

D.T1.2.3 ANALYSIS OF REGIONAL MARKET POTENTIAL FOR RAIL FREIGHT SERVICES - STYRIA

Final Report

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REIF Analysis of regional market potential for rail freight services - Styria

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1. Introduction

The deliverable “Analysis of regional market potential for rail freight services - Styria” in WP 1 (D.T1.2.3) covers a general status quo analysis for Styria as well as a detailed survey for the rail segment Gleisdorf-Weiz. This railway section is a regional branch, where a number of industrial sites are located which often possess siding tracks, but don’t use it due to different reasons to be investigated.

Further the Styrian regional rail infrastructure is described as well as its freight suitability and its integration into the TEN-T Network. Furthermore, the logistic market in Styria is highlighted as well as the economic, political and technical market conditions. It has to be noted that - although there is a significant potential of rail freight transports - some branches of the Styrian industry are affected by the impacts of the COVID-19 pandemic, above all the automotive sector. However, this sector was urged to re-organise due to changing framework conditions.¹

¹ Industriemagazin (2020): Österreichs Forscher: Autoindustrie wäre auch ohne Corona in der Krise. 25.04.2020 <https://industriemagazin.at/a/oesterreichs-forscher-autoindustrie-waere-auch-ohne-corona-in-der-krise>



2. Status quo Analysis of Market Potential

This chapter discusses at first the general rail freight potential for imports and export to respectively from Styria based on foreign trade statistics as well as rail and road freight transport statistics. Subsequently, the market potential for a regional subsection, namely, Gleisdorf - Weiz running into the Styrian Eastern Line is investigated based on a survey among the industry locations along the railway section.

2.1. General rail freight market potential Styria

In order to estimate the market potential of rail transports in Styria, the present foreign trade statistics are compared with the actual rail freight statistics. While foreign trade statistics inform about the total amounts of goods being imported and exported to/from a country, transport statistics allow to identify the mode of transport used to import/export these products.²

Traditionally, rail transports perform best for transporting bulk goods (especially in volumes of block trains), long transport distances (generally more than 300 km, in particular with foregoing or subsequent oversea transshipment) and are transports which are most likely periodic respectively can be scheduled on a middle or long-term basis.³

Within the last decades, the rising share of intermodal transport units (containers) as well as the growing importance of hinterland-transport of ports increased the transport volumes by railway. Competition in the logistic market is however challenging, as truck transports are generally more flexible, especially for short and time sensible transport relations.

The analysis of the rail freight market potential starts with an overview on the Styrian imports and exports volumes and relations of (heavy) goods as well as an analysis of rail freight volumes of imports and exports. As cross-border transports are as such longer than domestic transports, they are more interesting as market potential for rail transports than domestic relations. However, transports from the East of Styria, e.g. Gleisdorf to Upper Austria, e.g. Linz or Enns account for 250 km and can nonetheless be interesting rail freight connections if periodic and predictable.

Styrian foreign trade relations

Styrian imports in the year 2018 accounted for 12,5 Mio. tons, whereas the exports come to 10,5 Mio. tons. Styria thus reflects 13% of Austrian imports in tons and 17% of Austrian exports in tons. The year 2018 was chosen to illustrate the potential for foreign trade and transport relations, as it was a year with good framework conditions and positive economic development throughout Europe.

Germany is clearly the most important foreign trade partner, supplying Styria with bulk goods as coal, wood and pulp, stones (incl. chalk and cement) as well as iron and steel. Other important **import partners** are:

- Africa (ores),
- Poland and Russian federation (mineral fuels - coal and mineral oil),
- Czech Republic (wood)
- Slovenia (chemicals, pulp and wood) and
- Hungary (stones and earths, wood, iron and steel).

In terms of export the most important **export partners** for Styria are:

- Germany (paper and paperboard, iron and steel and articles of iron and steel, etc.)
- Italy (wood and articles of wood, iron and steel, cereals, etc.)
- Slovenia (earths and stones, wood and articles of wood, paper and paperboard, etc.)

The types of products exported are more miscellaneous than the imports. Apart from the above-mentioned products, vehicles (others than rail- or tramway rolling stock) and chemical products are weight-wise

² Remark to transit: Within the Styrian railway market, transit through Styria - from other Bundesländer or other countries, also uses Styrian railway infrastructure and thus affects railway capacities. Transits are however difficult to depict from the available statistics and will be identified by analysis of the latest available survey on alpine crossing freight transport 2015. This information will be complemented in the final report.

³ Econsult et. al. (2014): Vorschläge zur Attraktivierung des Anschlussbahnwesens. Zusammenfassende Ergebnisse der Studie AIRA - Adaptive & Innovative Referenzsysteme für Anschlussbahnen



important export goods. With the neighbouring regions of Slovenia, the traded volumes of stones and earths are further significant.

The importance of Slovenia as a trading partner for both imports and exports is justified by its geographical proximity as well as with the port of Koper which is an important terminal for Austrian trade relations.

