

“Market Analysis to develop existing and build up new marketable intermodal train offers between Rostock and Austria”

Interreg Baltic Sea Region Project #R032
“Sustainable and Multimodal Transport Actions in the Scandinavian-Adriatic Corridor”

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Version	1.2	Date	11.03.2019	Status	final
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Document Approval Chronology

Document			Revision / Approval	
Version	Date	Status	Date	Status
1	##.##.2016		##.##.2016	

Output Description (Application Form)

Output Schedule

Source	Deadline / Milestone					
	31.10.16	30.04.17	31.10.17	30.04.18	31.10.18	30.04.19
Planned according to work plan						
Expected						

Quality Criteria (for main outputs only)

Questions to be answered:

- What is the main contents (e.g. type of information) of the output and volume (e.g. # of pages, entries);
- What is the format of the main output (e.g. an excel tool, an online data base, a physical investment, a report publishable online and in print);
- If applicable, what functions/functionality of e.g. an IT solution: such as data exchange among different data bases, data export, data storage, etc. are foreseen.

Additional Quality Criteria (for all outputs)

Questions to be answered:

- What is the aim of the output?
- What is the thematic / geographical scope of the output?
- Who is the output addressing (target group)?
- How the output shall be used by the target group?

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1 Executive Summary

This report analyses the potential for reopening a multimodal transport connection between Scandinavia/Finland, Rostock Port and Austria with further connections to neighbouring regions in Slovakia, Slovenia and Hungary. Using the ferry link between Sweden, Denmark, Finland and the port of Rostock, RoRo units could be carried on by train to an intermodal terminal in Austria und distributed further from there.

Using numerous sources (European and country statistics, customs publication, company and press reports) and carrying out market interviews with representatives of key market players along the corridor allowed the assessment of the market potential, opportunities and risks of such an intermodal product. To grasp a general interest in such an intermodal product, as well as gaining an idea of concurrent expectations, requirements, and a potential volume were the main goals of these interviews.

The market section of this report includes a summary of:

- The existing transport offer (ferry links and intermodal connections) via Baltic ports
- Freight flows on the corridor
- Structure of transport market and intermodal potential (as stated in market interviews)
- Evaluation of opportunities and risks of an intermodal product on the corridor

The analysis identifies a market potential that could allow for five train departures per week between the port of Rostock and Austria, confirmed by a possible anchor customer. All interviewed market experts approved Wels to be the most suitable rail terminal in the area thanks to its geographic location and existing antenna to neighbouring regions.

However, the analysis also reveals that a low price level in the market and a possible resource shortage of the rail operators, mainly related to drivers and possible capacity bottlenecks in the Wels terminal, could be major risks for the success of such an intermodal offering.

2 Market Analysis

2.1 Methodology of Market Analysis

The ROSTOCK PORT GmbH operates the port infrastructure of the sea port Rostock as well as intermodal transshipment terminals in this port. With a share of around 60 % of the total operated volume, ferry and RoRo traffic is the most important market of the Rostock port, with the focus lying on connections to/from Denmark, Sweden and Finland.

Aside from the ferry connections, the port's attractiveness is severely dependent on efficient railway connections to the continental source and target regions of the intermodal traffic streams. Regarding this, Rostock Port is in strong competition with other sea ports on the southern Baltic coast, especially the port of Lübeck.

In the following market analysis, an overview of the current and future market for combined traffics between Austria incl. neighbouring countries (Slovakia, Hungary, Slovenia) and Scandinavia/Finland will be given. As an outcome, this analysis will provide concepts for trains and products for additional intermodal train connections between Austria and the mentioned neighbouring countries and the sea port Rostock.

Both extensive desk research as well as interviews with market participants and experts form the basis of the market analysis. An evaluation of the information provided by relevant market players, statistic authorities, the EU, customs and similar sources allowed the identification of a relevant potential for intermodal transports on the corridor. More than 20 market interviews with representatives of the following companies enabled the assessment of market interest in an intermodal product, volume potential and market requirements, e.g. quality and pricing.

Ports / <u>ferry lines</u>
<ul style="list-style-type: none">▪ Trelleborgs Hamn▪ <u>Stena Line</u>
Rail and intermodal operators
<ul style="list-style-type: none">▪ DB Cargo▪ Green Cargo / NTR▪ Kombiverkehr▪ <u>Metrans</u>

Results from market analysis created the basis for the ensuing development of the train concept.

2.2 Current Transport Offer on the Corridor

2.2.1 Baltic Ferry Links to Scandinavia / Finland

Several Baltic ports along the Baltic Sea offer ferry connections to Scandinavia and Finland. Rostock is the only port providing connections to both Denmark, Sweden and Finland and has an advantage in terms of travel distance to several Scandinavian destinations.

