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THE IMPORTANCE OF PASSENGER AIR TRANSPORT AND HIGH-SPEED RAIL FOR REGIONAL DEVELOPMENT

Summary: The article presents an overview of the theoretical aspects concerning the impact of passenger air transport and high-speed rail on regional development. There will also be shown statistics concerning the development of high-speed rail and air transport sectors within the European Union, as well as the prospects for further development. We will also discuss air transport development and the plans to build the so-called “line Y” of high-speed rail in Poland.

Keywords: transport infrastructure, high-speed rail, air transport, regional development.

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1. Introduction

Transport plays a fundamental role in the economy, and infrastructure is the basis of its functioning. In the context of increasing globalization and the free movement of people and goods, to cover distance as fast as possible is becoming increasingly important. One can talk about geographical distance, measured by the amount of kilometres and the distance of time given by the information of how long a journey between two points in space takes. With the development of civilization and the increasing prosperity of society we observe the growing value of time that is spent on work or leisure. It becomes important to cover the distance as efficiently as possible. Nowadays, according to the new model of the economy, quality of life as an indicator of welfare is taken into consideration. The economic prosperity of society is measured not only by indicators of income, but also by the study of quality of life, which is related to the value of time and quick, reliable transport [Stiglitz et al. 2010, p. 3]. Air transport is the fastest mode of transport regarding long-haul journeys. High-speed trains meet the need for rapid movement between urban centers, increasing the accessibility of regions at national and international levels. This article discusses the role of high-speed rail and passenger air transport in regional development. There will be also presented an overview of statistics

concerning the development of high-speed rail and passenger air transport sectors within the European Union, as well as the prospects for further development. Also discussed will be passenger air transport development in Poland and plans to build the so-called “line Y” of high-speed rail.

2. The economic importance of air transport and high-speed rail

The transport sector as an important component of the economy has a positive impact on the development and welfare of populations. Efficient transport systems provide socio-economic opportunities and benefits that result in positive multiplier effects such as better accessibility to markets, employment and additional investment. By contrast, deficient transport systems, also in terms of capacity or reliability, can have an economic cost such as reduced or missed opportunities [Rodrigue 2013]. Lack of infrastructure, known as an infrastructure gap can become a barrier to economic growth and the development of regions and whole economies. The economic impacts of transportation can be direct, indirect and related, which according to Rodrigue can be explained as follows [Rodrigue 2013]:

- direct impacts – the outcome of accessibility changes where transport enables employment, added value, larger markets and saving time and cost;
- indirect impacts – the outcome of the economic multiplier effects where the price of commodities, goods or services drop and/or their variety increases;
- related impacts – the outcome of economic activities and firms partly relying on efficient transport services for both passengers and freight.

The importance of transport can be considered at macroeconomic level, from the point of view of the whole economy. Within a national economy transportation and mobility are linked to the level of employment, output and income. On the other hand, at microeconomic level the importance of transportation and infrastructure affects the specific parts and sectors of economy, referring to producer, consumer and production cost.

All economies and regions do not share the same level of mobility, which is one of the most fundamental and important characteristics of economic activity, satisfying the need for passengers and freight to be relocated. Mobility is not only a catalyst for development, but also a reliable indicator of development. A transport service employs people, pays wages, invests capital and generates income, thus contributing to economic growth.

Many countries in the world have developed high speed rail systems, connecting main cities and even airports with city centres. Nowadays a high-speed rail network is perceived as a competitive and efficient substitute for highways and airports struggling with congestion problems. Measuring the impact of high-speed rail networks on local economies according to the key literature can lead to several transport and non-transport impacts on regional development.

The transport related effects of high-speed railway infrastructure can be pointed out as follows [Kamel, Matthewman 2008]:

- increase in accessibility;
- location of economic activity;
- costs of new rail links.

The primary effect of high-speed rail lines is the increase of accessibility of the connected cities and regions. Such benefits are important to passengers, particularly commuters, but also international business passengers and tourists. An existing high speed rail line can affect the location of economic activity, such as the positioning of offices, and is taken into consideration in SWOT analyses as a strength of infrastructural development. High-speed train lines can enhance the attractiveness of an area. One-third of the respondents even indicated that high-speed train services can be perceived as a factor in their location choice. The cost of new rail links and building the infrastructure are significant so it should not be justified in transport terms alone.

