     | 7 990   | 9 771   | 8 896   | 9 504   | 9 492   |
|  | Total Amber RFC countries | 3 167   | 3 982   | 4 049   | 4 720   | 4 859   |

Source: European Commission – Trade – EU Trade Helpdesk – Statistics

The transport performance analysis in Table 42 showed an increase in import of goods from all selected analysed countries to the EU countries and the Amber RFC countries. At the same time, a significant share of import of goods within the Amber RFC countries was showed. The most important importers of goods are Russia, China and Ukraine. Export of goods from the Amber RFC countries and the EU countries to the analysed countries showed a directional inequality. The highest export was achieved to the China and Turkey, while the lowest one to Belarus.

The development of indicators in Tables 41 and 42 is highly influenced by the political, trade and economic relations of all parties concerned. As a result of economic growth in most countries surveyed, we can assume an increase in import of goods and an increase in demand for international transport services.

**On the basis of the analysis carried out in Tables 40-42, it can be concluded:**

- economic growth in most of selected countries: shown by the analysis of the economic development of individual examined countries and the growth of international trade, the expected GDP growth in China is at 6 % and Turkey at 3 %,
- increase in number of goods transported from/to the EU 28 countries (including a share of the Amber RFC countries) from the selected countries: results from the analysis of trade between the Amber RFC countries and the selected countries. The analysis showed general growth in imports and exports of goods within the selected countries, e.g. the increase in imports from Turkey to the Amber RFC countries from 968 000 tons in 2010 to 1 421 000 tons in 2016.
- increase in demand for transport services from China, Ukraine and Russia: affected by the trade between the Amber RFC countries and the selected countries, economic development of selected countries and consumption of the Amber RFC countries (higher consumption results from the economic analysis carried out in Chapter 4),
- growth of international trade of the Amber RFC countries with Serbia,
- sufficient increase in demand for transport services from Serbia: confirmed by the growth of trade, imports of 1 839 000 tons of goods from Serbia in 2016 to the Amber RFC countries and exports of 2 336 000 tons goods from the Amber RFC countries to Serbia,
- pressure on fast, reliable and safe transport of goods from the selected countries to the Amber RFC countries as well as the EU countries: affected by the higher value of the goods transported, pressure on keeping the agreed arrival times, motivation of shift of transport performances from water to rail freight transport,
- sufficient potential for international rail transport from/to the selected countries from the EU 28 countries (including a share of the Amber RFC countries): confirmed by the gradual increase in number of goods transported within the selected countries and the EU countries,
- strategic importance of the Amber RFC for transportations East Asia – Central Europe: results from the geographical routing of the Amber RFC and technical condition of the railway lines,
- lowest transport potential for the Amber RFC can be expected from/to Belarus: shown by the results of import and export analysis with Belarus showing the lowest number from the selected countries,
- import of goods to the EU countries from the analysed countries has a generally increasing trend and such a trend can be expected also in the future, based on the GDP development in the analysed countries..

For the Amber RFC, the sufficient possibilities of new transport opportunities within the analysed countries are being created. New transport opportunities, that would be suitable for the

transport by rail, can be expected in Serbia, Ukraine, Turkey and Russia. Within these countries, the opportunities for international cooperation and the subsequent provision of comprehensive transport services are created, in particular through intermodal transport and transport of bulk substrates, gases and oil. Based on the development of transport flows, a directional inequality can be assumed.

Within acquisition the transportations and significant position of rail freight transport on the international transport services market, high quality railway infrastructure, available, reliable and cost-attractive services and technological undemandingness of transport of goods are necessary. In particular, it is necessary to take measures to reduce the technological lost times at the border crossings with selected countries resulting from the legislation and technical parameters of lines and rolling stock. It is important to eliminate the bottlenecks at border crossings.

## **9 AMBER RFC GRAPHICAL REPRESENTATION**

All analysed data, from which the results and conclusions presented in the previous Chapter were subsequently defined, were necessary to define exactly the Amber RFC routing and to divide all proposed lines into the principal, diversionary and connecting lines of the established corridor. The results of the draft for the precise routing of the established Amber RFC and the technical parameters of the lines are given in the continuation of Chapter 9.

The subchapter contains a graphical representation of all lines (principal, diversionary, connecting) which will be included in the Amber RFC in individual member states of the corridor. In the following figure, routing of the whole Amber RFC is shown for overall geographic overview of the corridor routing within the railway infrastructure of the member states.





Figure 33: Preliminary graphical representation of Amber RFC routing  
(Source: ŽSR, VVÚŽ)

## Republic of Poland

The initial routing of the principal line of the Amber RFC corridor in the Republic of Poland is at the Terespol border crossing with the Republic of Belarus in the direction Łuków – Dęblin – Radom. For connection of the capital of the Republic of Poland – Warszawa with the principal line, the connection Radom - Warszawa is being considered and at the same time with the diversionary

line Dęblin – Tłuszcz – Warszawa. From the railway station Radom, the principal line continues to the railway station Tunel where it is branched in the direction Tunel – Mysłowice Brzezinka – Oświęcim and Tunel – Podłęże. The line section Podłęże – Oświęcim creates again the connection of these branched routes. The rail connection with the Slovak Republic for the needs of the Amber RFC is through the border crossings Zwardoń (PL) – Skalité (SK) and Muszyna (PL) – Plaveč (SK). The connection to the railway border crossing Zwardoń – Skalité is through the principal line from the direction Oświęcim. The connection to the railway border crossing Muszyna – Plaveč is through the principal line in branching Kraków - Podłęże - Tarnów – Nowy Sącz. Construction of a new line Tymbark – Podłęże is planned and, once completed, it will become part of the principal line. The graphical representation of the Amber RFC routing on the territory of the Republic of Poland is shown in Fig. 34.



Figure 34: Graphical representation of Amber RFC routes on PKP PLK network  
(Source: ŽSR, VVÚŽ)

## Slovak Republic

The continuation of the Amber RFC on the territory of the Slovak Republic is realized in two branches through the railway border crossings Muszyna (PL) – Plaveč (SK) and Zwardoń (PL) – Skalitz (SK). From the railway border crossing Plaveč, the principal line continues in transit in the direction north - south in the direction Prešov – Kysak – Košice – Čaña št. hr. (SR) – Hidasnémeti (HU) to Hungary. The corridor is connected from the transport point of Košice to Hungary also via an diversionary line in the direction of Košice – Michal'any – Slovenské Nové Mesto – Sátoraljaújhely. Another proposed principal line passes through the border crossing Zwardoń – Skalitz and continues Žilina – Trenčín – Leopoldov where the principal line is branched into the following branches:

- Leopoldov – Bratislava – Bratislava-Petržalka – Rusovce (SK) – Rajka (HU),
- Leopoldov – Galanta – Nové Zámky/ – Komárno (SK) – Komárom (HU),  
– Nové Zámky/ - Štúrovo (SK) – Szob (HU).

For technological and operative reasons, these branches are connected by the connecting line Bratislava – Dunajská Streda – Komárno. Note: When it comes to terminals, generally all terminals along designated lines should become designated to the corridor as well, except if a terminal does not have any relevance for the traffic in the corridor or where a private terminal decides not to take part in a corridor. The feeder lines from/to the terminals are designated as 'connecting lines'. The graphical representation of the Amber RFC routing on the territory of the Slovak Republic is shown in Fig. 35.



Figure 35: Graphical representation of Amber RFC routes on ŽSR network

(Source: ŽSR, VVÚŽ)



## Hungary

The capital of Hungary – Budapest is located on the principal line as the important connection point of the lines from the Slovak Republic in the subsequent continuation of the corridor principal line to the Republic of Slovenia where this principal line provides the connection with the Balkan area through the Republic of Serbia through the railway border crossing Kelebia. Based on the transport potential and demand from carriers, the route Hatvan – Kelebia was designed and subsequently incorporated within the Amber RFC as the principal line in routing Hatvan – Szolnok – Cegléd – Kiskunfélegyháza – Kiskunhalas – Kelebia. The direction of the principal line from the border crossing Čaňa (SK) – Hidasnémeti (HU) is through the transport node Miskolc leading to Budapest through the railway station Füzesabony. Miskolc is also connected with the Slovak Republic by a diversionary line from direction of Slovenské Nové Mesto (SK) – Sátoraljaújhely (HU) – Mezőzombor – Miskolc. The further connection of Budapest with the Republic of Slovakia is through the border crossings Štúrovo (SK) – Szob (HU), Komárno (SK) – Komárom (HU) and Rusovce (SK) – Rajka (HU) which are located on the principal line. These border crossings continue in the direction Csorna – Szombathely – Zalaszentiván – Zalaölövő and then continue to the Republic of Slovenia through the border crossing station Hodoš on the Slovenian side. From both Csorna and Szombathely branches of the principal line continues to Sopron. The graphical representation of the Amber RFC routing on the territory of Hungary is shown in Fig. 36. GYSEV lines are indicated in yellow.

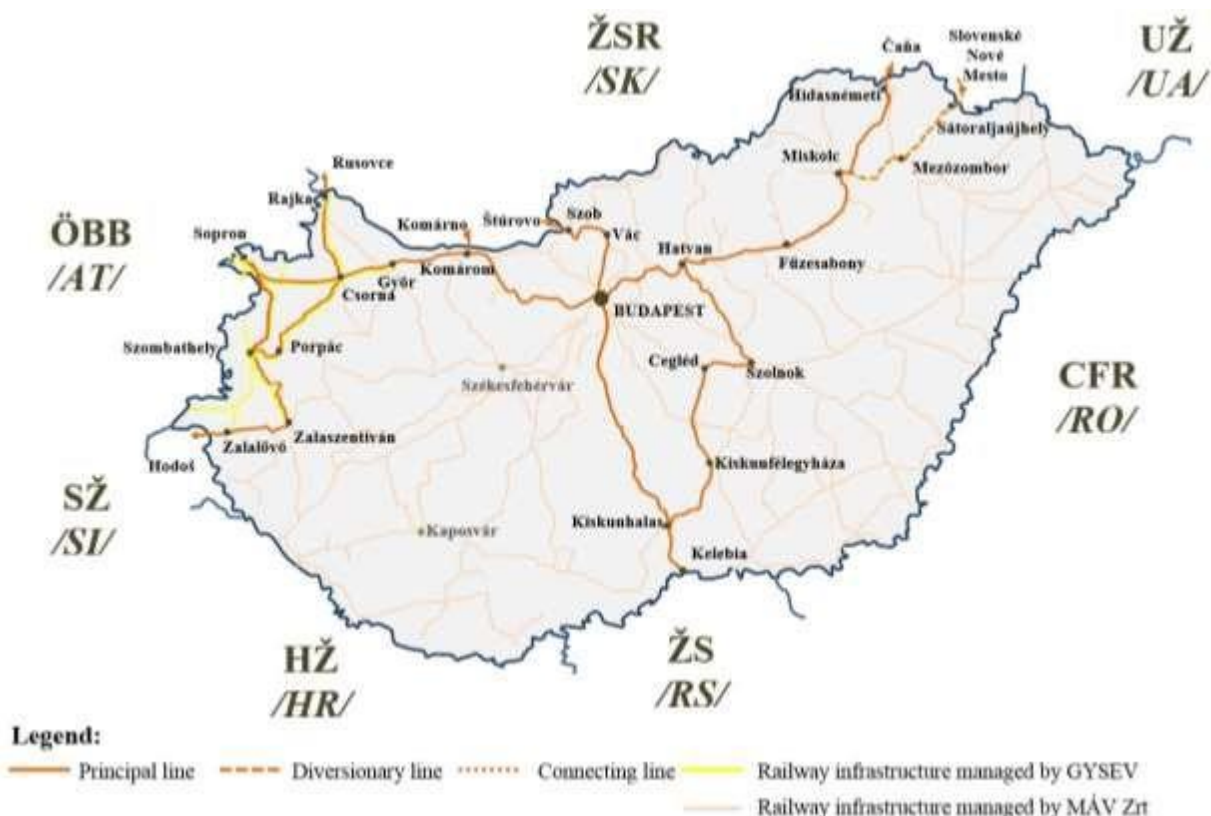


Figure 36: Graphical representation of Amber RFC routes on MÁV and GYSEV network  
(Source: ŽSR, VVÚŽ)

All track sections on the route Hidasnémeti s. b. – Budapest are to be classified as the principal lines of the Amber RFC. Justification: the route is a direct continuation of the principal lines from the Republic of Poland and the Slovak Republic; individual track sections on the route meet the technical requirements for the principal line (electrification, maximum train length, traffic density of the line); the classification of the lines creates better opportunities for investments in their modernization; potential of higher transport performances due to better corridor services; there are several transport possibilities on the eastern corridor route, e.g. from the Port of Koper, transport of final products from the factory in Haniska near Košice, goods transport from Asia to Hungary, etc.

### Republic of Slovenia

The principal line on the territory of the Republic of Slovenia passes in the direction southwest and is directed at Zalačevč (HU) – Hodoš (SI) – Pragersko – Celje – Ljubljana – Divača – Koper. The connecting lines to the principal line are directed at Velenje – Celje and Novo Mesto – Ljubljana. The graphical representation of Amber RFC on the territory of Slovenia is shown in Fig. 37.








Figure 37: Graphical representation of Amber RFC routes on SŽ-I network  
(Source: ŽSR, VVÚŽ)







## 9.1 Technical parameters of Amber RFC

For a rapid and graphic-visual representation of the technical parameters of the lines included in RFC Amber, the particular railway lines and terminals in the given countries are shown using the following signs:






### Description of stations:

|   |   |
|---|---|
|  | Border station of neighbouring country on the principal line    |
|  | Border station of neighbouring country on the diversionary line |
|  | Station lying on a principal line (selected station)            |
|  | Station lying on a diversionary line (selected station)         |
|  | Station lying on a connecting line (selected station)           |

### Type of line:

|   |                            |
|---|----------------------------|
|    | Corridor double-track line |
|    | Corridor single-track line |
|   | 3 KV DC                    |
|  | 15 KV AC (16 2/3 Hz)       |
|  | 25 KV AC (50 Hz)           |
|  | Non-electrified            |

### Description of capacity utilization schemes:

|   |                                 |
|---|---------------------------------|
|    | Information not provided        |
|    | Track capacity use 49 %         |
|   | Track capacity use 50% - 89 %   |
|  | Track capacity use above 90 %   |
|  | Railway station/ Border station |

### Intermodal freight mode:

9, G2, G

#### Intermodal freight code (P/C)

|   |              |
|---|--------------|
| 1 | P/C 50/370   |
| 2 | P/C 70/390   |
| 3 | P/C 70/400   |
| 4 | P/C 80/400   |
| 5 | P/C 80/401   |
| 6 | P/C 82/412   |
| 7 | P/C 90/410   |
| 8 | P/C 99/429   |
| 9 | P/C C21/C340 |

9, G2, G

#### Interoperational gauge

|    |                           |
|----|---------------------------|
| G1 | Interoperational gauge G1 |
| G2 | Interoperational gauge G2 |
| 0B | PpB/0-SM                  |
| 1B | PpB/1-SM                  |
| 1C | PpC/1-SM                  |
| 2C | PpC/2-SM                  |

9, G2, G

#### ERTMS equipment

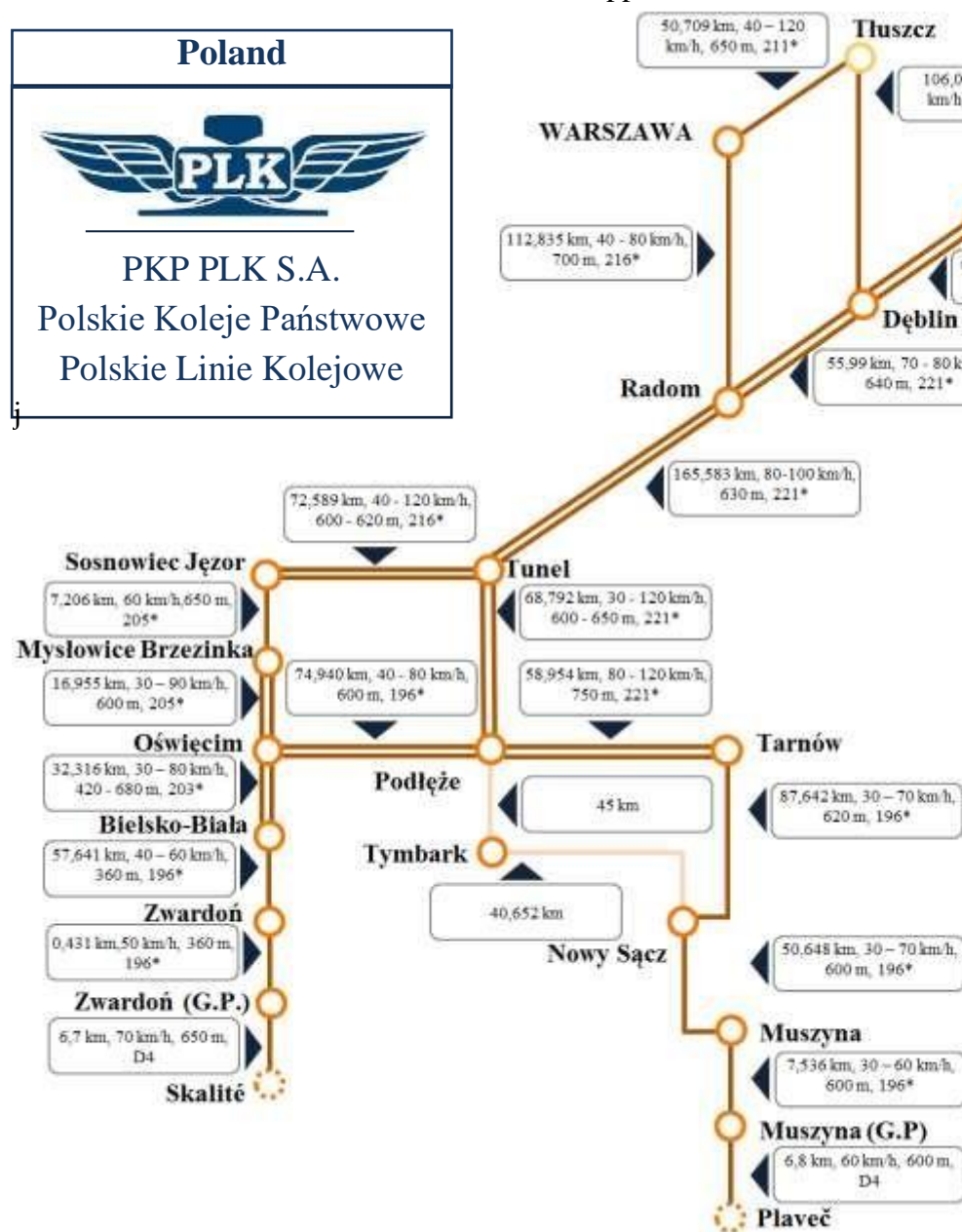
|   |         |
|---|---------|
| G | GSM-R   |
| E | ETCS    |
| Z | Zugfunk |

### Description of technical parameters of line:

10 km, 120 km/h, 700 m, D4 Distance, maximum speed, maximum length of train, axle load

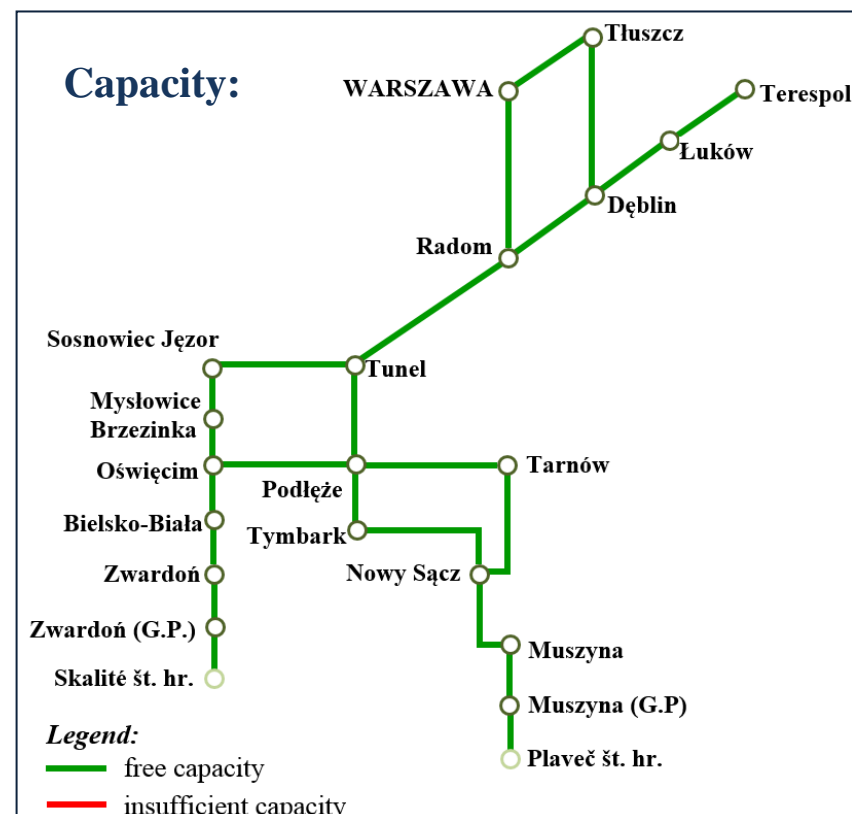


Technical data of the lines are listed in Appendix A

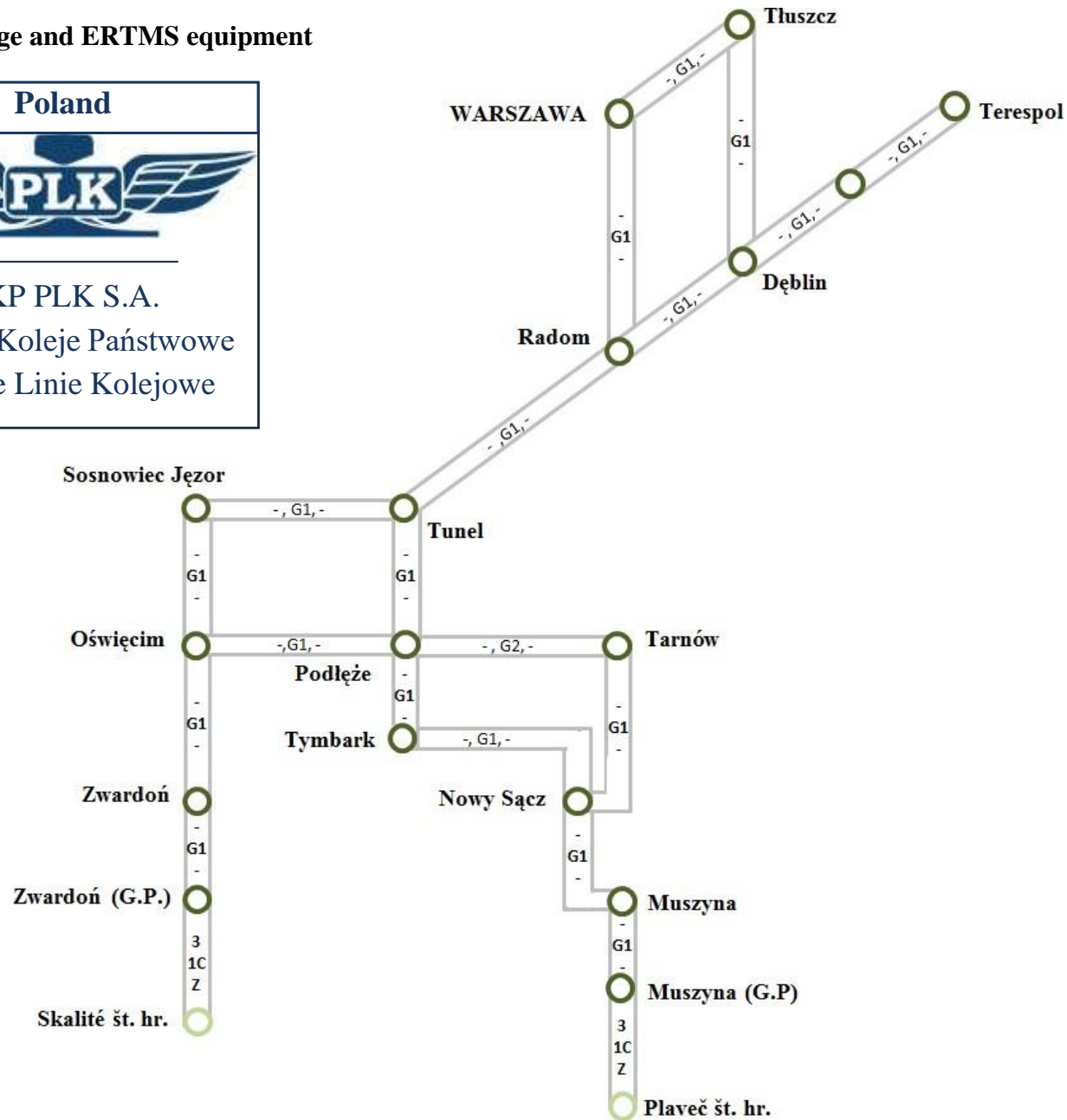


**Note:**

Expected line: Nowy Sącz - Tymbark - Podlężę  
\* Line category regarding axle load source: member of Amber RFC from Poland



Loading gauge and ERTMS equipment



Slovakia



ŽSR  
Železnice Slovenskej  
republiky, Bratislava



Note:

Different maximum speed (km/h) in the section:

<sup>1</sup>Žilina – Krásno nad Kysucou: 19,3 km, 140 km/h

Krásno nad Kysucou – Čadca: 10 km, 100 km/h

<sup>2</sup>Púchov – Trenčianska Teplá: 26,8 km, 160 km/h

Trenčianska Teplá – Trenčín: 7,5 km, 120 km/h

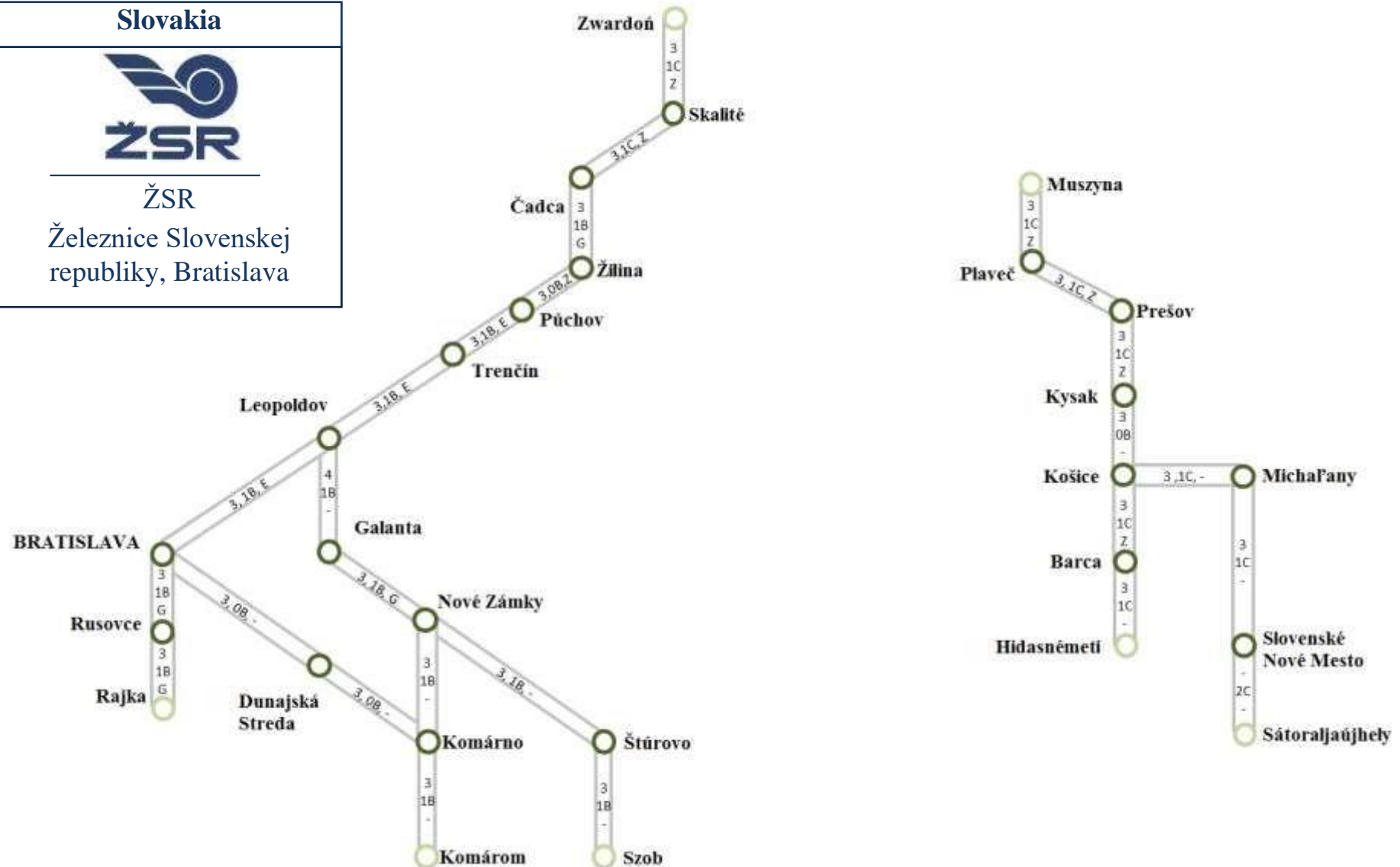
<sup>3</sup>Bratislava hl. St. – Bratislava Rača: 7,4 km, 100 km/h

Capacity:

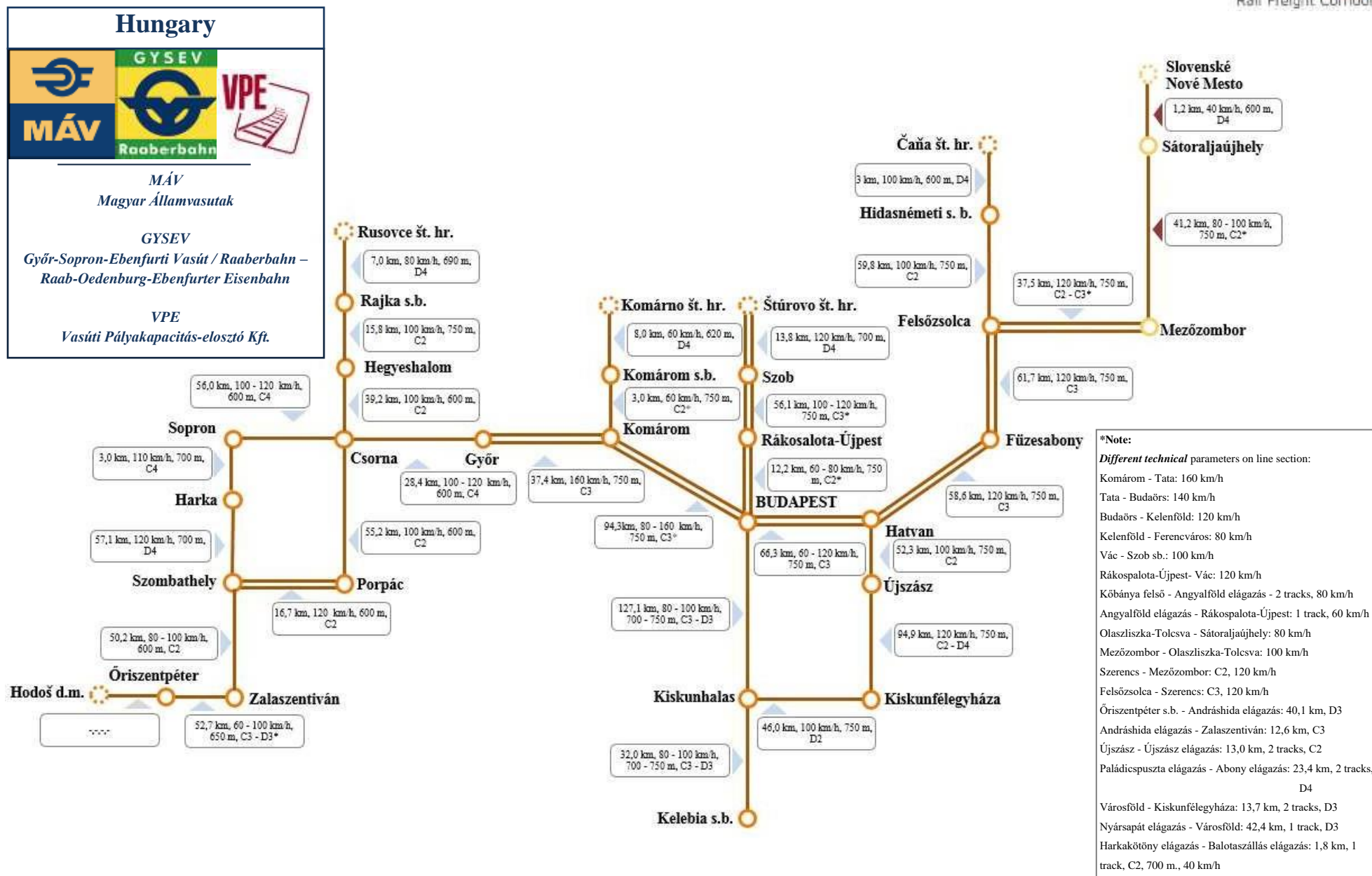


Loading gauge and ERTMS equipment

|   |
|---|
| <b>Slovakia</b>   |
|  |
| <p>ŽSR<br/>Železnice Slovenskej republiky, Bratislava</p>                         |



