

AIRPORT PLANNING AND ENVIRONMENTAL STRATEGIES IN CATALONIA

Pere Suau Sánchez y Montserrat Pallares-Barbera

Department of Geography
UAB

I. INTRODUCTION

Recent social movements have alerted public opinion and political administrations to the safety of the areas surrounding airports and the negative externalities produced by airport developments. From the economic geography perspective this is not a new issue, but due to the increasing importance of enlargements in airport capacity this has become a hot topic for policy makers and academics. Responsible airport development planning would avoid social conflicts and negative externalities in surrounding territories. Traditionally, the planning of airport developments has only focused on elements inside the airport; such as supply and demand forecasts and other aeronautical, engineering and economic variables. But the current airport framework presents new situations that cannot be solved by traditional methods since new and external variables are intrinsic to the decision-making process (Graham and Guyer, 1999). This paper deals with these new variables; in the sense of discussing how the trade-off between enlarging infrastructure and minimizing externalities are important elements in the decision making process regarding difficult-to-resolve incompatible land uses.

On the one hand, demand for airport infrastructure is linked to the demand to increase the competitiveness of a region. On the other hand, infrastructure development can be detrimental to the surrounding environment. This paper postulates that enlarging airport capacity should also consider the management of the environmental impact on surrounding areas; therefore, this paper considers the appropriateness of using Strategic Environmental Assessment (SEA) plans (European Directive 2001/42/EC) for airport planning to evaluate the environmental consequences of several alternative future scenarios.

After they were completed, externalities created by infrastructure projects in Europe were assessed by the Environmental Impact Assessment (EIA or Project Assessment. European Directive 85/377/EEC). This posterior assessment was often turned into a method for justifying decisions that had already been made, including projects lacking environmental principles.

Since mid-2006, and the EIA still in place, the SEA has been mandatory. The SEA model considers several elements, including biophysics, economic, social, political, and territorial variables to evaluate the environmental consequences of several alternative future scenarios. SEA has the advantage of anticipating the inclusion of measures for environmental protection, since it obliges the plan, program or policy to make an environmental sustainability report in relation to the possible alternatives for development. Subsequently the plan, program or policy proposal will be written on the basis of the considerations of the environmental sustainability report, the community involvement process and the environmental assessment.

The aim of this paper is to demonstrate how SEA is an essential planning tool for reconsidering the way airport capacity and environmental tensions are dealt with; and this is illustrated in the Catalanian Airport System. The paper analyzes the particular socio-environmental conflict that has arisen in the municipalities of *Gavà* and *Castelldefels* (close to *Prat de Llobregat* where Barcelona International Airport is located) since the new third runway came into operation at Barcelona Airport, along with the disturbance expected to be caused by the new South Terminal, which is still under construction. The prospective noise caused by aircraft landing and taking off on the third runway forced the airport authority to limit the airport's capacity. This conflict has been partially solved through amendments to the airport platform and important changes to the Traffic Management Advisor.

II. AIR TRAFFIC MARKET: THE MAIN ENGINE FOR CHANGES IN THE AIR TRANSPORT GEOGRAPHY

Important changes in the European air travel market affected its traditional structure; among these we can highlight the deregulation and liberalization of the market, privatization of flagship carriers, increasing number of low-cost carriers, and the development of secondary airports. In consequence there has been a rise in socio-environmental conflicts in areas surrounding airports that has affected the performance and practical capacity of airports.

III. AIRPORTS AND STRATEGIC PLANNING

There are many different and important consequences on the economic geography of the territory. For example, the disappearance of a low-cost airline from a secondary airport would seriously affect the local economy of a region. In this sense, Graham (1999) considers that future methodologies for forecasting air traffic should be based on the role and viability of specific airlines at particular airports. Therefore, analysis of the interaction between the airport and the territory should be made in a comprehensive manner, considering the airline's route pattern, airport development and territorial impacts (Suau, 2005).

Airlines, airport and territory are three basic interdependent elements. Territorial features being those affecting airport performance and attracting particular types of airline. However, airlines determine the success of the airport and subsequently the economic impact on the territory. Finally, airport features attract airlines and provide benefits to the territory, as well as creating tensions with the hinterland.