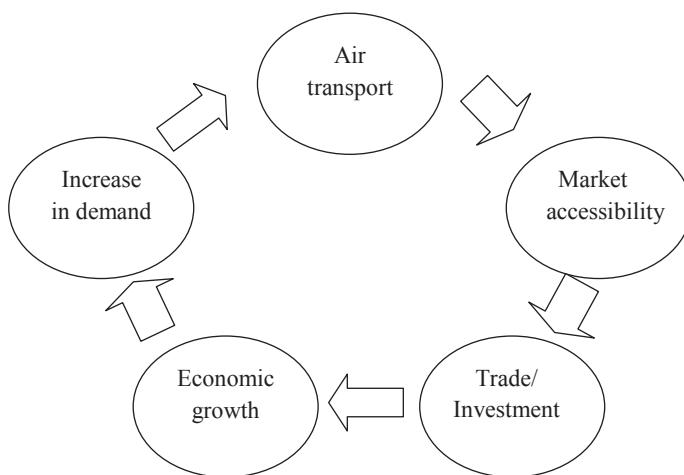
The non-transport benefits according to most studies are positive, but it is difficult to separate its influence from other factors contributing to economic growth. Mentioned below are the following non-transport impacts [Kamel, Matthewman 2008]:

- locational effects;
- property prices;
- labour market;
- intra-regional distributive effects;
- generative effects;
- catalytic effects.

As already mentioned above, some studies have indicated that the accessibility and presence of high-speed rail links can be considered by companies locating their business. Centrality and connectivity are important factors for the location of offices, with connectivity effects resulting from reduced travelling times. The availability of high-speed rail services can add to the attractiveness and image of a location. One of the effects of office developments can be increased property prices. Accessibility can enlarge a region's labour market by increasing the maximum acceptable commuting distance. High-speed rail can integrate formerly separated labour markets into one functional region. Intra-regional distributive effects can be related to local movements of people, companies and economic activities within a region and towards high speed stations. Generative effects can be described as stimulating the total regional or national level of economic activities. As far as the catalytic effect is concerned, high-speed rail can be a catalyst for additional investment in transport infrastructure, stations and the areas of cities surrounding the stations [Kamel, Matthewman 2008].

The modern economy nowadays is unprecedentedly dependent on the efficient movement of goods, services and capital between the different markets. Aviation, regardless of whether we live in a time of economic crisis or economic growth, plays

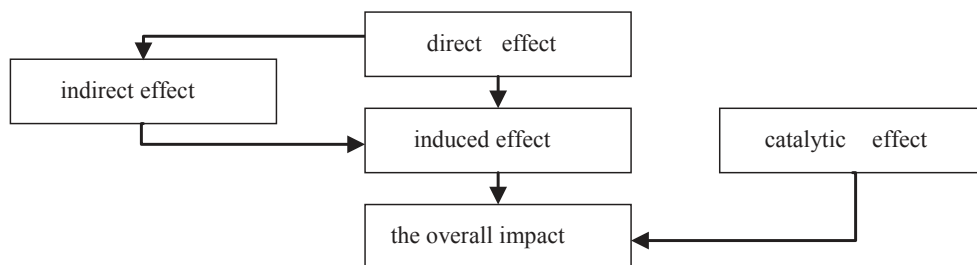
a key role in connecting local to global markets, as a condition of their development. The importance of air transport availability in the growth cycle is illustrated in the diagram below.



Graph 1. The circle of economic dependency between air transport and economic growth

Source: J. Brass, York Aviation.

Air transport provides access to markets. Better accessibility, considered as a strength of a region, is driving the growth in trade and foreign direct investment. Economic growth stimulates demand, including demand for air transport services, and thus the cycle closes. This simple mechanism shows the importance of air transport to the global and local economy. The local markets benefit from the presence of airport infrastructure, enabling the use of air transport services.



