ROADMAP "NEW RAIL INFRASTRUCTURE/SERVICES 2030" - D.T3.2.7

Report

Version 1.0
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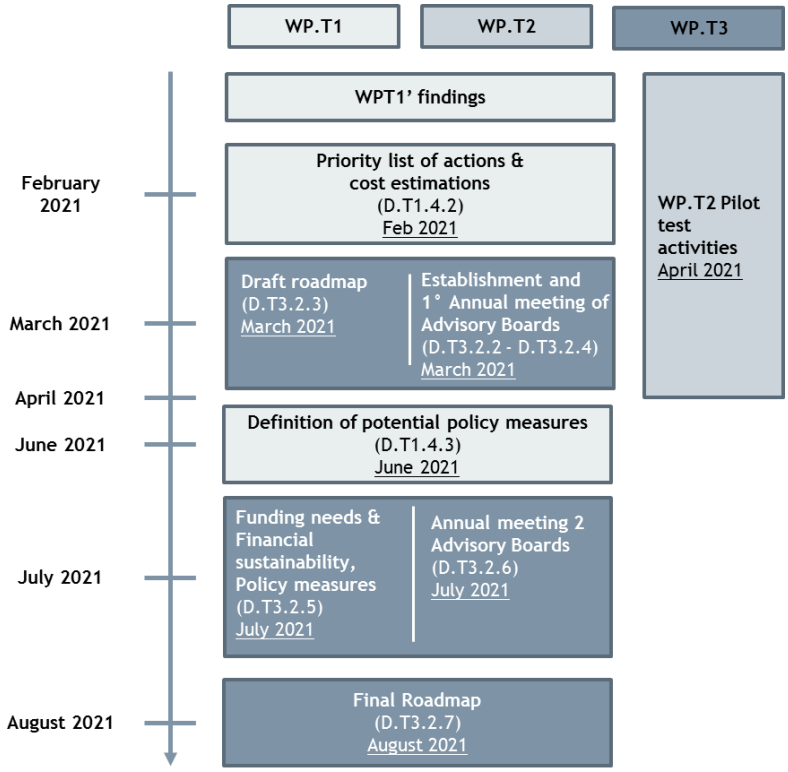
1. Introduction

This document represents the general methodology for the draft of the roadmap, as suggested by ITL Foundation as WP.T3 Leader. According to the Application Form, the roadmap is an operation plan that describes how to realise the interventions included in the priority list (D.T1.4.2) and to implement the potential policy measures (D.T1.4.3) that have been identified in the studies of WP.T1. The time horizon for the implementation of the actions is 2030. The template is used for the draft roadmap (D.T3.2.3) and the final roadmap (D.T3.2.4). The actions included in the final roadmap may vary from those one illustrated in the draft roadmap due to the recommendations of the advisory board about funding possibilities and policy measure.



Each partner was requested to elaborate the roadmap in its respective region (seven at project level: Thuringia, Slovenia, Emilia Romagna, Friuli Venezia Giulia, Croatia, Styria, Westpomerania) following these steps:

- the draft version of the roadmap (D.T3.2.3) is going to be discussed during the first Annual Meeting of Advisory Board (D.T3.2.4), that should be organised by March 2021.
- the final Roadmap (D.T3.2.7) will be finalized in the light of the advisory boards' recommendations on funding possibilities and policy measures (D.T3.2.5), discussed during the second Annual Meeting of Advisory Board (D.T3.2.6).

The roadmap is structured as follows: first chapters concern the introduction of road map's aims and content (chapter 1), the lessons learned from WP.T1's studies and researches and WP.T2's pilot activities (chapter 2) and the main challenges in order to launch new infrastructures and services (chapter 3). In chapter 4, partners have to list the interventions of the road map, identifying for each of them the priority area, the time horizon and the expected cost. Then, a description of those actions considered as a priority has to be provided (chapter 5).

2. Structure for Roadmap development

1) Introduction

The following roadmap describes how to realise the interventions that have been identified in the studies of WP.T1 and included in the priority list of actions (D.T1.4.2). According to the priority list the following measures to improve the Styrian railway infrastructure are essential:

- Construction of the new Bosruck tunnel (A.1)
- Upgrading of the Railway Line Bruck/Mur-Graz-Spielfeld-Maribor (A.2)
- Expansion of the Cargo Centre Graz-Werndorf (CCG) Terminal (A.3)
- New railway line connecting the future Koralm Railway line and the Steirische Ostbahn (A.4)

In section 2 the draft roadmap describes the lessons learned from WP.T1 – baseline study (D.T1.1.5), bottleneck analysis of rail infrastructure (D.T1.3.3), analysis of regional market potential for rail freight services (D.T1.2.3) with a focus on the rail section Gleisdorf – Weiz and the priority list of actions & cost estimations (D.T1.4.2).

Section 3 highlights the main challenges for the implementation of the roadmap.

Section 4 identifies and describes in detail the action and measures foreseen and the expected results from its implementation.

The implementation of the infrastructure measures described in the following roadmap intend to achieve the following **goals**:

- connecting Styria's industries sites to their export markets in Central and Northern Europe
- improving the connection of Styria to the Adriatic ports of Trieste, Koper and Rijeka
- adapting the capacity of the transhipment terminal Cargo Centre Graz to the expected raise in rail freight volumes related to the operation of the Koralm Railway line
- ensuring a high level connection of the Styrian East Railway and the industry sites located along the track with the Koralm Railway line
- consequently shifting road freight transport to rail and thus improving the ecological footprint of freight transport

2) Lessons learned from WP.T1 and WP.T2

In Styria no pilot activities have been conducted (WP.T2).

