Analysis of Potential Development for Strategic Freight Hubs

Interreg Baltic Sea Region Project #R032

Work Package	3.1 Assessing multimodal capacities and flows along the Scandria-Corridor				
Activity	3.1.3 Analysis of Potential Development for Strategic Freight Hubs				
Responsible Partner	Region Skåne				
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1	13.04.2017	Draft report	24.03.2017	Ok
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Output Description

In this activity an investigation regarding the potential development for the major intermodal hubs in the Scania region is carried out. The activity provides an overview of knowledge concerning multimodal transport in the Scandria Corridor focusing on the Scania region. A special focus is on future volumes in the major hubs.

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		Draft report	Final report			
Expected						

Quality Criteria
(for main outputs only)

- The main contents are information regarding development possibilities such as trade and traffic forecasts, capacity constraints and connections.
- The format of the main output is a report publishable online and in print

Additional Quality Criteria
(for all outputs)

- The aim of the output is to be a source for improved knowledge about future transport flows along the corridor.
- The output has a focus on potential development in core and comprehensive hubs within the Scania region. This is affected by the development in a broader geography especially including the Scandria corridor.
- The output addresses planners on different levels, politicians, freight- and logistic companies as well as consultants.
- The national forecasts includes a split in growth between the core- and comprehensive ports within the Scania region that can be questioned. The results presented in this report gives alternative growth numbers. These numbers can be used when planning the hinterland infrastructure. It is important to use as correct numbers as possible. Especially since there are some capacity constrains affecting the hubs.

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1 Summary

There are four main ports in Scania; Helsingborg, Malmö (CMP), Trelleborg and Ystad. Malmö and Trelleborg have status as TEN-T core ports, and Helsingborg and Ystad as comprehensive ports.

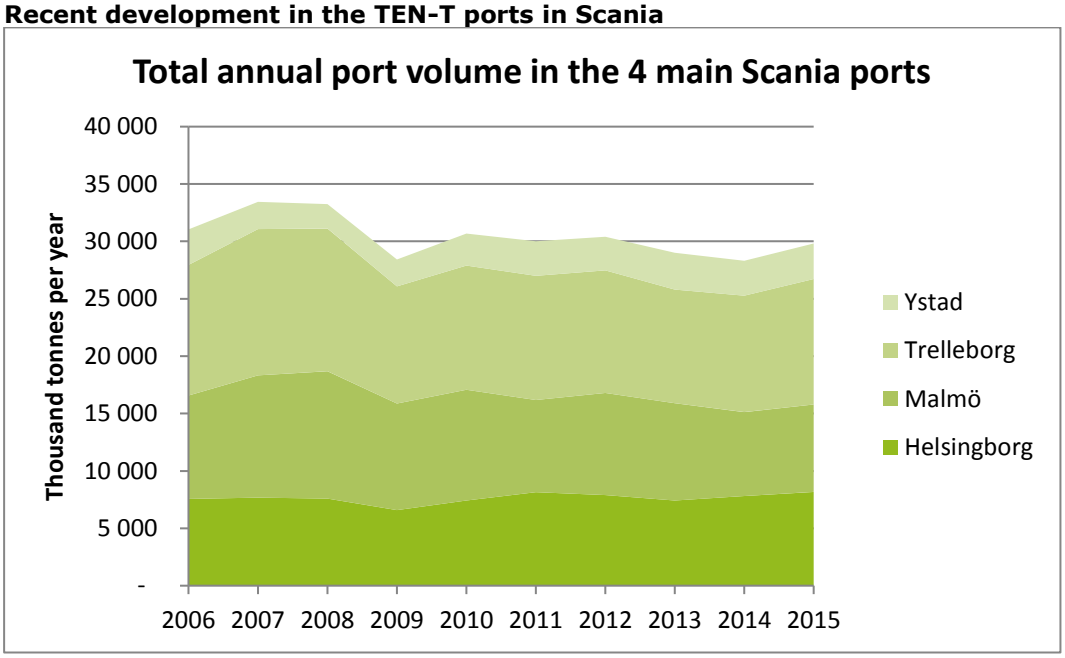
There are two main intermodal terminals for combined transports outside the ports; Malmö Kombiterminal and Helsingborg Kombiterminal. The exact volumes handled in these are not known, but Malmö is included in the core network and one of the biggest intermodal terminals in Sweden, with more than 80,000 units handled.

Apart from German ports, the port of Swinoujscie/Szczecin is important for Scania, especially as regards the ferry traffic between Swinoujscie and Ystad/Trelleborg. Poland is increasing as trade partner and has had a very positive economic development in recent years, with a GDP-development (PPS) of 38% between 2006 and 2015. At the same time mature economies within the Scandria corridor has grown steadily.

1.1 Port development in Scania

The Scania ports handle almost the same volume in 2015 as in 2006. The years from 2006 until the financial crisis showed a sturdy growth, but the crisis meant an abrupt decrease in the total volume. In the following period the volume has fluctuated around 28 000 to 30 000 thousand tonnes per year.

Recent development in the TEN-T ports in Scania

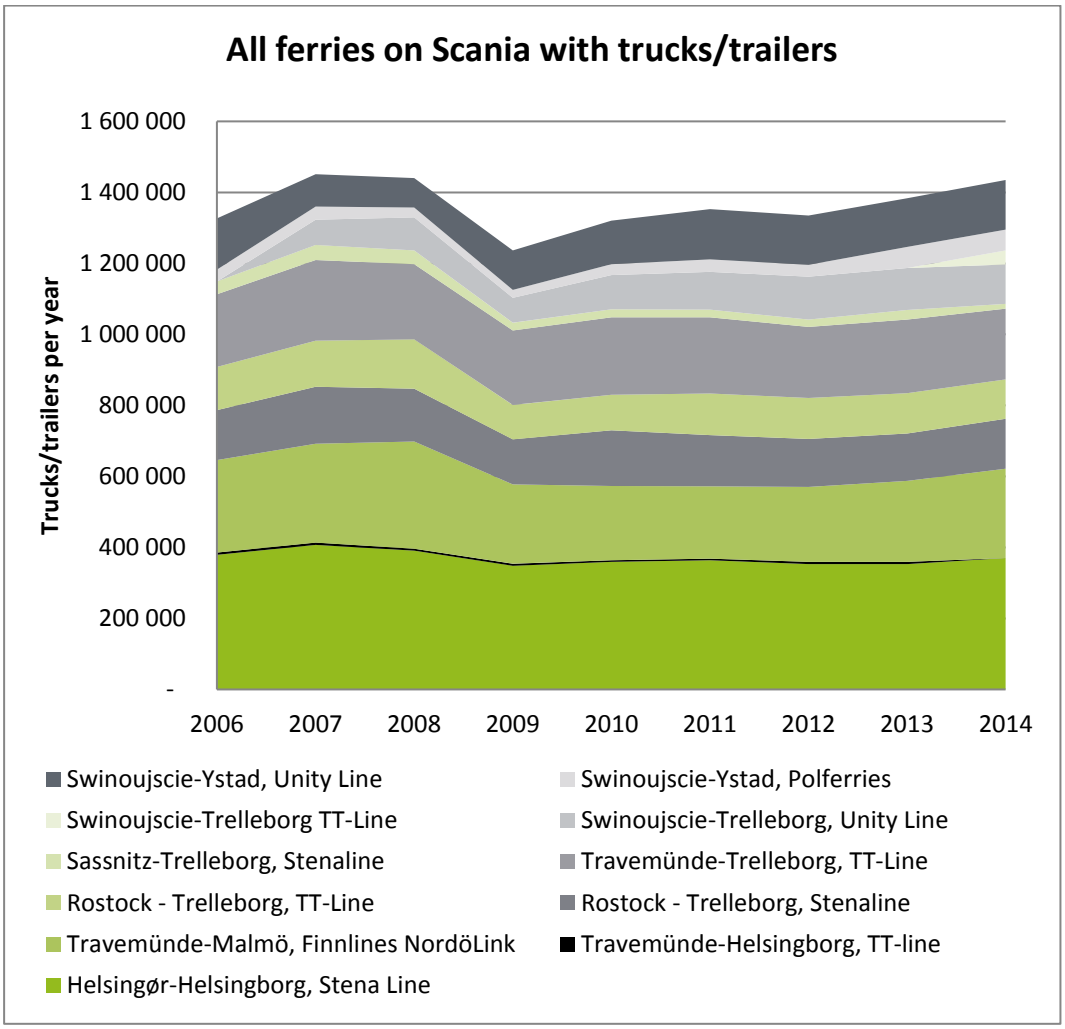


Source: Ports of Sweden

The port of Helsingborg has increased the volume from 7.6 to 8.2 million tonnes between 2006 and 2015. The container traffic has increased the most, whereas the trucks/trailers stayed at the same level.

The port of Malmö, as part of CMP, has decreased from 9 million tonnes in 2006 to 7.6 million tonnes in 2015. Trucks/trailers have stayed at the same level, whereas containers and non-unitized cargo has decreased.

The port of Trelleborg has had a slight decrease from 11.4 million tonnes to 10.9 million tonnes in the period. The trucks/trailers have increased by as much as 16% in the period, from 8.7 million tonnes to 10.1 million tonnes in the period. The rail freight volume has decreased by 67%.
The port of Ystad had the same volume, 3.1 million tonnes in 2006 and in 2015, with a large dip to 2.1 million tonnes in 2008. The trucks/trailers have increased from 2.4 to 2.7 million tonnes in the period, whereas the rail freight cargo has decreased by 45%.

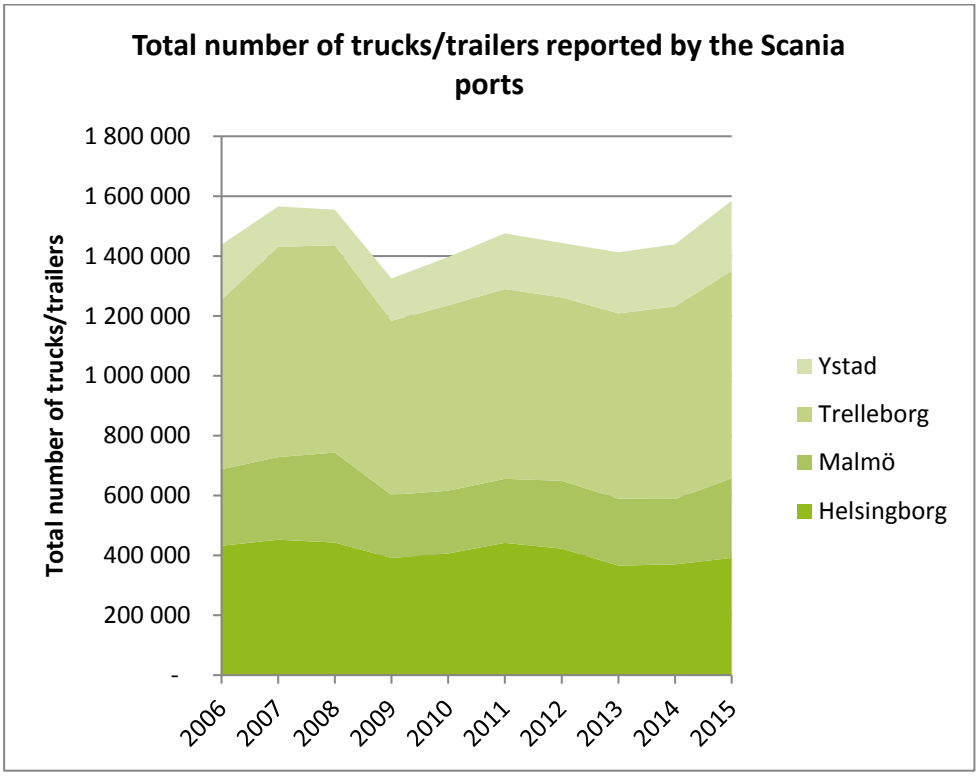


Source: Shippax, Ports of Sweden and own estimations

All ports in Scania have large RoRo traffic and the trend is increasing traffic with trucks/trailers on the ferries to Scania, from more than 1,33 million units in 2006 to a dip in 2009 to 1,24 million and then to some 1,38 in 2013.

For year 2014 not all ferry lines have reported their numbers of truck/trailers. Therefore the figure for the total volume in 2014 has been estimated to 1.43 million trucks/trailers. The figure above

shows the number of trucks/trailers per ferry line. Elsinore-Helsingborg is the most used ferry line, whereas the port in Trelleborg handles most traffic in total (see figure below) although it is split on different ferry lines.



Source: Ports of Sweden

The total number of trucks/trailers reported in 2006 was 1.44 million units. After a dip to 1.33 million units in 2009 the volume has increased steadily to 1.44 million in 2014 and as much as 1.58 million in 2015. For 2016 more than 1.6 million units was reported by the four ports.

The above figures also include the ferry Ystad – Rønne, with some 9,000 units in 2015.

1.2 Prognoses

Prognoses, forecasts and scenarios are based on a lot of different assumptions at a certain point of time and the assumptions could also change over time and other events could occur that will influence development in other directions. A prognosis/scenario should give a hint about the future development, but should never be seen as the full truth, as nobody is able to see into the future.

The Baltic Transport Outlook 2030 scenario forecast different developments for different segments within the ports overall. The container traffic was forecast to increase by 138% between year 2010 and year 2030, whereas RoRo transport of trailers was forecast to increase by 93% in the same period. Liquid bulk is forecast to decrease by 7%, whereas dry bulk and other traffic are forecast to increase between 32% and 47%.

The prognosis of the Swedish Transport Administration for year 2040 for the Scania ports foresees a total growth of 77% in the 4 ports, whereas the split of this development to the different port

seems to be somewhat strange. In the prognosis it is expected that Trelleborg, the largest port today, only to increase by 21%, whereas Malmö, on third place amongst Scania ports today is foreseen to increase by 140%.

The base prognosis for 2040 of the Swedish Transport Administration is compared with a previous prognosis for 2030 in the table below. As can be seen the methods differ in their prognoses.

Comparison of different prognoses

	Prognosis according to method by Ramböll from 2015			Swedish Transport Administration Prognosis from 2016			2014-	Prognosis	
Port	2010 mio. tonnes	Prognosis 2030 mio. tonnes	Change in %	Results 2014 mio. tonnes	Prognosis 2040 mio. tonnes	Diff. 2014-2040 in %	2010 diff.	2040 - 2030 diff. in tonnes	in %
Helsingborg	7,43	10,34	39%	7,81	14,48	85%	5%	4,14	40%
Malmö	9,65	13,55	40%	7,21	17,33	140%	-25%	3,78	28%
Trelleborg	10,83	15,92	47%	10,14	12,23	21%	-6%	-3,69	-23%
Ystad	2,78	6,47	133%	3,05	5,85	92%	10%	-0,62	-10%
	30,69	46,28	51%	28,21	49,89	77%	-8%	3,61	8%

Source: Swedish Transport Administration, 2014, "Prognos för godstransporter 2040 – Trafikverkets Basprognoser 2016", Report: 2016:062t and Ramböll, 2015,
Framtagning av godsvolymer genom TEN-T hamnar i Sverige – Metodrapport.

When instead applying the average annual growth rate for sea freight of 2.3% from the Swedish Transport Administration 2040 Prognosis, the volume development seem to be more appropriate. A recalculation of the split would then give the following scenario for the Scania ports in 2040:

Helsingborg:	14.11 million tonnes
Malmö:	13.02 million tonnes
Trelleborg:	18.31 million tonnes
Ystad:	5.51 million tonnes
Total:	50.95 million tonnes

1.3 Conclusions

The freight hubs in Scania already play a very important role in the Swedish transport system, as entry/exit points in international traffic. They have potential to continue to grow, following the growing demand for freight transports in the coming years.

There is a need to look into the future hinterland infrastructure to/from the ports and terminals in order to cope with this growth. There are already some bottlenecks, especially in the rail infrastructure, where capacity for freight trains is scarce. This, together with the overall goal of shifting long-distance road traffic to more environmentally-friendly transport modes, such as rail and sea, could be an obstacle in the years to come.

Collaboration, new thinking, new service offers and new business models will probably also be needed, in order for the shift to take place, especially concerning coastal shipping, connecting the long row of Swedish ports.

How the international trade flows develop have large consequences for the hubs in Scania. Poland has during the last decade surpassed both Italy and Spain as trade partner with Sweden. Czech Republic, Hungary, Slovakia, Romania, and Ukraine have also surpassed different Western European countries through the increased trade with Sweden. All of this indicates a further shift eastwards for the European trade volumes in the future. For such a development it is of great advantage for Scania to have two ports with routes on Poland, as well as routes on ports in Eastern Germany.

IMF World Economic Outlook foresees an overall GDP increase in the emerging and developing countries in Europe, among others Poland, of 3.2% annually or more than 20% increase in the period 2015-2021. In the same period an annual GDP increase of 1.9% is foreseen for the 28 EU Member States.

Capacity on the different parts of the infrastructure is of course very important for the freight hubs. Sufficient capacity in the hinterland connections is vital for smooth land-based operations to and from the hubs. Some bottlenecks are foreseen in the coming years, especially regarding rail infrastructure, and therefore it is important to focus on eliminating them.

The Scania freight hubs are already well ahead as regards introducing different measures for more sustainable operations, such as alternative fuels for equipment, and land electricity for the calling vessels.

The European transport political request of reducing the road transport and shifting to more sustainable modes, such as rail and sea transport, has so far not resulted in implementation of all necessary pre-requisites for establishing viable solutions for the shift, especially considering the present low costs for road transport, due to among others low fuel prices and cheaper drivers from Eastern countries.

Internalisation of external effects of transport will be on the agenda even further in the future and this means that the different transport modes will face further taxes and other burdens.

All in all, the Scania freight hubs are well performing and are well aware of the different issues that are important for their future development. They all have their niches – Ystad with Poland traffic, Trelleborg with four different routes to Polish and German ports, Malmö with the development of the CMP Norra Hamnen for intermodal traffic, and Helsingborg with intermodal traffic, both RoRo and especially container. Focus on developing the niches, together with the overall operations is important to keep up with the competitors in the future.

2 Summary in Swedish – Svensk sammanfattning

Det finns fyra stora hamnar i Skåne: Helsingborg, Malmö (CMP), Trelleborg och Ystad. Malmö och Trelleborg har status som TEN-T-stomhamnar och Helsingborg och Ystad som övergripande hamn.

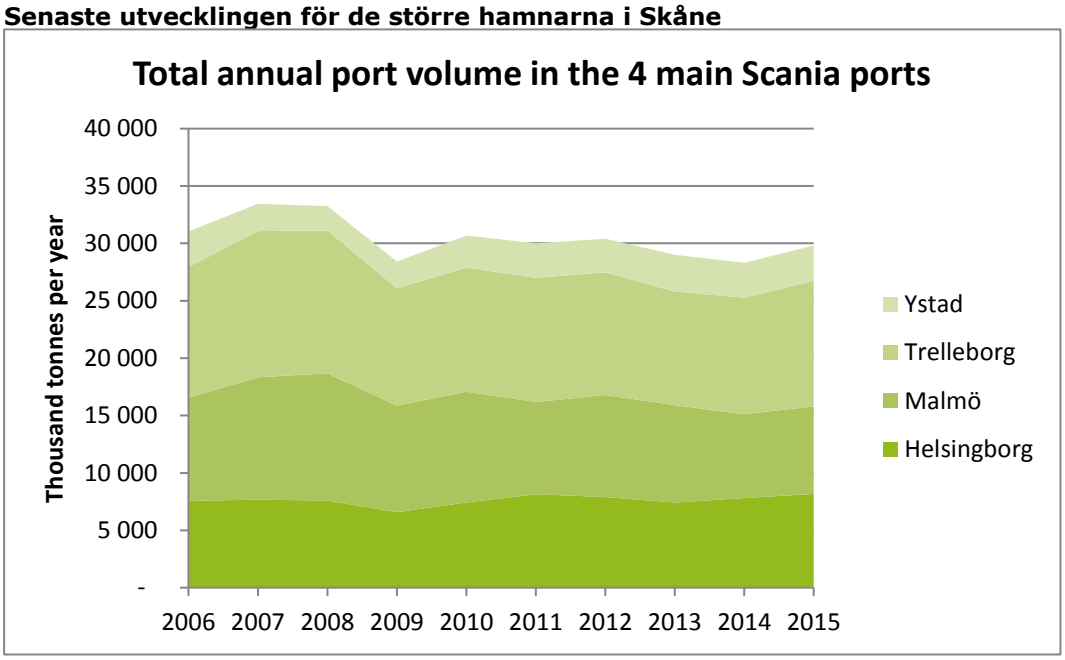
Det finns två större kombiterminaler för intermodal trafik utanför hamnarna; Malmö Kombiterminal och Helsingborg Kombiterminal. Volymerna som hanteras i dessa är inte kända, men Malmö ingår i stamnätet och är en av de största kombiterminaler i Sverige med mer än 80 000 hanterade enheter årligen.

Bortsett från tyska hamnar, är hamnen i Swinoujscie/Szczecin viktigt för Skåne, speciellt när det gäller färjetrafiken mellan Swinoujscie och Ystad/Trelleborg.
Den svenska handeln med Polen ökar och Polen har haft en mycket positiv ekonomisk utveckling under de senaste åren, med en BNP-utveckling (PPS) på 38 % mellan år 2006 och år 2015. Samtidigt har de mogna ekonomierna inom Scandriakorridoren ökat stabilt.

2.1 Hamnutveckling i Skåne

De fyra skånska huvudhamnarna har tillsammans en volym om cirka 30 miljoner ton per år för år 2015, vilket nästan är detsamma som för år 2006. Från år 2006 fram till finanskrisen ökade den totala volymen stort, men krisen innebar en drastisk nedgång, varpå volymen har varierat runt 28 till 30 miljoner ton under den efterföljande perioden.

Senaste utvecklingen för de större hamnarna i Skåne



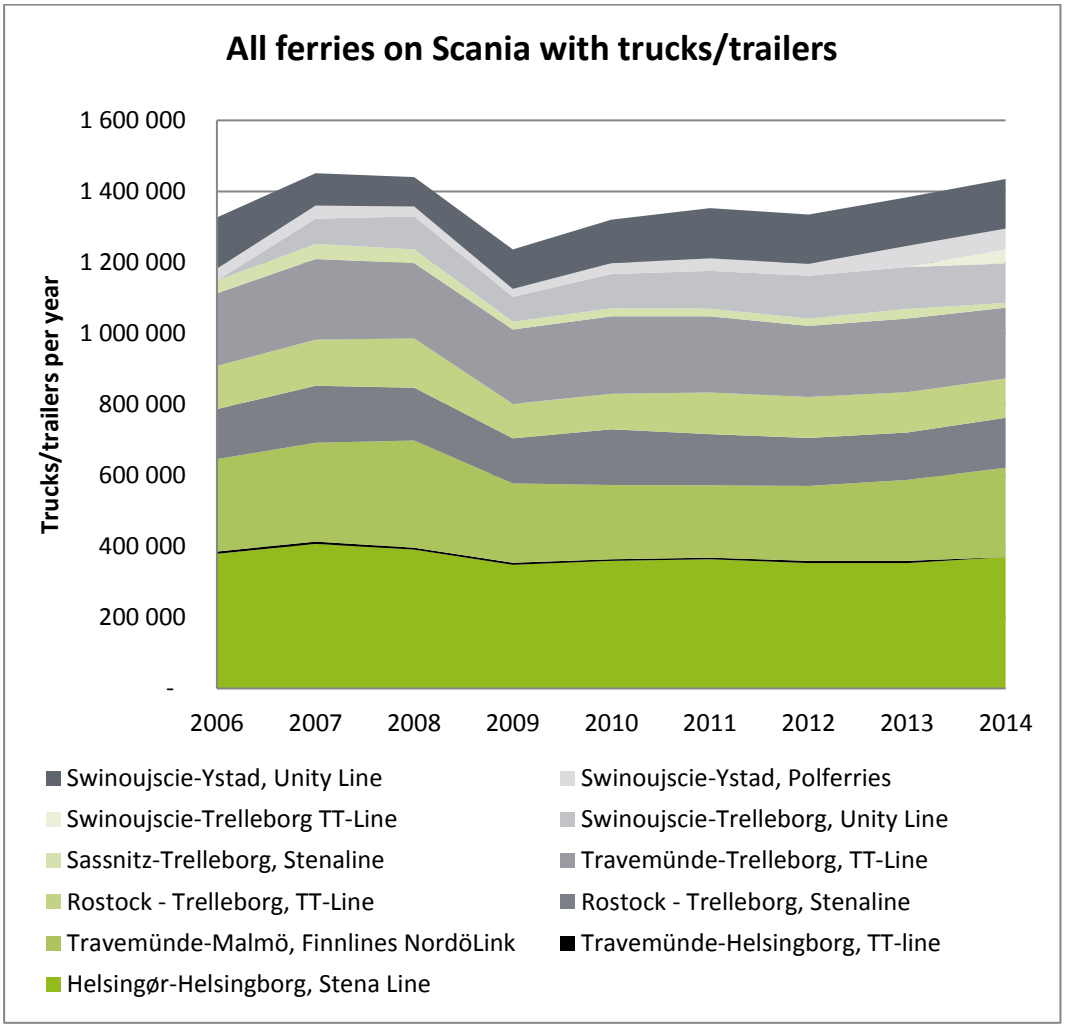
Källa: Sveriges Hamnar

Hamnen i Helsingborg har ökat volymen från 7,6 till 8,2 miljoner ton mellan 2006 och 2015. Containertrafiken har ökat mest, medan lastbilar/trailers stannat kvar på samma nivå.

Hamnen i Malmö, som är en del av CMP, har minskat från 9 miljoner ton år 2006 till 7,6 miljoner ton 2015. Lastbilar/trailers ligger kvar på samma nivå, medan containrar och icke-styckegods har minskat.

Trelleborgs hamn har haft en liten minskning från 11,4 miljoner ton till 10,9 miljoner ton under perioden. Lastbilar/trailers har ökat med så mycket som 16 % under perioden, från 8,7 miljoner ton till 10,1 miljoner ton. Järnvägsvolymen med färja har minskat med 67 %.

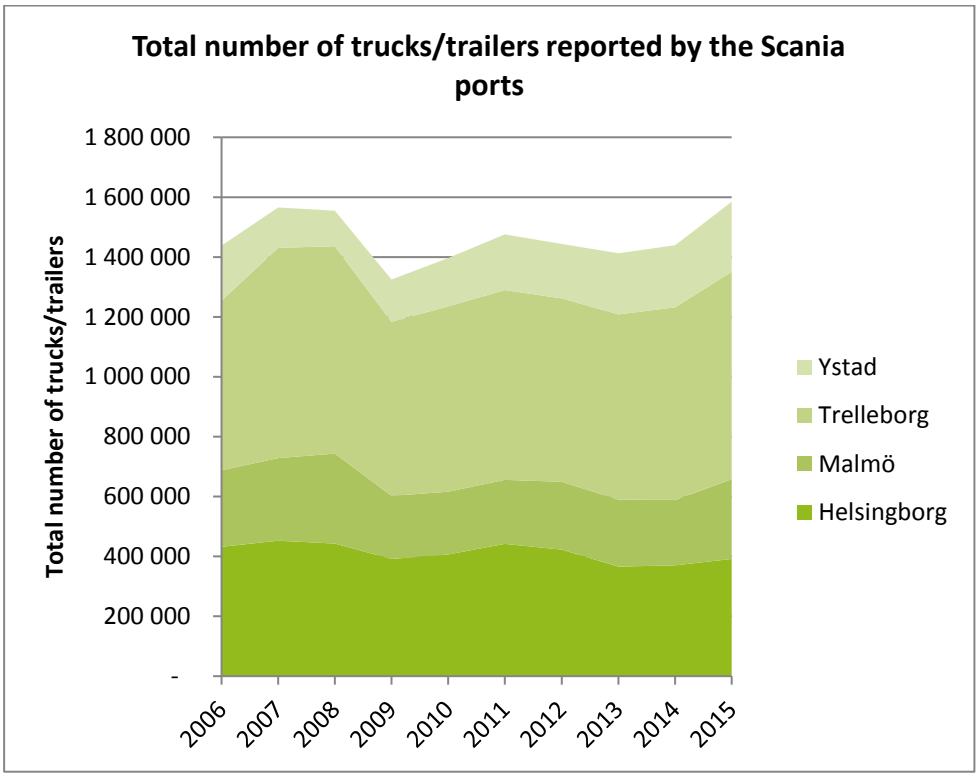
Hamnen i Ystad hade samma volym, 3,1 miljoner ton, i 2006 och 2015, med ett stort dyk till 2,1 miljoner ton 2008. Lastbilar/trailers har ökat från 2,4 till 2,7 miljoner ton under perioden, medan godstransporter på järnväg har minskat med 45 %.



Källa: Shippax, Sveriges Hamnar och egna uppskattningar

Alla hamnarna i Skåne haromfattande RoRo trafik och trenden med lastbilar/trailers på färjorna på Skåne är ökande, från mer än 1,33 miljoner enheter år 2006 via ett dykår 2009 till 1,24 miljoner och sedan upp till cirka 1,38 miljoner enheter år 2013.

För år 2014 har inte alla färjelinjer rapporterat in siffrorna för helåret 2014. En uppskattning av den totala volymen till 1,43 miljoner lastbilar/trailers för år 2014 har därför gjorts. Den största färjelinjen är Helsingborg-Helsingör (se figur ovan), medan Trelleborg är den hamn som har det största antalet lastbilar/trailers (se figur nedan).