Baltic Sea ferry links:



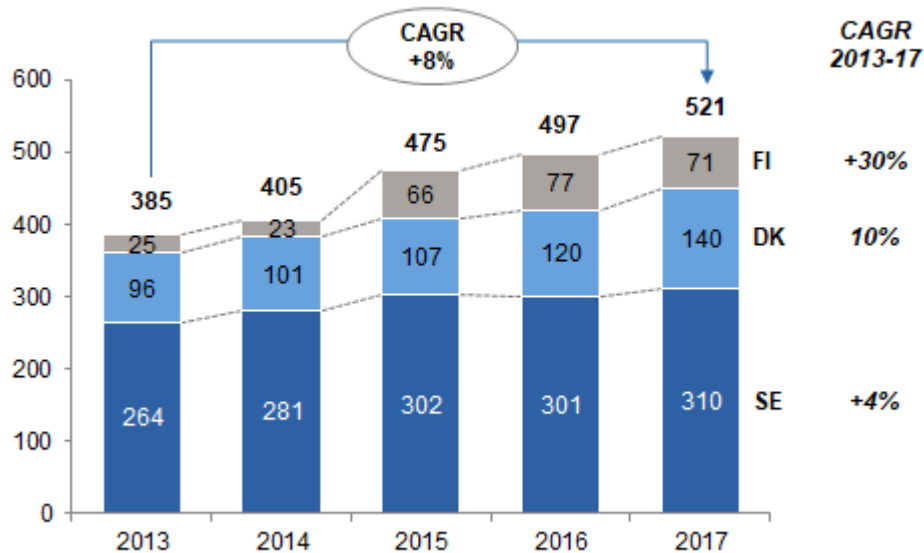
Comparison of sea distances by port:

Distance (km)	Kiel	Lübeck	Rostock	Swinemünde	Gdynia
Gothenburg	236	280	240	262	402
Trelleborg	140	128	83	97	240
Ystad	160	140	104	94	225
Hanko	570	560	515	458	366
Helsinki	631	622	580	525	418
St. Petersburg	778	762	721	663	561

Number of transhipped units, including both accompanied and unaccompanied units as well as train waggons (Sweden only), has increased in Rostock over the last five years by 8% annually. Strongest

growth showed volumes to / from Finland. Unaccompanied trailers stood for 24% of total ferry / RoRo volume in Rostock in 2017, accompanied trucks for 74% and rail waggons for 3%.

Port of Rostock: Annual ferry / RoRo units

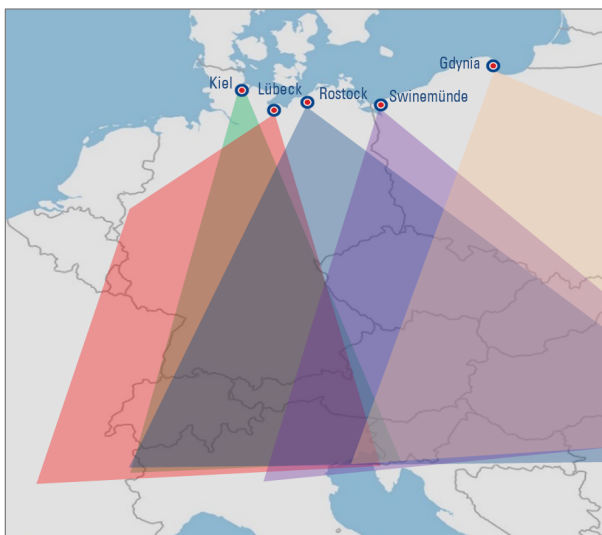


Source: Rostock Port

2.2.2 Intermodal Hinterland Transport

There is a strong overlap in the catchment area of the relevant German / Polish ports on the corridor.

Catchment area of Baltic ports (schematic):

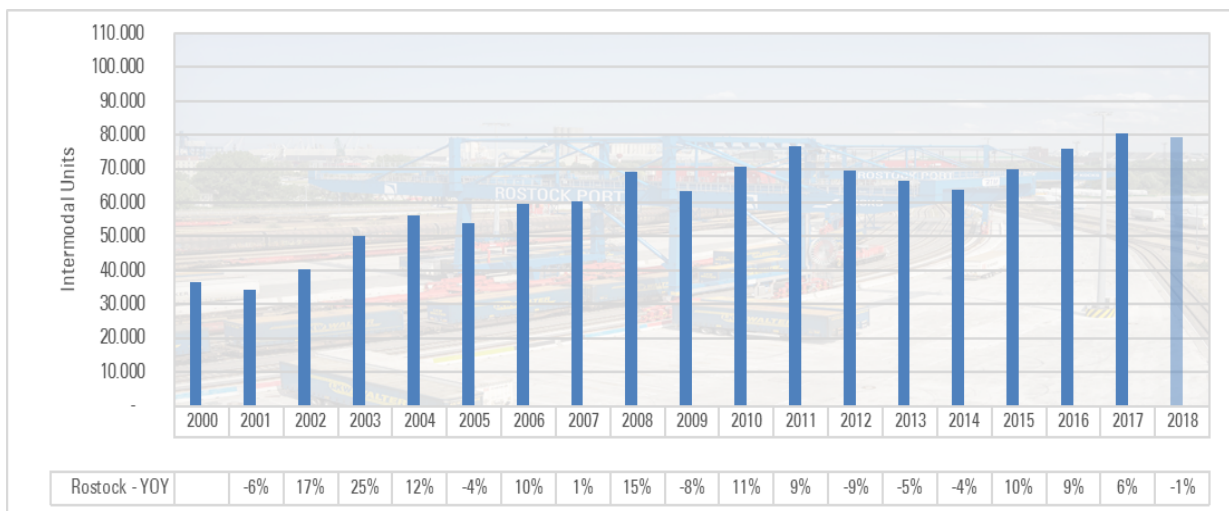


Source: Rostock Port

With intermodal train connections, the ports of Rostock, Lübeck and Kiel are targeting long-distance destinations in the European hinterland. After starting from approximately the same level in 2004, intermodal volume in Rostock and the other ports has developed differently.