The airport industry is complex, changes rapidly and is influenced by many variables. The features explained above require flexible and adaptable planning methodologies with

broad goals. Neufville and Odoni (2003) suggest that airport planning forecasts are always incorrect, since planners and managers have to face the realities of the deregulation and competition era, making forecasting somewhat unreliable. Therefore, responsible airport planning anticipates a wide range of possible futures, giving airport managers and operators the authority to dynamically adjust their plans and designs so that over time they can accommodate the variety of possibilities that may occur. Neufville and Odoni devised Dynamic Strategic Planning (DSP) as a methodology based on these principles. The stages of DSP are: inventory of existing conditions, forecast of future traffic, determine facility requirements, develop several alternatives for comparative analysis, and select the most acceptable first-phase development.

IV. THE ROLE OF STRATEGIC ENVIRONMENTAL ASSESSMENT

The current European airport framework presents socio-environmental and territorial conflicts that are not easy to resolve. On the one hand, there is a need for the development of air-infrastructure in order to increase the competitiveness of a region; but, on the other hand, such development can damage the environment and be against the interests of nearby inhabitants. The technical features of the airport infrastructure would be irrelevant for increasing air traffic volume. Enlarging airport capacity will depend, in the short term, on controlling the environmental impact of such a development in surrounding areas.

Strategic Environmental Assessment (SEA) follows the same idea as DSP. SEA is a process for assessing the environmental consequences of alternative future developments to ensure that significant environmental effects arising from policies, plans and programs are identified, assessed and mitigated. To evaluate the consequences of several alternative future scenarios SEA considers several elements, including biophysical, economic, social, political, and territorial variables. The legal framework of SEA is the *Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programs on the environment*.

SEA is important because it implies a change of thought and a new way of tackling socio-environmental conflicts related with planning. Firstly, SEA completes and enforces the Environmental Impact Assessment (EIA) that is applied under *EIA Directive 85/377/CEE* and the *Amended EIA Directive 97/11/EC*. EIA is performed for individual projects and is implemented after the project has been devised, but before the final authorization is given. SEA has the advantage of anticipating protective environmental measures, since it makes it possible for decisions in terms of policies, plans and programs to be made at the same that it is being produced. SEA also follows the so-called hierarchy principle, which means that SEA will be more effective the higher it is applied in the hierarchy of plans, thus avoiding duplications. Secondly, the SEA of a plan (which will have several projects assessed by the EIA) makes it possible to include environmental factors in strategic decisions from the beginning of the planning process in the form of such questions as: Is there a real need for this project? Should we take different future scenarios into account? Should we go for a railway or a highway? Do we need a dam, water transfer or a desalination plant?

V. POSSIBLE AIRPORT DEVELOPMENT SCENARIOS FOR CATALONIA

The three airports included in this paper are the commercial and international airports of Catalonia: Barcelona-El Prat (BCN), Girona-Costa Brava (GRN) and Reus (REU).

Barcelona airport is Spain's second largest airport in terms of passenger traffic, and in the period from 1996 to 2001 was the second fastest growing European airport in terms of passenger traffic. Since the Olympic Games in 1992 passenger traffic has grown by more than 100%, such that in 1992 the airport had 10 million passengers, and in 2004 had 24.5 million. With 30 million passengers in 2006, it is the 2nd most important airport in the Euro-Mediterranean region after Rome. In 1999, the Spanish Development Ministry (*Ministerio de Fomento*) approved the Master Plan for Barcelona Airport, also known as Barcelona Plan (AENA and Ministerio de Fomento, 2001a). The target of the enlargement plans determined by the Barcelona Plan is to meet demand requirements until 2020 and to consolidate Barcelona airport as a hub airport with the capacity for more than 90 operations in rush hour and 52 million passengers a year.