Källa: Sveriges Hamnar

Det totala antalet lastbilar trailers som rapporterades under 2006 var 1,44 miljoner enheter. Efter ett dopp till 1,33 miljoner enheter jämfört med 2009 volymen har ökat stadigt till 1,44 miljoner 2014 och så mycket som 1 580 000 2015.
Volymen för år 2016 överskred 1,6 miljoner enheter för de fyra hamnarna
I ovanstående siffror ingår även färjan Ystad - Rønne, med några 9 000 enheter i 2015.

2.2 Prognos/scenarier

Prognoser och scenarier är baserade på en hel rad olika antaganden vid en viss tidpunkt och dessa antaganden kan också förändras över tiden och andra händelser kan inträffa som kommer att påverka utvecklingen i andra riktningar. En prognos/scenario bör ge en fingervisning om den framtida utvecklingen, men får aldrig ses som hela sanningen, eftersom ingen kan se in i framtiden.

Baltic Transport Outlook 2030 scenariot visar på en förväntad utveckling för olika segment inom hamnarna. Containertrafiken beräknas öka med 138 % mellan år 2010 och år 2030, medan RoRo transport av trailers prognosticeras öka med 93 % under samma period. Flytande bulk förutspås minska med 7 %, medan torr bulk och annan trafik förväntas öka mellan 32 % respektive 47 %.

Trafikverkets prognos för år 2040 för Skånes hamnar förutser en total tillväxt på 77 %, medan uppdelningen av denna utveckling på respektive hamn verkar vara något underligt. I prognosen förväntas Trelleborg, den största hamnen i dag, bara att öka med 21 % fram till år 2040, medan Malmö, på tredje plats bland Skånes hamnar idag förväntas öka med 140 %.

Trafikverket basprognos för år 2040 har också jämförts med en prognos för år 2030.

Jämförelse av prognoser

	Method report by Ramböll, 2015			Trafikverket Prognosis 2016			2014-	Prognosis	
Port	2010	Prognosis 2030	Change	Results 2014	Prognosis 2040	Diff. 2014-2040	2010	2040 - 2030	
	mio. tonnes	mio. tonnes	in %	mio. tonnes	mio. tonnes	in %	diff.	diff. in tonnes	in %
Helsingborg	7,43	10,34	39%	7,81	14,48	85%	5%	4,14	40%
Malmö	9,65	13,55	40%	7,21	17,33	140%	-25%	3,78	28%
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Ystad	2,78	6,47	133%	3,05	5,85	92%	10%	-0,62	-10%
	30,69	46,28	51%	28,21	49,89	77%	-8%	3,61	8%

Källa: Trafikverket Prognos 2040 och prognos enligt Utveckling av godsvolymerna genom TEN-T-hamnar i Sverige - Metodrapport

Vid tillämpning av den genomsnittliga årliga tillväxttakten för sjöfrakt på 2,3 % från Trafikverket 2040 prognos verkar volymutvecklingen vara mer passande. En omräkning av fördelningen ger då följande scenario för utvecklingen i Skånes hamnar år 2040:

Helsingborg:	14,11 miljoner ton
Malmö:	13,02 miljoner ton
Trelleborg:	18,31 miljoner ton
Ystad:	5,51 miljoner ton
Total:	50,95 miljoner ton

2.3 Slutsatser

Godshubbarna i Skåne spelar redan en mycket viktig roll i det svenska transportsystemet, som porten till Sverige i en stor del av den internationella trafiken. De har potential att fortsätta växa, genom den ökande efterfrågan på godstransporter under de kommande åren.

Det finns ett behov av att undersöka den anslutandeinfrastrukturen till/från hamnar och terminaler för att klara av denna framtida tillväxt. Det finns redan vissa flaskhalsar, särskilt i järnvägsinfrastrukturen, där kapaciteten är begränsad. Detta kan vara ett hinder under de kommande åren, speciellt med det övergripande målet att flytta över långväga vägtrafik till mer miljövänliga transportsätt, såsom järnväg och sjö.

Samverkan, nytänkande, nya serviceerbjudanden och nya affärsmodeller kommer troligen också att behövas för att denna förändring skall ske, särskilt för att kunna använda kustsjöfart, för att förbinda svenska hamnar.

Hur de internationella handelsflödena utvecklas har stora konsekvenser för godsnaven i Skåne. Polen har under det senaste decenniet gått förbi både Italien och Spanien som handelspartner med Sverige. Tjeckien, Ungern, Slovakien, Rumänien och Ukraina har också gått förbi olika västeuropeiska länder genom ökad handel med Sverige. Allt detta tyder på en ytterligare förskjutning österut för de europeiska handelsvolymerna i framtiden. Givet denna utveckling är det en fördel att Skåne har två hamnar med rutter på Polen, liksom rutter på hamnar i östra Tyskland.

IMF World Economic Outlook förutser en ökning av BNP i tillväxt- och utvecklingsländer i Europa, bland annat i Polen, på 3,2 % per år eller mer än 20 % ökning under perioden 2015-2021. Under samma period förväntas en årlig BNP-ökning på 1,9 % för 28 EU-länderna.

Kapaciteten på de olika delarna av infrastrukturen är naturligtvis mycket viktigt för godsknutpunkter. Tillräcklig kapacitet i anslutningarna i inlandet är avgörande för smidiga, landbaserade operationer till och från naven. Vissa flaskhalsar förutses under de kommande åren, särskilt inom järnvägsinfrastrukturen, varpå det är viktigt att fokusera på att eliminera dessa.

Skånes godshubbar är redan långt framme i utvecklingen när det gäller att införa olika åtgärder för mer hållbar verksamhet, såsom exempelvis alternativa bränslen för utrustning och land-el för fartyg.

Den europeiska transportpolitiken innebär en vilja att minska vägtransporterna till förmån för mer hållbara trafikslag som järnväg och sjöfart. Hittills har förutsättningarna för att etablera hållbara lösningar för en sådan överflyttning inte varit helt på plats, särskilt med de nuvarande låga kostnaderna för vägtransporter (på grund av bland annat låga bränslepriser och billiga chaufförer från östeuropeiska länder).

Internalisering av externa effekter av transporter kommer att stå på dagordningen ytterligare i framtiden och detta innebär att de olika trafikslagen kommer att möta ytterligare skatter och andra bördor.

Allt som allt är Skånes hubbar väl med i utvecklingen och medvetna om de olika frågor som är viktiga för deras framtida utveckling. De har alla sina nischer: Ystad med Polentrafik, Trelleborg med fyra olika linjer till polska och tyska hamnar, Malmö med utvecklingen av CMP, Norra Hamnen för intermodal trafik på sjö och även på järnväg och Helsingborg med intermodal trafik, både RoRo och speciellt containers. Fokus på att utveckla de nischer, tillsammans med den övergripande verksamheten är viktigt för att hålla konkurrenterna stången i framtiden.

3 Introduction to Scandria®2Act

Scandria®2Act refers to BSR programme aim to "increase the efficiency of transporting goods and persons in north-south connections by increasing the capacity of transport actors in the field of interoperability not duplicating efforts by TEN-T policies".

As stated in the EUSBSR-Action Plan, "a well-functioning transport system, combined with greater attention to the spatial development and location patterns, is of vital importance for prosperity and economic growth" in the Baltic Sea Region (BSR). According to the Roadmap to a Single European Transport Area, the current patchwork of national transport systems is segmented and based upon oil (25% of total GHG emission on the bill of transport).

There is a need to address a more efficient and decarbonized transport system. European Commission (COM), Parliament and Member States (MS) agreed on a new European Transport Policy to be realized by 2030/2050 respectively. Major instrument will be core network corridors (CNC) coordinated by a European Coordinator. There are four of these CNC in the BSR, two surrounding the Baltic Sea: Scandinavian-Mediterranean (ScanMed) and North Sea – Baltic (NSB). The CNC will focus on the deployment of cross-border transport infrastructure.

A major challenge in organising transport along the corridor is the negative environmental impact caused by emissions mainly of road transport and the limited capacity of transport infrastructure in highly utilized corridor sections. The Core Network Corridor Study for the ScanMed Corridor identified a number of bottlenecks already existing in the transport network and confirms rising transport volumes between the corridor regions. This puts high pressure to develop cross-sectoral and cross-level solutions that minimise environmental impact of transport and optimise capacity utilisation.

Thus two very relevant approaches are to strengthen MULTIMODAL TRANSPORT and to deploy CLEAN FUELS. Both approaches have the potential to reduce GHG-emissions significantly. Although there is a variety of regional solutions in place, they are not sufficiently applied to the transnational extent of the core network corridor, since there is:

- a lack of continuity of clean fuel policies, strategies and applications along the Corridor,
- a lack of knowledge concerning multimodal corridor capacities especially in relevant cross-border regions,

When it comes to the full use of public transport potential, a lack of information about multimodal services and prices for international travellers is to be stated.

Currently, there is no integrated approach of corridor regions towards the EU Core Network Corridors. The multi-level GOVERNANCE (MLG) approach as initially addressed by the Scandria project and developed by BSR Trans Governance project needs to be consolidated and implemented.

Scandria®2Act is addressing these shortcomings by applying a cooperative approach to better utilize regional capacities for transnational corridor development.

3.1 Introduction to Work Package 3

3.1.1 Aim

For years, the modal split has been stable with around 75% of tonne-kilometres served by road transport and 25% served by inland waterways and rail. The ScanMed Core Network Corridor Study expects road traffic to grow. The EU Directive 2012/33/EC has, since 01/01/2015 applied stricter environmental standards to short sea shipping (SSS) in the designated SECA areas, which in turn might favour road transport.

As it is the aim of the project partners to foster environmentally friendly modes of transport securing mobility for people and freight, multimodal transport is to be strengthened in the Scandria® Corridor. As a prerequisite, existing knowledge has to be updated to take latest developments like economic crisis 2009, the SECA regulation or the new EU transport policy into account. This knowledge will be crucial for designing new multimodal transport services and adopting multimodal capacities in the corridor regions to meet market requirements.

In passenger transport a low share of international rail passenger transport show the difficult market position of international rail services in comparison to air transport or personal cars. This is caused by a number of reasons like pricing and attractiveness of offered connections, however is also stated, that using public transport means is relatively complicated for customers as relevant information and services especially in international travelling are not or not fully available.

To improve multimodality in freight and passenger transport in the Scandria® Corridor, the partners therefore aim

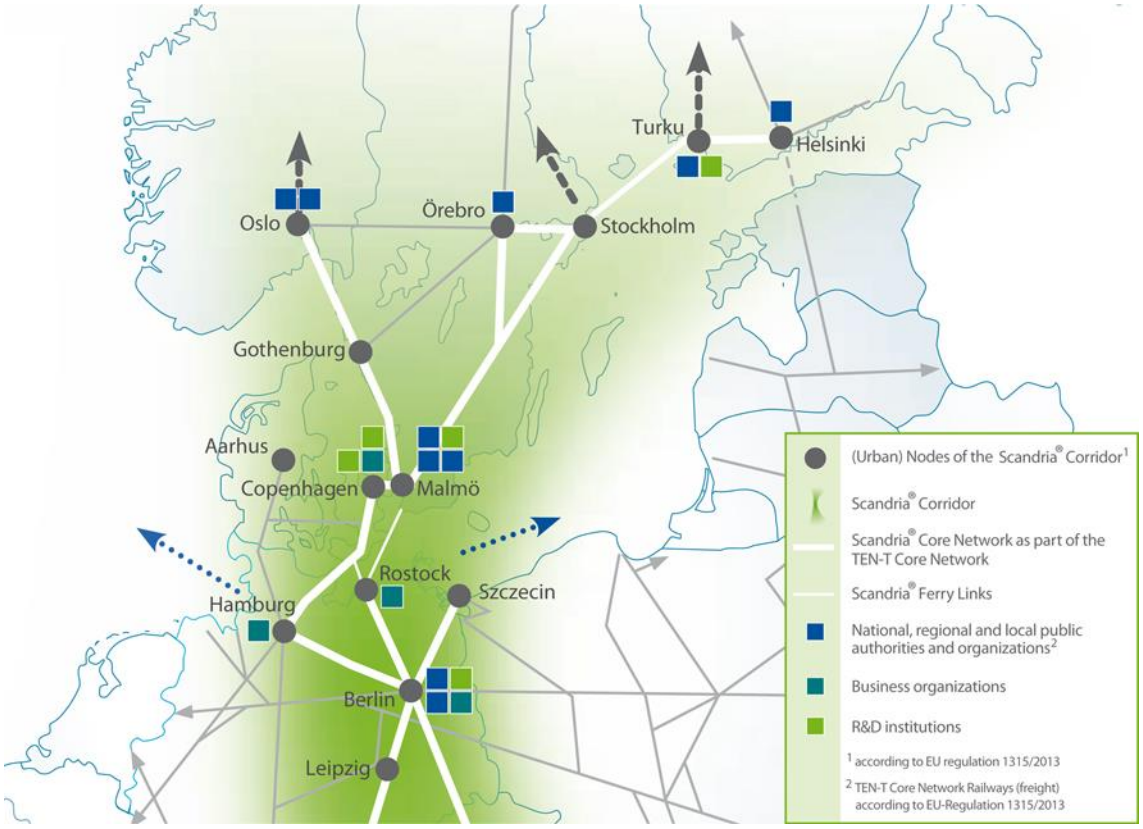
- to improve knowledge about transport flows in the corridor as a prerequisite for increasing capacity of regional stakeholders to adopt relevant policies,
- to facilitate multimodal transport services that are capable of shifting freight volumes from road to other, less burdening transport modes,
- to strengthen existing services in passenger transport by providing relevant information about international public transport services to customers.

3.2 Geography

3.2.1 Geographical scope of the Scandria®2Act corridor

The geographical scope of the Scandria®2Act corridor follows the Scandinavian-Mediterranean core network corridor from Helsinki /Stockholm/Oslo southwards towards Berlin. This means that the corridor starts in Helsinki and goes via Stockholm southwards toward Germany. At the same time, there is a branch of the corridor that starts in Oslo and connects with Stockholm as well as goes southwards.

Below the geography of the Scandria®2Act corridor can be seen:



Map of Scandria2Act partnership (© S. Hofschlaeger / pixelio.de | www.pixelio.de)

3.2.2 Geographical scope of this report

This report concerns development of ports and terminals especially in the Scania Region. This means that the primary scope is directed to the traffic within the corridor that concern these ports and terminals. The secondary scope is the areas nearby that also influence the development of the ports and terminals in the Scania region.

4 Description of the present situation

In the following the present situation of the international freight transport in Scania is described.

4.1 Primary ports

The primary scope includes these ports that will be described in the following. The structure is that the most interesting information is listed in order to make comparisons between different ports. This includes capacities as well as important hinterland infrastructure.

4.1.1 Ports in Scania

The ports in the Scania Region carry a vital part of the Swedish export volumes, with some 20% of the export volume in tonnes going via one of the Scania ports. And even the double, if this is measured in export value, as some 40% of the export volume goes via Scania ports.

The Scania region is specialised towards high-value cargo and does not have much heavy base industry, as forestry and mining.

The 6 public ports in the Scania Region.

In the following the 4 main ports are described. Landskrona and Åhus will not be described.

4.1.2 Environmental focus

The Scania ports are in the forefront as regards innovations and measures in order to reduce environmental effects of their operations, with a row of measures already implemented and a lot of interesting projects running. Measures such as land electricity, alternative fuels, focus on developing intermodal transports including rail operations etc.

4.2 Port of Helsingborg

Helsingborg is a full-service port, i.e. most types of commodities are handled in the port. It is fully owned by Helsingborg City and has some 230 employees. Helsingborg is a comprehensive port in TEN-T.
Helsingborg can handle vessels of up to 235 m length and has a draught of 13 m.

4.2.1 Operations

Helsingborg primarily handles containers, reloading between sea and land transport, bulk and RoRo traffic. Helsingborg is second-largest in Sweden on container handling after Gothenburg.

Helsingborg is a comprehensive port with some 7.7 million passengers the second-largest regarding number of passengers after Stockholm, with the very frequent arrivals of ferries (Every 15 min. daytime) from Elsinore (Helsingør).

Helsingborg is also specialised in the food segment and some 90% of all fruit and vegetables sold in Swedish grocery stores has passed through the port of Helsingborg.

4.2.2 Development potential

The port in Helsingborg has had a steady development, whereas the container segment has shown the largest growth and this is also seen as a growth area for the future.

4.2.3 Hinterland access

The port of Helsingborg has good access to the motorways E4, E6 and E20.
The access to the rail network is also good, with the only exception that cargo going north has to take a somewhat longer route, as freight trains are not allowed via Knutpunkten, the main train station in Helsingborg.

4.3 Copenhagen Malmö Port (CMP)

The company CMP was formed in 2001 as it was decided to join the 2 ports of Copenhagen and Malmö into one company. CMP owners are CPH City & Port Development (By & Havn) to 50% (which in turn is owned to 95% by Copenhagen City), Malmö city 27% and 23% by private interests. The port has some 500 employees across the Öresund.
CMP is a core port in the trans-European transport network.

In Malmö the port is situated in the northern parts of the city and can handle vessels up to 250 m and has a draught for vessels of 13.5 m.

4.3.1 Operations

CMP is mainly used for vet bulk, dry bulk, container and RoRo-traffic. There are still some passengers on the ferries to Germany, and Copenhagen is the largest port for cruise ships in Northern Europe. Malmö port is also a port for imported cars for Scandinavia, the Baltic countries and Russia.

4.3.2 Development potential

The port has large potential to expand as it owns some 150 hectare land that is not used.

4.3.3 Hinterland access

Malmö port has good access to the main motorways, with some 4 km to the E6/E20. The access road has good standard and goes outside the built-up area of the city. .

The railway traffic goes via Malmö Freight Yard, from where there are good connections to the railway network. From the intermodal terminal in the port there is 4 km to the freight yard.

In order to cope with the expected increasing volumes in the future, there are plans of a new way/railway bridge "Northern Port Bridge" as well as changes in the road and rail stretches. A pre-study for the Northern Port Bridge has been granted support from the EC.

CMP has also presented ideas about construction of a shunting yard in the Northern parts of Scania, in order to bundle the volumes to/from the Scania ports.

4.4 Trelleborg

The port of Trelleborg is a core port and a large hub for truck and trailer transports between Scandinavia and the Continent. It is the largest ferry port in Sweden as regards number of trucks/trailers via ferry and one of the largest in Europe as regards the RoRo segment. It is also the largest railway port in the Baltic Sea.

The port can handle ships of up to 240 m length and has a draught of 7.4 - 9 meters at the keys.

4.4.1 Operations

Mainly trucks and trailers, but also a number of rail freight wagons, are handled.

4.4.2 Development

The port has gone through a row of changes over the last few years, among others in connection with the move of the intermodal terminal to a new area, with 2 new tracks of 750 m. New RoRo ramps have also been built.

The RoRo segment has seen a steady development and this is expected to continue. The rail wagon segment seems to be diminishing and the question is whether anything will remain, once the Fehmarn Belt connection is established.

The volumes at the combined terminal are expected to grow further.

4.4.3 Hinterland access

Trelleborg is connected via E6/E22 and the main roads around Trelleborg see a considerable amount of trucks, especially in connection with the ferry departures and arrivals.

The rail connection is a single line towards Malmö, where there also are passenger trains.

4.5 Ystad

Ystad is a RoRo port mainly towards the Polish market, but the ferries to the Danish island Bornholm are also operated from Ystad. But the main part of the trucks to/from Bornholm uses the Køge-Rønne route.

The port can handle ships of up to 220 m length and has a draught of 7.2 m.

4.5.1 Operations

As a RoRo port the main vehicles handled are trucks and trailers – as well as passengers, buses and cars. The port also handles rail freight wagons to/from ferries and onwards to the Swedish rail system.
The port also handles some bulk cargo, such as pellets.

4.5.2 Development

The port has seen increases in the volumes during the latest years, due to the increases in the trade with Eastern and Central Europe.
The trend is larger volumes from Poland than to Poland, but the large growth is expected to continue.
There are plans to build 2 new RoRo berths towards the south in the outer port, in order to meet commercial demand in connection with the increasing export/import via Poland, as well as to be able to handle larger ferries.

4.5.3 Hinterland access

The road connections to Ystad are not as good as for the other ports as the motorway is farther from Ystad. The railway also crosses, and this sometimes leads to congestion.

The rail connection is Ystadbanan, which is a single line railway where there also are passenger trains.

4.6 Compilation of present RoRo/RoPax and Feeder lines

Below a compilation has been made of the different LoLo and RoRo routes presently active in traffic on the concerned Scania ports.

Present RoRo/RoPax and LoLo lines on Scania ports

Service	Company	Type
Helsingborg		
Equador/Dom. Rep/ Helsingborg/St. Petersburg/ Helsingborg	Baltic Reefers/Cool Carrier	LoLo
Bilbao/Thamesport/Helsingborg/Gedynia/Teesport /Thamsport	Mac Andrews	LoLo
Torneå/Helsingborg	Langh Ship	LoLo
Helsingborg/Bremerhaven/Rotterdam/Gothenburg	MSC	LoLo
Bremerhaven /Helsingborg/Århus/Bremerhaven	Maersk	LoLo
Hamburg/Copenhagen/Gothenburg/Helsingborg/ Bremerhaven/Hamburg	Unifeeder	LoLo
Rotterdam/Copenhagen/Helsingborg/Gothenburg/ Rotterdam	Unifeeder	LoLo
Hamburg/Copenhagen/Malmö/Aarhus/Fredricia/Helsingborg/Hamburg	Unifeeder	LoLo
Rotterdam/Hamburg/Oslo/Gothenburg/Helsingborg	Hapag Lloyd	LoLo
Bremerhaven/Hamburg/Copenhagen/Helsingborg/ Gothenburg/Aarhus	Hapag Lloyd	LoLo
Umeå/Sundsvall/Rotterdam/London/Helsingborg/Oxelösund-Umeå	SCA	RoRo
Helsingborg-Elsingore (Helsingør)	Scandlines	Ferry (RoRo)
Helsingborg-Elsingore (Helsingør)	HH-Ferries	Ferry (RoRo)
Malmö		
Travemünde - Malmö	Finnlines NordöLink	RoRo
Malmö-Helsinki/St. Petersburg	Finnlines	RoRo
Hamburg/Copenhagen/Malmö/Aarhus/Fredricia/Helsingborg/Hamburg	Unifeeder	LoLo
Zeebrugge-Malmö	K-Line	LoLo
Sundsvall/Iggesund/Lübeck/Malmö/Umeå	SCA	RoRo
Trelleborg		
Rostock-Trelleborg	Stena line	Ferry (RoRo)
Sassnitz-Trelleborg	Stena line	Ferry (RoRo)
Rostock-Trelleborg	TT-Line	Ferry (RoRo)
Travemünde-Trelleborg	TT-Line	Ferry (RoRo)
Swinoujscie-Trelleborg	TT-Line	Ferry (RoRo)
Swinoujscie-Trelleborg	Unity Line	Ferry (RoRo)
Ystad		
Swinoujscie-Ystad	Polferries	Ferry (RoRo)
Swinoujscie-Ystad	Unity Line	Ferry (RoRo)

Source: Compilation from different shipping lines and ports April 2017

4.7 Logistics areas in Scania

Scania is an important region for logistics companies and also has a large concentration of them in different parts of the region, mainly in the western parts, close to the main infrastructure.

The Swedish transport trade magazine Intelligent Logistik[1] yearly ranks the best logistics locations in Sweden. The criteria for selection include; geographic area and demographics, accessibility and infrastructure, total logistics land area, incl. new logistics areas, total offer of logistics services and

[1] http://intelligentlogistik.com/logistiklagen/

logistics education, cooperative climate and business networks as well as price and availability of pre-planned land for logistics.

The logistics regions in Scania made the following positions in the list:

- **Helsingborg region** stepped up from position 6 in 2016 to position 5 2017, with a new cluster for e-commerce in Ängelholm and large availability of logistic areas as well as a research centre for return logistics and city logistics – ReLog at Campus Helsingborg.
- **Malmö region** stepped back from position 10 to position 11 in 2017 with good infrastructure and access to new logistics areas, leading car import cluster and package terminal at Sturup.
- **Hässleholm/Kristianstad/Åhus** also took a step back from position 17 to position 18 this year. Good rail connections, beverage and foodstuff cluster. Education in production logistics at Campus Hässleholm.
- **Trelleborg/Ystad** took 2 steps back, from position 21 in 2016 to position 23 in 2017. Sweden's most important RoRo-port is expanding, but no larger new logistics establishments.

4.8 German ports

In the following the main German port in the range Hamburg to Sassnitz-Mukran are described.

4.9 Port of Hamburg

The Hamburg Port Authority (HPA) is an institution of public legislation and is owner of most real estates in the Hamburg port area proxying the city of Hamburg. HPA has run the port since 2005 and has some 1,900 employees.

The port of Hamburg is a core port, the largest universal sea port in Germany and a leading port for trade with China and a leading hub for Baltic Sea trade routes. The port is notable for the varied range of logistic services for imported and exported goods of all types.
The port of Hamburg has a total of 43 km of quay for seagoing vessels and can handle vessels of up to 12.8 m of draft irrespective of tide.

4.9.1 Operations

Around 9,000 ships call per year at the port of Hamburg, and more than 1,900 freight trains per week. Hamburg is the third largest container port in Europe with a container throughput of some 8.9 million TEU in 2016 and in the 18th place of container ports worldwide. In 2016 the port handled 138.2 million tonnes all in all, of which 91.7 million tonnes were in containers. Bulk cargo accounted for 44.9 million tonnes.

The port infrastructure consists of 280 berths for ocean-going ships, 58 landing terminals, and 130 km of public road and 294 km of port railway sidings.

Besides containers, bulk and other cargo the port of Hamburg has several cruise terminals and in 2014 handled 189 cruise ships and 590,000 passengers.

4.9.2 Operations

The port of Hamburg is a universal port, mainly used for containerized goods, breakbulk and bulk cargo.

4.9.3 Development potential

The volumes on Hamburg are stable, but the Elbe fairway needs to be deepened and this might disturb the volumes in the years to come. The decision about the fairway is not yet timed. There is also large competition as regards the overseas volumes between the ports in the northern range - between Le Havre and Hamburg.

Due to Gothenburg and Gdansk having direct calls by oceangoing ships, Hamburg has lost volumes in Short sea shipping on Sweden and Poland in recent years.

The port of Hamburg has 4 state-of-the art container terminals whereby the port is benefitting of being in the frontline as regards container handling in Europe, together with Rotterdam and Antwerp.

4.9.4 Hinterland access

The port of Hamburg has a well-developed hinterland network with good access to roads, rail and inland-waterway. With a total of 46.4 million tonnes transported by rail in 2016, the port of Hamburg is the leading rail hinterland port in Europe.

By truck the port has good access to the motorways A1, A7, A24 and A25. For inland-waterway the position at Elbe River gives ample opportunities for Inland Waterway transport.

In 2016 a total of around 91.7 million tonnes were handled in rail hinterland services of the Port of Hamburg. Of the hinterland traffic, some 42.3 percent of the cargo was transported by rail, some 12 percent by inland-waterway vessel, and some 43 percent by truck.

4.10 Port of Lübeck

Lübeck is a core port and Germany's second largest Baltic Sea port. It functions as a hub for the transport corridors between Southern, Western and Central Europe, the Baltic Sea and onwards to Scandinavia, the Baltic States and Poland.

Lübecker Hafen-Gesellschaft mbH (LHG) runs the public docks in Lübeck. LHG was founded in 1934 and is owned by Hansestadt Lübeck (62.3%) and PREEF Pan-European Infrastructure Two Lux S.à.f.l. (37.5%).

LHG provides cargo handling and additional services in the transport chain, including rail and inland waterways. The port has some 773 employees, and has a draught of between 8.5 and 9.5 m at the berths.

4.10.1 Operations

Lübeck operates two terminals specialized in handling wheeled cargo and in addition they can handle containers and LoLo loading. The port has 4 RoRo Terminals with a total of 18 RoRo berths.

Lübeck is one of Europe's most experienced operators in handling and storage of forest products, paper and cellulose. It is the largest handling and distribution centre in Europe for the Swedish and Finnish paper industry.

LHG's terminals offer up to 80 departures a week to 20 partner ports around the Baltic.

In addition to freight handling, over 400,000 passengers a year use the port on the way to/from a Baltic Sea voyage.

4.10.2 Development potential

Lübeck is developing its RoRo/LoLo services as well as its niche for forest products from Scandinavia. When the Fehmarn Belt fixed link is established some of the ferry lines will probably seize their service, as for example on Malmö. But Lübeck is also big on Finnish routes.

4.10.3 Hinterland access

The port of Lübeck has a good access to the motorways A1, A7 and A20. By inland waterway there is also good connection to the Elbe-Lübeck Canal with a direct link with the European inland waterway network.
The access to the rail network is good, with a direct link to the electrified, double-track main line to Hamburg

4.11 Rostock

Rostock Port is the largest German port on the Baltic Sea. Rostock Port is a core port owned by the Federal State of Mecklenburg-Western Pomerania and the Hanseatic City of Rostock. Their interests are protected by the company Rostock Port GmbH.

The port has a total of over 11 kilometres of quays and there are 47 berths available. It can handle vessels of up to 260 m and a draught of 9 to 13 m.

