



POLAND AS AN REGIONAL LOGISTIC HUB SERVING THE DEVELOPMENT OF NORTHERN CORRIDOR OF THE NEW SILK ROUTE

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ABSTRACT

The development of efficient land connection between Asia and Europe may be beneficial for improvement of trade exchange of both regions. The purpose of this paper is to present Poland as an example of country which represent continuous improvement along the seven years of research conducted by World Bank concerning logistic performance and may play an valuable role of logistic hub for northern corridor of the new silk route. Geolocation of Poland helps to play role of distribution hub for future trade and logistic operations conducted through northern corridor of the new silk route. Poland as an UE member develops quickly and builds both line and nod infrastructure along the main TENT corridors. Integration throughout communication system of roads and rail tracks with other European countries is another beneficial factor allowing Poland to offer opportunities as an potential logistical hub of Central European Countries.

Keywords: International logistics, transport, logistic performance, trade, infrastructure.

JEL Classification: F16, R4, L910

1. INTRODUCTION

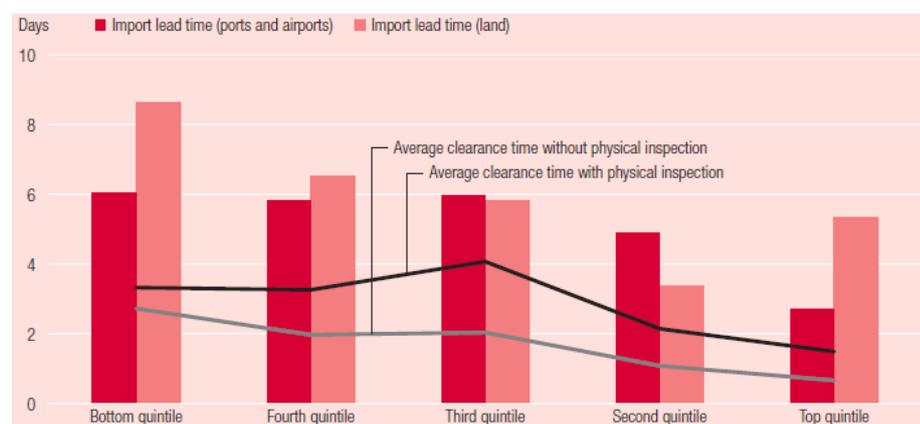
Interconnectivity between links in global supply chain is an crucial factor for efficient international supply chain. Connecting geographically dispersed nodes in the globalizing world increases pressure to improve existing logistic performance in the region. Identifying countries which may play an important role in the processes of connecting international supply chains is then one of managerial task. That is why developing an efficient logistic performance in the country may gain attention among investors and be beneficial for local and regional economy. Fast changing demand on the market, influences behavior of the different parts in supply chain. Increased tempo in delivering to the market, forces international supply chain operators to rely on secured locations (Gołemska, 2014). The World Bank observes the changes in the particular country by comparing six segments building final logistic performance index. To name them all: Customs, Infrastructure, Ease of arranging shipments, Quality of logistics services, Tracking and tracing, Timeliness. These factors creates an comparable picture which evolves over time. Some countries try to implement strategy to improve overall logistic performance. To do that there is a need for funds and time supplemented with political will to facilitate regulations. Continuous effort may be awarded by comparison made by independent researchers like ranking proposed by World Bank. The evolution of logistic performance index in time, verifies effectiveness of implemented strategy. In some cases country struggle with acquiring funds or political will to improve, additionally its location may significantly decrease the result of the effort incurred. But this is not the case of Poland. Constant improvement in the period of seven years proves effectiveness of the strategy to build logistical hub connecting international links of many industrial supply chains. Moreover, the trend to improve land connections between Europe and Asia is one of important factor influencing the development of logistic performance in Poland. That may add additional impetus for actual positive trend and speed up efficiency and reliability of transport and logistic operations in Poland. Analysis of the data gathered by the independent

institutions shows trends and helps to draw conclusions. This paper is organized as follows. Firstly LPI index will be presented as a tool for future comparison. Then next chapter will present evolution of Polish LPI index over seven year period. The final chapter will indicate possibility for connecting Poland with northern part of the new silk route.

