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Challenges for Polish ferry market development in Baltic Sea Region

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Abstract. Polish ferry market has become one of the prime segments of ferry shipping in Baltic Sea Region. It dominates in ferry industry in South Baltic. The ferry cargo and passenger traffic has been growing steadily since Poland's accession to the European Union. The estimates show that in 2017 the operators transported more than 1,2 million passengers and over 520 thousand cargo vehicles between ports in Poland and Sweden. The increase in trade turnover between Scandinavia and Central Europe as well as growth of tourism affect the demand for ferry transport. The aim of this paper is to explore the prime determinants influencing the development of Polish ferry shipping and to research the challenges that carriers operating the ferry services from Poland to Sweden must face such as internal competition between the operators in Polish market, competition from German and Lithuanian routes and low cost airlines as well as increasing trade volumes. The research hypothesis is: the growth of trade between Scandinavia and Central Europe as well as tourism traffic will increase the demand for ferry transport from Polish ports. Detailed research hypotheses are that: ferry services between Poland and Sweden constitute the primary market on the South Baltic and new tonnage investments to increase the capacity have to be taken.

1 Introduction

Ferry shipping is well developed in many regions of the world. Northern Europe and Mediterranean are regions of high concentration of ferry industry with Baltic Sea being one of the prime market [7].

Baltic ferry business is highly concentrated, at the beginning of January 2018, 16 major carriers operated on the primary international and domestic markets. Stena Line, Finnlines, Tallink, Scandlines and TT-Line dominate in Baltic Sea in terms of transport capacity and market share. The important carriers on the market include the Norwegian Color Line and Fjord Line as well as Polish companies operating in the South Baltic area. The network of ferry connections included 60 services with 116 ferries operated (ro-pax, cruise-roro i high-speed)[24].

It is not possible to estimate precisely the current volume of passenger and cargo ferry traffic in Baltic Sea Region. In previous years, the carriers published the annual and monthly volumes achieved on their routes, so it was possible to accurately estimate the

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turnover. Since 2015, some operators have stopped publishing data. On the basis of previous empirical data as well as market trends, it was is assessed, that in 2017 around 49 million passengers, 9 million cars and 3 million cargo units were carried on international and main domestic Danish and Swedish ferry lines (e.g. Bornholm and Gotland) in Baltic Sea Region [24].

In the Baltic Sea Region three prime ferry markets are separated:

- West Baltic - comprises the lines between Denmark and Sweden, Norway and Germany, services from Sweden to Norway and Germany and line Germany - Norway; the west market accounts for about 54% of passenger and about 62% of freight traffic,
- East Baltic - covers services from Sweden to Finland and Estonia, lines from Estonia to Finland and Russia; the east market accounts to 37.5% of passenger and about 19% of freight turnover,
- South Baltic/ Central Baltic - includes services between Sweden and Poland, from Sweden to Latvia and Lithuania and the connections between Germany and Lithuania, Latvia and Finland; the central market constitutes the 8.5% of passenger transport and about 19% of freight.

Routes between Poland and Sweden constitute a prime ferry market on the latter Baltic region.

2 Methodology and literature review

In the literature and in practice, there is not a uniform and generally used definition of ferry shipping and ferry vessel. The reason for it is connected with permanent transformation of the this type of ships, changes in supply and demand at ferry market, as well as approach of the authors to the presented issues.

Stapford states that ferries transport people, goods and vehicles over short distances by sea [30]. Kotowska highlights the carriage by ferry shipping two segments: passengers traffic and cargo transportation [9]. Similarly ferry shipping describes Wergeland [34]. Most authors however focus either on cargo or passenger segment.

Some of researches describe the cargo traffic only. Musso, Paixao and Lynce, as well as Paixao and Marlow define ferry shipping as a segment of short sea shipping and emphasise that these connections are an element of road –sea transport system to and from continental Europe [16. 18]. Paixao and Marlow, Morales-Fusco, Sauri and Melo as well as Daduna and et al stress the importance of ferry services in multimodal transport chains [17, 15, 4]. Cargo segment of ferry shipping is regarded by e.g., Suarez-Aleman, Trujillo and Medda, as well as Baird [31, 1].

