

# DOSSIER

## IDENTIFYING THE BOTTLENECKS IN THE AIRPORT INFRASTRUCTURES OF THE MAGHREB

*This dossier includes some reflections and results of the exercise carried out by CETMO on the identification of bottlenecks in the airport infrastructures of the Maghreb countries.*

*The realization of this exercise aims to contribute to the Mediterranean co-operation in two of the principal scopes identified as a priority in the work programme of CETMO: defining a multimodal transport network in the Western Mediterranean and improving the technical tools that allow for the prioritisation of the actions to benefit the transport in the region.*

*In this context, the main objective of this exercise is to identify, in a simple way and according to a common criteria for the three countries of the Maghreb – Algeria, Morocco and Tunisia -, the capacity problems of their airport infrastructures in the medium term.*

### **Basis of the exercise**

Before describing the main characteristics of the methodology adopted to carry out an exercise like this, it is necessary to highlight what have been the basic criteria followed for its definition.

Firstly, the methodology had to be uniform for the three Maghreb countries, as well as responding to the particulars of the airport infrastructures of this region.

On the other hand, it must be highlighted the intention to define a tool which will allow in the future to repeat, in a simple way, the same identification of the capacity restrictions carried out in this exercise. To fulfil this requirement it is necessary to accept that the demand for information has to be minimised and that the complexity of the methodology has to be limited.

Finally, it was intended that the final methodology be clearly organised into separate modules, in such a way that in later updates it will be possible to improve some of the parts without interfering in the applicability of the whole system.

### **Description of the adopted methodology**

The first part of the methodology attempts to estimate the capacity of the airport infrastructure under conditions of optimum use. This task is tackled in three separate sections, each of which analyses the capacity of a different sub-system: the airfield, the runway and the passenger terminal. Although the origin of the methodology is

based on the analysis of European airports, an adjustment has been made to improve the feasibility of the results for the Maghreb airports.

In the second part of the methodology the evolution of passenger and aircraft traffic is considered, making estimations on the average annual growth according to two hypotheses or different scenarios. These growth hypotheses are projected at two horizons (2005 and 2010), starting from a base year (2000).

Finally, through the comparison of the results from these two phases, an estimation of the airport utilisation levels are obtained for each one of its sub-systems. In this way, we obtain four different utilisation forecasts for each sub-system, according to one or another growth hypothesis and according to the horizon that we are referring to.

### **Information used**

An important factor to consider when defining a methodology to estimate the airport capacity is the quantity of information that is available; or, from another perspective, the dependence level on the availability of information that is accepted for each time that the exercise is done. Often estimating methods of this type are established and then no longer used due to their complexity or the large number of data needed for its correct use.

The main sources of information used to carry out this exercise have been, firstly, statistics published by national organisations responsible in

each country for the management of airports (the *Office National des Aéroports* in Morocco, the *Office de l'Aviation Civile et des Aéroports* in Tunisia and the Ministry of Transport and the *Etablissement National de Navigation Aérienne* in Algeria). These publications include detailed information of commercial passenger and aircraft traffic, through which it is possible to characterise the traffic, although only in an aggregated form for a fixed year. However, it is not possible to carry out an analysis of traffic for peak-hours, which are normally used for the capacity design of the airports.

*Traffic in the main airports of the Maghreb (year 2000)*

Country Airport	Total passengers	International passengers
	(10 <sup>3</sup> )	(10 <sup>3</sup> )
<b>Algeria</b>	<b>6.508</b>	<b>2.256</b>
Algiers	2.799	1.377
Oran	929	297
Constantine	632	235
Hassi-Messaoud	504	31
<b>Morocco</b>	<b>7.167</b>	<b>5.115</b>
Casablanca	3.570	2.624
Marrakech	1.426	1.066
Agadir	1.153	796
<b>Tunisia</b>	<b>9.649</b>	<b>9.046</b>
Monastir	3.917	3.899
Tunis	3.376	3.103
Djerba	2.145	1.894

The compilation of the characteristics of the infrastructures carried out in the database CETMO-INFRA: AÉROPORTS has also been of great use for the exercise. This compilation has equally counted on the collaboration of organisations previously mentioned.

To finish, it has been necessary to add information to all of these figures on the improvements of infrastructures, planned or in the process of being carried out, for the period 2000-2010.

### Improvements of the infrastructure

The Maghreb airports that already have improvements planned for their airport infrastructures or are in the process of working on are the followings:

- (i) Algiers airport is considering opening a new 20.000m<sup>2</sup> passenger terminal in 2004.

- (ii) Hassi-Messaoud airport is finalising the construction of a new 5.500m<sup>2</sup> terminal which will replace the old one.
- (iii) Casablanca airport is planning, in 2005, a new 40.000m<sup>2</sup> passenger terminal and is already carrying out work for a second runway; and
- (iv) Djerba airport is completing, by the end of 2003, the expansion of the passenger terminal, increasing its size by 16.000m<sup>2</sup>.

As well as these expansions, in Tunisia there are plans to open a new airport under concession in the region of Enfidha. The influence of this new infrastructure has not been taken into account when defining the annual growth rates of airport traffic in Tunisia, although it may be expected that the new airport will capture traffic from Tunis, Monastir and Djerba, reducing their utilisation rates.

### Main results of the exercise

The results of this first application allows us to identify, from among the 30 main airports in the region, those for which the estimated traffic for 2005 and 2010 could pose a problem for the capacity of one or more of their infrastructure sub-systems. In most cases, the sub-system in which congestion problems are found is the terminal building.

Constantine and In Amenas are the Algerian airports in which the highest congestion rates are expected for 2005 and 2010. Marrakech, Tanger and Al Hociema are the Moroccan airports in which the optimum capacity of the terminals will be reached first. In the case of Tunisia, the passenger terminal in Monastir has been identified as the principal bottleneck.

### Conclusions

With the exercise described, it has only been attempted to identify, following simple analytical methods, the Maghreb airports which are most likely to present future bottlenecks in terms of the capacity of their infrastructure.

It must be highlighted that said bottlenecks coincide significantly with the estimations carried out at a national level in each one of the three Maghreb countries. However, the results of this exercise should only be used as a tool to identify the regional priorities and strategies, without attempting in any way to replace the planning forecasts carried out by each country.