



MARKET ANALYSIS FOR TRAIN CONCEPTS BETWEEN SCANDINAVIA AND TURKEY VIA THE PORT OF ROSTOCK

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1. Executive Summary

This study analyses the potential for new train products and connection between Scandinavia and Turkey via the Port of Rostock. Using the ferry link between Sweden particularly the high frequent services to Trelleborg Finland and the port of Rostock, RoRo units (in the meaning of trailer and other unaccompanied transport equipment) or conventional rail cars could be either directly carried on by train to an intermodal terminal in Turkey or and transported via a hub terminal location on the route e.g. Budapest on the so-called “land route”. As an alternative also the “intermodal route” via an Italian port e.g. Trieste has been investigated. Based on analysis of different sources and a large number of interviews with representatives of key market players along the corridor allowed the elaboration of the market potential, the design of a competitive intermodal product, the assessment opportunities and risks of such an intermodal product as well as a selection of potential partners for the market penetration and product implementation.

The main findings can be summarised as follows:

Transport and Market Analysis

- Turkish economy faces a historic downturn, weak currency and thus fluctuating demand and insecurity regarding funding and implementation of big infrastructure projects are considered as threats.
- Due to the imbalanced flows for relevant commodities, adequate utilization in both directions will be a challenge and triangular services or hubs as bundling points may be considered.
- Despite Corona it is a challenging period to establish a new service in the market; Covid-19 pandemic created window of opportunity as rail services are associated with operational stability
- Strong intermodal competition through “neighbouring” Baltic ports such as Swinoujscie, Gdansk/Gdynia and the Baltic States (“cheap trucking” and German Baltic ports Luebeck (own intermodal operator for potential risk share) and Kiel (direct connection to Gothenburg)
- Monopolistic structures determine the established intermodal network via Italian ports (“multimodal route”) especially medium-sized/smaller market players search for alternatives.
- “Land route” is only partly exploited by today main player is Rail Cargo Group with high affinity to South-Eastern European market; only Hupac as alternative operator provides regular services.
- The market requirement for transit time Turkey (Istanbul)-Rostock are 5-7 days at least 3 departures per week as well as open train concepts and neutral operator to potentially attract cargo from most relevant market players are required.

Train Concept

- Train routing to Turkey via Serbia is the cheapest option but corridor via Romania assessed as a more reliable and safer alternative; Halkali is considered as the best terminal option in Turkey.
- Due to uncertainties in volumes, market requirements and the anticipated cost for a direct train on the land corridor, a hub concept is recommended at the first stage and can further be developed to a direct service

Market Penetration

- Potential users and partners: some ferry lines and several forwarders show strong interest and could act as anchor user that takes (utilization) risk; several Turkish forwarders and global players addressed their interest. An operator with an established network on the relevant corridor is considered as the first choice.

2. Transport and Market Analysis

2.1. Methodology of Market Analysis

Rostock is a multi-purpose port with a strong focus on ferry and ro-ro traffic. Apart from the ferry connections, the attractiveness of the port relies strongly on efficient railway connections to the continental source and to target regions of intermodal traffic flows.



Figure 1: Impression Port of Rostock

In the following market analysis, an overview of the current and future market for intermodal and conventional transports between Turkey and Scandinavia will be provided. As an outcome, this analysis will be the base for train concepts between Turkey and the port of Rostock. Both desk research as well as interviews with key market players and experts form the basis of the market analysis. An evaluation of the information provided by relevant stakeholders, statistic authorities, the EU, and similar sources allowed the identification of a relevant potential for conventional rail and intermodal transports on the corridor. More than 20 interviews with representatives of the below listed companies enabled the assessment of market interest in an intermodal product, volume potential and market requirements, e.g. quality, transit time, frequency and pricing.

The interview process followed a standardised procedure presented in the figure below.

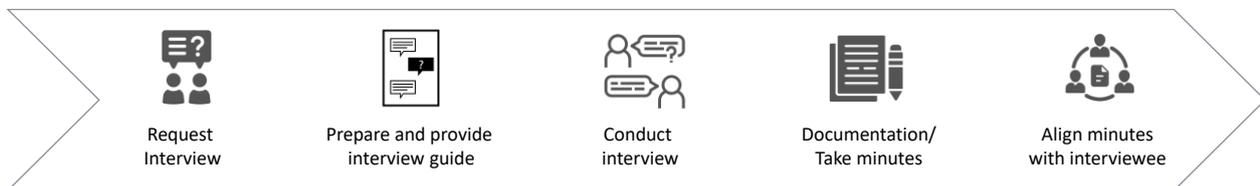


Figure 2 Interview Process

In a first step, more than 80 different companies could be identified as relevant stakeholders, which were then prioritized according to their contribution to a new train service. In total 18 companies were interviewed. Some companies were interviewed multiple times as different persons in charge had to be involved. Those companies included freight forwarders, intermodal and rail operators, ferry lines, intermodal operators. As the Turkish market is dominated by local freight forwarders, the interviews covered those to the same extent as well-known global players were involved. Direct contact to relevant cargo owners/shippers was avoided at this point of the analysis.



Figure 3 Interviewed market players

The interview followed a standardized questionnaire which was sent to the potential interviewee prior to the interview date and used as a guideline in the interview process. The questions covered various aspects such as status quo (company specific), total transport potential, rail transport potential, commodity mix, transport volume, major cargo hubs: origin-destination, transport routing, modal split, role in the transport chain, obstacles, minimum requirements, implementation period/starting date, knowledge on existing/planned funding schemes etc. Shortly after the interview, a summary was prepared and sent to the interviewee for confirmation.



Questionnaire: Market Analysis for Train Concepts between Scandinavia and Turkey via the Port of Rostock

The market analysis aims to identify cargo potential between Turkey or neighbouring countries and Scandinavia to establish a rail service via the Port of Rostock. The following questionnaire is used to address potential key players in the relevant transport corridor. It is meant as a guideline. Therefore, it is not necessary to answer all questions. Please skip the ones, that are not relevant for your company.

Status quo

1. Which commodities do you currently transport/ship between Turkey or neighbouring countries and Germany/Scandinavia?
2. What volumes do you transport/ship on a yearly/monthly/weekly/daily basis?
3. Where are the major cargo hubs?
4. Which transport route do you use? What is the route split? Do you prefer one routing over another – why?
5. Which mode of transport do you use? What is your modal split?
6. What is your approach regarding value creation? Do you operate on your own? Do you use (local) service providers?

Total Transport Potential

7. How do you consider the total transport potential in terms of commodity types, transport volume, transport routes/origin-destination, Full truck load (FTL)?
8. Which transport specific obstacles do you see in terms of infrastructure (e.g. potential restrictions (rail/road/maritime, border crossings), equipment supply (e.g. shortage of specific equipment), legislation, administration, guidelines (customs, transport law), terminal or port capacity, ferry capacity, other?

Rail Transport Potential

9. How do you consider the potential for rail transport in terms of commodity types, transport volume, transport routes/origin-destination, full truck load (FTL), different operating systems (e.g. intermodal, conventional, mixed trains)?
10. Which rail transport specific obstacles do you see in terms of infrastructure (potential restrictions, border crossings), equipment supply (e.g. shortage of specific equipment), legislation, administration, guidelines (customs, transport law), rail terminal capacity, other?
11. What are your minimum requirements, needs and benchmarks in terms of transport time, frequency, specific demands regarding reliability or punctuality, cost/commercial parameters, load units (e.g. container, swap bodies, trailers, conventional railway waggons), rolling stock (e.g. dedicated waggons), other transport aspects?
12. Do you see transport volume that is currently transported/shipped on other routes and could be shifted to a new rail service via the Port of Rostock?
13. Where do you see your part in terms of value creation? Would you consider establishing and operating a rail service via the Port of Rostock on your own?
14. What do you consider as a realistic implementation period? What could be the earliest starting date?
15. Do you know of any relevant national or EU funding schemes that can be applied to rail service product to/from Turkey?

Figure 4: Sample questionnaire used for interviews during market analysis

Main findings from the market analysis were used as a source for the development of the train concept.

2.2. Current Transport Offers on the Corridor

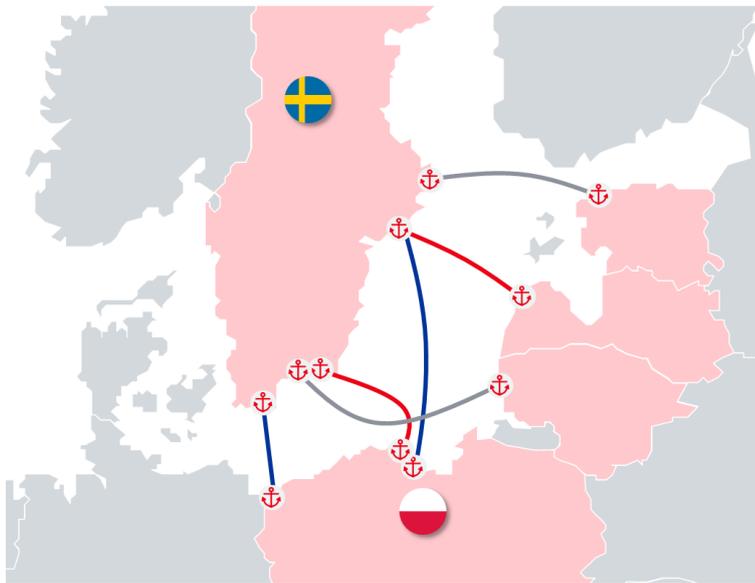
2.2.1. Baltic Ferry Connections to Scandinavia / Finland

Several Baltic Sea ports along the Baltic Sea offer ferry connections to Scandinavia and Finland. Rostock is the only port offering connections to Denmark, Sweden and Finland having the advantage in terms of the distance to several Scandinavian destinations. Furthermore, the railway ferry connection between Rostock and Trelleborg operated by Stena Line is unique as the transport of rail cars e.g. on the Świnoujście-Ystad route has been stopped. The existing ferry and RoRo connections to/from Rostock are shown below.



Figure 5: Current ferry connections from/to Rostock as of autumn 2020

Besides the German Baltic Sea ports Luebeck and Kiel, the Polish ports of Świnoujście, Gdańsk, Gdynia as well as Klaipėda (Lithuania), Ventspils (Latvia) and Paldiski (Estonia) offer regular ferry connections to Swedish ports and can be considered as major competitors.