The others pinpoint the passenger service and tourism functions of ferry shipping, e.g. Peter, Heijveld and Grey, Pantouvakis, Wild and Dearing [20, 6, 19, 36]. Mańkowska,, as well as Kizielewicz, Haahti,, Lukovic and Gracan focus on passenger segmentation [13, 8].

Some researches consider geographical markets, as Mathisen and Solvoll, Polydoropoulou and Litinas, Graham and Russell [14, 21, 5]. The other papers focus on ferry service network and fleet, e.g. Lai and Lo, Lo, An and Lin, as well as Wang and Lo [11, 12, 35].

Ferry shipping is also considered as alternative for land transportation in context of sustainable transport development, e.g. Casteliss, Usabiaga and Martinez, Kotowska, Chen, Yang and Notteboom [2, 10, 3].

The Swedish ShipPax, the leading ferry consulting and information provider, define ferry as a ship larger than 1000 GT that sails on a regular line and has passenger accommodation and is using ro-ro technology for the transportation of cars and commercial vehicles (if any), having sufficient free height on car deck(s) for this [26]. This definition of ferry ship will be assumed in the paper.

Ferry shipping is a type of liner trade where passengers and cargo form one market. Both segments are carried by one ship, ferries ply the regular route.

The principal aim of this paper is to analyse the development of Polish ferry market and to research the prime factors and challenges affecting this market. The research hypothesis is: the growth of trade between Scandinavia and Central Europe as well as tourism traffic will increase the demand for ferry transport from Polish ports. Detailed research hypotheses are that: ferry services between Poland and Sweden constitute the primary market on the South Baltic and new tonnage investments to increase the capacity have to be taken.

For the purpose of this paper, the analysis of ferry shipping at the South Baltic has been conducted. The analyses embraces cargo and passenger turnover, services network, fleet and carriers. The research is based on data collected directly from Polish operators. Moreover the author has conducted in-depth interviews with chairmen of management boards as well as cargo and passenger operation departments. The paper is based also on data from ShipPax publications and official trade figures collected from Statistics Sweden. Upon the available data Polish ferry market has been analysed.

The article focuses on selected factors determining Polish ferry market. With reference to the demand, foreign trade, as prime factor for cargo flows has been discussed and further development has been predicted. The passenger segment is highly affected by low costs airlines activity. Moreover the competition from German and Lithuanian routes was presented.

Other factors affecting the ferry market, as environmental requirements, access infrastructure, fuels prices, competition of land modes of transport do not fall within the scope of the research due to the limited volume of the study.

3 Selected factors determining ferry traffic demand

The mutual economic connections between Nordic countries as well as between the Baltic States and the countries of West and Central Europe are essential for the development of trade in the Baltic Sea Region. Cargo traffic flows from Central Europe to Scandinavian countries and vice versa are complementary to mutual trade turnover.

Close commercial relations between Scandinavia and northern Continental states are strongly developed since these countries have acceded to the European Union. The mutual turnover however shows the differences in exports and imports among individual countries. The highest trading volume is observed with Sweden being the prime Scandinavian partner for Central European states, the next are Denmark and Norway. Among Central European countries, Poland has become a prime trading partner for Sweden. (Fig.1 and 2). In 2017 the Polish exports amounted to 48,86 million SEK whereas import from Sweden totalled 38,51 million SEK (respectively 2,36 million tons in export and 2,37 million tons in import). Polish share in total Sweden foreign trade amounted to 3% in exports as well as in imports. This applies to both value and volume turnover [28].