Graph 2. The impact of air transport on regional development

Source: *The economic and social benefits of air transport*, ATAG, Geneva 2005.

Traditionally there are four types of effects created by the presence of an airport on a region's economy. These are direct, indirect, induced and catalytic effects. Direct impact is related to the creation of new jobs directly at the airport and its cooperating companies and organizations which enable its functioning. The indirect impact is manifested through the purchase of goods and services in the local supply chain of operators at the airport, which in turn stimulates employment and income in the units present in the chain. The induced effects occur when a person directly employed in companies operating at the airport and those working for the units occurring in the supply chain will allocate their income to purchase various goods and services in the local economy, which in turn will support employment and GDP growth. The effect of the catalyst occurs due to the fact that the airport plays an increasing role in improving accessibility for the business traveler, and supports the transport of goods and tourists. The presence of the airport and air transport services in the region significantly affect the economic development of the area.

3. Development of high speed rail and air transport in the context of the European Union

High-speed trains, compared to conventional rail reach a higher speed, but also require the appropriate infrastructure. According to the European Council Directive 96/48, high-speed trains can use three types of lines:

- special lines built for high speed rail, allowing for speeds of equal to or up to 250 km/h;
- standard line adapted to high speed allowing to achieve speeds of 200 km/h;
- standard line adapted to high speed which have special features as a result of topographical or urban planning, speed is adapted to the conditions.

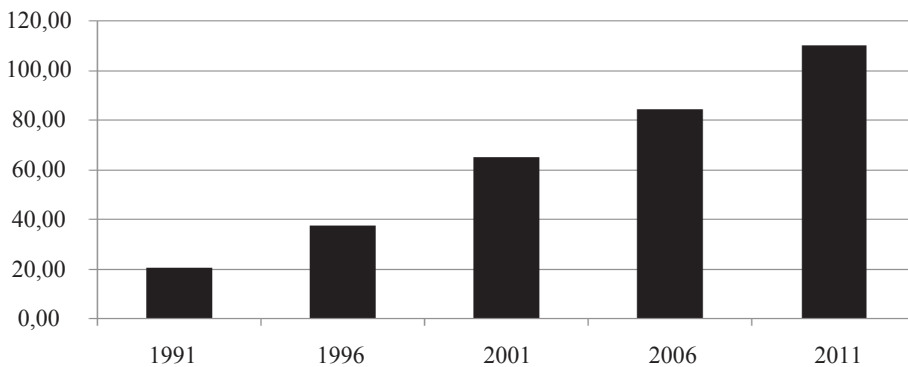
Depending on how the infrastructure and capabilities of high-speed trains cooperate with conventional rail, the following models can be distinguished [Campos, de Rus, Barron 2008, p. 6]:

- independent model – complete separation of high-speed rail and conventional rail, high-speed trains use their own exclusive and independent tracks;
- mixed model – the ability to use high-speed trains from both the specially built new lines, as well as the modernized lines of the conventional rail system.

The construction of high-speed rail infrastructure is extremely capital intensive. Nevertheless, this mode of transport is growing rapidly in many countries in the world. In most developed countries, in accordance with the procedures of this type of capital intensive infrastructure, investment is preceded by a detailed feasibility study which takes into account an analysis of the financial and economic benefits in the broad sense. The final decision to pursue this type of infrastructure investment is political, regardless of how widely it was consulted [Gorlewski 2012, p. 8]. As a result of determination and political vision, the first high-speed rail lines in the world

were established. The pioneer of the construction of a high-speed rail line was Japan, where in 1964 the first line connecting Tokyo with Osaka was built as a brand new infrastructure, replacing the pre-existing narrow-gauge line [Karbowski 2009, p. 94].

In Europe the first country to develop high-speed rail lines was France, starting in 1981, followed by Germany, Italy and Spain. Other countries, such as: Great Britain, Sweden, Belgium and Holland have rail lines where trains can reach speeds of at least 200 km/h. In the last decade one can observe the unprecedented extensive development of high-speed rail [Towpik 2009, pp. 16-19]. The tendency of traffic growth is shown in the graph below.



