TRANSFORMATION OF THE NATIONAL AIRPORT SYSTEM TOWARDS A HUB-AND-SPOKE MODEL - THE CASE STUDY OF POLAND

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Abstract

The dynamic development of air transport worldwide and, as a result, problems with airport capacity affect many countries, including Poland. According to forecasts, the main Polish airport located in Warsaw will reach its saturation capacity in 2022.

Consequently, the airport system in Poland is undergoing significant transformations to become a hub-and-spoke based model. The Central Communication Port (CCP) is designated to be the heart and its launch is planned for 2028.

For the Central Communication Port to start operations effectively in 2028, a number of changes are required in the current airport system. The years left to launch CCP will be a transitional period, during which it will be necessary to ensure, on the one hand, effective functioning of the airport system, and on the other, to prepare passenger traffic for the shift to CCP. Developing the railway and road infrastructure and their connection to the Central Communication Port to areas of important relevance will be necessary.

Keywords: Airport system, Poland, EU, H&S

INTRODUCTION

The scientific goal of this article is to elaborate a reliable, resource-based opinion on the strategy adopted by the State Airports in the transformation process of the Polish airport system towards a Hub-and-Spoke model. The broad context of the development of global air traffic and airports in the EU has been taken into account. To achieve this, the article discusses Hub-and-Spoke and Point-to-Point models operating in air transport. The premises of the decision to build an air hub in Poland were also presented. These include dynamic development of air transport in the world and Europe, forecasted congestion of European airports, growing competition at airports in the Middle East and the need to adapt the Polish transport infrastructure to Western European standards. The literature analysis method was applied. Due to the novelty of the issue, subject specificity and the small number of scientific studies of this type, sources also include studies of European bodies responsible for air transport as well as studies conducted by Polish ministries.

1. AIR TRANSPORT WORLDWIDE AND IN EUROPE

An upward trend in air transport has been observed since the global financial crisis of 2008/2009. In 2016, the number of airline passengers in the world increased by 6.3 % compared to 2015, reaching 3.7 billion. In 2014, airport revenues increased by 8.2 % [1].

In 2018, airlines carried a total of 4.3 billion passengers and 85 million tons of goods on a global scale. According to Air Transportation Action Group (ATAG) estimates, in 2016 the aviation sector was responsible for generating 3.6 % of global GDP and employing 65.5 million people. It pertains to direct employment in the aviation sector (airlines, airports, air traffic services), indirect (production for the aviation sector) as well as directly benefited by air transport (i.e. jobs existing thanks to expenses of employees employed in the aviation sector, e.g. shopping, services banking, restaurant and other)) and tourism-related [2]. Although air transport serves only 1 % of global trade in terms of volume, it is 35 % in value terms [3]. Air transport significantly supports globalization processes not only in tourism but also in production and services, allowing for the rapid

movement of workers employed in these industries. This also occurs through the significant share of air transport in e-commerce services.

As a result, air transport plays an extremely important role in the global economy. In Europe, air transport is responsible for 83 billion GDP and 12.2 million jobs.

Air transport is significantly conditioned by the existence of point infrastructure adequate to transport needs - i.e. airports. The air traffic map points to the existence of three major clusters of airports in the world. These include North America, Europe, and Asia.

By 2035, global air travel, as measured in Revenue Passenger Kilometers (RPKs), is expected to grow between 4.5 % and 4.8 % per year. The highest growth, about 6 % per year, is forecasted for emerging economies in the Asia-Pacific region, the Middle East, Africa, and Latin America.

It is estimated that the more mature European market will grow by 3.7 % annually. In North America, the increase will be between 2.9 and 3.1 % [4]. The announcement of an upward trend in air transport means an increased demand for airport services and the need to take measures to increase their current capacity. This is a significant challenge for EU airports.

2. HUB-AND-SPOKE VERSUS POINT-TO-POINT SYSTEM

There are two main types of connections between airports:

- direct between airports (Point-to-Point)
- indirect (Hub-and-Spoke) via a large airport hub. The hub acting as such gathers passengers from smaller, delivery airports. Consequently, economies of scale on long routes are possible, achieved by filling large aircraft, which contributes to their efficient use. Following, passengers are delivered to smaller regional destinations [5].

The creation of a Hub-and-Spoke system was a consequence of the liberalization of air transport.
Before deregulation, the world's flagship air carriers were state-owned, and air transport was strictly regulated. In 1978, the US deregulated air transport in the ‘80s and ‘90s saw the same transformation in the EU. In 1995, the US implemented open sky agreements with ten European countries.

These agreements established possible connection services between any point in one country to any point in another, with no restrictions as to the number of carriers or capacity. In the ‘90s this model was developed at European airports. It has led to a significant increase in transfer traffic at leading airports serving as a base for Air France-KLM, British Airways and Lufthansa [6].