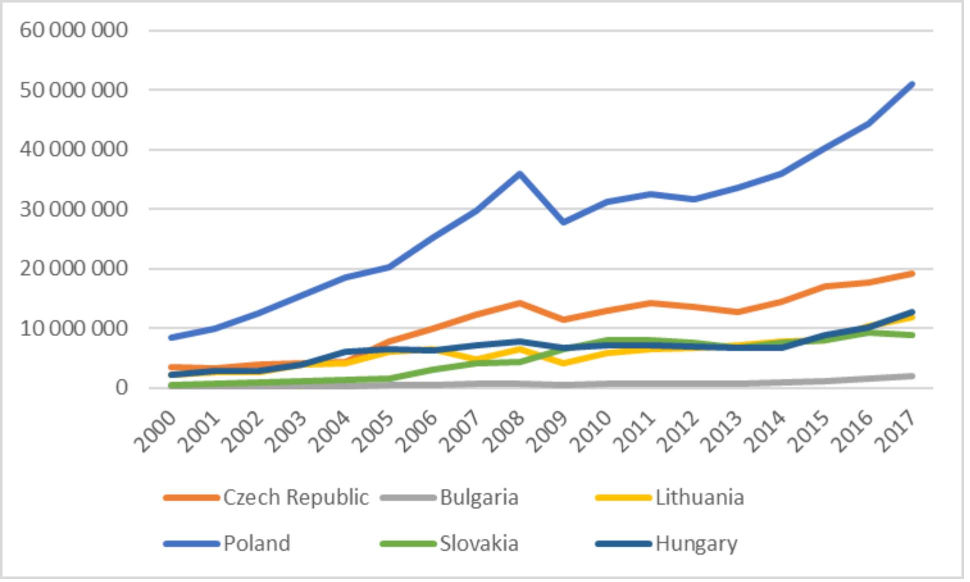

Fig. 1. Exports to Sweden from selected Continental countries in 2000-2017 (million SEK).Source: owns elaborations based on SCB Statistic Sweden.

The next trading partner are Czech Republic (1% in Swedish imports and exports), Hungary and Slovakia (both countries 1% in imports and less than 1% in exports). In comparison with Poland, these countries show significantly lower turnover, e.g. Czech Republic, Sweden's second-largest partner achieved a level more than 2.5 and 3.5 times lower in exports and imports respectively (Fig.1 and 2) [28].

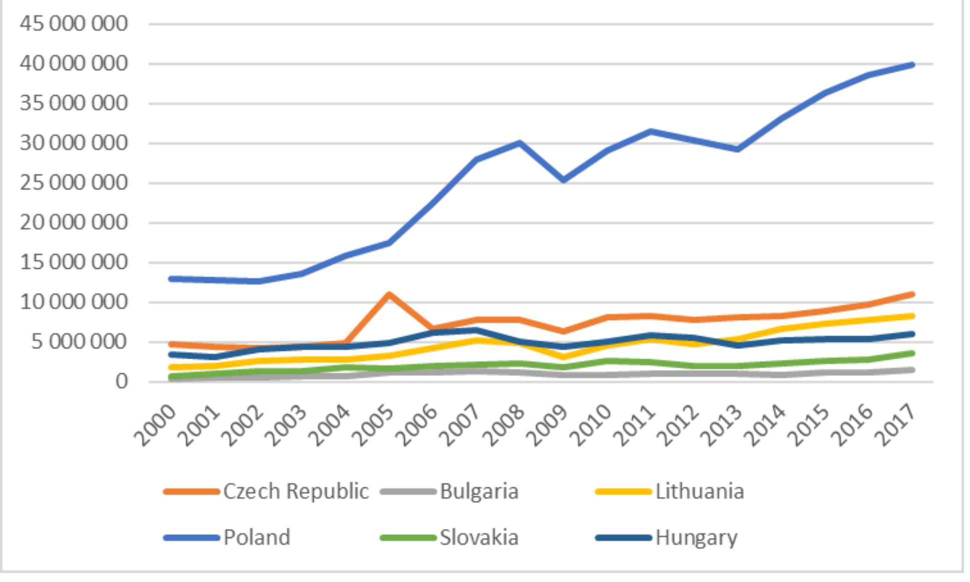

Fig. 2. Import from Sweden to selected Continental countries in 2000-2017 (million SEK). Source: owns elaborations based on SCB Statistic Sweden.