While some competitors have been more volatile than others, with the initiation and suspension of connections, or showed constant growth and then experienced a sharp increase in 2011 due to ferry lines moving to a particular port, Rostock displayed a constant growth of existing company train routes. However, in some cases the development suffers from the restriction of train lengths.

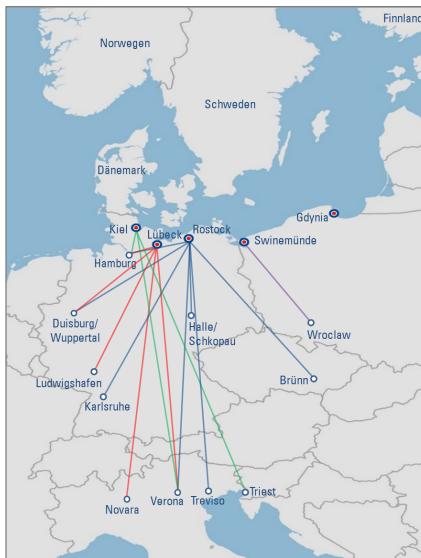
Intermodal units by port:



Source: Rostock Port

The Polish ports of Swinoujscie and Gdynia do not offer regular intermodal connections yet, but have started to develop facilities for intermodal transports. From Swinoujscie, a pilot train to Wroclaw has been operated for the Scandinavian forwarder Bring in December 2017.

Intermodal destinations and weekly departures by port:



Destinations operated and weekly departures		Rostock
Hamburg (DE)	(open)	5
Karlsruhe (DE)	(open)	5
Ludwigshafen (DE)	(open)	
Duisburg (DE)	(open)	
Wuppertal (DE)	(companytrain)	3
Halle/Schkopau (DE)	(open)	2
Brünn (CZ)	(companytrain)	6
Wrocław (PL)		
Triest (IT)	(open)	
Treviso (IT)	(open)	2
Verona (IT)	(companytrain)	10
	(open)	4
Novara (IT)	(companytrain)	
	(open)	
SUM	(companytrain)	19
	(open)	18
	Total	37

Source: Rostock Port

On the corridor to Austria, none of the German ports currently provide a regular intermodal connection. The train previously operated by Kombiverkehr from Rostock to Wels terminal, mainly with volumes from one anchor client, was suspended for various reasons in the beginning of 2018.

Port of Rostock: Intermodal development vs. total RoRo volume










Source: Rostock Port

In Rostock, intermodal volume growth reflects overall development of ferry / RoRo volumes. In 2017, intermodal freight in Rostock stood for 16% of total truck and trailer volumes operated by the port.

While intermodal facilities are well developed in Lübeck and Rostock, the port of Kiel as well as the Polish ports of Swinoujście and Gdynia are currently building or expanding terminal and rail facilities to improve rail hinterland transports.

Development of intermodal facilities by port:

	Kiel: Ostuferhafen	Kiel: Schwedenkai	Lübeck: Skandinavienkai	Lübeck: CTL	Rostock	Swinemünde	Gdynia
Terminalbetreiber	KombiPort Kiel		Baltic Rail Gate	Lehmann GmbH	Rostock Trimodal	Ferry Terminal Swinoujście	
							

Source: Rostock Port

2.3 Cargo flows on the corridor

2.3.1 Characterisation of goods flows on the corridor

The analysis is focussing on transport flows between Norway, Sweden and Finland to Austria and neighbouring regions in Slovakia, Slovenia and Hungary.

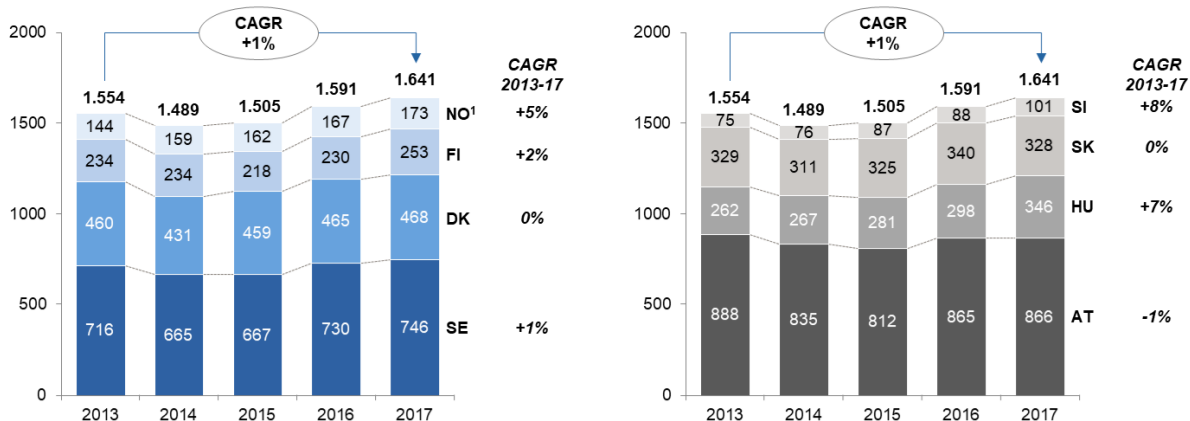
Goods flows between Denmark and Austria plus neighbouring regions are not part of this analysis, assuming that road transport is predominant in these cases.