Polferries <small>POLISH BALTIC SHIPPING Co.</small>	
Świnoujście – Ystad	Gdańsk – Nynäshamn
↕ 2 per day	↕ 1 per day
🕒 6 – 8 hrs	🕒 18 hrs

StenaLine	
Gdynia – Karlskrona	Ventspils – Nynäshamn
↕ 2-3 per day	↕ 1-2 per day
🕒 10,5 hrs	🕒 8,5 – 11 hrs

DFDS	
Klaipeda – Karlshamn	Paldiski – Kapellskär
↕ 1 per day	↕ 1 per day
🕒 13 – 15 hrs	🕒 9 – 10,5 hrs

Figure 6: Ferry connection from Eastern Baltic Sea ports

2.2.2. Rostock’s intermodal Hinterland Network

During the last years, the port of Rostock achieved a strong growth in the handling figures of Roro units and trailers. A major reason for the previous but also the future growth in this field of business is the extension of the port’s intermodal transport network, which has been extended, too. ROSTOCK PORT GmbH operates the port infrastructure as well as the intermodal transshipment terminals. ROSTOCK PORT has expanded the capacity of the intermodal terminal at Rostock aiming at the provision of necessary handling capacity for new block trains. Currently, approximately 90,000 units are handled annually what allow for about 40,000 additional freight units per year to reach the terminal’s full capacity.

The intermodal network comprises a few regular intermodal and conventional train services operated by different players.



Destination	Operateur	frequency/ week	transit time
Wuppertal (DE)	LKW WALTER	3	12 hrs
Halle (DE)	DEUCON	1	14 hrs
Verona (IT)	LKW WALTER DB Schenker TX Logistik	6 6 4	23 hrs
Cervignano (IT)	LKW WALTER	2	22 hrs
Treviso* (IT)	Green Cargo	2	21 hrs
Brno (CZ)	LKW WALTER	3	20 hrs
Lovosice (CZ)	LKW WALTER	5	11 hrs
Curtici (RO)	LKW WALTER	1	30 hrs
Vienna* (AT)	Green Cargo / RCA	2	21 hrs

Port of Bari

Port of Venice

Figure 7: Ferry and intermodal connections from/to Rostock

In 2020 the network has been enlarged especially with extensions to the Italian port of Bari and Venice as well as to Bettembourg. Figure 7 highlights the services with significance for the scope of the study.

2.3. Cargo Flows on the Corridor

The key objective of the transport analysis is the identification of basic market potentials. The initial step of the first working package is the analysis of trade flows and commodities between Scandinavia (defined in this study as Norway, Sweden and Denmark) and Turkey (including a wider catchment area in terms of the neighbouring countries like Romania or Bulgaria).

The survey covers the following features and aspects:

- Volumes measured in tons
- Import and export flows
- Commodity groups (HS 2 level)
- Transport modes (rail, road, sea, air)
- Time horizon of the past five years (2015-2019, respectively latest available data)

The required data will be mainly generated from the trade portal (international trade metadata) of EUROSTAT and TurkStat. Further information from existing market studies and reports (e.g. published by Scandia) will be considered in addition. Volume and commodities with a high affinity to rail transport that is currently moved by other modalities will be identified as potential.

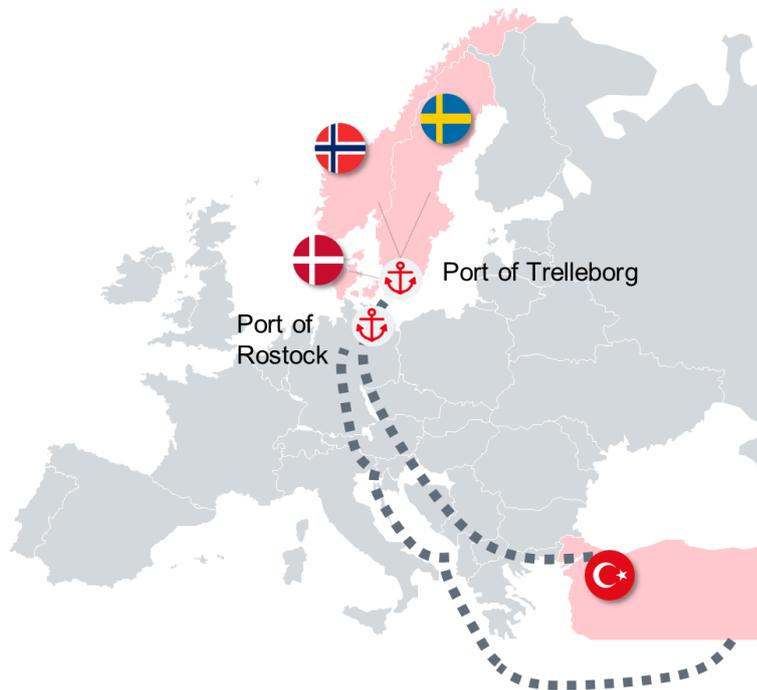


Figure 8: Catchment area of the transport analysis covering the Scandinavian countries Sweden, Denmark and Norway as well as Turkey

2.3.1. Characterisation of Goods Flows on the Corridor

The analysis of the latest available EUROSTAT data reveals, that the trade volumes from Turkey to Scandinavia were significantly lower - compared to the trade flow in the opposite direction. The exports to Turkey are dominated by bulk commodities especially iron ore, iron and steel but also pulp and paper. The majority of bulk goods especially iron ore are transported by vessels. Those commodity flows can hardly be shifted to rail. Also, large volumes of Turkish exports namely chromium ore, pebbles and gravel are transported on sea but important flows e.g. machinery are transported on land. Thus, however, the exports to Turkey exceed the imports, the land transport flows show an imbalance with large volumes northbound.

2.3.2. Imports to Nordic Countries from Turkey

In 2019, the Turkish export to the Scandinavian countries represented a volume of 1.1 million tons. The development of the Turkish trade flow to Scandinavia was less dynamic than vice versa. Throughout the past five years, the annual export volumes averagely growth by 0.8 %. In 2016, a drop in the export volumes across several commodities was stated. Amongst the Scandinavian countries, Sweden is the most prominent destination for Turkish exports - representing a share of 71 %. A portion of 19 % and 10 % was dedicated to Denmark and Norway respectively.

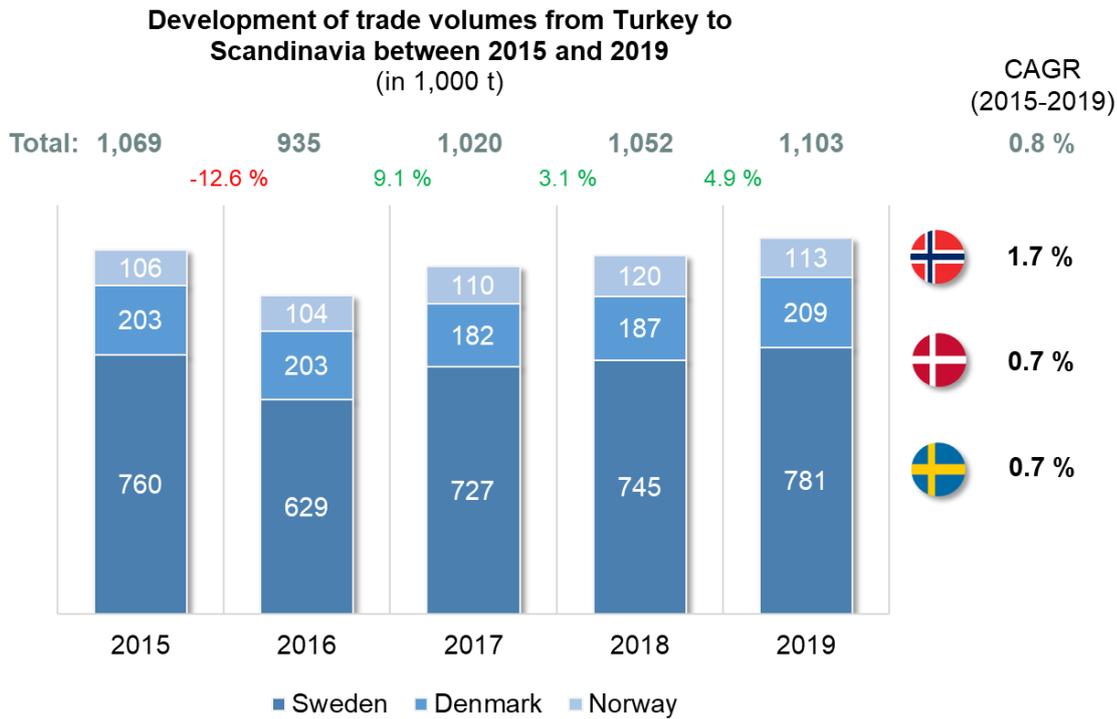


Figure 9: Development of Imports from Turkey to Scandinavia

Sea transport plays a crucial role in trade flows from Turkey, but transport on roads are of relevance as well. In 2019, approximately 82 % of the trade flow from Turkey to the Scandinavian countries were handled on seaways. A share of 17 % was transported on roads. The seaway transport registered the highest portion in Sweden, while road transport was able to attract considerable shares in Denmark and Norway. Less than 1 % of the total trade flows was related to the transport on rails. Following the EUROSTAT data, almost six thousand tons were transported from Sweden (= 1%), about two thousand tons were handled from Norway (= 2 %) and less than 100 tons were transported from Denmark to Turkey (= 0 %).



Modal split in the trade flow from Turkey to Scandinavia in 2019 in %

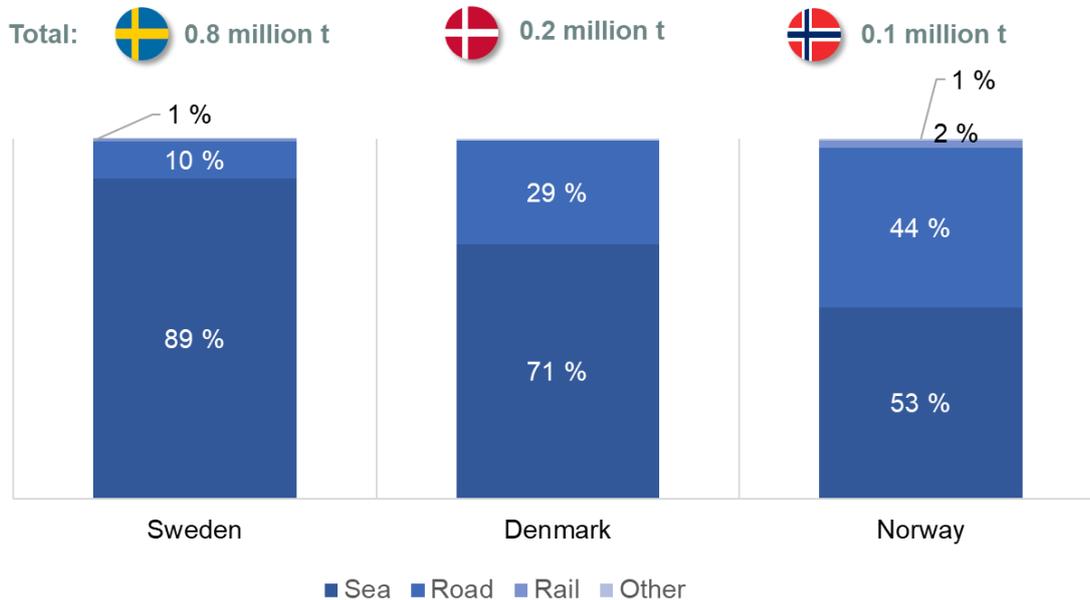


Figure 10: Modal Split for transports from Turkey to Scandinavia

In 2019, chromium ore, as well as pebbles and gravels, dominated the Turkish export to Sweden respectively to Scandinavia. These commodities are largely transported on seaways. Further relevant Turkish commodity groups trading to Scandinavia were machinery and mechanical appliances (basically household appliances [white goods]) as well as vehicles and parts thereof. Especially those commodity groups are suited for rail or truck transport. Thus, the northbound volume exceeds the southbound volume, which leads to imbalanced flows and significantly lower prices for land transports from Scandinavia to Turkey.