On the basis of data on trade turnover in the years 2000-20017 [28] and trend line the further growth of commercial traffic is forecasted. Polish export to Sweden is expected to rise by 5% till 2023 while Czech Republic and Slovakian is estimated to increase much higher - by 22% and 42% respectively. Import from Sweden to Central Europe is characterized by great instability, with large fluctuations in turnover, so the estimates and trend line are not reliable, however the volumes are expected to grow according estimates based on Statistics Sweden.

The commercial intercourse between Central European and two other Scandinavian countries is lower in value and volume. Poland is again the prime trading partner for Norway and Denmark with 3% share in foreign exchange of both countries. The other analysed states constitute around 1-2% in total turnover of Denmark and Norway [27, 29].

In mutual exchange dominate valuable commodities as electronic appliances, machinery, construction equipment, medical equipment, textiles, furniture, household appliance, food and agriculture commodities, as well as steel and semi-finished products.

Presented commercial intercourse, in regard to volumes and commodity structure, is the prime determinant developing the cargo flows from Central Europe to Scandinavia and creating the demand for ferry transport of cargo.

Passenger traffic is the second segment of ferry industry. The demand is created by people travelling in different purposes, e.g. visit chosen destination in connection with various needs, package trips, shopping, business. According to the prime factor generating the demand, the ferry passengers may be divided into categories:

- Liner passengers – travellers taking a trip in various reasons (visit an interesting destination, participation in culture or sport event, visit relations etc.), ferry crossing is only a part of whole trip,
- Cruise passengers – travellers participating in package trips of diverse nature, e.g. round trips for pleasure, trips with short stay in port of destination etc.,
- Conference passengers – participants in conferences and seminars organized on-board within liner trips,
- Shopping passengers – people who travel to purchase commodities on-board or in port of destination,
- Business passengers – passengers travelling in connection with their professional activities.

In practice, assigning the travellers to given category is not clear because passengers traveling e.g. as conference participants also do some shopping and enjoy entertainment. The assignment of traveller to a given segment results from the main transport need.

Polish traffic includes all mentioned categories, but over last ten years the structure of travellers has been changing. The number of liner and business passengers declined due to low cost airlines activity. The network of LCCs comprises flights from main Polish airports e.g. Warsaw, Gdansk, Cracow, Wroclaw, Poznan, Katowice to Swedish cities of Stockholm, Gothenburg, Malmoe, as well as Oslo and other Norwegian destinations. The frequency of Wizz Air and Ryanair flights are from 3 daily (e.g. Gdansk – Stockholm), 1 daily (e.g. Warsaw – Stockholm), to 2-3 weekly (e.g. Poznan – Stockholm, Poznan – Oslo, Cracow – Gothenburg, Cracow – Stockholm). The direct influence of LCCs on ferry markets is difficult to estimate, as the low cost airlines do not publish detailed figures for each destination. However in 2011 the total number of air passengers to or from Sweden amounted to 577,9 thousand, while in 2016 grew to 1 097 [32, 33]. The figure embrace LCCs traffic as well as flag carries, e.g. SAS and Lot as chief ones. So during 5 years the air traffic nearly doubled. In the same time the turnover of ferry passengers is stable and fluctuates around 1 000 thousand travellers yearly with slight increase in 1-2% y/y. One can assume, the increase in air traffic was caused primary by LCCs with cheap tariffs and some small destination, e.g. Swedish - Vaxjo, Malmoe, Polish - Wroclaw, Szczecin, Poznan, being not in traditional network.