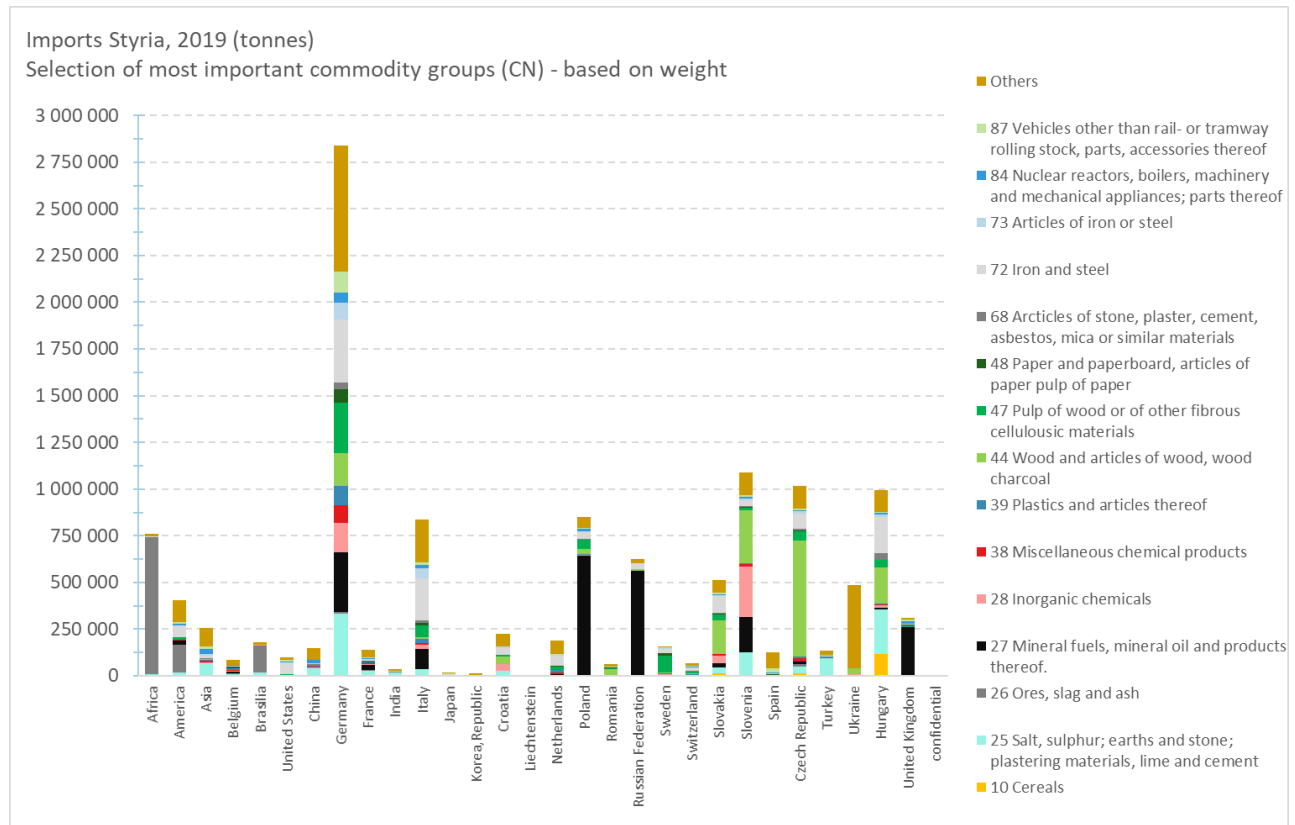


Figure 1: Imports Styria, 2018 in tonnes

Source: Statistik Austria, regional foreign trade statistics, 2018

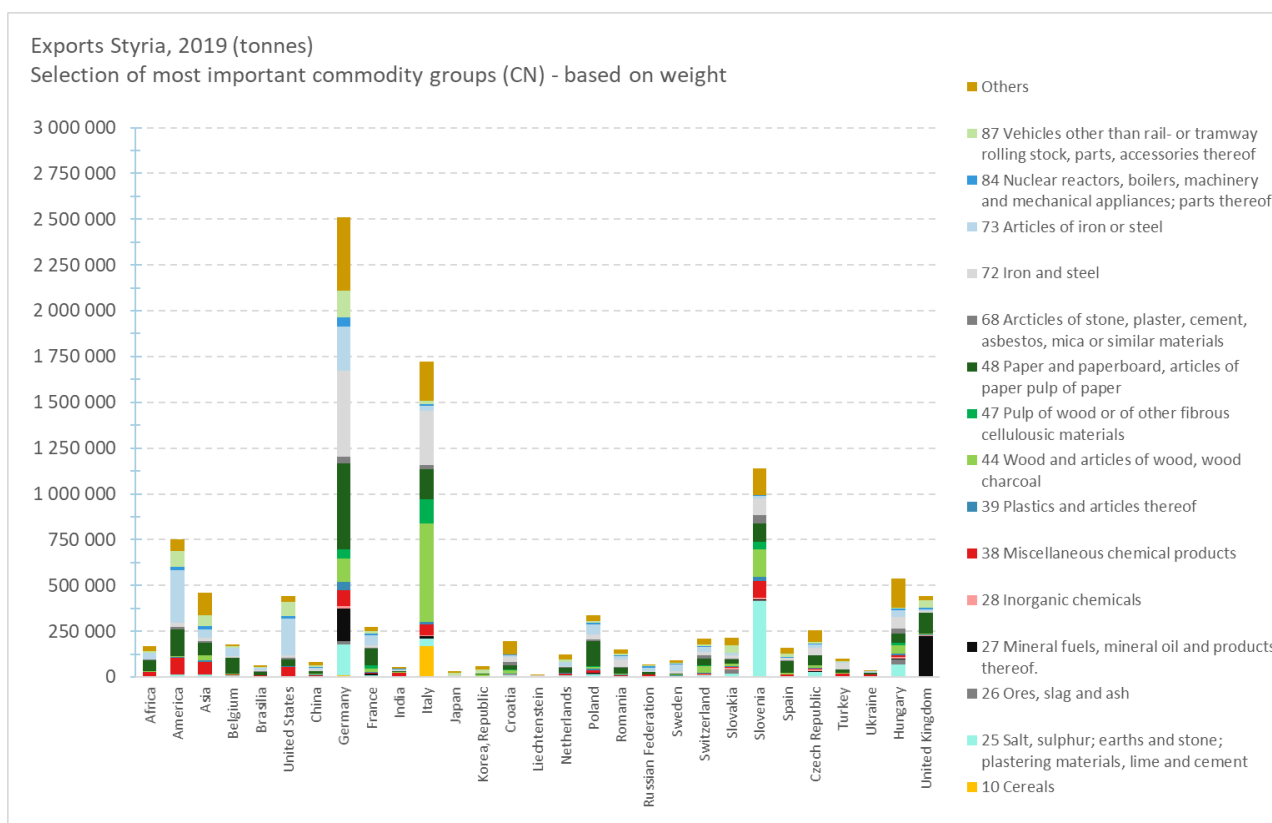


Figure 2: Exports Styria, 2019 in tonnes

Source: Statistik Austria, regional foreign trade statistics, 2019

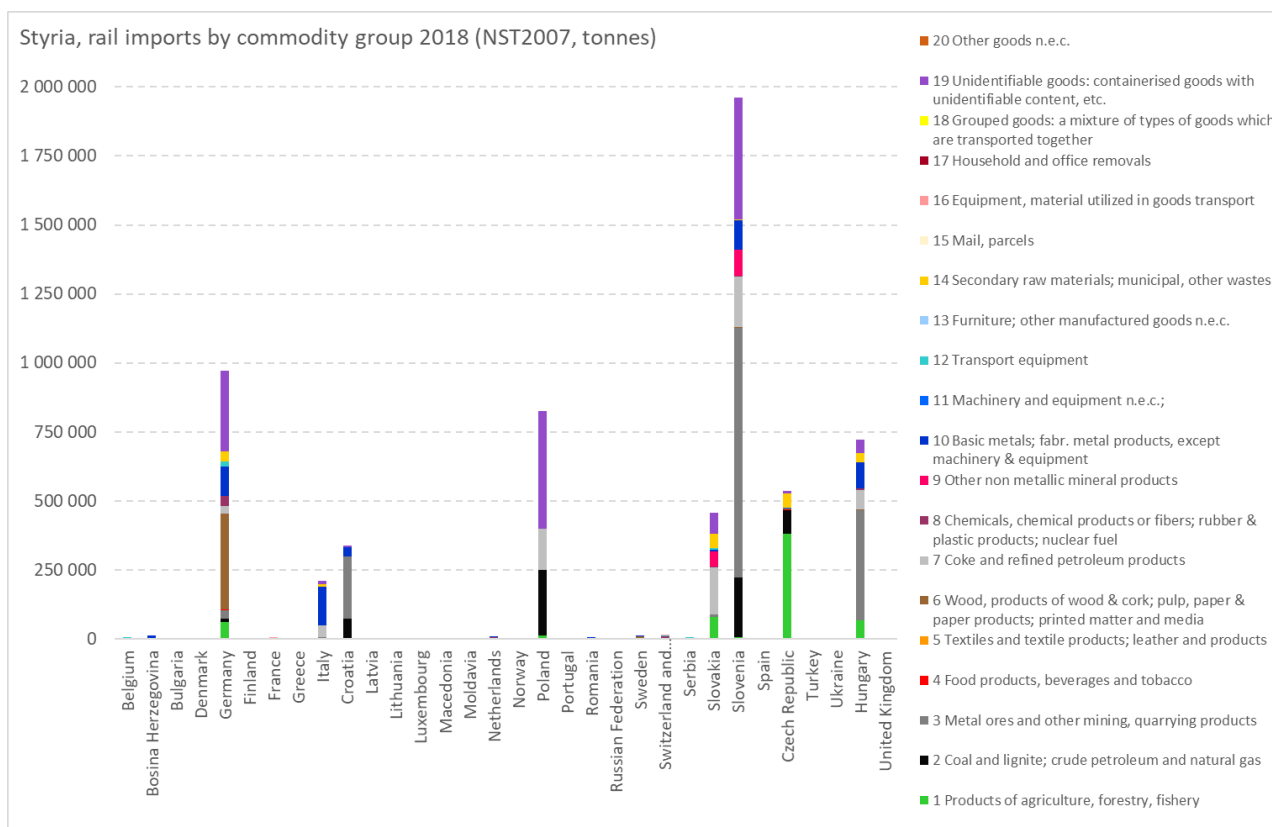


Figure 3: Rail imports Styria, 2018 in tonnes

Source: Statistik Austria, rail transport statistics, 2018

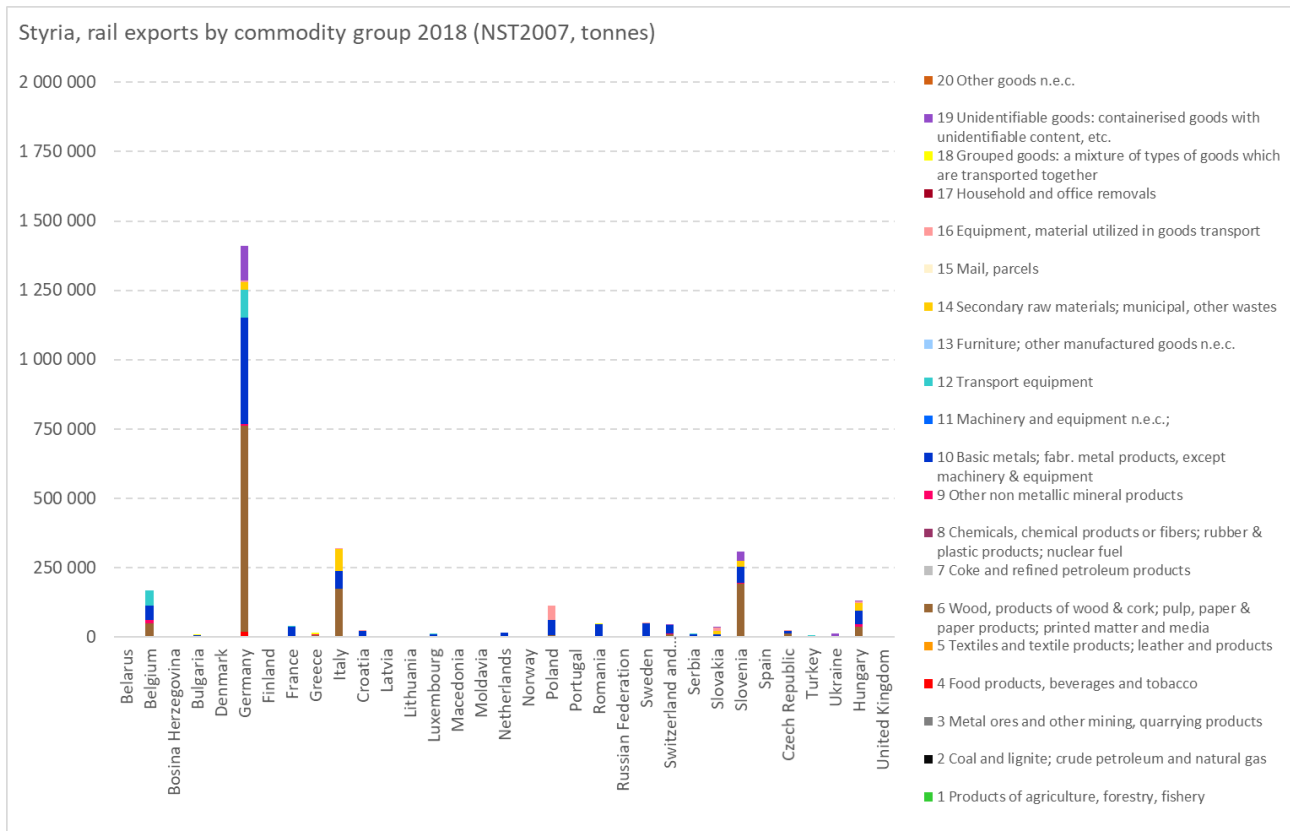


Figure 4: Rail exports Styria, 2018 in tonnes

Source: Statistik Austria, rail transport statistics, 2018

Rail transports

Styrian imports by rail accounted for 6,1 Mio. tonnes in the year 2018 whereas Styrian exports by rail accounted for 2,8 Mio. tonnes.

In opposite to foreign trade statistics where the land of origin and destination is stated, transport statistics capture the goods transported from their last transshipment point, e.g. a production zone, a logistic center or a port. This explains the differences between 1.05 Mio. tons of imports from Slovenia in foreign trade, as compared to the 1.9 Mio. tons imported to Styria by rail.

As illustrated in Figure 3, most imports by rail come from

- Slovenia (iron ore, coal, coke and containerised goods)
- Germany (wood, containerised goods and basic metals)
- Poland (coal, coke and containerised goods)
- Hungary (metal ores, basic metals, etc.) as well as
- Czech Republic (products of agriculture and forestry - mainly wood; coal and secondary raw material).

Slovenia and its vital port of Koper are an important logistic hub for Austria in general and for Styria in particular. Among the 906.000 tons of iron ore or other ores, the greater part of 730.000 tons steams from Africa (see figures above), further a significant volume of 440.000 tons of containerised goods come comes by rail from Slovenia / Koper to Styria.

The volumes of **exports per rail** account for only half of rail freight imports to Styria. Significant export amounts are transported by rail to

- Germany (1,4 Mio. tons, thereof 740.000 tons of wood, 380.000 tons of basic metals and transport equipment (e.g. empty containers)
- Italy (317.000 tons, thereof mainly wood) and
- Slovenia (308.000 tons, thereof mainly wood).

The quantities of exports are however small.

Within the last three years (2017-2019), the cross-border rail transport volumes of Styria decreased by 14% in imports and by 20% in exports. This is due to reduced imports of metal ores (-330.000 t) and containerised products (-530.000 t) as well as reduced export volumes of containerised products (-570.000 t) and basic metals (-110.000 t).

From this analysis of foreign trade relations and cross-border goods rail transport, a **potential for more rail transports** can be deduced. This is done by identifying transport relations and rail-affine commodities which show great values in foreign trade, but little or no freight transport by rail. The following **product groups and relations** were identified (see Table 1 for information on the trade and transport volumes⁴):

- imports from Poland of Coke and Coal
- imports of wood and pulp from Germany, Czech Republic
- imports of wood pulp or other fibrous cellulosic materials from Sweden
- imports of chemicals and chemical products from Germany and Slovenia
- exports of wood to Italy
- exports of iron and steel to Germany, Italy and Slovenia

Relation	Partner	Foreign trade volumes (2018)	Rail freight volumes (2018)	General rail freight potential
Imports of Coke and Coal	Poland	640.000 tons	240.000 tons	~ 390.000 tons
Imports of wood and pulp	Germany	450.000 tons	348.000 tons	~ 100.000 tons
	Czech Republic	670.000 tons	5.500 tons	~ 670.000 tons
Imports of wood pulp and cellulosic material	Sweden	90.000 tons	8.600 tons	~ 90.000 tons
Imports of inorganic chemicals	Germany	157.000 tons	37.000 tons	~ 120.000 tons
	Slovenia	270.000 tons	4.200 tons	~ 260.000 tons
Exports of wood	Italy	538.000 tons	173.000 tons	~ 370.000 tons
Exports of iron and steel	Germany	467.000 tons	380.000 tons	~ 90.000 tons
	Italy	294.000 tons	62.000 tons	~ 232.000 tons
	Slovenia	87.000 tons	57.000 tons (Basic metals, fabr. metal products)	~ 30.000 tons

Table 1: Comparison foreign trade volumes and rail freight volumes for selected relations

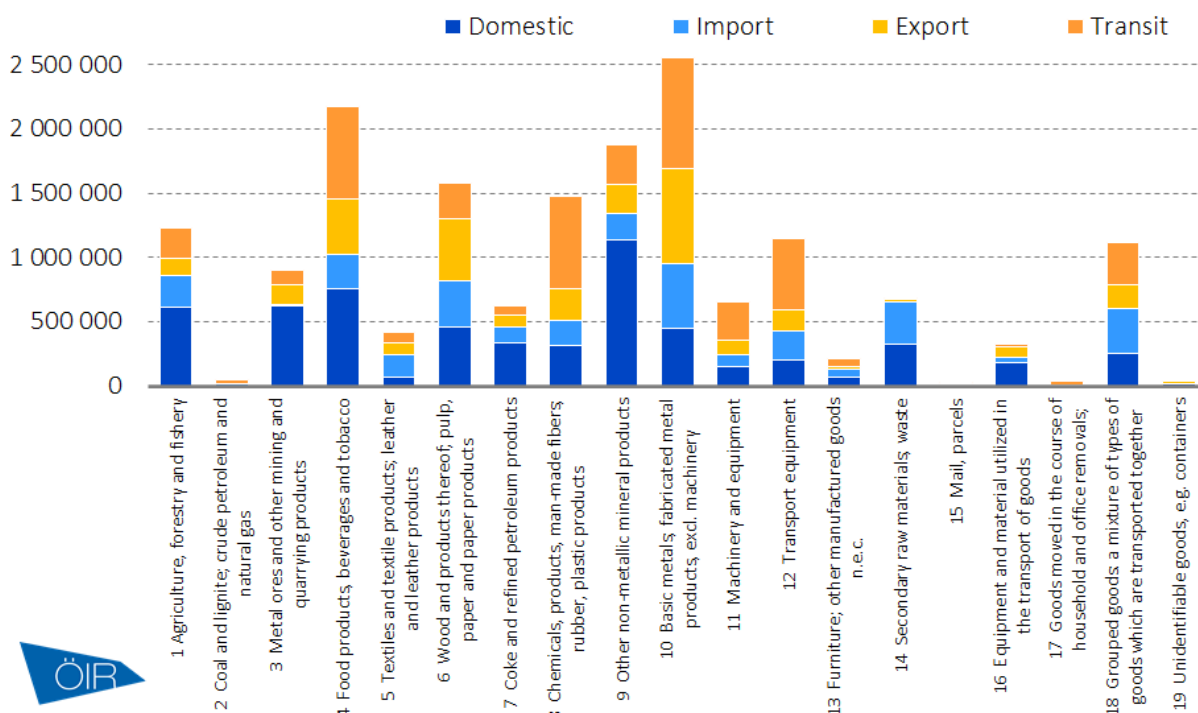
Source: ÖIR based on Statistic Austria Styria regional foreign trade statistic; Statistic Austria Rail freight statistic.

⁴ It has to be noted, that the volumes of certain transport and trade flows can fluctuate over time. The table gives thus only general indication about rail freight transport potentials that have to be verified by a detailed survey of source and destination of the related transports, their proximity to rail freight hubs, etc.

Furthermore, containerised products from all origins and destinations could be transported by rail. There are however limitations including intermodal loading/unloading infrastructure which hamper the modal shift from road to rail transport in praxis.



Schober, alpine crossing freight transport Road goods freight transport 2015 by NST2007 (tons)



Tauern, alpine crossing freight transport Road goods freight transport 2015 by NST2007 (tons)

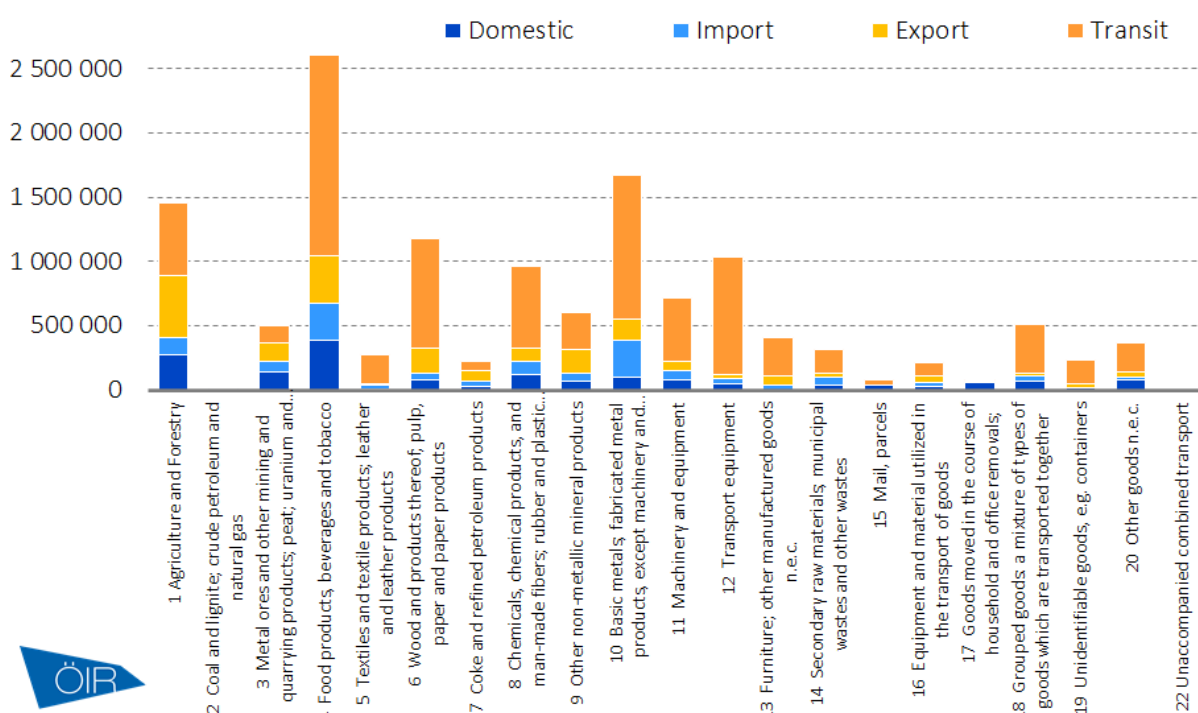
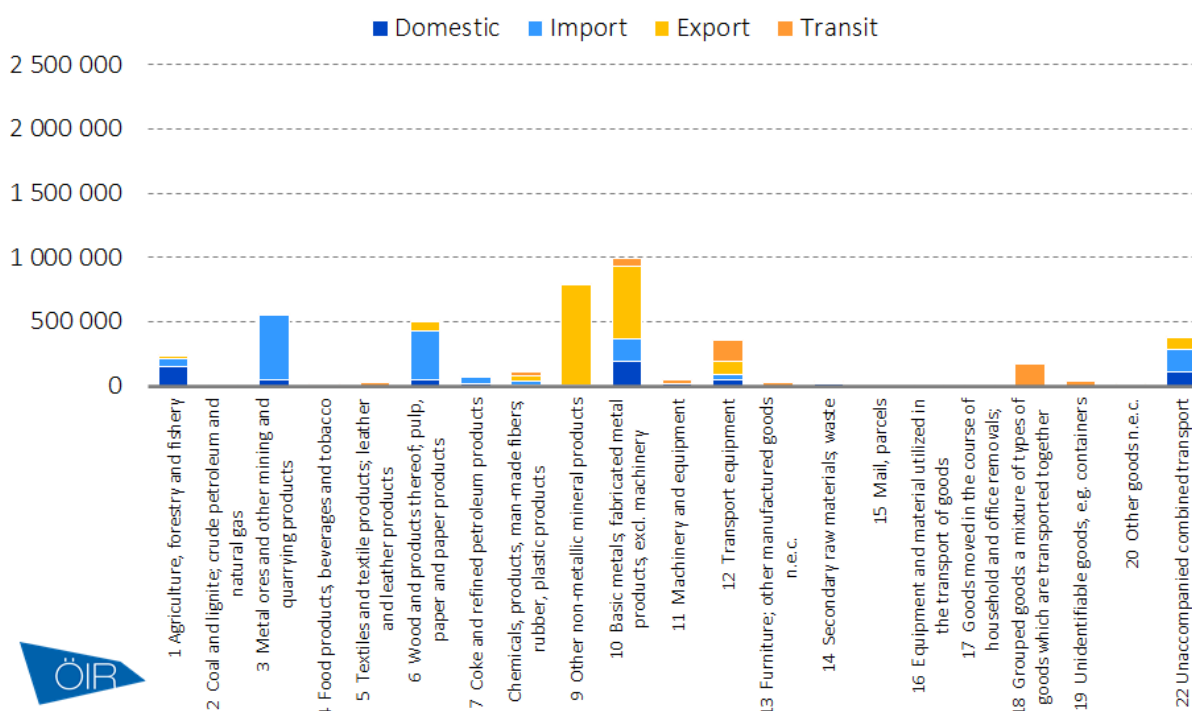