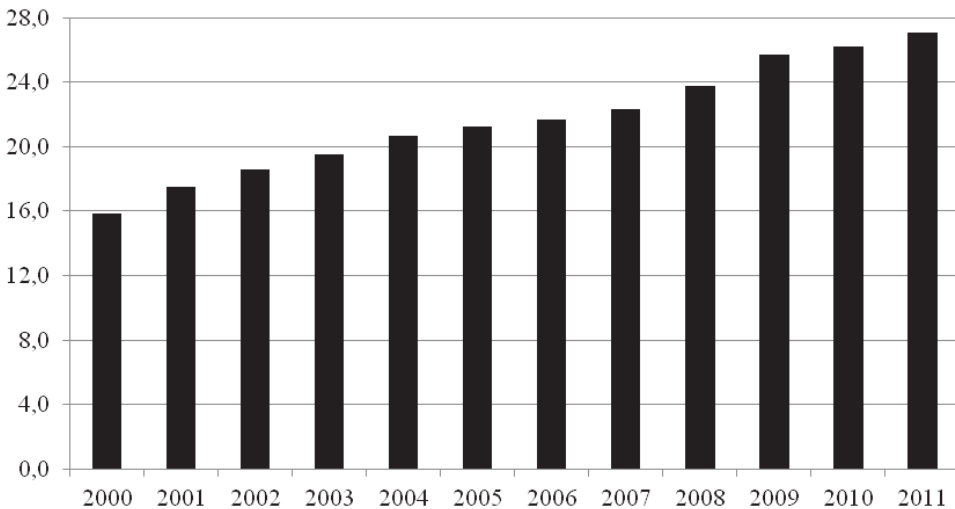
Graph 3. Passengers served by high-speed rail transport in the 27 countries of the European Union in 1991-2011 (billion passenger-kilometres)

Source: *Transport in Figures 2013*, European Commission, Luxembourg 2013.

Several economic and cultural centres in Europe, such as London, Paris, Brussels, Frankfurt, Amsterdam, Barcelona, Madrid, Rome and Milan can already be reached by high-speed trains at speeds of at least 300 km/h. European standards are being used for the development of high-speed railways in China, Latin America, the United States and Morocco [European Commission 2010, *High-speed Europe...*, p. 3]

The development of further connections in the European Union remains a key priority of several European programmes, such as the trans-European transport network (TEN-T) focusing on the development of high-speed transport. About 14 of the 30 priority projects put forward under this programme concern high-speed lines [European Commission 2010, *High-speed...*, p. 9]. There are currently different technical standards on the high-speed lines European network and this generates significant extra costs. The huge potential in terms of mobility throughout the continent has still not been fully exploited. This is why the European Union is promoting a pan-European HSL network. In order to do so, it is issuing common technical and quality standards for all Member States. It is also establishing a framework for the development and implementation of standardised tools, such as

the European rail traffic management system (ERTMS). It is being assisted in this by the European Railway Agency (ERA), the body responsible for helping to integrate the European rail networks by improving rail safety and allowing trains to cross borders within the EU without having to stop [European Commission 2010, *High-speed...*, p. 6].



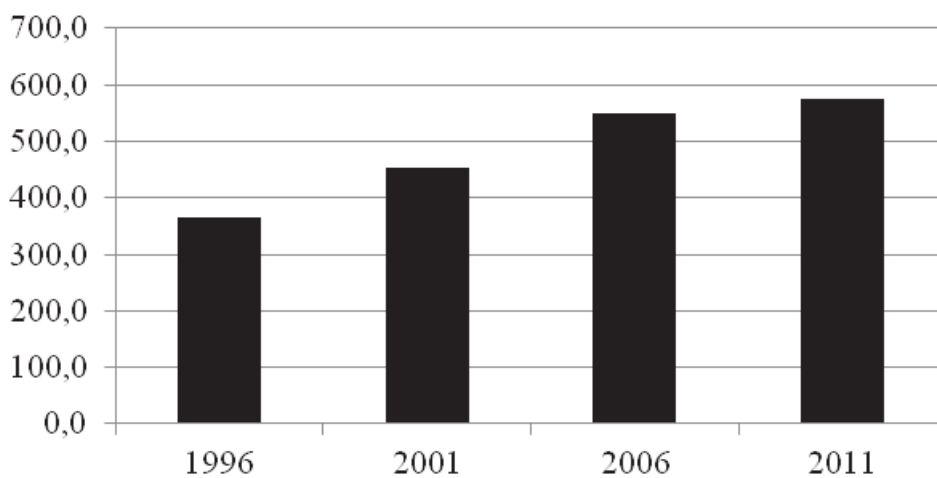
Graph 4. Share of high-speed rail in total passenger-kilometres in rail transport in the European Union in 2000-2011 (%)