2.3.2 Imports to Nordic Countries

Import volume to Nordics has been stable over the last years. Largest increase was seen in imports to Norway. Sweden is the largest market, making up for almost 50% of all imports to the area. 53% of all imports to Nordic countries are coming from Austria. But a large increase was seen during the last years in imports from Hungary as well as Slovenia.

Imports to Nordic countries on the corridor (by destination and origin, in 1.000 t)

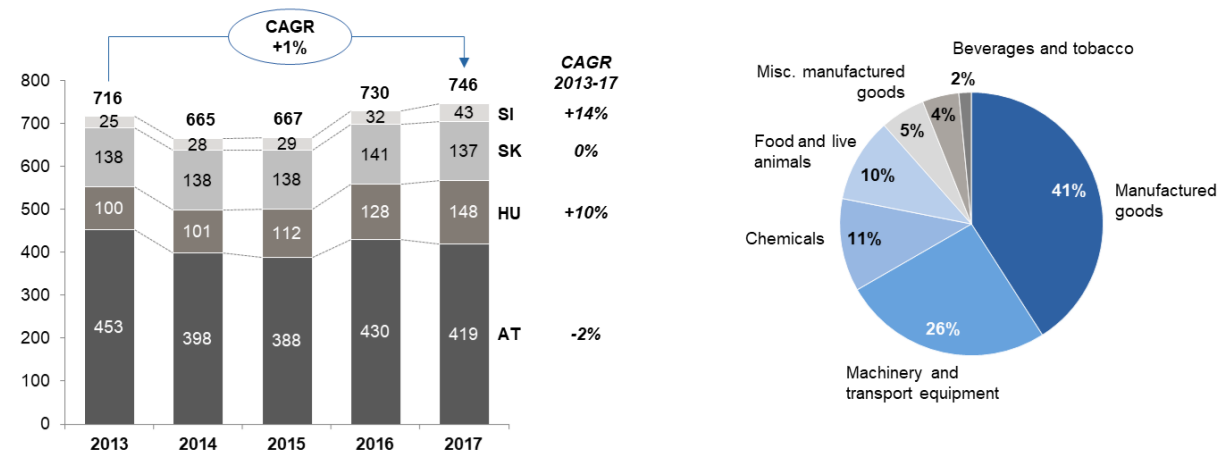


Source: Eurostat, national statistic offices

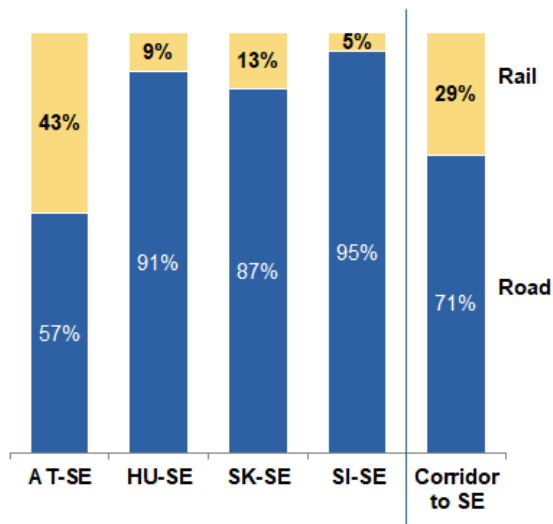
In-depth analysis for Sweden confirms this trend. During the last years, imports of vehicles and components from Hungary and Slovenia to Sweden have grown strongly.

30% of total import volume to Sweden (230.000 t) are iron and steel from Austria. In addition, there is a large flow of chemicals from Austrian chemical industry (75.000 t).

Imports to Sweden on the corridor (by origin in 1.000 t, by commodity in % of total tonnage)



Source: SCB (Statistics Sweden), Eurostat



Imports to Sweden: Modal split in % of total transport volume, 2017

In-depth analysis for Sweden shows a high modal share of rail transport, especially from Austria. This is due to high rail affinity of import goods, especially iron and steel. Rail share for neighbouring countries is significantly lower. It has to be noted that analysis is based on Eurostat data reported by Sweden, i.e. possible intermodal transport from load location to German port will be shown as road if transported by truck from Swedish port to destination.