Figure 5: Road freight transport in Austria, alpine crossing Schober and Tauern

ÖIR based on Alpine crossing freight transport CAFT 2015

Schober, alpine crossing freight transport Rail goods freight transport 2015 by NST2007 (tons)



Tauern, alpine crossing freight transport Rail goods freight transport 2015 by NST2007 (tons)

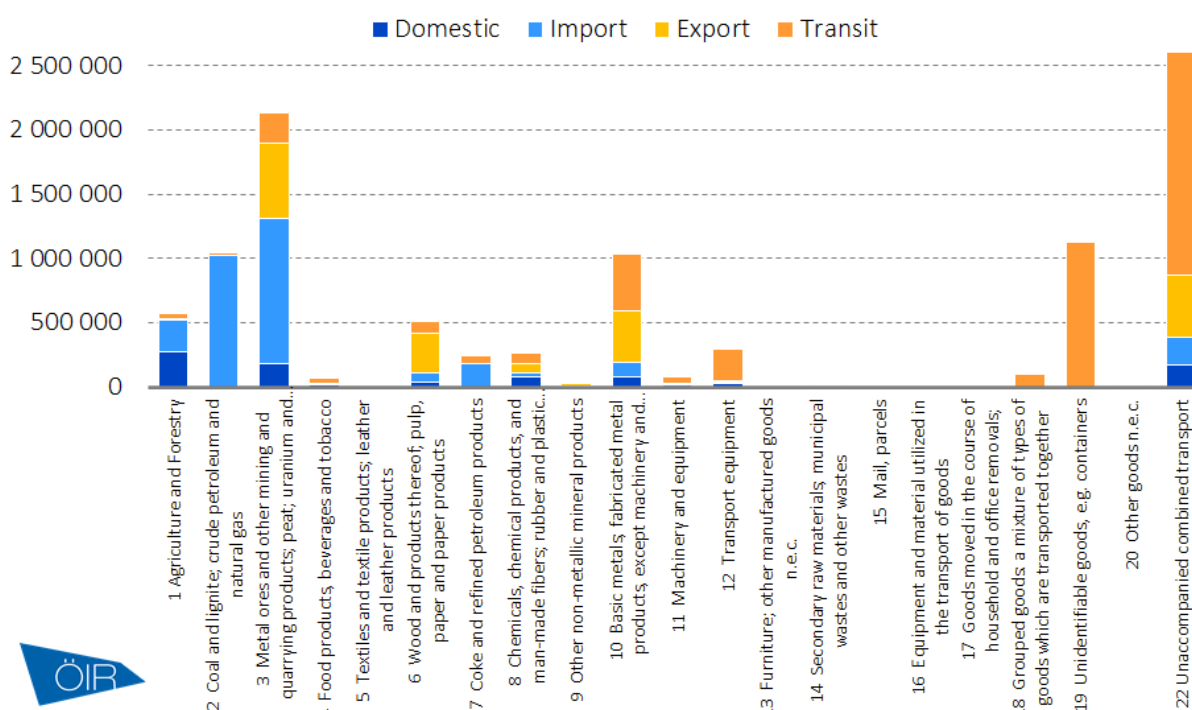
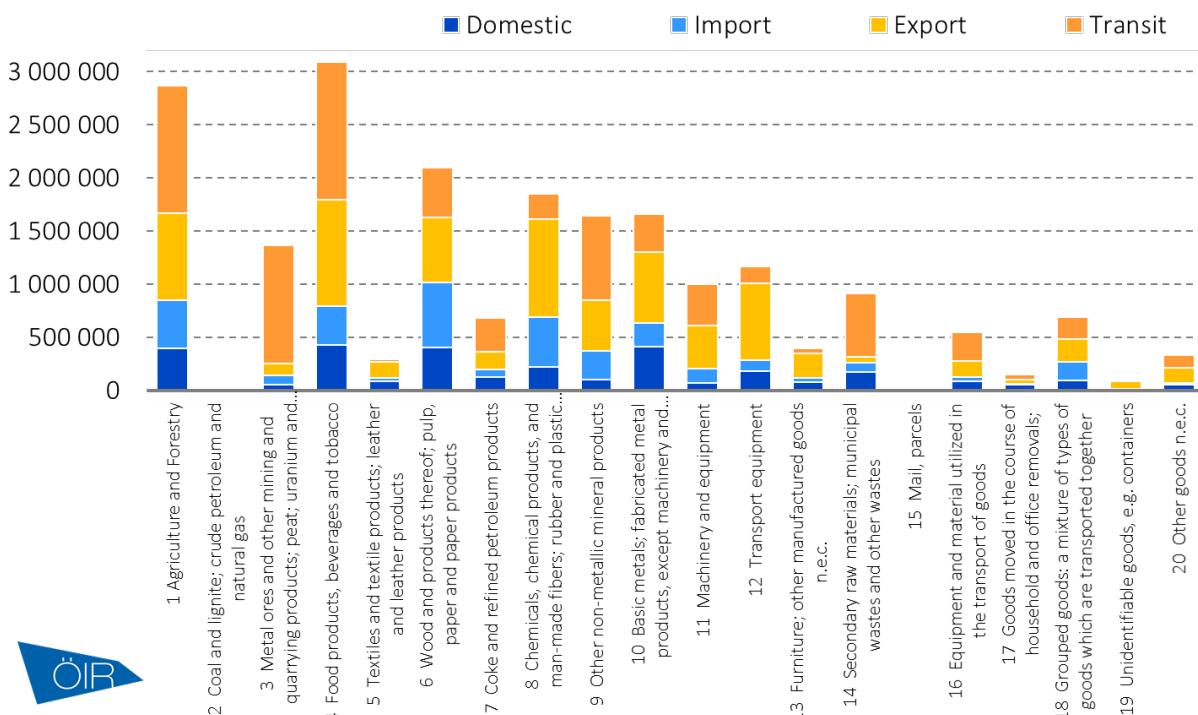


Figure 6: Road freight transport in Austria, alpine crossing Schober and Tauern

ÖIR based on Alpine crossing freight transport CAFT 2015

Wechsel and Semmering, alpine crossing freight transport Road goods freight transport 2015 by NST2007 (tons)



Semmering, alpine crossing freight transport Rail goods freight transport 2015 by NST2007 (tons)

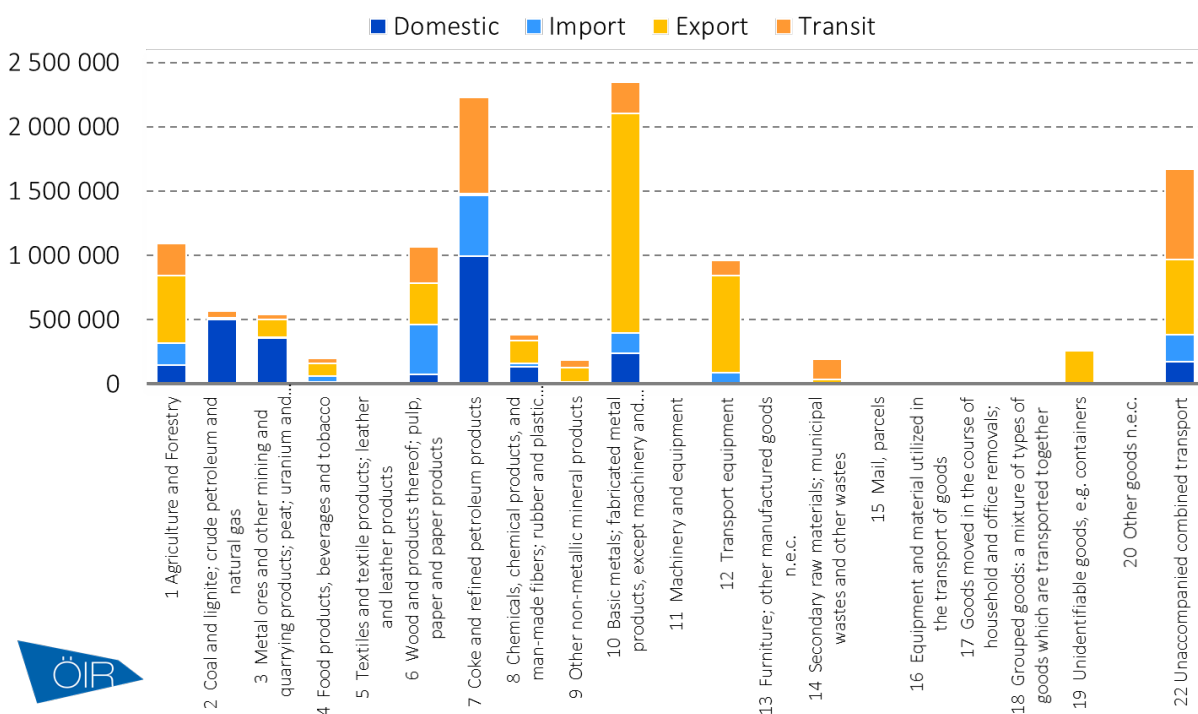


Figure 7: Road and rail freight transport in Austria, alpine crossing Semmering

ÖIR based on Alpine crossing freight transport CAFT 2015

A closer look at the alpine crossing freight transport relations by commodity group (NST2007) based on the periodical rail freight transport surveys (CAFT - Cross alpine freight transport), with the latest dating back to 2015, allows to cross-check the above observation.

Main alpine crossings for the above-mentioned freight relations are the Tauern pass (A10), the Schober/Pyhrn Pass (A9) as well as the Semmering (S6) together with the Wechsel pass (A2) with the respective rail sections. Figure 5, Figure 6 and Figure 7 highlight the differences between road and rail freight volumes. Whereas in the year 2015 both alpine crossings show significant total road transport volumes 17.1 Mio. tons across Schober and 13.6 Mio. tons across Tauern, rail freight volumes account for 4.4 Mio tons (Schober) and 11.5 Mio. tons (Tauern). In the eastern crossing over the Semmering (and Wechsel in case of road transport) 20.9 Mio. tons (15.3 via Wechsel and 5.6 Mio. tons via Semmering) contrast rail transports of 11.7 Mio. tons.

The comparable small freight volumes across the Schober pass originate from the capacity limits of the single-track section of the Pyhrnbahn that leads to utilisation rates of 80-100%⁵. However, the Schober pass is important for heavy goods imports to Styria as well as for transit from Western-Europe to the Balkan countries and their harbours. On the other hand, Tauern rail axis with an inclination of up to 30‰ is too steep for heavy freight transport. Consequently, unaccompanied combined rail transport (containers) are transported in great volumes, but also metal ores.

Judging from the road freight transports of metal ores across the Schober (2015 domestic 623.000 tons, 150.000 tons of export and 100.000 tons of transit there is still a potential for transport shifts towards rail transports, especially between Styria and Upper Austria (360.000 tons in both directions).

Further the high volumes of 2.6 Mio tons road transport of basic metals and fabricated metal products is highlighted in Figure 5 which have an equivalent of 1.0 Mio. tons each across Schober and Tauern and might have even more potential for modal shifting towards rail.

Transport volumes of wood, pulp and paper products are quite interestingly high by road (1,5 Mio. tons across Schober and 1.2 Mio. tons across Tauern), but again less than a half of these volumes is transported by rail.

Same holds true for chemicals and chemicals products which - particularly if they are bulk goods - are a potential market for rail freight transports.

Both Schober and Tauern are of high importance for the industry locations of Styria as well as Upper Austria. As highlighted in the diagrams, transit plays a very important role along both alpine crossings.

Concluding, a reference to another study is included which projects a significant rise of rail freight volumes on the Tauern-Pyhrn-Schober axis between the years 2010 to 2030. There, an increase of +53% along the Tauern axis is anticipated as well as increase of +193% along the Pyhrn Schober Axis.

Increase of freight volumes on the Tauern-Pyhrn-Schober axis between 2010 and 2030

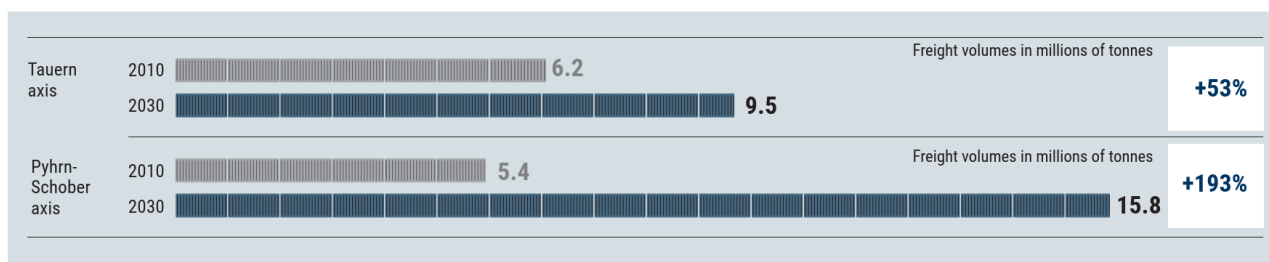


Figure 8: Projected increase of freight volumes on the Tauern-Pyhrn-Schober axis between 2010 and 2030

Plattform Tauern-Pyhrn-Schober Achse der Länder Kärnten, Oberösterreich, Salzburg, Steiermark (2018): On the right track to new perspectives The Tauern-Pyhrn-Schober axis (TPSA) in the future trans-European core network

⁵ ÖBB Infrastruktur AG: Zielnetz 2025+(2011): S.39



The alpine crossings of Semmering (rail) and Semmering and Wechsel (road) are further of great importance to the Styrian industry, as they connect Styria with the North-Eastern and Eastern European Countries. Further, transit from Italy and Slovenia crosses these alpine passes.

Looking at the data, one recognises immediately the comparably high share of road transport. Whereas almost 2.9 Mio. tons of agricultural products are transported via road, rail transports account for only 1.1 Mio. tons. Especially as regards transit relations, rail transport volumes are comparably low. Further, wood transports on road amount to twice the volumes of rail transport volumes. Here, road transports are clearly in favour as regards domestic transport, but also higher for all other relations. Solely for bulk transports of basic metals as well as coke and refined petroleum products rail performs to its potential.

One has to notice, that the commodity group of unaccompanied combined transport (e.g. containers) is quite important in the rail sector and that these transports can account for a multitude of goods which can be transported in containers (e.g. agricultural products as well as processed wood from saw mills).