Source: *Transport in Figures 2013*, European Commission, Luxembourg 2013.

The graph above presents the growing share of HSR lines in all rail lines in the European Union. In 2012, high-speed lines made up about 27% of all rail lines. According to Siim Kallas, Commissioner in charge of mobility and transport, Vice-President of the European Commission: “*The European Union is committed to making the transport and the mobility of people more secure, more efficient and more environmentally friendly, with priority given to social and territorial cohesion, as well as to economic dynamism.*” The European Union, in accordance with the transport policy and the development of the Trans-European Transport Network TEN-T, intends to triple the length of high-speed rail lines up to the year 2030. [European Commission 2010, *High-speed Europe...*, p. 3]

The air transport market in the European Union before the liberalization process was fragmented, with airlines treated as public entities to serve national interests. The creation of a single air transport market in the European Union brought substantial benefits for customers and improved the competitiveness of the European Union’s air transport industry [Button 2001, pp. 255-256]. The opening-up of the European air transport sector was implemented in four main stages, the so-called “air packages”

by regulating rules of competition, access to the market, procedure of setting prices and recognizing air carriers licenses, in order to create a single market for aviation [European Commission 2005, Annual..., pp. 150-151]. As a consequence of the liberalization process, every carrier having a license to offer air transport services for passengers, issued by any of the Member States, can fly on any route and offer any price of the service within the rules of free, fair and undisturbed competition. The new conditions of competition forced airlines to restructure, to introduce more flexibility in price setting and flight destinations. It contributed to the establishment of a new type of air carrier, the so called “no-frills” or “low cost” carriers following a cost leadership strategy, simplifying business by savings on all processes that do not bring value added for customers. LCC (low cost airlines) can offer services from secondary airports due to the lower landing and ground-handling fees. Such restrictions enabled them to minimize costs and allowed the setting of lower fares. The number of airlines has risen contributing to an increase in the amount of traffic. LCC have contributed to the intensive development of regional airports in the European Union. As a result, the competition on routes is much stronger in the sector and consumers have benefited from lower prices and the greater supply of services. Air passenger traffic is growing what is shown in the graph below.



Graph 5. Number of passengers carried by air transport in 27 countries of the European Union in 1996-2011 (billion passenger-kilometres)

Source: *Transport in Figures 2013*, European Commission, Luxembourg 2013.

The impact of liberalization in terms of ‘new entry’ and the development of competition on many of the denser routes within Europe has been constrained by the lack of capacity at key airports. While the existing aviation infrastructure has shown

considerable ability to handle increased demand, scope for further expansion within the existing infrastructure at certain airports is strictly limited. The estimates are that air traffic will grow by 4% a year over the coming years, leading to a near doubling of traffic by 2020. The forecasts undoubtedly show the opportunities for the further development of regional airports in the European Union. The Single European Sky is an ambitious initiative to reform the architecture of European air traffic control to meet future capacity and safety needs by organizing airspace and air navigation at a European rather than at a local level [European Commission 2004, *The Single...*, pp. 4-11]. In open markets, it is important to ensure fair competition. Therefore, the European Commission applies the competition rules on mergers and alliances, price-fixing and other arrangements to the air transport sector. Furthermore, a strict enforcement of state aid rules does ensure that airlines operate on a level playing field. Moreover, European Union transport legislation is composed of rules in several subject areas such as: economic policy, air traffic management, safety, security, environmental matters, social matters, passenger protection and external relations [European Commission 2004, *Guide...*, pp. 1-2].