2. LPI INDEX AS A PROGRESS MEASUREMENT

The span of seven years allows World Bank to formulate comparisons and present the ranking of countries in the field of logistic performance. Carefully measured progress in six categories concerning logistical and transportation operations consist of assessing the quality of trade and transport infrastructure. Improvement over existing one may be critical for future development of performance. Time and funds needed to improve this category are the most critical obstacle to make a perceptible change. The ease of arranging competitively priced shipments is a key to decrease cost of operations and increase availability of local partners for international trade structures. The competence of logistic staff influencing the quality of logistics service, explain advances of particular operators in trucking, warehousing or customs brokerage. Virtualization of supply chains help to increase level of control over moving resources. That is an important part of resilient supply chains and helps to avoid problems along the route, connecting partners in worldwide supply net. Thanks to the ability to track and trace consignments ITC systems of particular operator will be fed by the data and helps to achieve the resiliency in any unexpected situation. At last but not least: the timeliness. Measured frequency with which shipments reach consignees is a prove of reliable delivery. That secures the supply chain against delay and unexpected occurrences. Effective delivery to the market becomes more important over time and in time based competitive environment is a most precious factor. If shipment meet the goal within scheduled or expected delivery times, then the synchronization of the global net is a valuable asset on nowadays market. The competition forces especially international supply chains to offer greater variety of products and services, at lower cost and most important, in less time (Stalk, Haut, 1990). In such highly competitive environment of impatient customers it is rather important to choose location of logistics operation wisely. The research conducted by the World Bank shows existing of the logistic gap between developed and developing countries of the world.

Figure 1: Median Import Lead Time and Average Clearance Time, by LPI quintile



Source: Arvis J.R., et al 2014

It means that although the infrastructural changes are visible in all regions, the change for better is more significant in countries already high in the global ranking. The existing high level of infrastructure there is still improved, what underline the importance of this factor for logistic performance in general (Arvis, et al 2014). Availability of ports, airports, roads, rail, warehousing and transshipment facilities or existing information and communication technology become a trademark of certain regions and shapes international supply chains accordingly. The timeliness measured by the World Bank base on comparing lead time in import and export.

The located gap here, differentiate countries from high performing groups to those from the bottom of the ranking. If translate this fact to a time measure it is clear that the lead time in ports and airports takes two and a half day in top quintile in comparison to six days in bottom quintile. The three and a half day gap means a lot in tight supply scenario. Additionally if compare import lead time using land transportation operations it indicate two day gap in the same comparison. Time competition fuels more sophisticated solutions in logistics. In shortening of a life cycle of a product delay is quickly transferred in to a loss of a market opportunity. To build an efficient supply chain, there is indication hidden in the data presented in LPI index. Comparing countries through scope of LPI index may help to rationally chose a more suitable location for logistic operations.