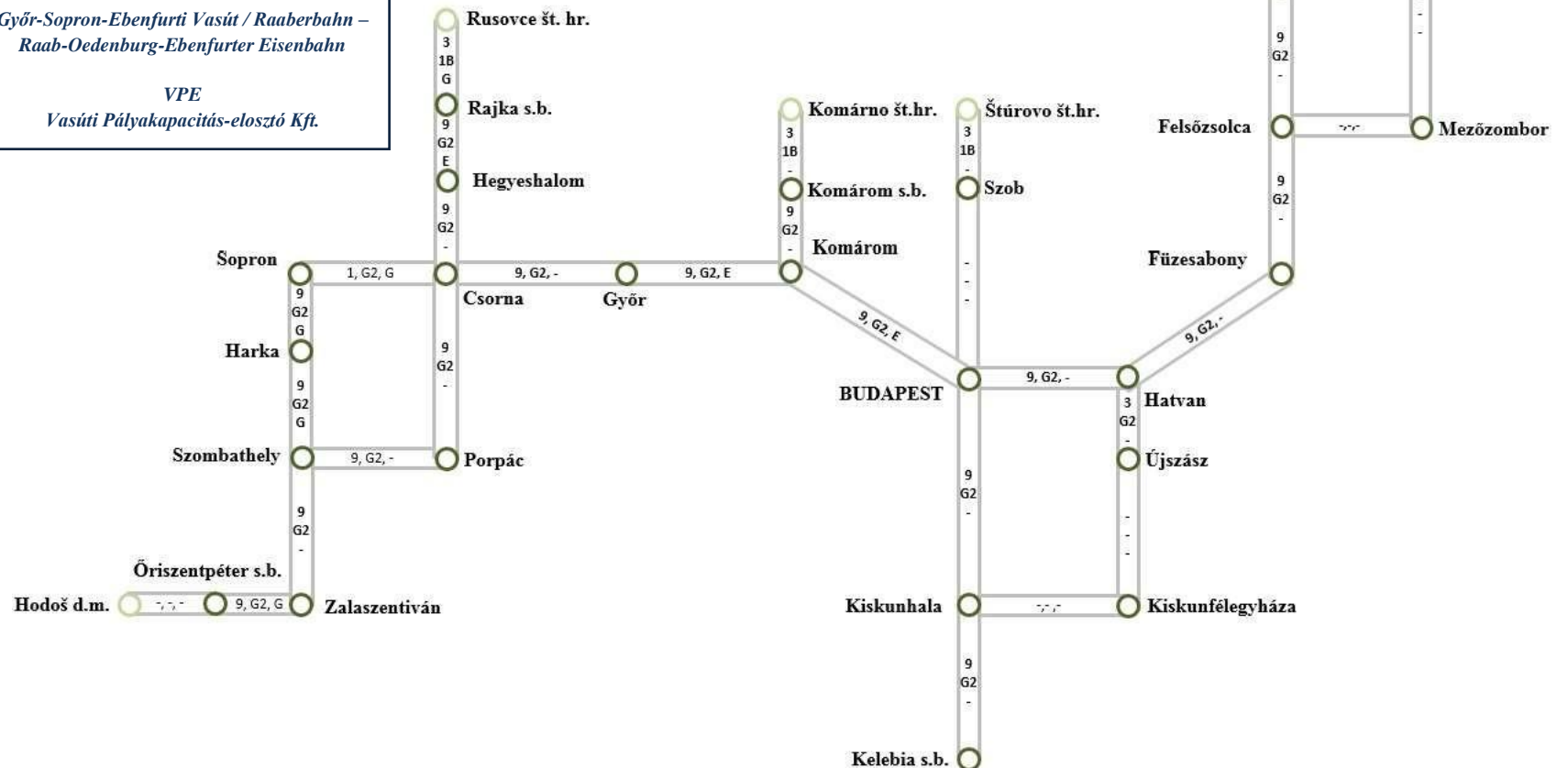
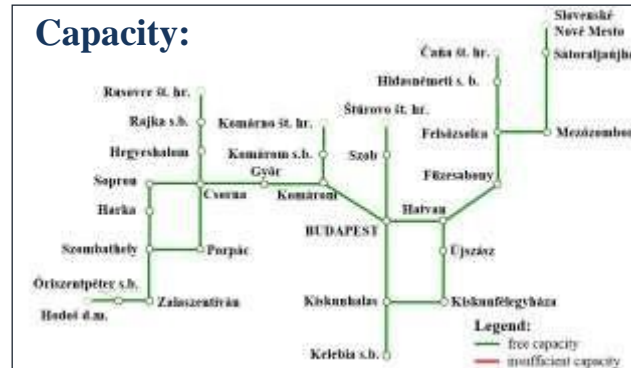




## Loading gauge and ERTMS equipment

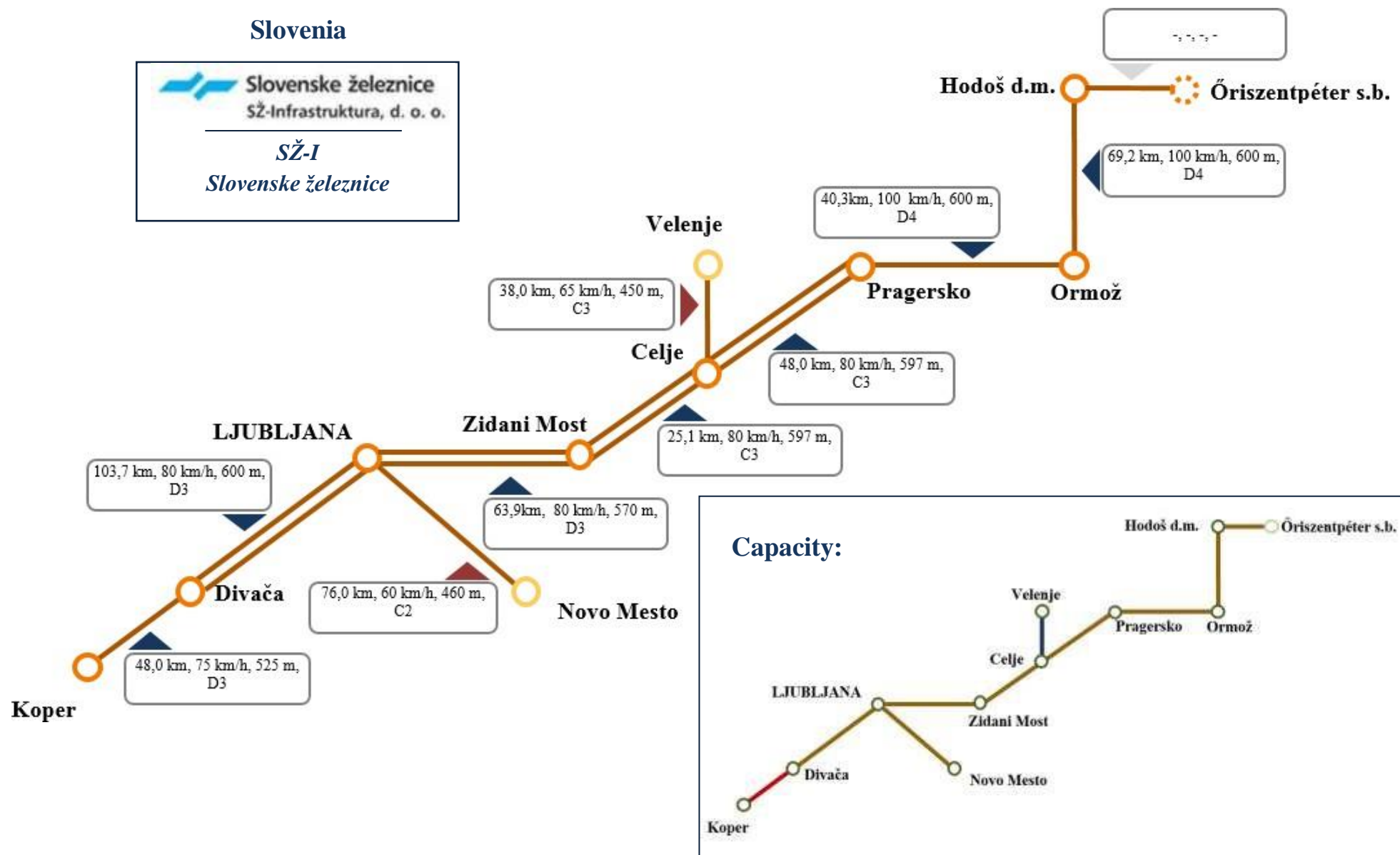


## Capacity:

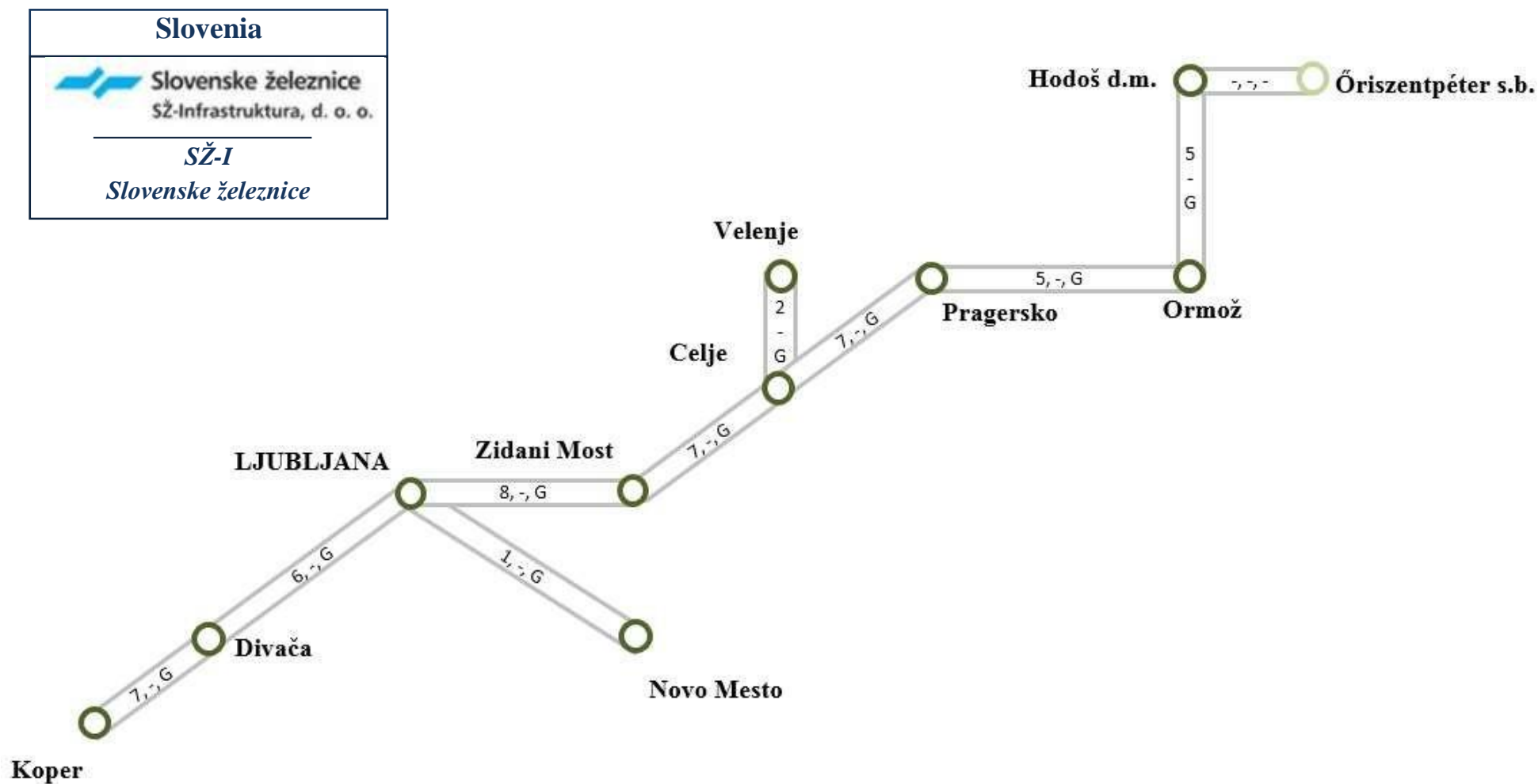




## Slovenia



# Loading gauge and ERTMS equipment



The rail freight services are directly linked to the marshalling yard services (in particular wagon loads) and intermodal terminal services (in particular loading, unloading, transshipment and administration as regards the transport units of intermodal transport). The graphical representation of the location of marshalling yards and intermodal terminals on the lines included in the Amber RFC is shown in Fig. 38.

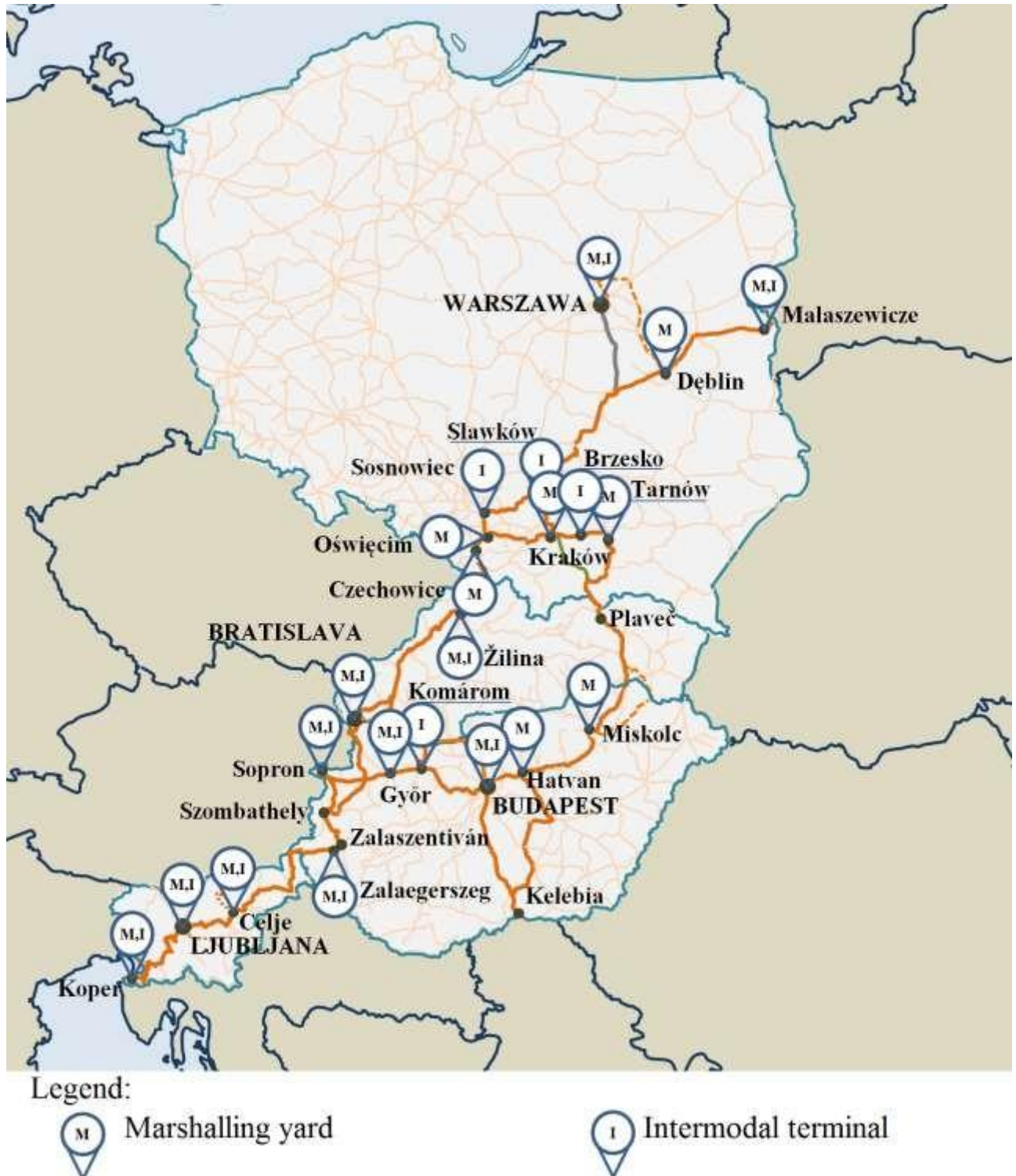


Figure 38: Graphical representation of Marshalling yards and Intermodal terminals on Amber RFC  
(Source: ŽSR, VVÚŽ)



Figure 39 shows the position of rail border crossings with countries outside the EU. Subsequently, Figure 40 shows the position of major ports and airports located in the territory of the Amber RFC countries.

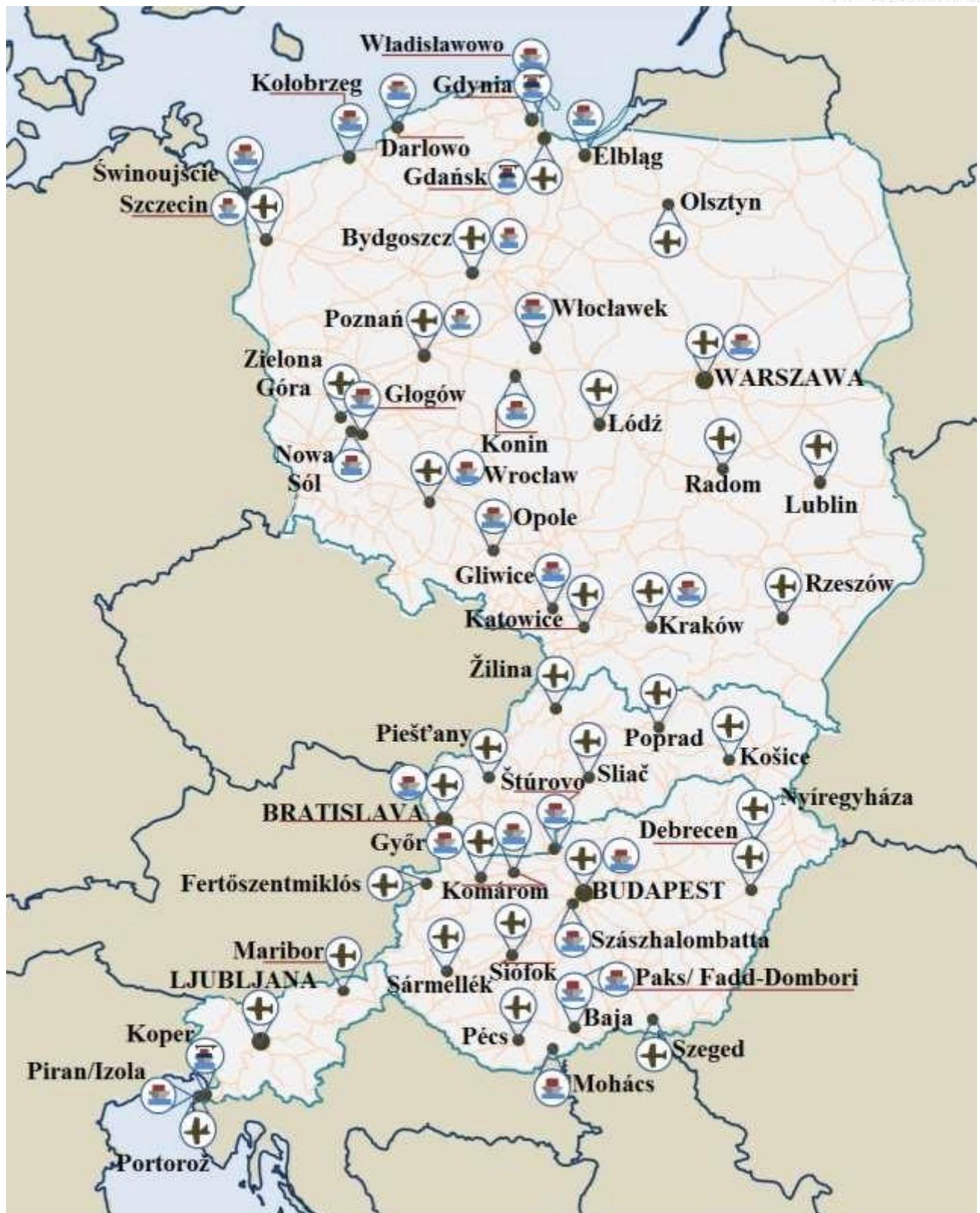


**Legend:**

|                                    |                          |                      |                      |
|------------------------------------|--------------------------|----------------------|----------------------|
| <u>UKRAINE (UA)</u>                | Countries outside the EU | <u>SLOVENIA (SI)</u> | Country of Amber RFC |
| Werchrata (PL)/ Rawa Ruszkaja (UA) | Borders stations         | <u>CROATIA (HR)</u>  | Country of the EU    |

Figure 39: Rail border crossings – with countries outside the EU

(Source: ŽSR, VVÚŽ)



**Legend:**



Airport



Sea port/ Inland  
waterways port



Sea port with  
container terminal

Figure 40: Position of ports and airports  
(Source: ŽSR, VVÚŽ)

Table 43 contains a list of significant transport points located in the territory of the Amber RFC countries and lines.

*Table 43: Traffic points of Amber RFC*

| Node name              | *ITT   | Marshalling yard                           | Other services  |
|------------------------|--|--|---|
| <b>Poland</b>          | Terminal kontenerowy Warszawa<br>Główna Towarowa<br>Loconi Intermodal Terminal<br>Kontenerowy Warszawa                           | Warszawa Główna Towarowa<br>Warszawa Praga |   |
|                        | EUROTERMINAL Sławków   | Jaworzno<br>Szczakowa                      |   |
|                        | Brzeski Terminal Kontenerowy/<br>KARPIEL Brzesko   |  |   |
|                        |  | Tarnów Filia                               |   |
|                        |  | Kraków Nowa Huta                           |   |
|                        | PKP Cargo Centrum Logistyczne<br>Małaszewicze<br>EUROPORT Małaszewicze<br>Terminal przeładunkowy<br>Wólka/Tradetrans<br>Tranzgaz | Małaszewicze/Cargotor                      |   |
|                        |  | Oświęcim                                   |   |
|                        | Terminal Sosnowiec Południowy  |  |   |
|                        |  | Czechowice Dziedzice                       |   |
|                        |  | Dęblin                                     |   |
| <b>Slovak Republic</b> | Bratislava SPaP, ÚNS   | Bratislava východ                          |   |
|                        | Žilina   | Žilina-Teplica                             |   |
| <b>Hungary</b>         |  |  | Őrisszentpéter/loading place  |
|                        |  |  | Andráshida/loading place<br>Zalalövő/loading place  |
|                        |  |  | Zalaegerszeg/scale & refuelling & loading place   |
|                        |  |  | Zalaszentiván/loading place   |
|                        | Sopron Intermodal Terminal   | Sopron marshalling yard                    |   |
|                        | Győr ÁTI Depo  | Győr-Rendező                               | Győr-Rendező/scale & loading place<br>Győrszentiván/loading place<br>Nagyszentjános/loading place<br>Ács/loading place            |
|                        | Komárom-Rendező  |  | Komárom/refuelling & loading place<br>Komárom-Rendező/scale & loading place<br>Almásfüzitő/loading place<br>Tata/loading place    |
|                        |  |  | Tatabánya/loading place<br>Bicske/loading place<br>Herceghalom/loading place<br>Biatorbágy/loading place<br>Budaörs/loading place |
|                        | Budapest Szabadkikötő Logisztikai Zrt.   | Ferencváros                                | Ferencváros/scale & refuelling & loading place<br>Soroksári út rendező/scale & loading place                                      |
|                        | BILK   | Soroksári út rendező                       | Soroksár/loading place  |
|                        |  |  |   |



|          |                     |                 |   |
|----------|---------------------|-----------------|---|
| Hungary  |                     |                 | Dunaharaszti /loading place<br>Taksony/loading place<br>Délegyháza/loading place<br>Kiskunlacháza/loading place<br>Dömsöd/loading place<br>Kunszentmiklós-Tass/loading place                                  |
|          |                     |                 | Bösztör/loading place<br>Szabadszállás/loading place<br>Fülöpszállás/loading place<br>Csengőd/loading place<br>Kiskőrös/scale & loading place<br>Soltvadkert/loading place<br>Kiskunhalas/scale & refuelling; |
|          |                     |                 | Balotaszállás/loading place<br>Kisszállás/loading place<br>Kelebia/scale & loading place  |
|          |                     |                 | Rákos/scale & loading place   |
|          |                     | Hatvan-Rendező  | Isaszeg/loading place<br>Gödöllő/loading place<br>Aszód/loading place<br>Hatvan/refuelling & loading place<br>Hatvan-Rendező/scale  |
|          |                     |                 | Hort-Csány/loading place<br>Vámosgyörk/loading place  |
|          |                     |                 | Kál-Kápolna/loading place<br>Füzesabony/scale & refuelling & loading place  |
|          |                     | Miskolc-Rendező | Mezőkövesd/loading place<br>Mezőkeresztes-Mezőnyárad/loading place<br>Nyékládháza/loading place<br>Miskolc-Tiszai/loading place<br>Miskolc-Rendező/scale & refuelling<br>Miskolc-Gömöri/loading place         |
|          |                     |                 | Felsőzsolca/loading place   |
|          |                     |                 | Hidasnémeti/loading place   |
| Slovenia | Ljubljana Moste     | Ljubljana Zalog |   |
|          | Port of Koper Koper | Koper tovarna   |   |
|          | Celje tovarna       | Celje tovarna   |   |
|          |                     |                 | Gorenje Velenje   |
|          |                     |                 | Revoz Novo mesto  |

Source: Member from countries of Amber RFC

## 9.2 Basic information on Małaszewicze dry port

The Małaszewicze dry port, located close to Terespol railway station, which is extensively used in international connections running via the nearby PL/BY border crossing of Terespol-Brest, operates on the Core Network Corridor North Sea-Baltic, Rail Freight Corridor North Sea-Baltic and Amber Rail Freight Corridor. It is a special place because of the EU border and customs border. Here lies the junction point between CIM and SMGS communication systems and 1435 mm and 1520 mm railway gauges. The difference of the gauges determines the transshipment of goods at the terminals in the area of the dry port. Małaszewicze is the biggest dry port at the eastern border of EU, it is a railway gate leading to European markets. Crucial transshipment terminals located in Małaszewicze, including a container terminal, are managed by PKP CARGO Group

**Key technical specifications of the terminals of PKP CARGO Group**

|                                  |  |
|----------------------------------|--|
| Total area:                      | 1 237 000 m <sup>2</sup>                 |
| Outdoor storage area – the yard: | 134 694 m <sup>2</sup>                   |
| Closed storage area:             | 5 300 m <sup>2</sup>                     |
| Roofed area:                     | 3 000 m <sup>2</sup>                     |
| Storage capacity:                | 2 000 TEU                                |
| Transshipment capacity:          | 10 057 500 tonnes per year               |
| Container terminal:              | 120 000 TEU per year                     |
| Railway tracks (usable):         | 14 112 m (1520 mm)<br>18 952 m (1435 mm) |
| Dual gauge railway tracks:       | 670 m (1435 + 1520 mm)                   |

**Equipment**

|                            |          |
|----------------------------|----------|
| Gantry cranes:             | 12 units |
| Rubber tire gantry cranes: | 1 unit   |
| Rubber tire digger:        | 16 units |
| Rubber tire loader:        | 5 units  |
| Reach stackers:            | 3 units  |
| Bucket elevators:          | 4 units  |

Plug in points for refrigerated containers

Forklifts with loading capacity of 1,6 to 4,5 t

**Transshipment terminals**

Transshipment activity is run on specialized terminals prepared technically and organizationally for transshipping and storing defined types of cargo. PKP CARGO Groups has at its disposal 7 transshipment terminals:

Table 44: Transshipment terminals of PKP CARGO Group in Małaszewicze

| Transshipment point                | Cargo type   |
|------------------------------------|--|
| Container Terminal <sup>1</sup>    | 20", 30", 40", 45" containers, HC, semitrailers                            |
| Terminal in Kowalewo <sup>1</sup>  | cargo on pallets, big bag cargo, bundles, bags, bulk cargo (grain, pellet) |
| Terminal in Podsedków <sup>1</sup> | coal, wood, woodchips  |
| Terminal in Raniewo <sup>1</sup>   | coal, wood, woodchips  |
| Universal Terminal <sup>1</sup>    | coal, wood, woodchips, ore, metals, unit goods (machines, vehicles etc.)   |
| Terminal in Wólka <sup>2</sup>     | coal, wood, woodchips, fertilizers, chemicals, steel products              |
| Terminal in Zaborze <sup>2</sup>   | coal, wood, woodchips, fertilizers, chemicals, steel products              |

Source: PKP Cargo Group

<sup>1</sup> run by PKP CARGO Centrum Logistyczne Małaszewicze

<sup>2</sup> run by PKP Cargo CONNECT

The scheme below presents the layout of PKP CARGO Group transshipment terminals in the area of the Małaszewicze dry port.

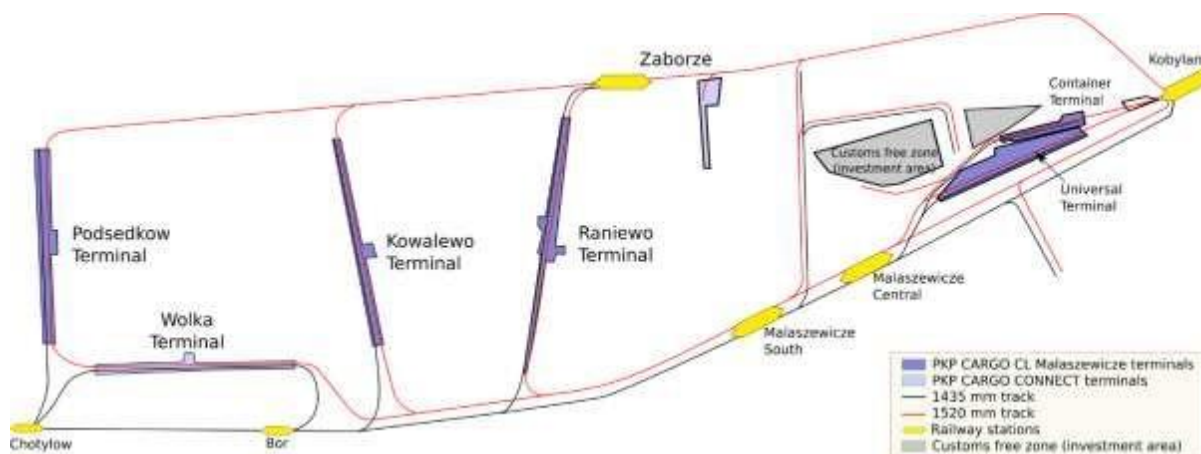


Figure 41: Layout of PKP CARGO Group transshipment terminals and railway stations in Małaszewicze

(Source: PKP Cargo)

It should be also mentioned that apart from the above mentioned key terminals there are also other transshipment points and terminals in the area of the dry port.

### Małaszewicze dry port – a bridge connecting China and Europe

Over a few recent years there has been noticed a substantial change in the cargo turnover in Małaszewicze which is due to launching freight transport from China and making railway transport a part of the vast concept of the New Silk Road (One Belt One Road). The increasing importance of the railway transport is a result of an advantageous relation of price to time of transport and punctuality.

The vital factor having a direct influence on the cargo turnover operations between China and Europe transported by rail is the transport time. A freight train from China arrives to Europe in 11-14 days, while e.g. sea transport takes 40-50 days. These times respectively affects the possibility of a quick cargo delivery to the customers, including flexible shaping of „door-to-door” deliveries.

The fact, that the trains heading for Europe are crossing only two customs borders, i.e. the one between China and the area of Eurasian union and the next one between Eurasian union and EU customs area is an additional advantage for using the services of Małaszewicze container terminal by entrepreneurs, which also relatively decreases the amount of customs formalities related to the transport. Moreover, there is a customs-free zone functioning in the area of the Małaszewicze dry port, where cargo can be stored without the obligation to pay tax and customs charges. There is no storage time limit.