The **baseline study** (D.T1.1.5) has shown the current situation of regional freight transport in Styria. Styria's economy concentrates within the central region of Graz and the industrial region in Upper Styria (Bruck an der Mur, Leoben, Kapfenberg). It's industry mainly export oriented, with Germany being Styria's most important export partner – with about 25% of Styria's goods (EUR) being exported to Germany[1]. Furthermore, it is expected that new transports between the EU and China (Silk Route) India and Turkey will attract up to 190% of freight transport to the Pyhrn-Schober axis.[2]

The key access points to the national railway network are the three terminals Cargo Centre Graz, the Montan Terminal Kapfenberg and the terminal St. Michael, connecting Styria to the national and to

[1] Statistik Austria, Foreign Trade of Austria's Bundesländer 2019. Values in EUR.

[2] Land Steiermark et. al (2021): Phyrn-Schober-Achse. Zeit für Weichenstellungen.

international corridors and markets. The main railway lines and international corridor lines are very well suitable for high-quality freight transport, but not yet developed for the general increasing freight transport to be expected after realisation of the main infrastructure project Koralm Railway line and Semmering Base Tunnel. The weaknesses of rail freight transport are related to

- steep inclines on the important railway connection to Upper Austria, Central and Northern Europe (Pyhrn-Schober axis) as well as
- insufficiently equipped regional links to the main railway lines,
- transhipment terminals working to capacity.
- Further, support for single wagonload transport is needed to push freight transport to the road in addition to infrastructure for easy transhipment between road and rail.

In Austria, road freight transport is responsible for 36% of greenhouse gas emissions.[3] Along the Pyhrn-Schober axis, one of the most important links of Styria to its trade partners Upper Austria and Germany, freight transport increased by 50% between 1999 and 2015, whereas rail transport stagnated.

Given the importance of rail freight transport for limiting climate change impacts, the political programmes at national and regional level give reason to hope, that rail freight transport will become even more important in the future. The conditions are good. But to achieve the goals, the expansion plans for the national and regional rail network must be made even more ambitious and implemented in right time:

- The rail-road terminal CCG as main logistic node has to be expanded.
- The Styrian railway network has to be developed in order to increase capacity and attractive rail paths for freight trains.
- Apart from the central region and industrial region in Upper Styria regional logistic nodes have to be developed with access to regional railway lines to concentrate regional freight transport.

The **bottleneck analysis** of rail infrastructure (D.T1.3.3) and the compilation of the **priority list of actions** (D.T1.4.2) have led to the following main findings:

The biggest bottlenecks in Styrian rail freight transport are missing high-capacity connections and the lack of capacity in the main rail network. By closing these gaps and eliminating capacity bottlenecks on the main rail network, freight transport on the subordinate network will benefit subsequently.

Styria misses a high-capacity rail connection to the economic centres of Upper Austria and further on to Central and the Northwest of Europe (including the North Sea harbours) along the **Pyhrn-Schober-Axis**. Extending this connection further towards Southeast Europe, would connect Styria, Upper Austria and Bavaria to the harbours of Koper and Rijeka as well as to the east Adriatic and Western Balkan region. Thereby Austria's strongest industrial regions Styria and Upper Austria would be linked and Styria would receive a high-capacity rail connection for its exports of Styrian products. Further, an Alpine-South-East Core Network would be created, connecting South-East Europe with Central Europe, making the Adriatic ports more accessible for a large economic region.

Presently, imports of Styria are handled almost uniquely via the Adriatic ports. In case of a stronger Pyhrn-Schober-axis, importing goods via the port of Hamburg would be possible at reasonable costs, at the same time the Adriatic ports would be more attractive for Central European Regions as Bavaria. Currently, the rail connection between the industrial region of Upper Styria and the Central region of

[3] VCÖ 2019: Factsheet: Wachstum des Gütertransports in EU braucht Bahnausbau.

Upper Austria is for long stretches only available via single-track lines and the mountain route to the Bosruck tunnel. The Bosruck tunnel is relatively steep, more concretely, it is only passable for freight trains up to a maximum weight of 1,000 tons due to the steepness of up to 21 ‰. This bottleneck restricts severely the capacity of rail freight transport. The **upgrading of the Pyhrn-Schober axis** and in particular the **construction of the new Bosruck tunnel** with flat ramps can solve this problem, which has an essential impact to the whole corridor reaching from North and Central Europe out up to Southeast Europe and the Harbours of Koper and Rijeka.

With the operational start of the Koralm Railway line (2025), the **section Bruck an der Mur - Graz** will be at the limit of capacity, as several transport corridors (Baltic-Adriatic, Pyhrn-Schober and the regional transport between Leoben and Kapfenberg) pass along this track. More than 400 trains per day are predicted on this section - this is a value far above the usual capacity utilisation for a double-track railway line. Over the next 20 years, a massive increase in freight traffic is expected from the Adriatic ports of Trieste, Koper and Rijeka heading north. In connection with regional and international passenger transport, the capacity of the almost continuous single-track line between Werndorf (in the south of Graz) and Spielfeld and respectively further to Maribor will therefore represent a further bottleneck in the rail network hampering efficient and fast rail connections. Under these circumstances, an effective shift from road to rail will not be possible. To achieve the required capacity for commuter trains, passenger trains and freight trains, the construction of additional tracks on the line between Bruck/Mur and Graz as well as for the area between Werndorf (in the south of Graz) and Spielfeld or Maribor is essential. The **upgrading of the railway sections Bruck an der Mur - Graz as well as** between **Werndorf and Spielfeld** and respectively further to **Maribor** will improve the connection of the Styrian economic areas to the Adriatic ports of Trieste, Koper and Rijeka. At the same time, it also strengthens the connection of the three ports to Styria and Central Europe.

