How to convert a regional airport into an "Airport City" in Central Europe: the "airLED" project

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Abstract

Between 1st July, 2012 and 31st December, 2014 nine partners of four Central European regions implement the "airLED" project through the CENTRAL EUROPE Programme, co-financed by the ERDF. Within the "airLED" project the four regions elaborate their strategic polycentric development plans in order to convert their regional airports to an "Airport City" by a common elaborated method. In the last decades, markets have become national and international in scale while the airports and their adjacent areas have functioned as catalysts for local economic development. The ability of differently sized airports to generate jobs and attract new business was used in many settlements to justify public investments in and around airport areas. The vision behind "airLED" project builds on the "Airport City" concept, advocating the importance of appropriately planned airport-area development. An Airport City is characterised by all the functions of a modern metropolitan centre being located on and immediately around major airport sites. It may entail arterial spines and clusters of aviation-linked and other businesses with systematically planned transport connections radiating outwards up to 20 km from the airport. The "airLED" project focuses on the economic development of catchment areas around airports, taking into account the direct, indirect and induced impacts of airport activities. The project aims primarily at enhancing the cooperation between public authorities and bodies concerned and having a stake in the economic development of areas surrounding a given airport. In this respect, good connectivity of the airport with its catchment areas both by road and rail is one of the major challenges.
Keywords: airport cities, airports' impact on urban development, connectivity, transnational cooperation.

1   Introduction

Nowadays growth centres are unthinkable without airports. Due to the characteristics of the air traffic – at least in the regions lying far away from the beaches – airports are situated necessarily farther away from the central business district (CBD) of cities. However, it is a fundamental need of air travelers to reach their destination in the shortest possible time. Therefore, it is an important aspect to ensure good accessibility of airports from the CBDs as well as from the residential areas. In this regard, appropriate links of airports to CBDs located in the cities and conurbanisations play a key role by public transport network or public roads. And equally important is that airports provide appropriate services to travelers: information, easily accessible transit station areas, parking etc.

One of the primary objectives of the "airLED" project financed by the Central Europe Programme within the European Union Regional Development Fund is to develop those strategic plans which are to be adopted for the areas and surroundings in the vicinity of each of the four Central European regional airports participating in the project. These plans are based on the regional development theory appeared in the early nineties as the "Airport City" concept. A key element of these polycentric development strategic plans is to review the situation of urban transport links between the airports involved and their urban environment, and the definition of their desirable development opportunities.

Accordingly, in the following I will deal with the role of airports in the sustainable urban development, the contents of the "airLED " project, the results of the project and the conclusions to be drawn.

2   Role of an airport in the sustainable urban development

Transport is a key factor of sustainable urban development, as it is responsible for about a quarter of the emission of pollution, carbon dioxide and other greenhouse gases. Therefore, sustainable urban development focuses on how transport needs and the environmental impact of satisfying transport needs can be reduced without adversely affecting the satisfaction of people's natural needs for social contacts, interfering with personal interactions.

However, with increasing leisure time and disposable income, the globalized economy generates needs for travelling to destinations which are located outlying of the residence of travelers. For this reason, nowadays there is an increasing proportion of flight transportation. Compared with the beginning of the nineties, now there are about 2.5 to 2.9 times more air traffic passengers, and compared with the beginning of the last decade nearly 1.5 times more on the continent.

This change of course has increased to a similar extent in travel demand between cities and their respective airports as well. It is therefore a necessary priority to deal with adequate transport links between airports and residential areas and CBDs, to create the harmonious development of airports and their surrounding areas, with particular emphasis on the development of public transport.

2.1 Characteristics of air transport intensive activities

Liberalization in European air transport has radically changed the travel habits of the population of the continent. In the early nineties, it was characteristic that European airlines – basically national and public owned – transported passengers to a node airport to and from where they "were divided into" their final destinations. Direct links were offered only between the airports of major cities. However, the far fewer passengers than today, at the then prevailing air ticket prices which was more expensive, also received a number of services for which they now have to pay extra.