Trade volumes and commodity structure from Sweden, Norway and Denmark to Turkey in 2019:

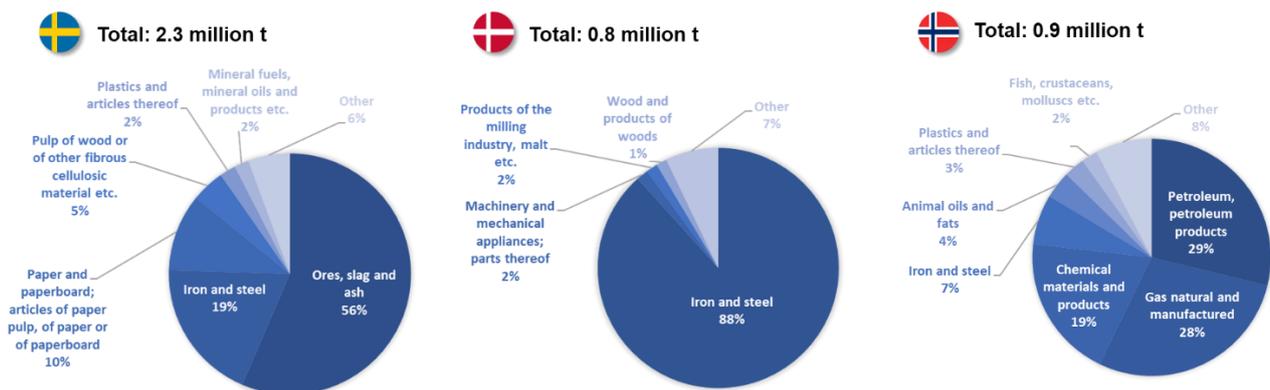


Figure 11: Trade volumes and structure from Turkey to Scandinavia

2.3.3. Exports from Nordic Countries to Turkey

In 2019, the trade of goods from Scandinavia to Turkey reached a volume of roughly 4.1 million tons in. Between 2015 and 2019, the trade flow from Scandinavia to Turkey was characterized by a peak in 2017 - reflecting a growth in all three Scandinavian countries. In 2017, the export of mineral fuels from Sweden and Denmark to Turkey increased essentially while the Norwegian export of gas grew substantially. During the past five years, the Scandinavian trade flow to Turkey grew averagely by 3.9 % per year. Even though



Sweden held the largest Turkey related export portion (57 %) compared to Denmark (23 %) and Norway (20 %), Denmark and Norway revealed the more vital development than Sweden in this five-year period.

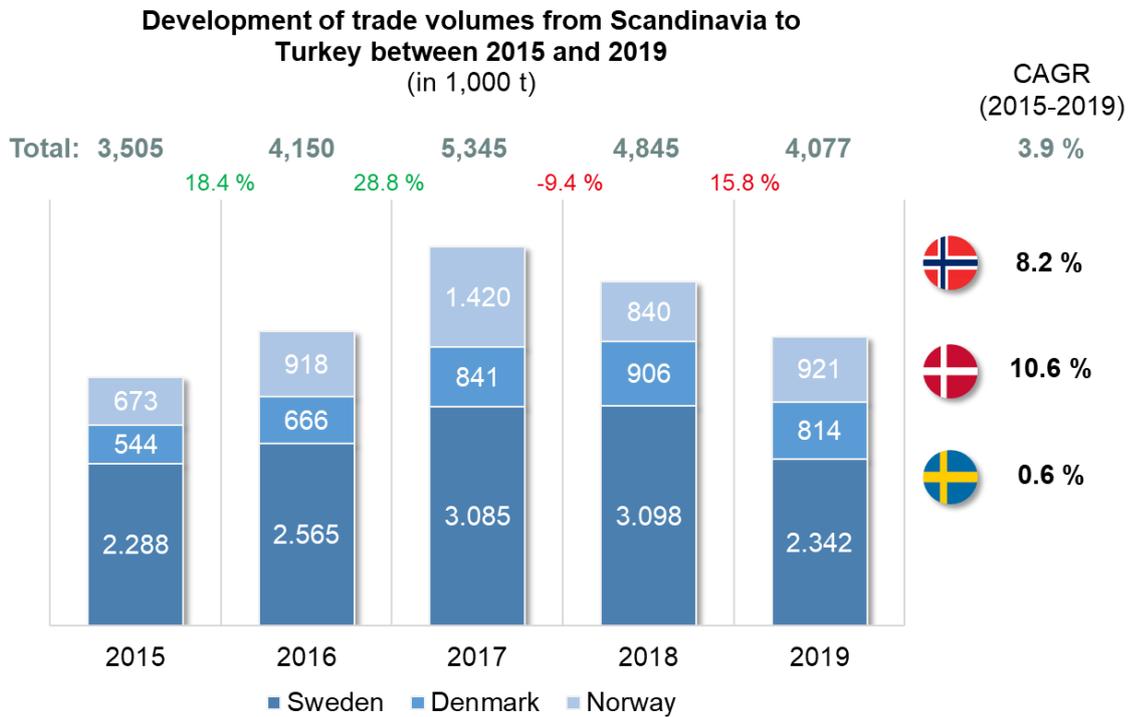


Figure 12: Development of Exports from Scandinavia to Turkey between 2015 and 2019

The transport on seaways dominated the trade flows from Scandinavia to Turkey with a total share of 97 % in 2019. The road transport held a portion of 3 %. The railway transport was not of significance in the trade between Scandinavia and Turkey for the time being. Denmark and Norway handled nothing on railways while Sweden only transported less than 100 tons in 2019.



Modal split in the trade flow from Scandinavia to Turkey in 2019

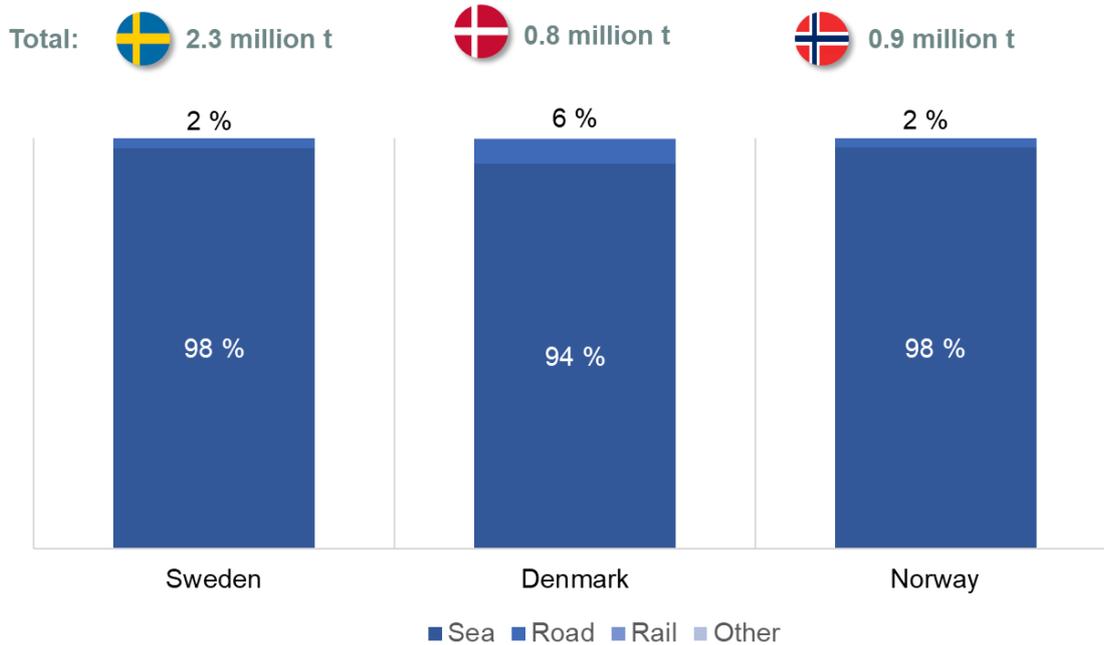


Figure 13: Modal Split for transports from Scandinavia to Turkey

Bulk products dominate trade flows from Scandinavia to Turkey. The determining import commodities for Turkey from the Scandinavian countries were iron ore (Sweden), petroleum, its products and gas (Norway) as well as iron and steel - basically referring to ferrous waste and scrap from Sweden and Denmark and ferroalloys from Norway. These commodities were predominantly transported on seaways resulting from the bulk transports advantage of large sea vessels.

Further relevant commodity groups were paper, paperboards, pulp and articles thereof (Sweden) as well as chemical materials and products, namely fertilizer, from Norway. In addition, certain kinds of polymers (a group of plastics and articles thereof) did play a mentionable role. Nonetheless compared to Turkish exports, the imports from Scandinavia, which form a potential for rail services are comparatively small. Even though the population in Turkey grew and is expected to grow up to 89.2 million in 2030, the development of Turkish imports was slowed down by the weak currency. The Turkish Lira has seen a massive drop over the last years. This affects all parts of the Turkish economy as well as foreign trade activities.