The **Cargo Centre Graz-Werndorf rail-road-terminal (CCG)** is Styria's most important logistic node for national and international freight transport and the most up-to-date cargo transport centre south of the Alps. Via a neutral logistics platform, CCG provides every-day access to combined transport routes heading for Koper, Triest, Neuss and the Northern ports (Hamburg, Bremerhaven, Rotterdam, Antwerp). At present, the capacity limit of the terminal (230.000 TEU/a) with its four tracks (700 m each), the two gantry cranes, mobile cargo handling equipment and storage space is reached. With the operational start of the Koralm Railway line the freight volume will increase. Due to the already existing full capacity utilization, no additional freight transhipment can be taken up. There is an immanent risk of modal shift to the road. An **expansion of the Cargo Centre Graz Terminal (CCG)** up to about 500.000 TEU/a is essential to increase the freight handling capacity for rail transports linked to the expected raise in freight volumes related to the operation of the Koralm railway. A new facility with four tracks, new gantry-cranes and container storage areas is planned which is connected to the Koralm Railway line and Southern Railway (Südbahn).

The **Styrian East Railway** (**"Steirische Ostbahn")** is a single-track railway line with diesel operation from Graz to the national border at Szentgotthárd (HU) and continues on the Hungarian state side. It connects a number of important industrial sites of the Graz central region to the main railway network. Nonetheless, this connection is presently not sufficient. Particularly, the section between Koralm Railway line and Gleisdorf is still insufficiently equipped for an efficient railway line that meets the requirements of a dense and fast commuter train service and for effective freight transport on rail. Freight trains currently have to pass through the Graz city area and have to change their direction in Graz. The existing line is not suitable for heavy goods traffic, because of the permissible speeds and the existing gradients. In the long term, capacity bottlenecks are also to be expected due to the planned and forecasted traffic. A new railway line connecting the future Koralm Railway line with the Steirische Ostbahn solves capacity problems and establishes a sufficient railway connection between important co-working automotive cluster industries. It provides a direct and high-quality connection of the largest industrial company in the Graz area (MAGNA) to the international rail

network and to suppliers in the region. The **upgrading of the Styrian East Railway** improves Styria's connection to some important railway junctions and economic centres of Hungary as Körmend, Szombathely, Porpác, Celldömölk, Pápa and Györ. In combination with the Koralm Railway line, an upgraded Styrian East railway can provide a high-level transport connection between Italy, Austria, Hungary and, subsequently, the EU member states Romania and Bulgaria as well as the Ukraine. In order to make this infrastructure project more cost efficient, it is anticipated to extend the tracks towards the South for passenger trains ("Fernitzer Bahn") and open up the settlement areas in the South of Graz to efficient commuter train services.

By closing these gaps and eliminating capacity bottlenecks on the main and subordinate rail network, freight transport in the whole network will benefit. The improvement of the high-level rail network and the provision of related services thus directly contributes to preventing the further closing of railway lines in the subordinate network.

The **analysis of regional market potential for rail freight services** (D.T1.2.3) has shown:

For Styria there is a potential of a transport increase of more than 30 per cent possible due to an upgrading of the Pyhrn-Schoberpass railway judging from the transport volumes of road freight transport of rail-affine goods in the year 2015 (according to cross-alpine-freight transport statistics). This potential originates mainly from imports and exports of Styria to Western European Countries and transports to Upper Austria.

The shifting of the overall rail transport potential from road freight transport passing the Pyhrn-Schober Pass requires major (long term) investments, namely the upgrade of the Pyhrn-Schober axis with the Bosruck base tunnel for rail freight transport. A transport potential to be shifted from road freight transport along the Pyhrn-Schober axis is seen in terms of the following products:

- Wood and products of wood and cork, especially paper and cellulose
- Metal ores and other mining and quarrying products
- Basic metals
- Secondary raw materials
- Agricultural products

With focus on regional rail transport, the **market potential of the rail section Gleisdorf - Weiz** has been analysed in more detail. A survey among companies has shown that that there is a future potential for rail transport in the transport of raw timber, but also raw paper from the region and feedstuffs to the region. To sum up the results of the survey among the industry locations, railway freight transports have to take action in three main fields in order to be more competitive to road transports:

- further development of multi-modal services with customer focus, with easily accessible booking and monitoring platforms for existing customers as well as new clients without railway sidings.
- further development of an efficient and interoperable infrastructure network across Europe, including the respective legal framework (technical standards, European Train Control System ETCS etc.) It has to be noted that rail freight transports need a fixed share of capacities as compared to passenger transport, especially for driving in and through agglomerations with frequent passenger services.
- the provision of a level playing field, namely the allocation of external costs to road transport (accident costs, climate costs, road maintenance costs, etc.). This is uttermost important, as businesses base their transport mode decision strongly on the amount of transport costs.

For the case of the region Gleisdorf - Weiz it is thus recommended to develop attractive multi-modal services, to ensure freight transport capacities, especially when driving to/through the agglomeration of Graz as well as to further develop the existing rail infrastructure as regards the bottlenecks identified in order to enable a modal shift of freight transports.

3) Main challenges for the implementation of roadmap

- The operational start of the Koralm Railway line at the end of 2025, accentuates the need for taking actions and eliminating the Styrian bottlenecks in the near future.
- Main challenge is the lack of money for investments in railway infrastructure. It is anticipated that most rail infrastructure measures will be postponed, because of lack of funding. The Styrian government and the stakeholders in Styria share an equal opinion on the priorities of the projects in Styria. The negotiations with the Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) and ÖBB Infrastructure AG reveal basic consensus about the project priorities. However, the implementation periods claimed by Styria are seen as much more long-term oriented from the point of view of the Ministry and ÖBB. For this reason, there is 100% agreement only on the terminal project, as the responsibility for the implementation lies solely with Styria.
- The implementation of the other priority projects can only be ensured by the national ministry. It is the main decision maker in ranking the railway projects in Austria. The Styrian provincial government and the stakeholders in Styria – Austrian Economic Chambers (WKO Steiermark), the Federation of Industry Styria (Industriellenvereinigung Steiermark), the Chamber of Labour (Arbeiterkammer Steiermark), the Austrian Trade Union Federation (ÖGB) – will make an effort to convince the Ministry and ÖBB to accelerate the implementation of the priority projects according to the envisaged time plan.