In contrast, nowadays "low-cost" airlines are offering their services on the basis of a quite different business model. In many cases, a portion of tickets are offered usually at not much higher prices than for urban travel, passengers are mostly transported directly from their starting point to their place of destination. At the same time, no extra service other than transport is included in the ticket price, it is even required to pay for checked baggage.

But it is precisely the fact that flying has become relatively much cheaper for a number of activities which has changed the division of labor so that those personal relationships which are essential can be maintained for people, even if the persons otherwise live and work in cities located far apart from each other.

Today, flights crisscross the skies of Europe so that 2/3rds of the population can reach one airport as a minimum within two hours. So any meeting to be held within one day in most parts of the continent can be held and participants living in any part of the mainland can reach that at the same day and arrive back to their place of residence.

Of course, the easier it is to organize this, the faster is getting from the place of residence to the affected airports, or from the aerodromes where the work took place, whether in the office, factory or even logistical base. The proximity of the airport is an important aspect in those sectors in which the work of the staff or the nature of the products requires proximity to the airport. In case of products, it is justified especially when they are generally relatively light, small in volume, but represent a high value, so that they can support the relatively high transportation costs. These products or the production of their necessary components are generally targeted to be delivered quickly. These include, for example, pharmaceuticals, electronic products, components, instruments, and even certain food products, or flowers. Frequent air travel need of staff arises especially in innovative sectors and services. These workers usually perform high value-added activities. Their knowledge also "suffers" the high travel costs. Namely, in their case the personal contact can't be replaced with modern technology offered by means of communication. Such activities are e.g. information technology, business consulting, a variety of research activities, and they also include the necessary links between large corporations and their international network of regional representation offices. Examples to the latter are the energy, oil, automotive industries, logistics, etc. Their common characteristic is that their staff (at least a part of them) travel on a daily, weekly and/or monthly basis. Just as an example for that: there is a daily flight between the pair of Audi factories in

Hungary and Germany. The airport serves mainly the in-house travel between Győr and Ingolstadt. Because of this, it became necessary to expand the local airport to enable them to receive machines larger than the current ones too.

2.2 Contribution of airports to the local economic development

The airports themselves have become a major economic enterprise because of the liberalization of air traffic. This is one of the engines of the local and regional economic growth in Europe. Although airport operators are directly employing only about 160 thousand people, but the other airport-related jobs provide employment opportunities for approximately 1.2 million people. Jobs related to aviation today contribute about € 59 billion to the EU's GDP.

In the framework of the "airLED" project, the "EU State-of-Art Report" showed that Central European airports of a significant volume of traffic are also the economic engine of their narrower and broader vicinity. For example, companies operating in the Franz-Josef Strauss Munich International Airport are employing nearly 30 thousand people who contribute by a remarkable ratio of the otherwise 'not negligible Bavarian GDP. In general, airports have a significant multiplicative effect, as every 1,000 direct airport jobs create nearly 2,100 indirect jobs at the national economy level in the European Union.

The airports are not only employers and creating jobs, providing a variety of services that include spaces, but also operations in themselves that generate demand for new services and innovative solutions to businesses open. They encourage research on materials of flight of new characteristics, the development of IT and automation solutions. Airports and businesses working in their environment are focused on providing high-quality services to the commercial and tourism sector: from shops, restaurants and entertainment facilities to the car and room renting business.

2.3 Criteria of an "Airport City"

In the development of the environment of airports, a concept appeared first in the U.S. which considers airports not only as a stopping place satisfying public demand, but also as a space to meet the complex needs of airports. As airports were increasingly complemented by services that bore the characteristics of a city: shops, entertainment places, restaurants, hotels and other businesses providing services at airports and settled in their neighborhood; incurred in the development of these complex ideas, planned demand. Thus was born the "Airport City" concept. The "father" of the theory is Professor John D. Kasarda, whose views on the matter can be summarized as follows [1].

The rapidly growing services at and near to the airports allow travelers and local residents in the immediate vicinity of airports to take up to 15 minutes from a place to engage with business, have a meal or find entertainment. This change in functions and land usage converts the airport into an "Airport City" in many cities.