Trade volumes and commodity structure from Turkey to Sweden, Norway and Denmark in 2019:

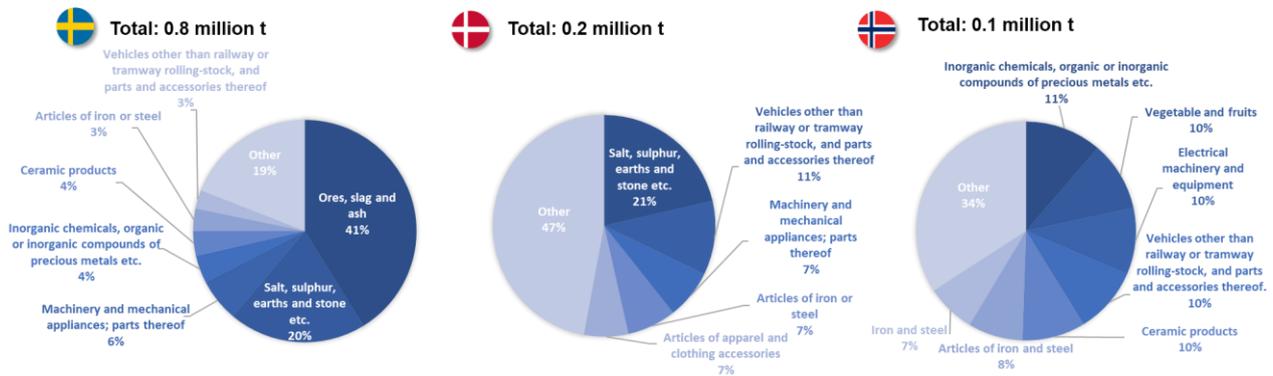


Figure 14: Trade volumes and structure from Sweden, Norway and Denmark to Turkey

2.3.4. Economic Outlook for Scandinavia and Turkey

Generally, economic forecasts fluctuate due to the ongoing Corona pandemic. All four surveyed economies are and will be suffering by the Corona pandemic resulting in negative growth rates in 2020. In 2021, the IMF expects a comparable strong recovery again. Due to high uncertainties related to the pandemic and its economic and social consequences, a reasonable forecast is limited for the time being. Many recent mid- and long-term forecasts, published by international economic institutions, were offset at present. Thus, the dotted lines which illustrated the development of the GDP growth after 2021 refer to the average growth rates in the previous time period between 2014 and 2018.

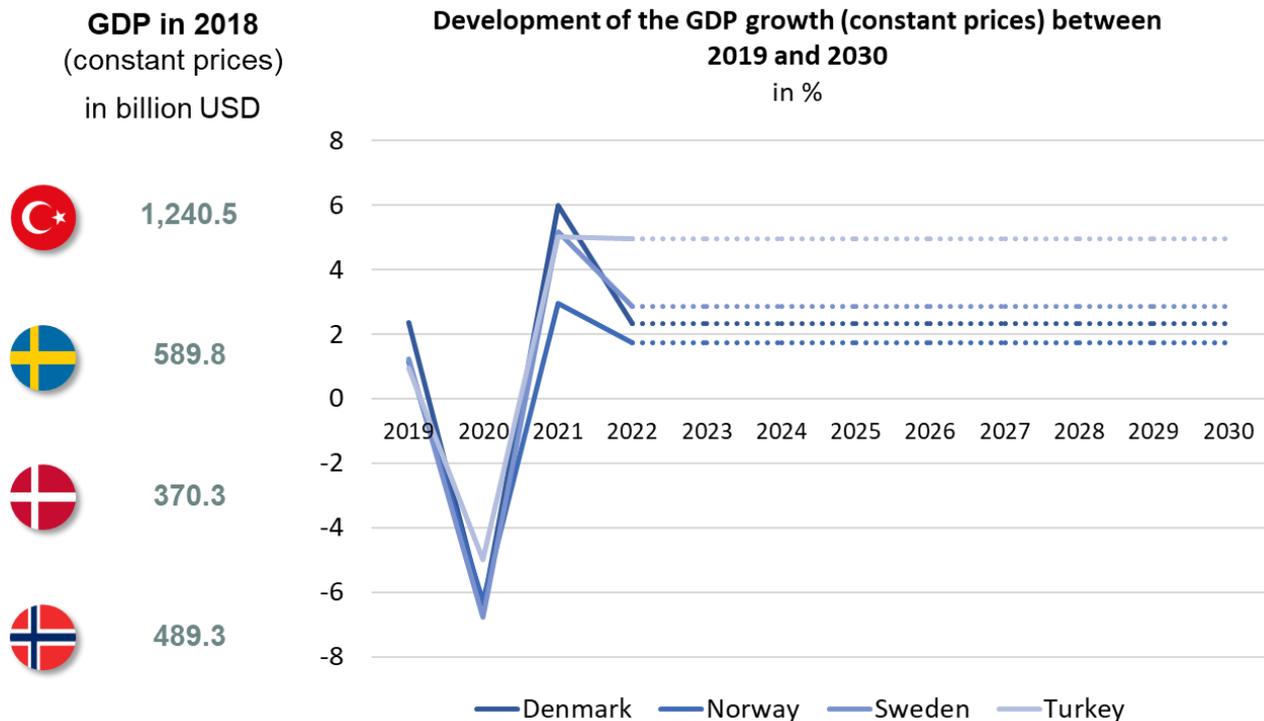


Figure 15: Development of the GDP growth (constant prices) between 2019 and 2030 in %

As the most populated country in the observed area, Turkey presents a large market for consumer goods. Amongst the study relevant countries, Turkey registered the largest population in 2019 while the

Scandinavian countries hosted a comparatively small population. All four national populations are expected to grow robustly between 2019 and 2030.

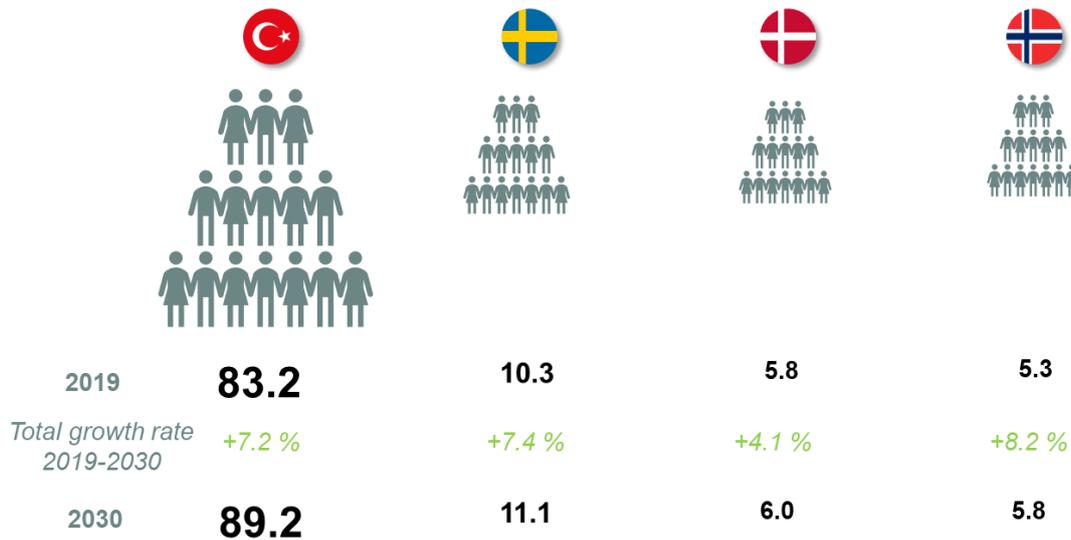


Figure 16: Development of total population in Turkey, Sweden, Norway and Denmark between 2019 and 2030

Despite the Corona pandemic, the Turkish economy is highly volatile and faces a historic downturn. The devaluation of the Turkish Lira reflects volatile Turkish market. The Turkish Lira has seen a massive drop over the last years. This affects all parts of the Turkish economy as well as foreign trade activities. According to Fitch Ratings, there are “sizeable downside risks” to its expectation that Turkey’s balance of payments will stabilise in the second half of the year 2020. “External pressures remain Turkey’s main credit weakness,” it said. This is extremely critical for big infrastructure projects as most construction companies have taken out foreign currency loans to finance PPP projects. Due to the devaluation of their own currency, they have to spend ever higher amounts of Lira to service the loans. The LIRA devaluation also forced Turkish logistics providers like EKOL to sell parts of their fleet in the last years.



Figure 17: Development of exchange rate Turkish Lira/Euro (2011-2019)



2.4. Potential for an Intermodal Product on the Corridor

2.4.1. Intermodal connections from/to Turkey

With respect to the existing intermodal connections, the market analysis revealed that large volumes especially crane able trailers are transported multimodal route via the Italian port of Trieste. Trieste is well connected to large intermodal hub terminals such as Ludwigshafen, Cologne Eifeltor but also Bettembourg. Important market players such as Ekol and Mars set up own company trains. They also have slot agreements with ferry lines in the Mediterranean Sea and can be considered as preferred customers on their routes.

The services on the land route have been increased during the last years, however, not all services are operated regularly. Rail Cargo Operator can be considered as the key player with regular services to Hungary (Budapest Bilk) and Curtici (Railport Arad). The only direct connections to Germany are company trains for BSH Group and an intermodal service to Duisburg launched by Mars Logistics

Transport Network – Market Players and their network on relevant intermodal corridors



Figure 18: Intermodal corridors from/to Turkey

2.4.2. Structure of the Intermodal Transport Market

The market analysis and interviews with key market players confirmed that the intermodal market is dominated by a few large Turkish forwarders. The large majority of intermodal load units especially intermodal trailers are transported by Ro/Ro ferry services to Italy mostly to Trieste. During the last years, some forwarders secured the majority of slots on ferries and established own company trains from/to Trieste.

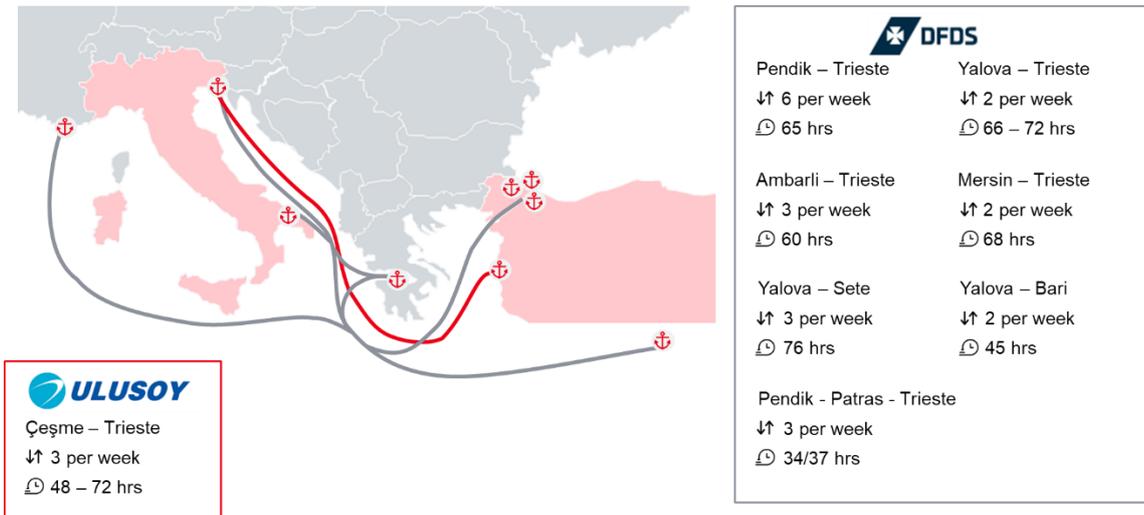


Figure 19: Main ferry connections to/from Turkey

On the land route regular direct services connect the Turkish terminals with intermodal terminals and hubs in Bulgaria, Romania and Hungary but also Austria and Germany. The services are offered mostly by rail operators. The market leader measured in trains/week is Rail Cargo Operator, followed by Hupac.