4) Identification of the actions

The roadmap's relevant actions are identified within the priority area of transport infrastructure and refer to the deliverable D.1.4.2. Priority list of actions & cost estimations and the deliverable D.T1.4.3 - Definition of potential policy measures.

ACTION/MEASURE	ESTIMATED COSTS	TIME HORIZON
A. TRANSPORT INFRASTRUCTURE		
A.1 Construction of the new Bosruck tunnel	1.5 billion EUR	2040
A.2 Upgrading of the Railway Line Bruck/Mur-Graz-Spielfeld-Maribor	A clear assessment of the costs is not yet possible due to the still unclear project specifications.	2040
A.3 Expansion of the Cargo Centre Graz-Werndorf (CCG) Terminal	97 million EUR	2030
A.4 New railway line connecting the future Koralm Railway line and the Steirische Ostbahn	850 million EUR €	2040
B. ROLLING STOCK / MACHINERY		
No relevant action/measure identified		
C. LEGISLATION/ADMINISTRATION		
No relevant action/measure identified		

5) Detail description of priority actions/measures

Number and name of intervention: A.1 Construction of the new Bosruck tunnel	
Priority area *Indicate the priority area of the intervention*	Transport infrastructure
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	The Pyhrn-Schober railway line is part of the TEN-T comprehensive network. At present, the rail connection between the Upper Styrian industrial region and the central region of Upper Austria is largely available via single-track lines only and the mountain route to the Bosruck tunnel, which is relatively steep for railways. The existing railway line in the area of the border between Styria and Upper Austria - the southern ramp to the Bosruck tunnel - is only passable for freight trains up to a maximum weight of 1,000 tons due to the steepness of up to 21‰. This bottleneck severely restricts the capacity of transportable goods in rail traffic. Expected results: The upgrading of the Pyhrn-Schober axis and in particular the construction of the new Bosruck tunnel with flat ramps (max. 12‰, ideally 3 - 5 ‰ in the variants with a long tunnel) can solve a problem, which has an impact to the whole corridor and are thus essential. Flatting the ramp with the construction of the new Bosruck tunnel increases the loading capacity of freight trains by 50% and the operation speed up to 100 km/h.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	The federal states of Carinthia, Upper Austria, Salzburg and Styria as well as the Styrian economic and social partnership have conducted numerous studies which support the integration of the Tauern-Pyhrn-Schober axis into the TEN-T core network as well as the necessity of realising the new Bosruck tunnel as soon as possible and emphasise the European added value of the project. In the course of the next TEN-T revision in 2023, the federal states of Styria, Carinthia, Upper Austria and Salzburg are aiming to include the two axes via Tauern and Pyhrn-Schober into the TEN-T core network. The ÖBB framework plan 2021-2026 does not include a new construction of the Bosruck tunnel, but only the renewal of the existing tunnel. This tunnel will remain in operation until 2040. A period of at least 15 to 20 years should be estimated for the planning, procedures and implementation of this project, which is subject to EIA. The completion of a new, double-tracked and flat-tracked tunnel is to be aimed for by 2040 at the latest. Thus, the project “New Bosruck tunnel” was submitted to the Federal Ministry (BMK) for inclusion into the ÖBB 2040 target network.

Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	**Austrian Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK)**: The ministry in its competence is the main decision maker in ranking the railway projects in Austria. The framework plan for the planned investments in rail infrastructure is coordinated with the **Austrian Federal Ministry of Finance**, which provides subsidies to ÖBB-Infrastruktur AG for the planning and construction as well as maintenance of rail infrastructure. **ÖBB-Infrastruktur AG** (subsidiary of **ÖBB-Holding AG**, which is wholly owned by the Republic of Austria): responsible for planning, construction and managing of the main railway infrastructure, has all information about the project. ÖBB-Infrastruktur AG will be the direct beneficiary of the measures.
Timeline *Indicate the time horizon for the implementation of the action*	The need to eliminate this bottleneck is immanent. The realistic time to eliminate it by the construction of the new Bosruck tunnel is about 20 years (2040). Thus, there is the need to start the planning immediately.
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	1.5 billion EUR €
Sources of financing[4] *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	100% ÖBB-Infrastruktur AG, based on public subsidies Subsidies by Connecting Europe Facility (CEF): Pyhrn-Schober railway line is part of the RFC 10 “Alpine-Western Balkan” and part of the TEN-T comprehensive network
Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	The construction of the new Bosruck tunnel with flat ramps has an essential impact to the whole corridor. The reduction of transport times and the increase of rail freight capacity results in more attractive rail services and lower transport costs. Consequently, a modal shift of freight transport from road to rail can be achieved and the present rail freight relations can be safeguarded. This implies positive environmental impacts as compared to a future rise of road transport. The upgrading of the Pyhrn-Schober axis would improve the connection of Styria to the economic trade partners in Western and Northwest Europe and conversely the connection of the Northwest of Europe to the Southeast European countries, particularly to the Harbours of Koper and Rijeka. Within Austria, a better connection between the Styrian and Upper Austrian economic areas would be guaranteed.

[4] This information, if already available, could be assumed in the draft version and it has to be confirmed in the final one

Compliance with the overall objectives of REIF project *Describe the expected contribution of the action/measure to the achievement of REIF project (e.g. connection to TEN-T corridor, ...)*	This infrastructure measure contributes to eliminating bottlenecks and lack of capacity in the Styrian railway infrastructure. By closing these gaps and eliminating capacity bottlenecks on the main rail network, freight transport on the subordinate network will benefit subsequently.
Compliance with guidelines of national and regional planning instruments *Describe the compliance with the aim of national and regional planning instruments*	Measures to improve the Styrian railway infrastructure are in line with the Styrian Transport Concept ("Steirisches Gesamtverkehrskonzept 2008+", StGVK) and with Styrian regional mobility plans (RMP). The aim of StGVK is to increase the share of rail transport in supra-regional and international freight traffic by upgrading the Styrian rail infrastructure to international standards and to reduce transport costs by rail. Regarding the freight transport in, out and into the Styrian region the main aims of the Styrian government's programme (2019) are streamlined to the strategic document STGVK. In particular, the aim is to finance road transport infrastructure in line with the polluter-pays principle and to increase investment in the expansion and attractiveness of the rail infrastructure (railway lines and the terminal Graz as the main hub in Styria) and freight transport services. At the national level, both the Austrian Climate and Energy Strategy 2030 #mission2030 and the Austrian Government Programme 2020 - 2024 call for freight transport to be handled in an energy-efficient, environmentally and climate-friendly way and to shift transports from road to rail.