Further, transport equipment - often empty containers - are transported by rail.

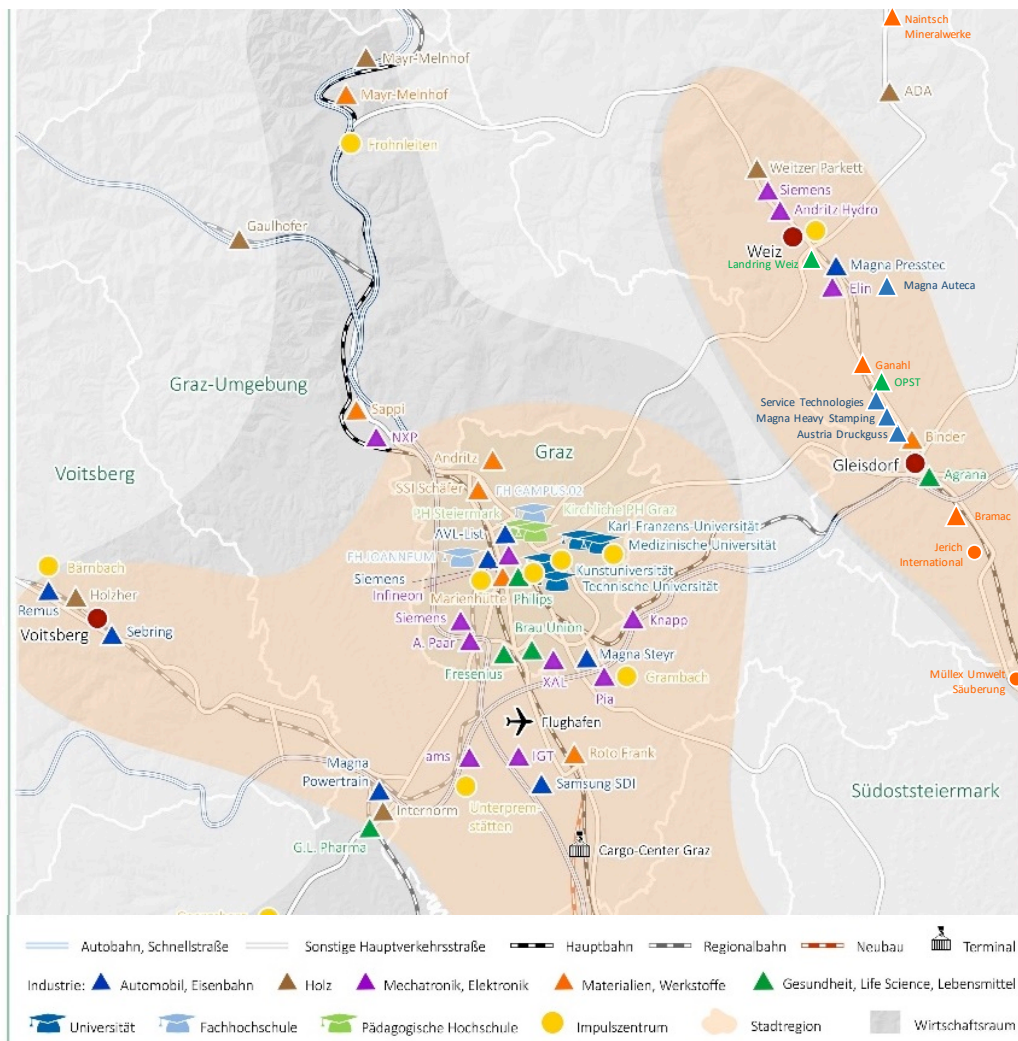
2.2. Rail freight market potential Gleisdorf - Weiz

With focus on regional rail transport, the market potential of the rail section Gleisdorf - Weiz will be analysed in more detail. To this end an analysis of the general transport volumes will give an indication on the past and present development of the rail freight transport on the track, whereas a survey among the industry locations will help to identify the future rail transport potential.

2.2.1. The region of Gleisdorf - Weiz

The rail section is operated by Steiermärkische Landesbahn (see also map 2 for further details). The track is not electrified and runs into the “Ostbahn” connecting it to Graz in the West and Szentgotthard (HU) in the East.

As illustrated in the map below, there are several industry locations to be found in this section, many of them supplier industry to the automotive sector, but also agricultural production sites are located here.



Map 1: Region Gleisdorf - Weiz. Location and main industry partners

2.2.2. Survey and results of the survey

In the course of the further investigations, the overall freight transport volumes on the section Gleisdorf - Weiz have been analysed. Additionally, a survey among industry locations has been conducted. The aim was to identify which industry partners see a potential for rail freight transports and to investigate the conditions to be met for realising them. The study has been conducted in close contact with the local railway operator "Steiermarkbahn".

A list of the companies that have been interviewed can be found in the Annex.

The region of Gleisdorf - Weiz is known for its metal processing industry which is strongly linked to the automotive sector and its wood processing industry.

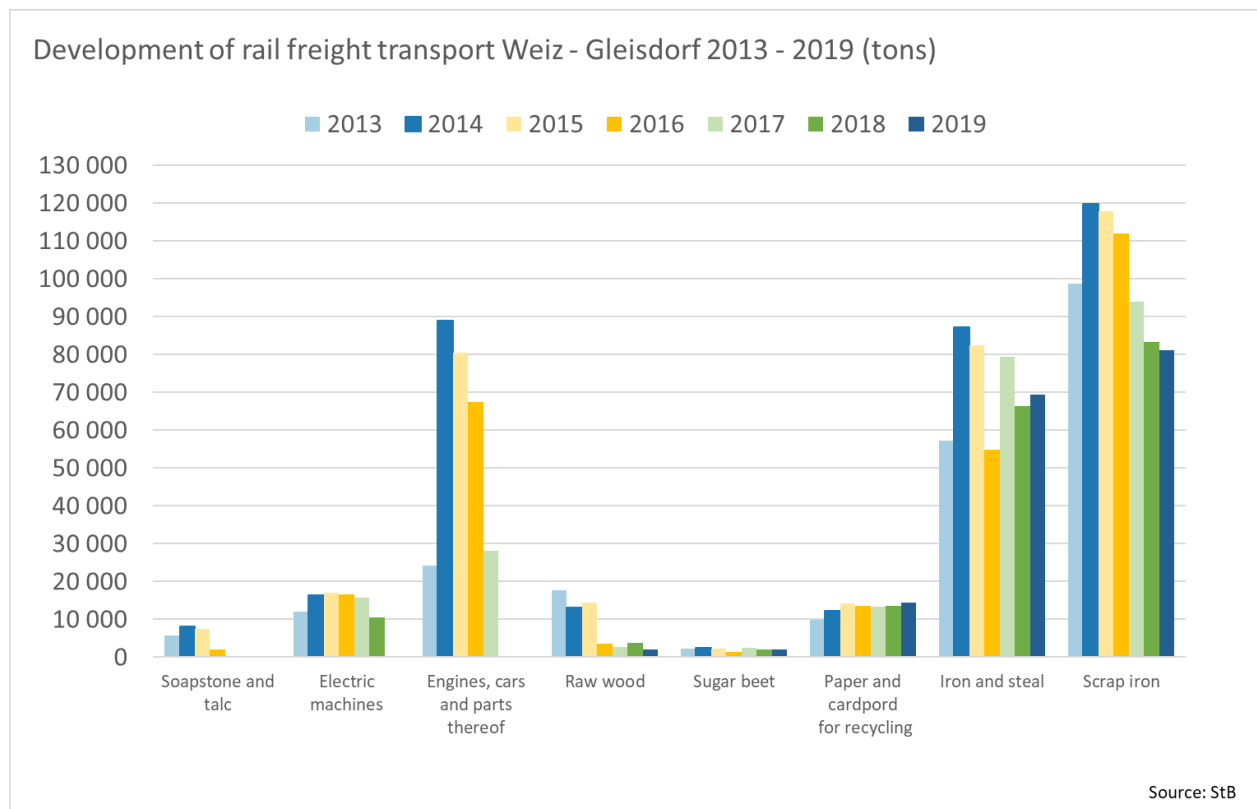


Figure 9: Development of rail freight transports Weiz-Gleisdorf 2013 - 2019

Source: Steiermarkbahn Transport und Logistik

Present rail freight volumes steam mainly from bulk goods, especially from scrap iron (more than 80,000 t in 2019), iron products (about 70,000 t in 2019). Further products transported by rail are paper for recycling. Further as well as high-and-heavy transports which are an important market segment. Transport volumes of raw wood were high in the years 2013 to 2015 due to high amounts of storm or snow damaged wood. These transport volumes decreased however in the subsequent years, without similar events of damage.

The interviews with companies along the railway section Gleisdorf - Weiz have shown that some logistical framework conditions are serious obstacles to reach the desired shift of transport volumes from road to rail.

2.2.2.1. Timber sector

In the case of **timber transports** the following arguments were mentioned:

The **unloading capacity at the customer storage** facilities of the wood processing industry (sawmills and paper industry) is an important bottleneck or enabler for rail transports. The storage facilities are often not sufficient for handling whole block trains loaded with logs. In these cases, delivery by truck is much more



flexible, as the transports arrive in smaller consignments and are delivered when they are actually needed in the production process (just in time principle). Road freight transport is able to meet these needs of customers more than rail transport.

The survey has shown that customers of timber transports prefer increasingly delivery by trucks. Often the transport prices for rail transports are claimed. At present, approximately 90% of timber transports in Styria are carried out by trucks, 10% by rail. In the past, the share of rail transport reached 30%. The potential to shift from road to rail in terms of timber transport is therefore estimated at regaining this 30% share.

For the region of Weiz - Gleisdorf, the following main destinations are suitable for timber transports by rail: Preding (Hasslacher Norica Timber), Leoben (Mayr-Melnhof Holz), Pöls (Zellstoff Pöls). These routes are suitable for single wagon traffic.

In long-distance traffic, Ybbs an der Donau (Stora Enso Wood Products) and Kolicevo Karton (Slovenia, Mayr-Melnhof Group) are suitable destinations that could be served by block trains.

2.2.2.2. Further findings

The decision to use the railway also depends on the **availability of a rail connection** at the starting point or the destination of a transport, respectively a short distance from the company site to the next railways station or loading point. Ideally, a feeder track is leading directly to the company. This avoids the time-consuming and expensive transshipment from trucks to rail. Due to organizational, time-related and cost reasons it is not acceptable to tranship goods more than once from truck to rail or vice versa.

One of the main topics is however the **pricing scheme** as compared to road freight transport.

Different industries mentioned the hampering fact, that deliveries by rail are agreed on a **long-term basis** (contracts usually run for one year), while deliveries by truck are often agreed in the short-term and are thus more flexible.

Many companies have cited the **rail freight prices** - which are higher than truck freight costs - as reason for not using the rail for transports.

Regarding cost and transport time, rail transports are competitive from a distance of 300 km or more. Within the study, we identified however relations of more than 900 km, where the businesses claimed lower transport costs for road transports. These points to the existing problems of wage dumping and social dumping within the truck transport industry as well as to the still complicated framework conditions for transnational freight transports within Europe.

An obstacle mentioned is the **low flexibility and at times poor service** provided by the railway companies. Interviewees claimed that short-term transports are difficult to perform, e.g. because of the lack of wagons available on the short hand. Others claimed missing or unknown contact partners at the terminals which is e.g. due to staff reduction at railway stations.

Nonetheless, very satisfied customers were interviewed, especially those with high volumes of recurring transports able to set annual contracts with rail transport operators.

Further, combined transports, especially accompanied transports (RoMo traffic) are seen to gain importance for long-distance transports given the extension of the RoMo-services and the raised awareness of end-customer regarding CO₂-emissions and environmental certificates. This holds true for products like paper, which is “near” the end-customer. Nonetheless for products where the end-customer is less aware about the transport cost and impacts “green transports” are less requested.

For some industries, transport by rail is only competitive with truck transport, when a certain threshold of transport volumes is reached allowing for transport in block trains. Given the reduced production volumes due to the economic development, reaching these transport volumes doesn’t seem realistic in the very near future.

2.2.2.3. Conclusions

The role of transport costs

The costs of freight transport play an important role in the competitiveness of rail transports and several interview partners referred to this fact. Even a small pricing difference can influence the transport mode decision. Reasons for higher transport costs for rail freight transport are:

- Loading, unloading and manoeuvring costs, especially for single wagons or clients without rail siding

Generally, rail transport costs differ significantly between single wagon transports and block train transports. Concretely, block train transports account for 60% of the costs of single wagon transports per net ton transported, mainly because of the higher manoeuvring costs of single trains (train travel costs, infrastructure usage fee for manoeuvring) which are twice as high as the manoeuvring costs of block trains.⁶

As a consequence, train transports are often more competitive for transport volumes allowing for block trains than single wagon transports. There is however national funding available to cover the differential amount, which is frequently used in Austria.

Further, initiatives to facilitate combined transport solutions based on a quicker transshipment between track and rail are developed, especially for stations without further infrastructure (e.g. crane trucks able to load and unload containers without infrastructure).

- External costs not assigned to road freight transports

Road transport of timber cause - especially when driving heavy machines used for wood work - severe damage on regional roads, which are maintained by municipalities and/or regions and thus the community and not considered in the selection of a particular transport mode. Further, accident costs and climate costs of road transports are higher (per net-ton transported) than for rail transports.

- Increasing awareness of transport impacts for certain transport products

For products near to the end-customer (e.g. paper), the reduction of CO₂-emissions as well as environmental certificates are gaining importance. For these products, accompanied transports are seen to take on greater significance.

- Price dumping in road transports

Truck drivers are often operating under high cost pressure leading to undermining social standards. Train operator on the other hand are obliged to have a number of qualifications and skills and social conditions are much closer monitored.

To sum up, 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.

⁶ Economica (2013): Schienengüterverkehr: Markt- und Wettbewerbssituation.

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.

