ABSTRACT

New forms of operation arise from the present and future prospects for large international railways, from High Speed trains to conventional ones. One of these new alternative international services could be an existing service at present but that is disappearing, as is the motorail. In the mid 20th century, the transportation of private vehicles by railway was of paramount importance. Its evolution has been affected by economic crises, changes of mentality and particularly by the fast evolution of alternative ways of transport (road and aerial). As a consequence a decrease in the number of existing routes has been observed.

A priori, this service offers obvious advantages: possibility of long trips without tiredness or traffic, decrease in the number of accidents on highways, services operating at night thus allowing a gain in days of vacation, less pollution, etc.. But in spite of all these favourable aspects, a large number of negative points still remains: lack of clear information for the users, time losses in the load-unloading of the vehicles, speed smaller than 80Km/h, deficient international network, etc..

A study of all the existing European services is undergone to reveal their weaknesses and strengths thus to be able to design a new concept of motorail adapted to the new infrastructures of the European transport system, to the new policies which tend towards a liberalization in practically all the railway aspects, etc.. The study is based on data from the RENFE (Spain), CP (Portugal), VR (Finland), NS (the Netherlands), ÖBB (Austria), SNCF-UK, GWT (United Kingdom), SNCF (Belgium), SBB (Swiss), SNCF (France), FS (Italy), DB (Germany), PKP (Poland), OSE-CH (Greece) and Optimal tours. It can be observed that technically distances of up to 1,700 km can be crossed, routes of up to 32 hours exist, the highest speed is 120 Km/h and the lowest 35. Also a series of qualitative and general parameters on the attitudes that must take the new service and what it must avoid can be established.

The general conclusion of the study on the present supply, especially for the case of Barcelona, is that a total reconstruction is necessary, from the transport means (the train must reach a speed of 120-160 Km/h, must adapt to the new infrastructures, the platforms must be rebuilt, etc.), to more commercial and financial aspects, (taxes, frequencies, commercial information for the clients, etc.)

Before predimensioning an hypothetical service, it is necessary to consider the profile of the possible clients. The usual type would be a tourist spending more than six nights in the place of destination, travelling long-to medium distance and that uses his vehicle for its vacations in family. It is also expected to obtain a residual percentage of other types of demand coming from other means of transport or other profiles of clients which, due to the limited extend of this thesis, will not be considered, for example the demand from the northern African citizens who return to their home country during the holidays.

Hence, European basic sectors where it would be interesting for the motorail to arrive in the future are pointed out (due to its high demand, the long duration of the travel by other ways of transport, etc.). Thus, on the European map, a connected and coherent network respecting schedules and frequencies, etc, is drawn.

In order to assess the percentage of captive demand from other sources, we compare prices and average journey times. It is tried to calculate them in the most possible objective form, provided they are comparable with each other. Out of this intermodal comparison, as advanced in previous paragraphs, it can be shown that the motorail presents, compared to its main competitor, an advantage in the gain of travel time, which increases as the distances increase. The hypothetical price of the new motorail is higher than the one of the private vehicles. Of the other ways of transport, the demand is considered so low that they are only indicated, without entering into too much detail.

In a first approach, a supply with minimum risk is taken. Orientative parameters on the year seasonal divisions, frequencies, composition of the trains, seats available, transported vehicles, etc. are given. Then some of these parameters, considering a maximum drop of a 10% of the users of the particular vehicle are modified. Also it is indicated how a station type should be, how the platforms should be built to satisfy the new raised necessities (transport of more vehicle types, less time losses, …), etc.

In conclusion, the railway panorama is favourable, but they must overcome important difficulties, technical as well as commercial. The present thesis just presents a possible way to save the motorail, and also other international railway services as an alternative to the High Speed trains.