Number and name of intervention: A.2 Upgrading of the Railway Line Bruck/Mur-Graz-Spielfeld-Maribor	
Priority area *Indicate the priority area of the intervention*	Transport infrastructure
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	The railway line Graz – Spielfeld – Maribor is part of the Baltic-Adriatic-Corridor and thus part of the TEN-T core network. With the operational start of the Koralm Railway line, more than 400 trains per day are predicted on the section between Bruck/Mur and Graz. This utilization exceeds the usual capacity of a double-track railway line by far. In order allow for this frequency of trains, long-distance trains will have to slow down their speeds and suburban trains increase their waiting times in stations for overtaking, while freight trains will be shifted to night time. Further, within the next 20 years, a massive increase in freight traffic is expected from the Adriatic ports of Trieste, Koper and Rijeka to the north. In connection with regional and international passenger transport, the capacity of the almost continuous single-track line between Werndorf (in the south of Graz) and Spielfeld and respectively further to Maribor will additionally be a bottleneck in the rail network. To achieve the required capacity for commuter trains, passenger trains and freight trains, the construction of additional tracks is essential. On the section between Bruck/Mur and Graz, this results partly in the construction of completely new lines distant from the existing double-track line. For the area between Werndorf and Spielfeld or Maribor, the addition of a second track is necessary, partially with line improvements. Expected results: The upgrading of the railway sections Bruck an der Mur - Graz as well as between Werndorf and Spielfeld and respectively further to Maribor will improve the connection of the Styrian economic areas to the Adriatic ports of Trieste, Koper and Rijeka. At the same time, it also strengthens the connection of the three ports to Styria and Central Europe.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Due to the foreseeable timeframes until the commissioning of the respective line sections, there is the need to start the planning immediately. The criteria of the TEN-T core network for freight and passenger traffic must be taken into account in the planning. ▪ Including the upgrading of the railway sections Bruck/Mur - Graz and Werndorf - Spielfeld into the ÖBB target network 2040.

	▪ Concrete planning mandate of the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) to ÖBB-Infrastruktur AG for the step-by-step implementation of the measures. ▪ Upgrading of the railway section Bruck/Mur-Graz with the same technical parameters as for the Koralm Railway line, the Linz - Wels section in Upper Austria or the railway line in the Lower Inn Valley in Tyrol. (i.e. new alignment to reduce travel time, four-tracks upgrade)
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	**Austrian Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK)**: The ministry in its competence is the main decision maker in ranking the railway projects in Austria. The framework plan for the planned investments in rail infrastructure is coordinated with the **Austrian Federal Ministry of Finance**, which provides subsidies to ÖBB-Infrastruktur AG for the planning and construction as well as maintenance of rail infrastructure. **ÖBB-Infrastruktur AG** (subsidiary of **ÖBB-Holding AG**, which is wholly owned by the Republic of Austria): responsible for planning, construction and managing of the main railway infrastructure, has all information about the project. ÖBB-Infrastruktur AG will be the direct beneficiary of the measures.
Timeline *Indicate the time horizon for the implementation of the action*	The need to eliminate this bottleneck is given by the start of the operation of the Koralm Railway line (end of 2025). The realistic time to eliminate it by the construction of additional tracks – partly with new alignments and tunnels - is about 20 years (2040). Consequently, there is a need to start the planning immediately.
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	A clear assessment of the costs is not yet possible due to the still unclear project specifications.
Sources of financing[5] *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	100% ÖBB-Infrastruktur AG, based on public subsidies Subsidies by Connecting Europe Facility (CEF): The railway line Bruck an der Mur - Graz – Spielfeld – Maribor is part of the Baltic-Adriatic-Corridor and thus part of the TEN-T core network and part of the RFC 10 “Alpine-Western Balkan” subsidies by Styrian State Government, based on promoting of regional rail transport

[5] This information, if already available, could be assumed in the draft version and it has to be confirmed in the final one

Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	The upgrading of the railway sections Bruck an der Mur - Graz as well as between Werndorf and Spielfeld and respectively further to Maribor will improve the connection of the Styrian economic areas to the Adriatic ports of Trieste, Koper and Rijeka. At the same time, it also strengthens the connection of the three ports to Styria and Central Europe. This results in a modal shift of freight transport from road to rail with the connected implications of reduction of emissions, noise and accident costs as compared to otherwise increased road transports.
Compliance with the overall objectives of REIF project *Describe the expected contribution of the action/measure to the achievement of REIF project (e.g. connection to TEN-T corridor, ...)*	This infrastructure measure contributes to eliminating bottlenecks and lack of capacity in the Styrian railway infrastructure. By closing these gaps and eliminating capacity bottlenecks on the main rail network, freight transport on the subordinate network will benefit subsequently.
Compliance with guidelines of national and regional planning instruments *Describe the compliance with the aim of national and regional planning instruments*	Measures to improve the Styrian railway infrastructure are in line with the Styrian Transport Concept ("Steirisches Gesamtverkehrskonzept 2008+", StGVK) and with Styrian regional mobility plans (RMP). The aim of StGVK is to increase the share of rail transport in supra-regional and international freight traffic by upgrading the Styrian rail infrastructure to international standards and to reduce transport costs by rail. Regarding the freight transport in, from and to the Styrian region the main aims of the Styrian government's programme (2019) are streamlined to the strategic document STGVK. In particular, the aim is to finance road transport infrastructure in line with the polluter-pays principle and to increase investment in the expansion and attractiveness of the rail infrastructure (railway lines and the terminal Graz as the main hub in Styria) and freight transport services. At the national level, both the Austrian Climate and Energy Strategy 2030 #mission2030 and the Austrian Government Programme 2020 - 2024 call for freight transport to be handled in an energy-efficient, environmentally and climate-friendly way and to shift transports from road to rail.