Although many of these airports have evolved organically and spontaneously, often causing conflicts and environmental problems, this process would be

improved remarkably through strategic infrastructure and urban planning in the future. In this process, the following will be planned:

- accessibility between the key points which is planned fundamentally on a time and not on a distance basis;
- enterprises should be installed preferably in the vicinity of airports, depending on the frequency of air transport they require, reducing the time spent with travel/transport;
- activities connected with air freight (production, storage, transportation) in the vicinity of airports should be separated in space from the services offered for offices as well as from passenger traffic;
- those business activities which are sensitive to noise and air pollution and the residential areas should be located in space so that they fall outside the path of air corridors;
- the airports and major economic centers and residential areas are linked by special motorways and express trains;
- special lanes used only by trucks also have to be established on the highways to airports, in order to reduce traffic jams;
- along the routes, focus should be placed on cluster-style development instead of chain-style development so that it should maintain enough green space between the clusters;
- unified standards should be established in the area for the airport buildings, roads for pedestrians, traffic routes, public spaces and landscape elements;
- the thematic architectural solutions, community art works and structures should be enhanced by a typical pathfinding way so that it should be transparent, accepted and clarifying these improvements;
- mixed-use residential and economic design solutions should be developed in the zones of employees and frequent travelers at the airport and its surrounding areas to facilitate the access to the airport by a human scale and a variety of local services and take into account the residential community as well;
- briefly, the development of the airport and its surrounding areas has to be sustainable and going hand in hand with "smart growing".

This approach does not appear in the most commonly used airport development plans, which increasingly consider local interests, include political considerations and are functionally fragmented, often conflict-progressed. A new approach is needed that combines airport planning and real estate development taking advantage of synergies. The future "Airport City" should be sustainable, economically efficient and socially beneficial, aesthetic and protecting the environment. The real question is whether they are created in the vicinity of major airports (they will be sure). Whether the smart way is to turn off and grow, minimizing problems and win over the largest decline in the airports, their users, businesses, the surrounding communities and their wider environment which they serve.

2.4 Different types of connections between airports and their surrounding areas by road/rail/intermodality

From our point of view, transport links between the airport and its surrounding area, especially between the airports and the central business and residential districts of the linked cities, deserve special attention. Travellers are looking for the best service of the complex "supply chain" in their trips from home to the final destination. Considering most European cities, it is essential to focus on the installation of public transport by tramway or other rail-type transport. Indeed, these are the systems that produce the least impact on the environment and transport passengers to their destination as quickly as possible.

The CBDs of European metropolises are located in or near to their downtowns which were formed in the 20th century at the latest. In several large cities, authorities are trying to disencumber them, or enhance the development of new districts – even because of needs for frequent flying – preferring zones that are located closest to the airport. This group includes projects for development of the surrounding zones of airports in progress or already completed respecting the principles presented before. Besides the previously mentioned Munich, projects like this are Düsseldorf, Zurich, Vienna or out of Central Europe: Madrid.

In all cities on the list of good practices, the city centre and the airport are connected in the easiest and quickest way by a certain rail-type traffic mode: S-Bahn, underground, special airport-rail or a rail system that belongs to the normal rail network. These airports can be easily reached by rail not only from the neighbouring cities, but from settlements in the wider catchment area. This is just the fact which ensures the good and quick (within 2 hours for 2/3rds of the population) accessibility of airports in Europe which was mentioned before.

Although rail network in most part of Central Europe is quite dense, there are regions which can be reached within an acceptable time only by road. That is why only those airports can expect appropriate development perspectives, which are properly connected to the highway network too. As another consequence, the airports are well connected with the residential zones of the surrounding cities also. One of the reasons for the development of the highway network is to improve the connections of residential zones with long-distances, therefore generally they are connected to the highway network of the given region.

And last but not least it should not be forgotten that there are formed intermodal nodes in order to realize smooth flows of arrivals and departures at the airports where more passenger and / or freight transport is realized. They are capable of serving several millions of passengers per year without forcing them to walk major distances with their baggage. At the same time, at these platforms passengers can get to their transfer connections on field or to their park places quite quickly and easily with appropriate information provided to them even if they do not speak the local language.