2.3. Analysis of regional rail network and services

2.3.1. The Styrian rail infrastructure

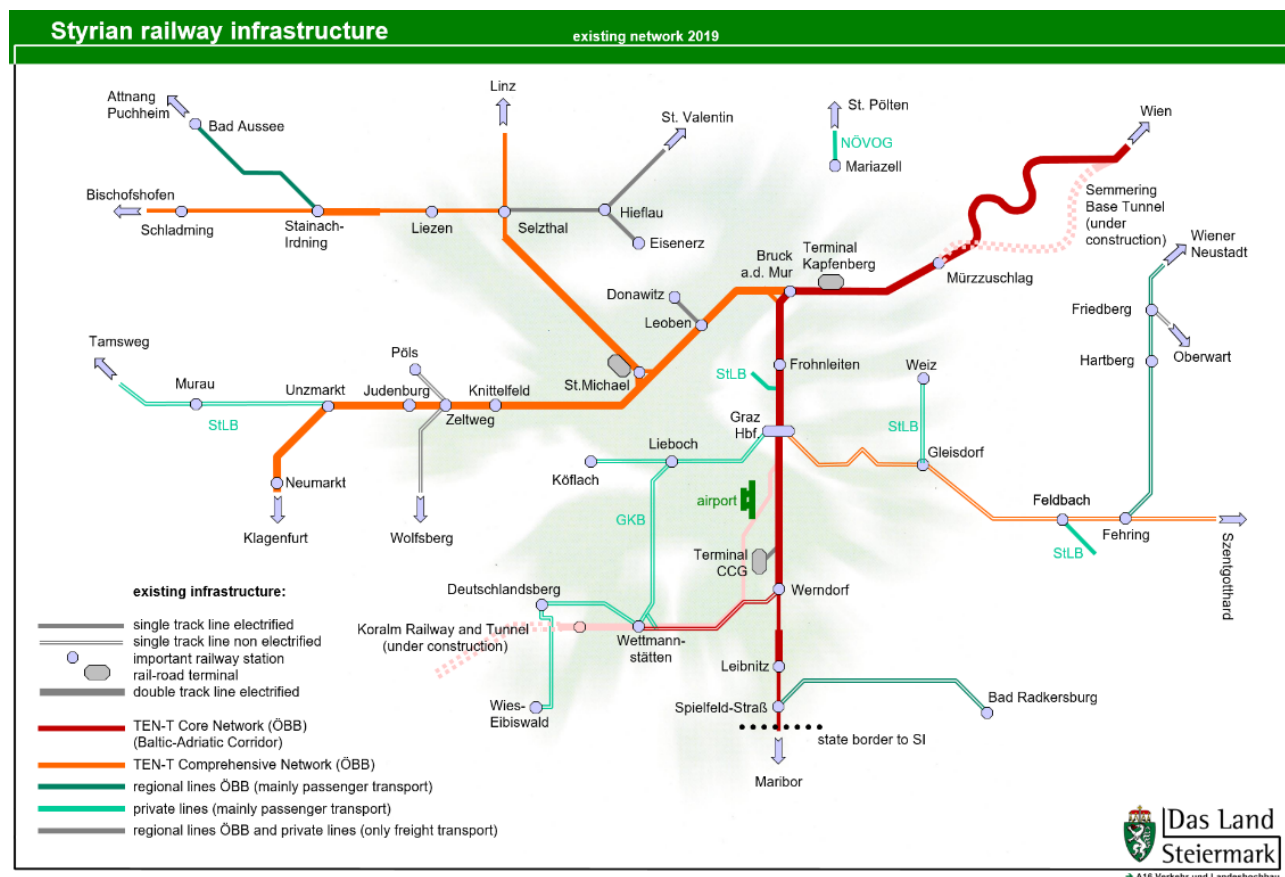
The **Styrian rail network** currently consists of around 1,000 kilometres of railway lines. The railway network for passenger and freight traffic comprises the network of the Austrian Federal Railways (ÖBB) with approx. 550 km on main lines and 140 km on secondary lines, the lines of the Styrian Provincial Railways (Steiermärkische Landesbahnen) with approx. 100 km and the lines of the Graz-Köflacher Railway (GKB) with approx. 90 km (see following map and annex).

The other lines are feeder lines with private freight traffic as well as lines that were closed down, but are still used for excursions, nostalgic trips, etc. by private associations.

The majority of ÖBB's main rail network is part of the Austrian high-performance railway network (Eisenbahn-Hochleistungsstreckennetz), the Trans-European Railway network (TEN) or part of international corridors as well as various international agreements on fast passenger transport (AGC) or combined freight transport (AGTC, RailFreightCorridors RFC).

The main railway lines in the Styrian railway network are:

- Southern railway line: from Vienna via Semmering - Mürzzuschlag - Bruck/Mur - Leoben - Neumarkt - towards Klagenfurt and Bruck/Mur via Graz - Spielfeld - towards Maribor (SI)
- Pyhrn-Schober railway line: from Leoben via Selzthal - towards Linz
- Ennstal railway line: from Selzthal via Liezen - Schladming towards Bischofshofen
- Styrian East railway line: from Graz via Gleisdorf - Fehring - towards Szentgotthard (HU)



Map 2: Styrian railway infrastructure

The main axes of the Styrian rail network are electrified and double-tracked (see map above and annex). Bottlenecks with single track lines are along the Pyhrn-Schober railway line (Spielfeld - Werndorf and Selzthal - Bosruck tunnel), the Styrian East railway line and the Ennstal railway line.

Most regional lines are non-electrified and almost exclusively used for passenger transport. Only a few short regional lines for freight transport are electrified.

2.3.2. Freight suitability of Styrian rail infrastructure

The main Styrian rail network is of Class D4, i.e. with an axial load of 22.5 tons or 8.0 t/m. It is thus **suitable for freight transports** and in line with the requirements of the TEN-T.

With the completion of the Semmering base tunnel and the Koralm tunnel a flat trajectory from South-Western to North-Eastern Europe will be available for goods transport.

Styria however misses a high capacity rail connection from the economic centres in central and the Northwest of Europe (including the North Sea harbours) to Southeast Europe particularly to the Harbours of Koper and Rijeka as well as to the east Adriatic and Western Balkan region. This is due to the single-tracked **bottleneck from Selzthal to Linz** and further North as well as to the rather steep (21‰) southern ramp to the **Bosruck tunnel**. This bottleneck hampers also the domestic connectivity of the industrial sites of Styria and Upper Austria.

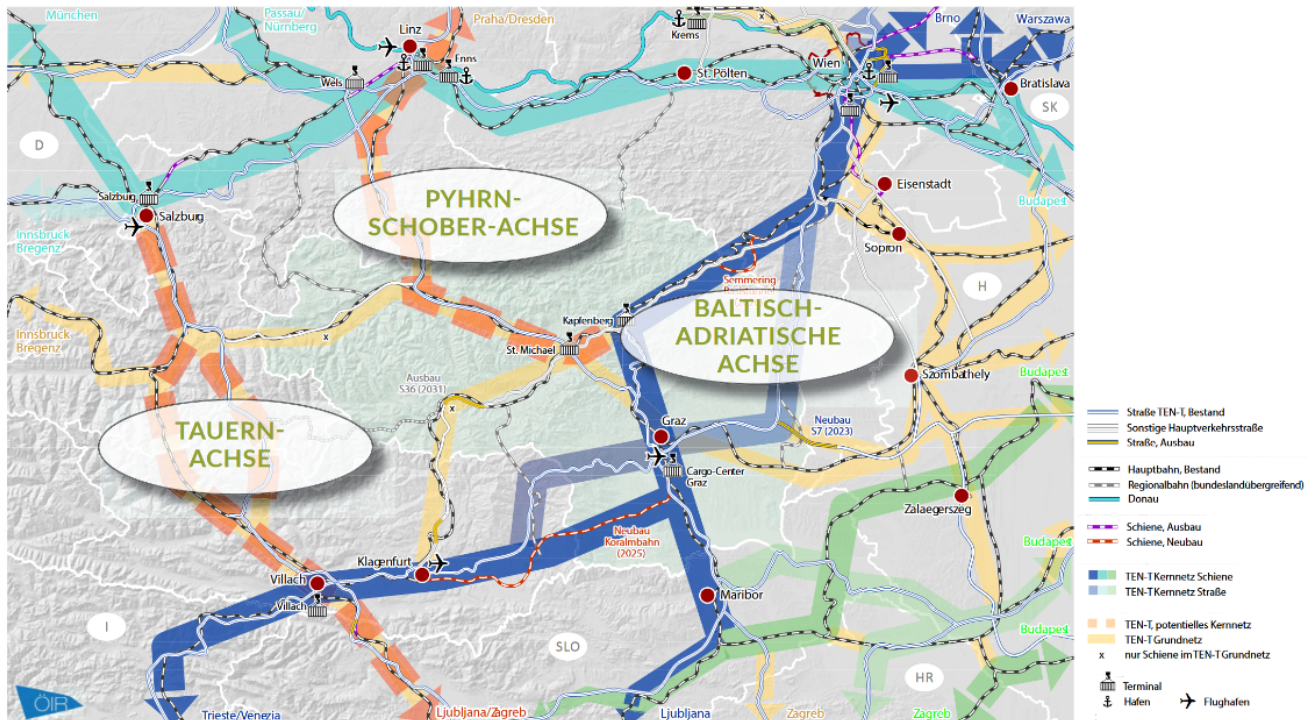
Additionally, the section **Bruck and der Mur - Graz** is well utilized. With the commissioning of the Koralm Railway (2025) this section will be **at the limit of capacity**, as several transport corridors (Baltic-Adriatic, Pyhrn-Schober and the regional transport between Leoben and Kapfenberg) pass along this track. Freight trains will be displaced by dense passenger traffic to off-peak and night times.

2.3.3. The integration of the Styrian rail infrastructure into the Trans-European Transport Networks (TEN-T)

All main transport axes of the Styrian railway network are part of the **Trans-European Transport Networks (TEN-T)**. The future southern railway corridor with Koralm railway and Semmering base tunnel as well as the railway line Graz - Spielfeld - Maribor are part of the Baltic-Adriatic Corridor and thus part of the TEN-T core network. The other main transport axes in the Styrian railway network are part of the TEN-T comprehensive network:

- TEN-T Baltic-Adriatic core network corridor: from Vienna via Semmering - Mürzzuschlag - Bruck/Mur - Graz - Koralmbahn - towards Klagenfurt and Graz - Spielfeld - towards Maribor (SI)
- TEN-T comprehensive network:
 - Pyhrn-Schober railway line: from Leoben via Selzthal - towards Linz
 - Ennstal railway line: from Selzthal via Liezen - Schladming towards Bischofshofen
 - Styrian East railway line: from Graz via Gleisdorf - Fehring towards Szentgotthard (HU)

In close proximity to Slovenia and Hungary, the Styrian railway network serves as an important link between Austria and South Eastern Europe. The Pyhrn/Schober axis - in combination with the Tauern axis - is intended to close the gap in the TEN-T core network connecting Central and South-Eastern Europe as an essential alpine crossing (see map below and annex).



Map 3: Desired TEN-T-network for Styria

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 Pyhrn-Schober axis (Linz - Selzthal - Graz - Maribor) should handle the heavy rail freight traffic, the Tauern axis (Salzburg - Villach - Ljubljana) the high-ranking passenger transport.

As indicated by the RailNetEurope (RNE) two Rail Freight Corridors (RFCs) are passing Styria.

The Baltic-Adriatic RFC (RFC 5) runs along the current Southern railway line from Vienna via Semmering - Mürzzuschlag - Bruck/Mur - Leoben - Neumarkt - towards Klagenfurt and via Graz - Spielfeld - towards Maribor (SI). It will be led over the Koralm Railway when it comes into operation.

The latest established RFC since 2018 is the Alpine-Western Balkan RFC (RFC10) which contains the Pyhrn-Schober axis and the Tauern axis as well. This RFC shall come in operation in 2020.



Rail Freight Corridors (RFCs) map 2018
Including extensions expected in 2020 as indicated by the RFCs



Map 4: Rail Freight Corridors

2.3.4. Intermodal facilities in Styria

There are three publicly accessible **freight terminals in Styria** (see maps 1, 7 and 8 and annex):

- the “Cargo Center Graz” terminal is located 15 km south of Graz
- the Montan Terminal Kapfenberg,
- and the Terminal St. Michael.

The three publicly accessible freight terminals in Styria - all are suitable for bimodal rail-road transshipment. The Cargo Center Graz (CCG) terminal is the most important logistic node for national and international freight transport and part of the TEN-T core network. A detailed description is given in the Baseline study Styria (D.T.1.1.5).

2.4. Analysis of the logistic market (Development and Trends)

2.4.1. Transport flows

Styria is an important player within Austria's economy. In the year 2017 about 12,4 million tons were imported (of a value of 155,7 billion EUR) and 9,3 million tons of goods (150 billion EUR) were exported. (Statistik Austria, Foreign Trade).

Due to Styria's location in the Alps, import and export flows from Northern and North Eastern Europe pass the Alpine crossings Schober (Pyhrn-Schober axis), Semmering and Wechsel (Baltic-Adriatic Corridor).

About 38 million tons are passing these corridors by road in the year 2015, rail transports account for about 16 million tons (excluding the minor rail connection across the Wechsel).

The Schoberpass is the most important road freight crossing with more than 17 million tonnes passing 2015 (+17% since 2009), while rail transports account for 4,4 million tons (-19% since 2009). This disproportionate development of road and rail freight transport is also owed to the fact that the Pyhrn-Schober axis is single-tracked from Styrian Selzthal to Wels/Linz in the North.

The Wechsel is the second important road axis with more than 15,3 million tons 2015 (+74% since 2009). At Semmering, the annual passage by road amounts to 5,6 million tons by road (equal to 2009 volumes) and almost 12 million tons by rail (+22% since 2009).

	Road							Rail					
	Mio. tons					%		Mio. tons				% p.a.	
	1999	2004	2009	2015	2017	04-15	99-15	1999	2004	2009	2015	04-15	99-15
Alpine crossing													
Reschen	1,2	2,0	1,2	1,2	1,0	-40%	0%	.	.	.	.	.	.
Brenner	25,2	31,1	26,2	32,4	36,3	4%	29%	8,2	10,2	13,1	13,8	35%	68%
Tauern	8,2	12,2	12,7	13,6	15,2	11%	66%	5,6	8,0	5,9	11,5	44%	106%
Schoberpass	11,2	14,6	14,3	17,1	18,8	17%	53%	4,6	5,4	4,3	4,4	-19%	-5%
Semmering	4,0	5,6	4,7	5,6	5,6	0%	40%	9,3	9,6	9,3	11,7	22%	26%
Wechsel	8,2	8,8	10,4	15,3	16,7	74%	87%	0,1	0,2	0,2	0,3	34%	221%
Schober, Semmering, Wechsel	23,4	29,0	29,4	38,0	41,1	31%	62%	14,0	15,2	13,8	16,4	8%	17%
Total	58,0	74,3	69,5	85,2	93,6	15%	47%	27,8	33,4	32,8	41,7	25%	50%

Table 2: Alpine crossing freight transport

Development of freight transport in Million tons by alpine crossing

Source: ÖIR based on Alpine crossing freight transport 2009, CAFT 2015; Summary Report on CAFT-Surveys 2014/15 ff

The alpine crossings - apart from Austrian domestic transport from and to Styria and Carinthia - are important transit routes between South or South-Eastern Europe and North or North-Eastern Europe. About 30% of the road freight transport volumes (Schober, Wechsel) and 20% of the rail freight volumes (Schober, Semmering) account for transit.

The particular transport flows are depicted in the following maps. Germany is clearly the most important economic partner. Unfortunately, transport flows from Styria to Italy are not included in this overview. Information on these flows is thus generated from Styria's foreign trade relations and described in subsequent paragraphs.