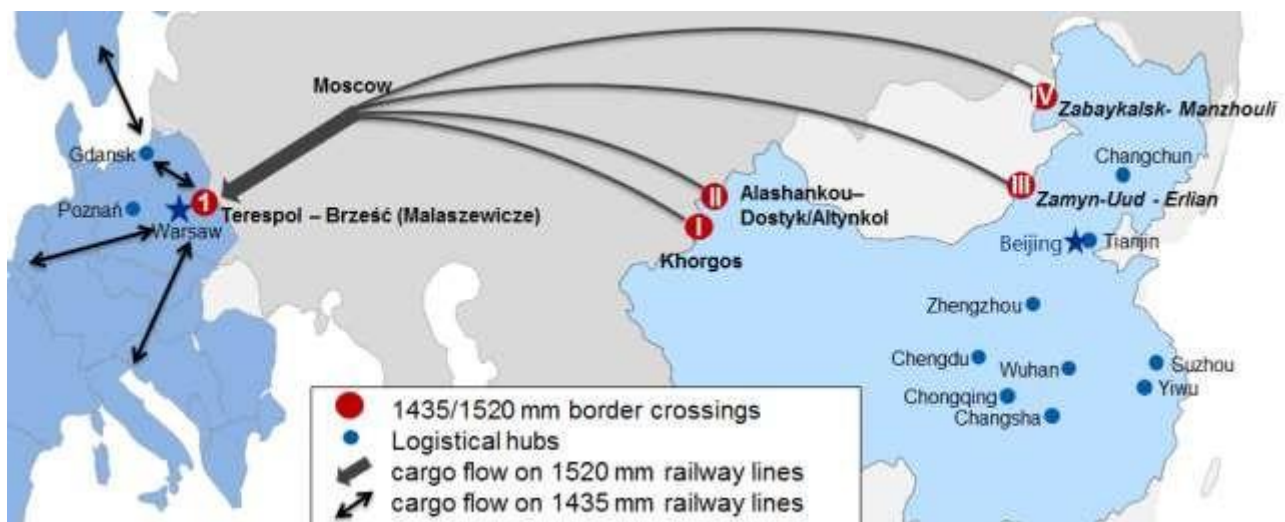


Figure 42: Key China-Europe rail freight transport directions and border crossings  
(Source: PKP Cargo)

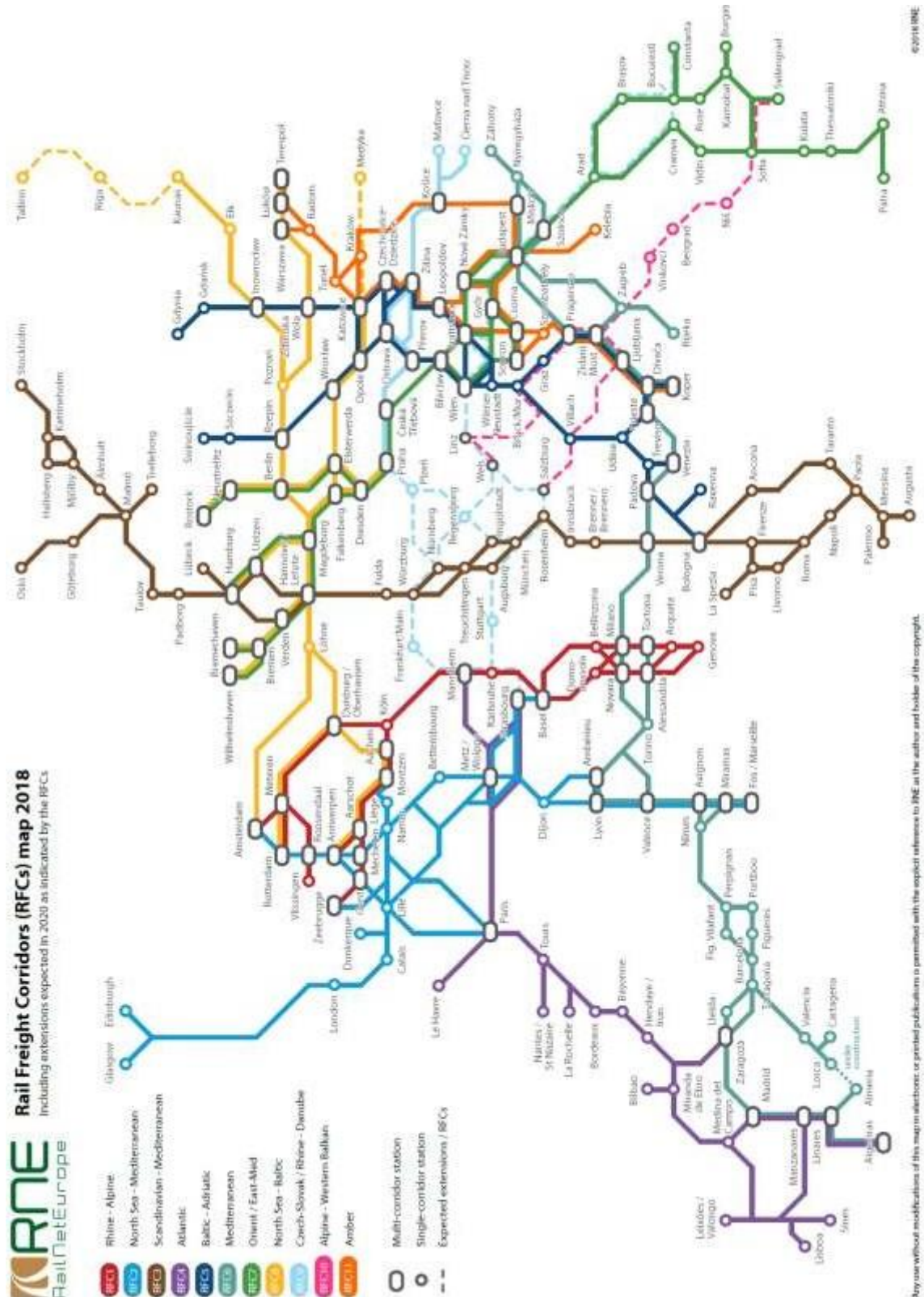
The dry port in Małaszewicze is a land bridge connecting Europe with China. Its special location creates possibilities of bringing together the concepts of Amber Corridor and the New Silk Road. This way the goal of transport mode diversification between China and Europe would be reached. The application of land transport, mainly rail or combined sea-land transport, for the cargo transported from Asia fits the EU transport policy concept of developing sustainable transport systems.

### 9.3 Summary basic comparison of RFC infrastructure

The European RFC corridors have been designed primarily on the basis of direction of the main transport flows of goods within the EU and the whole Europe in order to increase the attractiveness, reliability and efficiency of the rail system, taking utmost account of the customer

requirements. Each corridor has its specific role and strategic routing adapted to the transport requirements of the customers. In Table 45, a basic comparison of the infrastructure of the European RFC corridors is made for clarity and Figure 43 shows map of European RFC by Rail Net Europe.

Figure 43: Graphical representation of corridors Rail Net Europe



(Source: Rail Net Europe)



Table 45: Basic parameters of RFC corridors

| Corridor name                     | Number of countries | Length of lines in km | Seaport | Inland port | *ITT |
|-----------------------------------|---------------------|-----------------------|---------|-------------|------|
| RFC 1 (Rhine - Alpine)            | 5                   | 3 900                 | 6       | 6           | 100  |
| RFC 2 (North Sea - Mediterranean) | 6                   | 5 300                 | 19      | 12          | 98   |
| RFC 3 (ScanMed)                   | 5                   | 7 527                 | 13      | 2           | 66   |
| RFC 4 (Atlantic)                  | 3                   | 6 200                 | 15      | 4           | 52   |
| RFC 5 (Baltic - Adriatic)         | 6                   | 4 825                 | 8       | 3           | 84   |
| RFC 6 (Mediterranean)             | 6                   | 7 000                 | 9       | 4           | 90   |
| RFC 7 (Orient/East - Med)         | 8                   | 7 700                 | 8       | 16          | 30   |
| RFC 8 (North Sea - Baltic)        | 5                   | 6 045                 | 6       | 13          | 171  |
| RFC 9 (Czech - Slovak)            | 2                   | 970                   | 0       | 2           | 12   |
| RFC 10 (Alpine -Western Balkans)  | 5                   | N/A                   | N/A     | N/A         | N/A  |
| RFC 11 (Amber)                    | 4                   | aprox. 3 400          | 1       | 2           | 25   |

Source: Annual reports of RFC corridors

\*ITT- Intermodal transport terminal

The European Amber RFC will have the second smallest length of railway lines compared to the other European RFC corridors. This fact, however, does not change the strategic importance of its routing. The Amber RFC routing will contribute especially to support of transport from/to Port of Koper and transport from/to Belarus and the Republic of Serbia. At the same time, the routing allows an effective connection with the lines of international importance in individual member states. The small length of the lines included in the Amber RFC creates the most suitable conditions for coordination of possessions, ordering of transport routes and direction of investment activities leading to the provision of high quality and available services of the railway system.

## 9.4 Result and summary of the findings of Chapter 9

Based on the presented data in the particular subchapters of the eighth part of the TMS we can conclude the following facts:

- all principal lines are electrified – environmental benefit, lower costs of carriers,
- most of the other lines (alternative and diversionary line) are electrified – environmental benefit, lower costs of carriers,
- different electric power supply systems – need for harmonization = subsequently, reduction of requirements for transport companies and negative effects of DC traction system,
- all lines have 1 435 mm gauge – it is not necessary to change gauge during transport,
- infrastructure included in the corridor has sufficient free capacity for increase in rail freight transport performances affected by the Amber RFC services except the line Divača and Koper. The utilization of this line is 98% because there are 82 trains/day on this single-track line,



- most included railway lines do not reach the required demands for running long trains (750 m),
- some principal railway lines included do not reach the highest level of axle load – need for reconstruction/modernization,
- the Slovak Republic has all principal lines at the highest level of axle load,
- need for complete the ERTMS (European Rail Traffic Management System) on the principal corridor lines – complying with the interoperability requirements,
- routing creates the transport potential for international rail freight transport in the south – north/east direction,
- routing creates the transport potential for international rail freight transport in the direction of countries outside the EU – EU/the Amber RFC countries,
- possible connection of broad-gauge line in the Republic of Poland with the main corridor route in the Republic of Poland,
- routing improves connection of intermodal transport terminals in the member states concerned and provides direct routing for intermodal consignments from the Port of Koper,
- facilitates transport connection between the Adriatic sea port in the Republic of Slovenia and inland waterway ports on the Danube in Hungary and the Slovak Republic,
- supports the development of rail transport with the Republic of Serbia,
- potentially improves rail transport across the EU eastern border and on the land bridge between Europe and Asia.

From the overall point of view, the proposed routing, division of particular lines, including the technical parameters of the lines are satisfying and fulfilling the conditions for providing the high-quality rail freight services. Routing creates the suitable conditions for modal split change in favour of rail freight transport in the individual countries of the Amber RFC. The establishment of the Amber RFC, based on the submitted proposal, will contribute to the EU strategic objectives in the field of effective modal split and to reduction of negative external transport costs.

## **10 LAST MILE**

The rail freight transport is the most advantageous in the process of transport of bulk substrates from the economic and time point of view. Also, the lowest amount of negative external costs of transport is produced in this transport. Most often it is the transport of bulk substrates, gases, liquids, chemicals, cars, coiled sheet, etc. Rail freight transport has also had a significant position in the process of transport of single consignments. Endogenous and exogenous impacts have led to a long-term decrease in rail system performances in the process of transport of single consignments. A graduating international trade, showed in the previous parts of TMS between the Amber RFC countries, the EU countries and countries outside the EU, brings many opportunities for transportations having the character of single consignments. At present, there is an upward trend in the individual needs of manufacturing and trading companies demanding specific goods, which has a nature of transport of single consignments. This is due to marketing strategies aimed at individual requirements of customers. It is often the transport of goods by 1 – 8 road trains over 12 tons/day. These transportations are required by, in particular, the small and medium-sized enterprises and commercial companies.

At present and in the future, based on global direction, market liberalization, international trade activities and economic development, we can expect:

- construction of small and medium-sized production sites within the EU countries and Asia,
- construction of new logistic centres, central and distribution warehouses, large business houses,
- increase in demand for transport services for the transport of goods in international transport between production sites and logistics infrastructure,
- increase in demand for quality of transport services, particularly in terms of reliability and safety,
- need for a sufficient technical base necessary for transport of single consignments,
- pressure on reducing the negative external costs generated by increased demands for the transport of goods.

These facts create a sufficient transport potential which can largely take over the railway system. However, the use of existing rail freight transport opportunities requires a sufficient technical base that meets the technical and technological requirements on high quality, reliable, safe, available and flexible transport services. It is also an infrastructure that creates the necessary

direct connection between consignors and railway undertakings. Between this stable and mobile infrastructure, we can include:

- railway sidings,
- side and front loading ramps,
- specially assigned tracks for loading and unloading of goods,
- reinforced handling surfaces (loading, unloading, movement of handling equipment, depot, etc.),
- storage areas and buildings,
- storage sidings serving for the needs of consignor,
- necessary handling equipment,
- smaller local shunting yards, indicated as transfer stations, for train formation in the vicinity of above-mentioned sites, if their primary purpose is to enable the collection and delivery of wagons/trains to such specific sites,
- local rail tracks or connecting lines leading from and to the loading facilities.

The following Figure illustrates the elements of the Last Mile and relevant Last Mile infrastructure used by HaCon.

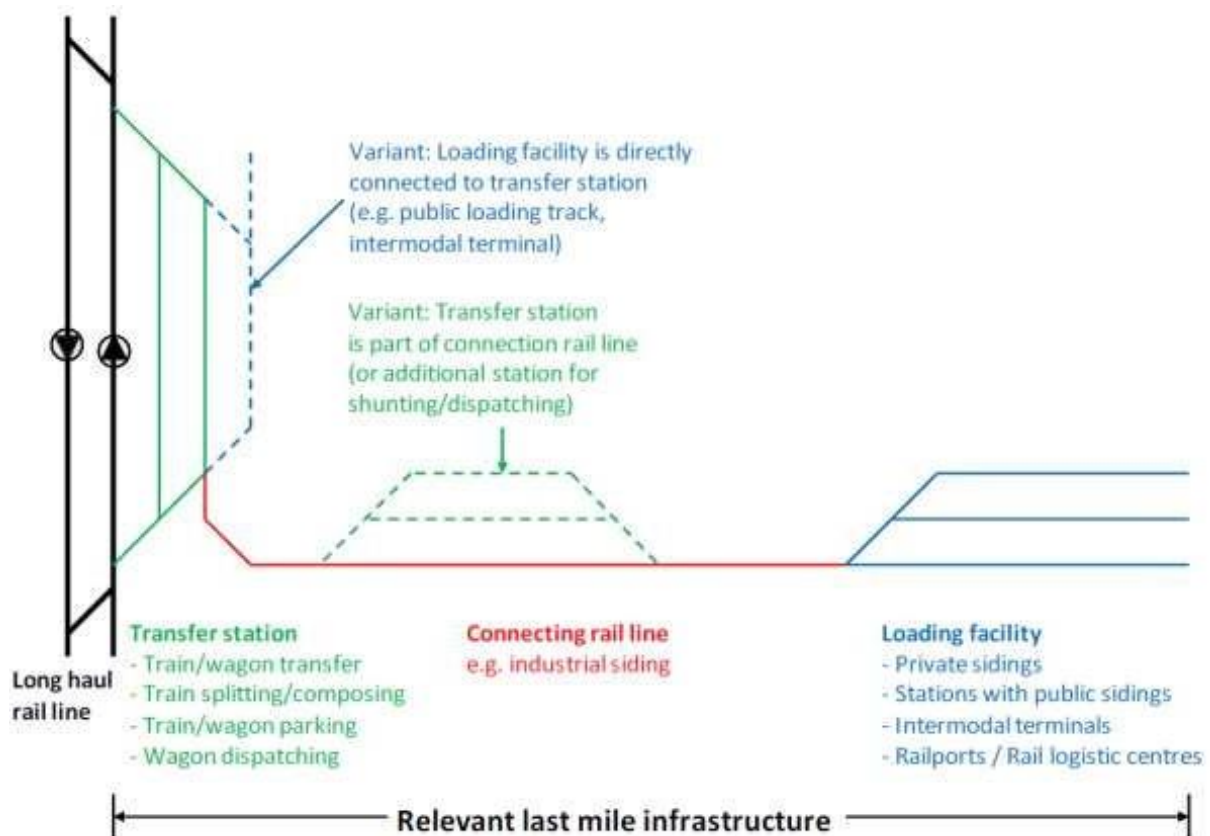


Figure 44: Components of „last mile infrastructure“  
(Source: HaCon)

**Types of last-mile infrastructure:**

- Private sidings,
- Stations with public sidings,
- Intermodal terminals,
- Railports.

One main intention to establish railports was to substitute private and public sidings which were no longer served by rail. Thus, they are principally open for everybody and for all types of cargo. They do not only provide pure transshipment but also additional services like storage, consignment or road pre-/end-haulage. An example of typical railport configuration and logistics services used by DB Schenker Rail is shown in Figure 45.

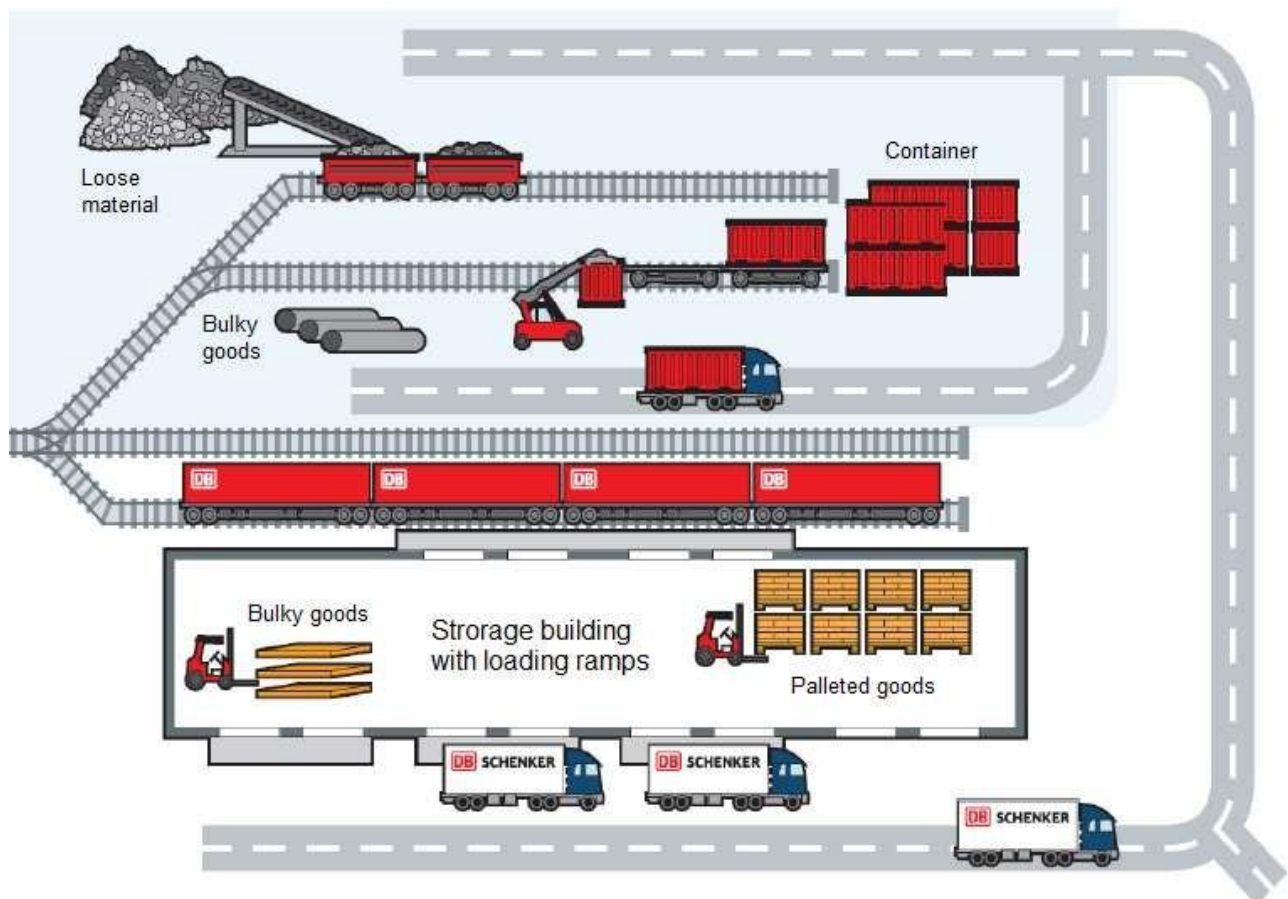


Figure 45: *Typical railport configuration and logistics services*

(Source: DB Schenker Rail)

The generated demand for transport services within the requirements for single consignments (or part-load consignments) provides several opportunities for rail freight transport services. However, the specific elements of these transports require high quality and available infrastructure. One of the elements of this infrastructure is the above mentioned last mile infrastructure the operation and building of which is necessary for the competitiveness of rail freight transport to

other modes of transport. High quality and available last mile infrastructure has a positive impact on the quality of rail system services and thus contributes to its competitiveness and customers' interest. However, for the use of Last mile infrastructure, it is necessary a participation of railway undertakings that are able to use this infrastructure within their business activities and creation of services. Operation, building, propagation and provision of services within Last mile require a sufficient investment and non-investment support from the state and competent government authorities. Support is necessary also from the legislative point of view to promote a shift of transport performances from more environmentally demanding modes of transport to environmentally friendly rail freight transport. Support of Last mile infrastructure and services can be ensured also from enviro resorts and funds, regional government budgets and harmonization of railway infrastructure charging.

In order to better meet the requirements of international transport customers, especially in the process of transport of single consignments and strong position of road goods transport, it is very important that reliable and transparent information services are provided within the rail freight transport in the short term. Insufficient access to information on Last mile infrastructure is a significant obstacle for rail freight transport in effective planning, especially in cross-border transport. Based on this need, the web portal within the whole EU with GIS functions has been developed which is capable to present in a transparent way all important information for various types of Last mile infrastructure. The current version of the portal is running on the internet domain „*www.railfreightlocations.eu*“. GYSEV has participated as a pilot region in the elaboration of this information portal. The web page enables to search according to more detailed criteria, zooming the map or direct selection from the list. By selecting the endpoint on the map, the available detailed information on the relevant part of the Last mile infrastructure is displayed. Detailed information on the relevant part of the Last mile infrastructure illustrated by the satellite image currently includes:

- basic data: type of Last mile infrastructure, address, specific data, opening hours, etc.,
- railway infrastructure technical parameters,
- availability of modes of transport provided,
- availability of services provided,
- links to websites that can be another source of information.

**The list of the Last mile for the Amber RFC is listed in Appendix F.**

The data in Appendix F show the need to extend and subsequently precise of the Last mile infrastructure for the Amber RFC. This step is necessary for provision of required transport services and increase in rail system performances in the process of transport of single consignments.

## 11 COMPARATIVE ANALYSIS OF RAIL AND ROAD FREIGHT TRANSPORT WITHIN THE AMBER RFC

The comparative analysis serves for comparison of the transport time and charges within the transport routes on the selected railway routes of the Amber RFC with comparable routes of road transport. The comparison of these two indicators will provide information on charge and time competitiveness of international rail freight transport on the Amber RFC lines.

### Input assumptions of comparative analysis:

- 4 model transport routes,
- observing a mandatory rest according to the European Agreement concerning work of crews of vehicles engaged in international road transport and restrictions on running time,
- average speed in international road goods transport,
- average speed of trains in international rail freight transport within the Amber RFC lines,
- average railway infrastructure charges and road goods transport charges on the lines of the Amber RFC and the relevant road network,
- distances in kilometres of individual model routes.

Table 46 provides a comparative analysis of the average running time between international rail and road freight transport for proposed model transport routes.

*Table 46: Comparative analysis of average running times*

| Route               | km in road transport | km in rail transport | Average transport time by truck | Average transport time by rail |
|---------------------|----------------------|----------------------|---------------------------------|--------------------------------|
| Koper – Košice      | 870                  | 955                  | 24 h 15 min                     | 19 h 06 min                    |
| Terespol - Budapest | 799                  | 976                  | 23 h 04 min                     | 19 h 30 min                    |
| Warszawa - Miskolc  | 585                  | 692                  | 10 h 30 min.                    | 13 h 48 min                    |
| Žywiec - Maribor    | 589                  | 657                  | 10 h 34 min.                    | 13 h 06 min                    |

The comparative analysis of average running time in Table 46 carried out on the model transport routes showed a shorter technological time of transport in international road goods transport on the routes Warszawa – Miskolc and Žywiec - Maribor. A shorter technological time of transport in favour of rail transport was achieved on the routes Koper – Košice and Terespol – Budapest. The analysis showed that the total technological times of transport in rail freight transport approach the technological times of transport in road goods transport, especially in case of block train technology. The effects of services and fulfilment of the Amber RFC vision and mission will contribute to time competitiveness of international rail freight transport and at the same time, the established corridor will create the suitable conditions for high quality, reliable and safe services of the rail system. For effective use of rail freight transport, it is necessary to remain in removing



barriers that hinder faster transport in international rail transport. The process of interoperability of the rail system within the EU countries helps remove barriers, too. In case of transport of bulk substrates, the rail freight transport can be considered to be competitive in the total transport time as the road infrastructure does not have sufficient capacities for the individual transport of bulk substrates.

Table 47 provides a comparative analysis of transport infrastructure charges between rail and road freight transport for proposed model transport routes. The charge is calculated for road freight vehicle with a total weight of 40 t and weight of goods of 22 t, for freight train with a total weight 1 500 t and weight of goods of 1 000 t. The analysis does not include any supplementary charges in road and rail transport.

*Table 47: Comparative analysis of charges*

| Route               | Road freight transport |                   |                         | Rail freight transport  |                   |                         |
|---------------------|------------------------|-------------------|-------------------------|-------------------------|-------------------|-------------------------|
|                     | charge<br>40 t vehicle | charge in<br>€/km | charge in<br>€/km/tonne | charge<br>1 500 t train | charge in<br>€/km | charge in<br>€/km/tonne |
| Koper – Košice      | 244,12                 | 0,2806            | 0,0128                  | 1886,4                  | 1,975             | 0,0020                  |
| Terespol - Budapest | 76,5                   | 0,0957            | 0,0044                  | 3406,24                 | 3,490             | 0,0035                  |
| Warszawa - Miskolc  | 31,9                   | 0,0545            | 0,0025                  | 2130,41                 | 3,079             | 0,0031                  |
| Żywiec - Maribor    | 126,9                  | 0,2154            | 0,0098                  | 1648,46                 | 2,509             | 0,0025                  |

The comparative analysis of charge burden in Table 47 showed higher charges per 1 km of route for rail freight. However, charge comparison per one tonne of goods transported/ route km showed a lower charge burden for international rail freight. At the same time, most of road infrastructure is charged in the model calculation, while road infrastructure is often not charged on the whole transport section. Lower charges in rail freight per one tonne of goods transported occur only in case of larger amount of goods transported as the charges in road freight transport are less dependent on weight. With a decrease in the amount of goods, the charges per tonne of goods in rail transport are significantly increasing. The positive result of the analysis was influenced by EU and national measures. The main measures were the liberalization of transport infrastructure charges and the reduction of charges based on marginal costs. The calculation showed sufficient competitiveness of charges in international rail freight transport against road freight transport when goods are transported in block trains.

The Figure below shows a comparison of some challenges rail freight transport faces compared to road freight transport.

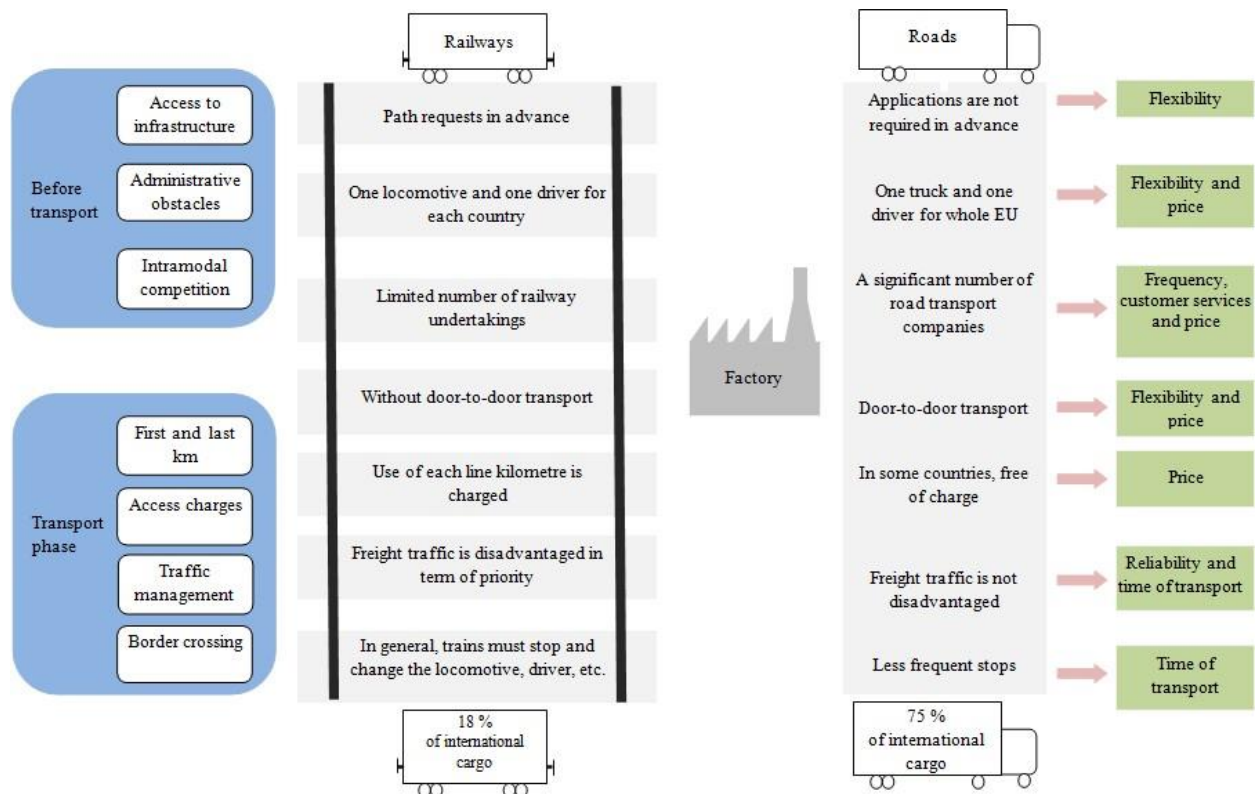


Figure 46: Comparison of challenges of rail freight to road transport  
(Source: European Court of Auditors)

## 11.1 Socio-economic benefits of the Amber RFC establishment

The Amber RFC establishment itself will have the following socio-economic benefits:

1. Reduction of air pollution costs:
  - negative effects on human health,
  - losses on agricultural production,
  - damage to materials,
  - impacts on biodiversity and ecosystems.
2. Reduction of greenhouse gas emissions:
  - sea level rise,
  - effects of energy use,
  - impacts on agriculture,
  - effects on water supply,
  - impacts on health,
  - impacts on ecosystems and biodiversity,
  - extreme weather conditions,

- disasters, that is, disaster risk
3. Reduction of unwanted noise emissions and consequent negative consequences.
  4. Reduction of traffic accidents:
    - material damages,
    - administrative costs,
    - treatment costs,
    - losses on production or on human capital,
    - risk value.
  5. Reduction of congestion.
  6. Reduction of water pollution risk.
  7. Reduction of vibrations and consequent negative consequences.
  8. Reduction of land use and vegetation.
  9. Improving quality of rail system services.
  10. Reduction of running times and train delays in international rail freight transport.
  11. Higher level of information exchange between infrastructure managers and carriers.
  12. Cost reduction for transport companies.
  13. Price competitiveness against other modes of transport.
  14. Improving fluency and reliability of international rail freight transport.
  15. Growth of rail system revenues.
  16. Decrease in road infrastructure maintenance costs.
  17. Increase of infrastructure manager revenues.
  18. Decrease in non-investment subsidies in railway infrastructure from public sources.
  19. Increase in investment subsidies in railway infrastructure modernization.
  20. Ensuring a sustainable development of the Amber RFC countries and the EU countries.

## 12 SWOT ANALYSIS OF AMBER RFC

The Amber RFC will put into operation on 30.01.2019. In order to determine its direction and development, it is important to make the most objective assessment of the current inputs of the internal and external environments by which it is affected. The several methods and tools deal with the strategic planning of which SWOT analysis was selected for the purpose of selecting the strategic direction of the Amber RFC.

### 12.1 Characteristics of SWOT analysis process

Method of SWOT analysis consists in identifying the internal environment of the studied subject using its strengths and weaknesses and in identifying the impact of external environment using opportunities and threats, Based on recognized results a review of internal and external environment analysis will be obtained, while the most appropriate strategy for the studied subject will be made up based on given scores. Elaboration SWOT analysis is conditioned by completion of collection and subsequent evaluation of all available data collected. Then, the created basis of SWOT analysis is qualitatively and quantitatively assessed by independent experts and stakeholders, in this case by individual members of Amber RFC. Without assessment of several experts and stakeholders, SWOT analysis has only subjective character of its maker and it is inconsistent for the adoption of strategic direction and decision-making.