However the Polish route Gdansk – Nynashamn is an example of LCCs` victims. In 2007 the ferries carried 154 thousand passengers, while in 2016 the traffic dropped below 90 thousand. The decline resulted from a number of factors, but the growing number of low costs flights to Stockholm destination has affected the ferry traffic chiefly [26, 25].

In the other hand the growing traffic of passengers travelling for shopping or taking parts in off season cruise trips is visible. Moreover in summer months more Czech and Slovakian motorized tourists are recorded on-board Polish ferries. The latter results from improved road infrastructure.

Another factor, competition from German and Lithuanian services is presented in the next paragraph.

4 The South Baltic and Polish ferry shipping market

The ferry market on the South Baltic comprises services from Germany to Denmark and Sweden, between Sweden and Poland as well as from Sweden to Lithuania. Routes from German ports in West Baltic - Puttgarden - Rodby and Travemunde - Trelleborg are less competing for Polish market, so there not studied. The traffic comprises cargo and passengers travelling between West Germany, France, Netherlands, Belgium, Switzerland, Austria and Denmark , Norway and Sweden. So the hinterland for Polish market is not disputable.

Competitive market for ferry traffic from Polish ports constitute services connecting eastern coast of Germany with Sweden and Denmark. The greatest potential is concentrated on Rostock – Trelleborg. The route is operated jointly by TT-Line and Stena Line, offering 3-5 day departures per day. The other is Rostock – Gedser, the short alternative for cargo transported from Central Europe via Germany to Denmark.

Table 1. Ferry sub-markets on South Baltic competitive for the Polish services

Market	Service	Operator	No. of ferries	No. of daily departures
Germany-Denmark	Puttgarden - Rodby	Scandlines	5	Up to 48
	Rostok - Gedser	Scandlines	2	8-10
Germany-Sweden	TravemundeTrelleborg	TT-Line	5	3-4
	Rostok –Trelleborg	TT-Line	5	3-5
	Rostok - Trelleborg	Stena Line	2	3-5
	Sassnitz - Trelleborg	Stena Line	1	1-2
Lithuania-Sweden	Kłajpeda - Karlshamn	DFDS Seaways	3	1-2

Source: owns elaborations based on Shippax Market 16, Shippax , Halmstad 2016, Shippax Guide 16, Shippax, Halmstad 2016.

Rostock-Trelleborg is the most competing in cargo segment for Polish operators. In the first decade of XXI century, the operators used to carry 280-290 thousand cargo units yearly. In 2009 the route revealed drop in volumes, the number of units decreased to 223 thousand trucks, to due to crisis. In subsequent years, the traffic was gradually recovering. In 2013 the joint service of TT-Line and Stena Line carried 246 thousand units, and during last 4 years the cargo traffic is stable and fluctuates around 250-270 thousand units yearly [24]. Sassnitz – Trelleborg is demonstrating fall in cargo volumes and now is not a competitor with 1 departure daily off season.

The Scandlines Rostock – Gedser, after decline in 2009, has been increasing the traffic since 2010. In 2016 the operator carried 86 thousand units. The route is convenient for traffic from Central Europe and Austria for hauliers driving to Denmark and to some extent to Norway. It is also a competitive alternative for cargo transported from Central Europe to Denmark, traditionally carried via Swinoujscie and fixed link – Oresundbroen.

The Klaipeda – Karlshamn is the most Eastern service on the Central Baltic, but is not so strong competitor for the Polish market. The latter transport trucks from Lithuania and some transit lorries from Belarus and Russia. Cargo from Ukraine and Central Europe are on marginal level due to the distance to Klaipeda and road connection. In 2014-2016 the turnover amounts to 130-140 thousand cargo units. [25, 24]. The growing demand on Lithuanian market caused addition sailings with third ship from the spring 2017.

Two presented connections from Rostock are the competitors for Polish routes from Swinoujscie, as both ports are based on the same hinterland.