The alpine crossings - apart from Austrian domestic transport from and to Styria and Carinthia - are important transit routes between South or South-Eastern Europe and North or North-Eastern Europe. About

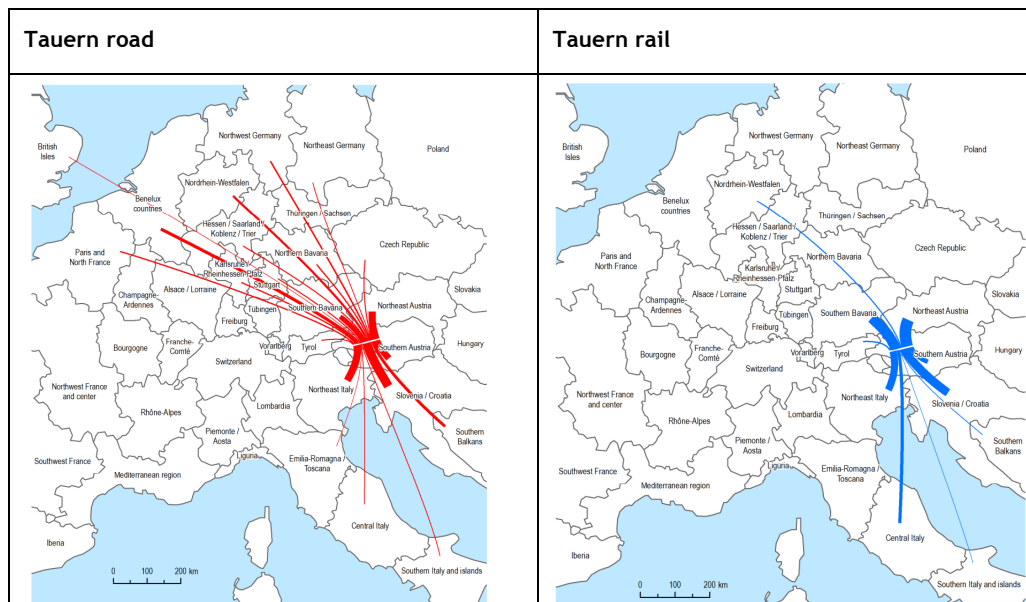
30% of the road freight transport volumes (Schober, Wechsel) and 20% of the rail freight volumes (Schober, Semmering) account for transit.

The particular transport flows are depicted in the following maps. Germany is clearly the most important economic partner. Unfortunately, transport flows from Styria to Italy are not included in this overview. Information on these flows is thus generated from Styria's foreign trade relations and described in subsequent paragraphs.

	Road, 2015			Rail, 2009			
	Mio. tons			Mio. tons			
	Domestic	Exports	Transit	Domestic	Import	Exports	Transit
Alpine crossing							
Tauern	12%	15%	62%	19%	19%	33%	29%
Schoberpass	35%	19%	28%	34%	21%	35%	10%
Semmering	61%	19%	3%	34%	29%	13%	25%
Wechsel	28%	28%	31%	.	.	.	.
Schober, Semmering, Wechsel	36%	23%	25%	34%	26%	20%	20%

Table 3: Alpine crossing freight transport by relation

Source: ÖIR based on Alpine crossing freight transport 2009, CAFT 2015; Summary Report on CAFT-Surveys 2014/15 ff





Map 5: Alpine crossing freight transport through Styria by relation 2014/15

Source: DG MOVE (2018). Transalpine Freight Traffic Flows: Summary Report on CAFT-Surveys 2014/15

Austria and Styria have the most intensive economic ties with its traditional main trading partner Germany, in particular with the southwestern economic region of Germany (Bavaria and Baden-Württemberg). In 2017, almost 30% of Styrian exports went to Germany. Another important trading partner was Italy with 6.4%. The picture was similar for goods imports: Germany accounted for almost 40% of Styria's goods imports. Italy accounted for 6.3% of goods imports. In addition to **motor vehicles and vehicle parts**, Styria's most important export goods included **machinery, electronic and electrical engineering products, iron and steel goods** as well as **paper and paper products**. In 2017, these goods accounted for around two thirds (66%) of Styria's export turnover (Economical Report Styria 2018).

In Styria, the **transport of steel and timber represents the largest share of the freight volume**.

Comparing the development from 1999 to 2018, the **Modal Split** regarding to road transport volumes (tons) at the Styrian border rose at all crossings, from +10% points at the Schoberpass to +4% points at Semmering. The two rail projects Semmering base tunnel and Koralm tunnel will improve the conditions for rail transport. For the better connectivity between South-East Europe and the Mediterranean Harbors on the one hand side and the economic centres in the North and West of Europe on the other side, infrastructure investments along the Pyhrn-Schober-axis are needed to shift freight transports from road to rail. This holds true as the alternative route along the Tauern axis has a gradient of (30 ‰) and is thus not suited well for heavy rail freight transports.

Alpine crossing	1999	2009	2015	2018	1999-2018
	Modal Split				% points
	Share road	Share road	Share road	Share road	
Reschen	.	.	.	.
Brenner	75%	67%	70%	73%	-2%
Tauern	59%	68%	54%	65%	+6%
Schoberpass	71%	77%	80%	81%	+10%
Semmering	30%	34%	32%	35%	+5%
Wechsel	99%	98%	98%	99%	0%
Schober, Semmering, Wechsel	63%	68%	70%	73%	+10%
Total	68%	68%	67%	72%	4%

Table 4: Modal Split development

Source: DG MOVE: Observation and analysis of transalpine freight traffic flows, key figures 2018

2.5. Analysis of the economic, political and technical market conditions

Styria has a long industrial tradition and is an R&D and export-oriented federal state. Styria is a world market leader in niches of the quality segment, e.g. in the manufacture of railway rails, railway systems, high-quality steel products, vehicles and machinery. Styria today has the highest R&D rate among the Austrian provinces.

The following sectors were defined as guiding markets in the “Economic Strategy Styria 2025”:

- Mobility: automotive sector, rail systems, aerospace
- Green-Tech: green energy, green resources, green buildings, timber
- Health-Tech: health and food

In Styria and Austria there are a lot of policy documents on national and regional level, including goals and strategies as well as instruments to promote rail freight transport:

- Steirisches Gesamtverkehrskonzept 2008 (StGVK): The strategic document on the development of mobility in Styria is already 12 years old, but is still up to date with regard to the goals in freight transport and international connections. The aim 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. By means of a nationwide truck toll and monitoring compliance with legal regulations (toll evasion, tonnage restrictions, labour regulations, technical standards etc.), the reduction of transport costs by rail by supporting the liberalisation process, the bundling of freight flows and the formation of logistics platforms with cross-company process integration as neutral partners, equal conditions can be created in the freight transport market for road and rail transport and external cost factors can be internalised.
<http://www.verkehr.steiermark.at/cms/beitrag/10911747/19512589>
- ÖBB Target Network 2025+ (2011): Target Network 2025+ is an expansion strategy for developing the rail infrastructure and is part of the "Overall Transport Scheme" for Austria. It contains investment in expansion and modernisation beyond the year 2025 and has been prepared by ÖBB-Infrastruktur on the basis of the Railway Act in close coordination with the Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT) and the Federal Ministry of Finance, together with external transport planners. Target Network 2025+ is being implemented in several stages. The goal is an efficient infrastructure as basis for more trains, more freight and better synchronised scheduling.
<https://infrastruktur.oebb.at/en/company/for-austria/future-rail-target-network>
- The Target Network for the horizon 2040 is currently being developed. Results are expected for the year 2023. Basis is the expected increase of the rail freight transport volumes in the next years:

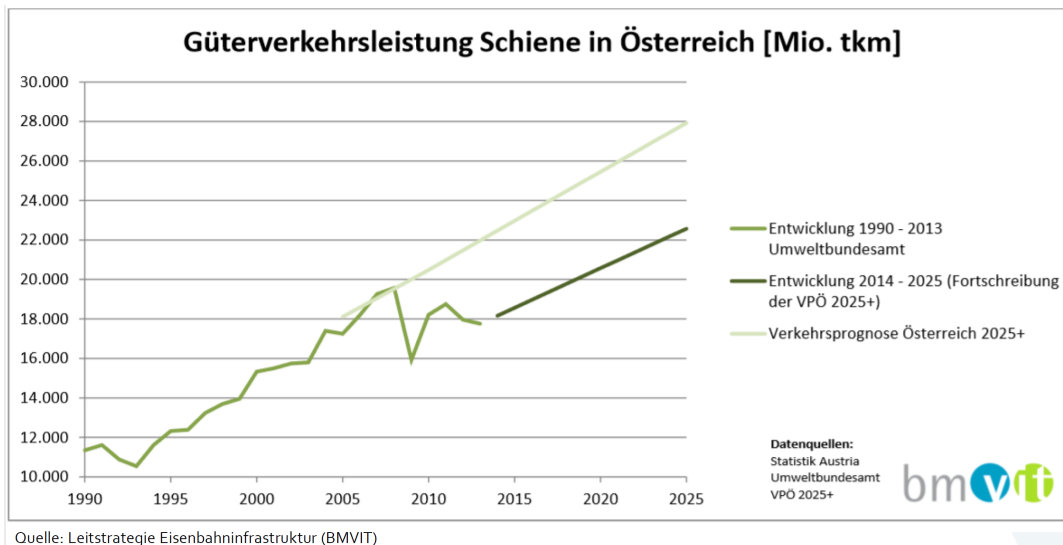
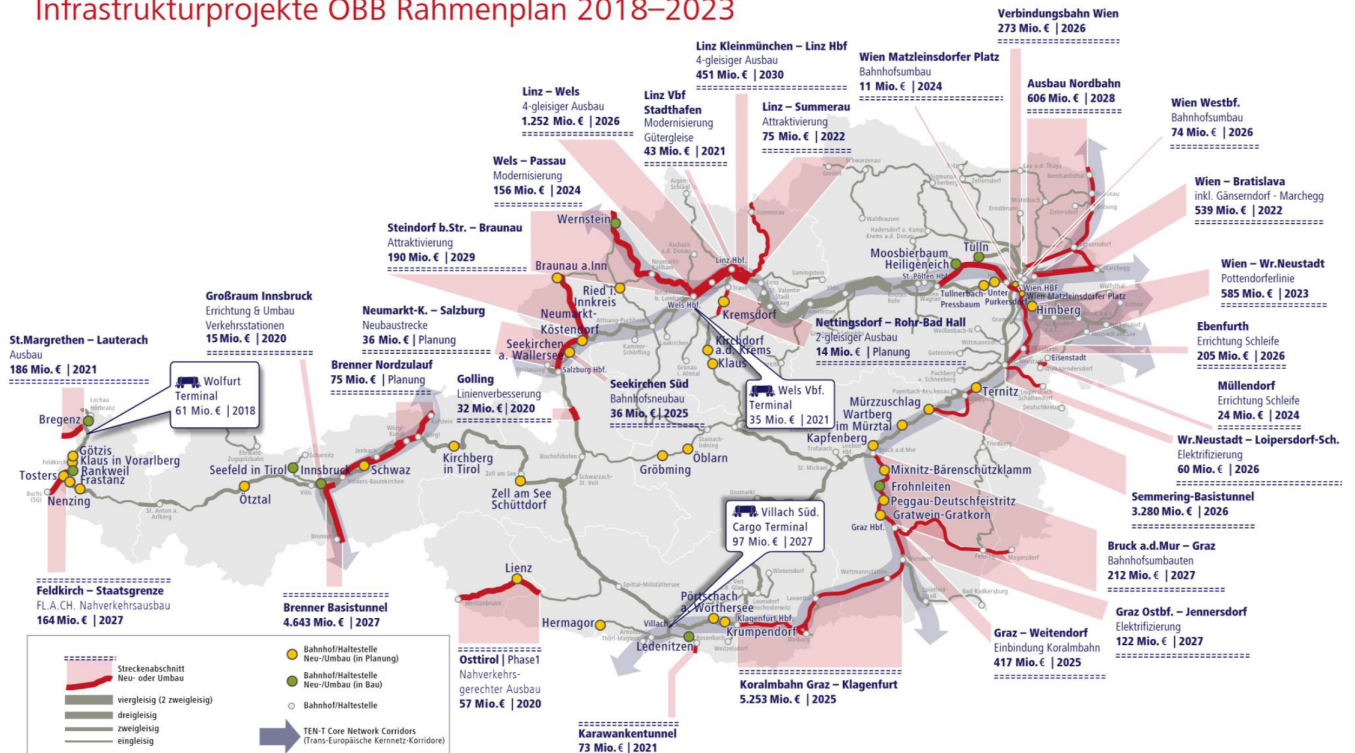


Figure 10: Rail freight transport in Austria 1990-2025

Source: Federal Ministry for Transport, Innovation and Technology (BMVIT)

- Weißbuch Infrastruktur GKB 2025+ (2015): expansion of railway infrastructure of the Graz-Köflacher Railway (GKB), mainly electrification and improvement of passenger train services, no measures to improve freight traffic.
- Styrian government's programme (2019): Regarding the freight transport in, out and into the Styrian region the main aims 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. Climate compatibility is the basis for the further development of mobility in Styria.
<http://www.stvp.at/files/2019/12/Agenda-weiss-grün.pdf>
- Austrian government's programme 2020 - 2024:
 - Freight transport is to be carried out in an energy-efficient, environmentally and climate-friendly manner. (see page 120)
 - Make rail freight transport financially more attractive (adjustment of subsidies up to EU-approved levels, use mainly for cost-intensive area-wide service, companies with low transport volumes, modal shift, promotion of single wagon transport)
 - Securing and expanding intermodal loading facilities in order to increase the efficiency of rail freight transport: promotion and support of direct rail connections to companies, including maintenance and operation; in the field of rezoning of industrial and commercial areas, connecting railways are to be promoted.
 - Increased transport of goods that are specifically suited to the rail sector. (see page 132)
<https://www.bundestkanzleramt.gv.at/dam/jcr:7b9e6755-2115-440c-b2ec-cbf64a931aa8/RegProgramm-lang.pdf>
- ÖBB's framework plan for the expansion of the rail network 2018-2023: contains all expansion measures in the Austrian rail network for the next 5 years. Every year the Federation invests more than two million Euros in expanding and modernising the route network and the railway stations. Investment in the railway is twice as high as in roads. For the period 2018-2023, around € 13.9 billion is planned for expansion of the railway network. About € 3.7 billion are