Fahrplan							Fahrplan						
Gültig bis 30.09.2020							Gültig bis 30.09.2020						
Istanbul Halkali-Sopron							Istanbul Halkali-Budapest Blik						
Verkehrstag	Laufzeit	Buchungsschluss	Annahmeschluss Istanbul Halkali	Bereitstellung Sopron	Profil/max. Eckhöhe der Ladeeinheit		Verkehrstag	Laufzeit	Buchungsschluss	Annahmeschluss Istanbul Halkali	Bereitstellung Budapest Blik	Profil/max. Eckhöhe der Ladeeinheit	
Montag	5 Tage	Mo 15:00	Mo 17:00	Samstag	PIC 70/400		Montag	4 Tage	Mo 15:00	Mo 17:00	Freitag	PIC 70/400	
Dienstag	5 Tage	Di 15:00	Di 17:00	Sonntag			Dienstag	4 Tage	Di 15:00	Di 17:00	Sonntag		
Mittwoch	5 Tage	Mi 15:00	Mi 17:00	Montag			Mittwoch	4 Tage	Mi 15:00	Mi 17:00	Montag		
Donnerstag	5 Tage	Do 15:00	Do 17:00	Dienstag			Donnerstag	4 Tage	Do 15:00	Do 17:00	Dienstag		
Freitag	5 Tage	Fr 15:00	Fr 17:00	Mittwoch			Freitag	4 Tage	Fr 15:00	Fr 17:00	Mittwoch		
Samstag mittag*	5 Tage	Fr 15:00	Fr 17:00	Donnerstag			Samstag mittag*	4 Tage	Fr 15:00	Fr 17:00	Mittwoch		
Sonntag abend**	5 Tage	Fr 15:00	Fr 17:00	Donnerstag			Sonntag abend**	4 Tage	Fr 15:00	Fr 17:00	Donnerstag		
Sopron-Istanbul Halkali							Budapest Blik-Istanbul Halkali						
Verkehrstag	Laufzeit	Buchungsschluss	Annahmeschluss Sopron	Bereitstellung Istanbul Halkali	Profil/max. Eckhöhe der Ladeeinheit		Verkehrstag	Laufzeit	Buchungsschluss	Annahmeschluss Budapest Blik	Bereitstellung Istanbul Halkali	Profil/max. Eckhöhe der Ladeeinheit	
Montag	5 Tage	So 12:00	So 17:00	Samstag	PIC 70/400		Montag	4 Tage	So 12:00	So 17:00	Samstag	PIC 70/400	
Dienstag*	5 Tage	Di 12:00	Di 17:00	Sonntag			Dienstag*	4 Tage	Di 12:00	Di 17:00	Sonntag		
Mittwoch	5 Tage	Di 12:00	Di 17:00	Montag			Mittwoch	4 Tage	Di 12:00	Di 17:00	Montag		
Donnerstag	5 Tage	Mi 12:00	Mi 17:00	Dienstag			Donnerstag	4 Tage	Mi 12:00	Mi 17:00	Dienstag		
Freitag	5 Tage	Do 12:00	Do 17:00	Mittwoch			Freitag	4 Tage	Do 12:00	Do 17:00	Mittwoch		
Samstag	5 Tage	Fr 12:00	Fr 17:00	Donnerstag			Samstag	4 Tage	Fr 12:00	Fr 17:00	Donnerstag		
Sonntag	5 Tage	Fr 12:00	Fr 17:00	Freitag			Sonntag	4 Tage	Fr 12:00	Fr 17:00	Freitag		

Figure 20: Rail Cargo Operator train schedule to/from Istanbul/Halkali as of autumn 2020



i Halkali ↔ Wien Wiencont

Halkali → Wien Wiencont							
Tp	Train no.	Valid from	Valid until	Departure days	Closing time	Ready for pick-up	Profile
S	40774	17.02.2020	12.12.2020	MO	A 16:00	H 06:00	
S	40774	17.02.2020	12.12.2020	TH	A 16:00	F 06:00	C70 C400 P400
S	40774	17.02.2020	12.12.2020	FR	A 16:00	H 06:00	
Wien Wiencont → Halkali							
Tp	Train no.	Valid from	Valid until	Departure days	Closing time	Ready for pick-up	Profile
S	40779	17.02.2020	12.12.2020	MO	A 18:00	E 13:00	C70 C400 P400
S	40779	17.02.2020	12.12.2020	TH	A 18:00	F 10:00	C70 C400 P400
S	40779	17.02.2020	12.12.2020	FR	B 18:00	G 10:00	C70 C400 P400

Figure 21: Hupac train schedule to/from Istanbul/Halkali as of autumn 2020

In contrast to other operators, Hupac prefers a routing via Serbia.

2.4.3. Intermodal Development Potential and Corridor Assessment

In order to present a comprehensive picture, the main outcome of the stakeholder interviews is presented in the form of anonymized key statements in the following figures:

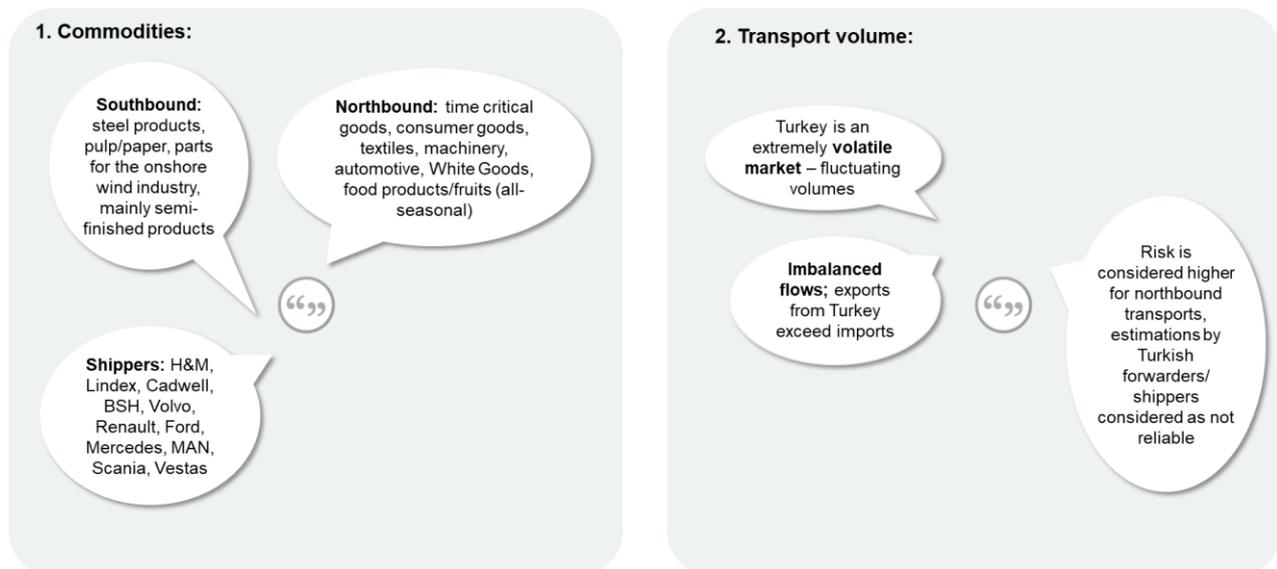


Figure 22: Key messages regarding commodity types and transport volume

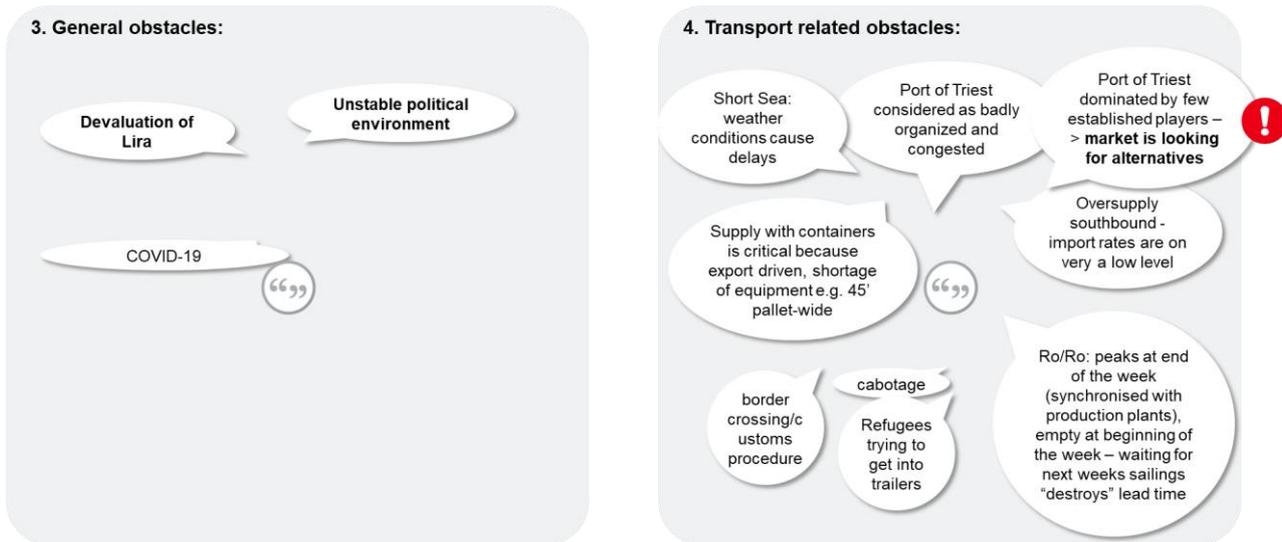


Figure 23: Key messages regarding general and transport related obstacles

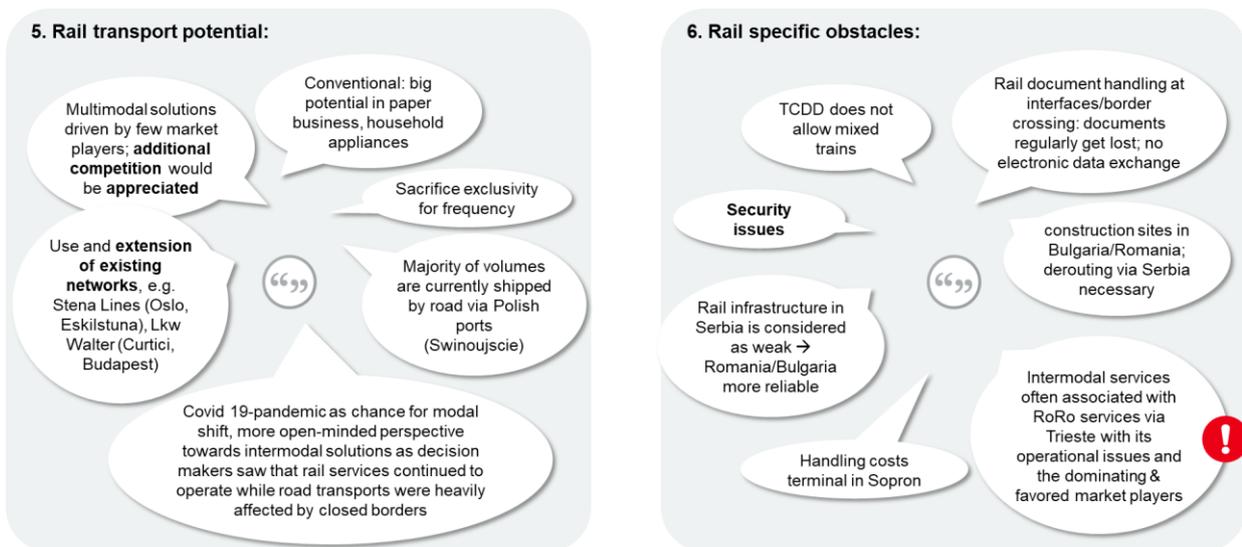


Figure 24: Key messages regarding rail transport potential and rail specific obstacles

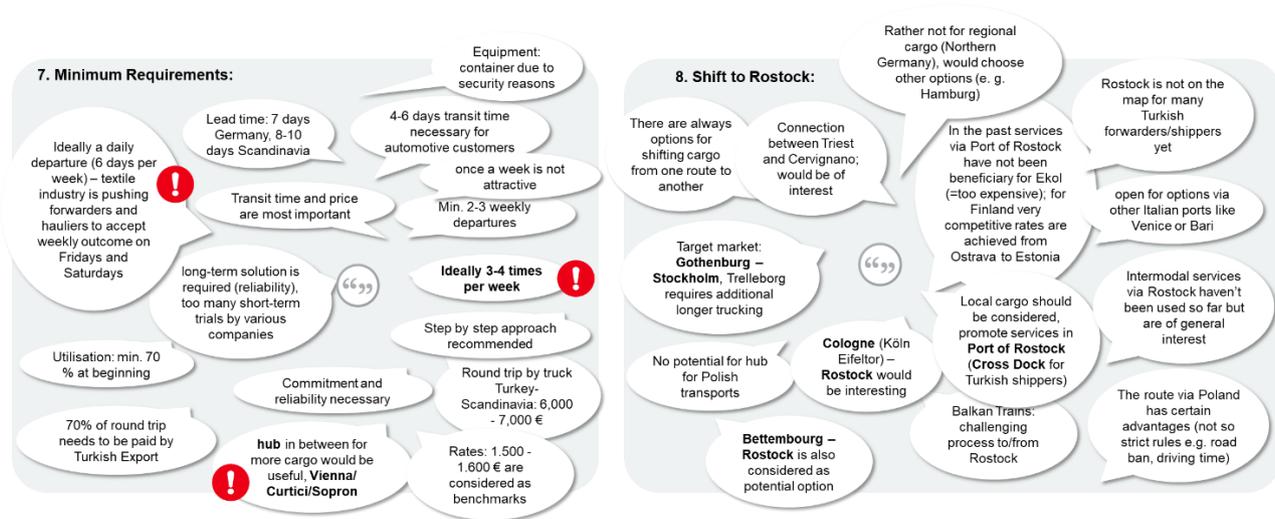


Figure 25: Key messages regarding minimum requirements and shift to Rostock

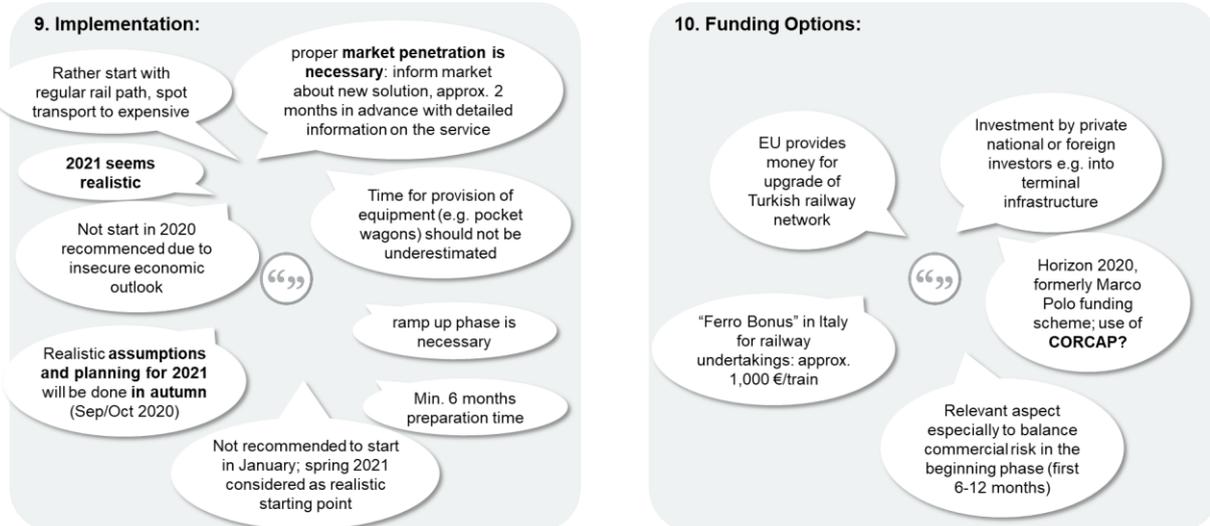


Figure 26: Key messages regarding implementation and funding options

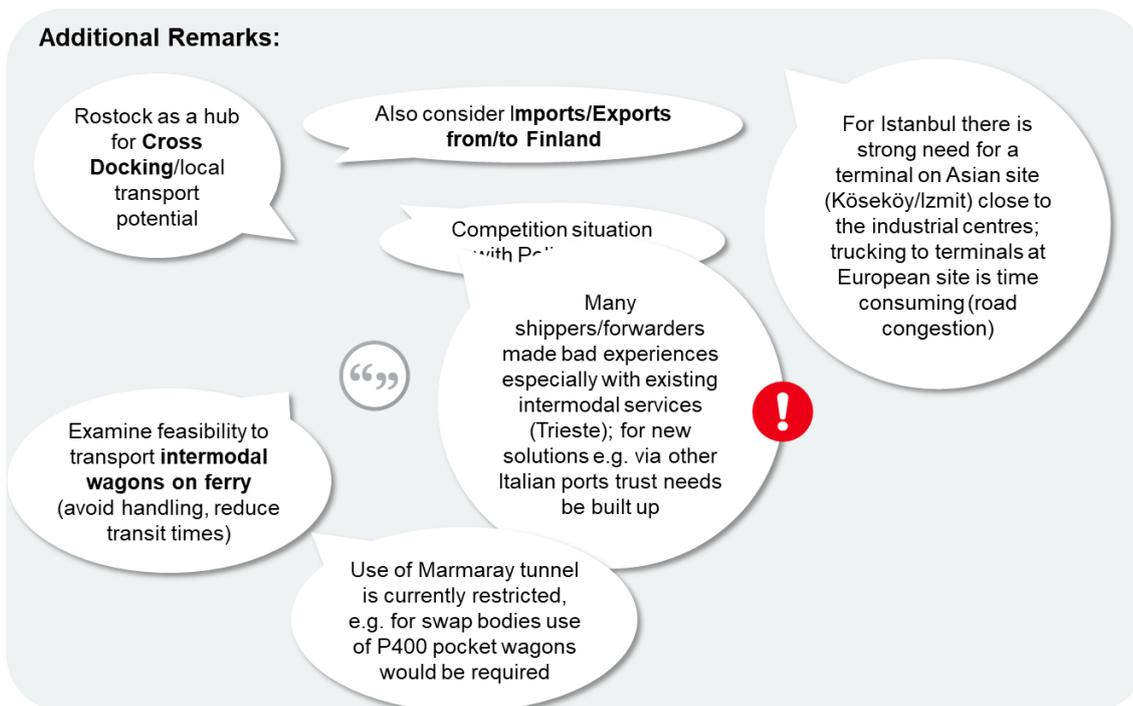


Figure 27: Key messages regarding additional remarks

Based on the market analysis especially the main findings gathered in the interviews a general assessment of the major intermodal corridors has been conducted.



+ Pro

- **Established and well-known connection**
- **High frequencies in train services** to various Central-European destinations (incl. Germany)
- **Short transit times** (rail) and various railway undertakings (competition)
- **Established connections from/to Rostock** (e.g. Verona, Cervignano) or via hub (Bettembourg)
- **Competitive transit time from Istanbul** (e. g. Pendik) to Northern Germany (e. g. Luebeck) in approx 6.5 days in theory

Contra **-**

- **Strongly dominated by few payers**, e.g. DFDS (80 % market share in RoRo services) and/or Ekol, Mars with established intermodal networks (partly company trains)
- **Large players** (e.g. Ekol and Mars) **are favoured**, smaller players faced with uncertainties and long transit times
- **Turkish port and especially Trieste congested** and not well organized, which leads to long waiting time in the ports and **unpredictable transit times** → in reality 6.5 days to Northern Germany are not realistic
- **Seasonal unpredictable** due to bad weather/storms in the Mediterranean
- Due to **activities by State of Hungary and Duisport for strategic engagement** in the Port of Trieste it will in future become **even more challenging** for third parties to participate and gain relevance on that transport corridor

Figure 28: Assessment of multimodal corridor via Trieste

+ Pro

- **Less interfaces and less parties involved**, no additional transport mode or intermodal transshipment (=reliable option)
- **Feasible option to connect existing South-eastern European rail hubs** (Budapest, Curtici, Sopron, Vienna) and **ongoing services** along the corridor to attract additional cargo and reduce utilisation risk
- Potential to constantly **achieve competitive transit time**

Contra **-**

- **Capable rail terminal infrastructure** limited to **European part of Turkey, potential bottlenecks** with increased rail service (e.g. Halkali)
- Development of terminal infrastructure depend on strategy of state-owned rail company TCDD, short-term private terminal investments unlikely
- **Infrastructural and operational bottlenecks** along the corridor (e.g. in Serbia)
- High costs bears financial risk for a single intermodal operator

Figure 29: Assessment of land corridor

In the interviews few market players especially medium-sized companies underlined their interest in using new intermodal services via the land route. That is why the consultant put special intention on the land corridor while setting up an intermodal train concept from/to Rostock.