4. Substitution and complementarity of high-speed rail and air transport

The expansion of the high-speed lines network has revolutionized rail transport. High-speed rail is very competitive to air transport on medium-haul routes. Nowadays high-speed trains account for approximately 40% of traffic over medium distances and even more on certain routes such as London–Paris, Paris–Brussels and Madrid–Seville. On journeys which take under three hours high-speed trains are the most competitive, because access time is much shorter than by air, and journey times are shorter than by car. High-speed lines are preferred over air and road travel for journeys of between 400 and 800 km. At below 150 km, they offer a limited bonus compared with road or conventional rail travel. Between 150 and 400 km, travel by rail (on both high speed and conventional lines) is quickest. Above 900 km, air travel gains the upper hand, except for journeys on which rail offers specific advantages [European Commission 2010, *High-speed Europe ...*, p. 10-11].

As far as intermodality and complementarity is concerned, there are some particularly remarkable examples of high-speed rail stations operating along intermodal lines with airports. Frankfurt International Airport observed a traffic increase following the introduction of the Frankfurt–Cologne high-speed line in 2002. According to Deutsche Bahn, two thirds of train passengers are either leaving or have arrived by plane. In France, the station at Paris Charles-de-Gaulle Airport is located at the interconnection between the north and the south-east high-speed line [Bouffard-Savary 2011, p. 7], served by 52 high-speed trains a day, linking the main towns in France, and by five high-speed trains serving northern Europe (Brussels

and Amsterdam). Brussels National Airport is linked to all the main Belgian cities and to several European cities such as Paris, Amsterdam, Cologne and Frankfurt. Airlines can make use of high-speed line networks to channel passengers from various regions to a central airport. This sort of synergy has been already created between Brussels and Paris Charles-de-Gaulle Airport [European Commission 2010, *High-speed Europe...*, p. 16].

5. Development and importance of regional airports in Poland

Launching low cost airlines onto the Polish market contributed to the development of regional airports. The enlarged infrastructure enabled traffic growth in the Polish civil aviation market. Consumers benefited from the wider range of flights and destinations. The table below shows the growth in passenger traffic at Polish airports through the years. In 2012 all Polish airports served four times as many passengers as ten years before.

Table 1. Number of passengers served at Polish airports 2002-2012 (in 000s)

| Airport \ Year | 2002 | 2003 | 2004 | 2006 | 2008 | 2010 | 2011 | 2012 |
|-----------------------|---------|---------|---------|----------|----------|----------|---------|----------|
| Warszawa-Okęcie | 4 936,8 | 5 167 | 6 085,1 | 8 101,8 | 9 437 | 8 712,4 | 9 337 | 9 567,1 |
| Kraków-Balice | 500,9 | 593,2 | 841,1 | 2 367,5 | 2 895,3 | 2 864 | 3 014,1 | 3 409 |
| Katowice-Pyrzowice | 202,2 | 258 | 622,6 | 1 458,4 | 2 406,6 | 2 403,2 | 2 544,1 | 2 518,4 |
| Gdańsk-Rębiechowo | 317,9 | 364,4 | 464,7 | 1 249,8 | 1 951,1 | 2 214,9 | 2 463,2 | 2 861,8 |
| Wrocław-Strachowice | 236,1 | 284,3 | 363,2 | 865,9 | 1 480,5 | 1 654,4 | 1 657,5 | 1 942 |
| Poznań-Ławica | 227,5 | 263,6 | 380,7 | 670,7 | 1 255,9 | 1 419,1 | 1 463,4 | 1 560,3 |
| Warszawa-Modlin | – | – | – | – | – | – | – | 857,5 |
| Rzeszów-Jasionka | 52,1 | 67,2 | 71,9 | 206,9 | 321 | 454,2 | 491,3 | 562,9 |
| Łódź-Lublinek | 1,9 | 7,3 | 6,3 | 216,8 | 341,8 | 413,5 | 389,3 | 463,5 |
| Szczecin-Goleniów | 76,8 | 87,4 | 95,8 | 176,7 | 298,6 | 282,5 | 262,1 | 347,1 |
| Bydgoszcz-Szwederowo | 13,4 | 20,1 | 26,1 | 133 | 264,9 | 278,1 | 279,5 | 328,1 |
| Zielona Góra-Babimost | 7,6 | 7,8 | 4,3 | 8,3 | 5,2 | 4,6 | 7,5 | 12,3 |
| Lublin- Świdnik | – | – | – | – | – | – | – | 5,7 |
| TOTAL | 6 573,2 | 7 120,3 | 8 961,8 | 15 455,8 | 20 657,8 | 20 700,9 | 21 909 | 24 435,5 |

Source: ULC data and airports statistics.