Number and name of intervention: A.3 Expansion of the Cargo Centre Graz-Werndorf (CCG) Terminal	
Priority area *Indicate the priority area of the intervention*	Transport infrastructure
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	An expansion of the terminal is essential to increase the freight loading capacity for rail transport. In a first phase the expansion contains the elongation of the existing tracks and the operation of a third gantry crane. The second phase shall go along with the construction of the Koralm railway. It includes the construction of a new terminal site with four additional tracks with two gantry cranes, additional storage space and new connections to the high-level rail and road network. These measures increase the capacity of the terminal up to about 500.000 TEU/a. Expected results: With the operational start of the Koralm Railway line the freight volume will increase. Due to the already existing full capacity utilization, no additional capacities can be taken up. There is an immanent risk of modal shift to the road. The expansion of the Cargo Centre Graz Terminal (CCG) up to about 500.000 TEU/a is essential to increase the freight handling capacity for rail transports linked to the expected raise in freight volumes related to the operation of the Koralm railway.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	The feasibility study has been completed. Negotiations on financing and company structure are underway. Extensions and adaptations at the Wundschuh transfer station are under negotiation. The aim is to separate ÖBB from Graz-Werndorf Projekt GmbH (GWP) to establish a PPP shareholder structure with the participation of the province of Styria. Detailed planning of the terminal infrastructure. Application for a 50 % subsidy by the Federal Ministry (BMK): “Anschlussbahn- und Terminalförderung”
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	**Cargo Centre Graz-Werndorf (CCG)**: CCG is the Terminal Operator. It will be the direct beneficiary of the measures. **GWP (Güterterminal Werndorf Projektgesellschaft)**: 100 % owned by ÖBB-Infrastruktur AG and part owner of the Cargo Centre Graz-Werndorf **ÖBB-Infrastruktur AG** (still owner of the GWP, subsidiary of **ÖBB-Holding AG**, which is wholly owned by the Republic of Austria): responsible for planning, construction and managing

	of the main railway infrastructure including the transfer stations to the terminal. **StB (Steiermärkische Landesbahnen):** operator of the CCG, company that manages the transhipment and railway operations at the Graz South Terminal, builds and manages regional railway infrastructures
Timeline *Indicate the time horizon for the implementation of the action*	**2030**
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	**97 million EUR in total** Including the expansion of the existing terminal, new terminal facilities, container and storage areas, workshops, road connections and necessary adjustments at the Wundschuh transfer station and at the access to the road network.
Sources of financing[6] *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	Negotiations on financing and corporate structure are underway. Public and private capital (expected): 50% private capital 50% by Styrian State Government subsidies by the Austrian Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK): "Anschlussbahn- und Terminalförderung" Subsidies by Connecting Europe Facility (CEF): RRT is part of the TEN-T core network on the alignment of the Baltic-Adriatic-CNC and the RFC 10 "Alpine-Western Balkan"
Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	The expansion of the Cargo Centre Graz Terminal (CCG) up to about 500.000 TEU/a is essential to increase the freight handling capacity for rail transports linked to the expected raise in freight volumes related to the operation of the Koralm railway. The expansion allows to shift transports from road to rail, respectively to handle the expected additional transport flows via rail transports. This implies positive environmental impacts as compared to a future rise of road transport.
Compliance with the overall objectives of REIF project *Describe the expected contribution of the action/measure to the achievement of REIF project (e.g. connection to TEN-T corridor, ...)*	This infrastructure measure contributes to eliminating bottlenecks and lack of capacity in the Styrian railway infrastructure. By closing these gaps and eliminating capacity bottlenecks on the main rail network rail freight transport on the subordinate network will benefit subsequently.
Compliance with guidelines of national and regional planning instruments *Describe the compliance with the aim of national and regional planning instruments*	Measures to improve the Styrian railway infrastructure are in line with the Styrian Transport Concept ("Steirisches

[6] This information, if already available, could be assumed in the draft version and it has to be confirmed in the final one

	Gesamtverkehrskonzept 2008+“, StGVK) and with Styrian regional mobility plans (RMP). The aim of StGVK is to increase the share of rail transport in supra-regional and international freight traffic by upgrading the Styrian rail infrastructure to international standards and to reduce transport costs by rail. Regarding the freight transport in, out and into the Styrian region the main aims of the Styrian government’s programme (2019) are streamlined to the strategic document STGVK. In particular, the aim is to finance road transport infrastructure in line with the polluter-pays principle and to increase investment in the expansion and attractiveness of the rail infrastructure (railway lines and the terminal Graz as the main hub in Styria) and freight transport services. At the national level, both the Austrian Climate and Energy Strategy 2030 #mission2030 and the Austrian Government Programme 2020 - 2024 call for freight transport to be handled in an energy-efficient, environmentally and climate-friendly way and to shift transports from road to rail.