3   Structure of the "airLED" project

On the basis of these principles was started a transnational project. The stakeholders of four Central European regions will elaborate their own strategic polycentric development plans regarding on the catchment area of each airport. During the whole period of the realization of the project, special attention was paid to the traffic connections of the airports, within that especially to the development of public transport connections between the airports and the cities located in their vicinity.

Within the objectives of the project partners, not only the development of special, local development plans are included but naturally also the dissemination of methods to the largest possible audience. They were developed and used during the realization of the project and can be followed generally. For more information please visit the project website http://airled.eu.

3.1 Partners

The "airLED" project will be realized by nine partners of four cooperating countries:

- Municipality of the 18th District of Budapest – Hungary, lead partner;
- Municipality of Vecsés – Hungary;
- KTI Institute for Transport Sciences – Hungary;
- Fondazione Istituto sui Trasporti e la Logistica – Italy;
- Emilia Romagna Region – Italy;
- Mazovia Voivodeship – Poland;
- IRM Institute of Urban Development – Poland;
- Business Support Centre Ltd. Kranj – Slovenia;
- Cerklje in Gorenjska Region – Slovenia.

Represented among the nine partners are municipalities, which are shareholders of one of the regional airports and at the same time are representing the affected inhabitants around the airports as well as institutions which deal with the issues of development of transport networks. The four affected airports are as follows:

- Liszt Ferenc International Airport, Budapest;
- Guglielmo Marconi International Airport, Bologna, Modlin Airport, Warsaw;
- Joze Pucnik International Airport, Ljubljana.

This partnership enables the extensive discussion of the problems, respecting the interest of all affected and interested parties as well as the development of professionally supported solutions regarding all questions and problems that may arise. All partners contribute with their special knowledge and approach to the elaboration of the strategic development plans. They are based on the synergies of an approach that is multidisciplinary yet based on different points of view.

The municipalities enjoy and rely on the trust and information of the local communities. The scientific institutions contribute to the success of the project, to the improvement of the quality of life of the people living in the catchment area of

the airports by "supplying" the methods and information of the recent results of scientific research.

3.2 Methods

One of the most important tasks during the realization of those projects which affects a large number of partners and several countries is the management of the project. Because of the diverse characteristics of the activities and the timing of the project, it was necessary to entrust the operative management activity to a professional organization well experienced in European projects which supported the Lead Partner. In order to support the project management activity, the following project bodies were established:

- RDCB – Regional Development Coordination Body;
- ASG – Assessment and Support Group;
- PB – Political Board;
- Steering Group.

Each body was formed by different level representatives of the project partners who meet regularly regarding on the accepted activity and time plan. The most important of them are the regular Peer Review Workshops, where the project's status and the developed documents are discussed.

Due to the fact that the project uses not only the information of which the project partners dispose directly, the results are discussed regularly at Master Classes with the representatives of the wider neighbourhood as well. On these events, the representatives of the professional and civil organizations of the region are also invited. The questions and remarks on these events will be included in the final development plans, too. Work began with status-quo analyses, first the general EU-State-of-Art Report, following the Status-quo Analyses of each regional airports used a common methodology. Based on the local specialities as well as on the general criteria of "Airport City", the development plans of the regional airports affected by the project will be prepared.

During the status-quo analysis process, the documents were prepared primarily on the basis of known studies and statistics. The developments are prepared by synthesis of ideas of transport, business and spatial development plans which integrate different points of view. These plans should reflect the different land-use characteristics, the environment protection requirements, the long-term social and business development contexts and the requirements of sustainability as well.

Besides desk-top research, we have devoted an important role in the new means and methods elaborated in the framework of the project, the interviews with different stakeholders and other surveys as well. The developed methods are general solutions and we are studying their usability in the framework of the project. In case of positive results, we will recommend to use them for other regional airports and other stakeholders in their vicinity if they are considering similar development possibilities.