3. DEVELOPMENT OF LOGISTIC PERFORMANCE INDEX OF POLAND

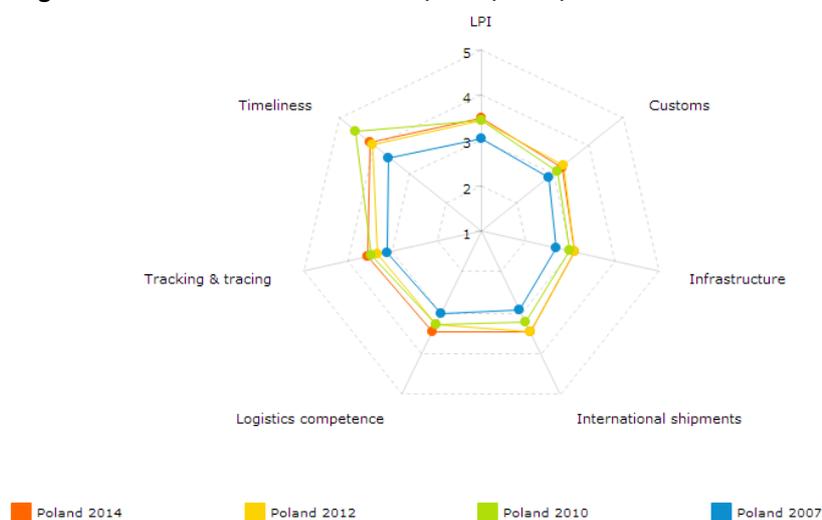
Cooperation among UE courtiers purposely improve logistic performance of the region. Creating union without borders allows free transfer of people, goods and capital. That becomes an landmark of European Union which in the process of negotiations and following accessions continuously build an coherent interconnected region. Thanks to the unification of 28 members now becomes much easier than before to distribute goods. Nonexistent border procedures decrease number of needed warehouse on local national base. There is spotted tendency to increase size of warehouses and promote them into distribution centers featuring additional services. Thanks to that and improved accessibility to all 28 members it is possible to build highly specialized pan European centers, covering distribution in whole Europe (Van Goor, Ploos van Amstel, 2003). EU countries planning for the expansion of transport corridors can boast achievements in this respect. Not coincidentally in the top ten of world ranking, drawn up in 2014, there is located seven European countries. The first place is occupied by Germany with a score of 4.12 LPI (Lpi.worldbank.org, 2014). Expensive expansion of highways, bridges, railways including adapting them to the high-speed and investments in nod infrastructure as airports and seaports, and quite developed in Western Europe inland waterways, constitute the efficiency of transport and the possibility of using intermodal solutions on the continent. The purpose of creating the LPI index is to increase the connectivity between word regions. This connectivity is understood as an importance of the country, airport, seaport for the international net of logistics. The logistic availability of a certain place allows international business to expand its reach and use an above average potential in maintaining supply chain operations. Becoming central in this light means reducing economic distance, increase efficiency in supply chain and connectivity with the other regions (Arvis, Shepherd, 2011). Poland as an member of UE become an beneficent of Cohesion funds. The Cohesion Fund is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90 % of the EU average. It aims to reduce economic and social disparities and to promote sustainable development. Moreover the Cohesion Fund allocates a total of € 63.4 billion to activities improve connectivity across EU members (The Cohesion Fund, 2016). To this belongs investment focusing on building Trans-European transport networks and infrastructure projects under the Connecting Europe Facility. Additionally the Cohesion Fund support projects related to energy or transport, as long as they clearly benefit the environment in terms of energy efficiency, use of renewable energy, developing rail transport, supporting intermodality and strengthening public transport. This become an financial fundament for development of modern infrastructure in Poland and is one of the cause of increase in logistic performance index. Thanks to the research of the World Bank replicated four times since 2007, it can be noted the positive trend in the assessment of each of the six key aspects of logistic performance in Poland. The leader of the ranking in 2014 is Germany. In table 1, Germany as a world leader serves as an comparison to polish effort to follow the path of its direct neighbor. The rank position of Poland in 2014 present an upgrade of nine places among most of developed in logistic sense courtiers of the world. To rival with the top then is difficult mostly because the value of time. It is very challenging to advance in the tempo of top lpi ranking, especially when noticed that the improvement among leaders is also impressive. As a result, the future upgrade in the ranking may be even more demanding.

Table 1: Comparison of an Output in 6 Areas of Logistic Performance of Poland through four World Bank rankings, from 2007 to 2014.