4.11.1 Operations

Around 8,000 ferries, RoRo vessels, cargo vessels and cruise ships are cleared at Rostock Port each year.
The port has 47 berths of which 25 are special berths, 5 for ferries, 3 for RoRo vessels, 2 for coal/building materials, 1 for cement, 3 for grain, 1 for fertilizer, 3 for heavy cargo, 6 for liquid cargo and 1 for chemicals.

In 2016 the port handled in total 26.8 million tonnes of goods, over 20,000 rail wagons. Ferries and RoRo traffic account for some 16 million tonnes, up 8% from 2015.
Rostock Port is a classical universal port which can handle rolling cargo, liquid cargo, general cargo and bulk cargo as well as project cargo and ferries.

4.11.2 Development

The Port of Rostock has a very large ferry and RoRo traffic and it shows a very good development, with 8% volume increase between 2015 and 2016. The intermodal hinterland transports increased by 9% last year and the port intermodal terminal handled some 76,000 units in intermodal rail traffic on the hinterland.

4.11.3 Hinterland access

Rostock Port has access to motorways A19 and A20 which gives access to Berlin, Lübeck and Szczecin. The port has 54 kilometres of rail tracks in the port and good access to the German rail network.

4.12 Sassnitz – Mukran Port

The port of Sassnitz is a comprehensive port and it is named Mukran Port. Mukran Port is Germany's sea port with the geographic and nautical shortest distance to Scandinavia, Finland, Russia and the Baltic States. It is situated in the north east of the island Rügen. Mukran Port is managed by the port operator company Fährhafen Sassnitz GmbH.

The port has 19 berths, split between conventional, RoRo and RailRo. It can handle vessels with a navigation depth of between 6.0 and 10.5 m.

4.12.1 Operations

Mukran Port provides ferry, trail, multipurpose and offshore terminals and is the only port in central Europe that also provides broad gauge railway, in addition to standard gauge, with rail and transshipment terminals suitable for Russian and Finnish broad gauges.

4.12.2 Development

The ferry port in Mukran is one of the last major transportation projects which the former GDR realized in the 1980s. The port was to guarantee efficient ferry service for the transporting of goods to and from the former Soviet governed port in. With the new umbrella brand "MUKRAN PORT" (since 1986) Fährhafen Sassnitz GmbH repositioned itself in the market. The new name reflects the transformation of the site in recent years from a typical ferry port to one of the major industrial and commercial centres in Mecklenburg-West Pomerania. Moreover, Sassnitz-Mukran as the future establishment for installation, operation and service centre for offshore wind farms in the German Baltic Sea.

4.12.3 Hinterland access

Mukran Port has access to motorways A20, A11, A14, A19 and A24 via the direct connection from Stralsund to the island of Rügen over the new Rügen suspension bridge.
The unique standard and broad gauge infrastructure in Western Europe, the port site has excellent conditions for multimodal trading with both Scandinavia and Russia and the Baltic countries.
The port has 54 km of standard gauge railway tracks (partly electrified) and 19 km of broad gauge railway tracks (not electrified).

4.13 Primary terminals

There are two main terminals for combined transport in Scania, outside the ports. They are both owned by Jernhusen, but operated by private operators on contract with Jernhusen.

As the terminals are private it has not been possible to obtain data on for example number of units handled. However for the BTO2030 and Trans Baltic Scenario reports, we were responsible among others in collecting data on terminals. At that point (in 2011), the following data was given by Jernhusen:

Malmö Kombiterminal: >80,000 units handled in 2011 and good development expected.
Helsingborg Kombiterminal: >40,000 units handled by 2020 and good development expected.

4.13.1 Malmö Kombiterminal

Malmö Kombiterminal is part of the core network and one of Sweden's largest terminals, as regards intermodal traffic volume. The terminal handles containers, trailers and swap bodies and also offers a row of ancillary services, including cross-docking and distribution.

Mertz transport AB is the operator of the terminal. The terminal has regular combined train services on different locations in Germany for Hupac, KombiVerkehr, TX Logistik and Van Dieren. The terminal is also connected to the network of Green Cargo and the Coop-train to the Mälardalen area is also operated. The three daily trains Trelleborg/Malmö- Stockholm are always full.

In 2013 the terminal handled 17,000 units, after Cargo Net had left the Swedish market and in 2016 this has grown to some 80,000 units.

Jernhusen is investing 100 MSEK in the terminal in new cranes that will increase the capacity in the terminal by 75%. The cranes are expected to be in service in January 2018 and then the terminal has a capacity of 140,000 units.

4.13.2 Helsingborg Kombiterminal

Helsingborg Kombiterminal is an important hub for food and the terminal is situated close to the city, wherefore it is optimal for city distribution. The terminal is not included in the TEN-T core network. It has electrified rail connection, and thereby fast and easy access to the rail network. The terminal is connected to the Green Cargo national intermodal network, as well as different terminals in Germany. The Real Rail train service on Luleå and Umeå also has their starting point in the terminal.

Interlink, a part of the GDL group, is the operator of the terminal and offer handling of containers, trailers and swapbodies. The terminal also offers ancillary services, such as cross-docking and distribution.

4.14 Hinterland infrastructure

The infrastructure that connects the different ports with the hinterland is of vital interest for multimodal transports. Should there be bottlenecks in the hinterland infrastructure, it will be difficult to develop new multimodal services for freight forwarders and intermodal operators.

The most important hinterland infrastructure is described in connection with the concerned port or terminal as well as shown in chapter 6, Infrastructure development until 2030.

4.15 Secondary ports and terminals

In the following some interesting ports and terminals are described, that are outside the primary area of interest, but that could be of interest as regards the development of ports and terminals in the Scania Region for the future.

4.15.1 Køge, Denmark

The port of Køge is one of the oldest in Denmark and it is undergoing a large development in recent years, where parts of the port are moved, outwards and the old port areas are being developed for residential areas. The port is not included in the core network.

In the period 2007-2022 the port area will double.

The RoRo ferry for Bornholm is one of the main commodities.

Nearby is the Scandinavian Transport Centre (STC), a large logistics area were a lot of large warehouses are located. The latest development is that PostNord is construction a big warehouse and a parcel terminal at STC, both to be finalised by the end of 2017.

STC is situated at the big junction between the E20 from the western Denmark and the E47 from the south and the Continent.

4.15.2 Swinoujscie/Szczecin, Poland

The ports of Swinoujscie and Szczecin are located farthest to the west in Poland close to the German-Polish border. The joint port authority for the 2 ports was established in 1998. Focus is on Swinoujscie that has TEN-T core port status and ferry connections to both Ystad and Trelleborg in Scania.

The port of Swinoujscie is situated directly by the sea, whereas the port in Szczecin is situated 68 km inland. The passage from Swinoujscie to Szczecin takes 4 hours.

Swinoujscie provides ferry routes and offer access for larger vessels - with a draught up to 13.2 meters. Port in Szczecin, is available for smaller vessels - with a draught up to 9.15 meters.

Hinterland infrastructure

The ports of Szczecin and Swinoujscie have good connections to the European system via the A11 and A20 motorways, and through the national road No. 3 (E-65) connection with the south of Poland, Czech Republic and Slovakia, and onwards with the south of Europe. Both ports also have good rail connections through the Oder railway main line, connecting to the industrial centres of western and southern Europe. The ports also have inland waterway connection with the Berlin and Brandenburg region.

Development

For several years the Szczecin and Swinoujscie Ports Authority has been one of the largest investors in the region utilizing EU funding. In 2014-2015 both ports implemented projects worth more than PLN 500 million (EUR 115 million), co-funded by the EU. The Seaports Development Strategy until 2027 provides for investment into the Szczecin-Swinoujscie port complex of nearly PLN 900 million (EUR 210 million).

4.16 Economic development and infrastructure investment

There are a number of countries that are of importance for the freight flows to the Scania Region. The development differs between the countries, and is described briefly below.

The indexed development in GDP per capita, with EU-28 as Index 100 for some selected European countries is pictured in table below. As can be seen from the table, Poland has had a large increase in their GDP per capita throughout the period, followed by Slovakia.

Gross Domestic Product (GDP) per capita in PPS (Purchasing Power Standards) Index (EU28 = 100)											
geo\time	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Difference 2006-2015
EU (28 countries)	100	100	100	100	100	100	100	100	100	100	
Belgium	116	115	114	116	119	119	120	120	118	117	0,9%
Czech Republic	81	83	81	83	81	83	82	83	84	85	4,9%
Denmark	123	121	123	122	126	125	126	126	125	124	0,8%
Germany	117	117	118	116	121	124	124	124	126	125	6,8%
France	107	107	106	107	108	108	107	108	107	106	-0,9%
Italy	105	105	105	104	103	102	101	98	96	95	-9,5%
Luxembourg	256	259	255	247	254	263	258	264	266	271	5,9%
Netherlands	135	137	139	137	134	134	132	132	131	129	-4,4%
Austria	125	123	124	125	126	127	131	131	129	127	1,6%
Poland	50	53	54	59	62	64	66	67	68	69	38,0%
Slovakia	62	67	71	71	73	73	74	76	77	77	24,2%
Finland	114	117	120	116	115	116	115	113	110	108	-5,3%
Sweden	125	127	126	122	125	126	127	124	123	123	-1,6%
United Kingdom	122	117	114	112	108	106	107	108	109	110	-9,8%
Norway	181	178	188	173	177	181	186	185	178	163	-9,9%

Source: Eurostat

Below the GDP development for selected EU countries is shown, with year 2006 as Index 100. The Slovak Republic, Poland and Luxembourg have the highest growth over the period.

GDP (PPS) in EUR, converted from domestic currencies. Index 100 = year 2006

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Belgium	100	106	108	107	112	116	119	120	123	126
Czech Republic	100	112	130	120	126	132	130	127	127	135
Denmark	100	103	107	103	108	110	113	115	118	121
Germany	100	105	107	103	108	113	115	118	122	127
France	100	105	108	105	108	111	113	114	115	118
Italy	100	104	105	102	104	106	104	104	105	106
Luxembourg	100	110	113	109	120	128	131	139	147	153
Netherlands	100	106	110	107	109	111	111	113	114	117
Austria	100	106	110	107	111	116	119	121	124	128
Poland	100	115	133	115	132	139	142	144	150	157
Slovakia	100	123	145	140	148	155	159	163	167	173
Finland	100	108	112	105	108	114	116	118	119	121
Sweden	100	106	105	92	110	121	126	130	129	133
United Kingdom	100	105	92	80	86	88	97	96	106	121
Norway	100	107	115	101	118	130	144	143	137	127

Source: Eurostat

The figure below shows the development of minimum wages in some European countries. As can be seen Slovakia has the highest development within the period, followed by Poland. But there are still large difference between the Eastern European countries and the Western European countries.

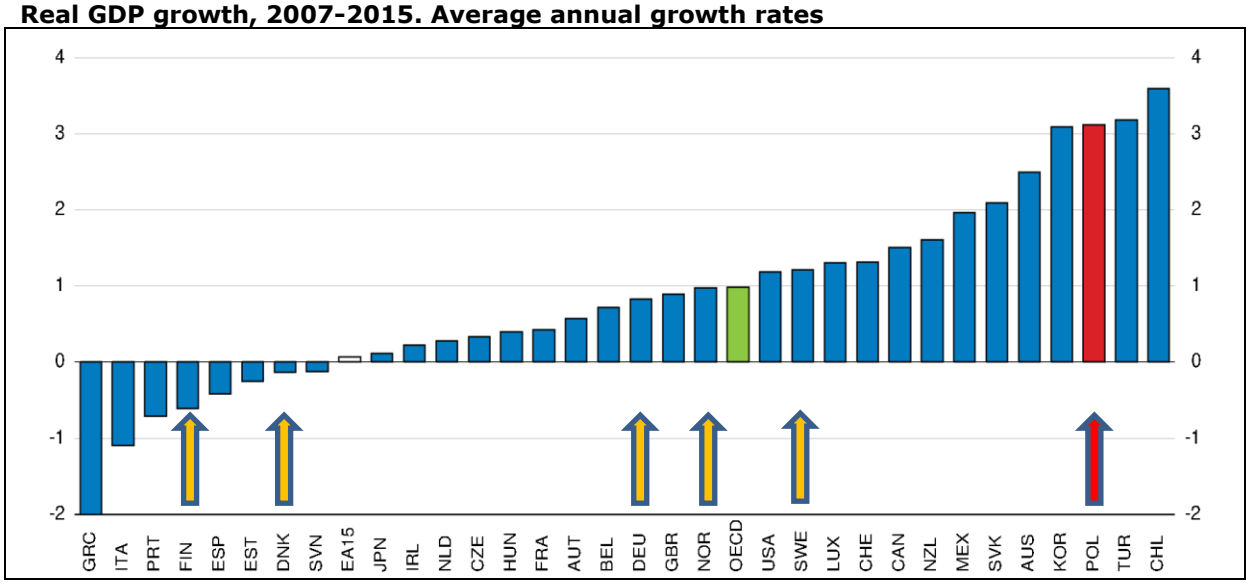
Minimum wages in EUR/month											
geo\time	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Diff. 2006-2015
EU (28 countries)	:	:	:	:	:	:	:	:	:	:	
Belgium	1 234	1 259	1 310	1 388	1 388	1 415	1 444	1 502	1 502	1 502	22%
Czech Republic	261	291	300	298	302	319	310	318	310	332	27%
Denmark	:	:	:	:	:	:	:	:	:	:	
Germany	:	:	:	:	:	:	:	:	:	1 440	
France	1 218	1 254	1 280	1 321	1 344	1 365	1 398	1 430	1 445	1 458	20%
Italy	:	:	:	:	:	:	:	:	:	:	
Luxembourg	1 503	1 570	1 570	1 642	1 683	1 758	1 801	1 874	1 921	1 923	28%
Netherlands	1 273	1 301	1 335	1 381	1 408	1 424	1 447	1 469	1 486	1 502	18%
Austria	:	:	:	:	:	:	:	:	:	:	
Poland	233	244	313	307	321	349	336	393	404	410	76%
Slovakia	182	221	241	296	308	317	327	338	352	380	109%
Finland	:	:	:	:	:	:	:	:	:	:	
Sweden	:	:	:	:	:	:	:	:	:	:	
United Kingdom	1 213	1 315	1 242	995	1 076	1 136	1 202	1 250	1 251	1 379	14%
Norway	:	:	:	:	:	:	:	:	:	:	

Source: Eurostat

The OECD published an economic survey of Poland in 2016[2] and it includes among others the following information regarding development and comparisons with other countries.

[2] https://www.oecd.org/poland/economic-survey-poland.htm

Real GDP growth, 2007-2015. Average annual growth rates

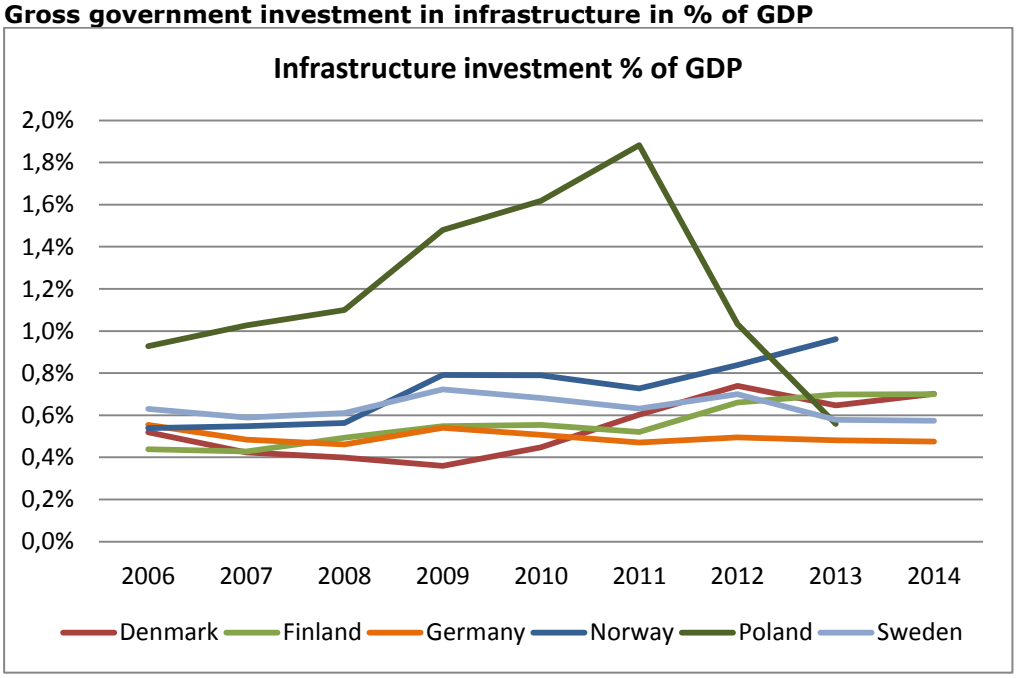


Source: OECD Economic Outlook 98 Database and updates.

Above the high annual GDP growth rates for Poland can be seen, compared with other European countries, also within the Scandria-corridor.

Strengthening transport infrastructure is partly done through investments in infrastructure and the figure below shows the gross government investment in infrastructure, as share of GDP:

Gross government investment in infrastructure in % of GDP



Source: OECD (2015), Transport infrastructure investment and maintenance spending.

The above figure shows the infrastructure investments as percentage of GDP in recent years for the Scandria countries. Poland has invested heavily in infrastructure in the period 2008-2012, with an investment peak of more than 1.5% of GDP in 2011. Norway's investment rate is increasing in the latest years towards 1% of GDP, whereas the other countries in the Scandria-corridor have investment rates of between 0.4 and 0.7% of GDP. Infrastructure investments in Germany has been lower than in the other Scandria countries since 2011

Poland

Source: https://www.cia.gov/library/publications/the-world-factbook/geos/pl.html

The Republic of Poland is the 70th largest country in the world and one of the largest in Europe with its some 312,000 km2. The country has a 440 km coastline along the Baltic Sea and apart from being neighbour other EU Member States, it also has Belarus, Ukraine and the Kaliningrad Oblast of Russia as neighbours.

Poland's natural resources are coal, sulphur, copper, natural gas, silver, lead, salt, amber and more than one third of the area is arable land.

Poland is still dependent on coal-fired plants, which also has led to large pollution. Some 89.5% of the electricity comes from fossil fuel.

Poland has been a member state of the EU since 2004 and is a member of NATO since 1999.

5 Historical port development in Scania

In the following we have looked into the recent development in the four important Scania ports. This includes the very important ferry traffic on these ports. The ferries have however not reported all their traffic for 2014, and for 2015 there are only few figures, wherefore we have chosen not to show ferry figures for 2015. We have also made own estimates on parts of the ferry traffic in 2014.

There is a split on different means, containers, flats and cassettes contra trailers and trucks. There is also a split regarding TEU and number of units, as well as in thousands of tonnes. The goods that is not unitized (such as bulk cargo) can be found in thousands of tonnes.

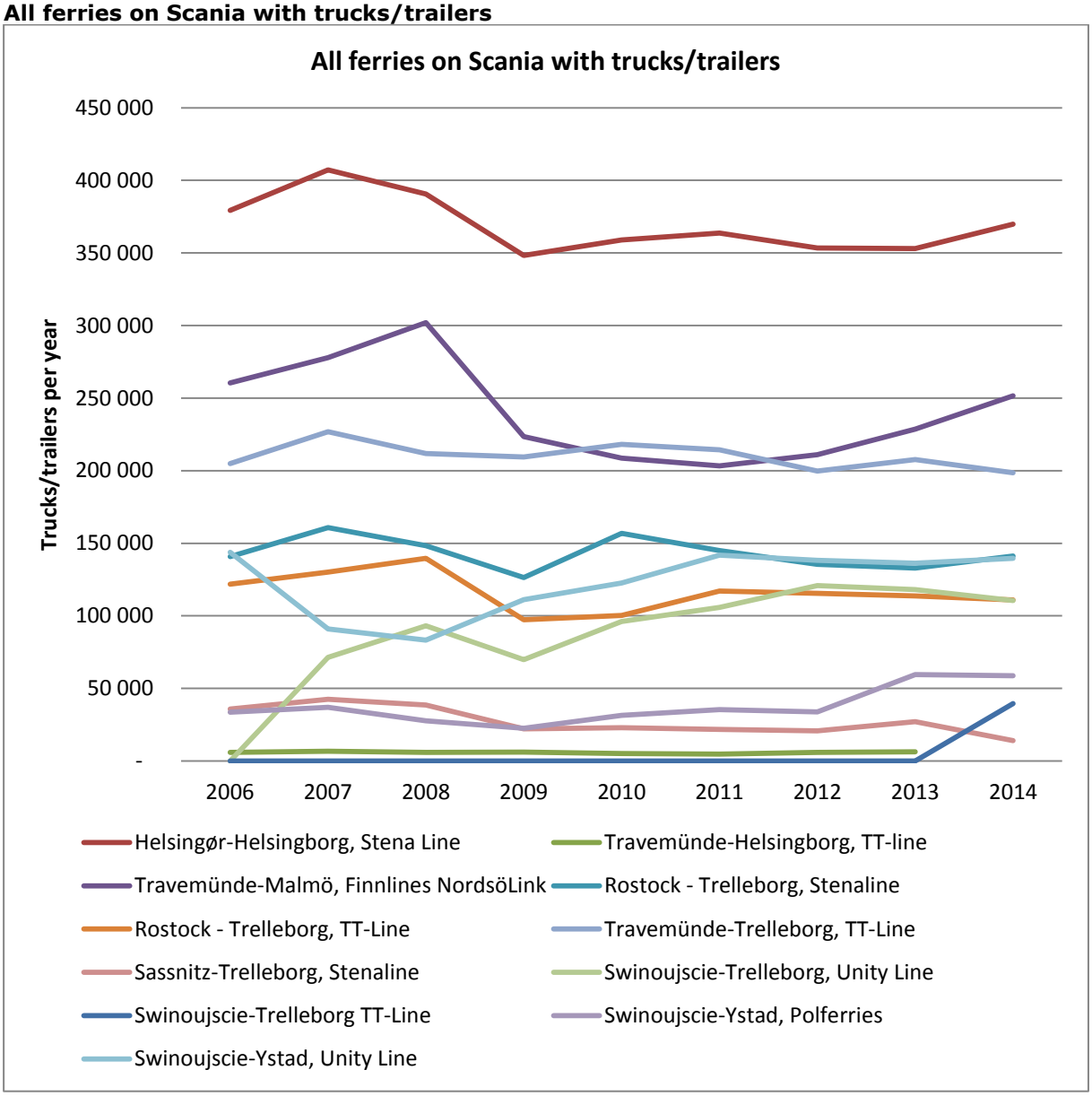
All in all the trailer traffic has a positive development the last decade. This is shown in figures at the end of the chapter. The truck/trailer volumes has decreased significant in CMP and slightly in Helsingborg, but has increased more in Trelleborg and Ystad.

5.1 Total trailer/truck traffic on Scania

The present ferry traffic with each of the main Scania ports is described under the concerned port above, including the development through the last decade, in order to see the development trend within the different routes and ferry lines.

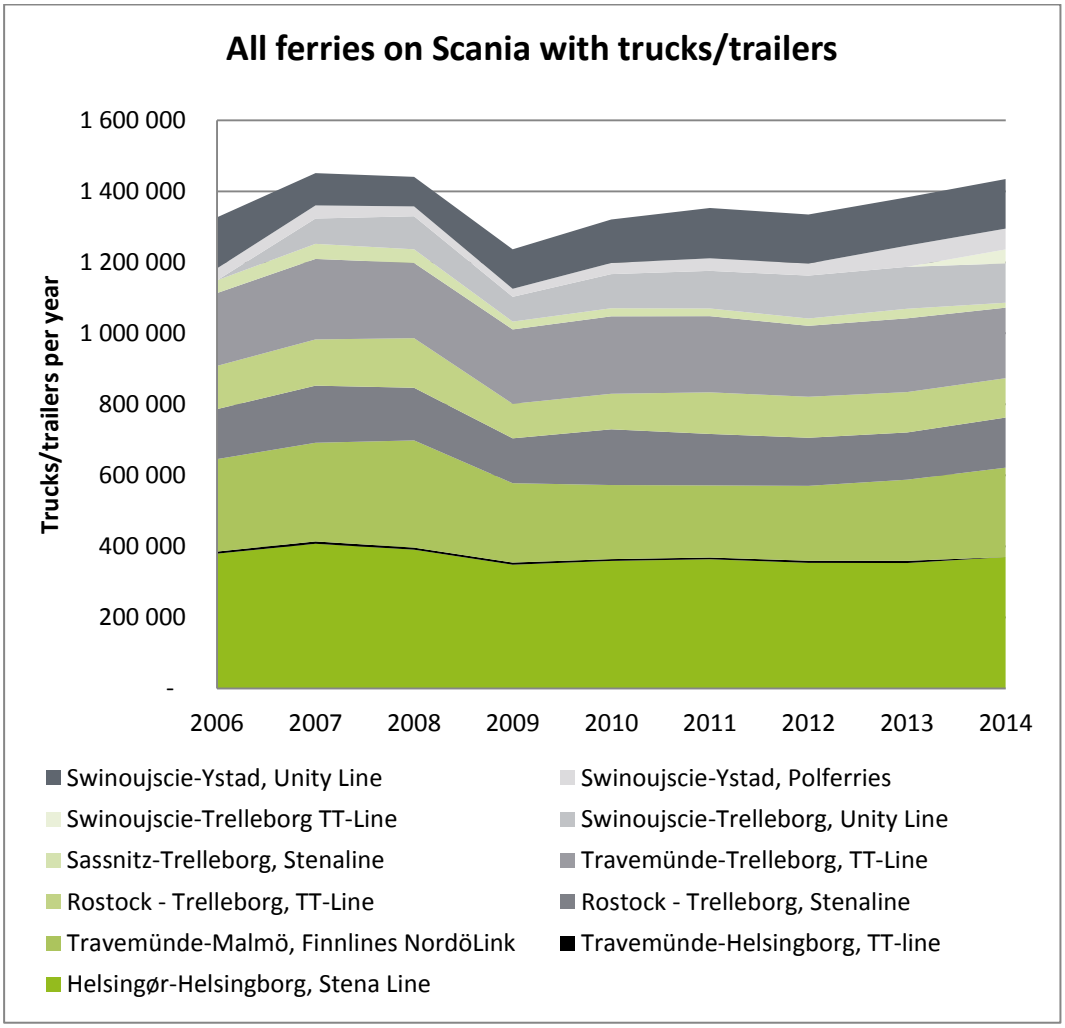
In the following the development of the dominating RoRo-traffic with trucks and trailers is described for the whole of Scania, based on the 4 main ports. The figures below therefore show all ferry routes with trailers on Helsingborg, Malmö, Trelleborg and Ystad.

All ferries on Scania with trucks/trailers



Source: Shippax, Ports of Sweden and own estimations

The figure above shows the numbers of all the RoRo lines with truck/trailer traffic on Scania and below there is a total of all the RoRo lines. As can be seen, the numbers have been fluctuating, but most lines seem to have a steady increase in the volume.

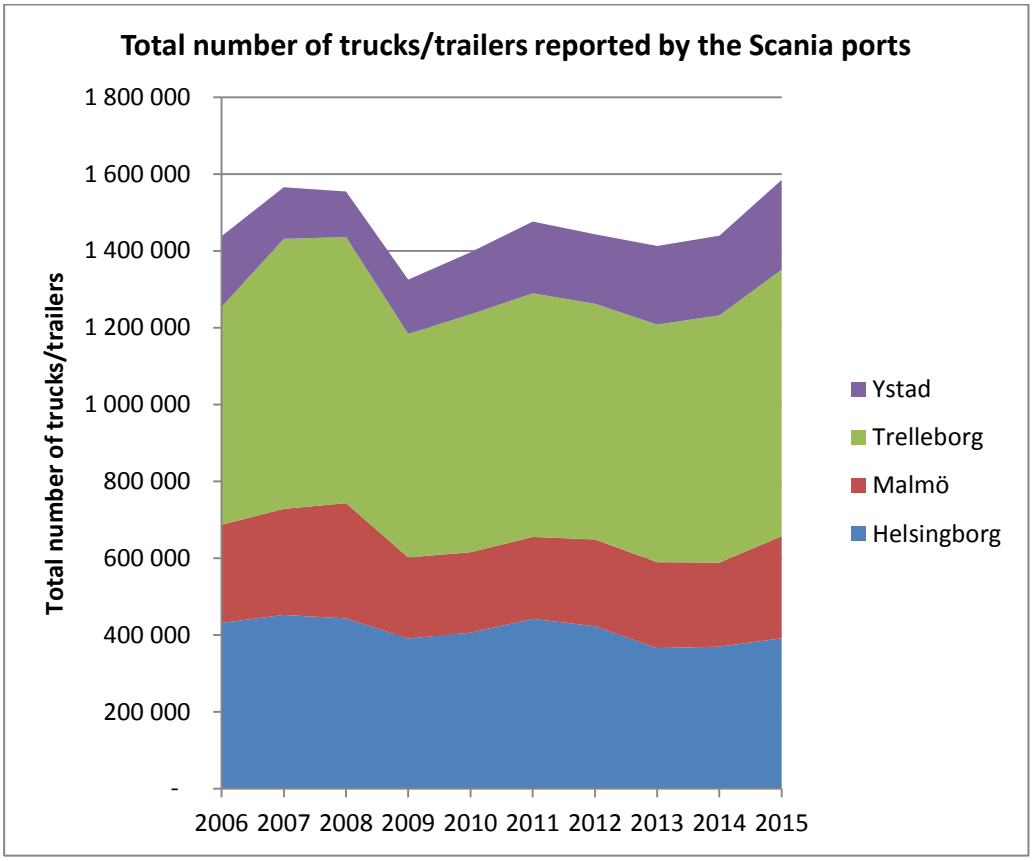


Source: Shippax, Ports of Sweden and own estimations

There is a trend of large increase in truck/trailer traffic on the ferries with Scania, from more than 1,33 million units in 2006 to a dip in 2009 to 1,24 million and then to some 1,38 in 2013.