3. Train Concept

3.1. Recommended Intermodal Terminals

Compared to countries in the European Union, the number of state-of-the-art intermodal terminals in Turkey is low, however the largest terminal operator the Turkish state-owned railways TCDD announced investments for the future. Existing conventional and intermodal train services from/to Europe predominately make use of terminals in the capital region (Istanbul).



Figure 30: Relevant Intermodal Terminals in Turkey



Figure 31: Relevant Rail Terminals in Turkey

Due to limitations for freight trains in the Marmaray tunnel, regular services from the Asian side have not been established, however, some trail and spot services could be recognized. Currently, the most important terminal with frequent international services is mainly located on the European side of Turkey in Halkali and Çerkezköy. The relevant terminals characteristics are presented in the fact sheets below.

Halkali is the most important international freight terminal in Turkey located on European side of Istanbul.



General Facts

- Total area: 12.2 ha
 - Bounded area
 - 55,000 sqm open storage area
 - 67,000 sqm covered storage area
- Number of railway tracks: 3 x 400m plus 4 storage tracks
- Equipment: 2 reach stacker
- Annual handling capacity: up to 55,000 units
- Opening times: 24 / 7
- regular container train services to Budapest (RCA), Curtici (RCA), Vienna (Hupac), Duisburg (Mars)*,
- Distance to Borders:
 - Kapıkule / Svilengrad (BG) : 278 km
- Shareholder:



*not active yet

Figure 32: Terminal characteristics Halkali

Çerkezköy serves as starting point for dedicated train services in the white goods segment.



General Facts

- Total area: 3.5 ha
 - 6000 sqm bounded open storage area next to terminal
- Number of railway tracks:
 - 2 for conventional handling: 40+370 m)
 - 3 sidings (each 176 m) with level access for container/semi-trailer handling
- Equipment: 1 reach stacker
- Annual handling capacity: up to 230.000 Units
- Opening times: 24 / 7
- Distance to Borders:
 - Kapıkule / Svilengrad (BG) : 190 km
- Shareholder:



- regular conventional company train services (BSH) to Giengen DE-CH-FR-DEN (DB Schenker), intermodal train service to Giengen (RCO)
- BSH plant and Barsan Warehouse have direct rail connection to Çerkezkoy Terminal.

Figure 33: Terminal characteristics Çerkezköy

On the other end of the corridor in Scandinavia, especially Sweden offers a dense terminal network; the relevant terminal locations will be further analysed.

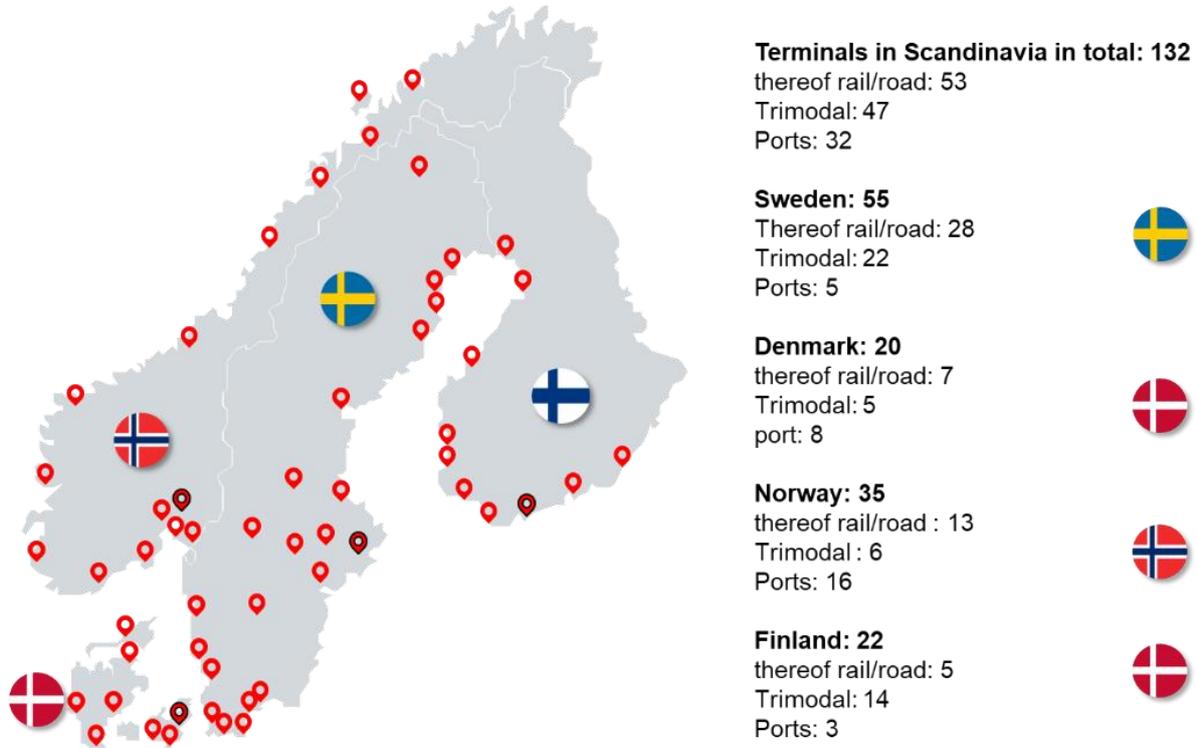


Figure 34: Intermodal terminal network in Scandinavia

Furthermore, it is recommended to include additional terminals on the corridor as a hub instead of starting directly with a direct connection. Especially for the ramp-up phase at the beginning of the implementation, the train utilization could potentially be increased. Terminals in Arad or Budapest could be feasible options. The Railport Arad is the largest Romanian terminal with high performance, well-connected infrastructure and an interesting location. The terminal is placed in the closest neighborhood of the biggest border crossing railway station between Hungary and Romania, on the Pan-European corridor TEN IV.



General Facts

- Total area: 10.3 ha
- Built-in area: 9 ha
- Number of railway tracks:
 - 5 under cranes
 - 2 for parking
 - 7 x 650 m
- Cranes: 3 RTGs and 2 reach stacker
- Annual lifting capacity: 200.000 TEU
- Storage capacity: 3.000 TEU
- Opening times: 24 hrs
- Shareholders:
 -  **trade trans**[®] (71%)
INTERNATIONALE TRANSPORT
 -  **Rail Cargo Group** (29%)
Member of OBB

Source: <https://www.railportarad.ro/en/pigallery>

Figure 35: Terminal characteristics Railport Arad

Budapest Bilk operated by Rail Cargo is one of the largest terminals in Hungary and also well connected especially in Rail Cargo Group’s network.



General Facts

- Total area: 22.3 ha
- Number of railway tracks:
 - 7 x 750 m
 - 1 x 280 m
 - 1 x 50 m
- Equipment:
 - Cranes: 2 RMGs and 9 reach stacker
 - 2 terminal tractors
 - 1 Semitrailer
 - 72 Connector (for refrigerated container)
 - 2 certified weighbridges
- Annual handling capacity: up to 230.000 TEU
- Opening times: 24 / 7
- Shareholder:  **Rail Cargo Group**
Member of OBB

Source: <https://www.railportarad.ro/en/pigallery>
https://www.railfreightcorridor6.eu/RFC6/PublicRFC6_7th-TAG-RAG_Rail_Cargo_Terminal-BLK_Co_Ltd-Presentation.pdf

Figure 36: Terminal characteristics Budapest Bilk

3.2. Train Routing and Frequency

The market analysis revealed the strong wish for a new service on the land route provided by a neutral operator. Most interview partners have indicated a service frequency of three departures per week as a minimum requirement. To be competitive towards truck transportation but also the multimodal corridor via Italy, a transit time from the terminal (Halkali) to the terminal (Rostock) between 5 and 7 days should not be exceeded. Existing regular services on the corridor achieve transit times of 2.5 days to Curtici/Arad and 4-5 days to Budapest/Sopron. To achieve the requested frequency, to bundle volumes and to lower



utilization risk for an operator, a hub concept via terminals with connections to Halkali such as Railport Arad or Budapest Bilk is considered as a possible option as indicated in the figure below.

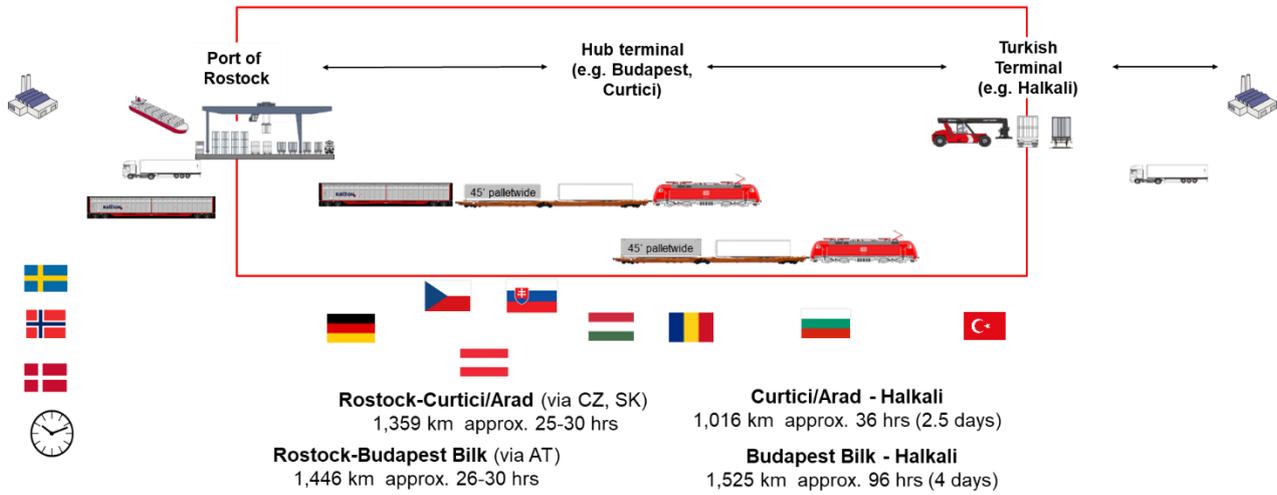


Figure 37: Transport chain with key infrastructure, equipment and estimated duration

The shortest route from Rostock to Halkali is approximately 2650 km long as presented in the figure below.

