ABSTRACT

Keywords: accessibility, airports, competition, level of services offered, choice models, GIS.

This PhD work performs an exhaustive search on accessibility indicators aimed at quantitative evaluation of the competitiveness of a territory in general or more in the detail of a transport terminal. The work has consisted of two main stages in chronological order: first the logical and practical criteria have been defined for the construction of various types of measures of accessibility; secondly, the indicators built in the first phase have been used in applications related to air transport for passengers, in particular in the valutation of the competition between airports.

The study area is the Campania Region and air terminals taken into consideration are three: Naples Capodichino, Naples Grazzanise (in progress) and Salerno Costa d'Amalfi. These airports, also in the light of the latest programs on a national scale, can not simply be competing, but given their proximity and their territoriality are an integrated airport system. In this context, the accessibility indicators are a powerful tool for assessing the degree of interoperability and the level of services that airports provide their basin of influence.

The accessibility indicators are a very powerful tool and in some cases simply to assess the criticality of a transport system and then establish appropriate interventions in the strategic planning stage, they lend themselves so well to be used in the pre-and meta-design of interventions provided in the area.

Although these quantitative measures require the work of a familiar figure of the transport systems and in-depth knowledge of the geographical and economic area of reference, or analyst, it is equally true that such measures may discover critical situations and immediate be interpreted by people less experienced, as decision-makers.

Considering the classifications proposed by different authors in the first decade of the new millennium, in the present work have been defined, two macro-categories of accessibility indicators: indicators based on the supply of the transport system (O) and indicators based on behavioural choice models (S). The first category of measures depends on the characteristics or "attributes" that depend on the performance of the transport system, which are always detected using a travel cost, these attributes can be combined with socio-economic attributes of the area and, in the case of air transport, with typical attributes of the air transport terminal.

The second category of measures depends instead on the attributes previously seen and user's own attributes, considered a rational decision-maker, the choice of an airport, about the problem of air transport is simulated with a model of probabilistic choice, the mathematical models used in this work belong to the family of "logistic functions" or simply "Logit".

The analytical expression of an indicator of accessibility can be simple or even coincident with a simple attribute as the travel time, can be represented by a combination of attributes each weighed with an appropriate coefficient of mutual substitution, the attributes can also be expressed by a nonlinear function.

The coefficients of mutual substitution, to express all the attributes in a single unit of measurement, for example in a generalized cost, must be suitably calibrated by appropriate investigations on the users' behavior of moving. In the case of the parameters used in the indicators based on the models of choice, it is necessary to build models of travel demand and compare them with the empirical data observed, this process involves a huge amount of data and a non-trivial analytic complexity.

In the first chapter are defined approaches and methods for the construction of the analytical expressions that represent indicators of accessibility, in the second chapter is formalized the problem of the measures of accessibility to the transport plane.

The third chapter describes the simulation models of movement and the random utility theory underlying the approaches of "behavioral" airport of choice, and this approach, applied in a case study in the area of interest was taken as reference in order to obtain the necessary parameters for the construction of indicators based on behavioral models of choice (S).

In the fourth chapter were finally implemented the measures of accessibility to the regional context represented by multi-airport system: Capodichino, Grazzanise and Salerno, the indicators have provided information about the competitiveness of airport sites and about their areas of preferential influence, such information is been interpreted in the context of integration in which the three regional airports play a complementary service.

Measures developed and represented in the form of graphs and tables are "aggregate", or representative of the entire study area. Measures have also been plotted on the municipal level, through the GIS MapInfo Professional 8.5, such as "unbundled" in the form of thematic maps.