Country	LPI rank	LPI score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
Germany 2014	1	4,12	4,1	4,32	3,74	4,12	4,17	4,36
Poland 2014	31	3,49	3,26	3,08	3,46	3,47	3,54	4,13
Poland 2012	30	3,43	3,3	3,1	3,47	3,3	3,32	4,04
Poland 2010	30	3,44	3,12	2,98	3,22	3,26	3,45	4,52
Poland 2007	40	3,04	2,88	2,69	2,92	3,04	3,12	3,59

Source: lpi.worldbank.org, 2014.

The measurement made by the World Bank in the years: 2007, 2010, 2012 and 2014, established a growth of LPI. In respective years it amounted to: 3.04, 3.44, 3.43 and 3.49. The progress in logistics performance is recorded in subsequent studies of the World Bank. The tempo of improvement were faster at the beginning of the seven year period and slower in recent years. But for sure is a positive indicator of the possible trend of development of Central and Eastern transport axis. The interconnectivity inside EU were the first goal for the countries building new relations and foremost supply chain links. The accession in 2004 added to the EU's economic body quite a large area of Central and Eastern Europe, which was a challenge in term of construction transport connections.

Figure 2: Polish LPI in the Years 2007, 2010, 2012, 2014

Source: lpi.worldbank.org/international/scorecard/radar/254/C/POL/2014/C/POL/2012/C/POL/2010/C/POL/2007#chartarea 24.11.2015.

The accession consisting of 10 countries: Cyprus, Czech Republic, Estonia, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia and Hungary was the biggest in the history of UE and significant in term of geography of the region. Noticeable improvement of logistics performance in Poland took place on the basis of expanding infrastructure and increase in logistics competence. New market opportunities for business partners from many EU members and promising competitive cost of labor and land in accessing countries, triggered development of intra-european supply chain links. Economic development after accession and increase in

contacts between Polish business entities and European supply chains created climate for investment in infrastructure. Improving the conditions for transport and storage was a necessity for fast developing net of distribution. Therefore areas along the international transport corridors increased its investment attractiveness and draw attention of businesses of international range. The environment of logistic infrastructure transformed in a positive way, what facilitated implementation of international logistics operations.

Analyzing of the fig 2 it is clear that the most noticeable change can be seen in the frequency of supply service without delay. The development of market for logistic services serves an catalyst for better flow of resources in the supply chain. The fastest grow was observed in road transport. The number of companies providing logistic services with licenses for international transport in Poland doubled from 2005 to 2009 (Brdulak, 2012). The agility of road transport in Europe makes it as an dominant mode. That is one of concerns and thus other, more environmental friendly modes are promoted. Significant growth of logistic competence and the area of tracing and tracking are an effect of improvement in education of skilled human resources and quick development of logistic services inside of many business units. That combine with improved ITC technologies and availability of ITC infrastructure caused significant change for better in these areas. Quickly growing warehousing market is an answer for a need to provide an well-equipped space ready to implement new scanning technologies and automation process in logistic centers. That growth tempo is faster than in other Central and Eastern European countries especially those joining EU after accession in 2004 (Burniewicz 2010).