The figure for 2014 did not include reporting from all ferry lines, as not all of them have reported their numbers for the whole year of 2014. We have therefore estimated the total volume to 1.43 million trucks/trailers in 2014.

As a comparison, we also made a figure showing the number of trucks/trailers as reported by the ports:



Source: Ports of Sweden

The total number of trucks/trailers reported in 2006 was 1.44 million units. After a dip to 1.33 million units on 2009 the volume has increased steadily to 1.44 million in 2014 and as much as 1.58 million in 2015.

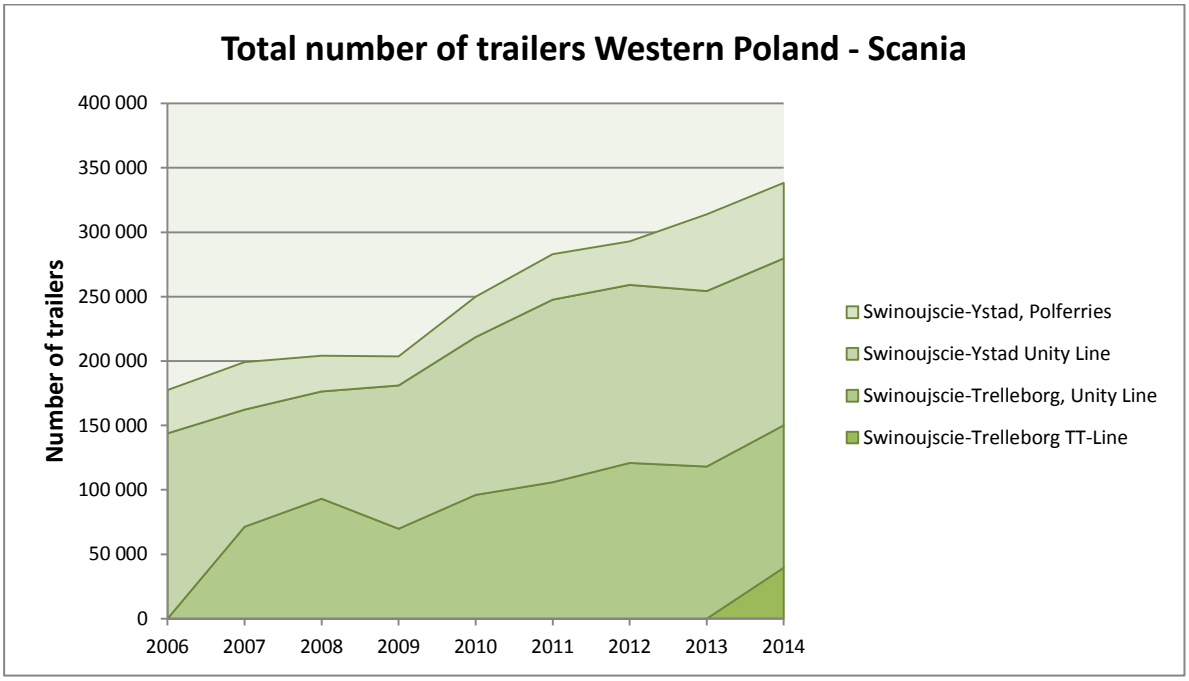
For the first half of 2016 a total truck/trailer volume of 815,000 units was reported by the 4 ports, indicating that the 2016 volume will end well above 1.6 million units. The above figures also include the ferry Ystad – Rønne, with some 9,000 units in 2015.

5.2 Poland traffic

The RoRo traffic between Scania and Poland has grown significantly during the last decade, as can be seen below. Unity Lines started up the route Swinoujscie – Trelleborg in 2007 and TT Line started on the same route in 2014.

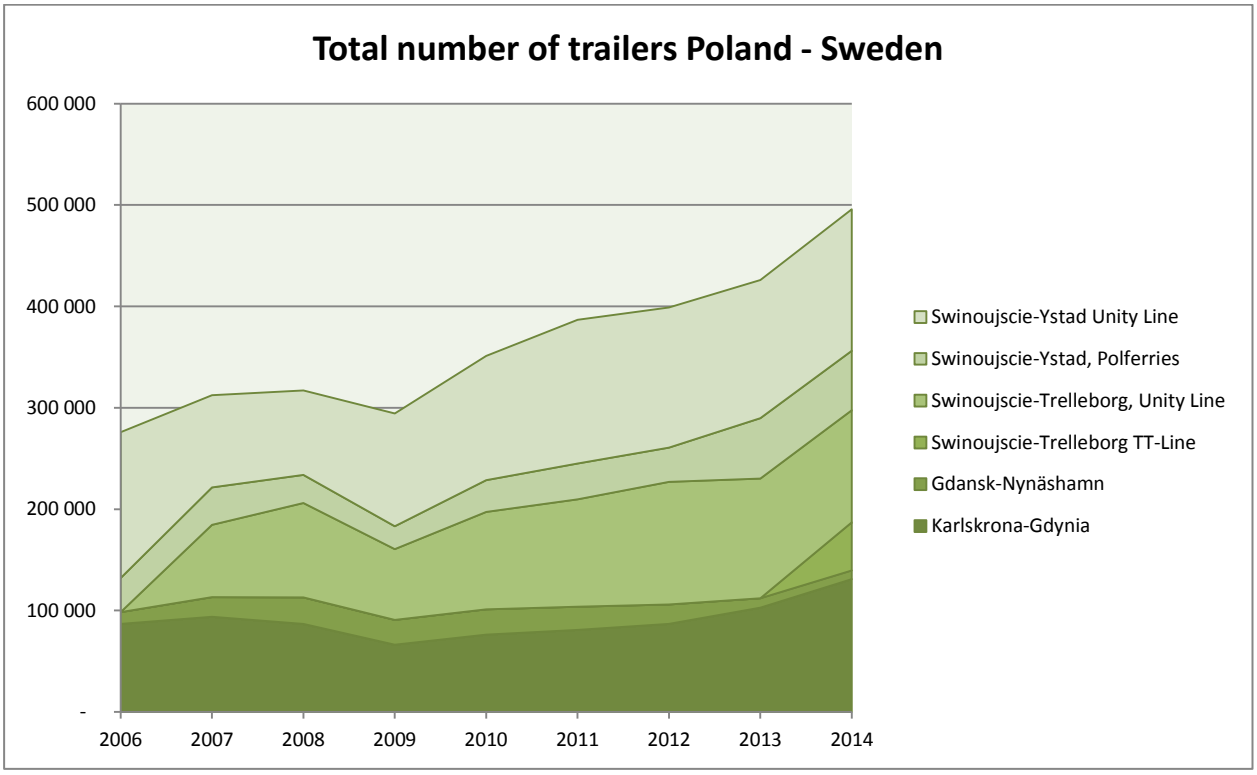
In 2006 some 177,000 trucks/trailers were transported and in 2014 some 338,000 units, which means almost a doubling of the number of units over the period. Although Polferries suffered a loss of volume during the financial crisis, Unity Line did not, as they started the Trelleborg route in 2007 and some of the volume was then transferred from the Ystad-route.

The ferry routes Poland – Scania account for two third of the RoRo volume with trucks/trailers between Poland and Sweden.



Source: Shippax, Ports of Sweden and own estimates

As a comparison, all ferry lines between Sweden and Poland can be seen below, with an increase from 223,000 trucks/trailers in 2006 to almost 500,000 in 2014, more than a doubling.

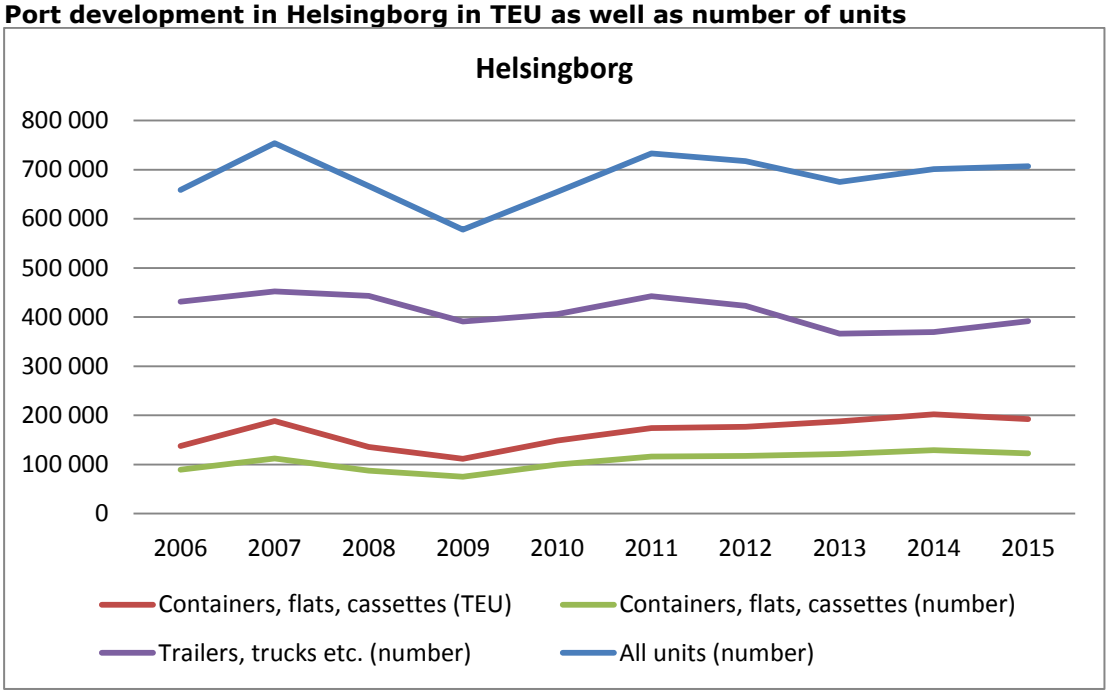


Source: Shippax, Ports of Sweden and own estimates

There are also large volumes between Norway and Poland that use the road transit route and ferries in Scania[3].

5.3 Helsingborg

Port development in Helsingborg in TEU as well as number of units

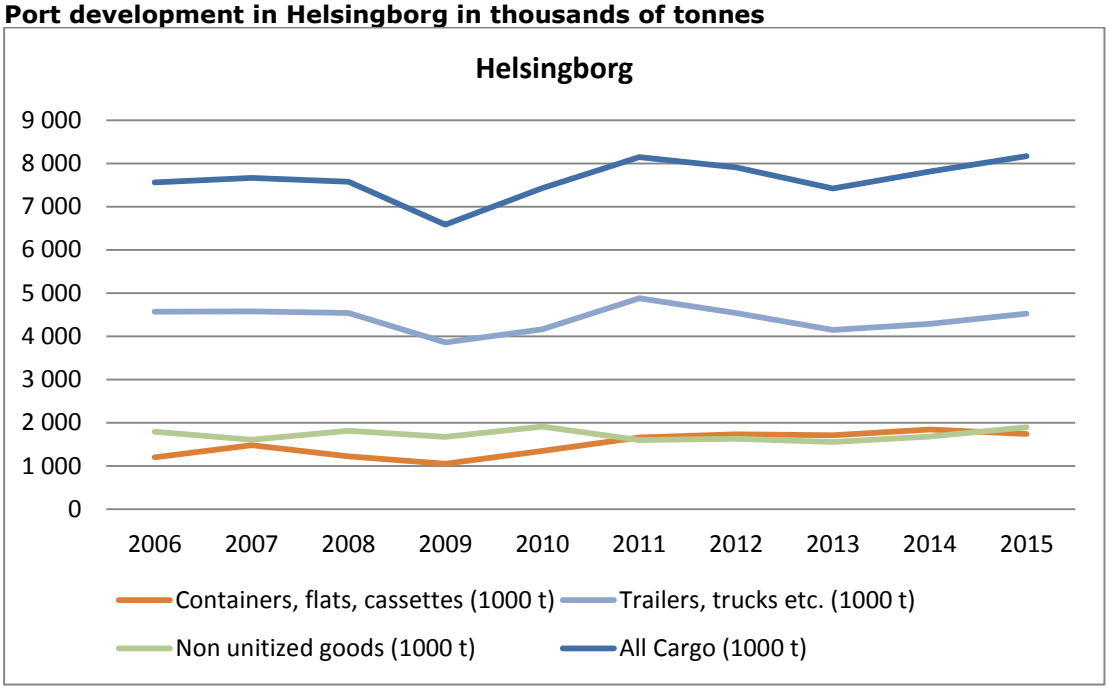


Source: Ports of Sweden

The port of Helsingborg has had an increase in the total number of units (Containers, flats, cassettes, trailers and trucks) over the last decade, although with fluctuating volumes due to the financial crisis. The volume has gone from almost 660,000 units in 2006 over a dip to 578,000 in 2009 and ending at more than 707,000 units in 2015.

[3] An overview of available data for assessing the potential for modal shift from road to rail/sea in the transport corridor between Northern Germany/Poland and the Oslo Region, Prestudy, Scandria2Act, WP 3.3.

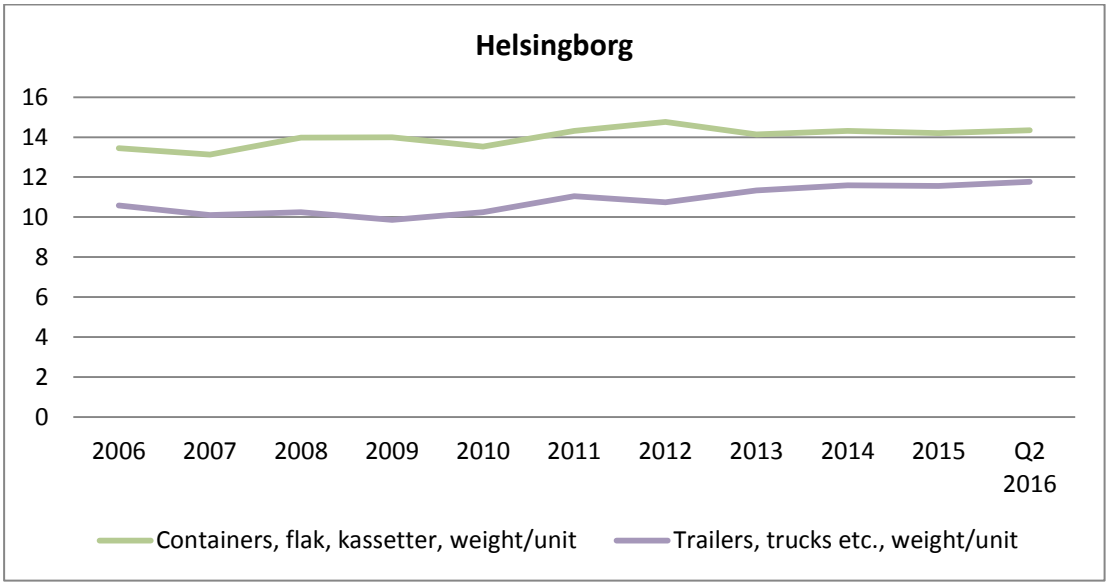
Port development in Helsingborg in thousands of tonnes



Source: Ports of Sweden

The figure above shows the development of the port volume in Helsingborg in tonnes. From almost 7.6 million tonnes in 2006, with a dip of 6.6 million tonnes in 2009 and then to almost 8.2 million tonnes in 2015, an increase over the decade of 8%.

The not unitized cargo has increased slightly over the decade with 1.9 million tonnes in 2015 compared to 1.8 million tonnes in 2006. The truck traffic fluctuates over the period, and ends at almost the same level in 2015 (4.5 million tonnes) as in 2006 (4.6 million tonnes).



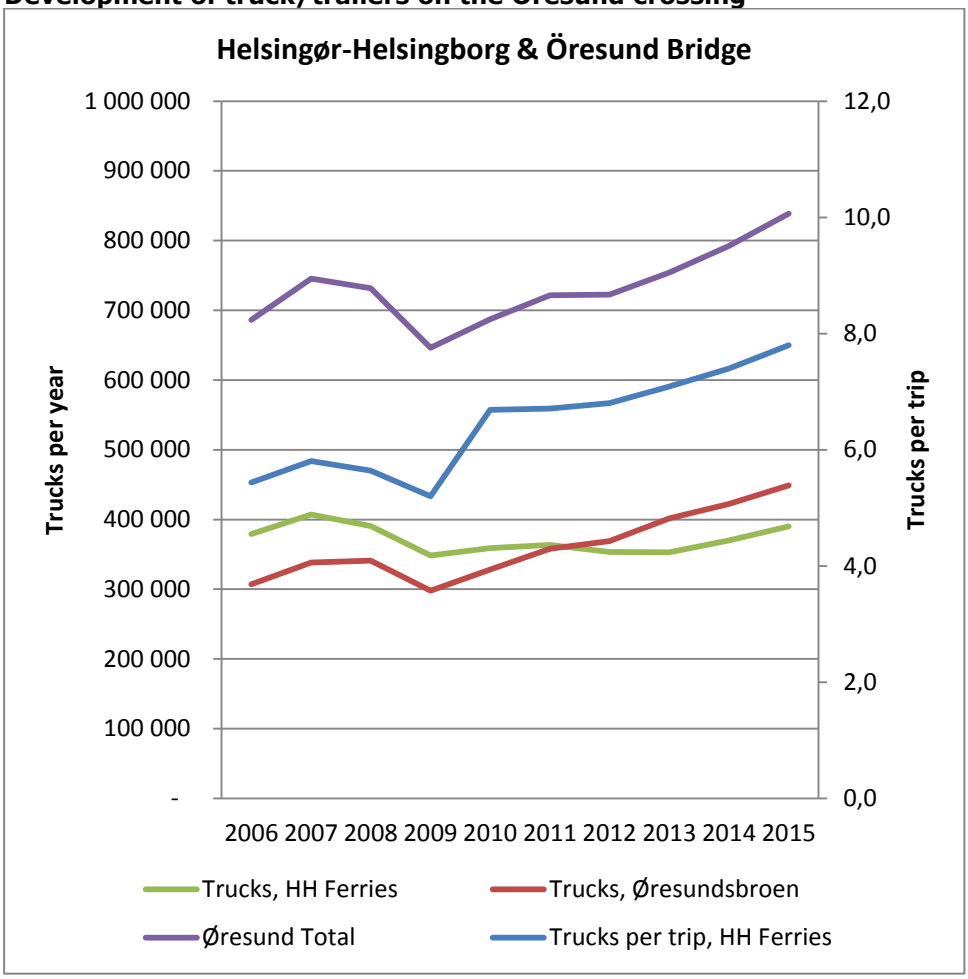
Source: Ports of Sweden

When looking at the development of the weight per unit, containers, flats and cassettes have increased their average weight from 13.5 to 14.3 tonnes/unit, whereas the trucks/trailers have increased from 10.6 to 11.8 tonnes/unit.

5.3.1 Öresund crossings by ferry and bridge

The ferry traffic on Helsingborg is dominated by the ferry crossing of Öresund to Helsingør (Elsinore). In the figure below this ferry is also compared with the traffic on the Öresund Bridge, as these are the 2 crossings between Scania and Zeeland in Denmark.

Development of truck/trailers on the Öresund crossing



Source: Shippax and Statistics Denmark

The truck/trailer traffic across the Öresund has increased significantly over the last decade, as can be seen above. This includes both the ferry service between Elsinore (Helsingør) and Helsingborg, as well as the traffic across the Öresund Bridge. The total truck traffic has increased from some 591,000 trucks annually in 2006 to 839,000 in 2015 or an increase of 42%.

The number of ferry trips on the HH route has increased from some 43,000 in 2006 over more than 54,00 trips in 2011 to 50.000 in 2015. The number of trailers per ferry-crossing has accordingly increased from 6.6 trucks/trip in average in 2006 to 7.8 trucks/trip.

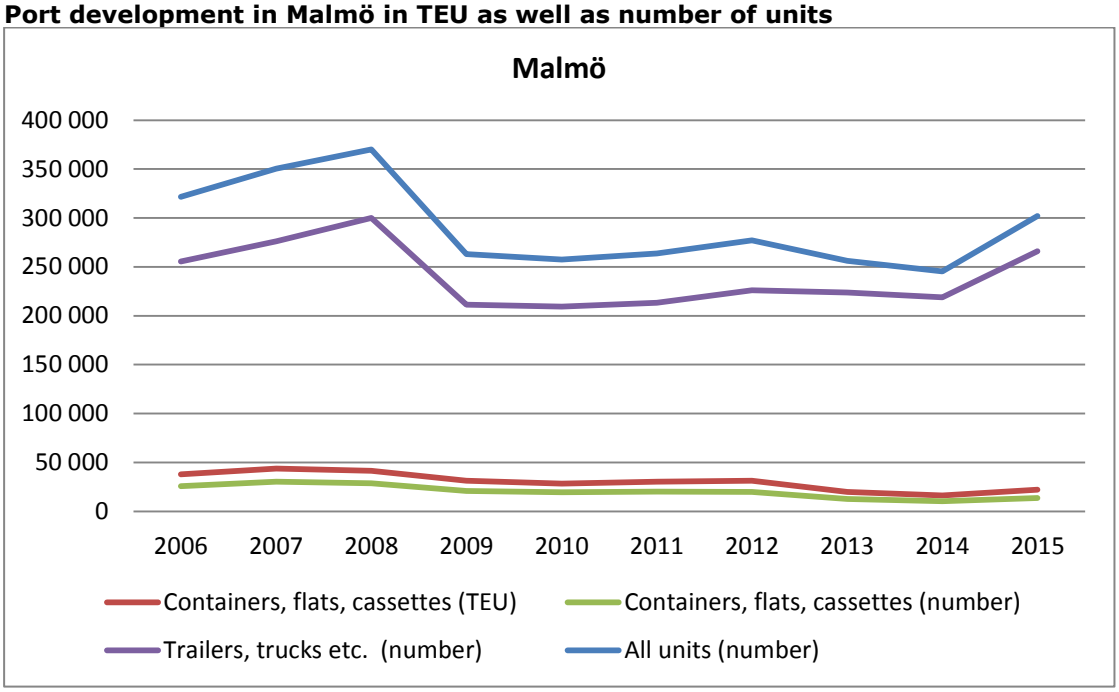
At the same time the traffic across the Öresund Bridge has increased even further than the ferries. Since 2013 the Öresund Bridge carries a bit more than 50% of the total volume of trucks across the Öresund.

5.3.2 Other RoRo ferry traffic on Helsingborg

TT Line had a weekend ferry service on Travemünde-Helsingborg, but the service ended 2013.

5.4 Malmö

Port development in Malmö in TEU as well as number of units

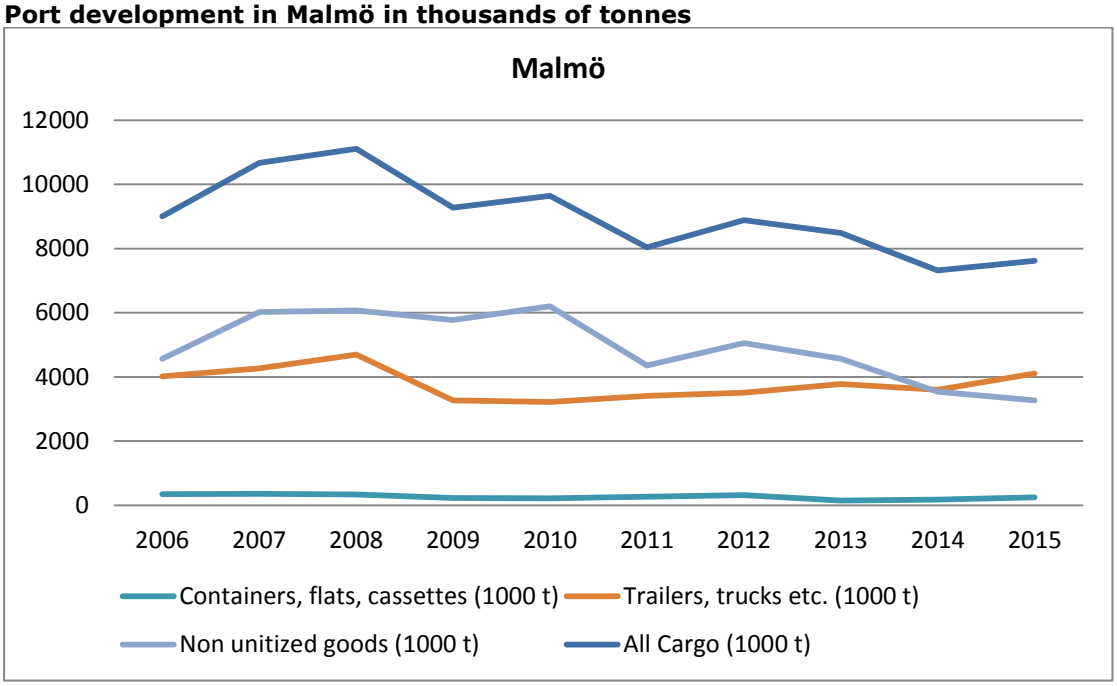


Source: Ports of Sweden

The have been considerable changes in the volumes at the port of Malmö. The truck/trailers are dominating the picture and containers, flats and cassettes have decreased in numbers with 47% between 2006 and 2015.

The truck/trailers have increased from almost 256,000 units in 2006 over a high of some 300,000 units in 2008 to 266,000 units in 2015, which is an increase of 4% over the decade.

Port development in Malmö in thousands of tonnes

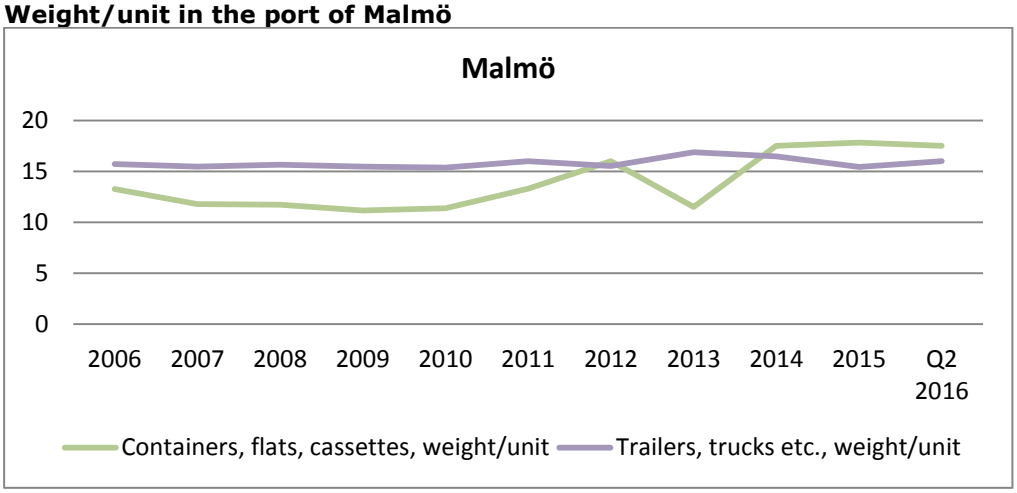


Source: Ports of Sweden

The total cargo volume on the port of Malmö has decreased from 9 million tonnes in 2006 to 7.6 million tonnes in 2015, with a high of 11.1 million tonnes in 2008.

The non-unitized cargo has decreased from 4.6 million tonnes in 2006 over 6.2 million tonnes in 2010 ton 3.3 million tonnes in 2016.

Weight/unit in the port of Malmö



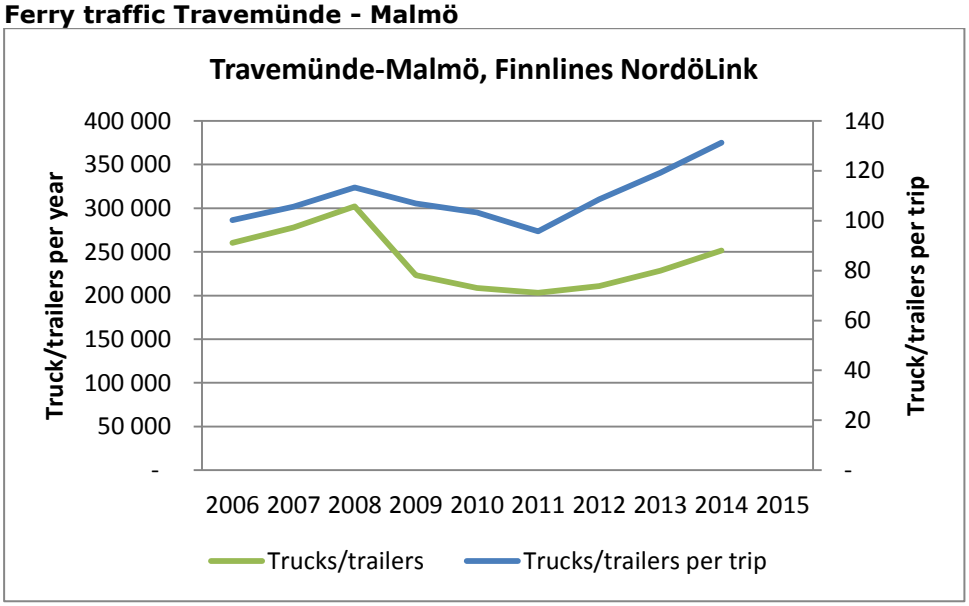
Source: Ports of Sweden

The average weight of containers, flats and cassettes have fluctuated during the decade as can be seen above. It has increased from 13.3 tonnes/unit in 2006 to 17.8 tonnes/unit in 2015.