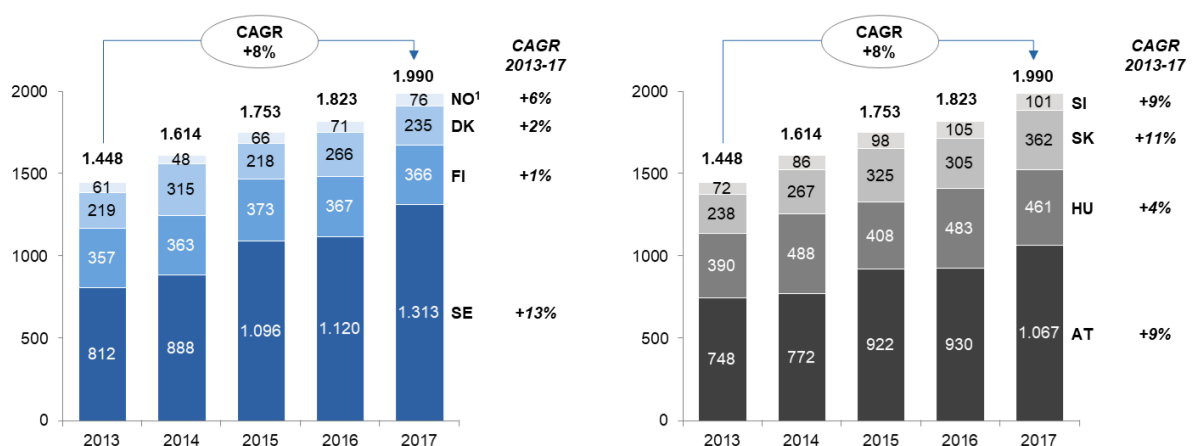
Source: Eurostat

2.3.3 Exports from Nordic Countries

Export volume from countries to Austria and regions in neighbouring countries has shown strong growth during the last years. This has mainly been driven by Sweden that stands for two thirds of the total export volume on the corridor.

Largest export market for Nordic countries in the region is Austria, but also exports to neighbouring countries grown considerably during the last years.

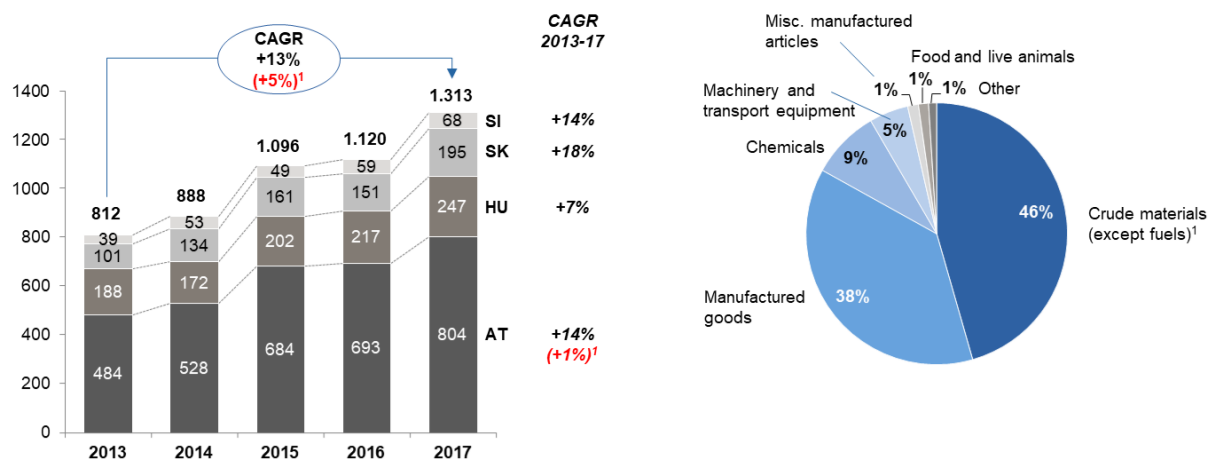
Exports from Nordic countries on the corridor (by destination and origin, in 1.000 t)



Source: Eurostat, national statistic offices

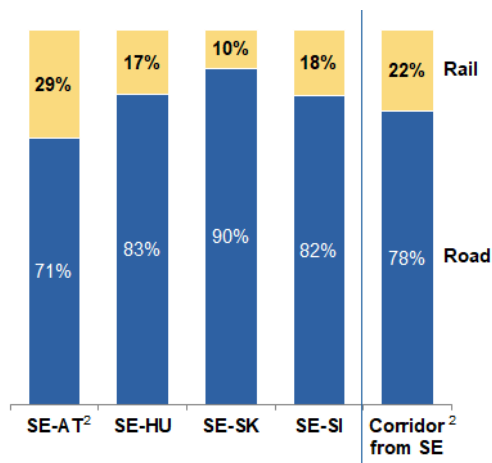
In-depth analysis for Sweden shows that the export of iron ore to Austria is the significant driver. Excluding this, there still is an annual growth of 5% in exports from Sweden on the corridor. Almost 50% of total Swedish exports on the corridor are paper and pulp, bounded mainly for Austria, but also Slovakia and Hungary saw strong growth during the last years. 12% of the export flow is iron and steel. In addition, Sweden exported 112.000 tons of chemicals, mainly to Austria, Slovakia and Hungary.

Exports from Sweden on the corridor (by destination in 1.000 t, by commodity in % of total tonnage)



1 Growth excluding export of iron ore

Source: SCB (Statistics Sweden), Eurostat



Exports from Sweden: Modal split in % of total transport volume, 2017

Rail share in exports (not including iron ore), is also highest to Austria. Both paper and pulp as well as iron and steel products show a high affinity for rail transport. Overall, there is a 22% rail share to the area. Again it has to be noted that the analysis is based on Eurostat data reported by Sweden, i.e. possible intermodal transport from German port to destination will be shown as road if transported by truck from Swedish origin to port.