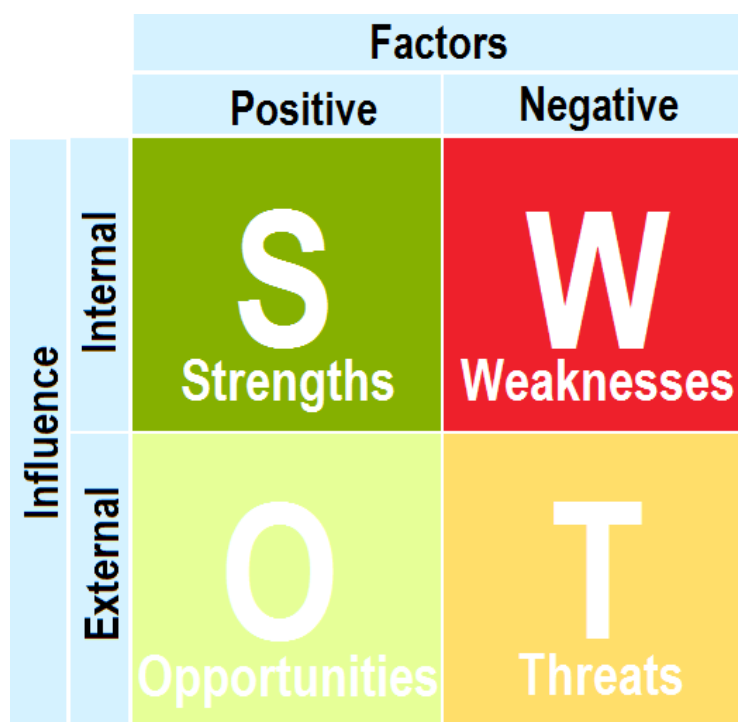


Figure 47: Theoretical graphical representation of SWOT analysis

### **Internal environment analysis S-W**

The goal of the internal environment analysis is to identify the main strengths and weaknesses of the studied subject. Following their analysis, the quantitative scores are assigned to their qualitative importance. It is necessary, as priority, to build the strategy on the recognized strengths through which competitive advantage is achieved. In case the assessed subject has insignificant and negligible strengths, its strategy is to be aimed at reducing the value of weaknesses which may be a potential threat for the subject.

#### **Among the most influential strengths we can include:**

- such strengths which are specific for the studied subject and it is difficult to implement them for other subjects,
- tradition of a particular subject,
- qualified personnel,
- positive image of the subject perceived by customers via annual satisfaction surveys,
- product quality or service quality,
- developing research and development, etc.

**On the other hand, the subject's weaknesses are characterized as critical factors which should be minimized to the lowest possible level. Among the weaknesses we can include:**

- high prices that do not correspond to the product/service quality,
- negative image perceived by customers,
- poor organization and organizational skills of management,
- insufficient adaption of service portfolio to market needs, etc.

### **External environment analysis O – T**

Finding the possibilities for new opportunities is one of the main reasons of the external environment analysis. The market opportunities are defined by three possibilities:

- Enforcing on the market with entirely new product/service (general possibility not directly applicable to Amber RFC).
- Enforcing on the market with existing product/service in innovative way.
- Enforcing on the market with scarce product/service.

Since the opportunities may have different forms on the market, the subject has to ensure their early and correct identification in the methodology of SWOT analysis elaboration. Among the opportunities we can include:

- streamline business processes in the market using available technologies,
- maximum use of offered infrastructure capacities and public resources,
- product innovation using state of the art technologies and customisation according to customer needs,
- drawing subsidies, etc.

The threats (risks) are the opposite of opportunities in the external environment that may have adverse effects on the direction of the studied subject and its development. Among the threats that may affect the company we include, in particular:

- legislative changes or lack of adequate legislative measures,
- lack of harmonised measures in the necessary procedures,
- political, economic, social, cultural, environmental and demographic changes,
- embargoes, tariffs, sanctions.
- new entrants into the market under consideration,
- management of overlapping sections, etc.

## **12.2 SWOT analysis of Amber RFC**

The following four tables give strengths, weaknesses, opportunities and threats of internal and external environment of Amber RFC. In tables, there are assigned importance to each indicator and scores achieved (resulting importance for individual parts of SWOT analysis is an average value of importance assigned by individual parties of SWOT). These two figures are then multiplied, while their product determines the final evaluation of indicator. The data presented in the tables are the resulting average values obtained from the infrastructure managers affected by the Amber RFC, the TMS elaborator and the academic environment.

### **Explanation of Prioritization**

#### **Strengths and weaknesses:**

- Importance. Importance shows how important a strength or a weakness is for the organization as some strengths (weaknesses) might be more important than others. A number from 0.01



(not important) to 0.99 (very important) should be assigned to each strength and weakness. The sum of all weights should equal 1.0,

- **Rating.** A score from 1 to 6 is given to each factor to indicate whether it is a major (6) or a minor (1) strength for the organization. The same rating should be assigned to the weaknesses where -1 would mean a minor weakness and -6 a major weakness,
- **Score.** Score is a result of importance multiplied by rating. It allows prioritizing the strengths and weaknesses. You should rely on your most important strengths and try to convert or defend your weakest parts of the organization.

### **Opportunities and threats:**

- **Importance.** It shows to what extent the external factor might impact the business. Again, the numbers from 0.01 (no impact) to 0.99 (very high impact) should be assigned to each item. The sum of all weights should equal 1.0,
- **Probability.** Probability of occurrence is showing how likely the opportunity or threat will have any impact on business. It should be rated from 1 (low probability) to 6 (high probability). (For Threats -1 (low probability) to -6 (high probability)),
- **Score.** Importance multiplied by probability will give a score by which you'll be able to prioritize opportunities and threats. Pay attention to the factors having the highest score and ignore the factors that will not likely affect your business.

*Table 48: Strengths of Amber RFC*

| <b>S (Strengths)</b>  | <b>Importance</b> | <b>Rating</b> | <b>Score</b> |
|---|-------------------|---------------|--------------|
| Interconnection of railway infrastructure within the countries included in Amber RFC                          | 0,07              | 5             | 0,35         |
| Railway system reliability  | 0,08              | 5             | 0,41         |
| Available information on technical specification of corridor railway lines                                    | 0,04              | 5             | 0,18         |
| Access to the important seaport Koper in the Republic of Slovenia   | 0,10              | 5             | 0,51         |
| Thanks to the corridor strategic location and routing, good connection with other RFC corridors is guaranteed | 0,08              | 5             | 0,41         |
| Existing cooperation between individual infrastructure managers within Amber RFC countries                    | 0,08              | 5             | 0,40         |
| Railway infrastructure safety   | 0,10              | 6             | 0,54         |
| Good technical conditions of railway infrastructure   | 0,08              | 5             | 0,41         |
| Available free capacity   | 0,07              | 5             | 0,39         |
| Connection by rail with countries outside the EU through BY/PL (Brest/Terespol) railway border crossing       | 0,10              | 6             | 0,60         |
| Flexibility of railway infrastructure (e.g. suitable alternative routes)                                      | 0,05              | 6             | 0,28         |
| Schengen area   | 0,03              | 6             | 0,21         |
| Procurement of railway infrastructure capacity from one place C-OSS   | 0,05              | 4             | 0,19         |
| Connection of railway transport with terminals within Amber RFC   | 0,06              | 5             | 0,31         |
| <b>TOTAL</b>  | <b>1</b>          | <b>-</b>      | <b>5,19</b>  |

*Table 49: Weaknesses of Amber RFC*

| <b>W (Weaknesses)</b>  | <b>Importance</b> | <b>Rating</b> | <b>Score</b> |
|--|-------------------|---------------|--------------|
| Insufficient implementation of TEN-T infrastructure minimum standards                        | 0,09              | -4            | -0,38        |
| Enforcement of various interests of infrastructure managers of member states                 | 0,12              | -3            | -0,34        |
| Traffic restrictions related to possession causing temporary capacity constraint             | 0,17              | -5            | -0,78        |
| Reducing the quality of rail freight services provided within Amber RFC                      | 0,14              | -3            | -0,42        |
| Poor technical condition in some sections of railway lines                                   | 0,15              | -5            | -0,69        |
| Bottlenecks of capacity utilization  | 0,10              | -5            | -0,44        |
| Insufficient technical parameters of railway infrastructure – requirements for modernization | 0,11              | -5            | -0,57        |
| Long waiting times at border crossings   | 0,13              | -4            | -0,50        |
| <b>TOTAL</b>   | <b>1</b>          | <b>-</b>      | <b>-4,11</b> |

*Table 50: Opportunities set for SWOT analysis of Amber RFC*

| <b>O (Opportunities)</b>  | <b>Importance</b> | <b>Probability</b> | <b>Score</b> |
|---|-------------------|--------------------|--------------|
| Trend of using more environmentally friendly mode of transport (opportunity for rail transport)                           | 0,08              | 4                  | 0,35         |
| Complete modernization of railway lines which limit the increase of line capacity   | 0,12              | 4                  | 0,51         |
| Investment of railway undertakings in sidings and siding operation  | 0,08              | 4                  | 0,34         |
| Increase in costs of road goods transport, e.g. toll charges  | 0,10              | 5                  | 0,47         |
| Increase in impact of transport policy of individual countries in favour of rail  | 0,10              | 5                  | 0,47         |
| Favourable economic growth of countries included in Amber RFC resulting in increase of import / export                    | 0,12              | 5                  | 0,56         |
| Improving mutual cooperation between RFC corridors  | 0,06              | 5                  | 0,30         |
| Potential for corridor extension to the north of the Republic of Poland towards seaports                                  | 0,08              | 4                  | 0,32         |
| Connection of major economic active regions within the Amber RFC  | 0,09              | 4                  | 0,38         |
| Investment and modernization (e.g. construction of new line, double-tracking, station upgrade-signalling equipment, etc.) | 0,08              | 3                  | 0,23         |
| Connection between inland ports on the Danube in Hungary and Slovakia   | 0,05              | 4                  | 0,21         |
| Connection with the lines in the Czech Republic   | 0,03              | 5                  | 0,17         |
| <b>TOTAL</b>  | <b>1</b>          | <b>-</b>           | <b>4,32</b>  |

Table 51: Threats set for SWOT analysis of Amber RFC

| T (Threats)   | Importance | Probability | Score        |
|---|------------|-------------|--------------|
| Building logistic centres without connection to railway infrastructure              | 0,06       | -3          | -0,17        |
| Lack of qualified personnel in operation  | 0,08       | -4          | -0,37        |
| Insufficient coordination in infrastructure development work                        | 0,09       | -4          | -0,37        |
| Reducing transport volumes of international freight trains                          | 0,10       | -4          | -0,34        |
| Tendency of transport policy of individual countries to rail transport disadvantage | 0,06       | -3          | -0,16        |
| Unfavourable economic development within Amber RFC countries                        | 0,07       | -3          | -0,21        |
| Reducing investment subsidies for rail transport                                    | 0,07       | -4          | -0,30        |
| Reducing non-investment subsidies for rail transport                                | 0,06       | -3          | -0,19        |
| Higher transport time compared to road goods transport                              | 0,10       | -5          | -0,44        |
| Lower flexibility compared to road goods transport                                  | 0,10       | -5          | -0,46        |
| Insufficient coverage of railway corridor routes to cover customer needs            | 0,11       | -5          | -0,57        |
| Stagnation (unsolved problems) in the field of maintenance and modernization        | 0,10       | -2          | -0,25        |
| <b>TOTAL</b>  | <b>1</b>   | <b>-</b>    | <b>-3,82</b> |

### 12.3 Resulting SWOT strategy of the Amber RFC

The quantitative scores were assigned to strengths, weaknesses, opportunities and threats (risks) in SWOT analysis for the Amber RFC. Quantified assessment of internal and external environment analysis needs to be put in comparison of vectors from which we find a particular position which represents model strategy for the Amber RFC.

Based on determining the resultant vector it is possible to determine a strategy:

- offensive,
- defensive,
- union: in case of the Amber RFC, this strategy cannot be applied,
- exit: in case of the Amber RFC, the strategy cannot be applied.

Using quantified evaluation of internal and external environment it was found by comparison of vectors: **Offensive strategy**, as model strategy for the Amber RFC. Graphical representation of matrix of model strategies with initial strategy for the Amber RFC is shown in diagram below.

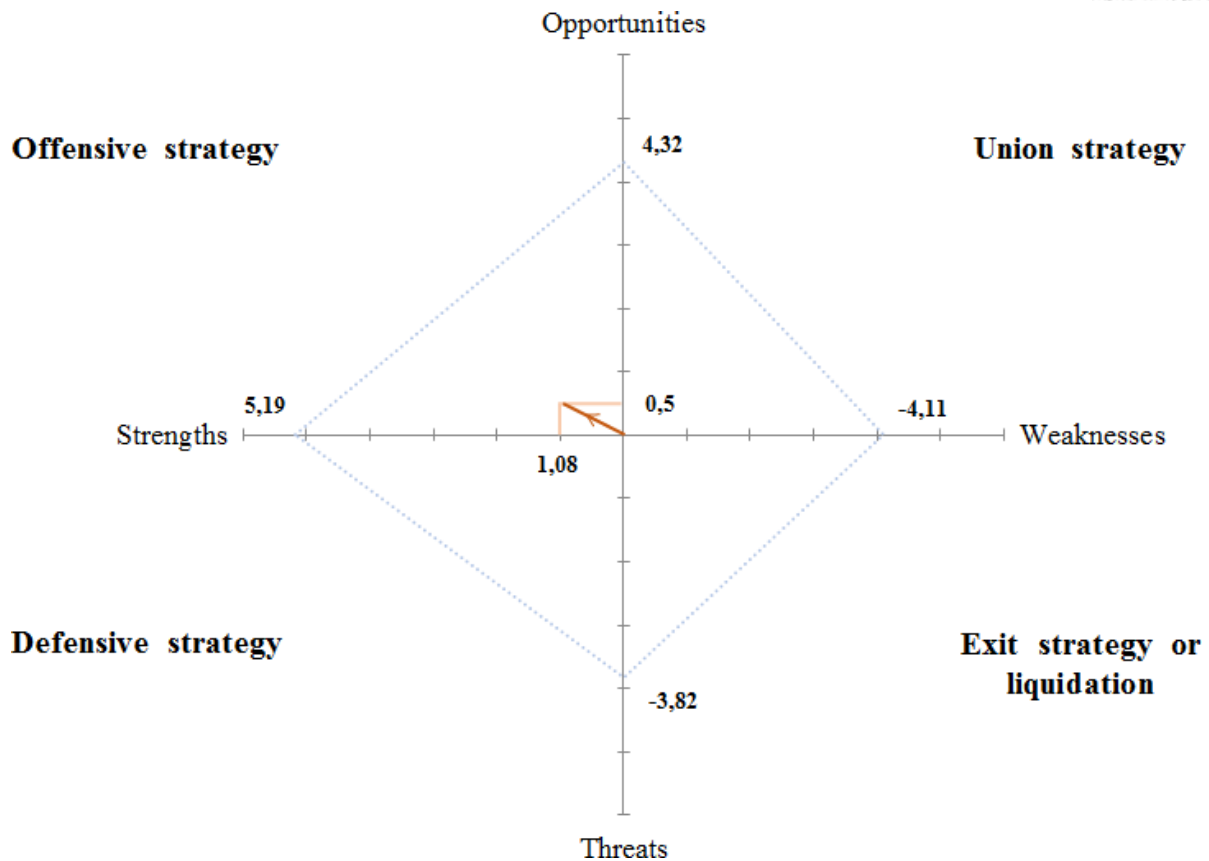


Figure 48: Matrix of model strategies for the Amber RFC

*\*Note: vector routing is the result of the difference between Opportunities and Threats, as well as the difference between Strengths and Weaknesses*

**Offensive strategy** is considered to be the most attractive strategic alternative. It can be used by an entity whose position is ideal with the predominant strengths over the weaknesses. Such an entity is able to use its strengths to realize the opportunities offered by the external environment. However, an entity must monitor its weaknesses and avoid defined risks. Based on the resultant strategy, it is necessary to take the following measures for the Amber RFC:

- increase the reliability of rail system services,
- developing the high-quality and available services of C-OSS,
- developing the cooperation with other RFC corridors,
- support for intermodal transport services,
- reducing the charges for local service trains,
- in operative transport management, to proceed to prioritize international freight trains,
- quality, flexible, reliable and cost-effective services of Koper seaport,
- close cooperation between infrastructure managers,

- coordination of investment projects in railway infrastructure within the Amber RFC lines,
- increased awareness of the corridor, its services and perspectives,
- exchange of information concerning operation, control and possessions,
- measures to reduce the technological times of operations for transport of goods from/to counties outside the EU,
- providing the best resources, e.g. human, IT,
- investment in interoperability,
- exclusive or dominant access to the most capable suppliers of MB Amber RFC.

The above mentioned measures result from the strategy and its characteristics. However, the Amber RFC itself cannot influence all measures mentioned. Therefore, it is necessary that the subjects, that can affect the individual measures, deal with the suggested measures (e.g. the ministries concerned, infrastructure managers, governments of individual countries, EC). The proposed strategic measures resulting from the SWOT analysis results are proposed to be implemented through the method “Attacks on competitive advantages” which is implemented with the aim to take over the market share of weaker competitors or reduce the competitive advantage of strong rivals. The attack is conducted by various methods, e.g. price reduction, effective advertising, marketing communication mix, new services, etc.

## 13 STRATEGIC MAP OF AMBER RFC

In order to fulfil the basic objectives of the Amber RFC, it is necessary to set out the strategic steps for their fulfilment. One of the appropriate methods for creating strategic processes is the Balanced Score Card – BSC. BSC is a complex strategic method that looks at the subject under consideration through four perspectives and their mutual relationships. It is a financial, customer, process, learning and growth perspective. BSC is based on the vision and strategy of the object under consideration and on that basis for each perspective the mission and strategic objectives, to which certain metrics and their target values are assigned, will be determined. All perspectives are logically connected and linked and this method, therefore, provides a complex view of the object under consideration and its performance.

### **Amber RFC main visions are:**

- growth of rail freight transport performances,
- fulfilling the EU transport objectives and reducing the negative external costs of transport,
- strengthening rail freight position within the individual member states of the Amber RFC,
- expand cooperation with rail carriers as well as between IM,
- strengthening and developing the cooperation between RFC corridors,
- maintaining and developing the rail freight services,
- developing the services concerning free capacity allocation,
- fulfilling the basic objectives of the liberalization of rail freight services market.

### **Amber RFC mission consists particularly in:**

- providing and improving the rail freight services (cooperation between IM, provision of important information on access to railway infrastructure, cooperation on sidings, etc.),
- creating a positive perception of rail freight transport and the Amber RFC (participations in various events, etc.),
- development and modernization of railway infrastructure,
- participation in transport policy development within the individual countries of the Amber RFC as well as at the EU level,
- promoting the development of rail freight transport as an environmentally friendly and perspective mode of transport compared to road transport,



- decreasing the transport performances of more environmentally demanding modes of transport,
- available non-discriminatory access to railway infrastructure and its capacity,
- effective transport of goods from/to EU, from/to countries outside the EU,
- reducing public spending,
- high satisfaction of all customers of the Amber RFC.

The following figure shows the BSC strategic map for the Amber corridor. The strategic map is based on the vision and mission of the Amber RFC and its four perspectives.





Figure 49: Map Balanced Score Card of Amber RFC



Continue of Figure 49:



Figure 50: Map Balanced Score Card of Amber RFC



## 14 AMBER RFC MARKETING STRATEGY

The draft for strategic direction of the Amber RFC is contained in chapters 12 and 13. In addition to the drafts in the above mentioned chapters, it is necessary to propose a marketing strategy which main task will be, in the first phase of the Amber RFC operation, its propagation. The chapter deals with a draft of marketing strategy in the field of propagation – marketing communication mix.

The Amber RFC is a provider of services that are characterized by:

- immateriality,
- inseparability,
- heterogeneity,
- impossibility of ownership,
- responsibility,
- longevity.

The draft of marketing communication will include:

- vision,
- mission,
- branding strategy.

The marketing strategy draft itself requires knowledge of the external and internal environment influencing on the Amber RFC. The external environment will be analysed based on the PEST (political, economic, socio-cultural and technological) analysis. The internal environment will then be examined using Porter's Five Forces of Competitive Analysis.

### A) PEST analysis (external environment):

#### 1. Political and legislative impact:

- European Union, European Commission,
- current legislation of the member states on business, transport, tax policy, labour law, sanctions, technical conditions,
- individual interests of the member states and the European Union in the field of transport policy, transport business, technical conditions,
- legislation of countries outside the EU (Ukraine, Belarus, Serbia, Turkey, China),
- international cooperation of the EU countries with countries outside the EU,
- international and internal customs legislation,
- intentions in foreign investment of individual EU countries, the Amber RFC countries, the USA, etc.,

- measures in the field of protection of national producers on the part of EU member states and the European Union,
- international law and its principles.

**2. Economic impacts:**

- economic development of the corridor member states,
- economic development of other EU countries,
- economic development of Serbia, Ukraine, Belarus, China and Turkey,
- economic development of the Czech Republic,
- development of unemployment in the Amber RFC member states and other EU member states,
- amount of investment allocated to the railway infrastructure development in the Amber RFC countries,
- amount of investment allocated to the development of other transport infrastructure in the Amber RFC countries,
- development of international trade,
- development of demand for international goods transport services,
- financial condition of the Amber RFC infrastructure managers,
- financial condition of infrastructure managers of the Amber RFC neighbouring countries.

**3. Socio-cultural impacts:**

- awareness of the population of the needs of greening transport,
- awareness of producers and forwarders of the needs of greening transport,
- population growth in the Amber RFC member states – higher demands on services and consumption,
- population decline in the Amber RFC member states – lower consumption,
- population growth in other EU member states – higher demands on services and consumption,
- population decline in other EU member states – lower consumption,
- change of purchasing behaviour of the population – preferring national products versus favouring substitutes made outside the home country.

**4. Technological and technical impacts:**

- modification of railway infrastructure technical standards,
- modification of technical standards of other modes of transport,
- interoperability of rail system,
- development in the field of railway signalling safety technology,
- development of rail transport means,
- development of transport means of other modes of transport,

- change of technological processes at border crossings,
- development of IT for data exchange in the field of transport services and transport operation,
- pressure on reducing the infrastructure technical restrictions,
- need of transport infrastructure modernization.

**5. Environmental impacts:**

- pressure on reducing the greenhouse gas emissions,
- reducing the transport accidents and associated pollution of natural resources,
- pressure on increasing the energy consumption from renewable energy sources,
- pressure on reducing the energy consumption from fossil fuels.

**B) Porter's Five Forces of Competitive Analysis (internal environment):**

**1. Existing, current competitors:**

- road freight transport,
- air freight transport,
- maritime freight transport in the direction of goods from/to China,
- RFC 5 corridor,
- road infrastructure managers in the Amber RFC member states,
- Gdańsk + Gdynia and Trieste seaports.

**2. Substitution products:**

- road network,
- road freight services,
- air freight services (e.g. consignments transported by intermodal transport: electronics, spare parts, etc.),
- multimodal transport services without the use of rail transport,
- maritime freight services in the direction of goods from/to China,
- allocation of international routes individually through infrastructure managers.

**3. Suppliers of:**

- energies,
- telecommunication and internet services,
- professional studies, surveys and analyses,
- IT and SW equipment,
- support services in the field of rail operation,
- repair services,
- materials of railway superstructure and substructure,
- construction companies carried out the modernization, reconstruction, repair, maintenance and renewal of railway infrastructure,



- office and administrative supplies.

**4. Potential competitors:**

- road freight transport over 12 tonnes,
- road freight transport up to 3,5 tonnes,
- road freight transport from 3,5 to 12 tonnes,
- air freight transport,
- maritime freight transport in the direction of goods from/to China,
- RFC 5 corridor.

**5. Stakeholders:**

- railway undertakings,
- intermodal operators.

These analyses serve for a draft of vision, mission and use of communication mix tools.

The vision is a starting point of the strategic management process and represents a set of specific ideals and priorities of the entity. It is an image of its successful future based on the fundamental values or the philosophy with which the goals and plans of the entity are connected. The vision gives an answer to the question: how will the entity look in the future. The vision must be clearly formulated, realistic and well communicable. The basis of each vision is the result to be achieved in the customer's interest. The specific content of the vision then depends on the entity itself and the sector in which the subject operates. Three basic objectives of vision:

- express the general direction,
- motivate people to move right,
- quickly and effectively coordinate efforts of people.

**Draft of the Amber RFC vision:** Provision of effective, available and flexible services for corridor users on the up-to-date, interoperable and safe railway infrastructure in order to increase the overall attractiveness of rail services and thus to contribute to an increase in rail freight transport performances and subsequent fulfilment of environmental objectives of the EU and the whole human population.

Well formulated mission can be a useful tool for strategy formulation, but also for day-to-day management decisions. The entity's mission presents not only the intention of entity existence itself, but also, towards other entities of market, the standards of behaviour of the whole organization, and, last but not least, the values respected by entity. The mission has the following functions:

- expresses the basic strategic intention of the owners and top management of the organization,

- has an external information character towards the public and stakeholders, suppliers, customers, interest groups, etc.,
- has an internal information character as the basic standard of management and employees behaviour.

**Draft of the Amber corridor mission:** Continuously build quality services for transport of goods, environment and public resources. Provide quality, available and non-discriminatory services to all corridor users and cooperate effectively with terminals. Cooperate with EU authorities, corridor member states authorities, intermodal operators and other RFC corridors. Create full-value mutual business relationships with major suppliers. Contribute to railway infrastructure development in line with customer needs and creation of competitive environment in the European and international transport system.

Brand Amber RFC – is a promise to the customer to provide specific benefits that are related to the product. Brand is name, title, sign, expression or their combination. Its purpose is to distinguish the product or service of one provider or group of providers from competitors. Brand is not created only by a logo, a visual style, a specific product, but also services and service associated with the main product, company and its image and brand communication.

#### **Requirements: Amber RFC brand evaluation**

- short, appropriate graphic processing - fulfilled,
- simply rememberable – fulfilled,
- easily identifiable - fulfilled,
- original, overtime - fulfilled,
- not inspiring negative associations - fulfilled,
- registered and legislatively protected – not fulfilled, need to supplement,
- applicable internationally - fulfilled.

The name of the corridor, including its logo, is recommended to be used in all documents dealing with the issue of the corridor and the RFC corridors, international rail freight transport, legislation, correspondence, commercial relation and marketing communication. The logo and name meet the conditions for the given type of propagation and clearly identify the surveyed corridor. Colours fit to its basic name – the Amber RFC.

The following table contains a draft for the use of marketing communication tools for the Amber RFC based on its main objectives and services provided. At the same time, the marketing communication strategy is designed based on the analysis of external and internal environment of the Amber RFC.

*Table 52: Draft for marketing communication application*

| Point                           | Use | Application  |
|---------------------------------|-----|--|
| Advertising                     | yes | Leaflets, brochures, emails sent to railway undertakings, intermodal operators and forwarders  |
| Sales support                   | no  | -  |
| On-line sales                   | yes | Through the C-OSS office, propagation of C-OSS on websites of infrastructure managers  |
| Public relations                | yes | Through email, social networks, discussion forums  |
| Sponsorship                     | no  | -  |
| On-line marketing communication | yes | Through email, social networks, discussion forums, website, EC websites, websites of infrastructure managers                         |
| Guerrilla marketing             | no  | -  |
| Product placement               | yes | -  |
| Content marketing               | yes | Through email, social networks, discussion forums  |
| Experiential marketing          | yes | Propagation by scientific and professional articles dealing with transport of goods, transport, ecology, savings in social transport |
| Green marketing                 | yes | Environmental benefits published at website, in studies, TMS, promotional products, conferences                                      |

## **15 CONCLUSIONS AND RECOMMENDATIONS**

The aim of the presented transport market study was a comprehensive assessment of transport, traffic, technological and social effectiveness of the Amber RFC. Consequently, on the basis of verified and consistent knowledge available, propose the strategy for the establishment of the Amber RFC. The strategic recommendation itself for the Amber RFC is listed in Chapter 12, while Chapter 13 contains a draft of strategic map for the surveyed corridor. The international rail freight corridor Amber will be established on 30.01.2019 and it should ensure, in particular, coordination between the various parties concerned, more effective transport management, increase awareness and overall quality of rail system services, non-discriminatory access to infrastructure, increase in transport performances, support shift of transport performances from more environmentally demanding modes of transport to rail freight transport as well as improve continuity of transport across member states, focusing on sufficient prioritization of rail freight transport.

On the basis of the economic, transport, traffic and technical analyses carried out, the comparison of modal split and other important qualitative and quantitative transport indicators, we can conclude that the establishment of the Amber RFC is, from socio-economic point of view, justified and necessary for the development of international rail freight services. The socio-economic benefits of the Amber RFC establishment are presented in subchapter 11.1.

The basic routing of the Amber RFC was determined by Commission Implementing Decision (EU) No 2017/177 of 31 January 2017. Another objective of the study was the assessment of the given basic routing according to the Implementing Decision, where the individual routes are divided by importance (TMS results: Koper – Ljubljana- Zalaszentiván/ -Sopron – Csorna/ - Rajka –Bratislava – Leopoldov – Žilina - Katowice/ -Komárom – Budapest/ -Komárom -Budapest – Kelebia (Hungarian-Serbian border)/ -Budapest- Vác – Nové Zámky – Leopoldov/ Budapest- Mezőzombor- Hidasnémeti- Košice- Plaveč – Muszyna- Nowy Sącz /-Tymbark –Podłęże/-Tarnów – Podłęże/ -Podłęże- Tunel- Dęblin- Terespol – (Polish-Belorusian border). A draft of exact routing and technical parameters of the individual lines is contained in Chapter 9. The routing draft itself is based on the research and analysis of the available statistical data.

The routing and geographical location of the Amber RFC provide a sufficient transport potential within the corridor countries, the EU countries as well as new transport opportunities from/to the Serbia and other countries outside the EU examined. In the TMS the routing creates the suitable conditions for corridor extension which is conditioned, in particular, by transport requirements. The analyses of assessing the transport opportunities showed an increase in demand

for transport services, particularly in international trade, with an upward trend in the following period. The research showed the competitiveness of international rail freight services on the Amber RFC lines at the time of transport and charging, compared to road freight transport. However, it is necessary to support services for single wagon load transport which are, inter alia, influenced by the Last mile infrastructure. The average speed of international freight trains will increase due to the Amber RFC services which will contribute to the attractiveness of the rail system services. Based on the routing, the Amber RFC can be included in the EU strategic transport infrastructure. Proven economic development in the examined countries as well as the forecast of transport performance development showed an increase in transport performance after the corridor establishment. The corridor establishment will contribute to meeting the EU transport policy objectives and creating the single European railway area necessary to modal split change. The modal split change will greatly contribute to decrease in social transport costs. At the same time, the sustainable development of the EU countries will be ensured.

Based on the comprehensive results of the presented transport market study, in order to ensure the further development of the single European railway area, fulfilling the EU and the Amber RFC objectives in the field of transport policy, we recommend to:

- provide services planned by the Amber RFC: drafting the international timetable, provision of capacity, one contact point,
- designate the Amber RFC infrastructure based on the results in Chapter 9: classification of individual lines was carried out based on the analysis of transport performances, geographic location, technical parameters of the lines and traffic flows,
- adopt a strategy draft based on the results of the SWOT analysis: since SWOT analysis is a tool for finding strategic direction,
- proceed to measures proposed in the SWOT analysis: the measures proposed in SWOT analysis are based on the current state and should contribute to the fulfilment of the basic objectives of the Amber RFC,
- as part of the strategy, proceed on the basis of the BSC strategic map: the draft of strategic map is based on the current state and the fulfilment of the individual parts of BSC will lead to meet the individual objectives of the Amber RFC (vision, mission, strategic objectives),
- take measures relating to marketing: marketing proposals should contribute to the promotion of the Amber RFC and its basic services,
- create a corridor website and an interactive corridor map: at least to provide the basic information on the Amber RFC, corridor routing, technical characteristics of the lines and corridor services.

Based on the TMS's comprehensive results, in order to further development of the Amber RFC and the fulfilment of its strategic objectives resulting from the corridor mission and vision, we propose the following measures:

- ensure proper and effective maintenance of railway infrastructure included in the Amber RFC – individual infrastructure managers,
- ensure proper and effective transport management, coordination of possessions – individual infrastructure managers of the Amber RFC,
- adaptation of transport management rules to the needs of rail freight transport – individual infrastructure managers of the Amber RFC,
- in ensure proper transport management and capacity allocation,
- increase number and quality of international rail freight capacities - C-OSS office: due to low free capacity on some line sections of the Amber RFC lines,
- increase and adapt the investment resources in modernization of the basic and connecting transport infrastructure within the corridor – Member States,
- start active cooperation with other RFC – the Amber RFC, individual infrastructure managers,
- cooperate permanently and effectively with intermodal operators, railway undertakings and carriers – the Amber RFC,
- complete the information on the Last mile infrastructure of the Amber RFC and take measures for its modernization, reconstruction and support – the Amber RFC, infrastructure managers, countries,
- elaborating a draft of interactive questionnaire available on the Amber RFC internet domain to obtain effective and quick feedback and specification for a particular customer and his/her needs – the Amber RFC and RNE,
- continuously improve the quality of marketing activity, especially marketing communication – the Amber RFC, infrastructure managers, carriers and intermodal operators,
- as appropriate, cooperation with scientific and educational institutions to address strategy and strategic management – the Amber RFC,
- regular evaluation of fulfilment of the Amber RFC main objectives.

Proposal of measures for support of the Amber RFC development and fulfilment of its strategic objectives resulting from its mission and vision in the technical field:

- unification of the traction system within the Amber RFC principal lines (elaborating the analysis and possible implementation and investment plan),



- improving the technical parameters of the principal lines to increase the level of axle load and maximum train length according to TEN-T and AGTC requirements,
- reduce the technological time of consignment dispatch from/to countries outside the EU: change of legislation, transport requirements, harmonization of transport and technical regulations,
- improve the exchange of information between infrastructure managers and railway undertakings.