During the decade the average TEU/unit has increased from 1.47 to 1.62, which means that the larger containers (40' and 45') are increasing.

5.4.1 Travemünde – Malmö

Ferry traffic Travemünde - Malmö

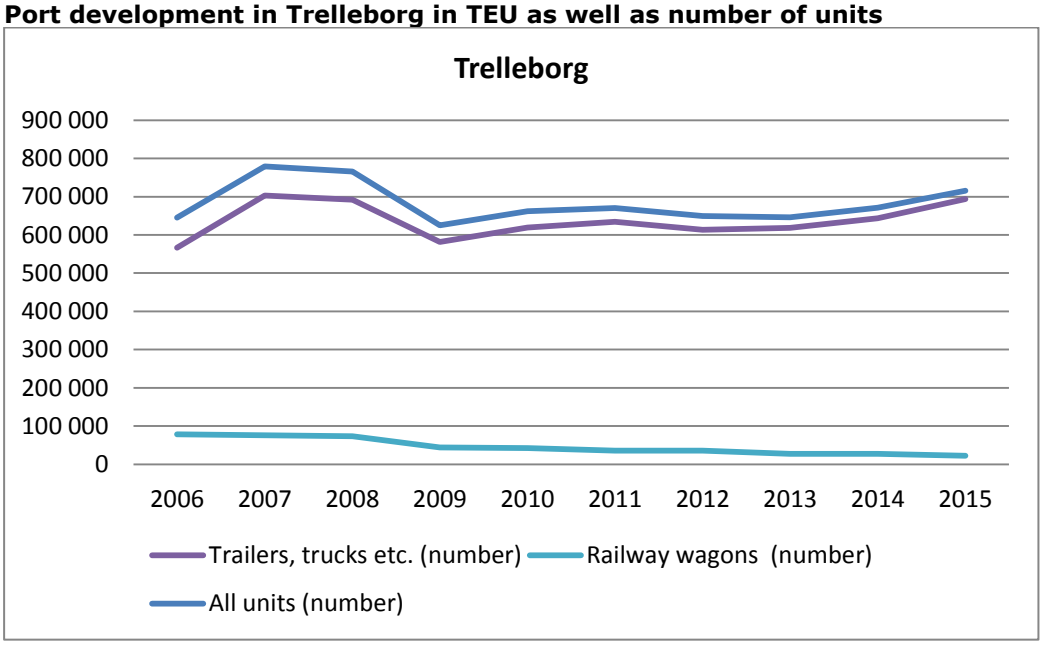


Source: Shippax

The ferry route between Travemünde and Malmö has seen a large increase in the number of passengers (+58%) and cars over the latest decade, whereas the trailer traffic has decreased from some 260.000 trailers in 2006 to 251.600 in 2014. (2015 numbers not available). The number of trips has decreased some 26% in the period and at the same time, the number of trailers per trip has increased by 31%.

5.5 Trelleborg

Port development in Trelleborg in TEU as well as number of units

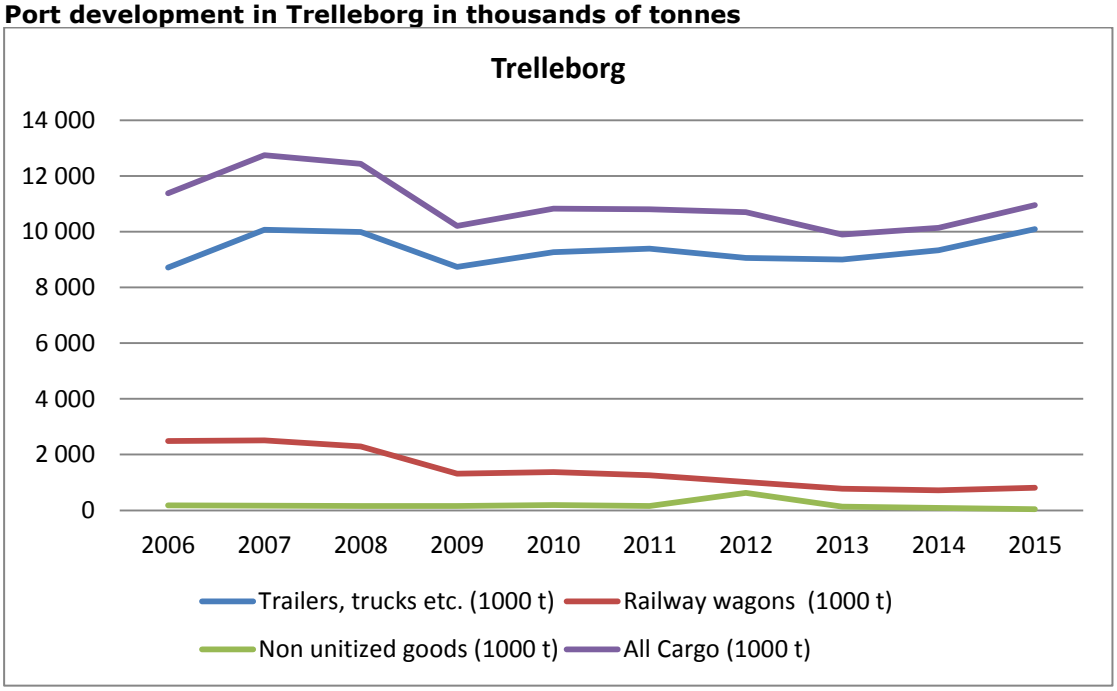


Source: Ports of Sweden

The number of truck/trailers has fluctuated during the decade, from some 567,000 units in 2006 with a high of some 703,000 in 2007 to 693,000 units in 2015, which means an increase of 22% over the decade.

The number of rail wagons has decreased to a fourth during the decade, from 78,200 in 2006 to 22,300 in 2015 (-72%). The ferries have not provided information regarding their rail wagon volume since 2013.

Port development in Trelleborg in thousands of tonnes



Source: Ports of Sweden

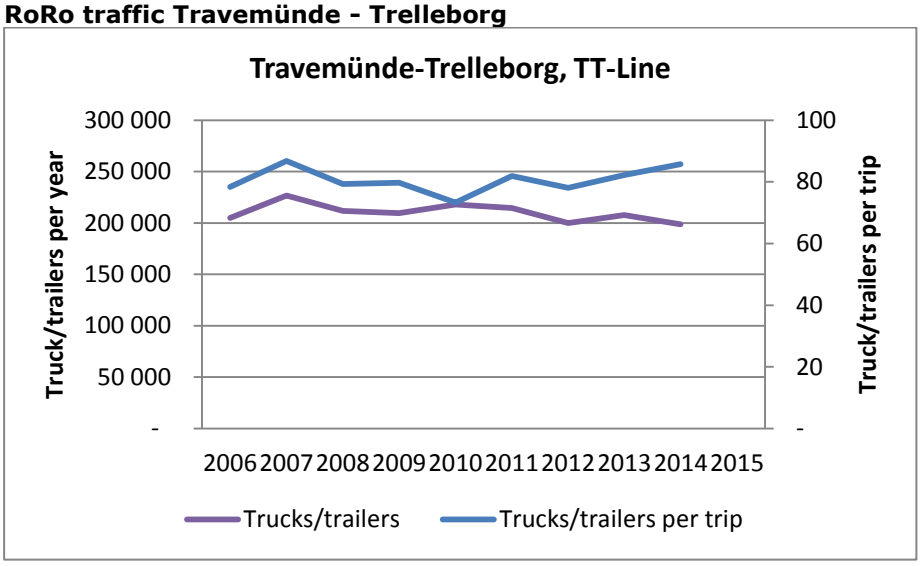
The total cargo volume on Trelleborg has fluctuated over the period and all in all had a slight decrease, from 11.4 million tonnes in 2006 to 10.9 million tonnes in 2015, with a high of 12.7 million tonnes in 2007.

The truck/trailer volumes have increased from 8.7 million tonnes in 2006 to 10.1 million tonnes in 2015 (+16%). The rail cargo volume has decreased by 67% from 2.5 million tonnes in 2006 to 815,000 tonnes in 2015.

As can be seen, the non-unitized cargo has a very low volume in Trelleborg, from 177,000 tonnes in 2006 over 623,000 tonnes in 2012 to a mere 37,000 tonnes in 2015.

5.5.1 RoRo on Trelleborg

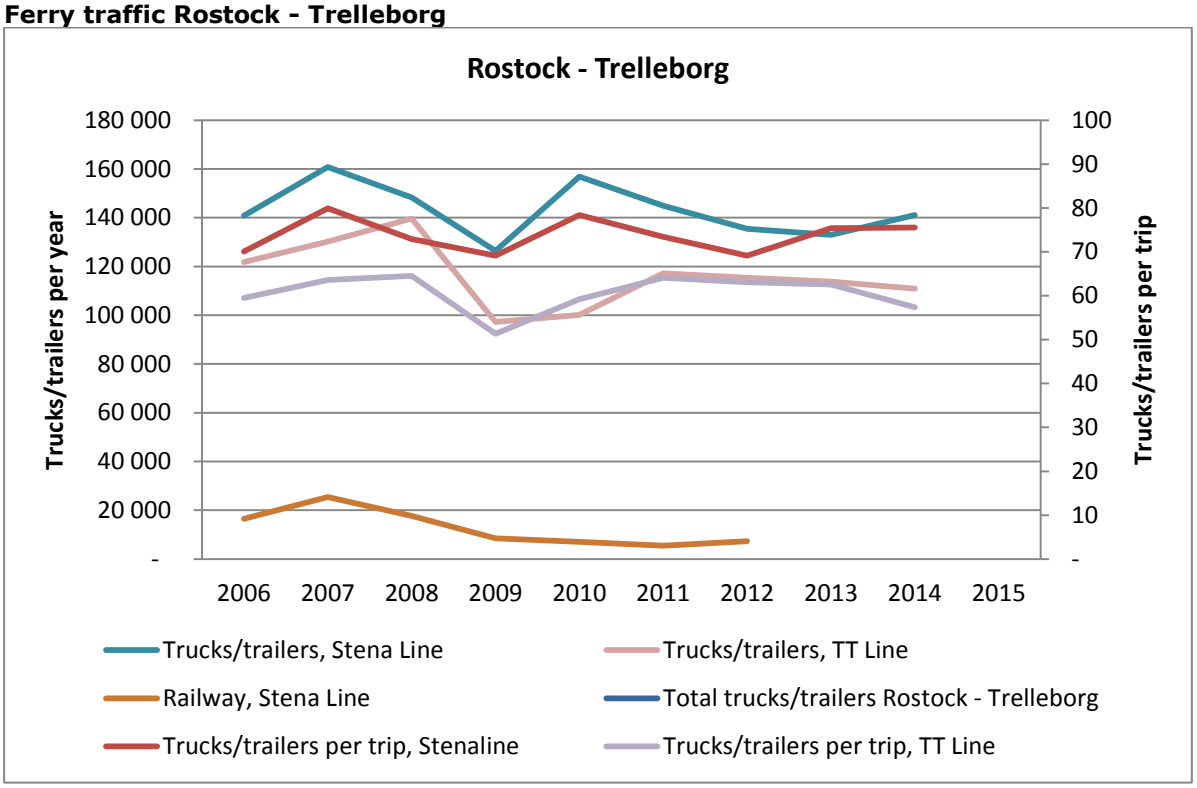
RoRo traffic Travemünde - Trelleborg



Source: Shippax and own estimates, as the volumes were not reported for the whole of 2014.

The TT Line route between Travemünde and Trelleborg has been stable in the volume throughout the last decade, with above 200,000 trucks/trailers annually. The number of trips has decreased with some 3% and therefore the number of trucks/trip has increased from 78 in 2006 to 86 in 2014.

Ferry traffic Rostock - Trelleborg



Source: Shippax and own estimates as some months have not been reported.

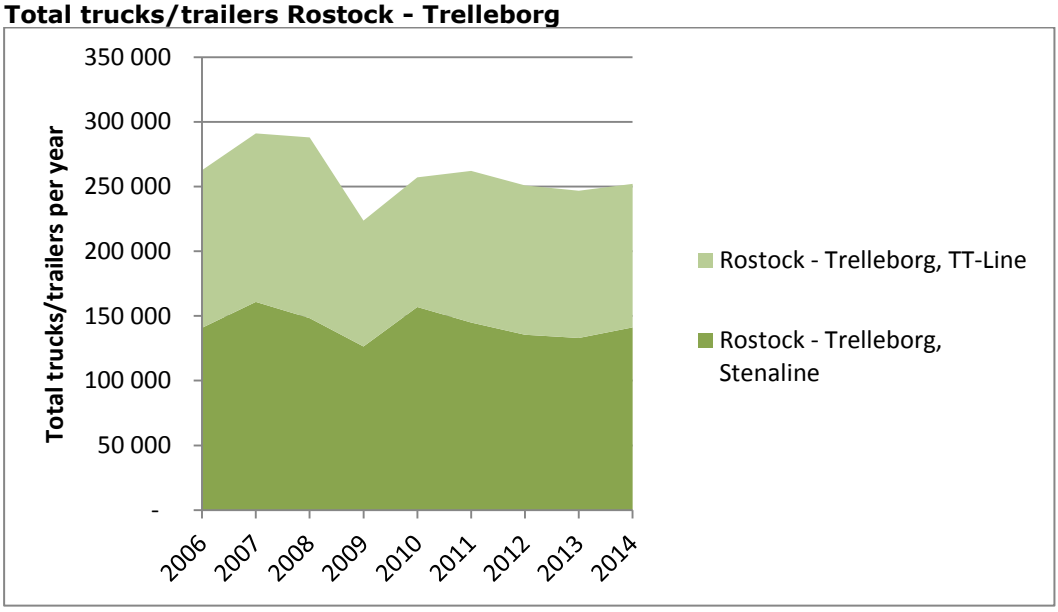
There are 2 ferry lines between Rostock and Trelleborg, Stena Line and TT Line. For TT Line the numbers end in October 2014, wherefore we have estimated the last quarter of 2014.

Both ferry lines have fluctuated a bit in volume during the decade with highs in 2007 and 2008. Overall, the volume is almost the same in 2014 as in 2006 for Stena Line, whereas TT Line has a small decrease between 2006 and 2014 of some 9%.

There are still some railway cargo volumes between Rostock – Trelleborg. However the figure above is based on available data.

No rail freight wagons have been reported by the ferry lines from 2013 and onwards.

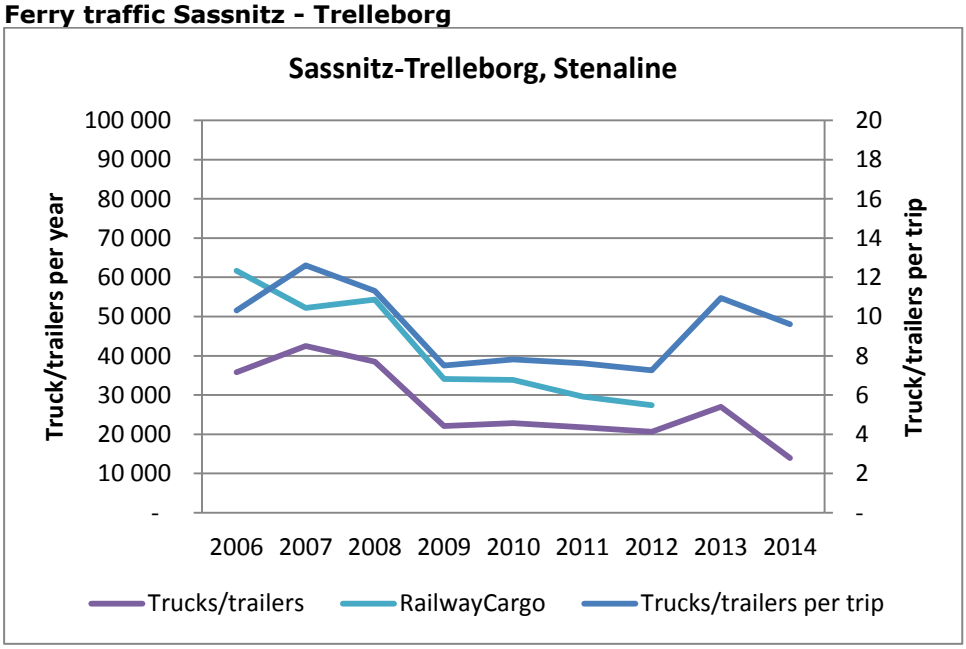
Total trucks/trailers Rostock - Trelleborg



Source: Shippax and own estimates as some months have not been reported.

The above figure shows the total of trucks/trailers between Rostock and Trelleborg. As can be seen, the volume suffered during the financial crisis with a dip of more than 60,000 units from the year before. Since then it has stabilized at around 250,000 units annually.

Ferry traffic Sassnitz - Trelleborg

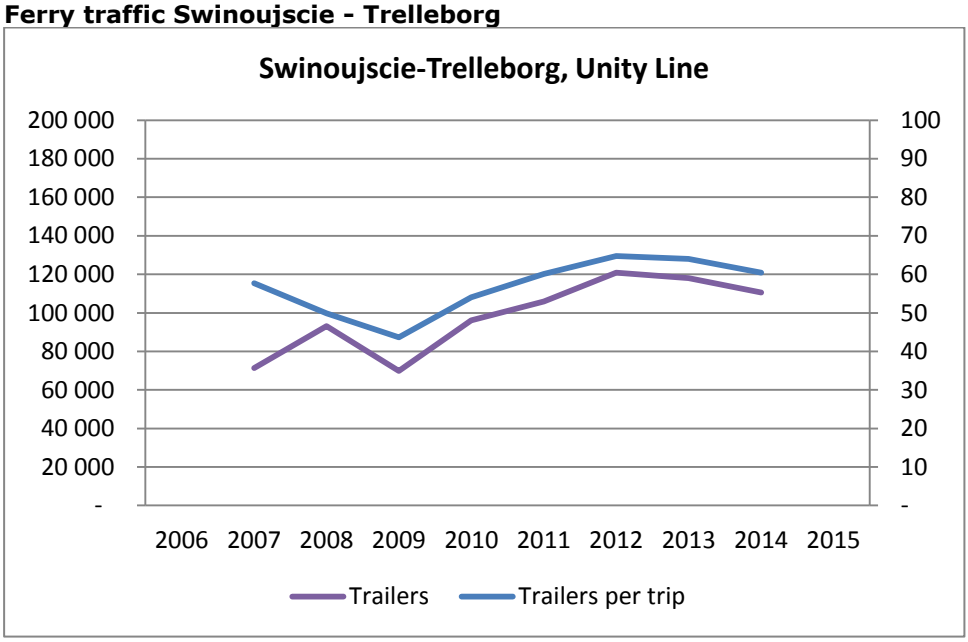


Source: Shippax

The ferry between Sassnitz and Trelleborg, now run by Stena Line, has had a fluctuating development and in 2014 a decrease in both trailers and railway wagons. This is also due to that one of the ferries was not running in the period October 2014 to May 2015, due to the Sulphur directive.

No rail freight wagons reported by the ferry line from 2013.

Ferry traffic Swinoujscie - Trelleborg



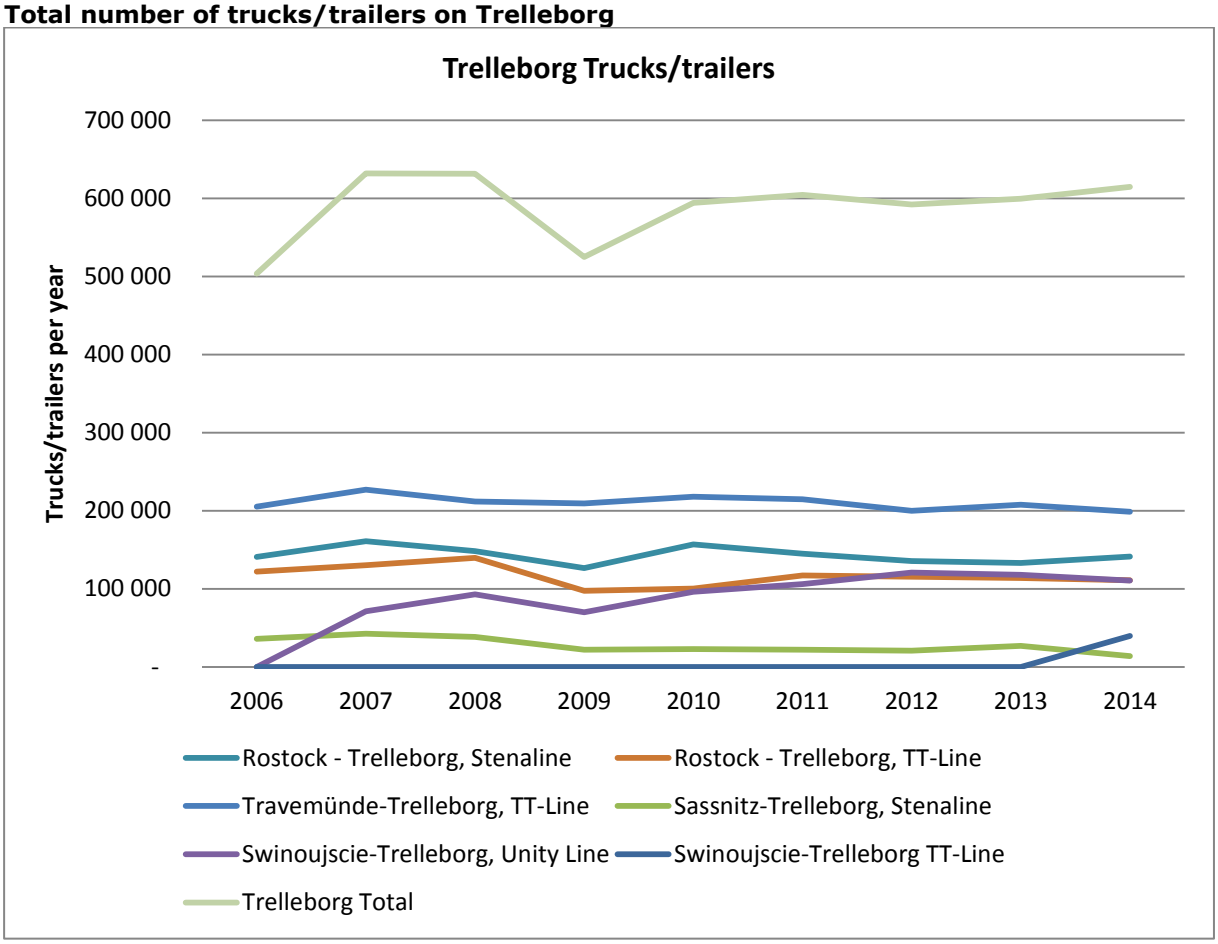
Source: Shippax

Unity Line started ferry service between Swinoujscie and Trelleborg in 2007 and TT Line started on the same route in 2014. As TT Line only has numbers for 2014, these are not in the figure.

Unity Line started with some 71,000 trailers/trucks in 2007 and this increased to more than 110,000 in 2014, an increase of 55%.

TT Line started its route Swinoujscie-Trelleborg in 2014.

Total number of trucks/trailers on Trelleborg



Source: Shippax and own estimations

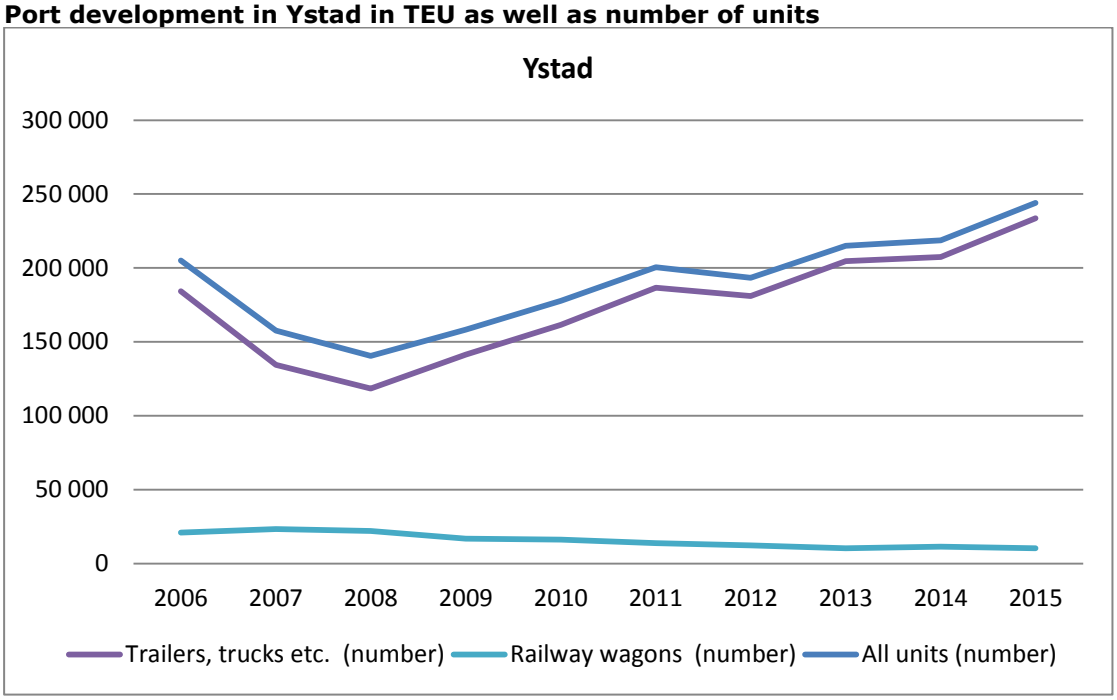
The development of the total trailer/truck traffic on Trelleborg can be seen in the figure above. The numbers for 2014 do not all include the full year for the TT Line routes, wherefore the numbers have been estimated.

There is however a rather large discrepancy in what has been reported by the port, compared with what the ferries have reported. The discrepancy in the reporting from the ferries is 3-11% of the total volume reported as truck/trailers by the port.

The trend is that the number of trucks/trailers is increasing steadily and in 2015 the port reported 8% more trailers handled compared with 2014.

5.6 Ystad

Port development in Ystad in TEU as well as number of units

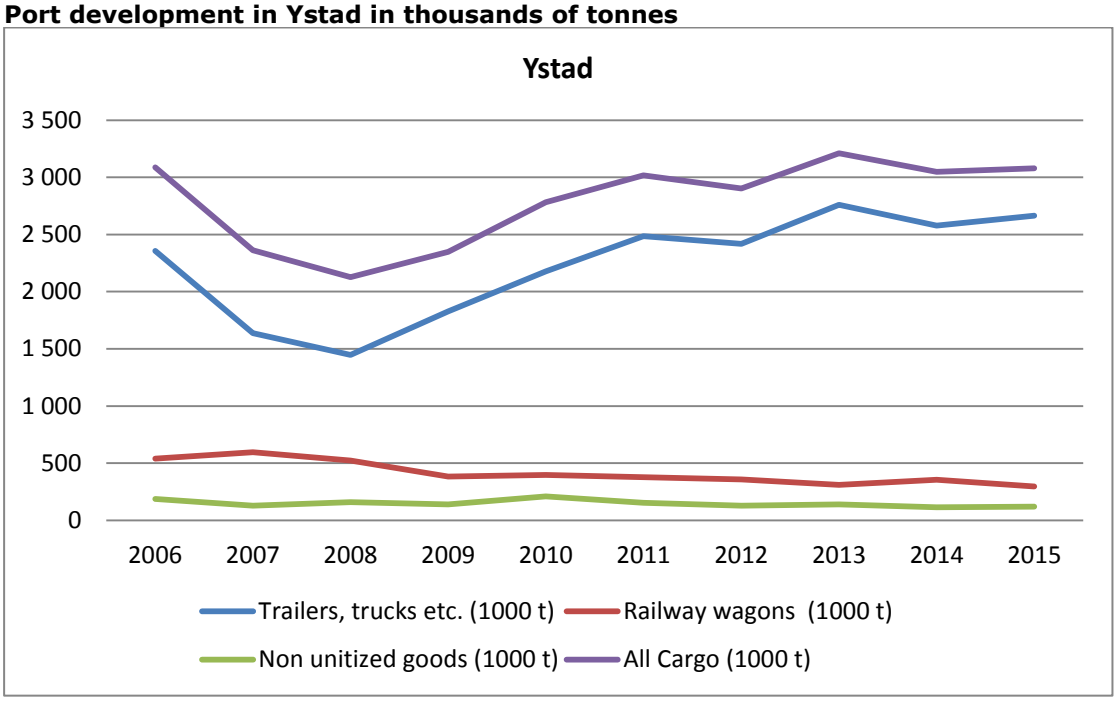


Source: Ports of Sweden

The port of Ystad recorded a large dip in the number of units during the financial crisis among the truck/trailer traffic. The numbers have increased from 184,000 units in 2006 to almost 234,000 units in 2015 (+27%), with a dip to 119,000 units in 2008. The number of rail wagons has halved during the decade, from almost 21,000 to some 10,400 wagons.

The volume on Bornholm accounts for about 4-5% of the number of trucks/trailers.