Polish ferry market comprises links to Sweden from ports of Gdynia and Gdansk located at East Coast and from Swinoujscie at West Coast. The services are as follows:

- Gdynia – Karlskrona (Stena Line),
- Gdynia – Nynashamn (Stena Line),
- Gdansk – Nynashamn (Polish Baltic Shipping Company – Polferries),
- Swinoujscie – Ystad (Unity Line),
- Swinoujscie – Trelleborg (Unity Line),
- Swinoujscie – Ystad (Polish Baltic Shipping Company – Polferries),
- Swinoujscie – Trelleborg (TT-Line).

Altogether 18 ferries ply these routes (table 2). The largest capacity is concentrated on the Swinoujscie - Ystad and Swinoujscie - Trelleborg, which are operated by 12 ferries. Other services are Gdynia - Karlskrona (4 ferries) and Gdansk - Nynashamn with 1 ferry. The latter one will increase the capacity September 2018 with chartered ferry Nova Star.

Table 2. Supply on Polish ferry market

Service	Operator	No. of ferries	No. of daily departures
Swinoujscie – Ystad	Unity Line	4	4
Swinoujscie – Ystad	Polferries	3	3
Swinoujscie – Trelleborg	TT-Line	2	1-2
Świnoujscie - Trelleborg	Unity Line	3	3
Gdynia - Karlskrona	Stena Line	4	3-4
Gdynia – Nynashamn	Stena Line	1	3 weekly
Gdansk – Nynashamn	Pollferries	1	3-4 weekly

Source: owns elaborations based on Shippax Market 17, Shippax, Halmstad 2017, Shippax Guide 17, Shippax, Halmstad 2017.

Stena Line dominate in passenger capacity with 3,298 passenger space, Gdynia – Karlskrona deploys the largest on Polish market cruise-trailer ferries and offer the variety of package trips. In cargo segment Unity Line leads with 10,718 total line meter.

It is not possible to estimate precisely the current volume of passenger and cargo ferry traffic from the Polish ports. Since 2015 the operators has not published the results. Consider the previous volumes and trend line as well as ferry terminals data, the increase in cargo and passenger traffic is estimated by 8% and 2% respectively y/y.

In passenger segment Stena Line leads with 45% share. In 2016 the traffic amounted to 608 thousand travellers. Such high traffic volumes results from the Stena Line tourist offer, dedicated to both the Swedish and Polish market and the possibility that arise from the operation of the cruise ferries. In turn, services from Swinoujscie transported a total of 614,000 passengers (without truck drivers). It is estimated that Unity Line carried more than half of this number on the Swinoujscie - Ystad , where cruise ferries are deployed.

In the freight segment, the highest total turnover are observed from Swinoujscie to Ystad and Trelleborg. In 2016, over 420,000 freight units (lorries and trailers) were carried on that sub-market. The turnover in the truck segment increased by 8.9% and the semi-trailers - intermodal units by 10.5% y/y. Unity Line`s share amounted to 40-45% in total cargo turnover. The Gdynia-Karlskrona line handled some 180,000 freight units in 2016, which accounts for 29% of trade in goods. The share of PŻB and TT-Line in the discussed segment amounted to 25-30%.

5 Requirements for Polish ferry market

Growing demand for freight service generate the need for cargo capacity. Currently, operators are facing deficiency in load line. The use of the available capacity for individual operators in 2016 was at the level of 70-80% and rose to 85 – 87% in 2017, which means that there is no space reserve. To meet the growing demand, the carriers have to increase the transport ability.

Some actions were taken in 2017. Polferries introduced newly purchased ferry Cracovia on Swinoujscie – Ystad and increased daily crossings to 3 in both directions.

In turn Stena Line added a fourth vessel on the Gdynia - Karlskrona, chartered ferry Gute dedicated for cargo units. The operator`s next move was the opening a new connection from Gdynia to Nynashamn with chartered Elisabeth Russ, change now by Bore Bay. Currently, the operator offers 50 calls a week from Gdynia to Sweden.