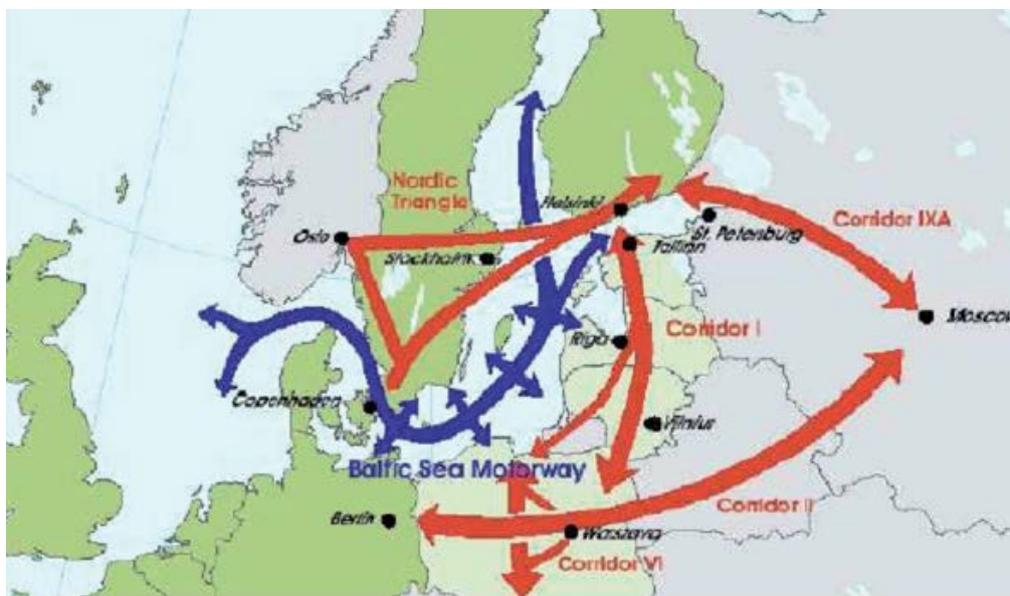
The geopolitical location is an important factor opening an development perspective for locating warehouses and advanced logistic centers. The location of most critical logistic facilities in Europe was dominated by the Blue Banana region especially in the Benelux region. However enlargement of UE territory forces many European supply chain to build regional logistic centers in CEE countries. The gravity of distribution models influences transportation operations and requires additional logistic infrastructure to perform on expected time of delivery. That formed an new spatial structure known as Central European Boomerang. Thanks to European cohesion funds, working in most CEE countries and a number of private sector investments, opportunities in this area are significantly improved. Expansion of highways along the European transport corridors, supplementing them with a network of local high speed lanes in the interior of the country and expansion of the port of Gdansk with intermodal container terminals, increases the efficiency of logistics in the region. Readiness of ports which may take over cargo shipment from Rotterdam and Hamburg is an additional advantage. The central European market consist of three fastest developing countries: Poland, Czech Republic and Hungary. The attention of investors focus in the most developed areas in term of transportation facilities. Recent investment in roads, rails and logistic centers focuses on connecting these three countries and help investors to further develop their interest close to the high populated areas. The industrial cooperation among business partners creates logistic ties and promote future expansion. The goal standing and continuously pointed out is to improve available infrastructure to the level of most advanced countries of Western Europe (DHL Report, 2016). In case of Poland it is both challenging and impressive task especially if the direct neighbor is Germany - world leader in logistic performance (two times in four rankings prepared by World Bank). In Poland the most demographically dens areas lies around cities like Warsaw, Poznan, Katowice, Wroclaw, and the Tri City with Gdansk and Gdynia as an marine ports. Relatively growing economy increases the potential of the internal market and influences the existing distribution net. New facilities constructed close to main cities representing highest logistic standard supporting use of information technology facilitating logistic operations. Thus the improvement in tracking and tracing as an part of logistic performance is possible due to advances in available modern logistic centers. These facilities are also located close to the well-connected areas. The example is Stryków. A small city close to Lodz. As an working intersection of two Trans-European Transport Networks transport corridors North-South and East-West allows quick access to European road network and improve the tempo of distribution operations. Along the A2 motorway there is located many logistic centers with concentration in the nearness of Poznan, Lodz and Warsaw. Similarly motorway A1 Influences expansions of such centers close to Krakow, Katowice and Wroclaw. One significant example supporting this trend is decision of Amazon to locate their distribution centers. One is located in the vicinity of Poznan –Sady, and two near Wroclaw -Bielany Wroclawskie (Koralewski, 2013). Amazon investment is also another example of expansion of western European supply chain into CEE countries. That supports the thesis of significant development of purchasing power in the region and increasing need for building efficient distribution network.