At EU and international level, to support green rail freight transport, we propose to take the following measures:

- internalisation of negative external costs of transport – the European Parliament and the Council, the European Commission, individual member states,
- extend the network of local and regional intermodal transport terminals and small Marshalling yards that can provide high quality and competitive intermodal transport services – individual member states, the EU,
- initiative and reconsideration of the possibility of harmonizing the rail infrastructure charging model within the lines included in the RFC corridors – individual member state, the EU,
- proceed to reduce transport infrastructure charges for local service trains, siding trains, trains serving terminals – individual infrastructure managers, individual member states based on liberalization charging principles.

These recommendations and suggestions are based on the results of the TMS and empirical knowledge of the professional public, university staff, staff of the infrastructure managers and carriers. The suggestions are intended to ensure a higher quality of railway system services and, in particular, international rail freight services. A well-set and distributed service will contribute to higher demand for rail freight services, effective modal split, savings in negative external costs of transport and sustainable development. This will contribute to fulfilling the vision and mission of the Amber RFC and thus meeting the EU's transport objectives.

## **LIST OF APPENDICES**

- Appendix A – Analysis of rail transport, xls. format
- Appendix B – Supplementary data – Poland
- Appendix C – Supplementary data – Slovakia
- Appendix D – Supplementary data – Hungary
- Appendix E – Supplementary data - Slovenia
- Appendix F – List of Last mile
- Appendix G – Modal split
- Appendix H – Maximum gradient on the Amber RFC lines

### Supplementary data - Poland

The following table provides an analysis of investments in railway and road infrastructure in the Republic of Poland in the period 2014 – 2017.

*Table 1: Analysis of investment subsidies in Poland*

| State expenditures-whole infrastructure               | 2014     | 2015      | 2016      | 2017      |
|---|----------|-----------|-----------|-----------|
| Investment subsidies in mill. PLN (1 EUR = 4,144 PLN) |          |           |           |           |
| rail  | 75,98    | 25,20     | 4 932,59  | 5 750,28  |
| road  | 9 405,46 | 11 488,17 | 15 731,41 | 19 002,74 |

*Source: member of corridor from Poland*

### Supplementary data - Slovakia

Table 1 contains an analysis of the average utilization of maximum capacity offered on ŽSR lines in the period 2013 – 2017.

*Table 1: Analysis of line capacity utilization*

| Description /Year   | 2013  | 2014  | 2015  | 2016  | 2017  |
|---|-------|-------|-------|-------|-------|
| Average share of (in %) use of maximum offered capacity on all corridor lines           | 27,08 | 28,95 | 32,88 | 35,00 | 34,22 |
| Average share of (in %) use of maximum offered capacity on regional lines               | 29,21 | 29,91 | 29,95 | 29,17 | 28,88 |
| Average share of (in %) use of maximum offered capacity on potential lines of Amber RFC | 25,89 | 28,34 | 32,35 | 33,48 | 32,97 |

From the data in Table 1, we can confirm sufficiently free capacity for international trains, certified trains and trains using European rail freight corridors. Sufficiently free capacity is currently demonstrated also on the lines that have potential to be included in the Amber RFC.

Table 2 provides an analysis of average revenues for the use of railway infrastructure for rail passenger and freight transport on the lines that have the potential to be included in the Amber RFC. At the same time, Table 2 contains the list of the planned investment within these lines.

*Table 2: Analysis of average revenues*

| Indicators/Year   | 2013   | 2014   | 2015   | 2016   | 2017   |
|---|--------|--------|--------|--------|--------|
| Average amount of revenues (EUR) from carriers per 1 km of track to be included in corridor for freight transport   | 17 842 | 18 881 | 20 099 | 21 642 | 16 856 |
| Average amount of revenues (EUR) from carriers per 1 km of track to be included in corridor for passenger transport | 22 231 | 22 786 | 25 691 | 25 106 | 18 874 |

*Table 3: Investments in railway infrastructure*

| Expected investments  | Impact of investment   | Expected investment amount (EUR) | Expected investment time span |
|---|--|----------------------------------|-------------------------------|
| Modernization of corridor st. border ČR/SR – Čadca – Krásno nad Kysucou, section Čadca – st. border ČR/SR, 3rd construction                   | Modernization of existing double-track railway line which is a part of the TEN-T network and the European railway corridor no VI. The length of section is 4,904 km  | 83 211 776                       | 2019/2021                     |
| Modernization of corridor st. border ČR/SR – Čadca – Krásno nad Kysucou, section Čadca – Krásno nad Kysucou (out of) 1st and 2nd construction | Modernization of existing double-track railway line which is a part of the TEN-T network and the European railway corridor no VI. The length of section is 9,4 km  | 220 000 000                      | 2021/2023                     |
| Modernization of the railway line Púchov - Žilina, for the line speed up to 160 km/h  | Modernization of the line Púchov – Žilina, for the line speed up to 160 km/h Stage I (Púchov - Považská Teplá)   | 392 720 001                      | 2016/2020                     |
| Completion of Žilina – Teplička marshalling yard and following railway infrastructure at Žilina node, realization                             | Modernization of the railway node Žilina is necessary prerequisite for the full development of a transit railway corridor in the north – south direction meeting the requirements of TSI – technical specifications for interoperability of conventional rail systems in Europe. | 390 723 415                      | 2019/2022                     |

*Table 4: Average charges for railway infrastructure – rail freight transport*

| Line section  | Charges (€)  |  |   |
|---|--|--|---|
|   | Transport of containers  | Transport of chemicals   | Transport of standard goods                                   |
|   | Access charges for intermodal train (ca. 40x40' containers 600 m, 1200 t.) | Access charges for block train (ca. 500 m, 1800 t, chemicals ) | Access charges for single loading wagons (ca. 500 m, 1500 t.) |
| 114 B Čadca - Zwardoń PL                                      | 72,58  | 91,43  | 82,01   |
| 106 D Žilina–Čadca–Mosty u Jablunkova (only to Čadca)         | 117,27   | 145,81   | 131,54  |
| 107 A Muzsyna PL – Plaveč – Kysak                             | 232,74   | 304,34   | 268,54  |
| 109 B Hidasnémeti HU – Čaña – Barca                           | 51,72  | 68,76  | 60,24   |
| 105 A Košice – Kraľovany (len po Kysak)                       | 116,79   | 131,6  | 124,2   |
| D Barca St 1 – Košice nákl.stanica (koľ.101)                  | 66,75  | 70,12  | 68,44   |
| 106 A Kraľovany – Žilina - Púchov (od Žilina zriad. stanica)  | 167,32   | 209,51   | 188,42  |
| 105 A Púchov - Bratislava hlavná stanica                      | 475,86   | 624,69   | 550,27  |
| 128 A Leopoldov – Galanta                                     | 123,22   | 150,89   | 137,06  |
| 120A Szob HU – Štúrovo – Bratislava hl.st. (od Nových Zámkov) | 284,95   | 370,91   | 327,93  |
| 120 B Komárom HU – Komárno – Nové Zámky                       | 119,56   | 151,09   | 135,32  |
| 124 A Komárno – Bratislava-Nové Mesto                         | 252,94   | 324,89   | 288,91  |

### Supplementary data - Hungary

Tables 1 and 3 give an overview of the investment and non-investment subsidies in railway infrastructure of Hungary in the period 2013 – 2017.

Table 1: Analysis of investment subsidies focused on railway infrastructure

| On the lines listed in Appendix A Sheet MÁV Zrt.<br>GYSEV VPE 1 (name of section, railway station, etc.) | Investment subsidies in mill. € |              |               |               |              |
|--|---------------------------------|--------------|---------------|---------------|--------------|
|  | 2013                            | 2014         | 2015          | 2016          | 2017+        |
| <b>MÁV Zrt.</b>  |                                 |              |               |               |              |
| Győr - Ferencváros   | 0,86                            | 2,51         | 0,85          | 2,55          | 1,13         |
| Őriszentpéter s.b. - Zalaszentiván   | 0,32                            | 1,36         | 0,85          | 2,04          | 0,00         |
| Kőbánya felső - Felsőzsolca  | 1,22                            | 2,56         | 2,41          | 4,06          | 1,3          |
| Felsőzsolca - Hidasnémeti s.b.   | 0,00                            | 0,06         | 0,1           | 0,34          | 0,00         |
| Ferencváros - Kelebia s.b.   | 0,54                            | 0,43         | 3,31          | 0,39          | 0,13         |
| Hatvan - Újszász   | 0,35                            | 0,68         | 0,49          | 0,68          | 0,83         |
| Újszász - Újszász elágazás   | 0,01                            | 0,01         | 0,35          | 0,00          | 0,06         |
| Újszász elágazás - Paládicpuszta elágazás  | 0,00                            | 0,00         | 0,11          | 0,00          | 0,02         |
| Paládicpuszta elágazás - Abony elágazás  | 0,03                            | 0,06         | 0,16          | 0,04          | 0,02         |
| Abony elágazás - Nyársapát elágazás  | 0,03                            | 0,00         | 0,00          | 0,00          | 0,00         |
| Nyársapát (incl.)- Városföld (excl.)   | 0,11                            | 0,36         | 0,12          | 0,33          | 0,24         |
| Városföld (incl.) - Kiskunfélegyháza (excl.)   | 0,07                            | 0,16         | 0,05          | 0,16          | 0,17         |
| Kiskunfélegyháza (excl.) - Harkakötöny elágazás (excl.)  | 0,10                            | 0,01         | 0,01          | 0,17          | 0,06         |
| Other  | 78,62                           | 72,58        | 76,6          | 71,17         | 53,14        |
| <b>TOTAL</b>   | <b>82,26</b>                    | <b>80,78</b> | <b>85,41</b>  | <b>81,93</b>  | <b>57,10</b> |
| <b>GYSEV</b>   |                                 |              |               |               |              |
| Rajka s.b. - Hegyeshalom   | 0                               | 0,177        | 2,578         | 0             | 0            |
| Sopron - Győr  | 0                               | 1,472        | 0,306         | 0             | 0            |
| Hegyeshalom - Porpác   | 0,637                           | 4,672        | 39,503        | 0             | 0            |
| Porpác – Szombathely   | 0                               | 0            | 0,224         | 0             | 0            |
| Szombathely - Zalaszentiván  | 0                               | 0,07         | 1,591         | 48,245        | 0            |
| <b>TOTAL</b>   | <b>0,637</b>                    | <b>6,391</b> | <b>44,202</b> | <b>48,245</b> | <b>0</b>     |

Table 2: Analysis of non-investment subsidies

| Non-investment subsidies in mill. EUR | 2013   | 2014   | 2015   | 2016   | 2017   |
|---------------------------------------|--------|--------|--------|--------|--------|
| <b>MÁV Zrt.</b>                       | 138,40 | 140,93 | 149,38 | 145,76 | 128,71 |
| <b>GYSEV</b>                          | 5,036  | 9,269  | 17,627 | N/A    | N/A    |



Tables 3 and 4 contain data on the selected economic and charge indicators of railway infrastructure, separately for GYSEV and MÁV Zrt.

*Table 3: Analysis of selected economic indicators of transport infrastructure – GYSEV*

| Indicators/Year   | 2013   | 2014   | 2015   | 2016   | 2017   |
|---|--------|--------|--------|--------|--------|
| Average amount of revenues (EUR) from carriers per 1 km of track to be included in corridor for freight transport   | 15 645 | 15 870 | 13 429 | 11 035 | 12 911 |
| Average amount of revenues (EUR) from carriers per 1 km of track to be included in corridor for passenger transport | 42 034 | 32 988 | 34 211 | 32 263 | 33 864 |
| Average operational cost (EUR) per 1 km of corridor lines   | 90 107 | 91 948 | 91 282 | 87 811 | 94 224 |
| Average operational cost (EUR) per 1 km of other lines  | 19 839 | 19 161 | 19 559 | 19 074 | 20 190 |
| Average non-investment subsidy from public resources (EUR) per 1 km of railway infrastructure                       | 23 012 | 22 753 | 23 860 | 25 107 | 29 171 |

*Table 4: Analysis of selected economic indicators of transport infrastructure – MÁV Zrt.*

| Indicators/Year   | 2013      | 2014     | 2015     | 2016     | 2017      |
|---|-----------|----------|----------|----------|-----------|
| Average amount of revenues (EUR) from carriers per 1 km of track to be included in corridor for freight transport   | 62 287    | 62 620   | 66 434   | 65 858   | 53 483    |
| Average amount of revenues (EUR) from carriers per 1 km of track to be included in corridor for passenger transport | 131 948   | 129 382  | 135 792  | 139 740  | 103 057   |
| Average operational cost (EUR) per 1 km of corridor lines   | 122 873,2 | 122 953  | 129 438  | 130 645  | 128 137   |
| Average operational cost (EUR) per 1 km of other lines  | 31 775,5  | 29 920,2 | 33 483,1 | 29 327,9 | 35 916,16 |
| Average non-investment subsidy from public resources (EUR) per 1 km of railway infrastructure                       | 19 100    | 19 449   | 20 615   | 20 116   | 17 762    |

### Supplementary data - Slovenia

The following table gives an analysis of capacity utilization of SŽ-I lines in the period 2013 – 2017.

Table 1: Statistical average of capacity utilization

| Description/Year   | 2013  | 2014  | 2015  | 2016  | 2017  |
|--|-------|-------|-------|-------|-------|
| Average share (in %) of use of offered maximum capacity on corridor lines                    | 69,15 | 69,15 | 70,58 | 70,58 | 74,29 |
| Average share (in %) of use of offered maximum capacity on regional lines                    | 52,25 | 52,58 | 53,72 | 53,72 | 55,86 |
| Average share (in %) of use of offered maximum capacity on lines considered in the Amber RFC | 65,17 | 65,17 | 66,00 | 66,00 | 69,34 |

The analysis of statistical capacity utilization showed a gradual increase in utilization of available line capacity on the corridor lines and lines considered for the Amber RFC. The utilization of the line between Divača and Koper is 98% because there are 82 trains/day on this single-track line. At the moment this line doesn't have enough free capacity for foreseen increase in transport performances at Amber RFC. Studies for the construction of the second track on the line Koper – Divača are on going and the upgrade of the line between Divača and Koper is an absolute priority.

Table 2: Analysis of investment subsidies focused on railway infrastructure

| On the lines of the Amber RFC                   | Investment subsidies in mill. € |        |        |       |
|---|---------------------------------|--------|--------|-------|
|   | 2013                            | 2014   | 2015   | 2016  |
| Infrastructure maintenance*                     | 59,69                           | 77,12  | 64,56  | 52,89 |
| Modernization of railway crossings*             | 0,40                            | 0,77   | 0,13   | 0     |
| GSMR*   | 3,83                            | 50,47  | 86,39  | 0     |
| ECTS* (corr D)                                  | 9,46                            | 13,62  | 19,48  | 0     |
| Maintenance works for public benefit*           | 23,98                           | 0,94   | 2,16   | 0     |
| Anti-noise barriers*                            | 0,04                            | 0,41   | 0,69   | 0     |
| Interventions / interventions projects*         | 0,64                            | 0,40   | 0,47   | 0     |
| New railway line Koper - Divača                 | 2,38                            | 1,87   | 1,62   | 0     |
| Upgrading of railway line Pragersko - Hodoš     | 66,64                           | 144,22 | 160,87 | 0     |
| Upgrading of line section Pragersko - Ptuj      | 0,02                            | 0,01   | 0      | 0     |
| Upgrading of line section Poljčane - Pragersko  | 1,51                            | 6,01   | 19,39  | 0     |
| Investment measures - upgrading Koper - Divača  | 46,68                           | 29,90  | 38,05  | 0     |
| Upgrading of line section Dolga gora - Poljčane | 2,00                            | 0      | 26,53  | 0     |
| Upgrading of line section Zidani most - Celje   | 0                               | 3,43   | 2,59   | 0     |
| <b>On other lines</b>                           |                                 |        |        |       |
| Infrastructure maintenance*                     | 0                               | 0      | 0      | 12,41 |
| New railway line Trst - Divača                  | 0,33                            | 1,31   | 1,58   | 0     |
| Modernisation of Kočevje railway line           | 7,32                            | 1,59   | 0,07   | 0     |
| New railway line Ljubljana - Kranj - Jesenice   | 0,33                            | 0,37   | 0,8    | 0     |

\*Ministry of finance of Republic of Slovenia: Explanation of the annual accounts of the SI budgets for year

The analysis of investment in railway infrastructure in the Republic of Slovenia, given in Table 2, showed a significant share of investment directed to the lines to be included in the Amber RFC. Investments directed to railway infrastructure directly affect the quality of rail transport services provided. Therefore, the correct allocation of investment sources to individual railway infrastructure projects is important. This fact applies to all countries of the Amber RFC.

Table 3 contains an analysis of the development of revenues from charges for the use of SŽ-I rail infrastructure in the period 2013 – 2016.

*Table 3: Infrastructure access charges*

| <b>Year</b> | <b>In €</b>  |
|-------------|--------------|
| 2013*       | 9 128 258,98 |
| 2014*       | 9 624 400,08 |
| 2015*       | 9 973 046,49 |
| 2016**      | 9 029 756,00 |

\*source Annual report of Public Agency of the Republic of Slovenia for Railway Transport (AŽP) for 2013 -2015

\*\*at 31st of July 2016 the AŽP finished with the calculation of infrastructure charges and SŽ-Infrastruktura started at 1st of August 2017 with access fee charging

**List of the Last mile of the Amber RFC**

**Republic of Poland**

| Object  | Type of equipment             | Address of equipment                                     | Contact details   |
|---|-------------------------------|--|---|
| <b>Area of Małaszewicze / Terespol</b>                            |                               |  |   |
| PKP Cargo Centrum Logistyczne Małaszewicze                        | Intermodal transport terminal | ul. Kolejarzy 22B<br>21-540 Małaszewicze<br>Poland       | PKP CARGO Centrum Logistyczne<br>Małaszewicze sp. z o.o.<br>T +48 83 343 75 63<br>F +48 83 343 75 63<br>sekretariat@clmalaszewicze.pl<br>www.clmalaszewicze.pl      |
| EUROPORT Małaszewicze Duże  | Intermodal transport terminal | ul. Warszawska 1C,<br>21 540 Małaszewicze Duże<br>Poland | EUROPORT<br>Małaszewicze Duże<br>T + (+48) 83 343 89 59<br>T +48 83 375 03 40<br>biuro@cleuroport.pl<br>www.cleuroport.pl   |
| Terminal przeładunkowy Wólka                                      | Intermodal transport terminal | 21 512 Zalesie<br>Poland                                 | Terminal przeładunkowy Wólka<br>T + 48 22 534 04 13<br>T +48 83 375 04 49<br>info@pkpcc.comsk<br>wolka@tradetrans.pl<br>www.tradetrans.eu                           |
| Transgaz S.A.   | Intermodal transport terminal | 21 512 Zalesie<br>Poland                                 | Transgaz S.A.<br>T +48 83 374-15-37, 374-15-38<br>T +48 600 078 499<br>transgaz@transgaz.pl<br>www.transgaz.pl  |
| <b>Area of Warszawa</b>   |                               |  |   |
| Terminal Kontenerowy Warszawa – PKP Cargo Connect Sp. z o.o.      | Intermodal transport terminal | ul. Marywilska 39<br>03 328 Warszawa<br>Poland           | PKP Cargo Connect Sp. z o.o.<br>T +48 22 534 04 13<br>info@pkpcc.coml<br>www.tradetrans.eu  |
| Loconi Intermodal Terminal Kontenerowy Warszawa                   | Intermodal transport terminal | ul. Jagiellońska 88<br>00 992 Warszawa<br>Poland         | Loconi intermodal Terminal, Warszawa<br>T +48 58 354 71 58<br>T +48 50 21 77 722;<br>T +48 51 57 70 348<br>loconi@loconi.pl<br>depot.waw@loconi.pl<br>www.loconi.pl |
| Polzug Terminal Kontenerowy Pruszków                              | Intermodal transport terminal | ul. Skorupki 5<br>00 546 Warszawa<br>Poland              | Polzug Terminal Kontenerowy Pruszków<br>T +48 22 33 63 400<br>warszawa.info@polzug.pl<br>www.polzug.de  |
| Terminal Kontenerowy Warszawa Główna Towarowa SPEDCONT Sp. z o.o. | Intermodal transport terminal | ul. J. Ordona 2a<br>01-237 Warszawa<br>Poland            | Spedcont<br>Ireneusz Marczak<br>T + 48 22 836 81 31<br>T + 48 42 613 74 23<br>tkwarszawa@spedcont.pl<br>www.spedcont.pl<br>bok@spedcont.pl                          |
| <b>Area of Katowice</b>   |                               |  |   |

|  |                                  |   |  |
|--|----------------------------------|---|--|
| Terminal<br>Kontenerowy Gliwice<br>- PKP CARGO<br>CONNECT Sp. z o.o.         | Intermodal transport<br>terminal | ul. Władysława Reymonta 32<br>44 100 Gliwice<br>Poland      | Terminal Kontenerowy Gliwice - PKP CARGO<br>CONNECT<br>T +48 32 23 18 877<br>info@pkpcc.com<br>e.sobczyk@pkpcc.com   |
| Terminal Sosnowiec<br>Południowy<br>(Spedycja Polska<br>Spedcont Sp. z o.o.) | Intermodal transport<br>terminal | ul. Kościelna 60<br>41-200 Sosnowiec<br>Poland              | Spedcont<br>Krzysztof Ptak<br>T +48 42 613 74 23<br>F +48 32 293 30 63<br>tksosnowiec@spedcont.pl<br>bok@spedcont.pl<br>www.spedcont.pl  |
| Euroterminal<br>Sławków  | Intermodal transport<br>terminal | CHL Groniec<br>41-260 Sławków<br>Poland                     | Euroterminal Sławków<br>T +48 32 71 42 400<br>T +48 32 714 24 54<br>info@euroterminal.pl<br>www.euroterminal.pl  |
| Polzug Terminal<br>Dąbrowa Górnicza  | Intermodal transport<br>terminal | ul. Koksownicza 6<br>42 523 Dąbrowa Górnicza<br>Poland      | Polzug Terminal Dąbrowa Górnicza.<br>T +48 32 792 70 91<br>T +48 32 75 01 570<br>dabrowa.terminal@polzug.pl<br>www.polzug.de   |
| PCC Intermodal -<br>Terminal PCC<br>Gliwice                                  | Intermodal transport<br>terminal | Portowa 28<br>44 100 Gliwice<br>Poland                      | PCC Intermodal S.A. Terminal<br>T + 48 32 30 18 471<br>depot@ppc.eu<br>www.pccintermodal.pl  |
| Brzeski Terminal<br>Kontenerowy –<br>Karpień sp. z o.o.                      | Intermodal transport<br>terminal | ul. Przemysłowa 6<br>32 800 Brzesko<br>Poland               | Brzeski Terminal Kontenerowy – Karpień<br>T +48 14 68 45 050<br>T +48 784 497 327<br>biuro@karpień.info.pl<br>info@karpień.info.pl<br>www.karpień.info.pl                            |
| Terminal<br>kontenerowy<br>Włosienica  | Intermodal transport<br>terminal | ul. Długa 1<br>32 642 Włosienica<br>Poland                  | Terminal kontenerowy Włosienica<br>T + 48 33 84 29 001<br>T + 48 53 79 99 735<br>railpolska@railpolska.pl<br>mariusz.bialek@railpolska.pl<br>www.balticrail.com<br>www.railpolska.pl |
| PCC INTERMODAL<br>- Terminal<br>Kolbuszowa                                   | Intermodal transport<br>terminal | ul. Ks. Ludwika Rucyki 3C<br>36 100<br>Kolbuszowa<br>Poland | PCC INTERMODAL<br>T +48 58 58 58 200<br>info.intermodal@pcc.eu<br>terminal.debica@pcc.eu   |
| Lubelski Terminal<br>Kontenerowy   | Intermodal transport<br>terminal | Drzewce 1<br>24 150 Nałęczów<br>Poland                      | Lubelski Terminal Kontenerowy<br>T +48 60 24 74 641<br>biuro@ltk-intermodal.pl<br>Darek@ltk-intermodal.pl  |
| Erontrans Terminal<br>Kontenerowy w<br>Radomsku                              | Intermodal transport<br>terminal | ul. Młodzowska 3<br>97 500 Radomsko<br>Poland               | Erontrans Terminal Kontenerowy<br>T +48 58 773 93 00<br>erontrans@erontrans.pl   |
| Loconi Intermodal<br>S.A. Terminal<br>Kontenerowy<br>Radomsko                | Intermodal transport<br>terminal | ul. Kraszewskiego 36<br>97 500 Radomsko<br>Poland           | Loconi Intermodal S.A<br>T +48 502 177 614<br>loconi@loconi.pl<br>depot.rad@loconi.pl  |

|  |                               |   |  |
|--|-------------------------------|---|--|
| Erontrans Terminal Kontenerowy w Strykowie | Intermodal transport terminal | ul. Batorego 27<br>95 010 Stryków<br>Poland | Erontrans Terminal Kontenerowy<br>T +48 58 773 93 00<br>erontrans@erontrans.pl                   |
| Terminal Kontenerowy Łódź Chojny           | Intermodal transport terminal | ul. Śląska 3A<br>93 155 Łódź<br>Poland      | Terminal Kontenerowy Łódź Chojny<br>T +48 502 177 614<br>loconi@loconi.pl<br>depot.lcj@loconi.pl |
| SPEDCONT Terminal Kontenerowy Łódź Olechów | Intermodal transport terminal | ul. Tomaszowska 60<br>93 235 Łódź<br>Poland | SPEDCONT Terminal<br>T +48 42 613 74 23<br>bok@spedcont.pl<br>sekretariat@spedcont.pl            |

## Slovak Republic

| Object                      | Type of equipment             | Address of equipment  | Contact details   |
|-----------------------------|-------------------------------|---|---|
| <b>Bratislava</b>           |                               |   |   |
| Bratislava Palenisko        | Intermodal transport terminal | Pribinova 24<br>82109 Bratislava<br>Slovakia                            | SPaP a.s.<br>T +421 2 58271 111, F +421 2 58271 114<br>spap@spap.sk<br>www.spap.sk  |
| Bratislava<br>UNS/ Slovnaft | Terminal                      | Vlečka Slovnaft, a.s.<br>Vlčie hrdlo 1<br>824 12 Bratislava<br>Slovakia | Slovnaft a.s., Bratislava<br>Ing. Ján Čerepán<br>jan.cerepan@slovnaft.sk  |
| UKV Terminal Bratislava ÚNS | Intermodal transport terminal | Lúčna ul. 12<br>82109 Bratislava<br>Slovakia                            | Rail Cargo Operator - CSKD s.r.o.<br>František Papuga<br>T +421 903 744 857<br>F +421 903 744 857<br>papuga@intrans.sk<br>www.railcargo.com |
| Bratislava východ           | Marshalling yard              |   | www.zsr.sk  |
| Devínska Nova Ves           | Marshalling yard              |   | www.zsr.sk  |
| Dunajská Streda             | Intermodal transport terminal | Povodská 18<br>92901 Dunajská Streda<br>Slovakia                        | Metrans (Danubia) a.s.<br>Mr. Jiri Samek<br>T +420 267 293 102<br>samek@metrans.cz<br>www.metrans.eu  |
| Nové Zámky                  | Marshalling yard              |   | www.zsr.sk  |
| Komárno zr.st.              | Marshalling yard              |   | www.zsr.sk  |
| Štúrovo                     | Marshalling yard              |   | www.zsr.sk  |
| Terminál Žilina             | Intermodal transport terminal | Bratislavská cesta 60<br>010 01 Žilina<br>Slovakia                      | Rail Cargo Austria AG<br>Fagan Miroslav<br>T +421-903-507-205<br>fagan@intrans.sk<br>www.railcargo.com/de                                   |
| Terminál Košice             | Intermodal transport terminal | Areál prekladisko Haniska<br>040 66 Košice<br>Slovakia                  | Metrans (Danubia) a.s.<br>Jiri Samek<br>T +420 267 293 102<br>samek@metrans.cz<br>www.metrans.eu  |



## Hungary

| Object                          | Type of equipment             | Address of equipment                               | Contact details  |
|---------------------------------|-------------------------------|--|--|
| <b>Sopron</b>                   |                               |  |  |
| Sopron Terminal                 | Intermodal transport terminal | Ipar krt. 21<br>9400 Sopron<br>Hungary             | Gysev Cargo Zrt<br>Tóth Péter<br>T 0036 99 577161<br>F 0036 99 577334<br><a href="mailto:toth.peter@gysevcargo.hu">toth.peter@gysevcargo.hu</a><br><a href="http://www.gysevcargo.hu">www.gysevcargo.hu</a>                      |
| Railport Sopron                 | Railport/Rail logistic centre | Sopron<br>Hungary                                  | DB Schenker Rail <a href="http://dbschenker.hafas.de">dbschenker.hafas.de</a>  |
| Logistics Service Centre Sopron | Railport/Rail logistic centre | Ipar körút<br>219400 Sopron<br>Hungary             | GysevCargo László Cseh<br>T +36(99)517 267 or 427, F +36(99)517 314<br><a href="mailto:cseh.laszlo@gysevcargo.hu">cseh.laszlo@gysevcargo.hu</a><br><a href="http://www.gysevcargo.hu">www.gysevcargo.hu</a>                      |
| <b>Győr</b>                     |                               |  |  |
| Terminal ÁTI Győr               | Intermodal transport terminal | Kandó K. u. 17<br>9025 Győr<br>Hungary             | ÁTI DEPO ZRT., T +36 96 512 991<br><a href="http://www.atidepot.hu">www.atidepot.hu</a>  |
| Port of Győr-Gönyű              | Intermodal transport terminal | Kikötő 1 H-9011<br>Győr-Károlyháza<br>Hungary      | Kikötő Zrt.<br>Mr. Ákos Pintér T +36 96 544 200<br>F +36 96 544 204<br><a href="mailto:pinterportofgyor.hu">pinterportofgyor.hu</a>  |
| Railport Győr                   | Railport/Rail logistic centre | Győr<br>Hungary                                    | DB Schenker Rail <a href="http://dbschenker.hafas.de">dbschenker.hafas.de</a>  |
| Győr                            | Marshalling yard              |  | -  |
| Hegyesalom                      | Marshalling yard              |  | -  |
| Komárom                         | Marshalling yard              |  | -  |
| Miskolc                         | Marshalling yard              |  | -  |
| <b>Budapest</b>                 |                               |  |  |
| Budapest Szabadkikötő           | Terminal                      | Weiss Manfréd út 5-7<br>H-1211 Budapest<br>Hungary | T +36 1 278 3102<br>F + 36 1 276 3978<br><a href="mailto:info@bszl.hu">info@bszl.hu</a>  |
| Budapest BILK                   | Intermodal transport terminal | Európa útca.<br>4 1239 Budapest<br>Hungary         | BILK Kombiterminal Co. Ltd.<br>Mr. Istvan Huszti<br>T +36 1 289 6000<br>F +36 1 289 6060<br><a href="mailto:bilkkombi@bilkkombi.hu">bilkkombi@bilkkombi.hu</a><br><a href="http://www.railcargobilk.hu">www.railcargobilk.hu</a> |
| Ferencváros                     | Marshalling yard              |  | -  |

## Republic of Slovenia

| Object                       | Type of equipment             | Address of equipment  | Contact details  |
|------------------------------|-------------------------------|---|--|
| Luka Koper – Port of Koper   | Intermodal transport terminal | Luka Koper d.d.<br>Vojkovo nabrežje<br>6501 Koper<br>Slovenia | Luka Koper d.d.<br>Andrej Cah<br>T +386 5 6656 905<br><a href="mailto:Andrej.cah@luka-kp.si">Andrej.cah@luka-kp.si</a><br><a href="http://www.luka-kp.si">www.luka-kp.si</a> |
| <b>Ljubljana</b>             |                               |   |  |
| Ljubljana Container Terminal | Intermodal transport terminal | Letališka 14<br>1000 Ljubljana                                | Slovenske železnice - SŽ-TP d.o.o.<br>Robert Gaber Roman Bricelj   |

|                 |                                   |   |   |
|-----------------|-----------------------------------|---|---|
|                 |                                   | Slovenia  | T +00386 1 29 13136, 12620<br>F +386 1 29 12 619<br>robert.gaber@slo-zeleznice.si<br><a href="mailto:roman.bricelj@slo-zeleznice.si">roman.bricelj@slo-zeleznice.si</a><br><a href="http://www.slo-zeleznice.si/en">www.slo-zeleznice.si/en</a>   |
| Ljubljana Zalog | Marshalling yard                  |   | Slovenske železnice - SŽ-TP d.o.o.<br><a href="http://www.slo-zeleznice.si/en">www.slo-zeleznice.si/en</a>  |
| Maribor         | Land Terminal<br>Marshalling yard | Vodovodna ul.34<br>2000 Maribor<br>Slovenia     | Slovenske železnice - SŽ-TP d.o.o.<br>Robert Gaber<br>T +00386 1 29 13136<br>F +386 1 29 12 619<br>robert.gaber@slo-zeleznice.si<br><a href="http://www.slo-zeleznice.si/en">www.slo-zeleznice.si/en</a>  |
| Celje           | Land Terminal<br>Marshalling yard | Kidričeva ulica 34<br>3000 Celje<br>Slovenia    | Slovenske železnice - SŽ-TP d.o.o.<br>Robert Gaber<br>T +00386 1 29 13136<br>F +386 1 29 12 619<br>robert.gaber@slo-zeleznice.si<br><a href="http://www.slo-zeleznice.si/en">www.slo-zeleznice.si/en</a>  |
| Sežana          | Private Terminal                  | Partizanska cesta 79<br>6210 Sežana<br>Slovenia | Adria terminali, d.o.o.<br>Aleš Miklavac<br>T 00 386 5 731 22 01<br><a href="mailto:ales.miklavac@luka-kp.si">ales.miklavac@luka-kp.si</a><br><a href="http://www.adria-terminali.si/">http://www.adria-terminali.si/</a>   |
| Novo mesto      | Private Terminal                  | Belokranjska 4<br>8000 Novo mesto<br>Slovenia   | Revoz, podjetje za proizvodnjo in<br>komercializacijo avtomobilov Novo mesto, d.d.<br>(shortened Revoz, d.d.)<br>Janez Rom<br>T 00 386 7 331 50 00<br><a href="mailto:janez.rom@renault.com">janez.rom@renault.com</a><br><a href="http://www.revoz.si/en/">http://www.revoz.si/en/</a> |
| Velenje         | Private Terminal                  | Partizanska 12<br>3320 Velenje<br>Slovenia      | Gorenje, gospodinjski aparati, d.d.<br>(shortened Gorenje, d.d.)<br>Slavica Papinutti<br>T 00 386 3 899 10 00<br><a href="mailto:slavica.papinutti@gorenje.com">slavica.papinutti@gorenje.com</a><br><a href="http://www.gorenje.co.uk/">http://www.gorenje.co.uk/</a>                  |