Number and name of intervention: A.4 New railway line connecting the future Koralm Railway line and the Steirische Ostbahn	
Priority area *Indicate the priority area of the intervention*	Transport infrastructure
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	Steirische Ostbahn is part of the TEN-T comprehensive network. It runs as a single-track railway line with diesel operation from Graz to the state border at Szentgotthárd and continues on the Hungarian state side. A new railway line is planned to directly connect the future Koralm Railway line with the Steirische Ostbahn. Expected results: A new railway line connecting the future Koralm Railway line with the Steirische Ostbahn solves capacity problems and establishes a sufficient railway connection between important co-working automotive cluster industries. Transports from the region Gleisdorf-Weiz are facilitated as with the new connection the trains do not longer have to run over large parts of the City of Graz and do not require shunting. Thus, it provides a direct and high-quality connection of the largest industrial company in the Graz area (MAGNA) to the international rail network and to a range of supplier industries in the region. The upgrading of the Styrian East Railway improves Styria's connection to some important railway junctions and economic centres of Hungary as Körmend, Szombathely, Porpác, Celldömölk, Pápa and Györ. In combination with the Koralm Railway, an upgraded Styrian East Railway can provide a high-level transport connection between Italy, Austria, Hungary and, subsequently, the EU member states Romania and Bulgaria as well as the Ukraine. In combination with an extension of the tracks to the South of Graz for passenger trains (“Fernitzer Bahn”), this link would be even more cost efficient and provide a commuter service for the settlement areas in the South of Graz, thus relieving the problem of the congested road system in the Region of Graz.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Due to the foreseeable timeframes until the commissioning of the respective line sections, it is essential to start the planning immediately and submitted at least for EIA so that a route permit can be obtained in order to keep areas free from other uses, as housing and business development. ▪ Electrification of the existing line by 2027 according to the ÖBB framework plan 2021-2026.

	▪ Including the railway line between the Koralm Railway line and the Steirische Ostbahn into the ÖBB target network 2040. ▪ Rapid start of the permitting process and EIA planning to obtain a route permit for the railway line to keep areas free from other uses, as housing and business development.
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	**Austrian Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK)**: The ministry in its competence is the main decision maker in ranking the railway projects in Austria. The framework plan for the planned investments in rail infrastructure is coordinated with the **Austrian Federal Ministry of Finance**, which provides subsidies to ÖBB-Infrastruktur AG for the planning and construction as well as maintenance of rail infrastructure. **ÖBB-Infrastruktur AG** (subsidiary of **ÖBB-Holding AG**, which is wholly owned by the Republic of Austria): responsible for planning, construction and managing of the main railway infrastructure, has all information about the project. ÖBB-Infrastruktur AG will be the direct beneficiary of the measures.
Timeline *Indicate the time horizon for the implementation of the action*	In 2012, the planning of the new railway line connecting the future Koralm Railway line and the Steirische Ostbahn was stopped by the Ministry of Transport. Currently, the electrification of the existing line is being planned and construction is scheduled to start in 2023. On the Hungarian side, electrification has already been implemented with the Hungarian electricity system. The need to eliminate this bottleneck is given after the start of the operation of the Koralm Railway line (end of 2025). The realistic time to eliminate it by the construction of this new railway line is more than 20 years (beyond 2040). Consequently, there is the need to start planning immediately in order to obtain the land for the route.
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	850 million EUR
Sources of financing[7] *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	100% ÖBB-Infrastruktur AG, based on public subsidies Subsidies by Connecting Europe Facility (CEF): railway line Steirische Ostbahn is part of the TEN-T comprehensive network

[7] This information, if already available, could be assumed in the draft version and it has to be confirmed in the final one

	subsidies by Styrian State Government, based on promoting of regional rail transport
Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	The measure will reduce the transport costs and decrease the travel times of rail transport passing between the Koralm Railway line to the Steirische Ostbahn. It will thus allow for more efficient rail freight transports for the important automotive industry in the region, as well as for exports of wood from the region via the Southern ports. It further improves Styria's connection to some important railway junctions and economic centres of Hungary as Körmend, Szombathely, Porpác, Celldömölk, Pápa and Györ. In combination with the Koralm Railway, an upgraded Styrian East Railway can provide a high-level transport connection between Italy, Austria, Hungary and, subsequently, the EU member states Romania and Bulgaria as well as the Ukraine. This results in a modal shift of freight transport from road to rail with the connected implications of reduction of emissions, noise and accident costs as compared to otherwise increased road transports.
Compliance with the overall objectives of REIF project *Describe the expected contribution of the action/measure to the achievement of REIF project (e.g. connection to TEN-T corridor, ...)*	This infrastructure measure contributes to eliminating bottlenecks and lack of capacity in the Styrian railway infrastructure. By closing these gaps and eliminating capacity bottlenecks on the main rail network, freight transport on the subordinate network will benefit subsequently.
Compliance with guidelines of national and regional planning instruments *Describe the compliance with the aim of national and regional planning instruments*	Measures to improve the Styrian railway infrastructure are in line with the Styrian Transport Concept ("Steirisches Gesamtverkehrskonzept 2008+", StGVK) and with Styrian regional mobility plans (RMP). The aim of StGVK is to increase the share of rail transport in supra-regional and international freight traffic by upgrading the Styrian rail infrastructure to international standards and to reduce transport costs by rail. Regarding the freight transport in, out and into the Styrian region the main aims of the Styrian government's programme (2019) are streamlined to the strategic document STGVK. In particular, the aim is to finance road transport infrastructure in line with the polluter-pays principle and to increase investment in the expansion and attractiveness of the rail infrastructure (railway lines and the terminal Graz as the main hub in Styria) and freight transport services. At the national level, both the Austrian Climate and Energy Strategy 2030 #mission2030 and the Austrian Government Programme 2020 - 2024 call for freight transport to be handled in an energy-efficient, environmentally and climate-friendly way and to shift transports from road to rail.

6) Conclusion

The baseline study has shown that the **main railway lines and international corridor lines are not yet developed for the general increasing freight transport**. Styria is a strongly export oriented economy, its main trade partners Germany and Upper Austria are located in the North-West of Styria.

The weaknesses of rail freight transport are related to insufficiently equipped regional links to the main railway lines, steep inclines on the important railway connection to Upper Austria and Central as well as Northern Europe as well as transhipment terminals working to capacity. Further, support for single wagonload transport by the railway undertakings is needed to push freight transport on the road as well as infrastructure for easy transhipment between road and rail.