Poland in the opposition to other CEE countries isn't landlocked. The expansion of container terminal in Gdansk serves as an argument supporting the effective increase of cargo transported through Poland. That additionally is one of condition of building the logistic infrastructure in the direct nearness of port. One of the greatest strengths of the Pomeranian Logistics Centre is location, near the container terminal DCT Gdańsk. Thanks to ability of adopting some of the largest ships in the world it has become an important port in the region. After putting the second berth in 2016 container terminal DCT Gdańsk will double its handling capacity reaching 3 million TEU per year (Eurologistics, 2015). The overall advances in logistic performance measured by World Bank summed up the effort in performing cohesion with western European logistic performance. LPI index measured in 2007 indicated 3.04 and in 2014 raised to 3.49. This is a significant advancement also expressed in the ranking. In 2007 Poland took 40. position in the global ranking. After seven year it is located on 31. Stabilization on place 30-31 in the final three measurements indicate that other countries also intend to raise the efficiency of its logistic performance and in fact further advances may be difficult because rising bar among well-developed counties from the top of global ranking. The reason for this observation is also the economic effects of globalization and the rapid development of the regions of the Far East, characterized by impressive economic growth.

4. CONNECTING POLAND WITH NOTHERN PART OF THE NEW SILK ROUTE

Geopolitical status of Poland including EU membership and localization in convenient passage may be a main reason to use its territory to build an efficient logistic hub. Expected increase in trade between Europe and Asia will curb the tempo of transformation of existing transportation corridors and available logistic infrastructure (Bentyn, Gołemska, Majchrzak-Lepczyk, 2015). The development of new silk road will be supported by Asian Infrastructure Investment Bank. That will secure funds for infrastructural transformation allowing increase of tempo of transportation and logistics performance of countries along the route. The analysis of connection between Poland and expected northern corridor of new silk road should focus on land transportation modes directing to Belarus as an part of northern corridor of the new silk road.

Figure 3: Baltic Sea Motorway and Land Corridors in the Region



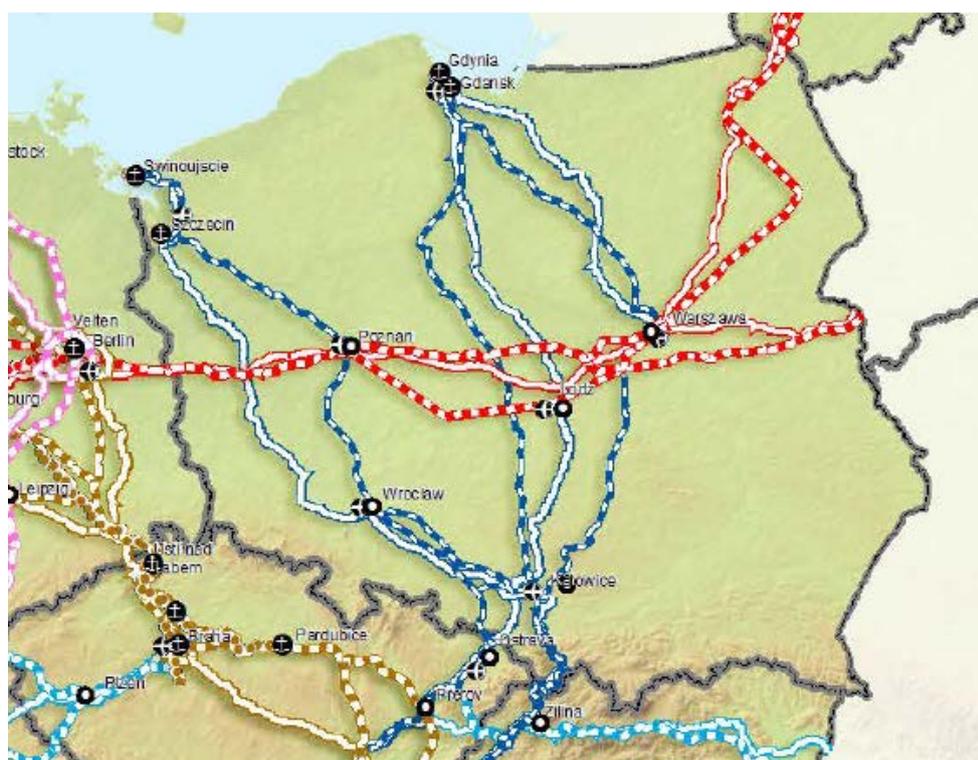
Source: Grzybowski M., Porty Gdańsk i Gdynia w systemie logistycznym Polski, Prace Naukowe Politechniki Warszawskiej, iss 76, p.44, 2010,