KTI and IRM, the two "knowledge-providers" prepared a study of good practices based on the realized status-quo analyses and on other knowledge from other sources. In this document especially those processes and solutions are

presented which are used by the airports of the regions and by the same regions participating in the project and which deserve to be followed by others. The strategy is built using the Open Living Lab method which focuses on permanent, interactivity based co-operation in order to achieve the goals. The strategies concentrate on three basic elements:

- Logistics and transport;
- Spatial development, protection of environment and urbanism;
- Business development and investment promotion.

3.3 Tools developed in the project

In the "airLED" project we developed three planning and development tools:

- Statistical analysis tool;
- Modelling tool and imagineering simulation;
- One-Stop-Shop.

The statistical analysis tool is a practical application of structural equation modelling (SEM) in development of the catchment areas of airports. The method is well known in the scientific literature. In our case, it was used for discovering those deeper existing relationships which can be statistically detected and modelled. Using this method those phenomena and processes can be identified on which special attention should be paid in the preparation of economic and spatial development plans of airports and their surrounding areas. The transport related variables and the relationships based on them play a special role. The tool is tested on the Liszt Ferenc International Airport, Budapest within the framework of the project.

The modelling tool and imagineering simulation will be elaborated in the Open Living Lab process. The essence of that is that the analytical tools already known and applied are combined so as to establish the basis for appropriate development strategies which meet the "Airport City" criteria. The airport is located in the heart of the "Airport City", thus the tool includes those special circumstances in the development of ideas which can provide only one airport in a given area. The analysis tool provides GIS-based analysis. One of its most important starting point is the current and desired transportation network, and the ideas for economic development based on it.

The essence of the One-Stop-Shop is that the municipalities or public authorities can contribute to the realization of developments serving the well-being of the population of the territories of their competence basically by improving the institutional and infrastructural environment of the economic development. Even therefore it is important that potential investors can acquire all relevant and necessary information which is indispensable for making their decisions regarding investment in only one step. Since not only the acquisition of information but also the time required and the complexity of the official procedures affect the decision, it is essential that local governments are more resilient i.e. that authorizations should be obtained in one place and quickly.

4   Results of the "airLED" project

Although the "airLED" project will be completed only by 31th December 2014, there are a large number of results which could already be reported. The most important is the knowledge and techniques that are embodied in the international cooperation in the framework of the project. During the cooperation with representatives of other countries and other cultures, the project partners could obtain not just knowledge regarding on problems and possible solutions focused on the direct objectives of the project, but regarding the different working methods and approaches too. Of course, the skills or methods we got up to the situation analysis are very important. Let us briefly consider these in the following.

4.1   EU-State-of-Art Report and Status-quo Analyses

Initially, the changes occurring in the European aviation and airport markets were examined. The most important fact is to emphasize that the European air transport market has changed essentially. New players have entered the scene, who have changed the nature of long-distance transport. In the medium (300–600 km) distance travel, railways fail to gain positions again because of the time factor. At the same time, earlier point-hub-point links are replaced by point-point links and offer for the longer distances much larger number of possibilities of connections than railway, they are faster and more flexible and adaptable to the demands of travelers. It has changed the competition between firms providing expressly capital intensive airport services and has increased the number of regional airports and their role.

The EU-State-of-Art Report provides information regarding this changing competition situation on the European air traffic market and on some highlighted Central European airports. This general status-quo analysis contains that information too which is generally relevant to the characteristics of the European air traffic market and to the relationships between the demand for air traffic services and the characteristics of the environment of the given airports. The paper also briefly discusses those doubts which have arisen in relation to the "Airport City" development concept.

The Status-quo Analyses of the four airports that are involved in the project are based on common principles. The big advantage of a uniform methodology is that the involved airports can be compared with each other not only overall, but by elements. So there is a clear picture showing that nowadays:

- only the airport in Budapest is in a situation to develop into an "Airport City" within a foreseeable future;
- in the case of Bologna, basically the demographic situation and trends, and partly the infrastructure, make future development possibilities doubtful;
- in case of Ljubljana, beside the demographic situation and trends also the number of passengers and the distance from the TEN-T network are the factors because of which it does not seem to be a realistic objective to develop the airport into an "Airport City";

- in case of Modlin, mainly the relatively short distance to the TEN-T networks could be considered as positive factor, because of all other characteristics there seems to be only a long-term possibility to develop it into an "Airport City".