## Modal split

### a. Comparison of modal split in passenger transport in Poland

| Year | Railway transport |      | Air transport |      | Road transport (Passenger cars) |       | Road transport (Motor coaches, buses and trolley buses) |       | Total mill. pkm |
|------|-------------------|------|---------------|------|---------------------------------|-------|---|-------|-----------------|
|      | mill. pkm         | %    | mill. pkm     | %    | mill. pkm                       | %     | mill. pkm   | %     |                 |
| 2010 | 17 921            | 6,98 | 8 273         | 3,22 | 188 810                         | 73,57 | 41 651  | 16,23 | 256 655,00      |
| 2012 | 17 826            | 6,90 | 11 864        | 4,59 | 189 324                         | 73,26 | 39 419  | 15,25 | 258 433,00      |
| 2014 | 16 015            | 6,02 | 13 811        | 5,19 | 197 032                         | 74,07 | 39 158  | 14,72 | 266 016,00      |
| 2015 | 17 367            | 6,46 | 13 486        | 5,01 | 200 570                         | 74,56 | 37 580  | 13,97 | 269 003,00      |
| 2016 | 19 175            | 6,96 | 15 591        | 5,66 | 203 783                         | 74,02 | 36 774  | 13,36 | 275 323,00      |

Source: Statistics Poland /www.stat.gov.pl/, Transport – activity results in 2016

### b. Comparison of modal split in freight transport in Poland

| Year | Railway transport |      | Road transport |      | Inland waterways transport |     | Maritime transport |     | Pipeline transport |     | Air transport |      | Total mill. tkm |
|------|-------------------|------|----------------|------|----------------------------|-----|--------------------|-----|--------------------|-----|---------------|------|-----------------|
|      | mill. tkm         | %    | mill. tkm      | %    | mill. tkm                  | %   | mill. tkm          | %   | mill. tkm          | %   | mill. tkm     | %    |                 |
| 2010 | 48 795            | 15,8 | 214 204        | 69,5 | 1 030                      | 0,3 | 19 773             | 6,4 | 24 157             | 7,8 | 114           | 0,04 | 308 073         |
| 2012 | 48 903            | 15,0 | 233 310        | 71,6 | 815                        | 0,3 | 20 299             | 6,2 | 22 325             | 6,9 | 123           | 0,04 | 325 775         |
| 2014 | 50 073            | 14,4 | 262 860        | 75,5 | 779                        | 0,2 | 13 621             | 3,9 | 20 543             | 5,9 | 146           | 0,04 | 348 022         |
| 2015 | 50 603            | 14,0 | 273 107        | 75,7 | 2 187                      | 0,6 | 12 739             | 3,5 | 21 843             | 6,1 | 156           | 0,04 | 360 635         |
| 2016 | 50 650            | 13,1 | 303 560        | 78,7 | 832                        | 0,2 | 8 242              | 2,1 | 22 204             | 5,8 | 190           | 0,05 | 385 678         |

Source: Statistics Poland /www.stat.gov.pl/, Transport – activity results in 2016

### c. Comparison of modal split in passenger transport in Slovakia

| Year | Railway transport |      | Air transport |      | Inland waterways transport |      | Individual road transport |       | Road public transport |       | Urban public transport |      | Total mill. pkm |
|------|-------------------|------|---------------|------|----------------------------|------|---------------------------|-------|-----------------------|-------|------------------------|------|-----------------|
|      | mill. pkm         | %    | mill. pkm     | %    | mill. pkm                  | %    | mill. pkm                 | %     | mill. pkm             | %     | mill. pkm              | %    |                 |
| 2010 | 2309              | 6,49 | 835           | 2,35 | 3                          | 0,01 | 26 879                    | 75,54 | 4 436                 | 12,47 | 1 119                  | 3,14 | 35 581          |
| 2012 | 2500              | 6,93 | 939           | 2,60 | 4                          | 0,01 | 26 900                    | 74,59 | 4 584                 | 12,71 | 1 137                  | 3,15 | 36 064          |
| 2014 | 2583              | 7,11 | 895           | 2,46 | 11                         | 0,03 | 27 251                    | 74,97 | 4 495                 | 12,37 | 1 115                  | 3,07 | 36 350          |
| 2015 | 3411              | 9,08 | 978           | 2,60 | 13                         | 0,03 | 27 531                    | 73,32 | 4 499                 | 11,98 | 1 119                  | 2,98 | 37 551          |
| 2016 | 3595              | 9,39 | 651           | 1,70 | 8                          | 0,02 | 27 836                    | 72,71 | 4 996                 | 13,05 | 1 197                  | 3,13 | 38 283          |

Source: Statistical office of the SR /www.statistics.sk/, EC - Statistical pocketbook 2017

### d. Comparison of modal split in freight transport in Slovakia

| Year | Road transport |       | Railway transport |       | Waterways transport |      | Air transport |      | Pipeline transport |       | Total mill. tkm |
|------|----------------|-------|-------------------|-------|---------------------|------|---------------|------|--------------------|-------|-----------------|
|      | mill. tkm      | %     | mill. tkm         | %     | mill. tkm           | %    | mill. tkm     | %    | mill. tkm          | %     |                 |
| 2010 | 27 411         | 64,22 | 8 105             | 18,99 | 2166                | 5,07 | 0,008         | 0,00 | 5000               | 11,71 | 42 682,01       |
| 2012 | 29 504         | 69,63 | 7 591             | 17,91 | 1078                | 2,54 | 0,008         | 0,00 | 4200               | 9,91  | 42 373,01       |
| 2014 | 31 304         | 69,03 | 8 829             | 19,47 | 684                 | 1,51 | 31,597        | 0,07 | 4500               | 9,92  | 45 348,60       |
| 2015 | 33 525         | 70,22 | 8 439             | 17,68 | 674                 | 1,41 | 106,833       | 0,22 | 5 000              | 10,47 | 47 744,83       |
| 2016 | 36 106         | 70,69 | 9 111             | 17,84 | 740                 | 1,45 | 117,981       | 0,23 | 5000               | 9,79  | 51 074,98       |

Source: Statistical office of the SR /www.statistics.sk/

e. Comparison of modal split in passenger transport in Hungary

| Rok  | Railway transport |      | Inland waterways transport |      | Road transport |       | Air transport |      | Total mill. pkm |
|------|-------------------|------|----------------------------|------|----------------|-------|---------------|------|-----------------|
|      | mill. pkm         | %    | mill. pkm                  | %    | mill. pkm      | %     | mill. pkm     | %    |                 |
| 2010 | 7 692             | 9,36 | 14                         | 0,02 | 68 845         | 83,82 | 5 586         | 6,80 | 82 137          |
| 2012 | 7 806             | 9,83 | 11                         | 0,01 | 68 661         | 86,46 | 2 934         | 3,69 | 79 412          |
| 2014 | 7 738             | 9,41 | 9                          | 0,01 | 70 163         | 85,32 | 4 323         | 5,26 | 82 233          |
| 2015 | 7 609             | 8,98 | 9                          | 0,01 | 72 221         | 85,25 | 4 875         | 5,75 | 84 714          |
| 2016 | 7 653             | 8,70 | 10                         | 0,01 | 74 300         | 84,44 | 6 032         | 6,85 | 87 995          |

Source: Hungarian Central Statistical Office /www.ksh.hu/

f. Comparison of modal split in freight transport in Hungary

| Year | Road transport |       | Railway transport |       | Inland waterways transport |      | Pipeline transport |       | Total mill. tkm |
|------|----------------|-------|-------------------|-------|----------------------------|------|--------------------|-------|-----------------|
|      | mill. tkm      | %     | mill. tkm         | %     | mill. tkm                  | %    | mill. tkm          | %     |                 |
| 2010 | 33 721         | 66,71 | 8 809             | 17,43 | 2 393                      | 4,73 | 5623               | 11,12 | 50 546          |
| 2012 | 33 735         | 66,47 | 9 230             | 18,19 | 1 982                      | 3,91 | 5802               | 11,43 | 50 749          |
| 2014 | 37 517         | 67,86 | 10 158            | 18,37 | 1 811                      | 3,28 | 5801               | 10,49 | 55 287          |
| 2015 | 38 352         | 69,11 | 10 010            | 18,04 | 1 824                      | 3,29 | 5 305              | 9,56  | 55 491          |
| 2016 | 40 006         | 68,55 | 10 528            | 18,04 | 1 975                      | 3,38 | 5850               | 10,02 | 58 359          |

Source: Hungarian Central Statistical Office /www.ksh.hu/, Eurostat, EC – Statistical pocketbook 2017

g. Comparison of modal split in passenger transport in Slovenia

| Year | Passenger cars |      | Buses and Coaches |      | Railways  |     | Tram and Metro |      | Total mill. pkm |
|------|----------------|------|-------------------|------|-----------|-----|----------------|------|-----------------|
|      | mill. pkm      | %    | mill. pkm         | %    | mill. pkm | %   | mill. pkm      | %    |                 |
| 2010 | 25 600         | 83,0 | 3 200             | 10,4 | 813       | 2,6 | 1 226          | 3,98 | 30 839,00       |
| 2012 | 25300          | 83,5 | 3 200             | 10,6 | 742       | 2,4 | 1 060          | 3,50 | 30 302,00       |
| 2014 | 25600          | 82,9 | 3 400             | 11,0 | 697       | 2,3 | 1 179          | 3,82 | 30 876,00       |
| 2015 | 26 000         | 82,2 | 3 600             | 11,4 | 709       | 2,2 | 1 332          | 4,21 | 31 641,00       |

Source: Republika Slovenija –Statistični Urad /www.stat.si/, Eurostat, EC – Statistical pocketbook 2017

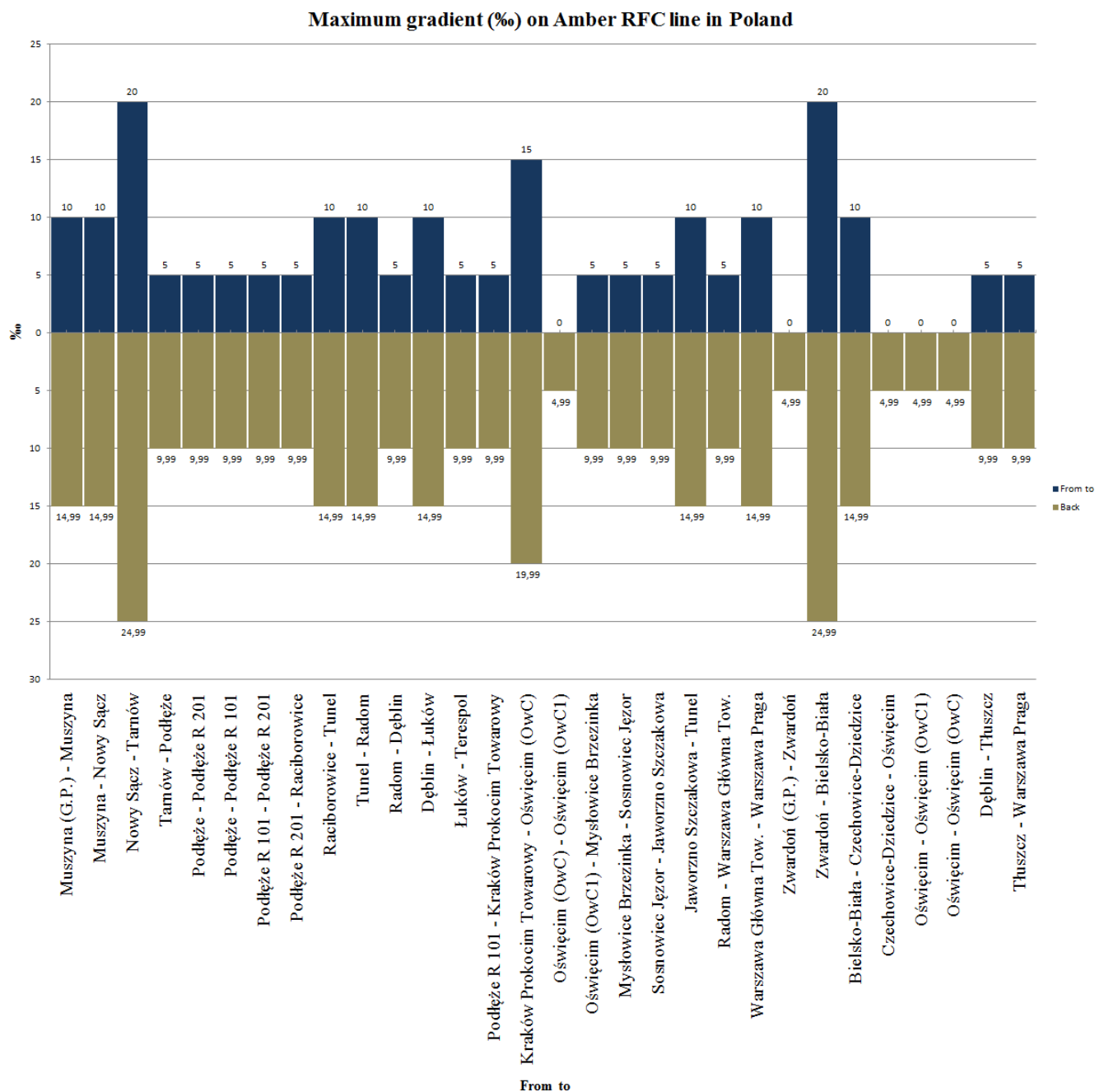
h. Comparison of modal split in freight transport in Slovenia

| Year | Road transport |       | Railway transport |       | Air transport |      | Total mill. tkm |
|------|----------------|-------|-------------------|-------|---------------|------|-----------------|
|      | mill. tkm      | %     | mill. tkm         | %     | mill. tkm     | %    |                 |
| 2010 | 15 931         | 82,32 | 3421              | 17,68 | 1,5           | 0,01 | 19 353,5        |
| 2012 | 15 888         | 82,07 | 3470              | 17,92 | 1,1           | 0,01 | 19 359,1        |
| 2014 | 16 273         | 79,83 | 4110              | 20,16 | 1,1           | 0,01 | 20 384,1        |
| 2015 | 17 909         | 81,09 | 4175              | 18,90 | 1             | 0,00 | 22 088,1        |
| 2016 | 18 707         | 81,10 | 4360              | 18,89 | 0,9           | 0,00 | 23 075,1        |

Source: Republika Slovenija –Statistični Urad /www.stat.si/, Eurostat

## Maximum gradient on the Amber RFC lines

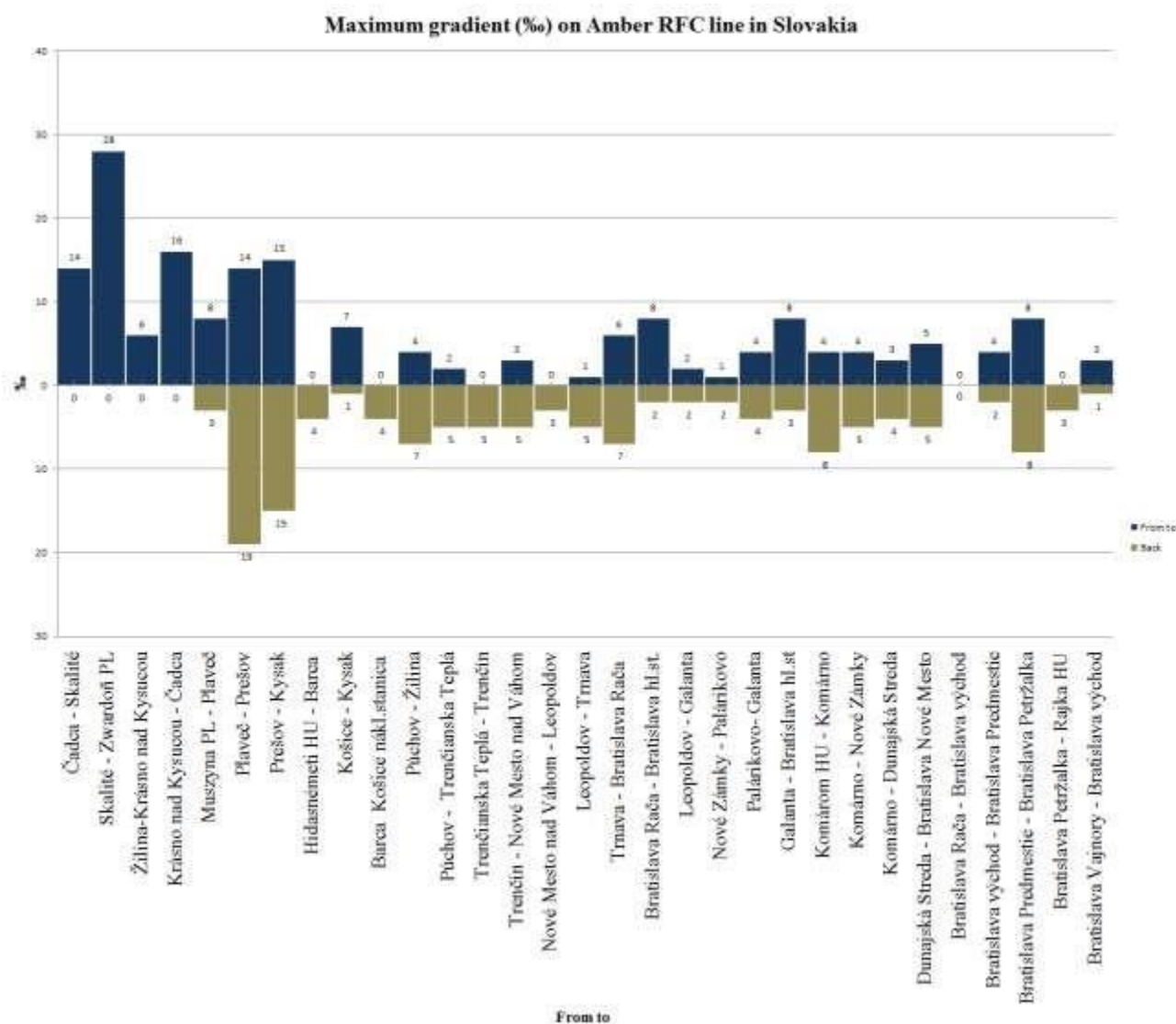
### Gradient in Poland



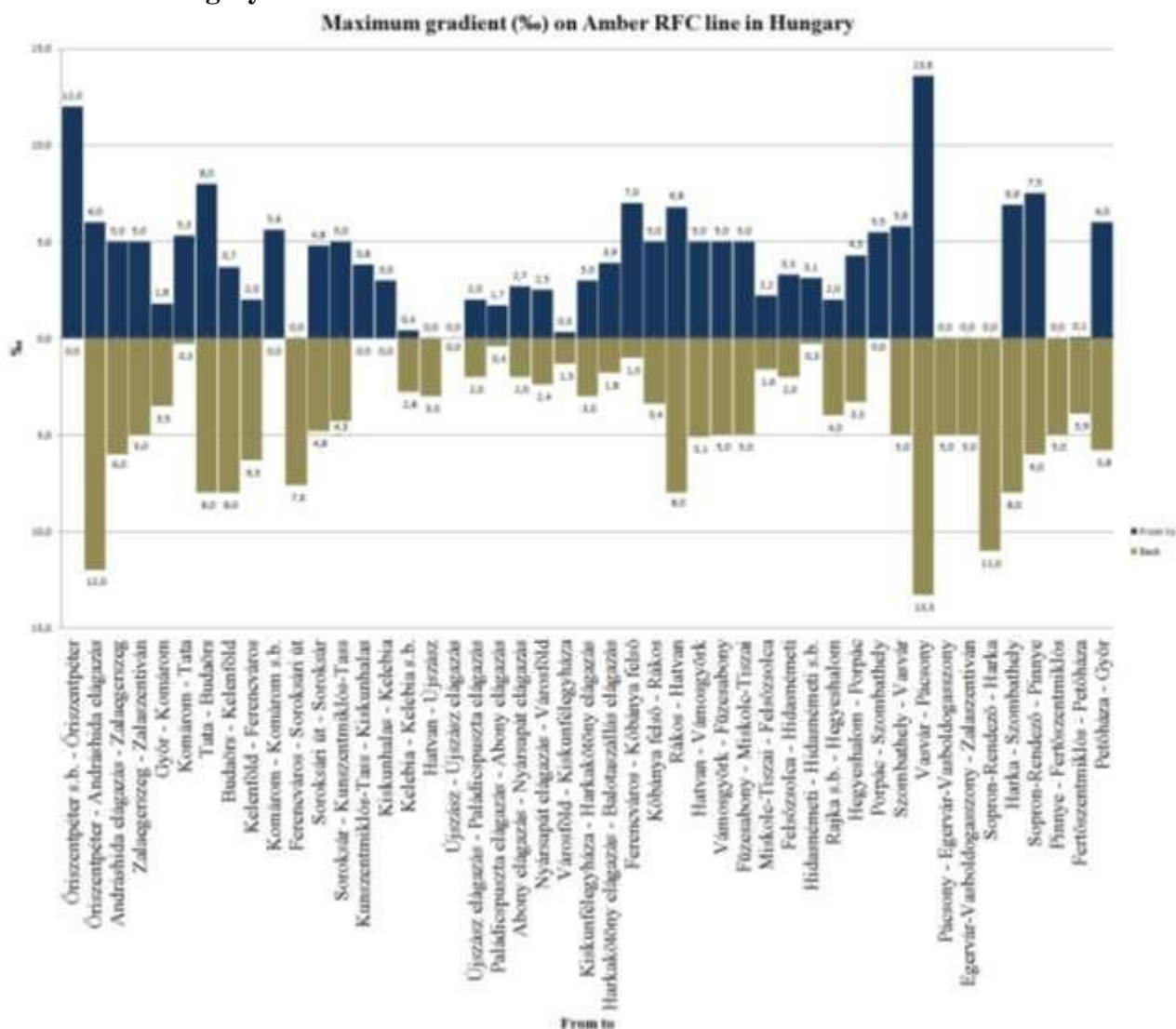




## Gradient in Slovakia

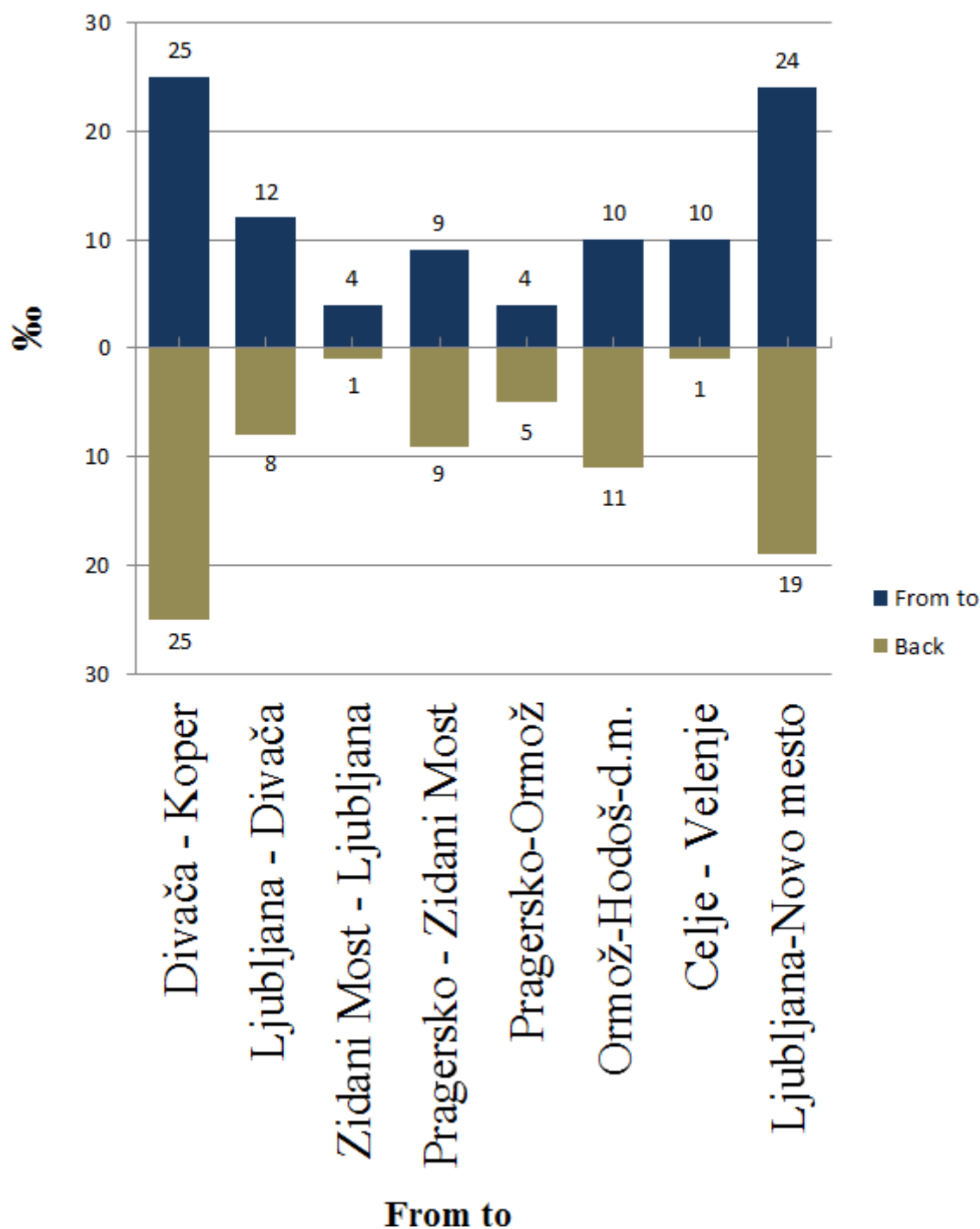


## Gradient in Hungary



## Gradient in Slovenia

### Maximum gradient (‰) on Amber RFC line in Slovenia



# Assessment of KPIs for TT2020



## Outcome from the MB meeting why KPIs are needed for:

- planning and setting RFC objectives
- steering RFC business activities
- increasing the added value and the quality of international rail freight
- assessing the achievement of objectives
- achieving the customers' expectations and
- preparing useful reports

in order to assess the overall performance of RFC organization.

## Background

Article 19 (2) of Regulation (EU) 913/2010 requires the Management Board (MB) of the Rail Freight Corridors (hereinafter: RFCs) to *monitor the performance of rail freight services on the freight corridor and publish the results of this monitoring once a year.*

The RFCs are free to choose their own Key Performance Indicators (KPIs) to fulfil this requirement of the Freight Regulation – following the harmonisation of the used KPIs.

RNE guideline „Key Performance Indicators of Rail Freight Corridors“ provides recommendations for using a set of KPIs commonly applicable to all RFCs.

In accordance with Article 14 of the Freight Regulation the Executive Board with his Framework for Capacity Allocation (FCA) is also a decision-making body for monitoring the capacity allocation procedure.



## Selection and publication of KPIs:

The selection of the KPIs shall remain within the responsibility of RFCs decision-making bodies (MB by taking ExBo FCA)

The KPIs of the RFCs may include a set of commonly agreed KPIs and individual KPIs.

The description of the KPIs (including definition, calculation formula, targets, source of data and data processing tool, publication of the results, etc.) should be published in the Corridor Information Document (CID).

## Set of KPIs applicable for Amber RFC\*

- The CG assessed which KPI should be used by Amber RFC for TT2020 and a recommendation for MB was made. There was hesitation about KPIs no 7 and 8 but at the end of the day they are recommended, too.
- The KPIs will be produced, as appropriate, by C-OSS representative (supported by WG TT/C-OSS where needed) and by WG TM,TP&O.
- Once ready, the KPIs will be delivered to WG Marketing, which will integrate the KPIs in the yearly performance monitoring report of Amber RFC.

\*RNE IT tools (PCS and TIS, the data processing tool is RNE OBI) shall be used for the KPIs calculation.

| No | Business area   | KPI (Source of data)                         | Timeframe          | Recommend to MB (Y/N)                       | Entity in charge |
|----|-----------------|--|--------------------|---|------------------|
| 1  | Capacity mngmt* | Volume of offered capacity (PCS)             | At X-11 and at X-2 | Y   | C-OSS            |
| 2  | Capacity mngmt  | Volume of requested capacity (PCS)           | At X-8             | Y   | C-OSS            |
| 3  | Capacity mngmt  | Volume of requests (PCS)                     | At X-8             | Y   | C-OSS            |
| 4  | Capacity mngmt  | Volume of capacity (pre-booking phase) (PCS) | At X-7.5           | Y   | C-OSS            |
| 5  | Capacity mngmt  | Number of conflicts (PCS)                    | At X-8             | Y   | C-OSS            |
| 6  | Capacity mngmt  | Volume of requested RC - km*days (PCS)       | X+12               | Y   | C-OSS            |
| 7  | Capacity mngmt  | Volume of requested RC - dossiers (PCS)      | X+12               | Y (To be aligned with other RFCs)           | C-OSS            |
| 8  | Capacity mngmt  | Average planned speed of PaPs (PCS)          | X-10.5             | Y (Common calculation methodology is there) | C-OSS            |

\*Capacity management: meaning the performance of the RFC in constructing, allocating and selling the capacity of the RFC.

| No | Business area |  |   |   |            |
|----|---------------|--|---|---|------------|
| 9  | Operations *  | Punctuality at origin (TIS)  | In January after the timetable year concerned | Y | WG TM,TP&O |
| 10 | Operations    | Punctuality at destination (TIS)   | In January after the timetable year concerned | Y | WG TM,TP&O |
| 11 | Operations    | Overall number of trains on the RFC (TIS)  | In January after the timetable year concerned | Y | WG TM,TP&O |
| 12 | Operations    | Delay reasons (TIS)<br>The KPI is connected to Punctuality at origin and Punctuality at destination. | To be determined                              | Y | WG TM,TP&O |

\*Operations: meaning the performance of the traffic running along the RFCs monitored in terms of punctuality and volume of traffic.

| No | Business area |  |  |   |                      |
|----|---------------|--|--|---|----------------------|
| 13 | Market* dev.  | Overall number of trains per border (IMs' national tools)  | In January after the timetable year concerned      | Y | WG TM,TP&O           |
| 14 | Market dev.   | Ratio of the capacity allocated by the C-OSS and the total allocated capacity (PCS for the nominator; IMs' national tools for the denominator) | In December before the start of the timetable year | Y | WG TT/C-OSS<br>C-OSS |

\*Market development: the capability of the RFC in meeting the market demands will be monitored.

## **Annex 2**

### **PROCESS DESCRIPTIONS FOR CORRIDOR-OSS**

(in reference to clause 3.1 and 4 of the C-OSS contract)

- 1. CONSTRUCTION AND PREPARATION OF PRE-ARRANGED PATHS (PAP)**
- 2. ALLOCATION: HANDLING PAP AND PAP PLUS (INCL. FEEDER ETC.)**
- 3. POST-ALLOCATION: MONITORING**
- 4. PREPARATION AND ALLOCATION OF RESERVE CAPACITY (RC)**
- 5. OTHER PROVISIONS**



## **1. CONSTRUCTION AND PREPARATION OF PRE-ARRANGED PATHS (PAP)**

### **1. Call for PAP construction**

1.1. The C-OSS starts the process of PAP construction by addressing the concerned IM/AB in August/September and requiring the elaboration of the national PAP segments incl. border harmonization until end of December on basis of the conclusions of the capacity estimation for the corridor. In the event a common offer on an overlapping section with another RFC was decided by the Management Board, the C-OSS contacts the C-OSS of that RFC in order to coordinate the construction and publication of the common offer.

1.2. To ensure a consolidated way of PAP construction the C-OSS may give indications on the required amount and train parameters of PAP and/or a particular type of PAP to be used if he has received respective recommendation by the Management Board (MB) based on the analysis of the transport market study, wishes of customers or other sources and taking into account the estimated market demand and C-OSS's own experience. The C-OSS may also indicate the direction of the construction (backwards/forwards) with regard to identified reference points. C-OSS transmits these figures/data together with milestones/deadlines to all IM/AB together with the mandate to start PAP planning/construction.