Port development in Ystad in thousands of tonnes



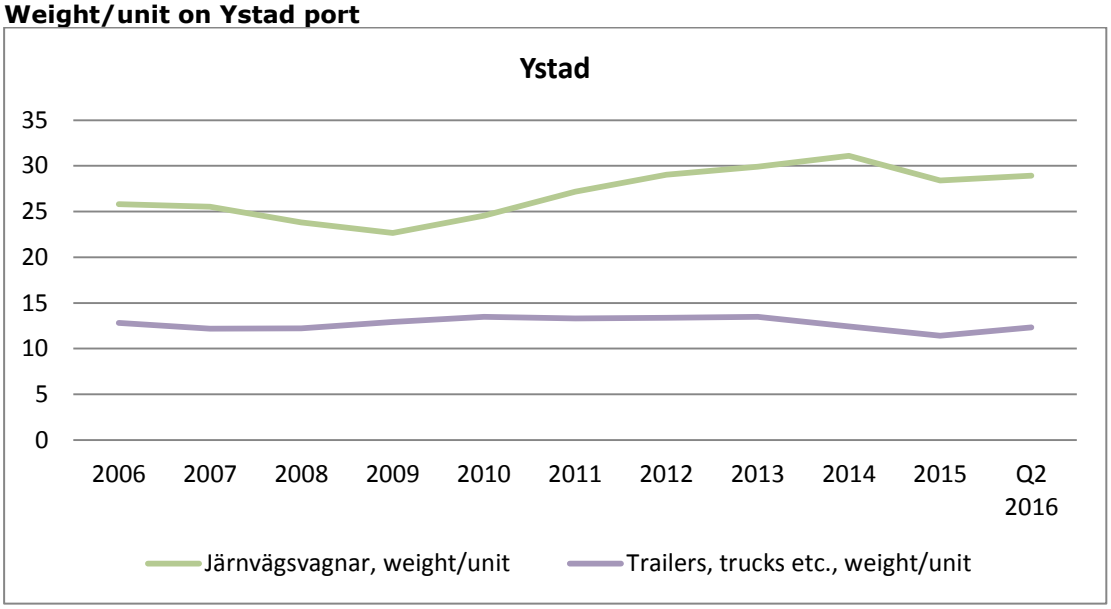
Source: Ports of Sweden

The development trucks/trailers in tonnes has also fluctuated, starting at 2.4 million tonnes in 2006 increasing to almost 2,7 million tonnes in 2015 (+13%), with a dip in 2008 to 1,4 million tonnes.

The rail cargo has decreased by 45% over the decade, from 540,000 tonnes in 2006 to 295,000 tonnes in 2015 (-45%).

The non-unitized cargo has decreased from 188,000 tonnes in 2006 over 209,000 tonnes in 2010 to 119,000 tonnes in 2015.

Weight/unit on Ystad port



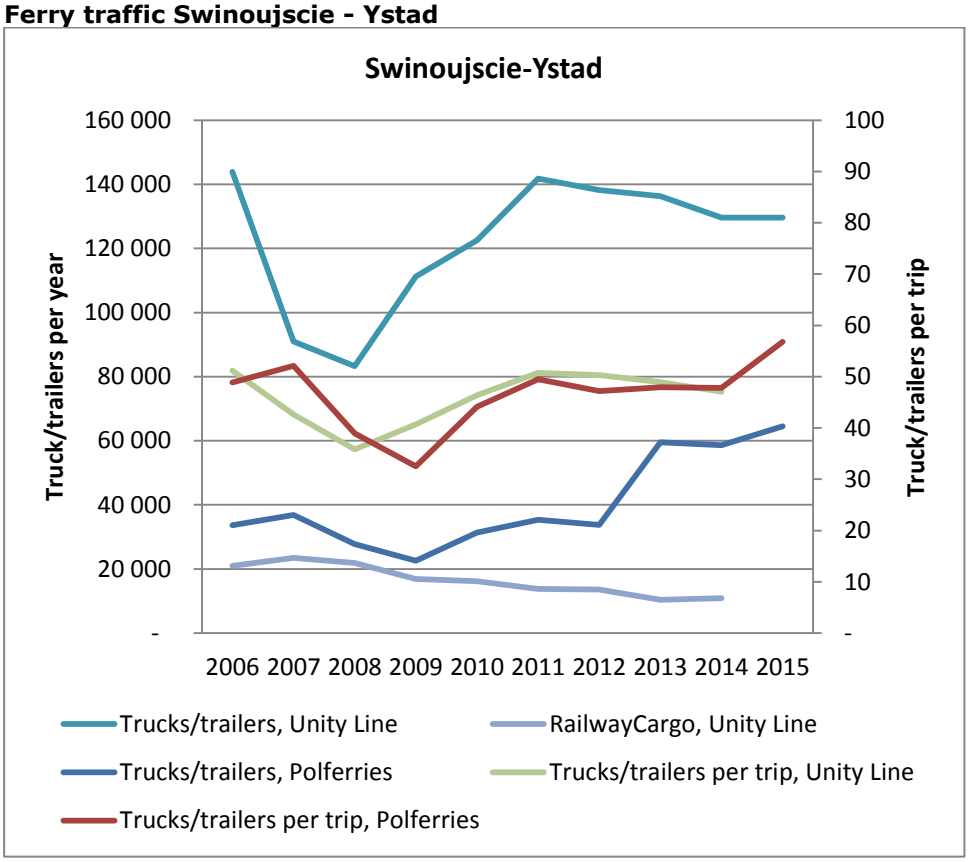
Source: Ports of Sweden

As can be seen from the figure above, the rail wagons have increased their average weight throughout the decade, from 25.8 tonnes/wagon in 2006 to 28.4 tonnes/wagons. This is probably due to a larger number of the larger wagons that can carry more cargo.

The average truck load has been quite stable around 12-13 tonnes/unit although it was only 11.4 tones/unit in 2015.

5.6.1 Swinoujscie – Ystad

Ferry traffic Swinoujscie - Ystad



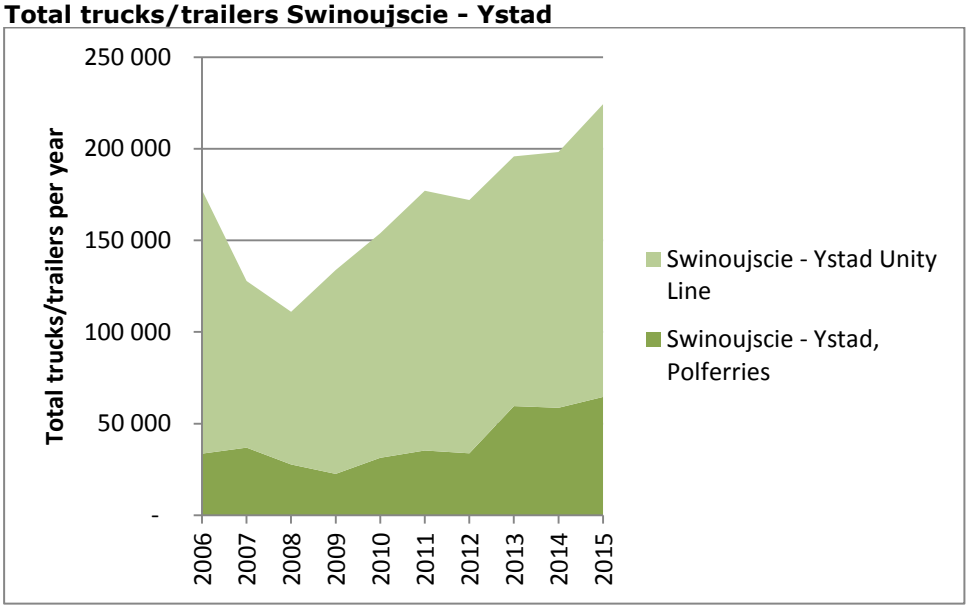
Source: Shippax, Ports of Sweden and own estimations

There are 2 ferry lines between Swinoujscie and Ystad, Polferries and Unity Line. Unity Line is the only service with railway wagons. The route carried almost 21.000 rail wagons in 2006 and this decreased to close to 10.900 in 2014 (-48%).

The total number of trucks/trailers between Swinoujscie and Ystad were some 177,000 in 2006 and the traffic had a large drop in 2007 to 111,000 trucks, thereafter the volumes have been increasing to reach some 198,000 trucks in 2014.

Polferries has almost doubled its truck volume during the decade, from almost 34,000 to almost 65,000 (+74%) in 2015. Unity Line however, had almost 144,000 trucks in 2006 and this had decreased to some 140,000 in 2014 (-10%).

Total trucks/trailers Swinoujscie - Ystad



Source: Shippax, Ports of Sweden and own estimations

As can be seen above, the number of trucks/trailers is increasing steadily on the route Swinoujscie-Ystad, and this despite that Unity Line also runs a ferry line Swinoujscie-Trelleborg since 2007 and TT Line started a ferry on the same route in 2014.

During the financial crisis mainly seen in 2008 where the total truck traffic dipped to some 111,000 trucks. From then an increase of 79% could be seen in 2014, to 198,000 trucks.

6 Infrastructure development until 2030

In order to find out which infrastructure bottlenecks that possibly will exist by 2030, compared to the infrastructure development planned for the coming years, the study of the Scandinavian-Mediterranean core network corridor has been consulted.

The study was made in 2014 and looked into the decided infrastructure projects in the ScanMed Corridor, which goes through Scania, as well as critical issues as regards possible bottlenecks that can influence the transport system in the future.

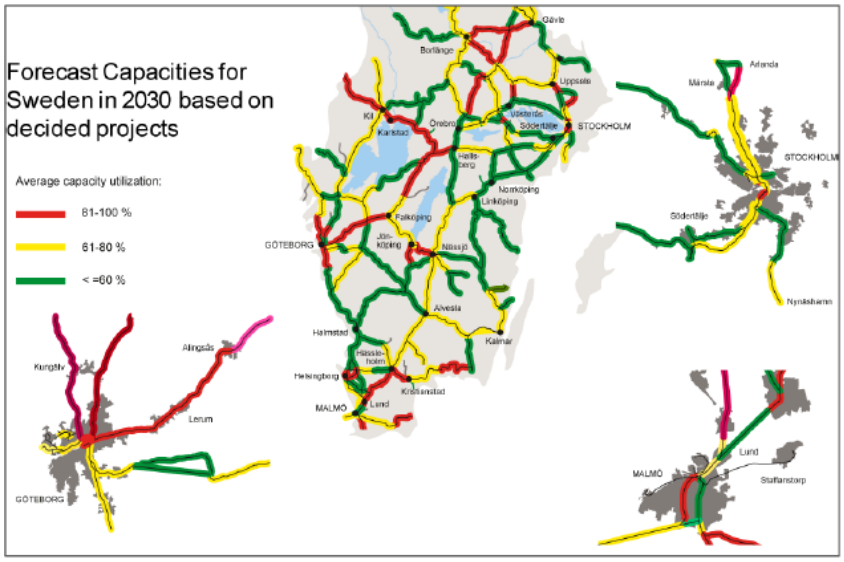
Part of the information from the ScanMed study has been updated, especially as regards the major Danish infrastructure projects, where delays have occurred since the ScanMed study was published in 2014. At the same time the Swedish Government is presently revising the infrastructure plans for the future and a new 12-year plan is expected in the beginning of 2018.

6.1 Rail infrastructure capacity

The main infrastructure bottlenecks are seen in the rail infrastructure.

As can be seen in the maps of rail capacity below, there are capacity constraints foreseen on different parts of the main rail sections in the corridor in the years to come.

Forecast capacities for Swedish rail sections in 2030 based on decided projects in the Swedish National Plan



Source: Scandinavian-Mediterranean Corridor – Draft Final report

The above figure reveals that rail capacity is expected to be exhausted in 2030 on several sections of the rail network, especially around the areas of Malmö, Helsingborg, Trelleborg and Hässleholm.

Forecast capacities for Danish and Swedish rail sections in 2020, based on already decided projects until 2020

Colour of sections: red – no capacity, yellow – limited capacity, green – free capacity
Source: Scandinavian-Mediterranean Corridor – Draft Final report

The figure above concerns rail network capacity by 2020 and includes a complete electrification of the Danish railway network (the whole project is expected finalised by 2026). The complete Danish rail network will also receive a new signalling system and this is expected finalised by 2023.

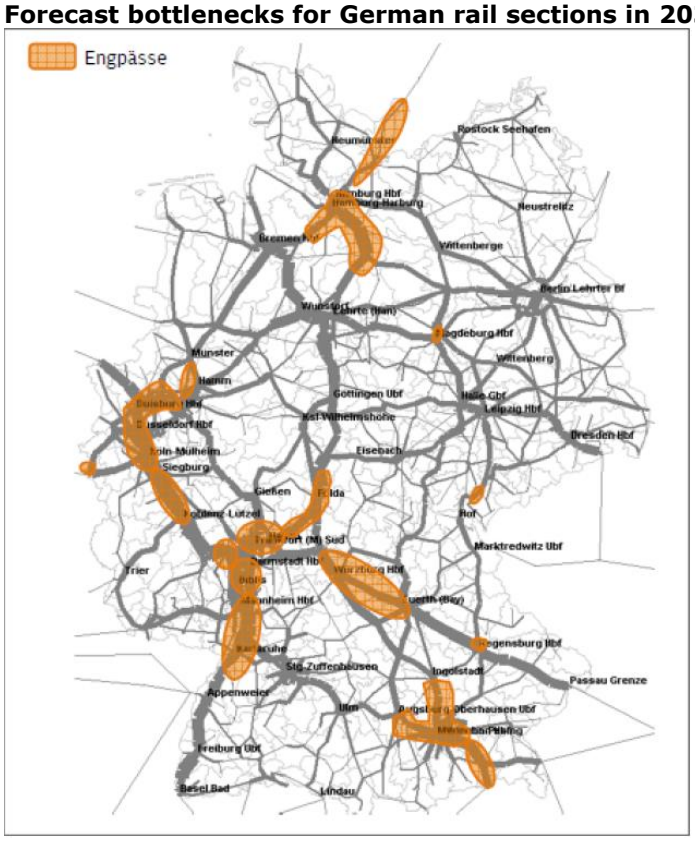
There is a bottleneck by Vordingborg, which will be removed after the construction of the new Storstrøm Bridge, expected to be finalised by 2022.

The major project Fehmarn Belt Fixed Link establishes a fixed direct connection between Scandinavia and continental Europe. In the future, freight trains will be able to avoid the 160 km longer detour via the Great Belt. This will create a strong transport corridor between the Öresund region in Denmark/Sweden and Hamburg in Germany. The Fehmarn Belt Fixed Link has been delayed several years and is now expected finalised by 2028.

The scenario above does not include the completion of the double-track extension of the southern access to the Fehmarn Belt Fixed Link in the German hinterland railway network, which will be finalised a few years after the opening of the Fehmarn Belt Link.

The figure above shows the forecast bottlenecks for German rail sections until 2030, and as can be seen, important parts of the network will have capacity restraints.

Forecast bottlenecks for German rail sections in 2030



Source: Scandinavian-Mediterranean Corridor – Draft Final report

When looking at the level of infrastructure investments in Germany, which is the lowest among the Scandria-countries (see figure on page 33) there seem to be a mismatch to the expected infrastructure restraints.

6.2 Future road infrastructure capacity

Unfortunately the ScanMed study does not include a map over expected capacity constrains in the road network in Scania or Denmark in the future.

Major critical issues and works in the road infrastructure in Scania and surrounding areas in the near future:

- E6 sections in Scania
- Køge Bugt Motorway near Copenhagen, expansion finalised by 2018
- Puttgarden – Oldenburg
- A7 Rader Hochbrücke with speed limits for heavy trucks, new bridge expected by 2026
- Other A7 sections where expansion is going on

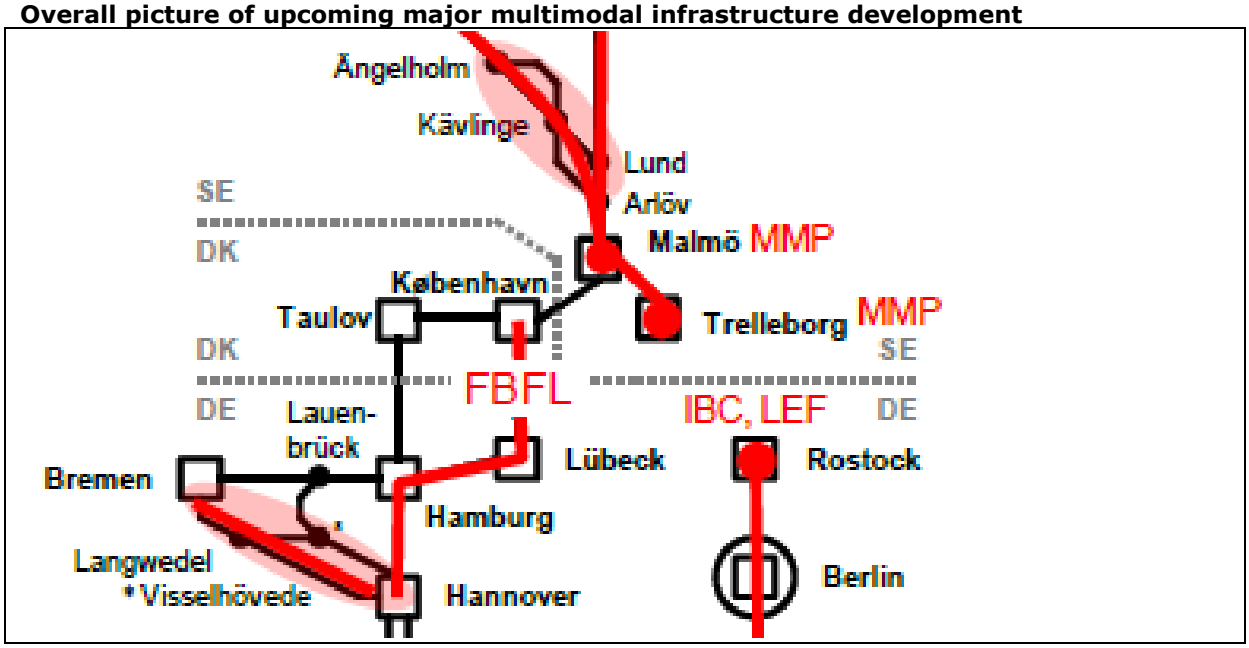
For northern Germany the picture below shows the road sections where larger congestion is expected for 2025. Dark blue sections will have congestion more than 300 hours per year. Light blue sections will have congestion more than 100 hours per year.

Forecast capacities for German road sections in 2025 based on road network 2015 (BMVI 2014)

Source: ScanMed study
Dark blue sections will have congestion more than 300 hours per year.
Light blue sections will have congestion more than 100 hours per year.

The ScanMed study also includes a figure where the major multimodal infrastructure development plans are included as can be seen below.

Overall picture of upcoming major multimodal infrastructure development



Source: ScanMed study 2014

Explanations to the map above: Pre-identified sections, including projects:

Rail (studies and works)

FBFL = Fehmarn Belt Fixed Link

IBC = Ice-breaking capacities

LEF = Low emission ferries

7 Swedish trade with commodities and trade development

The Swedish trade has developed with much higher growth rates in the Eastern European countries in the latest years.

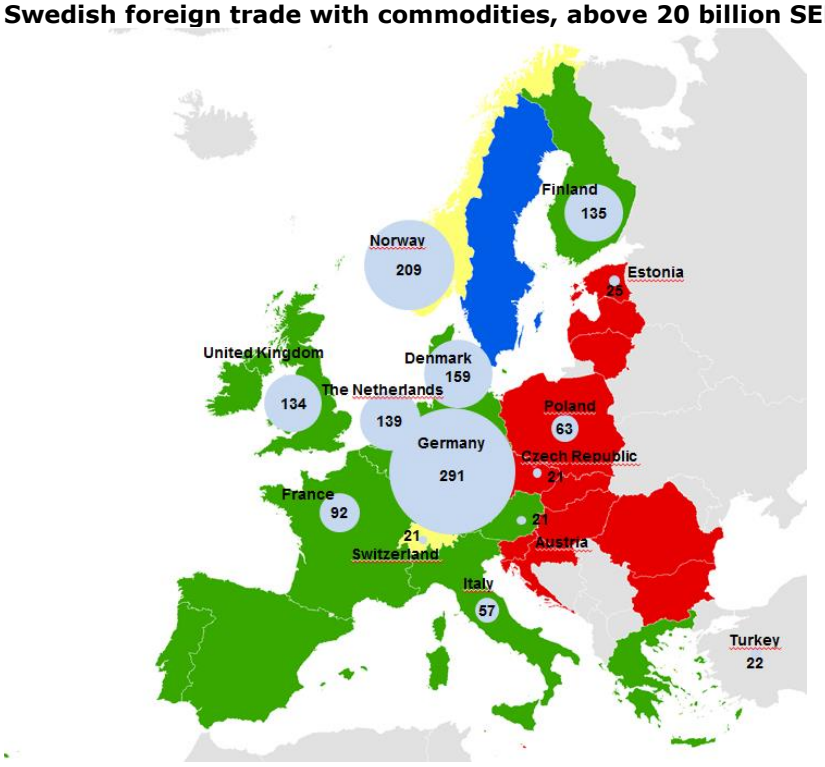
Sweden's 25 largest European trade partners 2013, and changes from 2003

	Billion SEK	2013	2011 (highest year)	Diff 2013 to 2011	2003	Diff 2013 to 2003	Position change 2003 to 2013
1	Germany	291,3	329,8	-12%	208,4	40%	
2	Norway	209,2	212,3	-1%	123,2	70%	
3	Denmark	157,5	168,9	-7%	115,6	36%	up 1
4	The Netherlands	138,8	130,4	6%	86,0	61%	up 2
5	Finland	134,5	135,2	-1%	87,1	54%	
6	UK	134,2	152,8	-12%	118,3	13%	down 3
7	Belgium	95,2	98,9	-4%	65,4	46%	up 1
8	France	92,4	107,3	-14%	77,5	19%	down 1
9	Poland	62,9	64,0	-2%	29,3	115%	up 2
10	Italy	57,5	63,6	-10%	52,7	9%	down 1
11	Spain	31,5	36,8	-14%	37,3	-16%	down 1
12	Estonia	24,7	30,9	-20%	12,2	103%	up 3
13	Austria	21,5	24,1	-11%	17,7	22%	
14	Czech Republic	20,9	22,6	-7%	8,6	142%	up 2
15	Switzerland	20,8	21,1	-1%	18,0	16%	down 3
16	Ireland	17,1	25,6	-33%	15,4	11%	down 2
17	Lithuania	12,4	11,8	5%	6,9	81%	up 2
18	Hungary	11,1	12,9	-14%	8,2	35%	up 1
19	Portugal	8,5	10,0	-14%	7,4	15%	down 1
20	Latvia	8,4	8,9	-6%	6,6	28%	
21	Slovakia	8,4	10,6	-21%	2,5	231%	up 2
22	Romania	5,8	4,9	20%	2,4	146%	up 2
23	Greece	3,5	4,6	-24%	5,8	-40%	down 2
24	Luxemburg	3,2	3,5	-8%	2,9	8%	down 2
25	Ukraine	2,6	4,2	-37%	2,0	31%	up 2

Source: SCB, foreign trade with commodities

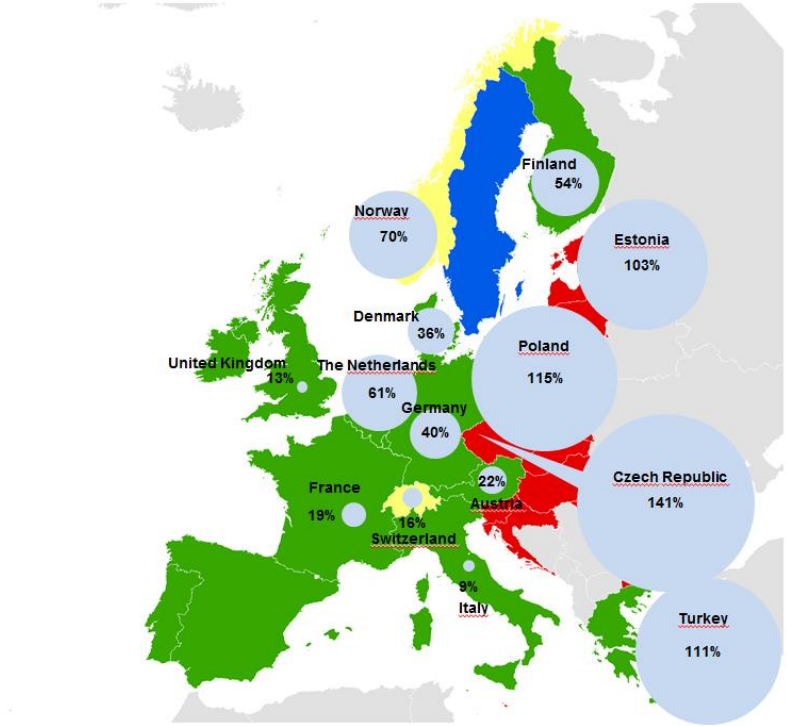
As can be seen in the above list, there have been some changes as regards trade partners in the years from 2003 to 2013. Poland is now no. 9, having surpassed both Italy and Spain. The Czech Republic has also climbed 2 steps to no. 14, surpassing Switzerland and Ireland. Lithuania, Slovakia, Romania and Ukraine have also managed to move 2 positions forwards as European trade partner in the period 2003-2013.

Swedish foreign trade with commodities, above 20 billion SEK in 2013



Source: SCB, foreign trade with commodities

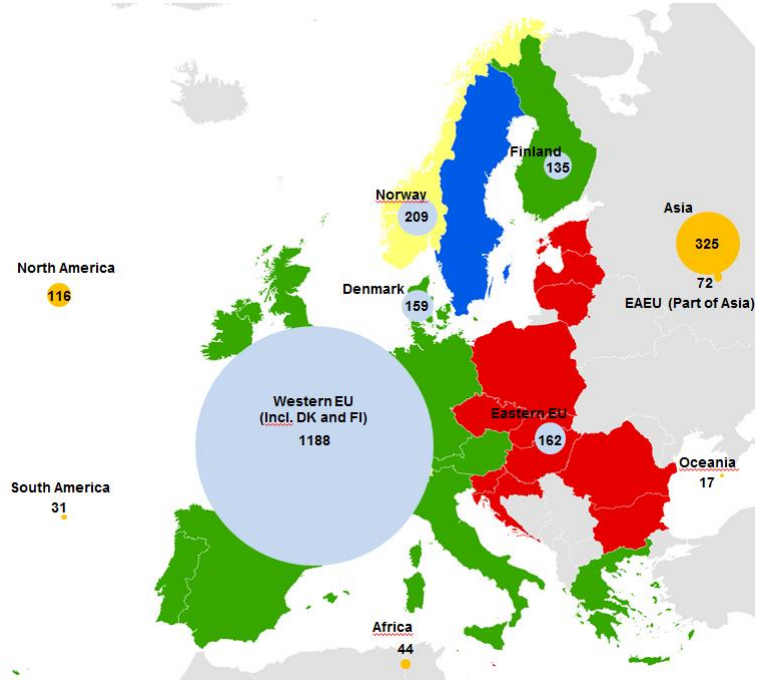
Relative change in % in the Swedish foreign trade between 2003 and 2013



Source: SCB, foreign trade with commodities

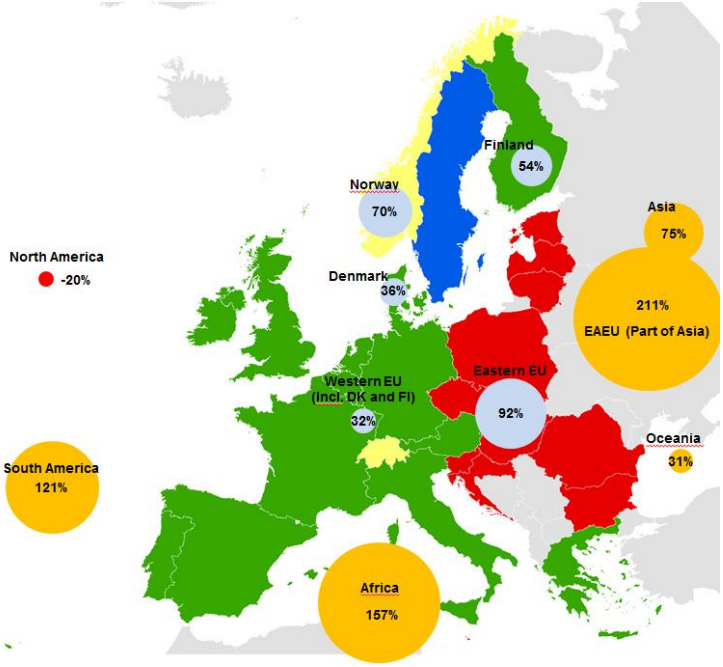
When looking at the global trade, the following picture of the Swedish trade and its development in the period 2003-2013 can be seen:

Swedish foreign trade with commodities with different regions, in billion SEK in 2013



Source: SCB, foreign trade with commodities

Relative change in % in the Swedish foreign trade with different regions between 2003 and 2013



Source: SCB, foreign trade with commodities

As can be seen above, the trade is increasing much more with Eastern Europe and regions outside Europe than with Western Europe, except for the trade with North America, which has decreased with 20% in the period.