Infrastrukturprojekte ÖBB Rahmenplan 2018–2023



Source: ÖBB Infrastruktur AG, BMVIT

2.6. Analysis of the industrial structure and clusters (potential customers)

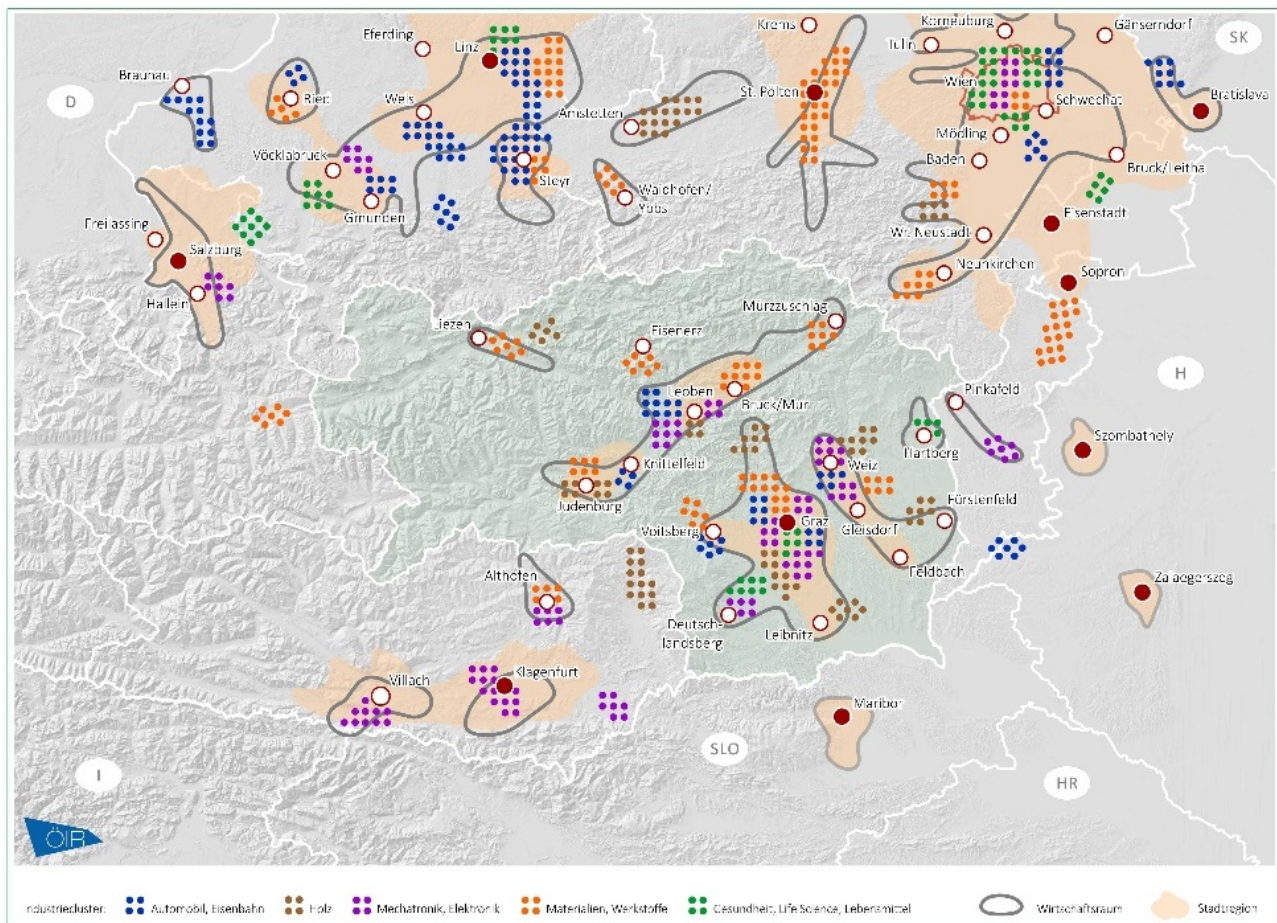
The technological core competences of the Styrian economy are materials and material technologies, machinery and plant engineering as well as digital technologies including sensor technology and microelectronics. The following map summarises the industrial clusters in Styria:

- Automotive, rail
- Timber
- Mechatronics, electronics
- Materials and material technologies
- Health, life science, food

The economic areas in Styria are as follows (see map below):

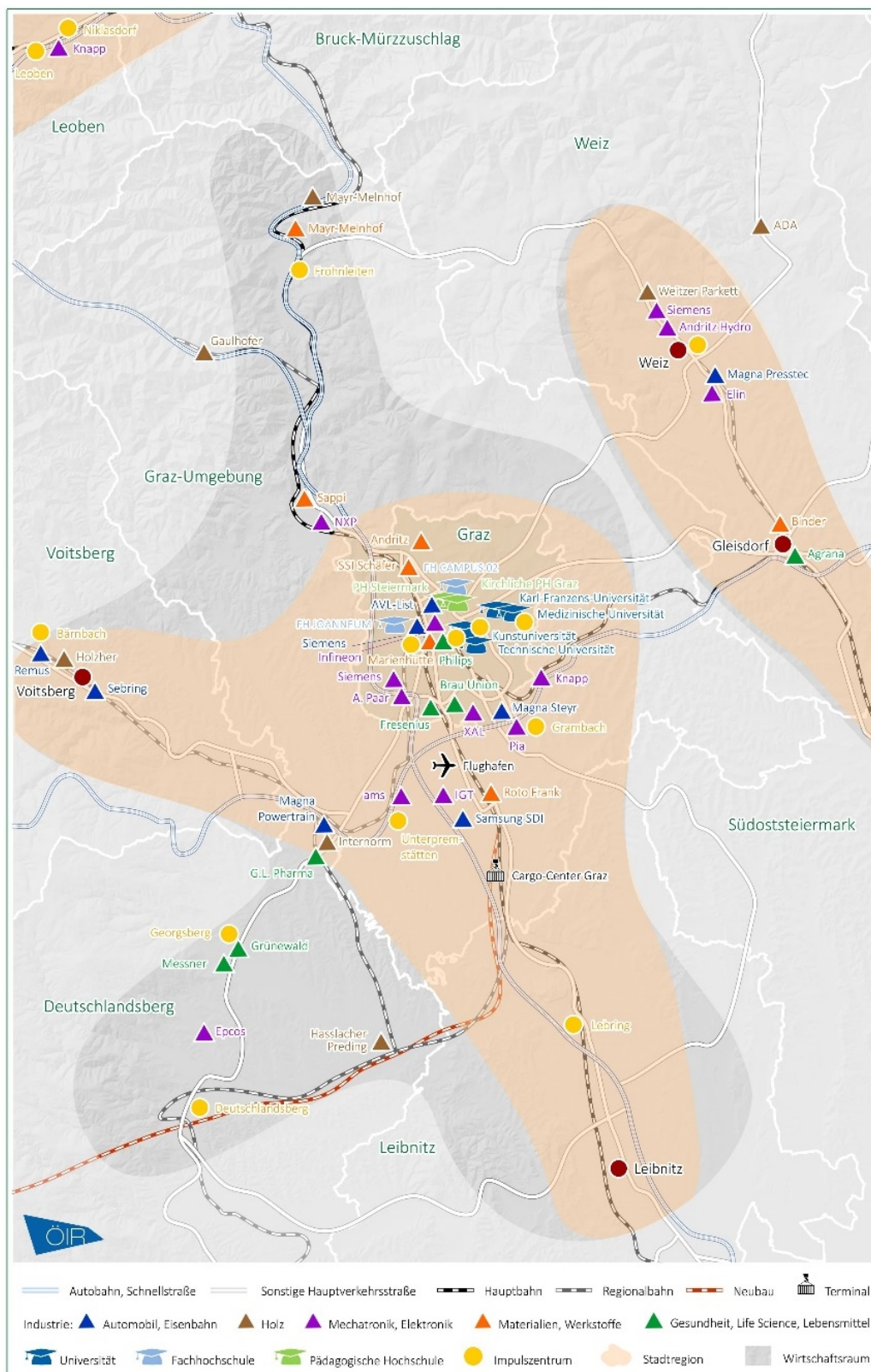
- The Upper Styrian central region: from Judenburg to Mürzzuschlag
- The central area of Graz: from Leibnitz to Frohnleiten, including Voitsberg and Deutschlandsberg
- The economic area Weiz - Feldbach - Fürstenfeld
- The economic area Hartberg
- The Liezen economic area

The map includes companies with more than 200 employees. Individual companies are grouped together to point clouds.

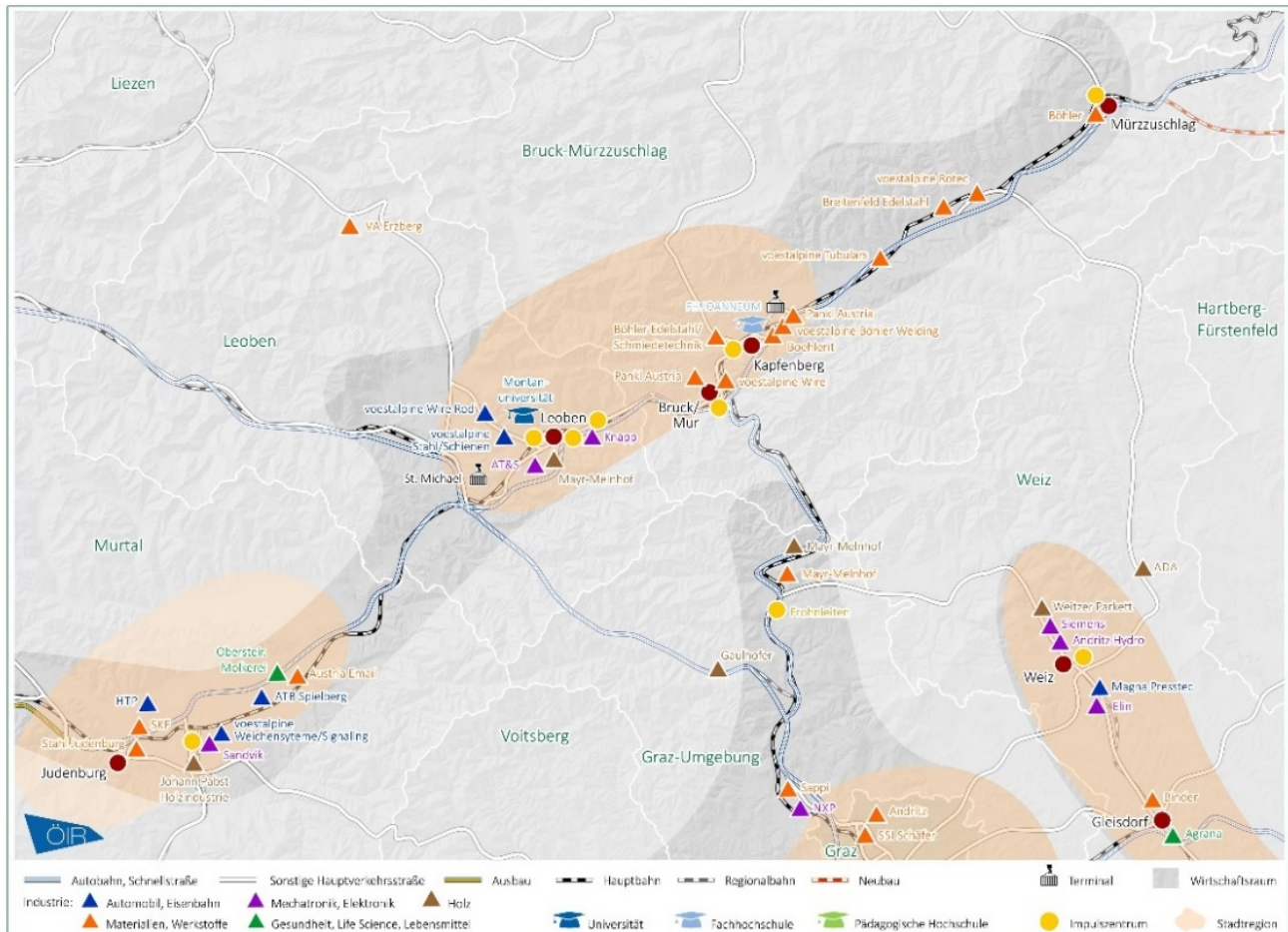


Map 7: Economic and central areas in Styria and neighbouring regions

The most important industrial sites are situated in the central regions of Graz and Upper Styria (see maps below).



Map 8: Economy, education and transport in the central region of Graz



Map 9: Economy, Education and Transport in the central region of Upper Styria

The **automotive and railway industries** of Styria are concentrated in the central regions of Upper Styria and Graz and in the economic region of Weiz - Gleisdorf - Feldbach. Leading companies are voestalpine, Magna and AVL-List.

The **timber processing industry** is represented in all economic areas of Styria. The most important companies are Mayr-Melnhof, Internorm, Gaulhofer, Johann Pabst Holzindustrie, ADA Möbelfabrik, Weitzer Parkett, Hasslacher Preding and Admonter Holzindustrie.

The **mechatronics and electronics industries** are located in the central regions of Upper Styria and Graz and in the economic area Weiz - Feldbach. The most important companies include AT&S, Knapp and Sandvik in the central region of Upper Styria, Siemens, Knapp, NXP, Anton Paar, PIA, XAL, IGT, Epcos and ams in the central region of Graz as well as Siemens Andritz Hydro and Elin in the region Weiz - Gleisdorf -Feldbach.

The cluster **“materials and materials technologies”** is represented in all economic regions of Styria, especially in the Upper Styrian central region. Among the most important companies are voestalpine, Böhler, Boehlerit, Pankl, Breitenfeld Edelstahl, Austria Email, SKF, Stahl Judenburg and Mayr-Melnhof. Leading companies in the central Graz area are Andritz, Sappi, SSI Schäfer, Marienhütte, Roto Frank, in the economic area Weiz - Gleisdorf - Feldbach the Binder company, in the Liezen area the Liezen machine factory and foundry.

The **health, life science and food cluster** is not yet strongly represented in Styria, but has a high growth potential. The most important companies are located in the central area of Graz, including Brau Union, Philips Health Systems, G.L. Pharma, Grünewald and Messner. In the economic area Weiz - Gleisdorf - Feldbach the company Agrana in Gleisdorf is to be mentioned.

The Styrian industrial clusters are mostly well connected to the main railway lines (see maps above):

- Austrian Southern Railway (Südbahn) Mürzzuschlag - Bruck/Mur - Leoben - Judenburg - towards Klagenfurt and Bruck/Mur via Graz - Spielfeld - towards Maribor (SI)
- Pyhrn-Schober railway line: from Leoben via Selzthal - towards Linz
- Styrian East railway line: from Graz via Gleisdorf - Fehring - towards Szentgotthard (HU)

as well to regional lines:

- Gleisdorf - Weiz railway line (Weizerbahn)
- Graz-Köflacher railway line: Graz - Lieboch - Köflach (Köflacherbahn) und Graz - Lieboch - Wies-Eibiswald (Wieserbahn)

The following table shows the suitability of goods and industries for rail freight transport.

Goods (for regions)	High rail freight suitability	
	yes	no
Timber, paper and pulp	x	
Iron ore	x	
Coal and coke	x	
Basic metal products	X	
Chemicals (basis products)	x	
Cars and parts of cars	x	

Industries/companies (for regions only)	High rail freight suitability	
	yes	no
Automotive and railway industries	x	
Timber processing industry	x	
Mechatronics and electronics industries		x
Materials and materials technologies	x	
Health, life science and food cluster		x

Table 5: Goods/industries/companies and its rail freight suitability

3. Summary and recommendation

For Styria (without the concrete results of the survey with particular focus on the region Gleisdorf - Weiz) 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 stems mainly from imports and exports of Styria to Western European Countries and transports to Upper Austria.

Further, according to first findings of the survey along the railway section Gleisdorf - Weiz an increase of rail freight transport is possible for corrugated raw paper that amounts to a potential of more than 30% of the present paper and waste paper transports in this region. However, further analysis is needed to relate this potential to the overall transport volumes of the section Gleisdorf - Weiz.

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.

The shifting of road transports of corrugated raw paper of about 60,000 tons/year requires changes in logistic chains and further investigation at the dispatcher of the goods. Enquires for further details are planned at short notice.

- A transport potential to be shifted from road freight transport along the Pyhrn-Schober axis is seen in terms of the following products:
- Agricultural products
- Metal ores and other mining and quarrying products
- Wood and products of wood and cork, especially paper and cellulose
- Basic metals
- Secondary raw materials

With focus on regional rail transport, the market potential of the rail section Gleisdorf - Weiz has been analysed in more detail. 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.

4. List of References

Adelsberger, H., Petzmann, H. (2018): Schienenkorridore für die Steiermark. Ausbauvorstellungen für den Güter- und Personenverkehr. Steirische Regionalpolitische Studien Nr. 01/2018.