However, considering that the present market challenges can be met not only by the development of an airport into an "Airport City", the project can help some stakeholders in determining the elements in their present strategic development plans that can be realistic goals. In addition, the Status-quo Analyses of course, point out which areas should be developed in order to realize the quickest progress.

Only two of the four airports, Bologna and Budapest are located so close to the city center that it can also be connected directly to the urban transport system. Ljubljana Airport is 25 km away; Modlin is 40 km away from the city center. Despite of this situation, for now the airports in Bologna and Budapest are connected to the urban transport network by bus only. However, both cities plan to link the airport facilities directly into the rail network, which would transport passengers directly to the city center. Since there is neither a tramway nor an underground railway network in Bologna, the airport cannot be connected in this way by the urban transport system. At the same time, in Budapest there could be a realistic alternative to extend the underground line until the airport. Here, the intermodal node of railway, the underground station and the city bus line that is currently connecting the airport with the city's central business district, is located next to the existing aero-lane.

4.2 Polycentric development plans

The polycentric development plans of the four airports and their catchment areas involved in the project are in progress for preparation. In the framework of the project, the status-quo analyses, including studying various development projects, are completed. Each involved regional development cooperation bodies become, in part already are, familiar with the different points of view and priority considerations during the meetings. Knowing all this, an iteration process is going on by which at the end the development plans will be created that will take effect as the different decision-making bodies of the individual stakeholders adopt them.

Considering that these plans contain visions that are viable on the long-term, it is clear that it should be concerned with the traffic development needs of the airports and their vicinity. As a consequence of the geographical, spatial, demographical and economical endowments, in case of Ljubljana and Modlin of course these development plans may contain the interurban bus and railway links in addition to the necessary road improvements. In case of Bologna and Budapest in addition to the development plans for road, the urban transport related goals must be included as well. However, it should not be forgotten for any of the airports that these development needs should be measured in each case to the passenger traffic of the airport or should be measured to the transport demand expected that is determined by the overall economic development of the catchment area of the airport.

4.3   Recommendations

Eurostat publishes data of more than 500 European airports serving the civil aviation. Most of these facilities are of local importance serving less than 100 thousand passengers yearly. Nevertheless, the existence of the airport should not be ignored in any case when making economic development decisions. Because, depending on what the other conditions are, it could happen that a still insignificant airport can represent such a competitive advantage in a region which can attract significant investments. Thus it can greatly contribute to the development of the immediate environment of the airport. In these cases, the development of urban public transport links between the airport and the settlements in its neighborhood must be taken into account, because it can basically help contribute to the acceptance of the airport based on the additional benefits and to reducing the resistance of the people living next to the airport that could emerge because of the environmental load associated with the airport development.

In connection with the development of an airport, decades-affecting investment decisions must be made that are engrossing major fixed assets. It is why the decision making process should be supported by appropriate, multidimensional analyses analogous to those that were presented in the "airLED" project. An important lesson for us is also the diversity, openness and democracy of the decision-making and communication methods which is reflected in the Open Living Lab process. The RDCB meetings and the different regular meetings of different level served as useful examples. The contribution of the unbiased knowledge-providing scientific institutions to the work within the framework of the ASG also has to be highlighted. Because in the end, there is a need to take political decisions in this process, it is essential that the Political Board should regularly get information in this process because they are representing the greatest range of stakeholders and they have to be able to intervene if it is necessary.

5   Conclusions

During the 30-month-period of the realization of the "airLED" project, it has created opportunities to explore development opportunities in part that regional airports are facing in Central Europe. The nine cooperating partners in four countries tested or used methods that others may also benefit from while preparing their own strategic polycentric development plans. During this work, particular attention was paid to the accessibility of regional airports not only in the wider surroundings, but also to closely related cities. It turned out that connection to the urban transport grid is a great help for the success of the development and for the attractiveness of the airport because of the relatively rapid accessibility. This, however, usually needs to create a better connectivity than the existing one.

References

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