2 Basis for calculation excluding export of iron ore

Source: Eurostat

2.3.4 Summary of Cargo flows on the Corridor

Import and export flows on the corridor are fairly balanced. Import volumes are stable, exports have shown growth, strongly driven by Sweden.

Imports to Nordics

TRANSPORT VOLUME 2017 IN 1.000 T

LOAD	UNLOAD				
		SE	DK	FI	NO
	AT	419	213	148	86
	HU	148	110	54	35
	SK	137	113	40	38
	SI	43	32	11	15
	Σ	747	468	253	174

- Stable transport volume over the last years
- Important share of imports are iron and steel from Austria, chemicals from Austria, machines, vehicles and components from Hungary and Slovakia

Exports from Nordics

TRANSPORT VOLUME 2017 IN 1.000 T

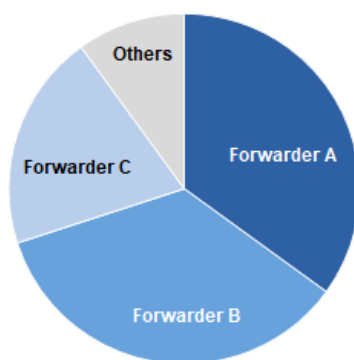
UNLOAD	LOAD				
		SE	DK	FI	NO
	AT	803	91	152	21
	HU	247	79	108	27
	SK	195	53	87	27
	SI	68	13	19	1
	Σ	1.313	236	366	76

- Strong growth of export volume, mainly driven by Swedish iron ore and pulp & paper exports
- Exports mainly consist of paper and pulp exports, Swedish iron ore exported to Austria, iron and steel as well as chemicals

Source: Eurostat, national statistic offices

2.4 Potential for an intermodal product on the corridor

2.4.1 Structure of the transport market



Estimated segmentation of RoRo market on the corridor

Several interviews confirmed that there is a high concentration in the relevant transport market, i.e. the RoRo segment on the corridor. A group of three large forwarders is dominant in the market, though it has to be noted that the split of market share can change rapidly depending on respective assignment of the large transportation contracts.

The large forwarders define the market price level and smaller forwarders find it very difficult to compete. Several of them confirmed in interviews that therefore they chose not to compete in this market.

Source: Qualitative estimation based on market interviews conducted in 06/ 2018

2.4.2 Intermodal potential on the corridor

Market interviews allowed the discussion of a general interest of participants (forwarders, ferry lines, intermodal operators) in an intermodal solution on the corridor.

One of the large forwarders expressed a clear interest in transferring daily trailer volumes from road to rail between Austria and the port of Rostock. As currently no rail solution exists on the corridor, there is a clear willingness to analyse potential advantages of an intermodal solution.

Several other forwarders also confirmed a possible transfer of smaller daily trailer volumes to an intermodal transport product between Austria and the port.

In addition to forwarders, a shipping line also expressed willingness in taking over commercial responsibility for development and marketing of an intermodal product on the corridor. This could be offered as a package (ferry + train) to customers.

Relevant intermodal operators display a general interest to develop an intermodal concept on this axis, yet a clear prerequisite is the identification of commitment of anchor customers.

Summarising, the analysis showed a substantial general market potential for an intermodal product on the corridor. However, meeting market requirements in terms of product pricing frequency, quality, etc. is crucial for realising the identified market potential. Therefore, a continued development process needs to clarify the likelihood of meeting these requirements in the future.

3 Train concept

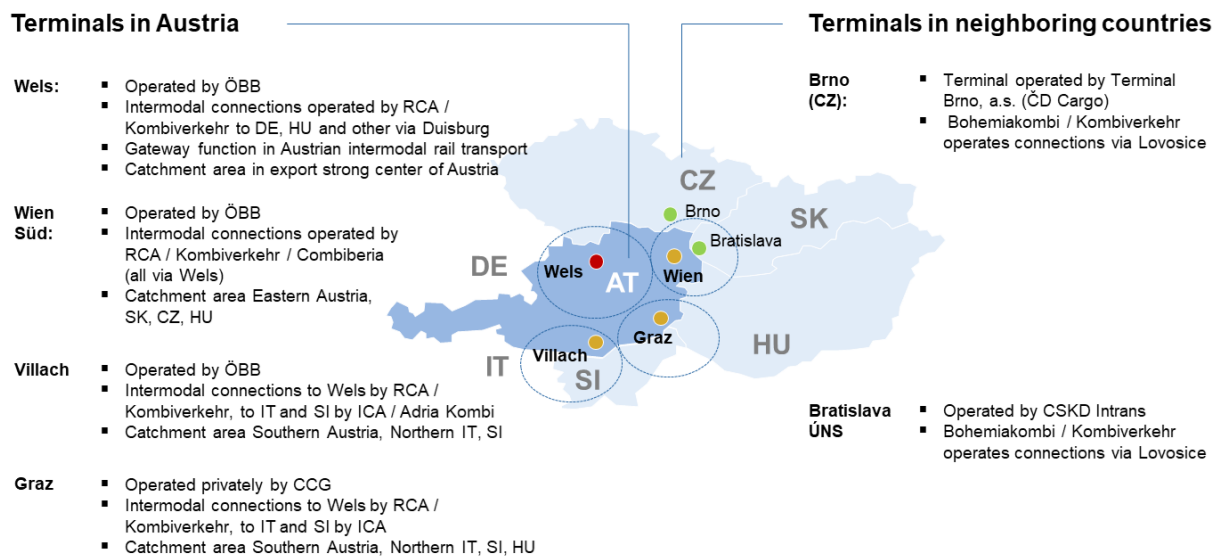
3.1 Selection of Intermodal Terminal at Southern End