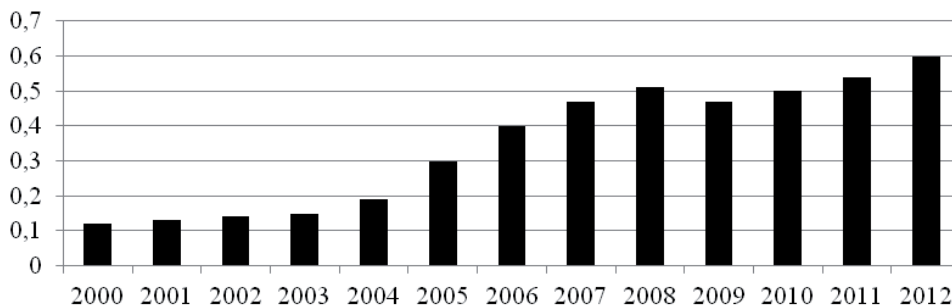
The infrastructure of Polish airports developed rapidly after accession to the European Union to face the challenge of growing traffic. In 2012, two airports were opened in Warsaw and Lublin. All the Polish airports served about 20 million passengers in 2010, and according to forecasts, in 2030 the predicted level is of 60 million of people. In the table above the growing trend is visible. The most up-to-date statistics show more than 24 million air transport passengers in Poland in 2012.

Table 2. Number of passengers served by regional airports in Poland in 2002-2012

| Year | 2002 | 2003 | 2004 | 2006 | 2008 | 2010 | 2011 | 2012 |
|----------------------|-------|-------|-------|-------|--------|--------|--------|--------|
| Passengers (in 000s) | 1 636 | 1 953 | 2 877 | 7 354 | 11 221 | 11 989 | 12 572 | 14 869 |
| Market share (%) | 25 | 27 | 32 | 48 | 54 | 58 | 57 | 61 |

Source: ULC data, own calculations.

The role of regional airports has become more significant during the last decade. In 2002 regional airports served only 25% of passengers and in 2012 about 61%.

**Graph 6.** Air transport mobility index in Poland in 2000-2012

Source: Eurostat.

The air transport mobility index of Poland, showing how many times a year an average inhabitant traveled using air transport, is growing and in 2012 reached the level of 0,6. This is a typical ratio for a country in which the air market is developing. Countries with small populations often have high ratios above 6%, and in developed countries with a stable growth of air traffic the ratio varied from 2% to 6%. According to the forecast presented earlier, a continuous growth in both mobility and traffic is predicted to the year 2030 [ULC 2013].

6. Planned high-speed rail network in Poland

The planned high-speed railway network in Poland should consist of the new Warsaw-Lodz-Poznan/Wroclaw line “Y” and the modernised E65 South Line (Central Trunk Line) to reach high-speed railway parameters from Warsaw to Katowice and Krakow with a possible extension to the German, Czech and Slovak borders. The project contributes to the idea of drawing up international high-speed connections to Central Europe in the framework of TEN-T. Line Y would have a length of 450 km with trains running at a maximum speed of 350 km/h. Journey times would be significantly reduced: passengers will travel from Warsaw to Lodz in no more than 35 minutes (compared to today’s 1h 30min), from Warsaw to Poznan

in 1h 35min (compared to 3h) and from Warsaw to Wroclaw in 1h 40min (compared to 5h). Feasibility studies also take into account the reconstruction of the most important junctions: Warsaw, Poznan, Wroclaw and Lodz. One of the most ambitious projects is the construction of the cross-city tunnel in Lodz to link two railway stations without any direct connection, resulting from the historical split of the Lodz railway junction into the Lodz Kaliska and Fabryczna. “*Radical actions are needed in order to fulfil requirements of EU sustainable development policy and to restore the importance of Polish railway transport*”, concluded a study on the state of Polish railways which boasted planned investment and a strategy of development to reach synergy effect [The railway business magazine 2010, Poland..., p.1]