Northern corridor will leads from China through Kazakhstan, Russian Federation, Belarus, Poland to the central part or EU – Germany. Road and rail transport will play an dominant role because of flexibility and speed of connections. Marine transportation may play an additional and supportive role as an optional way of

transportation. Possibility to reach far, global destination in efficient way is an existing option thanks to improved marine infrastructure and access to Deepwater Container Terminal Gdansk. Availability of international ports stresses potential of Poland as an intermodal hub for transportation operations. Comparison of Baltic Sea Motorway and land corridors in the region express the possibilities of transportation routes using marine connections and well developed land corridors in direction West–East and North–South in the Poland territory. The Trans-European Transport Network is a net of corridors build cohesion for the members of UE. The main aim is to close the gaps between Member States national transport networks (Leonardi, Woodburn, Allen, Browne, 2010). It will serves as a remedy for bottlenecks that still hamper the smooth functioning of the internal market. Additionally TEN-T helps to overcome technical barriers such as incompatible standards for railway traffic. In effect the net of transportation helps to create a better, more efficient structure in European supply chain promoting speed of delivery, seamless transport chains for passenger and ecologic freight (European Commission, 2016). In Poland already function two corridors:

1. The Baltic-Adriatic Corridor is one of the most critical trans-European road and railway axes. Starting at the Baltic following through industrialized areas between Southern Poland, Vienna and Bratislava, the Eastern Alpine region and Northern Italy and connects with the Adriatic Sea. Important railway projects along the way: Semmering base tunnel, Koralm railway in Austria, Cross-border sections between Poland, Czech Republic and Slovakia as an important axis connecting CEE countries.

Figure 4: The overall TEN-T Corridor Map



Source:http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/maps_upload/corridors_png/Europe_Corridors_ALL_web2_07_2014.pdf

2. The North Sea-Baltic Corridor connects the ports of the North Sea with the ports of the Eastern shore of the Baltic Sea. This corridor provide modern road and rail transport links between the three Baltic States, Poland, Germany, and Belgium. Connecting CEE countries with existing European logistic hub in Germany and the Netherland ports is an important factor increasing

accessibility of cargo located in Poland to the main European distribution hubs. Inland waterways created along the Odra River and German, Dutch and Flemish ports or Mittelland-Kanal are additional options for ecological alternative in transportation. Project Rail-Baltic as a part of corridor will create an European standard gauge railway between Tallinn, Riga, Kaunas and North-Eastern Poland. That may be beneficial for transportation links leading to Russian Federation.

Road links from Poland to Belarus consist of two main roads. First one is Polish A2 road (E30) it leads to international crossings Kozłowicze-Kukuryki or Terespol-Brest road M1 (E30), from Brest to Minsk and further to Moscow as Russian M1 road. A2 road is partially finished highway connecting Germany throughout Poland with Belarus. The majority of this route is a modern standard highway (German border to Warsaw). Planned modernization will be finished by the year 2020. The other is express road S8 and S19 linking Warsaw with international crossing Bobrowniki and goes further as Belarus express road M6 leading to Minsk. This link connects border of Belarus to A2 corridor and most importantly leads to Strykow near Lodz where lies crossing of A1 and A2. The most important Polish road crossing of north-south and west-east highways. Access to European net of roads thanks to rapid road modernization allows international operator to distribute goods across EU territory. Large metropolitan areas like Katowice, Warsaw, Wrocław and Poznań create additional demand for goods and develop quickly logistic infrastructure like warehouse facilities and additional road links.