### **2. Monitor PAP construction**

2.1. The C-OSS relies on a consecutive bilateral harmonization of the border times of the national PAP segments between the concerned IM/AB. The IM/AB shall inform the C-OSS about the interim results of the border harmonization and any difficulties occurring. The C-OSS shares this information continuously with all IMs/AB along the corridor and - if necessary- provides support and guidance to the IM/AB in case of difficulties.

### **3. Review and finalize PAP offer**

3.1. The C-OSS assembles the path segments delivered by the IM/AB in one document (excel) and checks the consistency of the PAPs. The C-OSS detects any need for adaptations and approaches the IMs/AB concerned to introduce the adaptations.

3.2. If necessary the C-OSS organizes a meeting for finalizing the PAP offer with all concerned parties (C-OSS, all IMs/AB, TT experts and/or national OSS, and - depending on their involvement - terminals).

### **4. Information and involvement of the MB**

- 4.1. The C-OSS forwards the final PAP offer to the Management Board in December for validation and as a draft version to RNE for inclusion in PCS. In case of a still pending need for adaptation of the PAP offer the C-OSS especially addresses the concerned IM/AB and asks for an evaluation / delivery of revised PAP until 20th December at the latest. The C-OSS will inform the Management Board and RNE about the outcome immediately.
- 4.2. The validation by the Management Board shall be done until end of the year. No reaction is assumed as validation.
5. Publish and promote PAP
  - 5.1. After validation by the Management Board the C-OSS takes the necessary actions for publishing the PAPs in PCS and other further communication channels (e.g. website of corridor, events, messages to be published by IMs/AB ect.). For this purpose the C-OSS provides a user-friendly format of the PAP path catalogue.
  - 5.2. The C-OSS promotes the PAP by presenting them to the customers (e.g. customer letter, RAG/TAG, customer meetings, conferences etc.).

## **2. ALLOCATION: HANDLING PAP AND PAP PLUS (INCL. FEEDER /ADJUSTMENTS/ PAP ON MULTIPLE CORRIDORS)**

### **A. Registration and Checking of PAP applications**

1. Collect path applications referring to PAP
  - 1.1. The C-OSS receives and collects all path requests for PAP placed via PCS. All PAP on the corridor are displayed in PCS and can therefore only be requested via PCS as unique booking tool. The applicant submits the path request by choosing a concrete PAP and opening a PCS dossier for it. The path request may contain feeder/outflow paths and/or minor adjustments to the displayed PAP (differing train parameters, other stops which do not affect the published border times of PAP). The C-OSS reads the dossier and ensures further treatment.
  - 1.2. Applications for PAP placed directly at involved IM/AB (e.g. by using national booking tools, by traditional OSS network, by reference in a PCS dossier) will only be considered by the C-OSS if the concerned IM/AB has on a voluntarily basis redirected the applicant to place a correct PAP request in PCS and the request in PCS is received by the C-OSS on time.

1.3. Applications for PAP placed via other channels to the C-OSS (e.g. e-mail, fax, telephone, RNE paper template) will have to be redirected to PCS. The C-OSS will inform the applicant accordingly and provide basic support for using PCS. The C-OSS is not entitled to open PCS dossiers for the applicant.

## 2. Register the path application

2.1. The C-OSS establishes and maintains a path register for all incoming PAP applications in PCS containing a dossier number, name of applicant, requested PAP segment, requested running days and specifying the follow-up activities of the C-OSS concerning the concrete path request. This register has to be made available to the concerned IM/AB at any time (see contact list) and in a simplified form allowing for business confidentiality to all concerned applicants.

2.2. In the register the C-OSS shall distribute the path applications to the following categories:

- 1 Pure PAP  
Request fully in line with PAP or PAP segment (See chapter B)
- 2 PAP plus feeder/adjustment  
Request fully in line with PAP or PAP segment and feeder path required in addition (PAP see Chapter B, Feeder see Chapter C); request referring to PAP segment(s) but requiring minor changes of running times and/or parameters which do not affect the PAP border times (See chapter C)
- 3 PAP with involvement of other corridors  
Request is fully in line with PAP or PAP segments and requiring PAP on other corridors (see Chapter B and C) as well as including feeder/outflow on other corridors.

## 3. Check applications with regard to C-OSS competence

3.1. The C-OSS evaluates his competence for the further treatment of the incoming PAP applications immediately after receipt and sorts out the following request types:

- Applications for passenger trains
- Applications with major changes (e.g. changing all fixed PAP border times). Depending on which PaP segment the major change is required, the C-OSS might treat it partly. For example, if the major change refers to the last PaP segment of a journey, the C-OSS will treat the first PaP segments.

The C-OSS will conduct/be responsible for any application of PAP and RC for corridor infrastructure capacity for freight trains crossing at least one border on a corridor and for which the capacity request was done in PCS and decide on capacity allocation in accordance with the FCA . .

3.2. The C-OSS forwards those applications immediately to the concerned IM/AB (see contact list in annex) for further exclusive treatment and refrains from any further activity concerning these applications.

- 3.3. The C-OSS informs the applicant that he is not competent for this request and that it has been handed over to the concerned IM/AB for further exclusive treatment.
- 3.4. If the path request contains elements of another corridor and/or there is common offer with another RFC, the C-OSS will immediately contact the other concerned C-OSS to commit on a ""coordinating C-OSS"" who will ensure the further management of the PCS dossier (in principle this should be the C-OSS according to the start PAP segment requested). In any case the ""coordinating C-OSS"" will forward the element of the PAP request concerning the other corridor to the concerned C-OSS without further delay and ask for the result of the allocation decision of the other C-OSS to be communicated to the ""coordinating C-OSS"" until end of April at the latest.
4. Check the quality of the path request
  - 4.1. The C-OSS checks immediately after receipt if the path request is complete and consistent (e.g. technical parameters, running times etc.). If special national mandatory parameters are required the concerned IM/AB (see contact list) will support the C-OSS in checking the consistency with regard to these parameters. The C-OSS assumes that the applicant has accepted the published PAP characteristics by requesting the selected PAP.
  - 4.2. In case of missing or inconsistent data the C-OSS will directly contact the leading applicant and require the relevant data updating/changes within 5 working days.
  - 4.3. The C-OSS checks if the leading applicant has clarified the request within the required timeframe. If the applicant does not clarify the required data the C-OSS will inform the leading applicant that further treatment of the request is not possible.
5. Check the legitimization of the applicants
  - 5.1. The C-OSS checks the legitimization of the applicants per involved path segments immediately after receipt of the path request on basis of a list of applicants per IM/AB if applicable.
  - 5.2. If the C-OSS detects a missing legitimization he informs without further delay the concerned IM/AB (see contact list in the annex) and asks for checking the legitimization within 5 working days. This check should be done in the same timeframe than the clarification of the request by the applicant (according to A 4.2). The C-OSS informs the applicant that he will refrain from any further treatment as long the legitimization isn't clarified.
  - 5.3. The C-OSS checks if the concerned IM/ AB could clarify the legitimization. In case of no answer by the concerned IM/AB until X-7.5 the C-OSS will not consider the pending request in the PAP pre-allocation but park it until clarification is done. If requested by the applicant, a partial treatment of the path request on international segments not affected by missing/unclear legitimization will be ensured by the C-OSS.

- 5.4. Applicants shall assign the RU responsible for train run as early as possible but at least until the individual deadlines stipulated in the national laws or rules of the concerned IM/AB (as long as no corridor specific deadline has been agreed upon in the Management Board).
6. Confirm further handling of path requests or execute rejection of path request
  - 6.1. The C-OSS sends a message to the applicant to confirm the receipt of the path application by the C-OSS and announce further treatment according to the defined category after having positively executed the checks (depending on the PCS function availability).
  - 6.2. The C-OSS updates the path register accordingly to the results of the checks (incl. closing of dossiers, which means path rejection)
7. Handle late path requests (if applicable) and change request
  - 7.1. The C-OSS considers all PAP applications which are placed in PCS after publication of the path catalogue at X-11 until the RNE deadline for path applications for the annual timetable at X-8.  
The C-OSS updates the published path catalogue by withdrawing the booked/allocated PaP. The non-booked PaPs will be treated in accordance with chapter B point 4.3.
  - 7.2. Change requests for PAP placed by the applicant after the X-8 deadline until X-5 will be treated by the C-OSS according to the following rule: "Downsizing" changes to the PAP request (e.g. cancellation of running days, shortening of route by deleting entire PAP segments, lower parameters) which do neither affect the international character of the PAP nor the ranking of the request in the allocation decision according to B 1.2. will be handled by the C-OSS and documented in the PCS dossier and the path register accordingly. "Substantial" changes to the PAP request affecting the border times and the ranking of the request in the allocation decision according to B 1.2 will be assumed as withdrawal/complete cancellation of the PAP request. Those change requests will then be forwarded to the concerned IM/AB for further treatment as late requests in remaining capacity.
  - 7.3. The C-OSS will inform the applicant that late and/or change path request will be handed over to the concerned IM/AB for further exclusive treatment and that the C-OSS will refrain from any follow-up. The allocation decision will be taken after the finalization of the annual timetable at X-3,5 only. The Corridor OSS will communicate the path offer to the applicant on behalf of the concerned IM/AB if the C-OSS has been the entry point of the request.

## B. Allocation decision on PAP

1. Execute the allocation decision

- 1.1. The C-OSS will evaluate/consider for the allocation decision on an equal basis all valid path requests out of the categories specified hereafter and placed on-time before the deadline at X-8:  
 Category 1 all requests aiming at pure PAP;  
 Category 2 the core PAP part of the PAP plus feeder requests; in case of requests with adjustments the C-OSS only considers PAP path segments not substantially affected by the required adjustment (e.g. adjustment not influencing the fixed border times);  
 Category 3 the PAP part of the ""own"" corridor.
- 1.2. The C-OSS decides which PAP segment is to be allocated to which applicant. In case of conflicting applications the C-OSS decides on basis of the priority rules described in the FCA. The allocation decision has to be taken until end of April.
- 1.3. The C-OSS may offer alternative PAP to an applicant with lower priority. The applicant has to commit to this offer within 5 working days – otherwise the application with lower priority will be forwarded to the concerned IM/AB to be handled in the regular elaboration process of the annual timetable (for a tailor-made offer or national catalogue path). The C-OSS may in case of competing requests also contact the applicant with higher priority and propose a shifting of the PAP / an alternative solution if this enables both competing applicants to receive a satisfying offer. The alternative solutions depend on the agreement of both applicants to be given to the C-OSS until end of April.
- 1.4. In case of PAP requests involving 2 or more corridors, the C-OSS has to consider the allocation decision of the other concerned C-OSS. If the published TT does not fit at connecting point of both corridors the "coordinating C-OSS" may offer an alternative PAP itself or require an alternative PAP from the other involved C-OSS to build a harmonized TT offer for the applicant. The applicant has to commit to this alternative offer within 5 working days - otherwise the application will be forwarded to all concerned IM/AB to be handled in the regular elaboration process of the annual timetable (for a tailor-made offer).
2. Inform coordinating C-OSS
  - 2.1. In case of PAP requests involving 2 or more corridors the C-OSS sends the result of its pre-allocation decision to the coordinating C-OSS, 2 working days before end of April.
3. Update path register and path catalogue
  - 3.1. The C-OSS marks the result of the allocation decision in the path register at the latest in the first days of May of each year. In case of PAP plus feeders/adjustments and PAP on multiple corridors the indication in the path register will be done as a pre-allocation only (as connectivity of feeders and adjustments and/or with other corridors still to be checked).
4. Inform concerned IMs/AB



- 4.1. The C-OSS will inform the concerned IM/AB on the pre-allocation decision automatically via PCS for inclusion in the draft timetable.
- 4.2. Path applications which could not be met due to conflicts and the execution of the priority rules mentioned above (applications with lower priority) are forwarded by the C-OSS to the concerned IM/AB at the latest in the first days of May with the demand to provide a draft offer until one week before the RNE deadline for the draft offer. Those applications with lower priority will be handled by the concerned IM/AB as on-time applications for the annual timetable and will therefore be included in the regular construction process of the annual timetable.
- 4.3. All non-booked PAP will be referred to the MB by the C-OSS. Until the end of April the MB will decide if the non-booked PAP will:
  - a) be returned to the concerned IMs/AB to allow for an efficient use of the not requested PAP capacity in the regular annual timetable process – in which case the C-OSS will hand over the non-booked PAP to the concerned IMs/AB also until the second working day of May ; or
  - b) be used as late PAP – in which case they will be retained by the C-OSS to run the late PAP requests process in accordance with RNE guidelines.

## 5. Inform applicants

- 5.1. The C-OSS provides interim information to the applicants on the status of their application at the beginning of May. The interim information informs the applicants with higher priority about the allocation decision in their favor and announces the formal draft path offer which will be given on behalf of the concerned IM/AB by the C-OSS with the draft timetable offer in X-5 via PCS.
- 5.2. The C-OSS informs the applicants with lower priority that did not accept an alternative PAP offer at the beginning of May that their path requests have been forwarded to the concerned IM/AB for further treatment in the regular process for establishing the annual timetable and that the C-OSS will provide the draft path offer on behalf of the concerned IM/AB with the draft timetable offer in X-5 via PCS.
- 5.3. The C-OSS informs the applicants for PAP plus feeder and/or adjustments and/or involving multiple corridors on the pre-allocation of the PAP segment at the beginning of May and announces the forwarding of the feeder and/or adjustments to the concerned IM/AB. Without further notice the applicant agrees to be contacted by the concerned IM/AB bilaterally for the fine-tuning of the feeder/adjustment/connecting paths. The C-OSS will also announce the provision of a consolidated answer by X-5 for those requests.

## C. Monitoring PAP Plus

### 1. Forward of feeders and/or adjustments and/or connections with other corridors

- 1.1. The C-OSS forwards the requested feeder path and/or adjustment to the concerned IM/AB at the latest in the first days in May for elaboration of a timetable offer fitting to the PAP already reserved (pre-allocated).
- 1.2. The C-OSS will document the forwarding in the path register without further delay.
- 1.3. In case of feeders affecting two or more IM/AB the C-OSS may monitor the construction process e.g. by indication of construction direction (if required by the applicant).
- 1.4. Questions occurring during the path elaboration process (e.g. concerning feeders/connection construction) may be discussed and arranged between concerned IM/AB and applicant bilaterally - if this procedure is agreed upon by the customer. In this case the C-OSS has to be informed without further delay about any adjustment resulting from this coordination. Therefore this information shall be documented in the path register in written form by the concerned IM/AB.
2. Receive the TT offer elaborated by the concerned IM/AB
  - 2.1. At the latest one week before the RNE deadline for the draft timetable, the draft timetable offers for feeders and adjusted PAP segment(s) shall be handed over from the concerned IM/AB to the C-OSS. Also tailor-made TT offers for applicants with lower priority and for connection of 2 or more corridors shall be handed over from the concerned IM/AB to the C-OSS.
  - 2.2. If no draft TT offer has been delivered at all until 4 days before the internal deadline (see point 2.1) the C-OSS shall make a reminder to the concerned IM/AB. If no answer is given, the C-OSS shall then inform the Management Board legal representative of the IM/AB which did not deliver the required path offer and ask for clarification within 3 working days.
  - 2.3. If no draft TT offer has been delivered even after intervention of the concerned legal representative of the Management Board here above mentioned, the C-OSS will ask the applicant if to keep the pre-allocated PAP or to forward the entire path request to the concerned IM/AB for delivering a tailor-made path (including corridor segment and feeder) in the regular elaboration process of the annual timetable.
  - 2.4. The C-OSS will consolidate the timetable (PAP plus feeder and/or adjustments and/or connections with other corridors) and update the path register to display a consolidated overview of the PAP plus offer and inform all concerned IM/AB automatically via PCS.

#### D. Communicating offer to applicant

1. Communicate the draft timetable offer

1.1. At the RNE deadline for draft TT (X-5) the C-OSS communicates the draft timetable offer for every valid PAP request to the applicants via PCS. The C-OSS hereby stresses the fact that he is acting on behalf of the concerned IM/AB and that the appropriate contract will have to be concluded between the concerned IM/AB and the applicant on basis of applicable national law and of the IM/AB's conditions. If the publication via national tools is still necessary, the IM/AB have to ensure that there are no differences to the PCS publication. In any case it has to be made clear that the legally binding TT including feeder/outflow path is shown in PCS.

## 2. Handle applicant observations for PAP

2.1. The C-OSS monitors the applicant observations placed by the applicant on the draft timetable offer PAP in PCS. For that purpose the C-OSS requires an answer by the concerned IM/AB until one week before the deadline for the final TT offer (at X-3,5). This procedure only concerns justified observations related to the original path request - whereas modifications to the original path requests will be handed over to the concerned IM/AB for further exclusive treatment without further involvement of the C-OSS.

## 3. Communicate the final timetable offer

3.1. At the RNE deadline for final TT (X-3,5) the C-OSS communicates the final timetable offer for every valid PAP request to the applicants via PCS. The C-OSS hereby stresses the fact that he is acting on behalf of the concerned IM/AB and that the appropriate contract will have to be concluded between the concerned IM/AB and the applicant on basis of applicable national law and of the IM/AB's conditions. If the publication via national tools is still necessary, the IM/AB have to ensure that there are no differences to the PCS publication. In any case it has to be made clear that the legally binding TT is shown in PCS.

## 3. POST-ALLOCATION: MONITORING

### A. Documentation of indicators for PAP

#### 1. Number of PAP offered

1.1. The C-OSS analyses the published PAP path catalogue and documents the number of offered PAP at least per national segments. The number of running days should be considered in this analysis. This analysis is done until end of January.

## 2. Number of PAP requested until X-8

2.1. The C-OSS registers all requests referring to PAP and placed at the C-OSS in due time (before the RNE deadline for the annual timetable at X-8) according to article 13.5 of EU Regulation 913/2010. The registration is done in PCS and includes information on the date of the request and the name of applicant.

2.2. Whereas in the path register the names of the applicants are shown - the C-OSS will only indicate the number and the core characteristics of the path requests for monitoring reasons (such as requests affecting 1,2,3,4 IMs/ABs, requests with/without feeders, requests aiming at x running days; PAP adjustments requested). If possible for internal reasons a rate/percentage of requested PAP in relation to the path catalogue shall be shown (e.g. x % of the PAP offered have been requested). The indication is done until end of April. Rejected applications (incl. the reason) should also be listed.

## 3. Number of conflicting requests

3.1. On basis of the conflicting requests (double booking) detection done in PCS, the C-OSS indicates the number of conflicts (in relation/percentage of path requests) and the sections where conflicts occur (and the number of applications concerned). The indication is done until end of May. If possible it shall also be indicated by which means the conflicts could be solved (coordination, alternative PAP accepted by customer, tailor-made paths requested from concerned IM/AB).

3.2. If return of PaPs is decided by the MB, the C-OSS documents the number of returned PAPs to the IM/AB after the pre-allocation at X-7, 5.

## 4. Number of PAP allocated

4.1. The C-OSS indicates the number of the PAP offered at X-5 by the C-OSS on behalf of the concerned IM/AB. The indication is done after the publication of the draft TT offer on basis of PCS dossiers shifted in the draft TT offer phase (at the latest until end of July). It shows explicitly the share/ percentage of PAP and PAP plus feeder.

4.2. The C-OSS indicates the number of the PAP allocated at X-3,5 by the C-OSS on behalf of the concerned IM/AB. The indication is done after the publication of the final TT offer on basis of PCS dossiers shifted in the final TT offer phase (at the latest until end of August). It shows explicitly the share/ percentage of PAP and PAP plus feeder.

4.3. With regard to PAP offered but not contracted by the applicants as well as PAP cancellations the C-OSS will indicate the number of contracted PAP (= PAP in active TT in PCS) in relation to the PAP offered (indicator 5) until end of November in the evaluation report.

## 5. Number of late paths requests for PAP if applicable

- 5.1. If late PAP are decided by the MB, the C-OSS indicates the number of late paths requests received by the C-OSS after X-8 until X-2 (forwarded to IM/AB) The indication is done until end of October. The registration is done in PCS and includes information on the date of the request and the name of applicant.

**B. Documentation of indicators for reserve capacity**

**1. Number of capacity slots offered**

- 1.1. The C-OSS indicates the contingent of “capacity slots” for RC requests per day/segment (flexible RC approach) offered as reserve capacity after X-2. The number of running days offered should be considered in the indication. The indication is done until end of October (X+10).

**2. Number of capacity slots allocated**

- 2.1. The C-OSS indicates the number of capacity slots allocated by the C-OSS on behalf of the concerned IM/AB. For this purpose the C-OSS maintains and updates a register monthly to show the number of paths allocated out of reserve capacity for one timetable year.

**C. Documentation of other capacity-related indicators**

1. The C-OSS will deliver other indicators related to corridor capacity that may be adopted by the MB and fall within the competence of the C-OSS.

1.1. The timing and format of the delivery will be agreed between the MB and the C-OSS.

2. The C-OSS will be consulted by the MB prior to adoption of any such indicator.

**D. Evaluation report for the MB and ExBo**

**1. Elaborate the report**

- 1.1. The C-OSS summarizes the indicators collected for PAP and for reserve capacity and, as the case may be, for other capacity-related indicators, in one report (power point summary). The report shall be available end of November.

- 1.2. For internal reasons only the C-OSS shall also analyses the compliance of the IM/AB with the C-OSS process (e.g. on-time delivery of feeders, support in checking the requests etc.) by showing defaulting behavior.

- 1.3. The C-OSS collects any available information on the customers' satisfaction on basis of outcome of a questionnaire decide by the MB.
2. Present the report
  - 2.1. The C-OSS participates on request to the relevant meetings of the MB and the ExBo to present the report.
  - 2.2. The C-OSS collects the feedback of the MB and the ExBo on the report and if necessary develops measures for improvement within the MB.

#### **4. PREPARATION AND ALLOCATON OF RESERVE CAPACITY (RC)**

1. Call for Reserve Capacity
  - 1.1. The C-OSS starts the process of RC by addressing the concerned IM/AB in July and requiring the indication of a contingent of “capacity slots” for RC requests per day/segment (flexible RC approach) until end of July on basis of the conclusions of the capacity estimation for the corridor.
  - 1.2. The C-OSS may also ask IMs/AB for guaranteed reference journey times per segment(s). Milestones/deadlines will be transmitted as well.
2. Review and finalize RC Offer and inform the MB
  - 2.1. The C-OSS assembles the RC path segments delivered by the IM/AB in one document (excel) and detects need for adaptations. In case of inconsistencies the C-OSS clarifies them in cooperation with the concerned IM/AB.
  - 2.2. The C-OSS forwards the assembled RC offer to the MB on end of September for validation by the MB and as a draft version to RNE for inclusion in PCS. No reaction is assumed as approval. In case of a need for adaptation the C-OSS especially addresses the MB legal representative of the concerned IM/ AB and asks for an evaluation/delivery of revised RC without further delay.
3. Publish RC offer
  - 3.1. The C-OSS publishes the RC offer in PCS and on the website of Amber corridor at X-2.



#### 4. Allocate and administrate RC

- 4.1. The C-OSS collects all path requests for RC placed via PCS until 30 days before the day of operation. Applications placed via other channels (e.g. e-mail, fax etc.) will have to be redirected to PCS. The C-OSS informs the applicant accordingly. The application will only be considered with the date of the PCS application.
- 4.2. The C-OSS checks the application with regard to C-OSS competence, quality of request and legitimation of applicants. "Wrong requests" (= national paths, passenger paths) will be forwarded to the concerned IM/AB for further treatment and the applicant will be informed accordingly. Requests with unclear/missing data will be presented to the applicant and to the concerned IM/AB for clarification. The clarification has to be provided within 5 working days. If no clarification could be reached the C-OSS rejects the path application. The delivery of feeder/outflow paths is based on the construction process as described in Art. 48 of EU Directive 2012/34.
- 4.3. The C-OSS forwards the request to the concerned IM/AB in the order that the C-OSS can forward to the applicant a harmonized offer. In this matter the C-OSS gives each IM/AB a timeframe for his offer which has to respect the offer of the precedent IM/AB. The C-OSS executes the allocation decision on basis of the date when the request has been placed following the "first come, first served principle".
- 4.4. The C-OSS updates the electronic versions of the RC path catalogue by withdrawing the allocated paths and informs the concerned IM /AB.
- 4.5. The C-OSS communicates the path offer to the applicants on behalf of the concerned IM/AB. He specifies that he is acting on behalf of the concerned IMs/AB and that the appropriate contract will have to be concluded between the concerned IMs/AB and the applicant on basis of applicable national law and of the IMs/AB's conditions.

### 5 OTHER PROVISIONS

1. In addition to the tasks described in chapters 1-4, the C-OSS performs the following activities.
  - 1.1. The C-OSS acts as a single point of contact for the applicants and coordinator of information

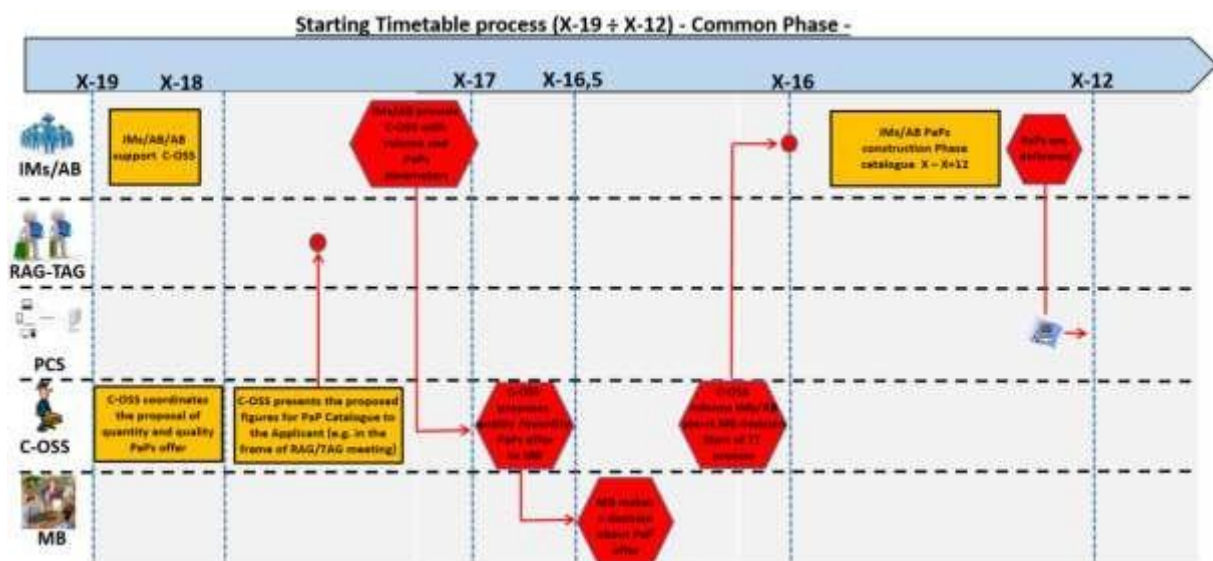
1.2. The C-OSS supplies the following information contained in the CID and published on Amber RFC website:

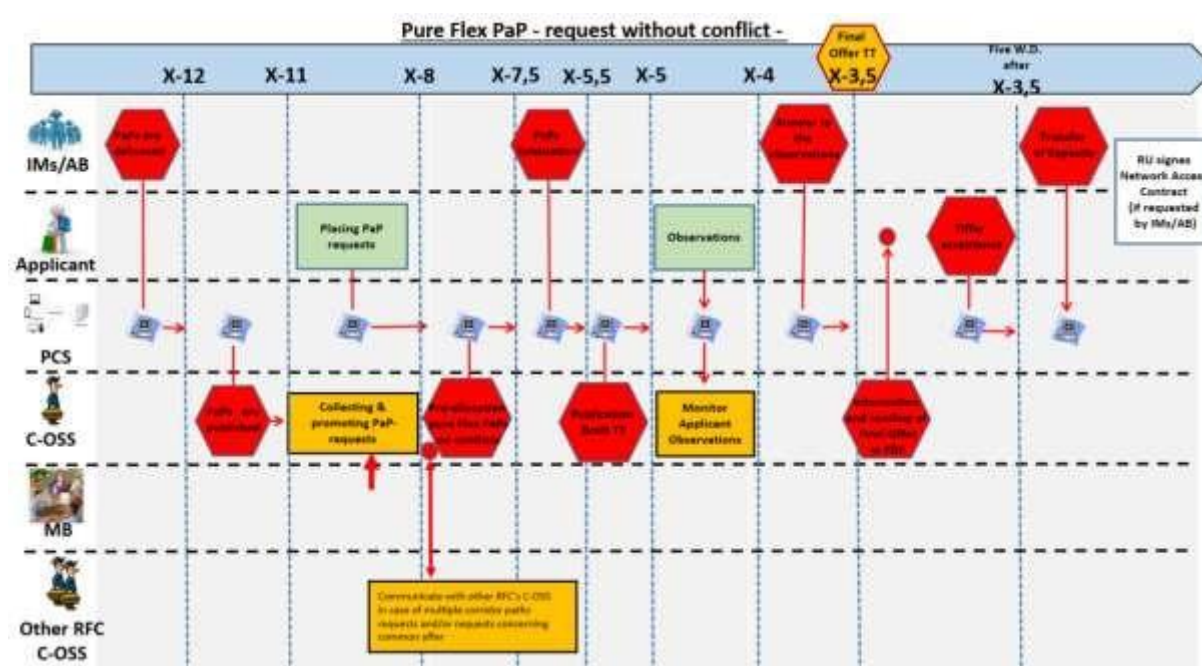
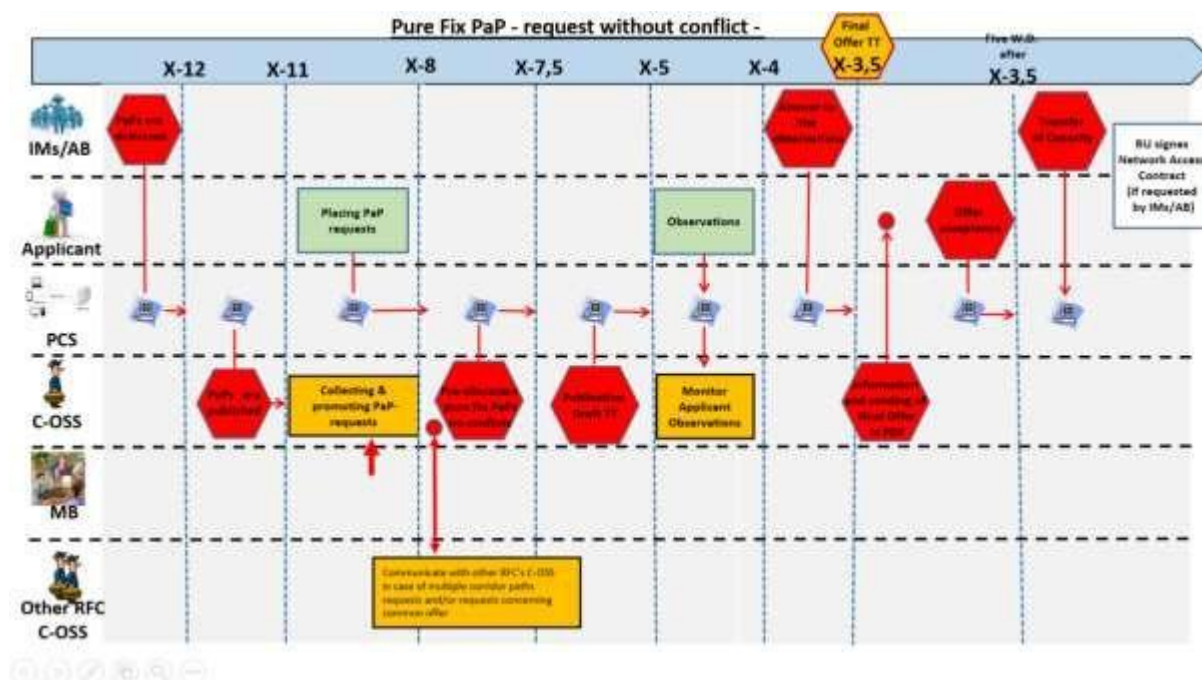
- network statements for national networks regarding Amber RFC, as included in Book 2
- list, characteristics, conditions and method of access to the terminals along Amber RFC, as included in Book 3
- functioning of the C-OSS, capacity allocation, authorised applicants and traffic management, including in the events of disturbance, as described in Book 4
- implementation plan of Amber RFC, as included in Book 5.

1.3. If requested by applicants, the C-OSS provides assistance, if possible, with regard to capacity in the running timetable, other than RC, for freight trains crossing at least one border on a corridor, contact the involved IMs/AB and facilitate the coordination of the allocation process done by the involved IMs/AB.