Euroafrica bought from the Italian operator ro-pax which is a sister ship of Galileusz. The ferry will be renamed Copernicus and will ply Swinoujscie – Trelleborg under Unity Line brand. The newest acquisition on the Polish market is mentioned above Nova Star. Ferry is chartered by Polferries and will operate Gdansk – Nynashamn line as second vessel.

The activities of Polferries, Unity Line and Stena Line in terms of increasing transport capacity are response to the market demand. Ferry cargo segment is the most dynamically growing sector of maritime transport in the Baltic Sea Region and Polish services are the best example of this.

Most of ferries were built in 1980-1996, all of them need replacement. The potential renovations or conversions of ferry fleet particularly in the context of adaptation to SECA requirements is not profitable.

Hence, it is necessary to implement projects for the construction of new ferries for the Polish market. In March last year, Polferries ordered a ro-pax ferry which is scheduled for operation in 2019. A second vessel is planned for this operator as well as four more ropaxes are anticipated for Unity Line. Until the finalization of the extremely ambitious but necessary for the Polish market project, carriers will have to charter ferries or purchase vessels on the secondary market. This task is difficult due to the lack of used ferries on the market with appropriate parameters (load line) and acceptable age.

The next challenge for Polish ferry market focuses on terminal infrastructure. Ferry traffic is concentrated in 3 terminals.

The largest, both in terms of turnover and available infrastructure, is located in Swinoujscie. The terminal has 6 berths with ro-ro ramps. Nevertheless currently its traffic capacity is insufficient. In 2017 total 3576 calls were registered, up 9- 12 calls daily. At the terminal infrastructure investments are planned to adapt the potential to the growing volume and support for intermodal transport. As part of the modernization berth 5 and 6 will be jointed to serve the ship up to 265 m of LOA. For lorries three new parking spaces will be constructed. The new berth will be fitted with a gallery for passengers.

In Gdynia ferry terminal is located in Western part in the immediate vicinity of container terminals. The infrastructure limits the capacity of the terminal due to length of berths and parking space as well as number of calls 4-5 daily. The new public terminal is under construction and is planned for 2020. The terminal will berth ferries up to 245 m length and be fitted with double ramp enable the simultaneously loading and discharging.

The only terminal with currently sufficient infrastructure is operated in Gdansk, where ships to 225 LOA may berthed. Terminal is fitted with 3 ramps, the parking for approximately 125 lorries and 12 buses and is very well connected with the road network (the A1 motorway and the S 7 expressway being built). It also has access to the railway infrastructure.

Two presented challenges are the most important factors the ferry operators have to face. Moreover during last 5 years another phenomenon is visible. The cargo flows between Europe and Scandinavia have been shifting to East. The latter results from congestion in German motorways and improving road infrastructure in Poland. These impact the connection from Polish terminals. More Austrian, Czech, Slovakian and other European lorries are recorded on Swinoujscie services, before transported via Rostock and Sassnitz. The share of Central European origin hauliers amounted to 30-40% depends on service. Similar effect is registered on Gdynia and Gdansk routes, where share of foreign hauliers e.g. Czech, Slovakian, Hungarian or Romanian increase to about 35% of cargo segment.

6 Conclusions

Commercial intercourse between Central Europe and Scandinavia is showing an upward trend and a further increase in mutual exchange of goods is expected. Increasing trade will result in growing demand for transport of wheeled cargo from Polish ports. Moreover the shifting of cargo flows from West to central and East corridors is another factor influencing the demand. The passenger sector is stable primarily due to cruise and shipping travellers. Low cost airlines are the main competitor to ferry links.

Services from Polish ports constitute the most important ferry sub-market in South Baltic. The chief competitor is Rostock – Trelleborg with stable turnover, but investment in tonnage planned by TT-Line may result in another growth of cargo traffic. Current tonnage operated on Polish market is insufficient in capacity. Hence carriers to improve their competitiveness and adjust the transport possibilities to the increasing demand have to invest in tonnage.

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