In Austria road freight transport is responsible for 36% of greenhouse gas emissions.[8] Along the Pyhrn-Schober-axis road freight transport increased by 50% between 1999 and 2015, whereas rail transport stagnated. For achieving the goal of shifting freight transports from road to rail, the expansion plans for the national and regional rail network must be made even more ambitious and implemented in right time. Therefore, the planning and variant analysis of these infrastructure measures has to start immediately, in order to ensure timely realisation. The targets are:

- The Styrian railway network has to be developed in order to increase capacity and attractive rail paths for freight trains between the most important economic trade partners.
- The rail-road terminal CCG as main logistic node has to be expanded.
- Apart from the central region and industrial region in Upper Styria, regional logistic nodes have to be developed with cost-efficient access to regional railway lines in order to support regional freight transport.

The bottleneck analysis of rail infrastructure and the compilation of the priority list of actions have shown that **the biggest bottlenecks in Styrian rail freight transport are missing high-capacity rail connections and the lack of capacity in the main rail network**. Styria misses a high-capacity rail connection to the economic centres of Upper Austria and further on to Central and the Northwest of Europe (including the North Sea harbours) along the **Pyhrn-Schober-Axis**. The extension of this connection towards Southeast Europe would establish an Alpine-South-East Core Network, linking Southeast Europe to important economic centres of the EU.

Without eliminating the main bottlenecks in the Styrian rail infrastructure, an effective shift from road to rail will thus not be possible. Consequently, the shifting of freight to ecologically sound means of transport will not take place. According to the priority list of action the following measures to improve the Styrian railway infrastructure are essential:

- Construction of the new Bosruck tunnel
- Upgrading of the Railway Line Bruck/Mur-Graz-Spielfeld-Maribor
- Expansion of the Cargo Centre Graz-Werndorf (CCG) Terminal
- New railway line connecting the future Koralm Railway line and the Steirische Ostbahn

Due to the steepness of up to 21 ‰ the Bosruck tunnel is a bottleneck that severely restricts the capacity of transportable goods in rail traffic. Consequently, road transports on the well developed motorway rose significantly, whereas rail transports stagnated. The **upgrading of the Pyhrn-Schober axis** and in particular the **construction of the new Bosruck tunnel** with flat ramps can solve this problem, which has an essential impact to the whole corridor working towards an Alpine-South-East Core Network.

[8] VCÖ 2019: Factsheet: Wachstum des Gütertransports in EU braucht Bahnausbau.

With the operational start of the Koralm Railway line (2025), the **section Bruck an der Mur - Graz** will be at the limit of capacity, as several transport corridors (Baltic-Adriatic, Pyhrn-Schober and the regional transport between Leoben and Kapfenberg) pass along this track. Over the next 20 years, a massive increase in freight traffic is expected from the Adriatic ports of Trieste, Koper and Rijeka heading north.

To achieve the required capacity for commuter trains, passenger trains and freight trains, the **upgrading of the railway sections Bruck an der Mur - Graz as well as** between **Werndorf and Spielfeld** and respectively further to **Maribor** is necessary. It will improve the connection of the Styrian economic areas to the Adriatic ports of Trieste, Koper and Rijeka. At the same time, it also strengthens the connection of the three ports to Styria and Central Europe.

The **Cargo Centre Graz-Werndorf rail-road-terminal (CCG)** is Styria's most important logistic node for national and international freight transport and the most up-to-date cargo transport centre south of the Alps. An **expansion of the Cargo Centre Graz Terminal (CCG)** up to about 500.000 TEU/a is essential to increase the freight handling capacity for rail transports linked to the expected raise in freight volumes related to the operation of the Koralm railway.

The **Styrian East Railway** (**"Steirische Ostbahn")** – a single-track railway line with diesel operation from Graz to the national border at Szentgotthárd (HU) – is not suitable for heavy goods traffic, either because of the permissible speeds or because of the existing gradients. In the longer term, capacity bottlenecks are also to be expected due to the planned and forecasted traffic. The **upgrading of the Styrian East Railway** improves Styria's connection to some important railway junctions and economic centres of Hungary as Körmend, Szombathely, Porpác, Celldömölk, Pápa and Györ. In combination with the Koralm Railway line, an upgraded Styrian East railway can provide a high-level transport connection between Italy, Austria, Hungary and, subsequently, the EU member states Romania and Bulgaria as well as the Ukraine. At best, this investment is combined with a new commuter train connection for the South of Graz ("Fernitzer Bahn").

The operational start of the Koralm Railway line at the end of 2025, accentuates the need for taking actions and eliminating the Styrian bottlenecks in the near future.

By closing the gaps and eliminating capacity bottlenecks on the main rail network, freight transport on the subordinate network will benefit subsequently. The improvement of the high-level rail network and the provision of related services thus directly contributes to preventing the further closing of railway lines in the subordinate network.

Main challenge for the implementation of roadmap is the lack of money for investments in railway infrastructure. It is anticipated that **most rail infrastructure measures will be postponed**, because of lack of funding.

The implementation of the priority projects can only be ensured by the national ministry. It is the main decision maker in ranking the railway projects in Austria. The negotiations with the Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) and ÖBB Infrastructure AG reveal basic consensus about the project priorities. However, the implementation periods claimed by Styria are seen as much more long-term oriented from the point of view of the Ministry and ÖBB. For this reason, there is 100% agreement only on the terminal project, as the responsibility for the implementation lies solely with Styria. The Styrian provincial government and the stakeholders in Styria – Austrian Economic Chambers (WKO Steiermark), the Federation of Industry Styria (Industriellenvereinigung Steiermark), the Chamber of Labour (Arbeiterkammer Steiermark), the Austrian Trade Union Federation (ÖGB) – will make an effort to convince the Ministry and ÖBB to accelerate the implementation of the priority projects according to the envisaged time plan.