As the market analysis showed, the volumes to/from Austria are the basis for establishing an intermodal connection, whereas the volumes to/from Slovakia and Hungary are necessary complements for this base volume. The intermodal terminal at the southern end of the corridor must therefore be able to serve the most important traffic generating and receiving areas in Austria, but also offer possibilities to catch the additional traffic to/from Hungary and Slovakia.

The project has analysed the potential destination terminals in the project area. Only a smaller part of the existing terminals in the area focuses on handling continental intermodal units. Most terminals are designed and optimised for handling sea containers, and do not dispose of the necessary space for handling larger quantities of trailers or swap bodies which cannot be stacked.

From these considerations the intermodal terminal in Wels emerges as the preferred terminal for the Southern end of the corridor.

Selection of relevant terminal with focus on continental intermodal transport



The conducted interviews confirmed Wels as the preferred terminal in the areas, notably stating that it offers very good access to strong Austrian export regions and provides rail connections to all relevant destinations in the wider project area.

Emphasis lies on the vital gateway connections to/from Wels to South Eastern Europe, and especially to Bratislava and Budapest, to generate sustainable volumes for the intermodal train connection on the corridor. Currently other terminals in the project area do not have such onward gateway connections.

Location of Wels terminal in the region

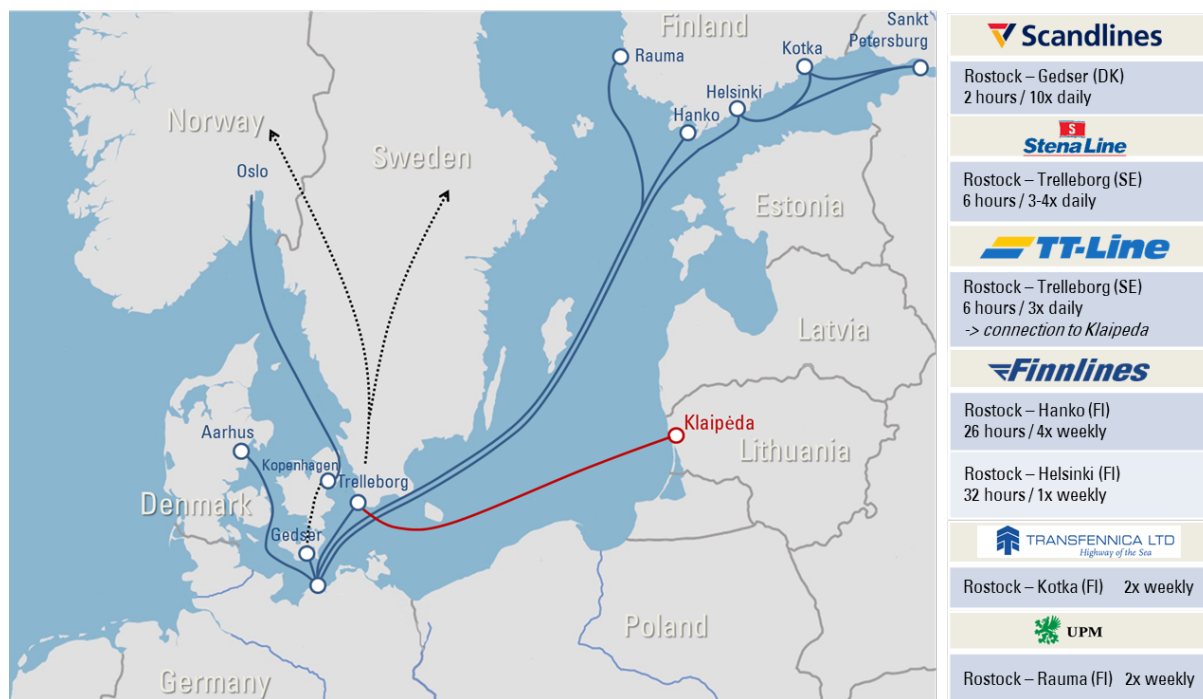


Since the intermodal terminal is operating at or close to capacity, the implementation phase of the project will require special attention to the availability of slots and handling capacity in Wels.

3.2 Train Routing and Frequency

Most interview partners have indicated a service frequency of three departures per week as a minimum requirement and up to five departures per week as desirable.

It is necessary to coordinate the train timetables with the ferry links to and from Sweden and Finland. These timetables will also depend on the prevailing transported freight flows on the corridor.



A train service between Rostock and Wels can be routed entirely through Germany:

Rostock – Berlin/Magdeburg – Halle – Nürnberg – Passau – Wels,

or as an alternative through the Czech Republic:

Rostock – Berlin – Dresden – Praha – Ceske Budejovice – Linz – Wels.

Since the route from Praha to Linz has not been upgraded in recent times, is partially single-track, requires two changes of signaling/train-Protection systems and three changes of electrification system, resulting in the need for more costly multisystem locomotives, this route has not been considered further.