Another even more important for the purposes of new silk road land link is rail. The main railway hub is Brest. Through its rail link UE to Belarus. The territory of Belarus is crossed, from Brest to Orsha through Minsk where main national hub and dense demographic area is located. The international rail line goes further to Moscow, effectively connecting Berlin, Warsaw, Minsk and Moscow. The interesting project designed by the Belarusian Railway consists of facilitating cargo transportation by the named accelerated trains. That allows to offer simplified customs procedures, and cargo tracking system. Thanks to running on a fixed schedule it concedes accurate freight planning. Moreover it brings significant reduction of time required for a round trip East-West-East compared to regular freight trains. That was possible due to simplified cargo operations and higher cargo safety standards during transportation (Belarusian Railway, 2016).

Figure 5: Accelerated Trains in Container Transportation Belarusian Railway



Source: http://www.rw.by/en/freight/container_transportation/accelerated_trains

One of the many accelerated train is link from Chengdu to Lodz. Since April 2013 it has been operating regular weekly cargo connection from Chengdu to Lodz. For more than two years it was performed on over 100

scheduled and 50 charter trips. The speed of transportation overcomes marine transportation significantly. Rail transport to Europe in container train operated by YHV Logistics (China) and Hatrans Ltd (Poland) takes 10-12. Additional travel time to further European countries takes another 1-2 days. The destination area Lodz is former industrial center of Poland. The city is close to the capital, which can be reached within 60 minutes by car. The aforementioned crossings of highways A1 and A2 in nearby Strykow helps to develop logistic centers in the area. Thanks to access to road and rail net, proximity of local and major airport in Warsaw, Lodz works as an transshipment center for further destination in EU. Colliers international identifies the following cities as Emerging Distribution Hubs by 2020. Three of them lies in Poland and additional two in Czech Republic and Serbia. Among polish locations is Lodz, Gdansk/Gdynia or Tricity, Katowice and Wroclaw (Colliers, 2012). The development of distribution centers in Poland prepares advanced infrastructure helping to control the distribution in the EU. In 2014, the total supply of modern warehouse space in major Polish markets amounted to nearly 9 million square meters. New contracts accounted for 71% of demand, compared to 29% subject to renegotiation (Colliers, 2015).

5. CONCLUSIONS

In order to develop an efficient land connection between Asia and Europe there is a need to build and modernize existing logistic infrastructure along the planned corridor of the new silk road. Poland serves as an example of continuous development and increased logistic performance since it became a member of UE. Its geographic position in Europe helps to create potential for development of roads, rail links and distribution centers. Moreover access to ports and close cooperation with other UE members builds potential of Poland as an international and European logistic hub. The northern corridor of the silk road leads thru Belarus and enters Poland from east. The available and quickly appearing logistic centers in the strategic locations Strykow where is located most promising logistic hub of Poland. Development of ports increase additional interest of distributors gaining access to efficient marine transportation. The proximity of Germany, European leader in logistic performance influences business development, especially in the area of logistic services. Serving as a potential hub for goods transported from Asia, Poland may be an efficient hub allowing to distribute it across Europe thanks to already build net of transportation corridors. The investment in logistic sector makes Poland an emerging European hub in the view of professionals. That vision complies with the growing need of supplementation of existing Blue Banana with locations placed further in east direction. The accession of ten countries to UE in 2004, in this eight creating CEE countries, caused a constantly growing need for increase in logistic performance in this region. After seven years in research conducted by World Bank, it is visible improvement of logistic performance in Poland. That allowed to improve its position in world ranking and moreover draw attention of international supply chains. Further facilitating of logistic infrastructure may be beneficial for Europe and Asia, both interested in creating new silk route.

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