Routing via Bad Schandau (CZ, SK, HU, RO, BG)

Land	von Bahnhof/Grenzpunkt Nummer	Name	1)	nach Bahnhof/Grenzpunkt Nummer	Name	1)	Entfernung (km)
DE	213439	Rostock Hbf	4,8	0649	Bad Schandau Grenze	1,2	455
CZ	0649	Decin st.hr.	1	0890	Lanzhot st.hr.	1	416
SK	0890	Kuty st.hr.	1,2	0887	Starovo st.hr.	1,2	203
HU	0887	Szob hatar	1	0946	Lokoshaza hatar	1	272
RO	0946	Curtici Fr.	1,2	0971	Giurgiu Nord Fr.	1,2	634
BG	0971	Ruse fr.	1	140202	Svilengrad	1,3	386
							2366

Routing via Passau (AT, HU, RO, BG)

Land	von Bahnhof/Grenzpunkt Nummer	Name	1)	nach Bahnhof/Grenzpunkt Nummer	Name	1)	Entfernung (km)
DE	213439	Rostock Hbf	4,8	0460	Passau Hbf	1,2	838
AT	0460	Passau Hbf	1,2,i	0796	Sopron (Or)	1,k	372
HU	0796	Sopron hatar	1,k,r	0946	Lokoshaza hatar	1	440
RO	0946	Curtici Fr.	1,2	0971	Giurgiu Nord Fr.	1,2	634
BG	0971	Ruse fr.	1	140202	Svilengrad	1,3	386
							2670

Source: DIUM



Figure 38: Possible routing of the new service

On the land corridors, different routing options exist and are in use. Services to Hungary, Austria and Germany use the corridor via Bulgaria and Romania. Some players prefer the routing via Serbia, which has been reported as the cheapest option. One of the shortest and based on the expert interviews also reliable route runs via Slovakia and the Czech Republic and enters Germany in Decin/Bad Schandau.

3.3. Train Composition intermodal Wagons

The market analysis showed a demand for a new intermodal service. For the transport of conventional rail cars from/to Turkey services like the BSH company train are well established but especially Turkish forwarders search for options for (un-accompanied) trailer transport. In addition, also a demand for transport of other intermodal units especially 45' pallet-wide units could be deducted. Thus, a sample train could consist of both pocket and platform wagons, examples are shown in the figures below.

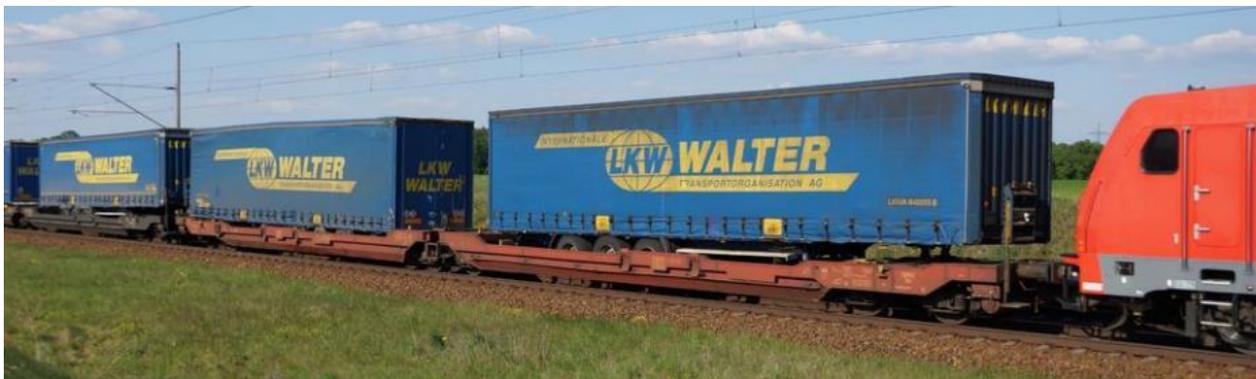


Figure 39: Sample pocket wagon Sdggmrss – T3000



Figure 40: Sample platform wagon Sggmrs(s) 90'

The key technical parameters for both wagon types are presented in the following table.



Table 1: Wagon characteristics

	Pocket wagon Sdggmrss - T3000	Platform wagon Sggmrs(s) 90'
Tare Weight	Approx. 35 t	Approx. 29 t
Maximum Load	100 t	106 t
Axle load	22.5 t	22.5 t
Total length over buffers	34.20 m	29.59 m
Loading length in feet	104 ft	90 ft

Source: VTG AG.

Depending on the route and railway undertaking, train sets on the corridors could be formed of 10 pocket wagons (Sdggmrss) and 6 to 7 90' platform wagons Sggmrs(s).

3.4. Cost Estimation

For sample (direct) trains a first cost calculation has been conducted based on a price indication by an operator.

Table 2: Indication of train costs for different routings

Routing	Train length in m (net)	Train composition	Capacity trailer	Capacity 45' cont.	Wagon Cost	Traction	Total cost/train (one way)	cost share trailer	cost share 45' unit	Total cost/trailer	Total cost / 45' unit
BG-RO-HU-AU	518,5	10 Sdggmrss +6 Sggmrs(s)	20	12	6,750 €	44,688 €	51,438 €	3.28%	2.86%	1,688 €	1,473 €
	548,2	10 Sdggmrss +7 Sggmrs(s)	20	14	7,100 €	45,588 €	52,688 €	3.10%	2.71%	1,635 €	1,427 €
BG-RO-HU-SK-CZ	518,5	10 Sdggmrss +6 Sggmrs(s)	20	12	6,750 €	44,270 €	51,020 €	3.28%	2.86%	1,674 €	1,461 €
	548,2	10 Sdggmrss +7 Sggmrs(s)	20	14	7,100 €	45,170 €	52,270 €	3.10%	2.71%	1,622 €	1,416 €
BG-RS-HU-AU	518,5	10 Sdggmrss +6 Sggmrs(s)	20	12	6,750 €	44,288 €	51,038 €	3.28%	2.86%	1,675 €	1,462 €
	548,2	10 Sdggmrss +7 Sggmrs(s)	20	14	7,100 €	45,038 €	52,138 €	3.10%	2.71%	1,618 €	1,412 €
BG-RS-HU-SK-CZ	518,5	10 Sdggmrss +6 Sggmrs(s)	20	12	6,750 €	43,720 €	50,470 €	3.28%	2.86%	1,656 €	1,445 €
	548,2	10 Sdggmrss +7 Sggmrs(s)	20	14	7,100 €	43,620 €	50,720 €	3.10%	2.71%	1,574 €	1,374 €

Source: own calculation based on inquiry

However, it can be expected that actual cost for a train will be significant lower, especially when regular services and high utilization of rolling stock can be achieved, it can be conducted that the cost for a round trip will be up to 100.000 € per train.



4. Market Penetration

4.1. Market Requirements for the Intermodal Product along the Corridor

The intermodal market on the corridor is dominated by a few players. Especially the RoRo service via Turkish and Italian ports is equal to a monopoly environment with almost no competition. On the land route, several players tried to establish services but left the market after a short trial period which left several customers sceptical. Strong Turkish hauliers which have a big market share rely on road transport which is a strong competition and sets the benchmark in terms of pricing, transit time and quality (reliability). However, many market players stated that there is a need for further intermodal services. Especially companies without cargo volume to fill 1-2 trains per week and run company trains prefer open solutions. Big international forwarders also prefer a neutral intermodal operator. Some of those companies have policies that do not allow to use a service by a big competitor. It is necessary to identify at least 1 or 2 anchor customers. Some market players asked for a risk share in terms of a financial contribution by the Port of Rostock. In order to be marketable, a majority of the forwarders requires a frequency of at least three weekly train departures. Some even stated the necessity of a daily departure to meet quality requirements of automotive or retail clients. Time of departure and arrival of the intermodal train must 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.

4.2. Opportunities and Risks from the Market Perspective

The overall positive response from different market players shows that there are reasonable opportunities for a new train service on the corridor. The market analysis, especially the market feedback showed that there is market potential that justifies at least 3 departures per week as a first step. Since 2 intermodal operators have established services on the corridor already it is seen as extremely challenging to implement a separate and competing service without either of those two players. Rather, it is suggested to partner with one of the companies, which would also determine the terminal that will be involved as a hub. The different routing options are not ideal but might improve due to infrastructure works within the next years. This may also lead to the possibility of running longer trains. The ongoing Corona pandemic created a window of opportunity as rail services kept at a stable level even during the lock-down phase in many countries while road transport came to a halt.

However, the potential overall cost for a new train service is considered as high. This underlines even more, the option to start with an existing operator and extend their service via a hub terminal further to Rostock. Alternative road service on the other hand is extremely competitive regarding pricing and transit time. Trucking companies can react to the imbalance in trade flows more flexible than rail operators.

4.3. Suggested steps for Marketing of the Intermodal Product

The new train service is to be promoted by means of a product sheet. A product sheet summarizes technical and operational aspects of the trains service in an appealing format, but moreover highlights the significant benefits for potential partners/users. The format of the product sheet will be digital (e. g. pdf. or jpg), ideally at a maximum length of one or two pages. It must contain a short description/text with simple sentences and/or bullet points, contact details and eye-catching visual elements like a map or icons plus a QR code, which provides e. g. a link to the further information regarding the train service.








INTERMODAL SERVICE BETWEEN SCANDINAVIA AND TURKEY VIA THE PORT OF ROSTOCK



Your advantages:

-  Frequent connection with **3 weekly departures**
-  Competitive transit time of **6-7 days**
-  Capacity for **all container sizes and trailers**
-  Hop on/off option in **Budapest**

Istanbul Hub/Hall	Budapest Bld	Port of Rostock/Trelleborg	Transit Time
Mon	Fri	Sun/Mon	A-G/H
Wed	Sun	Tue/Wed	
Fri	Tue	Thu/Fri	

Port of Trelleborg/Rostock	Budapest Bld	Istanbul Hub/Hall	Transit Time
Mon	Tue	Sun/Mon	A-G/H
Wed	Thu	Tue/Wed	
Fri	Sat	Thu/Fri	

From the possible connections, we select the schedule and route you need. You already have the right connection and need a price information? Please contact us.

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Timetables and further information on the Port of Rostock can be found at www.rostock-port.de and directly on your smartphone



Figure 41: Draft of a first product sheet

Generally, trade fairs (e.g. the biennial transport logistic in Munich), regular sector events (organized by BVL, DVWG, SPC etc.) or publications, especially in the target market Turkey (e.g. with Rail Turkey En, UTIKAD), provide an ideal platform to promote a new train service. Due to the Covid-19 pandemic, the majority of those events have been cancelled or were shifted to alternative digital formats like webinars, which can also be effective communication and product placement tools. It is suggested to contact the different stakeholders that have been involved in the market analysis and share the results with them to see whether they are interested or not. The aim is to gather as many Expressions of Interest or Letters of Intent as possible, that validate the need for a new train service. Partnering with a lead intermodal operator and 1 or 2 major anchor customers could be an effective approach.