In recent years, services on the corridor have suffered from delays and service disruptions which were mainly due to a shortage of locomotive drivers on the German section of the route. Therefore, during the implementation period particular attention needs to be paid to the availability of resources with the intermodal and train operators chosen for the service.

3.3 Intermodal Wagons

Since the expected intermodal traffic on the corridor is predominantly using trailers due to the roll-on/roll-off operations on the Baltic sea ferries, the intermodal wagons chosen for the proposed connection Rostock – Wels need optimisation for this type of intermodal units.

The most recent wagon types are standardised T2000 and T3000 models, specifically designed to accommodate trailer traffic. The T3000 wagon type, used for the cost modelling on the corridor, has the following main parameters:

Length over buffers (mm):	34.000
Tare weight (t):	34,8 t
Payload (t):	80,0 t

Each six-axle articulated wagon can carry two intermodal trailers.

With a maximum train length of 580 m on the corridor, a trainset can be formed out of 17 T3000 wagons with a capacity of 34 intermodal trailers.

3.4 Cost Estimation

Based on the assumptions discussed above, a simplified estimation of the rail and operating cost for an intermodal product on the Rostock – Wels route was elaborated.

The estimation is based on the following main data:

Rail distance Rostock – Nürnberg – Wels (km):	961
Average train speed on network (km/h):	55
Minimum trainset cycle time (days):	2
Wagon Type:	T3000

Wagons per trainset (#):	17
Average train utilization (fill rate, %):	80% - 90 %
Traction:	Electric AC 15kV, 16 2/3 Hz locomotive

The cost estimation for this report assumes the service between Rostock and Wels to run with dedicated resources (locomotives, wagons) for the product. In such a setup, due to the trainset cycle time of two days, train frequencies of 3 and 6 roundtrips per week lead to the most attractive unit cost.

However, in the implementation of the product, some rail and intermodal operators may find possibilities to combine the resources used for the Rostock – Wels corridor with other products related to the same geography, and therefore be able to achieve competitive costs also with other train frequencies.

Effectively, when compared to the current price level on the corridor and considering expectations raised by interview partners, an intermodal product on the corridor will need train fill rates well beyond 80% and tight control on cost in planning, implementation and operations to be economically viable.

Certain further optimisations of cost can be expected during the project's implementation. Since such optimisations – i.e. sharing some local cost, or filling trains with other traffic such as wagonload – depend on the specific situation and possibilities of the rail and intermodal operator involved, they cannot be sensibly taken into account in the general cost estimation for the purpose of this report.

**Cost Estimation of an intermodal train connection on the corridor (one-way €/trailer)
with an assumed train fill rate of 80 %.**

1 Frequency (roundtrips/week)	2	3	4	5
Total Cost (€/trailer)	560	509	560	528

**Cost Estimation of an intermodal train connection on the corridor (one-way €/trailer)
with an assumed train fill rate of 90 %.**

1 Frequency (roundtrips/week)	2	3	4	5
Total Cost (€/trailer)	512	467	512	486

4 Market Penetration

4.1 Market Requirements for the Intermodal Product on the Corridor

As shown in section 2.4.1, the intermodal market in the corridor is highly concentrated. In order to establish a new intermodal connection on the corridor it will be necessary to acquire at least one of the big forwarders operating on the corridor for the new train (“anchor client”), and then fill remaining capacity with other, smaller clients. Some of the existing big clients on the corridor seem to prefer to run their own trains (“company trains”), while others have shown interest in such an “open” train concept.

During interviews, forwarders and operators clearly described requirements and their fulfilment for an intermodal rail that intends to compete with road transport. Poor production quality has been a major reason for laying down the previously existing intermodal product on the corridor. Forwarders attribute very high importance to reliably meeting defined transport times.

In order to be marketable, a majority of the forwarders requires a frequency of at least three weekly train departures. One potential anchor client even stated the necessity of five weekly departures to meet quality requirements of his industrial shippers.

Time of departure and arrival of the intermodal train must mandatorily correspond to the ferry schedule of the port.

In terms of price expectations, the level on this corridor is very low with benchmarks from Eastern European trucking firms. The existing company train from Rostock to Brno and the previous Kombiverkehr / Schenker product from Rostock to Wels also give indications for the expected market price level.

As already explained in section 3.4, it will be necessary to identify rail and intermodal operators who are able to meet the market prices with their individual potential for cost and volume optimisation.

4.2 Opportunities and Risks from a Market Perspective

From a market perspective, there are clear opportunities for the development of an intermodal product on the corridor. During interviews, a market potential could be identified that would generally justify five departures per week. So far, no other intermodal product exists on the corridor that could take up the existing transport volume. And the intermodal terminal in Wels would allow to serve the whole area via antennas including neighbouring regions in Slovakia, Hungary and Slovenia.

However, the low overall price level and high price sensibility of the identified anchor customer is a major risk for a successful setup and operation of the intermodal product on the corridor. Additionally, the scarcity of resources at the rail operator side, especially concerning loco drivers, is a risk currently endangering the operational quality of the train. As previously mentioned, the risk of potential capacity bottlenecks in the intermodal terminal in Wels also requires further assessment.