Despite some benefits that the Hub-and-Spoke system brings, it also generates high costs. These include operating costs (the costs of operating large aircraft, leading to greater consumption of airport infrastructure, and the costs of handling transit passengers; these also cover the costs of additional luggage handling equipment, rooms for passengers awaiting transfer, check-in of passengers, employees serving passengers and their luggage). In addition, the H&S system leads to airport congestion, extends travel times and is more prone to delays [7].

In addition, low-cost carriers have changed the scenario of the aviation market over the past ten years by offering passengers cheaper Point-to-Point connections, operating mainly from smaller airports, including European airports [8].

3. AIRPORTS IN THE EUROPEAN UNION - CURRENT SITUATION AND DEVELOPMENT PROSPECTS

Airports in Europe are located on three lines. The first line, including among others, the ports in London, Paris, and Madrid, serves about 50 % of air traffic in Europe. The second line includes the ports in Frankfurt, Munich,

Amsterdam, Rome serving about 40 % of air traffic in Europe. The third line runs through Hungary, Slovakia, Poland, and Finland. It accounts for the remaining traffic in Europe. There is no robust airport on this line capable of handling future air traffic generated by Central and Eastern European countries [9].

Upward trends in air transport should be enjoyed, however, according to forecasts, EU airports located on the first and second lines - serving 90 % of air traffic in Europe will not be able to provide air traffic without delays and canceled flights.

According to the report of Eurocontrol, “the number of flights is projected to be 50 % higher in 2035 than in 2012. However, airport capacity is expected to increase by just 17 % by 2035. As a consequence, around 1.9 million flights will be lost under the most likely scenario, representing approximately 12 % of demand in 2035, or an estimated 120 million passengers who will be unable to fly” [10].

In line with this phenomenon, there will be a demand for new large and medium airports. Meanwhile, the majority of airports in the EU are small regional airports. 60 % of them are serving fewer than 1 million passengers annually [11].

In the period covering 2000-2013, €4.5 billion of the European Union budget was dedicated to expenditures for airport infrastructure, in particular through the European Regional Development Fund (ERDF) and the Cohesion Fund (CF). EU-funded airports located in five Member States: Estonia, Greece, Spain, Italy, and Poland have together, received a total of €666 million between the 2000-2006 and the 2007-2013 programming periods. The European Court of Auditors (ECA) decided to audit those airports. The audit results published in December 2014 were critical. “EU-funded investments in airports provided poor value for money. (…) Too many airports received funding, with many in close proximity to one another, and that EU-funded infrastructure was, in many cases, over-sized. Only half of the audited airports had successfully increased their passenger numbers, while seven of the 20 airports studied were not profitable and risked closure in the absence of public support” [12].

On the 7th of December 2015, the European Union adopted a new aviation strategy for Europe. Its goal is to strengthen the “competitiveness and sustainability of the entire EU air transport value chain”. It is also worth quoting that the most important resolutions of the European Parliament for the future development of European airports include:

- the resolution of the 9th of September 2015 on the implementation of the 2011 White Paper on transport, “the EP called for the development of an EU airport network including, first of all, major airports (i.e. hubs) and, secondly, 'a well-served, viable and supported network of local, provincial and regional airports’;
- the resolution of the 11th of November 2015 on aviation, „the EP highlighted the loss of competitiveness of EU airlines and airports vis-à-vis subsidised third-country carriers and airports, requested a proactive policy to ensure a level playing field on ownership and encouraged Member States 'to improve their national infrastructure to allow their airlines to compete on more favourable terms’” [13].

4. THE AIRPORT SYSTEM IN POLAND

Poland has 15 public access passenger airports, which in 2017 checked in over 40 million passengers. Chopin Airport in Warsaw plays a key role, serving 39.4 % of the clients of Polish airports in 2017. 94.2 % of passenger traffic in Poland was served by 7 airports checking in over a million passengers a year. These airports include Warsaw, Cracow, Gdańsk, Katowice, Modlin (near Warsaw), Wrocław and Poznań [14].

2018 was a record year for Chopin Airport in terms of profit generated and the number of passengers checked in - 18 million. However, forecasts show that in 2022 its capacity will be exhausted. This means that, according to forecasts regarding the increase in air traffic, by 2028 from 9 to 15 million passengers who would like to take advantage of the services of Chopin Airport will not be able to do so [15]. The reasons for this situation can be

reduced to two factors: dynamic air traffic growth around the world and the lack of a coherent strategy for the development of airports in the post-war history of Poland. For decades, after 1945, no decision was taken to build a central airport that would relieve the airport at Okęcie. This happened despite the conclusions drawn from several reliable expert opinions made over the last 40 years. All clearly indicated the need for such an investment. It was not until 2017 that the Polish government took a decision to build a Central Communication Port (CPK).