Girona airport is located in a reasonably decent position from a tourist, commercial and industrial point of view, since it is near the Costa Brava, the Pyrenees, and the cities of Girona (10 Km) and Barcelona (85 Km). Girona airport has one 2,400-meter long and 45 meter wide runway and a platform with the capacity to station 18 large airplanes and 10 small general aviation planes. The overall capacity is 18 movements per hour. The activity of the airport has been traditionally been linked to tourist activity. That is why the airport has never had stable traffic. Year after year when the summer season ended, the airport was largely unused other than by passengers on the Girona-Madrid route, which is why plans were made to close the airport. However, from November 2002 this started to change. In 2003 the airport received almost one and a half million passengers and more than 20,000 flights; this meant an increase of 160% in relation to the previous year. The reason for such a large increase was a settlement with Irish Low-Cost carrier Ryanair in 2002. At the end of 2003, the Catalan Government, the Girona Deputation, and the Girona Chamber of Commerce settled an agreement by which, from 2004, Girona airport would become Ryanair's operational hub in the south of Europe. It was forecast that the new Ryanair hub would create 1,200 direct, indirect and induced jobs and would attract bus companies to open new lines to the airport.

Reus airport is located 78 Km from Barcelona and 160 from Girona and is mainly influenced by the Province of Tarragona (674,000 inhabitants). Reus airport is an international civilian airport with a runway of 2,455 meters long and 45 wide, which has capacity for 24 movements per hour. The airport also has a 53,230 m² stationing platform for six aircraft.

The airport has two terminals, one for departures and another for arrivals, as well as an annex building for checking in low cost flights. The departures building has a surface of 4,050 m², and the new arrival building (opened in July 2005) is 3,800 m², improving the airport's passenger handling up to 1,500 passengers per hour, and six simultaneous flights.

The traffic at Reus airport features a large number of international charter flights, exclusively tourist flights, and its high season is between May and October. In particular, 88% of the total traffic comes from the UK. On a national level, 95% of scheduled flights connect with Madrid (AENA website).

Most territorial and socio-environmental conflicts created by Catalonia's international airports are concentrated on Barcelona airport, which is located in an area that suffers from major infrastructural pressure. In the delta of the Llobregat River there are numerous infrastructures that have created several conflicts, but since the creation of the Master Plan for airport enlargement the protagonist of all these conflicts has been the airport.

The new third runway (07R-25L) has been one of the most controversial developments. The third runway started to operate on 30 September 2004. The decision regarding its location was a matter of debate for several years; some preferred a longer runway nearer the sea while others believed that a shorter runway should be located further inland. Eventually, the decision was made to locate it at a distance of 1,350 m and in parallel to the first runway (allowing simultaneous operation of both runways). This location had some impact on the Llobregat Delta Natural Park; some of the littoral pine forest was cut down.

The municipality where the airport is located, *el Prat de Llobregat*, benefited from the new third runway. However, other municipalities suffered noise disruptions from the outset. The areas that particularly expressed complaints were the coastal neighborhood of *Gavà Mar* in the municipality of *Gavà* and to a lesser extent the municipality of *Castelldefels*. It is important to note that in November 2004 *Gavà* City Hall approved the expansion of the *Gavà Mar* neighborhood, even though it was aware that the new district was destined to suffer from noise disruption.

The Environment Monitoring Commission of the Enlargement Developments of Barcelona Airport (CSAAB) includes the Technical Working Group for Noise. This group meets with AENA professionals and the *Barcelona*, *Gavà*, *Castelldefels* and *el Prat de Llobregat* City Councils to monitor the noise impact and make the right decisions.

On 11 December 2003 the CSAAB (AENA, 2005) approved the noise print associated with the west configuration with *Castelldefels* voting against it. So, until the inauguration of the new South Terminal (located between the two parallel runways) 85% of landing and take off operations would use the west configuration and 15% the east configuration. Both configurations flew over *Gavà* and *Castelldefels* but out of the Leq 65dB area during the day and Leq 55dB during the night (legal limits in Catalonia for noise disruption. Gencat, 2002).

But since 30 September 2004, the day on which the third runway started operating, the runways have suffered several changes to their configurations as a result of the disturbances created. Therefore, on 14 November 2005 the CSAAB approved a new operational configuration that would have 85% of daytime take offs leaving from runway head 25L in the *Castelldefels* and *Gavà* direction; bigger aircraft would have to continue taking off from the runway head 25R. This way, the populated areas of *Gavà* and *Castelldefels* would not be flown over since the aircraft were forced to make a 60° left turn just after take off to fly over the sea. But this configuration, which involves major minimization of the noise disruption over the populated areas, requires a large amount of work and changes to be made to the airport platform, which was to be completed by the end of 2006. This work was: adjustment of runway head 02, airplane by-pass from runway head 07L to enable 95% of take offs to be made from the new third runway, and a new Terminal Traffic Management Advisor (TMA). All of this work cost approximately €18.9 million (AENA, 2005).