7. Conclusion

According to the wider economic benefits, infrastructure investment in high-speed railways and regional airports contributes to the increasing availability of regions from the point of view of different target groups, including residents, the business sector, tourists and other visitors. It has wide impact on increasing the investment attractiveness of regions and their economic development, urban revitalization and enhance the safety of travel. Also relevant are the socio-economic benefits resulting from the improvement of the standard and quality of life, according to consumers using this kind of fast and reliable transport service.

The development of regional airports and airport facilities is largely catalyzed by the low cost airlines. This tendency and new paradigm in airports' infrastructure planning is also observed in Poland, where regional airports have intensively developed throughout the years following accession to the European Union. The role of regional airports is growing in both passenger and cargo traffic.

High-speed rail can be, on the one hand, a substitute for air transport, on the other hand plays a complementary role to airport high-speed rail links, giving the opportunity to connect airports with city centres and other main cities. The high-speed rail network in Europe is expected to expand substantially across the continent over the next few decades, connecting regions and cities even faster and more effectively than before.

Poland is expected to develop high-speed rail lines in the future, connected with the European network. Also planned is the development of airports in Poland and its infrastructure and a project of a central airport is being considered. According to traffic forecasts, the development of a fast transport infrastructure seems to be unavoidable in the foreseeable future to enable us to face the challenge of ongoing economic development.

References

- Amos P., Bullock D., Sondhi J., *High-Speed Rail: The Fast Track to Economic Development?*, The World Bank, Beijing 2010.
- Bouffard-Savary E., *L'enquête 2011 sur la complémentarité TGV-avion en France*, Direction générale de l'Aviation civile, Paris 2011.
- Campos J., de Rus G., Barron I., *A review of HRS experiences around the world*, MPRA, 2008.
- Council Directive 96/48/EC of 23th July 1996 on the interoperability of the trans-European high-speed rail system, OJ L 235, 1996.
- Gorlewski B., *Kolej dużych prędkości. Uwarunkowania ekonomiczne*, Szkoła Główna Handlowa w Warszawie – Oficyna Wydawnicza, Warszawa 2012.
- High-Speed Europe. A sustainable link between citizens*, Directorate-General for Mobility and Transport, European Commission, Publications Office of the European Union, Luxembourg 2010.
- Kamel K., Matthewman R., *Locate in Kent. Perfect for Europe. Perfect for Business*, 2008, www.locateinkent.com.
- Karbowiak H., *Podstawy infrastruktury transportu*, Wydawnictwo Wyższej Szkoły Humanistyczno-Ekonomicznej w Łodzi, Łódź 2009.
- Rodrigue J.-P., *The Geography of Transport Systems*, Routledge, New York 2013.
- Stiglitz J.E., Sen A., Fitoussi J.-P., *Mismeasuring our lives: Why GDP Doesn't add up*, The New Press, New York 2010.
- Towpik K., *Infrastruktura transportu kolejowego*, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2009.

ZNACZENIE PASAŻERSKIEGO TRANSPORTU LOTNICZEGO I KOLEI DUŻYCH PRĘDKOŚCI DLA ROZWOJU REGIONALNEGO

Streszczenie: Artykuł prezentuje przegląd teoretycznych aspektów związanych z wpływem transportu lotniczego oraz kolei dużych prędkości na rozwój regionalny. Pokazane są również statystyki dotyczące rozwoju kolei dużych prędkości oraz transportu lotniczego w Unii Europejskiej, a także perspektywy dotyczące przyszłości. Omówiony został rozwój transportu lotniczego w Polsce, a także planowania „linii Y” kolei dużych prędkości.

Słowa kluczowe: infrastruktura transportu, kolej dużych prędkości, transport lotniczy, rozwój regionalny.