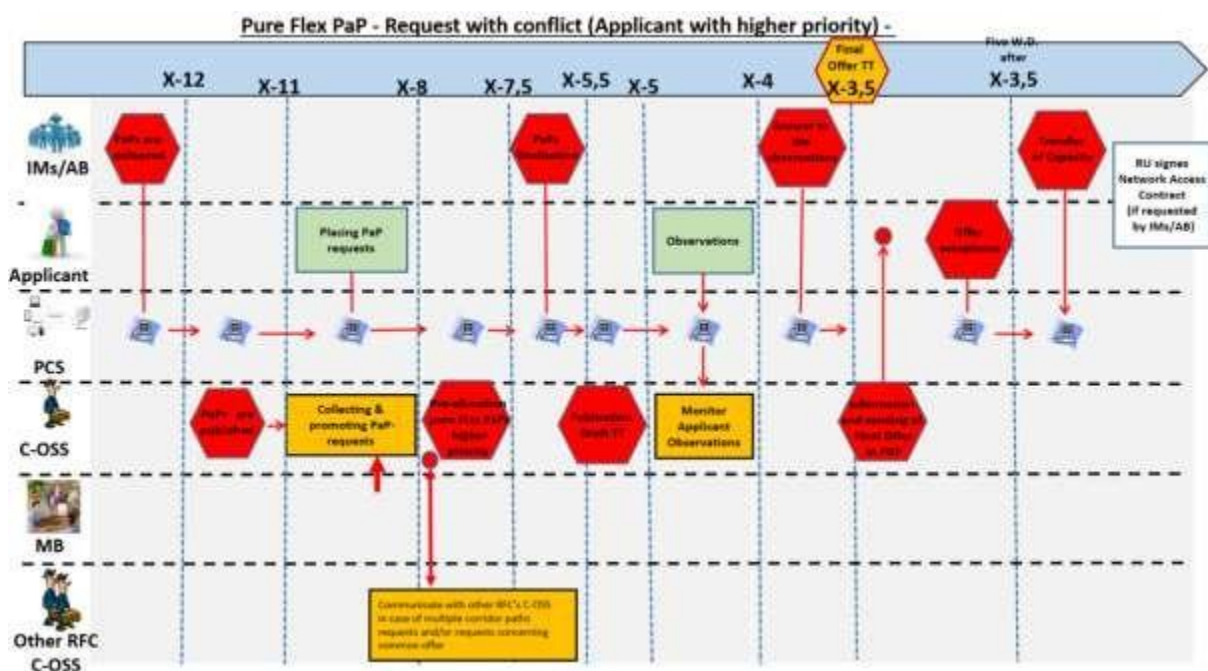
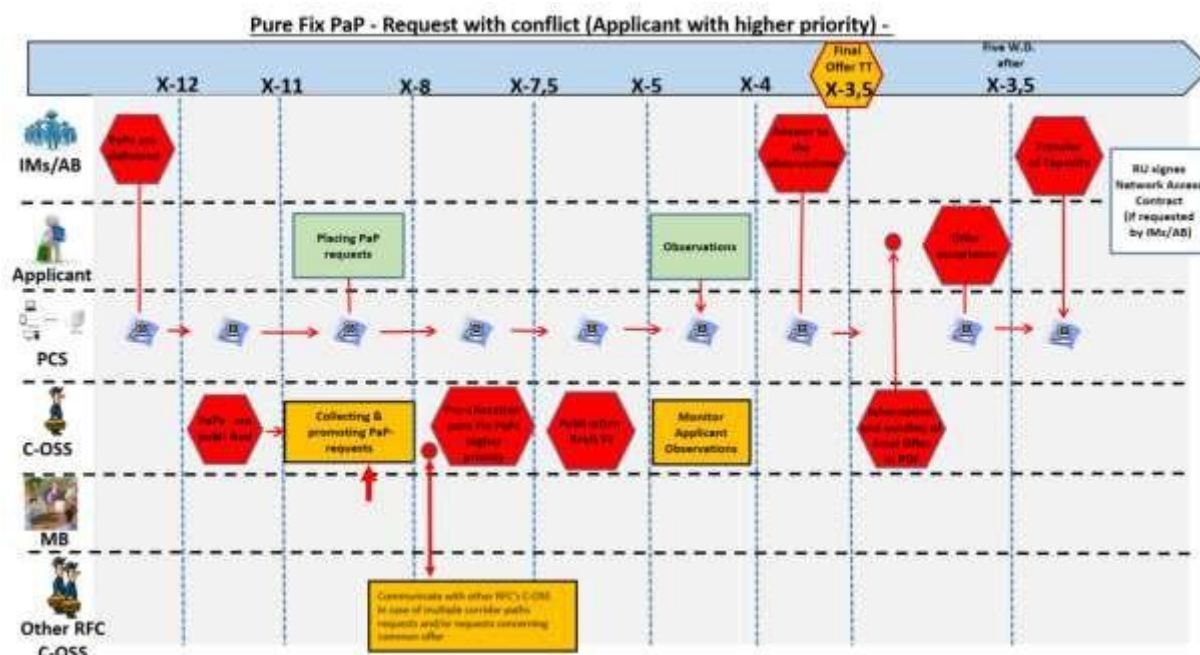
2. Main activities and deadlines for the process are visualised on the charts below

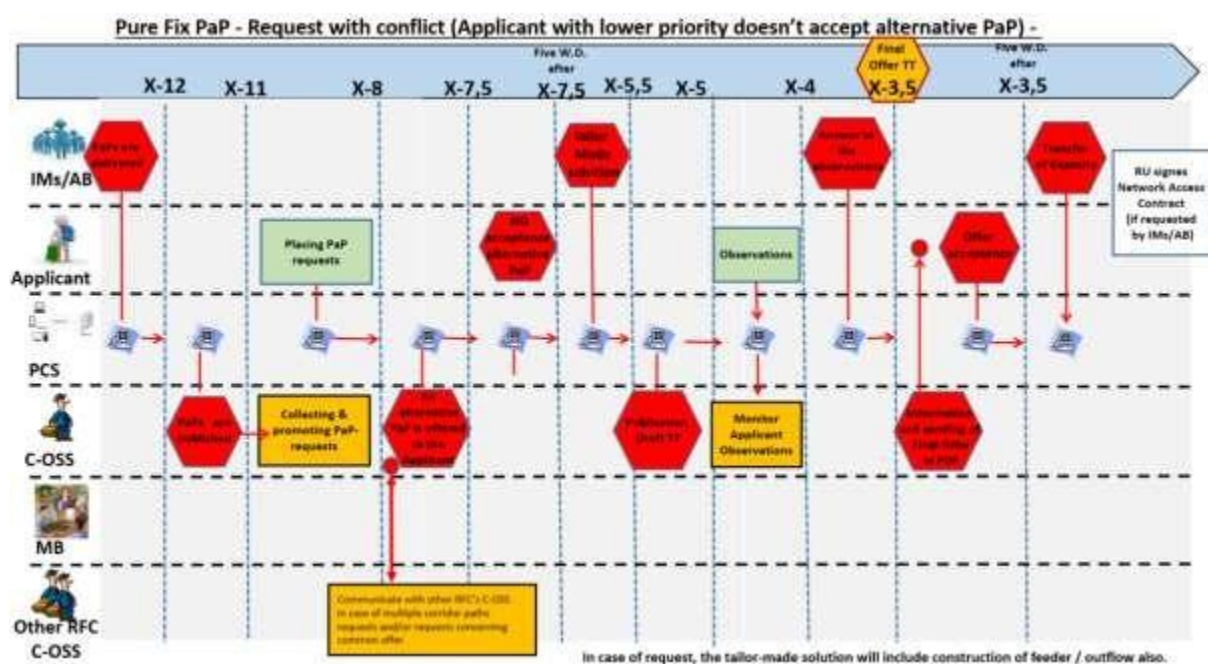
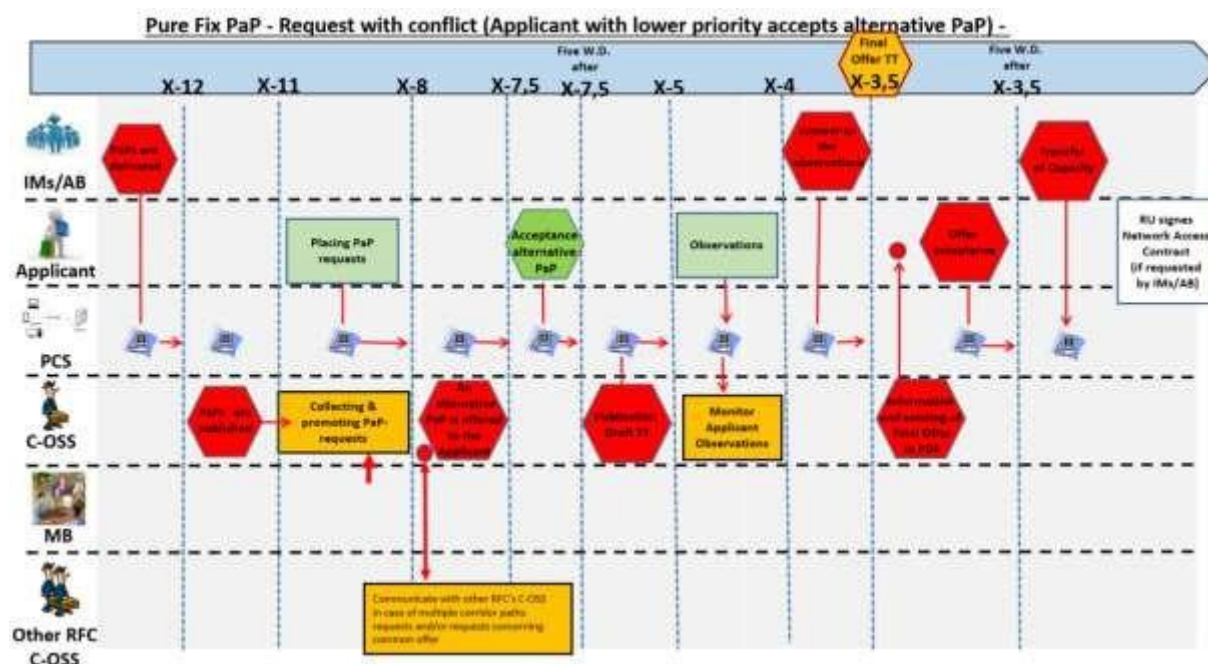
### Activities and deadlines for the process



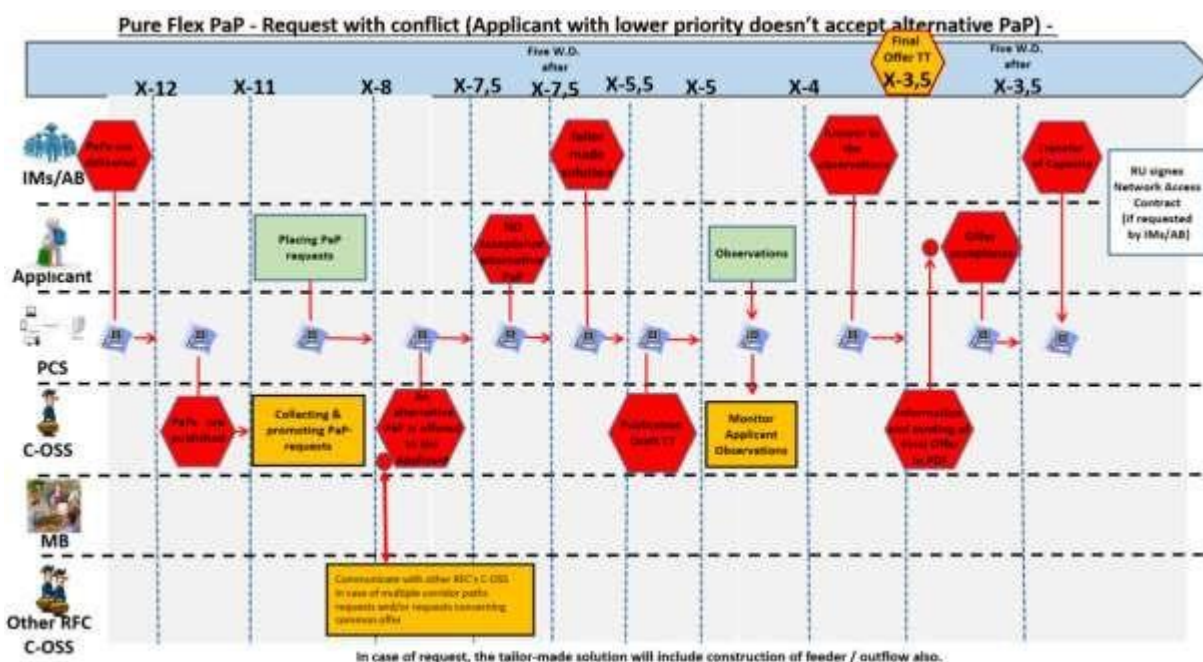
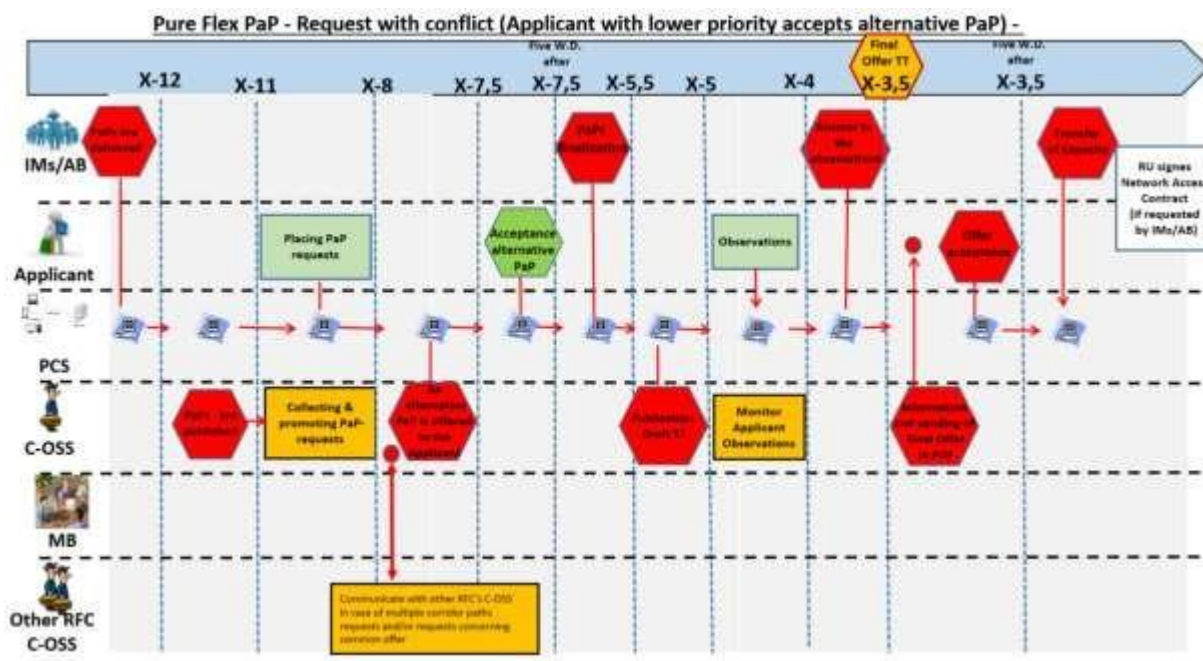






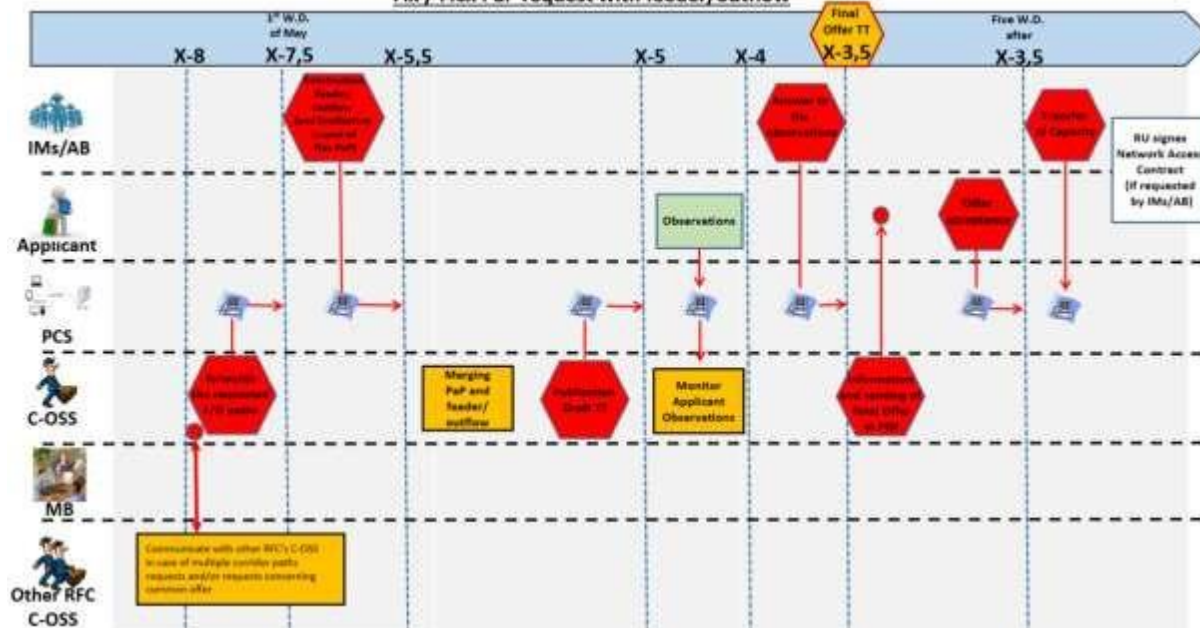




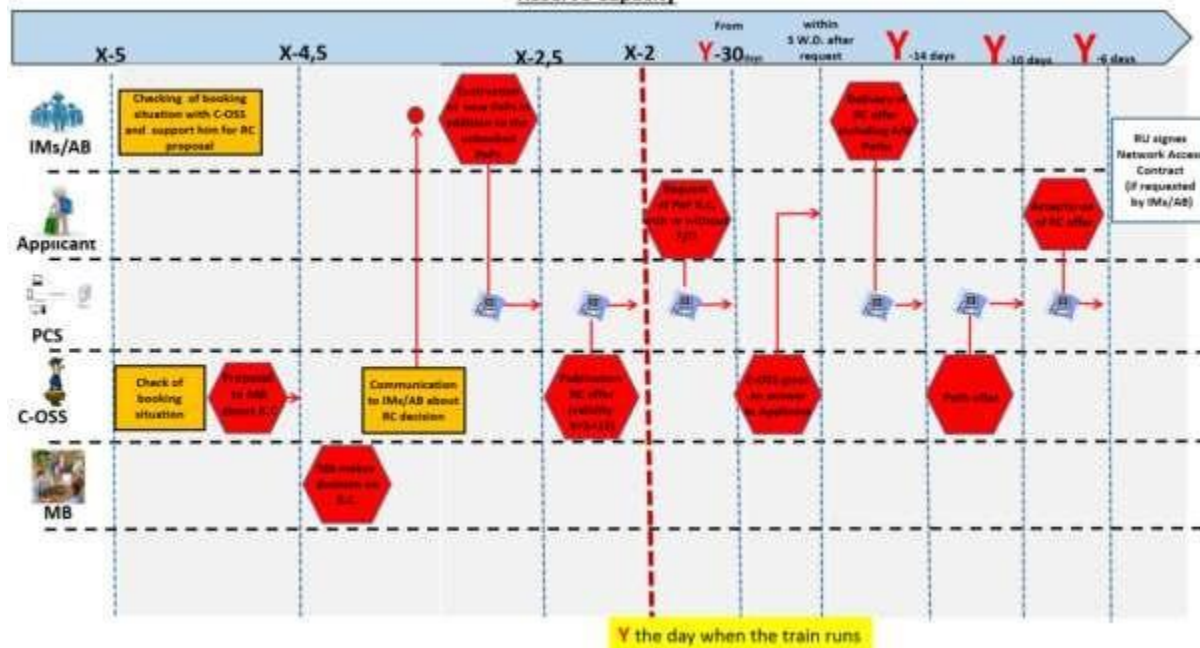




### Fix / Flex PaP request with feeder/outflow



### Reserve Capacity



## **Annex 1.1 to Annex 2 of C-OSS Contract**

### **Detailed workflow description for the Collaborative Model on the overlapping sections of Amber RFC and RFC Orient/East – Med**

#### **Agreement between the Management Board of Amber RFC and Management Board of RFC Orient/East - Med (OEM RFC)**

In 2019 the Amber RFC will be operational and will offer PaPs for TT 2020. Amber RFC will have common offer on overlapping sections with RFC Orient/East – Med.

In order to optimize the usage of the scarce capacity in the bottleneck sections and to avoid negative competition between the corridors a *Collaborative Model* was chosen to regulate the workflow of C-OSS managers. The C-OSS of the involved RFCs will be responsible for uploading and allocating the PaP offer on the overlapping sections as described below. The responsible C-OSS will publish PaPs for sections in accordance with responsibility marking another RFC as "Participating RFC" in the PaP dossiers. Applicants will still experience a single point of contact as C-OSS managers work strongly together.

**C-OSS of RFC Orient/East-Med will be responsible for publication and uploading the PaP offer on overlapping sections with Amber RFC on sections: Bratislava-Rajka, Galanta via Nové Zámky – Štúrovo, Nové Zámky to Komárom, Sopron-Győr, Győr-Ferencváros, Štúrovo-Ferencváros,**



**C OSS of the concerned RFCs collaborates as a network** within the operational cooperation framework between the involved RFCs. Each C-OSS is responsible for selling the capacity on overlapping sections as described above.

**Advantages:**

- C-OSS of the concerned RFCs **have a coordinated offer**
- Collaboration leads to the **best capacity offer** for applicants
- Applicants have a **single point of contact** as all C-OSS collaborate and act as one virtual C-OSS
- **Clear sales competences between** the C-OSS

The following process description regulates all tasks and processes necessary to provide our applicants with the best possible support by optimizing the allocation between involved RFCs. The described tasks and processes are relevant for the C-OSS of involved corridors.

| Topic  | Responsible Actor                                | Description   |
|--|--|---|
| <b>Understanding the applicants' capacity needs</b>        |  |   |
| Capacity wishes of applicants                              | C-OSS of the involved RFCs for their sections    | C-OSSs send "capacity wish list template" to applicants operating on their sections. Applicants aggregate their capacity wishes for all RFCs in one document and send it back to any C-OSS. |
| <b>PaP construction</b>                                    |  |   |
| Preparation of PaP Kick-Off workshop with IMs if necessary | C-OSS of the involved RFCs                       | Harmonization of the expectations of the PaPs to be constructed by the IMs. Basis is the capacity wish list template and last year's experiences.   |
| Kick-Off PaP construction if necessary                     | C-OSS of the involved RFCs for their sections    | Individual workshops on involved RFCs. No need for C-OSS cross-participation due to coordination beforehand.  |
| PaP construction   | IMs  | IMs construct the PaP segments.   |
| PaP harmonization  | C-OSS of the involved RFCs                       | C-OSSs together will monitor the process and check harmonization of RFC's PaP offer.  |
| <b>PaP publication</b>                                     |  |   |
| PCS upload   | C-OSS of the involved RFCs<br>For their sections | Upload of PaP offer to PCS. Each C-OSS for its sections in accordance with described responsibility.  |
| Website  | C-OSS of the involved RFCs for their corridor    | RFC OEM PaP catalogue shows also harmonized Amber RFC PaPs on overlapping sections<br>Amber RFC PaP catalogue shows also harmonized RFC OEM PaPs on overlapping sections                    |
| <b>Applicant request PaP</b>                               |  |   |
| Applicant request  | Applicant  | Applicant orders PaPs via PCS.  |
| <b>Pre-Allocation PaP</b>                                  |  |   |

|  |   |   |
|--|---|---|
| No conflict<br>Pre-Allocation at x-7,5           | C-OSS of the<br>involved RFCs<br>for their sections | Pre-Allocation is done in PCS.  |
| Conflict solving                                 | C-OSS of the<br>involved RFCs<br>together           | PCS displays to all C-OSS the conflicts.<br>Coordination between C-OSS necessary: Each C-OSS calculates for the conflict path in its sections the K-value. Then, all K-values are summed up for the priority calculation. |
| Alternative PaP / path                           | C-OSS of the<br>involved RFCs<br>for their sections | Communication of alternative options (different PaP or tailor-made path to be constructed later by the IMs) is done by the C-OSS with the conflict in its sections.   |
| <b>Draft and Final offer PaP</b>                 |   |   |
| Check and Publication of<br>Draft- / Final offer | C-OSS of the<br>involved RFCs<br>for their sections | Each C-OSS double-checks the offer of the IMs and publishes them via PCS.   |
| <b>Reserve Capacity Publication</b>              |   |   |
| PCS upload                                       | C-OSS of the<br>involved RFCs For<br>their sections | Upload of RC offer to PCS. Each C-OSS for its sections.   |
| Website  | C-OSS of involved<br>RFCs<br>for their corridor     | RC Catalogue will be published on the website   |
| <b>Applicants request Reserve Capacity</b>       |   |   |
| Applicant request                                | Applicant   | Applicant orders Reserve Capacity via PCS.  |
| <b>Pre-Allocation Reserve Capacity</b>           |   |   |
| Pre-Allocation rules                             | C-OSS of the<br>involved RFCs<br>for their sections | "First come – First serve".   |
| TT Construction                                  | C-OSS of the<br>involved RFCs<br>together           | Order of TT construction in case more than one RFCs are involved shall depend on the construction starting point.   |
| Deadlines for ordering                           | C-OSS of the<br>involved RFC<br>for their sections  | All involved RFCs have the same 30-day rule.  |
| <b>Draft and Final offer Reserve Capacity</b>    |   |   |
| Check and Publication of<br>Draft- / Final offer | C-OSS of the<br>involved RFCs<br>for their sections | Each C-OSS double-checks the offer of the IMs and publishes them via PCS.   |
| <b>After Sales / Applicants contact</b>          |   |   |

|                                  |   |   |
|----------------------------------|---|---|
| Applicants questions or requests | C-OSS of the involved RFCs for their corridor | <p>An applicant chooses the C-OSS according to the focus market of his question, or a preferred language or further reasons</p> <p>If a question refers to many markets an applicant still will have a single point of contact as all C-OSS closely collaborate and act as one virtual C-OSS to an applicant.</p>   |
| Applicants acquisition           | C-OSS of the involved RFCs for their corridor | <p>C-OSS applicant's care will be done by each C-OSS for its corridor with a regional focus.</p> <p>C-OSS can collaborate based on best practice approaches. Examples:</p> <ul style="list-style-type: none"> <li>• Common C-OSS applicant's visits for an applicant that operates trains in relevant corridors.</li> <li>• Regional applicant's conferences organized by the C-OSS of the concerned RFCs.</li> </ul> |



## **Annex 1.2 to Annex 2 of C-OSS Contract**

### **Detailed workflow description for the Collaborative Model on the overlapping sections of Amber RFC and RFC Mediterranean**

#### **Agreement between the Management Board of Amber RFC and the General Assembly of RFC Mediterranean**

In 2019 the Amber RFC will be operational and will offer PaPs for TT 2020. Amber RFC will have common offer on overlapping sections with RFC Mediterranean

In order to optimize the usage of the scarce capacity in the bottleneck sections and to avoid negative competition between the corridors a *Collaborative Model* was chosen to regulate the workflow of C-OSS managers. The C-OSS of the involved RFCs will be responsible for uploading and allocating the PaP offer on the overlapping sections as described below. The responsible C-OSS will publish PaPs for sections in accordance with responsibility marking another RFC as "Participating RFC" in the PaP dossiers. Applicants will still experience a single point of contact as C-OSS managers work strongly together.

**C-OSS of RFC Mediterranean will be responsible for publication and uploading the PaP offer on overlapping sections with Amber RFC on the following sections with Pap ID defined by C-OSS of Amber RFC :**

- **Koper- Divača-Ljubljana**
- **Ljubljana-Zidani Most – Pragersko**
- **Pragersko-Ormož –Hodoš**

**On the following sections, each C-OSS will publish the Paps offered to their RFC's on the Hungarian Network:**

- **Hodoš-Zalaszentiván**
- **Ferencváros- Szerencs -Mezőzombor.**

The following picture gives a brief overview on the main cornerstones of the Collaborative Model.



|  |        |  |   |  |   |
|--|--------|--|---|--|---|
|  | Border |  | Connecting route  |  | Handover Point                                  |
|  | RFC 11 |  | Future principal route RFC 11                                       |  | Handover Point combined with Intermediate point |
|  | RFC 6  |  | Intermediate Point<br>→ Stop and feeder/outflow-connection possible |  |   |

**C OSS of the concerned RFCs collaborates as a network** within the operational cooperation framework between the involved RFCs. Each C-OSS is responsible for selling the capacity on overlapping sections as described above.

**Advantages:**

- C-OSS of the concerned RFCs **have a coordinated offer**
- Collaboration leads to the **best capacity offer** for applicants
- Applicants have a **single point of contact** as all C-OSS collaborate and act as one virtual C-OSS
- **Clear sales competences between** the C-OSS

The following process description regulates all tasks and processes necessary to provide our applicants with the best possible support by optimizing the allocation between involved RFCs. The described tasks and processes are relevant for the C-OSS of involved corridors.

| Topic  | Responsible Actor                                | Description   |
|--|--|---|
| <b>Understanding the applicants' capacity needs</b>        |  |   |
| Capacity wishes of applicants                              | C-OSS of the involved RFCs for their sections    | C-OSSs send "capacity wish list template" to applicants operating on their sections. Applicants aggregate their capacity wishes for all RFCs in one document and send it back to any C-OSS. |
| <b>PaP construction</b>                                    |  |   |
| Preparation of PaP Kick-Off workshop with IMs if necessary | C-OSS of the involved RFCs                       | Harmonization of the expectations of the PaPs to be constructed by the IMs. Basis is the capacity wish list template and last year's experiences.   |
| Kick-Off PaP construction if necessary                     | C-OSS of the involved RFCs for their sections    | Individual workshops on involved RFCs. No need for C-OSS cross-participation due to coordination beforehand.  |
| PaP construction   | IMs  | IMs construct the PaP segments.   |
| PaP harmonization  | C-OSS of the involved RFCs                       | C-OSSs together will monitor the process and check harmonization of RFC's PaP offer.  |
| <b>PaP publication</b>                                     |  |   |
| PCS upload   | C-OSS of the involved RFCs<br>For their sections | Upload of PaP offer to PCS. Each C-OSS for its sections in accordance with described responsibility.  |
| Website  | C-OSS of the involved RFCs for their corridor    | RFC Med PaP catalogue shows also harmonized Amber RFC PaPs on overlapping sections. Amber RFC PaP catalogue shows also harmonized RFC Med PaPs on overlapping sections                      |
| <b>Applicant request PaP</b>                               |  |   |
| Applicant request  | Applicant  | Applicant orders PaPs via PCS.  |
| <b>Pre-Allocation PaP</b>                                  |  |   |

|   |   |  |
|---|---|--|
| No conflict<br>Pre-Allocation at x-7,5        | C-OSS of the involved RFCs for their sections | Pre-Allocation is done in PCS.   |
| Conflict solving                              | C-OSS of the involved RFCs together           | PCS displays to all C-OSS the conflicts. Coordination between C-OSS necessary: Each C-OSS calculates for the conflict path in its sections the K-value. Then, all K-values are summed up for the priority calculation. |
| Alternative PaP / path                        | C-OSS of the involved RFCs for their sections | Communication of alternative options (different PaP or tailor-made path to be constructed later by the IMs) is done by the C-OSS with the conflict in its sections.  |
| <b>Draft and Final offer PaP</b>              |   |  |
| Check and Publication of Draft- / Final offer | C-OSS of the involved RFCs for their sections | Each C-OSS double-checks the offer of the IMs and publishes them via PCS.  |
| <b>Reserve Capacity Publication</b>           |   |  |
| PCS upload                                    | C-OSS of the involved RFCs For their sections | Upload of RC offer to PCS. Each C-OSS for its sections.  |
| Website                                       | C-OSS of involved RFCs for their corridor     | RC Catalogue will be published on the website  |
| <b>Applicants request Reserve Capacity</b>    |   |  |
| Applicant request                             | Applicant                                     | Applicant orders Reserve Capacity via PCS.   |
| <b>Pre-Allocation Reserve Capacity</b>        |   |  |
| Pre-Allocation rules                          | C-OSS of the involved RFCs for their sections | "First come – First serve".  |
| TT Construction                               | C-OSS of the involved RFCs together           | Order of TT construction in case more than one RFCs are involved shall depend on the construction starting point.  |
| Deadlines for ordering                        | C-OSS of the involved RFC for their sections  | All involved RFCs have the same 30-day rule.   |
| <b>Draft and Final offer Reserve Capacity</b> |   |  |
| Check and Publication of Draft- / Final offer | C-OSS of the involved RFCs for their sections | Each C-OSS double-checks the offer of the IMs and publishes them via PCS.  |
| <b>After Sales / Applicants contact</b>       |   |  |

|                                  |   |   |
|----------------------------------|---|---|
| Applicants questions or requests | C-OSS of the involved RFCs for their corridor | <p>An applicant chooses the C-OSS according to the focus market of his question, or a preferred language or further reasons</p> <p>If a question refers to many markets an applicant still will have a single point of contact as all C-OSS closely collaborate and act as one virtual C-OSS to an applicant.</p>   |
| Applicants acquisition           | C-OSS of the involved RFCs for their corridor | <p>C-OSS applicant's care will be done by each C-OSS for its corridor with a regional focus.</p> <p>C-OSS can collaborate based on best practice approaches. Examples:</p> <ul style="list-style-type: none"> <li>• Common C-OSS applicant's visits for an applicant that operates trains in relevant corridors.</li> <li>• Regional applicant's conferences organized by the C-OSS of the concerned RFCs.</li> </ul> |