VI. FUTURE AIRPORT SCENARIOS FOR CATALONIA

1. Scenario 1 - Permit expansion of GRN and limit the growth of BCN and REU

This first scenario seeks to find a better territorial balance by allowing the development of Barcelona airport up to what is currently programmed in the 2001 Master Plan, the development of Reus airport up to what the 2006 Master Plan defines as the «foreseeable scenario», and the development of Girona airport up to what the 2006 Master Plan defines as the «maximum possible development». This first scenario implies:

- Limiting the development of Reus airport up to the foreseeable scenario.
- Limiting the development of Barcelona airport up to that defined in the Master Plan (Third runway + new South Terminal).
- To start studying a second runway as defined in the maximum development scenario of the Girona Airport Master Plan.

2. Scenario 2 – Expand BCN airport and limit GRN and REU airports

The aim of this scenario is to reinforce Barcelona airport's role as a hub. Segmenting and planning the air traffic market in airports in the same region is a difficult task. Airports in the same region usually compete to attract passengers. The pursuit of large and dense economies by airlines and the desire to control airport schedules can be summarized by saying: air traffic attracts air traffic. In fact, the efficiency of hub-and-spoke networks requires major control by the airline of the airport in order to guarantee connections between flights. Infrastructural concentration means more intensive and better use of these infrastructures, and concentrated ecological damage. In this sense the «ecological damage»/«socio-economical advantage» relation is lower. The development of the secondary airports implies new infrastructural developments to provide public transport accessibility, this means twice as much environmental damage and territorial fragmentation. The second scenario implies:

- Limiting the development of Reus airport up to the foreseeable scenario.
- Limiting the development of Girona airport up to the foreseeable scenario.
- Initiating studies for a new Barcelona airport Master Plan with a new fourth runway and satellite terminal.

VII. CONCLUSIONS

On 26 October 2006, and at least before the opening of the new South Terminal, the configuration approved on 14 November 2005 is going to become operative. This has meant a reduction of 90% in aircraft flying over *Gavà* and *Castelldefels* and a reduction of up to 20dB for the *Gavà Mar* neighborhood.

The enlargement of the airport is one of the projects contained in the so-called Delta Plan, which represents an investment of €30,000 million over 15 years in infrastructures, the aim being to generate synergies between the airport, the port and the logistic zone (Zona Franca). Failure to take advantage of the boost implied by the Delta Plan, the new operational configuration and TMA that avoids noise disturbances, and the Star Alliance project for

Barcelona airport would be a strategic mistake with major socio-economic consequences for the Barcelona metropolitan area and Catalonia as a whole.

Between 2020 and 2025 Barcelona airport will reach its maximum capacity of 52 million passengers (Suau and Jimenez, 2005). Mega-infrastructure projects entail years of negotiation between stakeholders, and conversations and consensus need to be devised and applied. For some time now, the public debate concerning Barcelona airport has incorporated two important issues: a possible fourth runway over the sea and a Satellite Terminal, which would be located between the two parallel runways and in front of the South Terminal that is still under construction. Now is the time to start seriously debating a new Master Plan for Barcelona airport to eventually be applied if needed.

Despite the increase in traffic at Reus and Girona airports, these are and will be airports sustained by low-cost airlines and cannot contribute to the desire to empower intercontinental flights from Catalonia. However, it is true that in the scenario of a congested Barcelona airport, strategies could be devised to transfer flights from Barcelona to Reus and Girona airports. On the other hand, empowering a secondary airport implies a major infrastructural investment to improve its weak accessibility, thus provoking environmental damage and a high level of territorial fragmentation. Barcelona airport does not require the planning of new accessibility infrastructures, since the Delta Plan has already planned for High Speed Train and metro connections.

Therefore, we consider that the concentration of the negative impacts of infrastructures in a limited area or territory, such as that defined around Barcelona airport, could be a better option from the environmental and strategic point of views than for a wider territory, such as Catalonia, to be fragmented by more infrastructures. This alternative not only means better control of environmental impacts, but is also the option that best responds to the economic and competitive requirements.