Austrian Institute for Regional Studies - ÖIR (2018): Styria in an international context - central areas, economy and transport (maps and report), on behalf of the Office of the Styrian provincial Government, sections 16 and 17.

DG MOVE (2018). Transalpine Freight Traffic Flows: Summary Report on CAFT-Surveys 2014/15.

DG MOVE, Swiss confederation FOT (2019): Observation and analysis of transalpine freight traffic flows. Key figures 2018

Office of the Styrian provincial Government (2019): The Styrian rail network,
URL: <http://www.verkehr.steiermark.at/cms/beitrag/10026466/11156914/> (in German)

Office of the Styrian State Government, Department 16 (2018): Die Tauern-Pyhrn/Schober-Achse (TPSA) im europäischen Kontext. Ein Argumentarium zur Aufnahme in das Transeuropäische Kernnetz, URL: <http://www.verkehr.steiermark.at/cms/beitrag/12741791/152556324/>

Office of the Styrian State Government, Department 12 (2019): Economical Report Styria 2018 (Wirtschaftsbericht Steiermark 2018), URL: http://www.wirtschaft.steiermark.at/cms/dokumente/11019062_34724454/16e65498/Wirtschaftsbericht%202018_Web.pdf (in German)

RNE - RailNetEurope (2018). Rail Freight Corridors in Europe, URL: <http://rne.eu/rail-freight-corridors/>

5. Annex

Map A.1: Economic and central areas in Styria and neighbouring regions

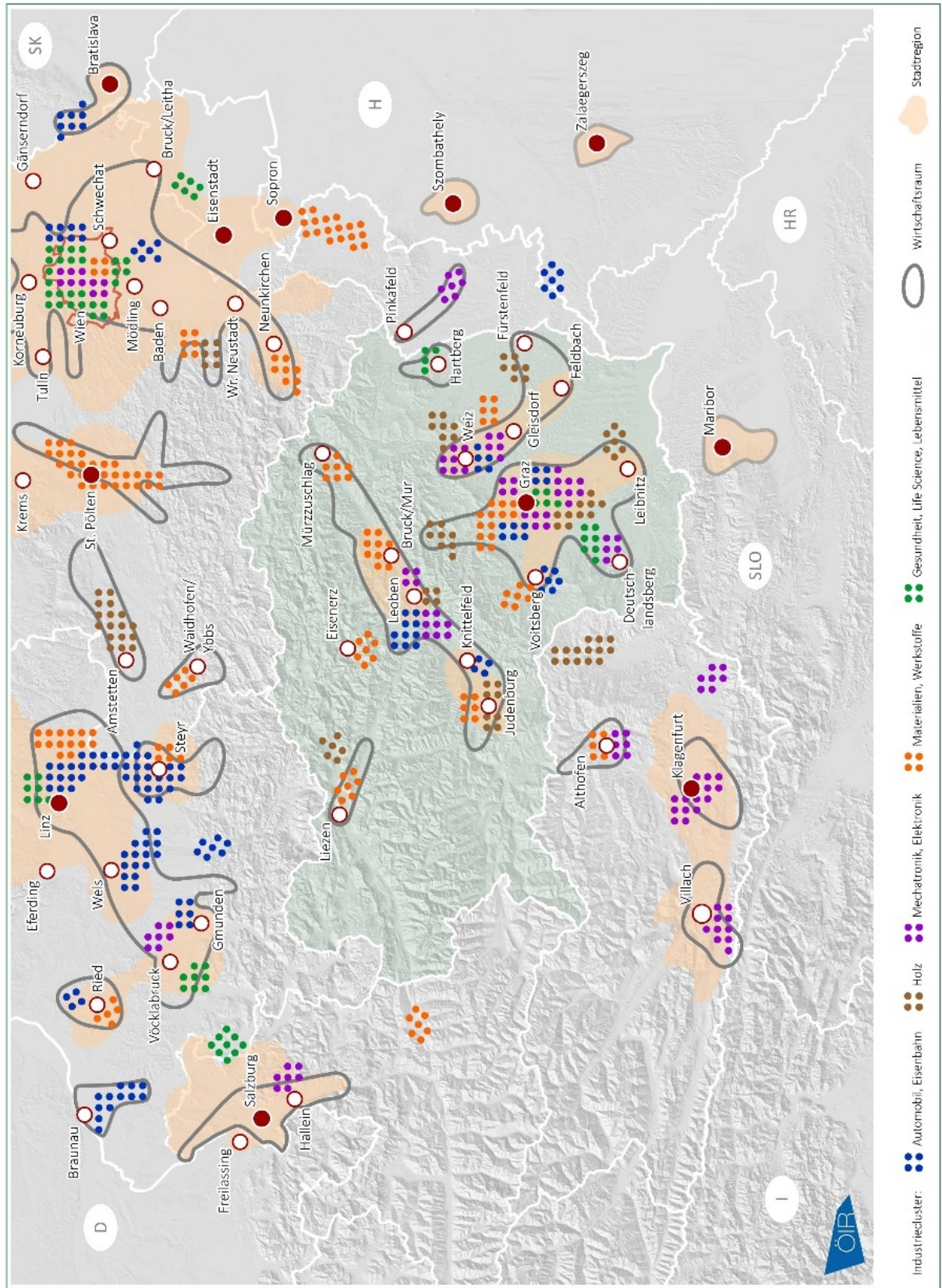
Map A.2: Economy, education and transport in the central region of Graz

Map A.3: Economy, education and transport in the central region of Upper Styria

Table A.4: List of surveyed companies in the Weiz - Gleisdorf region

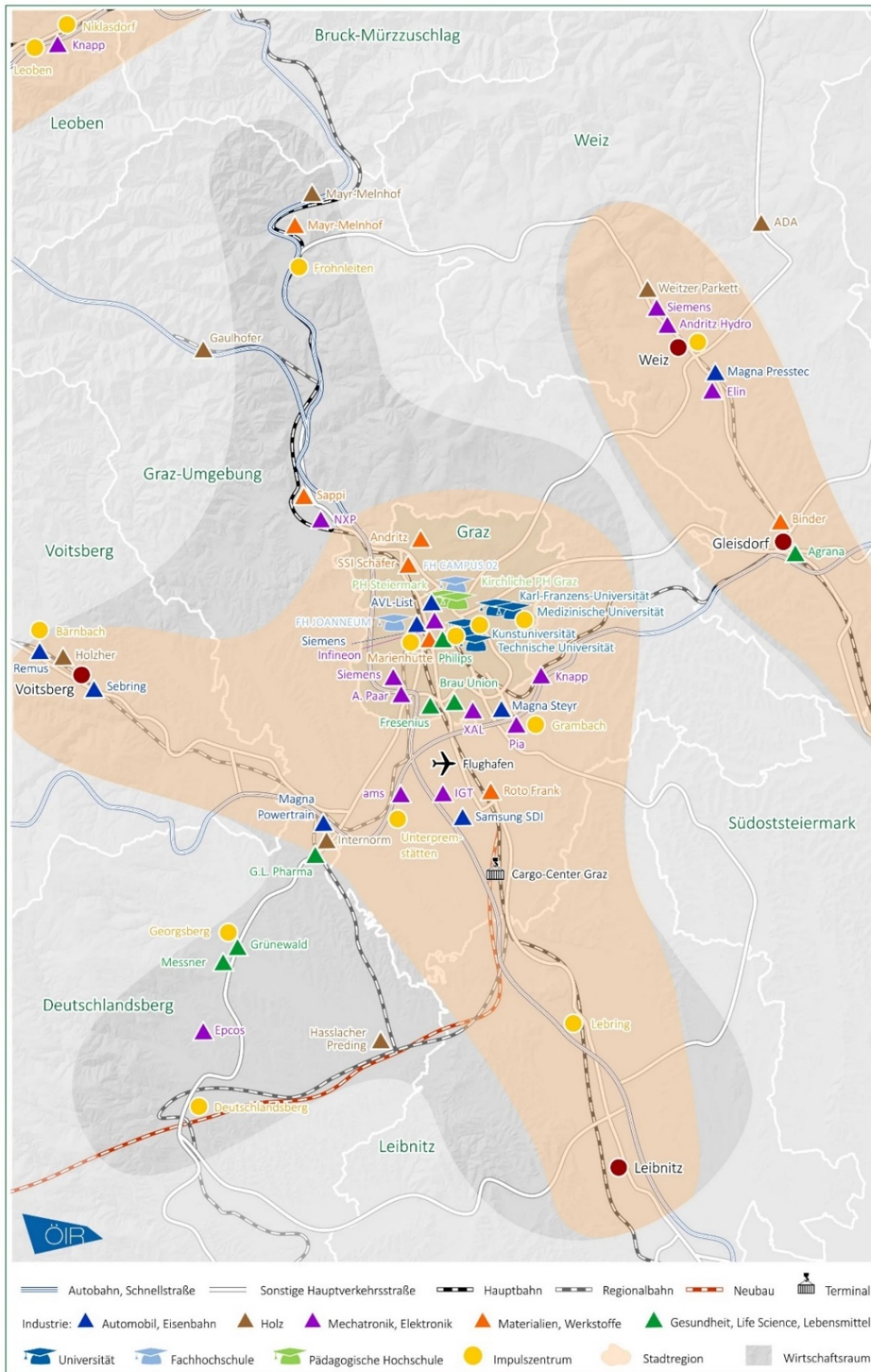


Die Steiermark im überregionalen Kontext – Zentralräume, Wirtschaft und Verkehr Wirtschafts- und Zentralräume in der Steiermark und angrenzenden Regionen



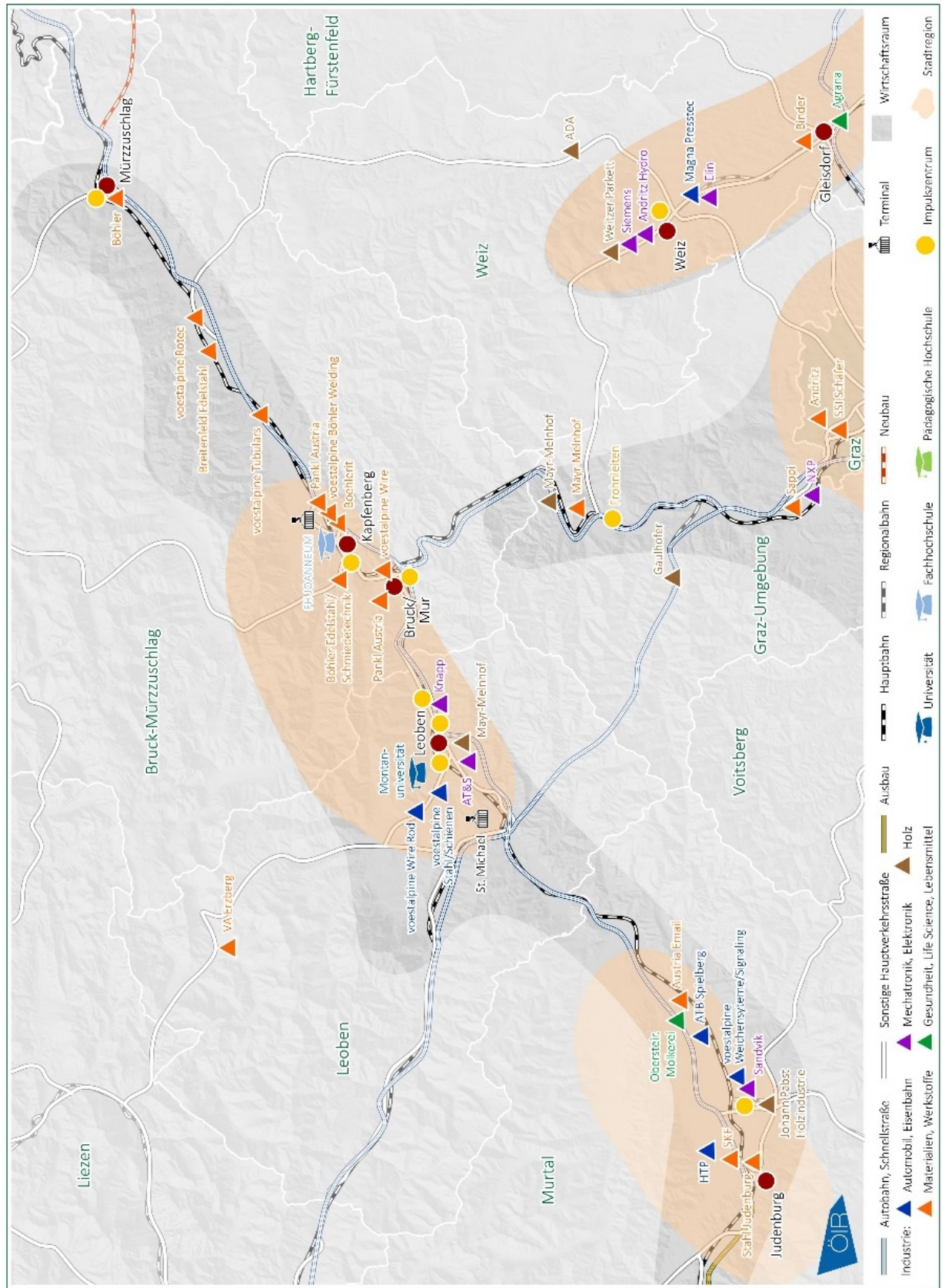
Map A.1: Economic and central areas in Styria and neighbouring regions

Die Steiermark im regionalen Kontext – Zentralräume, Wirtschaft und Verkehr Wirtschaft, Bildung und Verkehr im Grazer Zentralraum



Map A.2: Economy, education and transport in the central region of Graz

Die Steiermark im regionalen Kontext – Zentralräume, Wirtschaft und Verkehr Wirtschaft, Bildung und Verkehr im obersteirischen Zentralraum



Map A.3: Economy, education and transport in the central region of Upper Styria



Company	Location	Interviewee	Website
Binder+Co AG	Gleisdorf	Peter Gradwohl	www.binder-co.com
Automotive industry	anonymous	anonymous	anonymous
Andritz Hydro GmbH	Weiz	Martin Reiser	www.andritz.com
Rondo Ganahl AG	St. Ruprecht an der Raab	Karl Pucher	www.rondo-ganahl.com/en
Gößlbauer GmbH & Co KG	Weiz	Ulrike Gößlbauer	https://goesslbauer.jimdo.free.com
Waldverband Steiermark	Graz	Bernd Painsitt	www.waldverband-stmk.at
Forstamt Gutenberg	Gutenberg an der Raabklamm	Ulrich Stubenberg	www.walderlebnis.com
Weitzer Parkett	Weiz	Michael Kovacs	www.weitzer-parkett.com/en
Mayr Melnhof Holz Leoben GmbH	Leoben	Stefan Hierzenberger	http://www.mm-holz.com/en
Meier Verpackungen GmbH	Albersdorf	Walter Michelitsch	www.meierverpackungen.at
Herbert Lugitsch u. Söhne Ges.mBH	Feldbach	Daniel Lafer	https://h.lugitsch.at
Jerich International	Gleisdorf	Rene Scheidl	https://www.jerich.com/

Table A.4: List of surveyed companies in the Weiz - Gleisdorf region



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