Polish airports are faced with two main identifiable problems:

- the fragmentation of the airport market in Poland, which is not beneficial either for Polish airlines or for Poland's position on the European air map. Small, regional airports supply air hubs - located in other European countries (e.g. in Germany, the Netherlands or England). Thus, they strengthen foreign airlines based in these hubs [16],
- reduced capacity at the leading Polish airport, namely Chopin Airport in Warsaw, celebrating its 85th anniversary in 2019.

In connection with the above, a strategy for the development of the Polish airport system is currently being implemented, aiming to create a strong, modern hub at the third airport in Europe.

5. PREMISES AND PROJECT ASSUMPTIONS FOR THE CONSTRUCTION OF CCP - AN AIR HUB FOR POLAND AND EUROPE

From the European perspective, the main premises for the construction of CCPs should be recognized as:

- predicted air transportation growth and congestion of existing European airports,
- movement of the centre of gravity of European air-traffic towards the East and South,
- growing competition for European hubs from Gulf & Turkish hubs.

Over the last 20 years, the centre of gravity of European air-traffic has slowly shifted. This trend is expected to continue. The Eastern states have typically less traffic than in Western Europe and therefore a higher potential for growth. It is expected that such countries as Croatia, Latvia, Estonia, Poland, Moldova will at least double their departures per 1,000 capita [17].

Another issue is that existing European hubs are now typically facing competition between 50 % and 60 % of their connecting routes to Asia-Pacific. Istanbul, Abu Dhabi, and Doha, which have all more than doubled the number of their connecting routes since 2010 and overtaken part of European hubs transit passenger traffic [18].

Taking all above into the consideration, it’s logical to expect that the establishment of a new hub-airport on the third line of airports in Europe, would fit into EU strategy on airport development. Such an airport hub could help with congestion of Western European airports and retain transit passengers in the EU. From the Polish perspective, the construction of the CCP is a great opportunity for Poland to play an important role in servicing global air traffic and to make up for post-war backlogs in the construction of transport infrastructure (mainly railway and airport).

A decision has been taken that the Central Communication Port (CCP) will be located near the town of Stanisławów (between Warsaw and Łódź), in the immediate vicinity of the A2 motorway, the Warsaw-Łódź railway line and the planned tracks of the High-Speed Railway. The Economics Committee of the Council of Ministers adopted the construction recommendation on 4 March 2017; the project's aims are to “build and operate a profitable, innovative transport hub, which will rank as one the world's top ten airports, and at the same time will become an important component of the national rail passenger transport system and an attractive alternative to road transport.”

The construction of the Central Communication Port project consists of the following components:

- the construction of an international airport, located 45 km west of Warsaw;
- the construction of a railway hub, whose functions will go beyond that of an airport railway station;
- the construction of railway lines within the borders of Poland, with a total length of over 900 km;
- the construction of a logistics center, 100 hectares in area;
- the construction of 65 km to 250 km (depending on the option chosen) of roads in Poland;
- rapid growth of PLL LOT, with the Polish airlines to become one of the leading carriers in Central Europe;
- integration of the Warsaw and Łódź agglomerations; the development of the "Airport City", with hotels, exhibition and congress facilities, and company headquarters.

CCP will provide services for 500 inter-regional trains a day. Commercial speed on the railway lines leading to the CCP is to be at least 140 km/h. The CCP-based transport system, scheduled for 2020-2030(35) is estimated at PLN 35-40 billion [19].

Construction of the CCP and creation of the H&S system is an extremely comprehensive and thus difficult task. In addition to building an air hub, it means building about 900 km railway lines, reorganization of air transport in Poland, and attracting foreign carriers to the CCP. All this occurring under time pressure, as the first stage of operations of the air hub should be in 2028.

However, given the changes taking place in the aviation markets and the opportunity it creates for Poland, abandoning this initiative would mean a great missed opportunity for Poland and Europe.

CONCLUSION

This article presents the premises for launching the central Polish air hub. From the point of view of the EU and Polish interests, such an investment is justified. It will be conducive to:

- bringing the state of Polish transport infrastructure closer to European standards,
- relieving Western European airports, which according to forecasts will not be able to handle the growing passenger traffic,
- creating a counterweight to competing with European airports, and airports in the Middle East,
- handling interchange passenger air traffic in the region of Central and Eastern Europe.

The assumptions presented above are based on research and forecasts regarding the development of air traffic, carried out by Eurocontrol, Airports Council International, European Commission and documents of the European Parliament, the Polish Ministry of Development and the document concerning the creation of the Central Communication Port (CCP) in Poland.

Construction of the CCP and creation of the H&S system is an extremely comprehensive and thus difficult task. In addition to building an air hub, it means building about 900 km. railway lines, reorganization of air transport in Poland, attracting foreign carriers to CCP. All this takes place under time pressure, as the first stage of the operation of the air hub should be in 2028.

However, given the changes taking place in aviation markets and the opportunity it creates for Poland, abandoning this initiative would mean a great missed opportunity for Poland and Europe.

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