When looking at the developing economies of the BRICS countries, the trade development has been the following for 2013 (development 2003-2013):

China	83 billion SEK	(+155%)
Russia	69 billion SEK	(+216%)
India	14.7 billion SEK	(+59%)
Brazil	6.6 billion SEK	(+98%)
South Africa	4.7 billion SEK	(+105%)
Total BRICS:	190 billion SEK	(+153%)

Trade with the BRICS-countries has increased by 153% between 2003 and 2013, but seemed to peak in 2011 at some 211 billion SEK and decreased in 2012 with 7% and in 2013 with 10%.

7.1.1 Swedish trade with Asia 2003 - 2013

Russia and EAEU

When/if the present embargoes on trade with Russia are lifted there is an immense potential for trade with Russia and the other countries in Eurasian Economic Union (EAEU) – Armenia, Belarus, Kazakhstan and Kyrgyzstan. The EAEU was established in 2015, with an integrated single market of 183 million people and a gross domestic product (GDP) of more than 4 trillion USD (Purchasing

Power Parity - PPP). As comparison, The European Union has more than 500 million inhabitants and GDP of some 16.5 trillion USD according to IMF in 2016, accounting for some 22% of the world GDP of 75 trillion USD.

Swedish trade with the EAEU-countries (numbers from before they were established) was 72 billion SEK in 2013, an increase of 211% since 2003. But the all-time high was in 2011 with 97 billion SEK. Russia accounts for some 95% hereof.

Russian ports around St Petersburg are developing and large investments have been made in port and hinterland infrastructure during the latest years.

China

China is the largest trade partner in Asia for Sweden with 83 billion SEK in 2013 (+155% 2003 – 2013). China is developing their infrastructure immensely in recent years Kina in order to cope with the ever growing transports. Further to this, investments are made in order to strengthen both the rail and road network to connect Asia with Europe. Although the Trans Siberian Railway seems not to have much capacity, other routes are also developing, such as the route from China via Kazakhstan to Europe.

India

In recent years India has developed considerably towards possibly being the new production area for global production. This would mean shorter transport routes by sea to Europe than from China, and also probable development of land transport in the future.

Swedish trade with India was 9.3 billion SEK in 2013 (+59% 2003 – 2013).

7.1.2 Swedish trade with other continents 2003 - 2013

The African continent has also developed considerably during the last decade and is seen as a possible future global production area. Large investments in infrastructure and production have already been made, partly funded by China. In 2013 Nigeria was the largest African trade partner to Sweden with 12.4 billion SEK (+495% since 2003), followed by South Africa with 9.6 billion SEK (+105% from 2003).

Trade with North America has decreased with 20% in the period, from 145 billion SEK in 2003 to 116 billion SEK in 2013. 2006 was the year with the highest trade level with USA and Canada, and 2012 was the highest year as regards trade with Mexico.

The trade with South America has increased with 121% in the period 2003-2013, from 13.8 to 30.6 billion SEK, with 2011 as the highest year.

Trade with Oceania has increased from 12.9 to 16.6 billion SEK, with 2011 as the highest year with 21.8 billion SEK.

7.2 Trade development until 2021

There are different predictions as regards the economic development of different global regions.

The International Monetary Fund, IMF assumes in the latest World Economic Outlook[4] (WEO) the following annual average increases in different regions (assumed until 2021):

IMF World Economic Outlook		Average annual increase of GDP at constant prices, 2015-2021
World	191 countries	3,5%
Major advanced economies (G7)	Canada, France, Germany, Italy, Japan, United Kingdom, and United States.	1,6%
European Union	28 countries	1,9%
Emerging market and developing	152 countries	4,7%
Commonwealth of Independent States	12 countries	1,0%
Emerging and developing Asia	29 countries	6,4%
Emerging and developing Europe	12 countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Kosovo, FYR Macedonia, Montenegro, Poland, Romania, Serbia, and Turkey	3,2%
ASEAN-5	Indonesia, Malaysia, Philippines, Thailand, and Vietnam	5,2%

Source: IMF World Economic Outlook

Prospects differ sharply across countries and regions according to WEO, with emerging Asia in general and India in particular showing robust growth and sub-Saharan Africa experiencing a sharp low down. There is a more subdued outlook foreseen for advanced economies, e.g. regarding Brexit and uncertain fate of institutional and trade arrangements between the United Kingdom and the European Union.

According to the Swedish Transport Administration Prognosis 2040 the growth of the global economy is estimated to 3% annually in the years towards 2040. Average annual growth rates of economies in the Swedish Transport Administration 2040 Prognosis, *(WEO annual GDP increases 2015-2021):*

- Asia and Oceania 3.9% *(6.4-5.2-3.5%)*
- Africa south of Sahara 3% *(4.7%)*
- Central and Eastern Europe 2.7% *(3.2-1.9%)*
- Latin America 2.6% *(4.7-3.5%)*
- MENA 1.9% *(3.5%)*
- North America 2.3% *(1.6-3.5%)*
- The Nordic Countries 2% *(1.9%)*
- Other parts of Western Europe 1.9% *(1.9%)*

[4] http://www.imf.org/external/pubs/ft/weo/2016/02/weodata/index.aspx

The above list is not totally comparable, as the regions are split in different manners and the details of the growth rates does not have the same basis. But it shows the different spans of the growth rates foreseen.

The Swedish commodity trade is expected to increase by 150% between 2012 and 2040 in monetary terms, according to the prognosis.

8 Forecasts and scenarios

Prognoses, forecasts and scenarios are based on a lot of different assumptions at a certain point of time and the assumptions could also change over time and other events could occur that will influence development in other directions. A prognosis/scenario should give a hint about the future development, but should never be seen as the full truth, as nobody is able to see into the future.

The Swedish Transport Administration (Trafikverket) has made a base prognosis for 2040, based on the new version 1.1 of Swedish transport model for freight Samgods.

As this 2040 prognosis is based on the latest possible background data in the Samgods model, it cannot be fully compared with other recent forecasts and scenarios such as Baltic Transport Outlook 2030 (BTO2030) and others.

We have however made short summaries of BTO2030 and the ITF Transport Outlook 2017 for comparison.

International Transport Forum, ITF published on 30 January 2017 the ITF Transport Outlook 2017 with an overview of recent trends and near-term prospects for the transport sector at a global level, as well as long-term prospects for transport demand to 2050, for freight (maritime, air and surface), passenger transport (car, rail and air) and CO2 emissions[5].

8.1 BTO2030

The BTO2030 made a scenario for the development between 2010 and 2030 for the whole Baltic Sea Macro region. As it was made for the whole Macro region and based on an earlier version of the European transport model TRANS-TOOLS, it might not be very accurate for all the regions within the Macro region. The TRANS-TOOLS model is made to calculate development for the whole EU, and therefore not very accurate for smaller regions. The Baseline of the model was modified within the project to better fit the traffic development 2008-2010.

The sea freight volume was developed for coastal areas and Scania is set as one coastal region in BTO2030.

Baltic Transport Outlook 2030, Sea freight Scenario for 2030 Scania Region ports

Baltic Transport Outlook 2030, Scania coastal region	Containers	Dry Bulk	Liquid Bulk	RoRo trailers	RoRo other	Other traffic	Total
Volume 2010, million tonnes	2,00	5,20	4,20	23,60	0,75	1,20	36,95
Scenario for 2030, million tonnes	4,00	7,40	3,40	44,00	1,50	1,60	61,90
Increase in %	100%	42%	-19%	86%	100%	33%	68%
Scenario for the Macroregion, increases in %	138%	42%	-7%	93%	47%	32%	30%

Source: Baltic Transport Outlook 2030

As can be seen above the development is foreseen to be in line with the development for the whole Baltic Sea Region, although the RoRo traffic, other than trailers is foreseen to double in Scania, where an increase of 47% is foreseen for the whole Macro region.

[5] http://www.itf-oecd.org/transport-outlook-2017

8.2 ITF Transport Outlook 2017

Continued strong growth in transport demand, both passenger and freight, means that even in the most optimistic ITF scenario, transport CO2 emissions in 2050 will still be at 2015 levels of around 7.5 giga-tonnes, according to ITF projections for global transport demand. This scenario already assumes that new technologies and changed behaviour lead to significantly less CO2 being emitted.

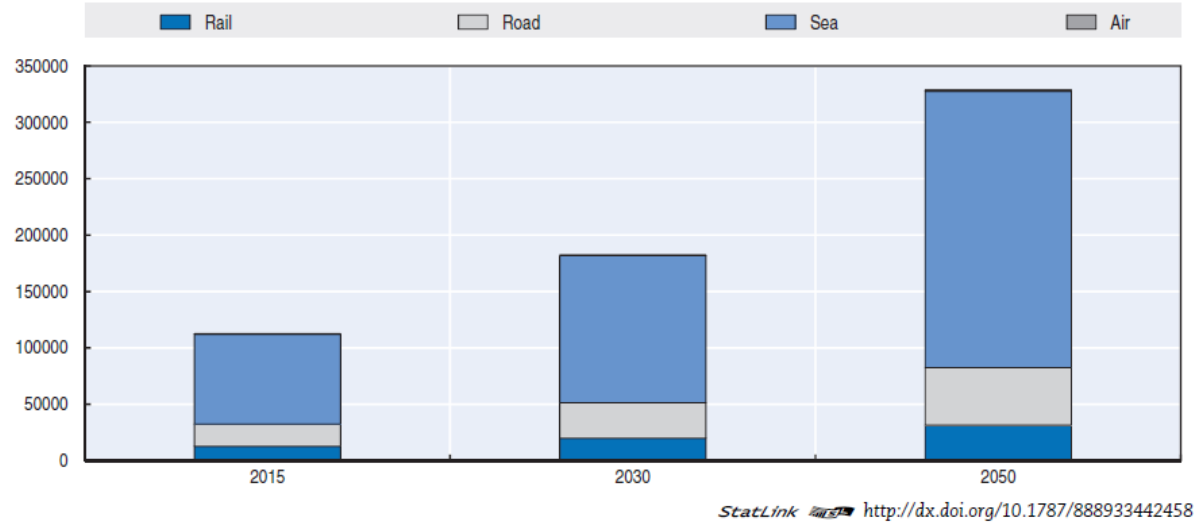
On a global level, a key factor for the difficulty in reducing transport CO2 emissions over the long run is shifting global trade patterns. As trade moves to regions with a lack of rail or waterway infrastructure, greenhouse gas emissions from road freight will almost double. Driven by more trade among the region's emerging economies, freight transport on intra-Asian routes will grow particularly strongly, by as much as 250% to 2050. Operational measures such as truck-sharing, route optimisation or relaxation of delivery windows to optimise use of transport capacity would help to mitigate the emission increases.

In the ITF Transport Outlook's less optimistic baseline scenario, a doubling of global transport demand will lead to an increase of transport CO2 emissions of 60% between 2015 and 2050.

8.2.1 Growth of freight transport demand towards 2030 and 2050

The global freight transport demand is expected to grow 3.3% annually until 2030, whereas thereafter to grow slightly lower, 3.1% annually. Maritime transport accounts for the largest share, growing from 71% in 2015 to 75% in 2050.

Freight transport demand by mode, Global Baseline scenario, billion tonne-km



Source: ITF Transport Outlook 2017

The following annual growth rates are foreseen for the different transport modes in a global perspective.

Annual growth rate for freight transport demand, compared to GDP
Global compound annual growth rate (%), ITF baseline scenario

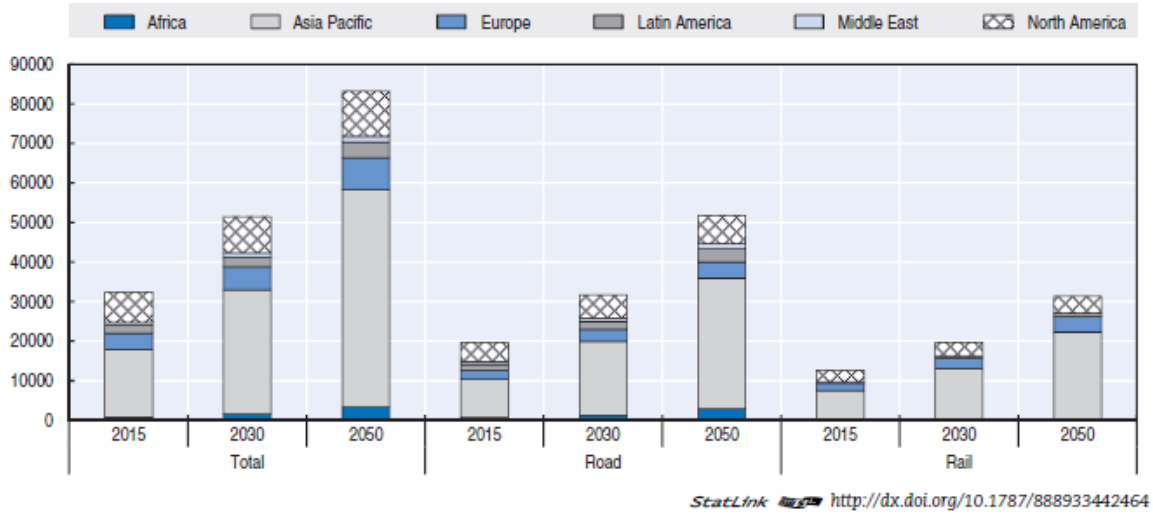
	2015-30	2015-50
GDP	2.7	2.5
Freight transport demand	3.3	3.1
Rail	3.0	2.6
Road	3.2	2.8
Aviation	5.6	5.4
Sea	3.4	3.3

Source: ITF Transport Outlook 2017

8.2.2 Surface freight development, ITF Baseline scenario

The total global surface freight (road and rail) is expected to grow from 32,000 billion tonne-km in 2015 to some 83,000 billion tonne-km in 2050, accounting for some 25% of the total global freight demand. Freight transport increases in all regions, but most of the growth will occur in developing economies, with volumes tripling in the non-OECD economies, to represent almost 80% of all surface freight transport demand in 2050.

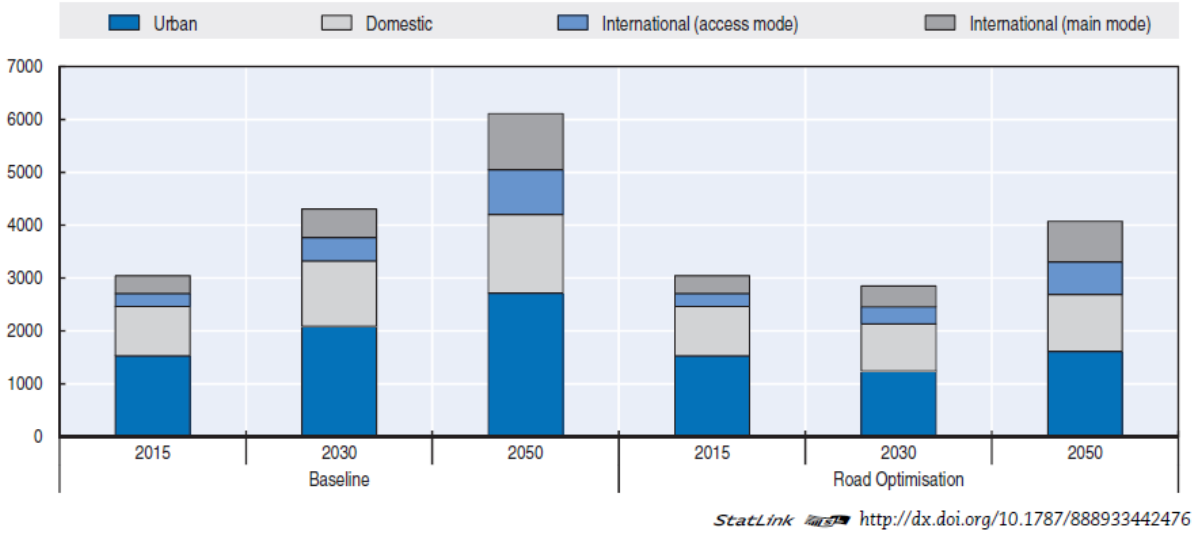
Surface freight tonne-km by regions, ITF Baseline scenario, billion tonne-km



Source: ITF Transport Outlook 2017

The fastest growth takes place in Africa, by a factor 3.7 from 2015 to 2050, although from a very low level. In Asia the transport work will increase by a factor 3.2 from 2015 to 2050, accounting for more than two-thirds of all global surface freight. Within Asia there are large differences, with some 50% for Japan and by a factor 3.5 in Southeast Asia. In Europe the surface freight transport work is projected to double and in North America to grow only by 50%.

ITF Road freight activity by sector, billion vehicle-km
Baseline Scenario and Road Optimisation Scenario



Source: ITF Transport Outlook 2017

ITF has also made a Road Optimisation Scenario, as can be seen in the above comparison with the ITF Baseline Scenario, where freight transport operators optimise their load factors and decrease the number of empty trips via a collection of measures, incl. route optimisation, asset sharing between companies etc. It is also expected that delivery windows are relaxed, which has a large impact, especially for urban freight.

The Road Optimisation scenario reduces the vehicle-km to some 60% of the level in the Baseline Scenario. Further to this the Scenario also is influenced by disruptive technologies, such as autonomous trucks, Internet of Things etc.

8.3 Swedish Transport Administration prognosis 2040 - Sources and assumptions

The base prognosis of Swedish Transport Administration for 2040 is built on different assumptions from different sources. It is built on LU 2015, described below, as well as OECD Regional Outlook for country groups. Further to this also on a row of reports made by Swedish Transport Administration. It is also built on the existing plans for infrastructure investments according to the valid infrastructure investment plan for 2014-2025.

8.3.1 Long Term Survey of the Swedish Economy 2015 (Långtidsutredningen – LU 2015)[6]

This Survey is published regularly with intervals of some 4 years and it is put together by an expert group within the Ministry of Finance in the Swedish Government.

The purpose of the Long-Term Survey of the Swedish Economy is to provide a basis for economic policy and generate discussion on formulation of policy. It is also to provide a coherent picture of long term economic development.

[6] http://www.regeringen.se/contentassets/86d73b72a97345feb2a8cbc8b6700fa7/sou-2015104-langtidsutredningen-2015-huvudbetankande

Until 2060 the Survey's scenario shows that material wealth in terms of GDP per capita will more than double, population will increase to almost 13 million people and average life expectancy is expected to increase by five years for women and approximately six years for men. At the same time the distribution of public resources and development of public finances will entail significant, but not unmanageable, challenges.

The LU 2015 highlights four development trends in particular:

- Technological development
- Continued internationalisation
- Demographic development
- Climate change and climate commitments

Some conclusions:

- Productivity growth for the entire economy in Sweden is expected to increase by about 1.7 per cent per year on average
- Increase in GDP of just over 2 per cent per year between 2015 and 2060
- GDP per capita is expected to increase 1.7 per cent on average per year
- Real incomes measured as GDP per capita will more than double by 2060.

8.3.2 Conclusion on differences from previous prognosis for 2030

- New base year 2012 with new demand for freight transport and a new offer.
- New prognosis year 2040 based on the LU 2015, a new commodity value prognosis, a new foreign trade prognosis and a new transit prognosis
- All costs are recalculated to price level year 2014
- Higher fuel taxes for road are implemented
- Version 1.1 of the Samgods model has been used.

8.3.3 General remarks

The growth of the global economy is estimated to 3% annually in the years towards 2040. Average annual growth rates:

- Asia and Oceania 3.9%
- Africa south of Sahara 3%
- Central and Eastern Europe 2.7%
- Latin America 2.6%
- MENA 1.9%
- North America 2.3%
- The Nordic Countries 2%
- Other parts of Western Europe 1.9%

The Swedish commodity trade increases by 150% between 2012 and 2040 in monetary terms, according to the prognosis.

The total growth in tonnes for the period 2012 – 2040 is estimated to 59%.

- Swedish domestic freight traffic is estimated to grow with 1.4% annually, from 213 million tonnes in 2010 to 295 million tonnes in 2040.
- The transit traffic is estimated to grow with 1.9% annually in the period, from 7 to 11 million tonnes.
- Swedish international freight traffic is expected to grow faster, the export with 2.2% annually, from 84 to 141 million tonnes and the import with 3% annually, from 81 million tonnes in 2012 to 163 million tonnes in 2040.

The largest increase is expected in the commodity group high-value goods (267% in the period) and this is mainly through increase in the international transport, where the import of high-value goods (355% in the period) is expected to increase heavily.

The annual increases of the transport work within the different transport modes are estimated to:

- 1.6% annually for rail freight
- 1.8% annually for road freight
- 2.3% annually for sea freight

8.4 Regional development in the Swedish Transport Administration 2040 prognosis

The road traffic in Scania Region is expected to increase with 1.6% annually on the European roads network and with 1.74% on the other road network. This means a total increase of 1.65% annually on the road network in Scania, in vehicle-km.

8.4.1 Regional development in the Scania Ports

Swedish Transport Administration expects the following volume increases split per port in the Scania region.

Annual loaded and unloaded volume per TEN-T port according to the Swedish Transport Administration 2040 prognosis

Ports	Results 2014	TRV Prognosis 2040	Increase 2014-2040	Prognosis annual increase	2.3% annually from 2014	diff from prognosis
Helsingborg	7,81	14,48	85%	2,40%	14,11	-2,58%
Malmö	7,21	17,33	140%	3,43%	13,02	-24,85%
Trelleborg	10,14	12,23	21%	0,72%	18,31	49,75%
Ystad	3,05	5,85	92%	2,54%	5,51	-5,83%
Total	28,21	49,89	77%		50,95	

Source: Swedish Transport Administration 2040 Prognosis and own calculations

It has not been possible to go into the details of the above prognosis. Instead own calculations have been made as regards the development in the 4 ports.

The light blue column shows the average annual growth rates used in the Swedish Transport Administration 2040 Prognosis on port level and here it can be seen that they differ substantially between the 4 ports.
The green columns on the right above show the development when using the 2.3% average annual increase in sea freight volume set as average annual development for sea freight in the Swedish

Transport Administration 2040 Prognosis. This is then compared to the detailed prognosis provided by Swedish Transport Administration on port level in the far right green column.

There seem to be some large discrepancies in the Prognosis, especially as regards the expected development on Trelleborg, set in the Prognosis to be much lower (21%) than the other ports. This leads to wondering why the volume in Trelleborg only would increase by 0.72% annually in average between 2014 and 2040.Trelleborg is the port in Scania with the largest volume in 2014 and a check of the recent volume development, the 2016 volume on Trelleborg is close to 11 million tonnes, up more than 8% compared to the 2014 volume.

On the other hand, Malmö is set to increase by 140% between 2014 and 2040, which stipulates an average annual volume increase of 3.43% on Malmö. In 2016 had a total volume of 7.76 million tonnes, which is 7.6% above the figure of 2014.

As the ports seem to have very different development foreseen in the Prognosis for 2040, the growth rate of 2.3% annually and the expected volume by 2040 in the left green column seem to be much more appropriate.

A quick comparison with the BTO2030 Scenario shows some differences. The BTO 2030 baseline in 2010 show almost 37 million tonnes in Scania ports in 2010, where the statistics for the 4 ports give a total of 30.7 million tonnes (Source: Ports of Sweden).

BTO 2030 expect an increase of 68% to 61.9 million tonnes in 2030, and this is much more than the TRV Prognosis that ends at 49.9 million tonnes in 2040, 10 years later.

8.5 Regional development Swedish Transport Administration 2030 prognosis

The previous prognosis from Swedish Transport Administration was based on year 2010, with a prognosis for 2030. Below the development according this prognosis is shown for the 4 TEN-T ports in Scania.

Development of freight volumes through the TEN-T ports in Sweden - Method report[7]

TEN-T ports i Scania			
Port	**2010 mio. tonnes**	**Prognosis 2030 mio. tonnes**	**Change in %**
Helsingborg	7,43	10,34	39%
Malmö	9,65	13,55	40%
Trelleborg	10,83	15,92	47%
Ystad	2,78	6,47	133%
	30,69	46,28	51%

Source: Development of freight volumes through the TEN-T ports in Sweden - Method report

The sea freight volume in the BTO2030 scenario was developed for coastal areas and Scania is set as one coastal region in BTO2030.

Scenario for development for the Scania coastal region in BTO2030

[7] Development of freight volumes through the TEN-T ports in Sweden - Method report (Framtagning av godsvolymer genom TEN-T hamnar i Sverige – Metodrapport), 2015-03-23, Ramböll

Baltic Transport Outlook 2030, Scania coastal region	Containers	Dry Bulk	Liquid Bulk	RoRo trailers	RoRo other	Other traffic	Total
Volume 2010, million tonnes	2,00	5,20	4,20	23,60	0,75	1,20	36,95
Scenario for 2030, million tonnes	4,00	7,40	3,40	44,00	1,50	1,60	61,90
Increase in %	100%	42%	-19%	86%	100%	33%	68%
Scenario for the Macroregion, increases in %	138%	42%	-7%	93%	47%	32%	30%

Source: Baltic Transport Outlook 2030

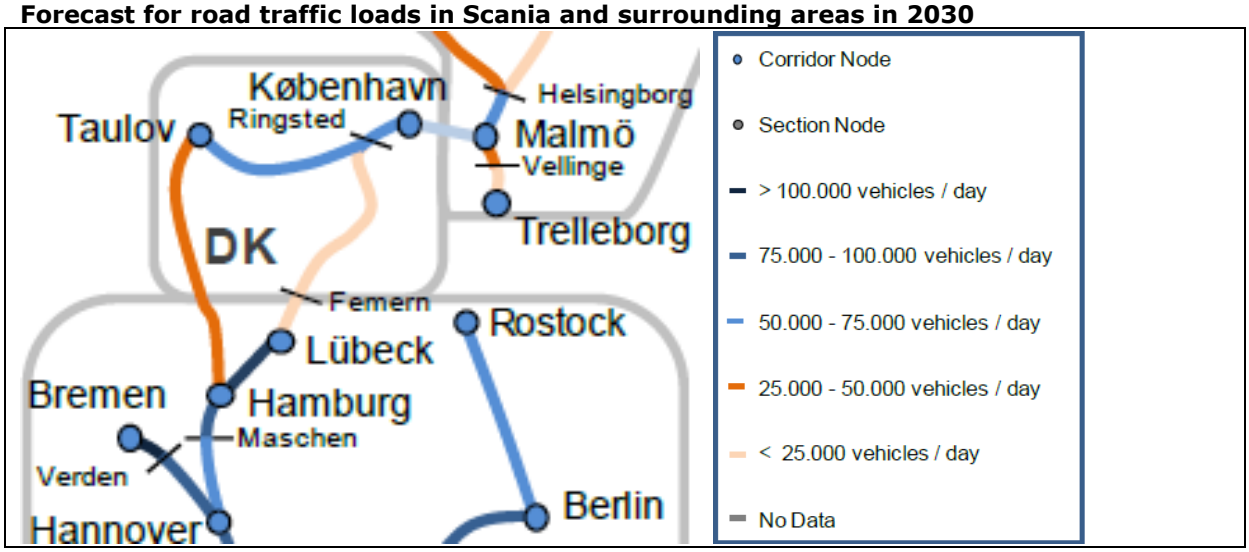
The BTO2030 volume for the Scania coastal area in 2010 is 20% higher than the Swedish Transport Administration volumes for 2010. This is probably due to different data sources, as well as the fact that the Scania coastal area also includes the smaller ports in Scania.

The BTO2030 Scenario foresees a slightly higher development in the Scania coastal region than the Swedish Transport Administration prognosis for 2030.

8.5.1 Visualised forecast for 2030 in Scania and surrounding areas

The ScanMed study has made visualisations based on the different forecasts for 2030 that were available as the study was concluded in 2014.

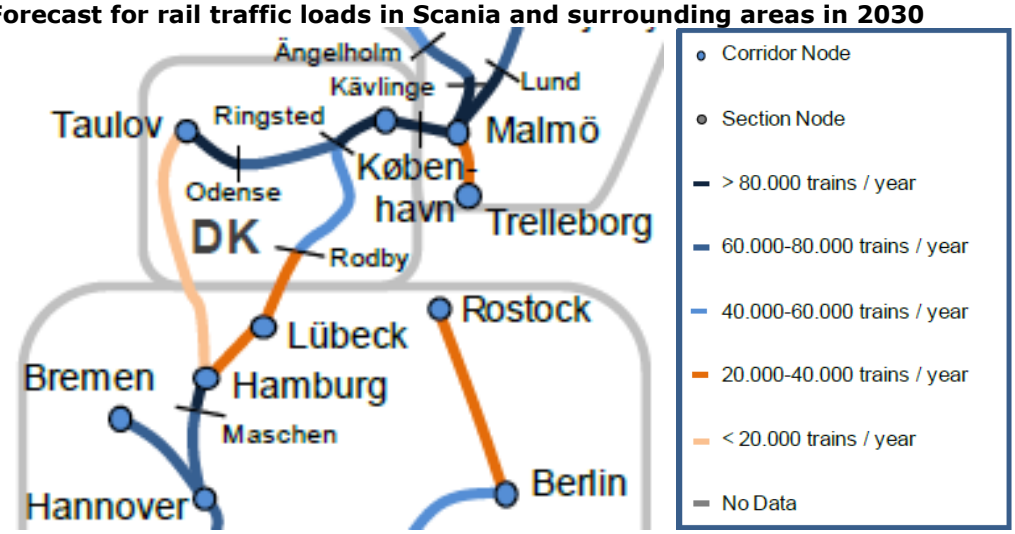
Forecast for road traffic loads in Scania and surrounding areas in 2030



Source: ScanMed study 2014

As can be seen in the above figure, the road network between Hamburg and Lübeck is foreseen to have a traffic load of more than 100.000 vehicles/day, whereas many of the other main roads also have rather heavy traffic loads.

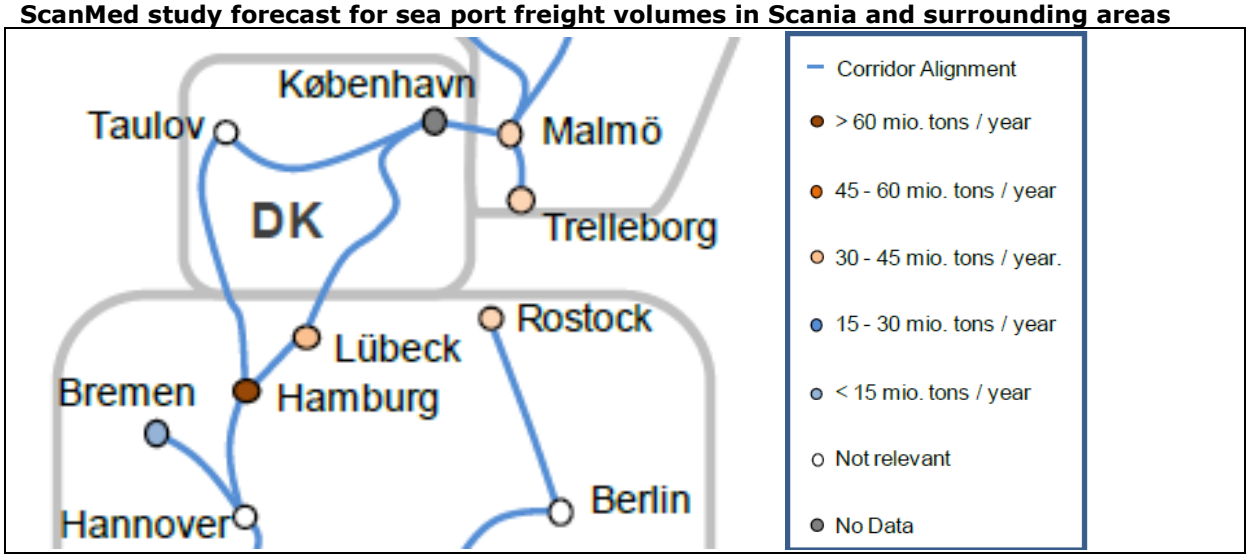
Forecast for rail traffic loads in Scania and surrounding areas in 2030



Source: ScanMed study 2014

The figure above shows forecast for rail network loads in 2030. As can be seen some sections will have a very heavy network load of more than 80.000 trains/year (dark blue lines); Hamburg-Maschen, Ringsted-Copenhagen-Malmö-Lund as well as Odense-Taulov and Malmö-Kävlinge.

ScanMed study forecast for sea port freight volumes in Scania and surrounding areas



Source: ScanMed study 2014

As can be seen above, Hamburg is forecast to have a volume of > 60 million tonnes per year (138 million tonnes in 2016), whereas Lübeck (16.3 million tonnes in 2015), Rostock (29 million in 2016), Malmö (7.8 million tonnes in 2016) and Trelleborg (11 million tonnes in 2016) are forecast to have a volume between 30 and 45 million tonnes per year by 2030.

These forecast volumes for the Malmö and Trelleborg is far apart from the Swedish Transport Administration prognosis for 2030 and 2040 for the 2 ports as well as very far apart from the development in the ports in recent years.

8.6 Comparison of Swedish Transport Administration prognoses for 2030 and 2040

Below is a comparison of the prognosis 2030 with the new prognosis for 2040, as regards the development in the 4 TEN-T ports in Scania.

Comparison Swedish Transport Administration Prognosis 2030 (Ramböll) with Swedish Transport Administration Prognosis 2040

	Method report by Ramböll				Trafikverket Prognosis 2040				Actual	Prognosis	
Port	2010 mio. tonnes	Prognosis 2030 mio. tonnes	Growth in %	Avg. annual change	Results 2014 mio. tonnes	Prognosis 2040 mio. tonnes	Diff. 2014-2040 in %	Avg. annual change	Diff. 2014-2010 diff.	Diff. 2040 - 2030 diff. in tonnes	in %
Helsingborg	7,43	10,34	39%	1,28%	7,81	14,48	85%	2,40%	5%	4,14	40%
Malmö	9,65	13,55	40%	1,31%	7,21	17,33	140%	3,43%	-25%	3,78	28%
Trelleborg	10,83	15,92	47%	1,49%	10,14	12,23	21%	0,72%	-6%	-3,69	-23%
Ystad	2,78	6,47	133%	3,30%	3,05	5,85	92%	2,54%	10%	-0,62	-10%
	30,69	46,28	51%	1,59%	28,21	49,89	77%	2,22%	-8%	3,61	8%

Source: Swedish Transport Administration Prognosis 2040 and Development of freight volumes through the TEN-T ports in Sweden - Method report and own calculations

The comparison above shows that the calculated average annual growth rates differ quite substantially – both between the different ports but also in the different prognoses.

The column Actual Difference 2014-2010 shows actual volume figures in the concerned ports. Here can be seen that Malmö has had a volume decline of 25% between 2010 and 2014. Trelleborg has had a small decline of 6%.

8.7 Conclusions on forecasts, prognoses and scenarios

The freight transports are in all the different scenarios and forecasts expected to grow significantly over the coming years towards 2030, 2040 and 2050. They are however not easy to compare with each other as they have different basis years, sources and assumptions.

ITF expects a doubling of the global surface freight transport (road and rail) between 2015 and 2050 in the ITF Baseline Scenario. The Road Optimisation Scenario foresees that the road sector can reduce the number of vehicle-km with 40%, compared to the Baseline Scenario, due to a large focus on optimisation, through for example optimising routes, asset sharing and new technologies.

According to Swedish Transport Administration 2040 prognosis the growth of the global economy is estimated to 3% annually in the years towards 2040, whereas ITF Transport Outlook 2017 foresees GDP to grow 2.7% annually between 2015 and 2030, and 2.5% when looking between 2015 and 2050, as a lower global economic growth is expected between 2030 and 2050.

Road transport is expected to grow significantly, but with implementation of many different measures, both within transport operation as well as within policy change, this growth could be reduced significantly and thereby also reduced the concerning CO2-emissions.

The Swedish Transport Administration 2040 Prognosis split up on the Scania ports seem to have large discrepancies, wherefore it seems a more appropriate scenario to use the 2.3% average annual growth in sea freight.

A recalculation of the split in the 2040 Prognosis would then give the following scenario:

Helsingborg:	14.11 million tonnes
Malmö:	13.02 million tonnes
Trelleborg:	18.31 million tonnes
Ystad:	5.51 million tonnes
Total:	50.95 million tonnes

A prognosis is based on a lot of different assumptions at a certain point of time and the assumptions could also change over time and other events could occur that will influence development in other directions. A prognosis should give a hint about the future development, but should never be seen as the full truth, as nobody is able to see into the future.

9 Overall trends

There are a lot of different megatrends that will change how things are done today. Some technologies will disrupt the way of thinking and working and new ways will emerge.

9.1 Trends in logistics

When looking at the development of transport for the future, some logistics trends will possibly change the way logistics have performed until now. Technology development will change the way logistics are organised within different areas in order to increase efficiency and this will lead to changes also in the freight hubs. Some of the technologies will have global implementation and therefore lead to changes in how future logistics chains are set up. Some of them will also be implemented in the freight hubs and make the operations more efficient. One example would be the full implementation of technologies that make the different loading units and vehicle/vessels communicate and hereby also ensure smoother operations within, but also outside terminals.

Implementation of different new technologies in the hubs could also be a competitive advantage.

How the different developments will influence the Scania freight hubs is not possible to predict.

Some of the logistics trends[8] that have entered the stage are:

- A**utonomous logistics**: Self-driving vehicles so far mainly in warehouse logistics, unmanned aerial vehicles or drones
- **Internet of Things:** The potential to connect virtually anything to the internet and accelerate data-driven logistics. It is estimated that by 2020 more than 50 billion objects will be connected to the Internet.
- **Machines joins the logistics workforce:** A new form of collaboration is emerging, where robots work side-by-side with employees, supporting repetitive and physically demanding tasks in logistics operations.
- **Delivery of anything, anytime, anywhere:** The future of retail logistics is changing rapidly. Through Omni-channel logistics, where the customers buy via a row of different channels on-line and off-line, which leads to logistics having to adapt and offer innovative Omni-channel solutions.
- **Rising demand for fair and responsible supply chains:** companies are increasingly turning social and environmental challenges by creating fair and sustainable solutions, driven by megatrends as sustainable consumption, digitalization and globalization.

Technology trends that will have a large impact within the coming 5 years:

- **Augmented Reality** will provide new perspectives in logistics planning, process execution, and transportation.
- **Big Data:** Logistics is being transformed through the power of data driven insights.
- **Cloud Logistics** is ideal for complex, volatile environments, cloud computing enables a variety of new "logistics-as-a-service based business models.

[8] Logistics TREND Radar Version 2016, DHL Trend Research

- **Internet of Things** has the potential to connect virtually anything to the Internet and accelerate data-driven logistics.
- **Low-cost Sensor Technology** enables exciting new applications within the logistics industry.
- **Robotics and Automation** are entering the logistics workforce, supporting zero-defect processes and boosting productivity.

Technology Trends with timeframe beyond the coming 5 years:

- **3D printing** will disrupt logistics by adding new diversity to manufacturing strategies.
- **Bionic Enhancement Technologies** such as wearables and exoskeletons expand the boundaries of current physical barriers.
- New generations of **Digital Identifiers** such as digital watermarking, disposable smart labels, and low-cost biometrics expand predictive control options for supply chain steering, asset, stock and inventory management, and end-to-end security.
- The new generation of **Self-driving Vehicles** are more flexible and reliable than ever before.
- **Self-learning** or machine-learning **Systems** will become a game-changing enabler for completely autonomous data-driven optimization in logistics.
- **Unmanned Aerial Vehicles** or drones could change tomorrow's logistics by adding a new form of express delivery via carefully coordinated air networks.

9.2 Fuel prices and development

9.2.1 Oil prices

The oil prices have been very low in recent years and this influences the transport cost to a very large extent. The crude oil price dropped below the 100 USD-mark in July 2014, and has been as far down as USD 29.04 in January 2016, but is now at USD 51.68.

This means that the fuel accounts for a much smaller part of the transport costs than it did 2 years ago. And this goes for road transport as well as sea transport. This has also made the expected decline in sea freight in the Baltic Sea due to the Sulphur Regulation much less visible.

Source: http://www.macrotrends.net/1369/crude-oil-price-history-chart

Where are the oil prices heading? It is all very much based on politics and not easy to predict, with for example the new president in the US, Russian trade embargo etc.

Earlier predictions (around 2010) from the International Energy Agency had a scenario span for 2030 from USD 50 to 200 per barrel.

9.2.2 Renewable fuels

There is a growing market for renewable fuels, especially in Sweden, where some different second-generation biofuels are produced from different waste products and distributed in a growing number of areas.

HVO, or Hydro-treated Vegetable Oil, as an example, has developed fast during the latest years also for the heavy road industry in Sweden, where some hauliers push for establishment of a local filling station and there are at least 18 stations today. But the normal fuel suppliers have also added HVO to their product list, for example OKQ8.

HEFA, Hydro-processed Esters and Fatty Acids, is a synonym of HVO that is increasingly common.

The advantage with bio fuels as HVO is that it gives some 90% CO2-reduction compared with normal diesel fuel. You do however need to calculate about 10% higher fuel cost than for normal diesel.

LNG is developing as fuel in the shipping industry and there are plants and distribution places in a few spots in the Baltic Sea on its way. LNG could also be an option for the road transport industry in the future.

9.3 Infrastructure charges

The transport modes have different manners in order for the users to pay for the use of the infrastructure, and this also varies from country to country. The basis is that the user should pay for the

direct costs and there are different systems to collect the charges in different countries. The charges are mainly distance-related and time-based, as well as depending on the type of vehicle and engine. Some also include cost of air and noise pollution.

EU sets common rules on road infrastructure charging[9] and also regarding internalisation of external costs of road transport. In the future all transport modes will have to fully pay for the external effects from traffic, such as noise and air pollution. This internalisation of external cost is already partly introduced in different countries, for example the noise surcharge for rail freight wagons in Germany, and the higher charges for lower Euro Class truck engines in different countries. Many large cities also have infrastructure charges for use of the local infrastructure, for example Stockholm, Gothenburg and Oslo.

There are also discussions about introducing further charges in order to internalise the external costs of transport further, and partly also as means to shift road freight transport towards the more environmentally-friendly rail and sea transport. One example is the road traffic tax that is discussed in Sweden and also has been discussed in other countries. There were discussions about such a tax in Denmark a few years ago, but the suggested system was rejected.

9.3.1 Rail infrastructure charges

The different countries have different systems as regards how they charge the rail freight operators for the use of the rail infrastructure. The charges should cover the direct costs for the use of the infrastructure. The normal is that there is a basis charge for the specific route based on the number of km – and the type of train, weight etc. Thereto there are different surcharges, for example environmental surcharge for diesel traction, noise surcharge and for the different services used en route, such as shunting etc.

In Germany the charges are depending on type of train as well as type of route. Between 2016 and 2017 the charges increased between 2.4% and 2.7%, depending on route type.

Noise from "old" rail freight wagons is a large issue, especially in Germany. There have schemes with support for those that implement quieter breaks on freight wagons. Therefore there is also a surcharge for noise from rail freight wagons of 3% of the total infrastructure route fee. The surcharge was 2.5% in 2016.

German rail infrastructure route fees for freight trains for 2017, excl. noise surcharge

Longdistance routes	EUR/routekm	Express freight trains	Standard freight trains
Route class	Fplus	16,45	9,97
	F1	8,40	5,09
	F2	5,82	3,53
	F3	5,23	3,17
	F4	5,05	3,06
	F5	3,71	2,25
	F6	4,97	3,01

Source: DB Netze[10], The highest route class is for the high speed rail network, where freight trains are not allowed.

[9] http://ec.europa.eu/transport/modes/road/road_charging/charging_hgv_en

[10] https://fahrweg.dbnetze.com/fahrweg-de/produkte/trassen/trassenpreise/trassenpreise_2017.html

The rail infrastructure charges in Denmark and Sweden are calculated at some 0.004 kr (SEK or DKK) per tonne km on the normal rail routes, and quite a lot lower than the German charges. Thereto there are different surcharges depending on what type of route, train, engine etc. The charges for use of the infrastructure on the fixed links – Great Belt Link (some 6,400 DKK) and Öresund Bridge (some 6,000 SEK) are much higher seen per km.

In Sweden the charges are set to increase quite heavily over the coming years and this is a much discussed issue amongst the rail freight operators, as they feel it makes it more difficult to shift freight from road to rail.

9.3.2 Road infrastructure charges

The road freight operators also pay infrastructure charges and these are different in different countries. In Sweden, Denmark, Luxemburg and the Netherlands this means that heavy vehicles with minimum weight of 12 tonnes have to pay for a Euro vignette in order to use the motorways and toll highways. The tariff is based on engine type and number of axles of the vehicle.

In 2017 a Euro 6 - Euro 2 truck with 3 axles pay 750 EUR and with 4 axles or more 1,250 EUR. An old Euro 1 truck with up to 3 axles pays 960 EUR and with 4 or more axles 1,550 EUR.

In Germany the trucks have to pay "LKW Maut"[11] for the use of motorways and selected federal trunk roads. The trucks need to have a special On-Board-Unit (OBU) for this, to calculate the exact fees for the specific roads that have been used. The fees differ depending on the emission class of the truck and the number of axles. A 3-axled truck with Euro6 engine pays 0.113 EUR/km and should it have 5 axles or more, the truck should pay 0.135 EUR/km. An old 3-axled truck with Euro 1 engine and 3 axles pays 0.196 EUR/km and with 5 axles or more the truck should pay 0.218 EUR/km. Within a few years the Maut will also be introduced for cars in Germany.

Other European countries also have toll systems for heavy trucks[12]. For many of them a special OBU is needed in order to calculate the fees – and this also means that trucks in international traffic have different OBUs in their truck cabin.

[11] https://www.toll-collect.de/en/toll_collect/rund_um_die_maut/maut_tarife/maut_tarife.html
[12] https://www.dkv-euroservice.com/gb/services/toll/toll-services-by-country/more-countries/

10 Trends Scania

Scania is a very important area when it comes to Swedish transports as a large part of the traffic is going to, from or through Scania. A large part of the Norwegian trade also uses Scania ports as their entrance to Scandinavia.

Below some of the areas that will influence the freight transport in Scania in the future are mentioned.

10.1 Sustainable development

The Scania ports are in the forefront as regards innovations and measures in order to reduce environmental effects of their operations, with a row of measures already implemented and a lot of interesting projects running. Measures such as land electricity, alternative fuels, focus on developing intermodal transports including rail operations etc.

At the same time the European focus is to reduce the road transport and shift to more sustainable modes such as rail and sea transport. So far the pre-requisites of establishing viable solutions for shift have not been fully in place, especially with the present low costs for road transport, due to among others low fuel prices and cheaper drivers from Eastern countries.

10.2 Fehmarn Belt fixed link

When the Fehmarn Belt fixed link is established, it is foreseen to be able to handle a large amount of freight trains for Sweden, and this is due to make changes in both rail freight logistics as well as road transport logistics. How this will influence the ferry transports between Germany and Scania is yet to be seen, but the farther away from the Schleswig-Holstein Region, the smaller the competition will be. Therefore, Rostock and other ports further to the east can expect to be able to be competitive also after the Fehmarn Belt connection is finalised. At the same time the Fehmarn Belt connection will have an impact on the connections between the Scania region and Travemünde.

There will be a long row of years until the whole Fehmarn Belt connection is established, with better hinterland infrastructure, wherefore there are ample changes to adapt to this. With the technology within logistics developing, there are also a row of other trends that will have made changes within logistics already before this.

Some changes in the ferry lines can be expected in the years closer to the opening of the Fehmarn Belt connection, in order to ensure economically viable routes also with the competition of the direct land route via the fixed links.

10.3 Overseas ports for Scania

Gothenburg is the largest port in Scandinavia and also has some overseas calls. But, will Gothenburg be able to keep the present overseas calls or even increase the number of calls? With the present situation with labour conflict in the port the performance in the container terminal is not satisfactory. This will hopefully be solved within shortly.

The combined terminal in the heart of Gothenburg will be moved out into the port in the coming years and this could lead to higher volumes on rail also for trailers in the future. The operator of the new terminal will be

Hamburg, Bremerhaven and Rotterdam are important overseas ports for Scania and therefore good connections on road, rail and shortsea with these major ports are important. Whether the dependence on these overseas ports will change is due to a row of different factors.

Will Aarhus be able to attract further overseas calls in the future? The development at the port of Aarhus in the latest years shows that this could actually be the case in the future. But there are a number of uncertainties, such as sufficient capacity on the rail network.

Will Gdynia be able to increase the number of overseas calls? So far this has mainly been for the local Polish market and this will probably not change in the coming years.

10.4 Other logistics solutions, such as coastal shipping

With the EU goal of reducing the CO2 foot print of road freight transport, a solution could be to transfer volumes to coastal shipping. The problem is however, that the incentives to move to coastal shipping are not really in place as the services offered seem not to be attractive enough for the shippers. The coastal shipping only accounts form some 3% of the Swedish inland transport work[13] today.

Transport price is often the main factor regards a possible shift, and the following are seen as the main obstacles to tackle for the shipping industry:

- The service offer need to increase with acceptable transport time as well as good frequency
- Services should be easier accessible, for example rethink the large volume as regards smaller shippers. Think more of bus than taxi
- Costs for handling/reloading in different ports is a very large part of the total transport cost
- State fees are an important part of the costs
- New business models are needed

The potential is larger for a shift towards Short Sea Shipping (SSS) and with further extension with further ports, routes and possible route extensions within the present SSS-network across the Baltic Sea/North Sea.

10.5 Competitors to the Scania ports and terminals

Who are the "real" competitors to the Scania ports and terminals? Scania has a very good position as the entry/exit point for Scandinavian cargo.

But there is competition from the direct transport by land transport between the Continent and Scandinavia, i.e. the routes through Denmark and via the Öresund Link/Elsinore/Helsingborg mainly by road, but partly also by rail as regards the remaining rail ferry lines.

[13] Sjöfartsverket, Analysis of development potential for inland and coastal shipping in Sweden, "Analys av utvecklingspotentialen for inlands- och kustsjöfart i Sverige", Dnr 16-00767

There is also competition from other Swedish ports, but more on a smaller scale as they should more be seen as a supplement for other routes, for example the Blekinge ports that handle routes with Easter Poland and Lithuania.

10.6 Social conditions within the EU

During the latest years we have seen large increases in the use of non-Scandinavian trucks and drivers, as these are cheaper. This will probably change as the EU-countries work further with social issues on an overall level.

The use of drivers from Eastern EU-countries is well-established among forwarders in order to minimise the costs. But, it is not just a cost problem, it is also a social issue. In the Eastern EU Member States the national road transports have partially been taken over by drivers from countries further east, and hereby have forced the EU-drivers to look for other job opportunities, such as international road freight transport, where they might be weeks and months away from home, just in order to have a job.

In Germany a minimum wage level was introduced, to which all companies on the German infrastructure should apply. This also means that the compliance to this and other regulations, especially within the road transport area needs to be monitored. It can be expected that this can lead to further changes in how the cargo is transported.

11 Roundtable discussion 14 December 2016

The Scania freight hubs participated in a round table discussion led by Region Scania in December 2016, where a lively discussion took place, regarding the development of the freight hubs.

The following freight hubs participated:

- Copenhagen Malmö Port
- Port of Helsingborg
- Port of Trelleborg
- Port of Ystad
- Helsingborg Kombiterminal
- Malmö Kombiterminal

A lot of interesting thoughts were discussed around the table and a simple SWOT was made together for the freight hubs in Scania:

Strengths	**Weaknesses**
Close to Continental Europe	Competition neutrality – all modes do not carry their own costs
Unlimited capacity at sea	Some of the hinterland connections
Large intermodal capacity	
Efficient terminals giving strong competitive power	
Opportunities	**Threats**
Increase cooperation	There will be no more investments in rail ferries in the future
Increased interaction with the customers - networking and concrete partnerships.	Rail: No alternative rout should anything happen to the rail connection via Öresund Link
Region Scania can create an intermodal forum	
Growing market	
Political focus on sustainability	

The participants expressed the wish to continue such discussions together in a similar forum also in the future.

12 Conclusions

The freight hubs in Scania already play a very important role in the Swedish transport system, as entry/exit points in international traffic. They have potential to continue to grow, following the growing demand for freight transports in the coming years.

As mentioned in earlier chapters there is a need to look into the hinterland infrastructure to/from the ports and terminals for the future in order to cope with this growth. There are already some bottlenecks, especially in the rail infrastructure, where capacity for freight trains is scarce. This could be an obstacle in the years to come this with the overall goal to shift long-distance road traffic onto more environmentally-friendly transport modes – rail and sea.

Collaboration, new thinking, new service offers and new business models will probably also be needed, in order for this shift to take place, especially in order to use coastal shipping, connecting the long row of Swedish ports.

12.1 Economic development

How the international trade flows develop has large consequences for the hubs in Scania. Poland has during the last decade surpassed both Italy and Spain as trade partner with Sweden. Czech Republic, Hungary, Slovakia, Romania, and Ukraine have also surpassed different Western European countries through the increased trade with Sweden. All of this indicates a further shift eastwards for the European trade volumes in the future. For this development it is of course an advantage that Scania has 2 ports with routes on Poland, as well as routes on ports in Eastern Germany.

IMF World Economic Outlook foresees an overall GDP increase in the emerging and developing countries in Europe, among others Poland of 3.2% annually or more than 20% increase in the period 2015-2021. In the same period an annual GDP increase of 1.9% is foreseen for the 28 EU Member States.

Regarding trade with other Continents and overseas trade volumes, the Port of Helsingborg is well-established as the second largest container port in Sweden and ample opportunities to keep this position.

The development of overseas calls in Scandinavia and the Baltic Sea could also change in the future. Gothenburg and Gdansk are well-established with overseas calls and this has also led to that the Port of Hamburg has had decreasing volumes on Sweden and Poland in recent years.

12.2 Infrastructure development

The capacity on the different parts of the infrastructure is of course very important for the freight hubs. Sufficient capacity in the hinterland connections is vital for smooth land-based operations to and from the hubs.

There are already some bottlenecks in the infrastructure, especially as regards railway and the infrastructure development plans for the coming 12 years in Sweden will be decided by the Government by the end of this year. Hopefully the largest known bottlenecks will be eliminated within a few years, such as the main lines in Scania. In Denmark some large rail projects – electrification, signalling system and some new lines - are ongoing and are expected finalised within the coming

10 years. In Germany both rail and road will have bottlenecks in the coming years, especially around Hamburg.

12.3 Forecasts and scenarios

Prognoses, forecasts and scenarios are based on a lot of different assumptions at a certain point of time and the assumptions could also change over time and other events could occur that will influence development in other directions. A prognosis/scenario should give a hint about the future development, but should never be seen as the full truth, as nobody is able to see into the future.

The BTO 2030 scenario for 2030 forecast different development for different segments within the ports overall. The container traffic was forecast to increase 138% between 2010 and 2030, whereas RoRo transport of trailers was forecast to 93% in the same period. Liquid bulk is forecast to decrease by 7%, whereas dry bulk and other traffic are forecast to increase between 32% and 47%.

The Swedish Transport Administration prognosis for 2040 for the Scania ports foresees a total growth of 77% in the 4 ports, whereas the split of this development to the different port seems to be somewhat strange. In their prognosis they expect Trelleborg, the largest port today, only to increase by 21%, whereas Malmö, on third place amongst Scania ports today is foreseen to increase by 140%.

When applying the average annual growth rate for sea freight of 2.3% from the Swedish Transport Administration 2040 Prognosis, the volume development seem to be more appropriate.

A recalculation of the split in the 2040 Prognosis would then give the following scenario for the Scania ports in 2040:

Helsingborg:	14.11 million tonnes
Malmö:	13.02 million tonnes
Trelleborg:	18.31 million tonnes
Ystad:	5.51 million tonnes
Total:	50.95 million tonnes

The recalculation do not take into account the forecasted economic development. The southern ports have connections to the faster growing eastern markets. By taking this into account the numbers would have been changed even greater in the same direction as the recalculation above.

12.4 Other trends that influence the freight hubs

Technological development both within the hubs but also outside will certainly influence them. Implementation of different new technologies in the hubs could also be a competitive advantage. This could be the use of different technologies to make operations more efficient both in the terminals, in the vessels and vehicles, e.g. Internet of Things.

Fuel prices influences transport, especially road and sea transport. The oil prices could develop from the historically low levels seen in recent years to levels around or even above 100 UED/barrel. This could e.g. lead to larger competitive advantage for rail transport. Availability and development of different types of renewable fuels is important both for the operations within the hubs, where

some ports already are converting all their terminal operations to the use of renewable fuels. LNG could be an option for further vessels, but might also be used in road vehicles in the future.

Sustainability

The Scania freight hubs are already well ahead as regards introducing different measures for more sustainable operations, such as for example alternative fuels for equipment, and land electricity for the calling vessels.

The European focus is to reduce the road transport and shift to more sustainable modes such as rail and sea transport. So far the pre-requisites of establishing viable solutions for shift have not been fully in place, especially with the present low costs for road transport, due to among others low fuel prices and cheaper drivers from Eastern countries.

Internalisation of the external effects of transport will be on the agenda even further in the future and this means that the different transport modes will face further taxes and other burdens.

Infrastructure charge is one way to solve part of the internalisation, and new systems for this will probably be introduced in the coming years.

Keeping ahead of other hubs as regards environmental burden of operations could be a competitive advantage compared to the competitors.

Fehmarn Belt connection

The new fixed link between Denmark and Germany that is expected to be finalised by 2028 will also influence the hubs around the southern Baltic Sea. Freight trains between Scandinavia and the Continent will have a faster and shorter route and the fixed link will probably also give changes in logistics.

How this will influence the ferry transports between Germany and Scania is yet to be seen, but the farther away from the Schleswig-Holstein Region, the smaller the competition will be. Some changes in the ferry lines can be expected in the years closer to the opening of the Fehmarn Belt connection, in order to ensure economically viable routes also with the competition of the direct land route via the fixed links.

12.5 The Scania Freight Hubs

All in all the Scania freight hubs are well performing and are well aware of the different issues that are important for their future development. They all have their niches – Ystad with Poland traffic, Trelleborg with 4 different routes to Poland and German port, Malmö with the development of the CMP Norra Hamnen for intermodal traffic on seas and onwards on rail, and Helsingborg with inter-modal traffic, both RoRo and especially container. Focus on developing the niches, together with the overall operations is important to keep up with the competitors for the future.

For the coming years the RoRo traffic will be the overall largest focus and here the freights hubs are in front line and therefore will be able to keep up with the development, as long as the hinter-land connections have sufficient capacity. The development of more sustainable operations both in the hubs but also to and from them will come even further in focus. The hubs, together with opera-tors will have ample opportunities to introduce viable and more environmentally-friendly solutions

for the hinterland transports in the future, both on sea and on rail, should the different incentives for this come in place.

At the roundtable discussions cooperation between the different hubs and other stakeholders was emphasised as an opportunity for the future development.