ABSTRACT

PLANNING SYSTEM OF METRO NETWORKS. COMPARISON BETWEEN COPENHAGEN AND BARCELONA

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Copenhagen and Barcelona are planning and building metro lines these days. Although the transport planning’s processes follow some basic standards, the methodology and decisions used are different depending on each city.

Barcelona and Copenhagen are really different. They have different size, but also different customs and habits. This also affects to the public transport planning and its studies of viability.

The aim of this thesis is to analyze the tools used to plan metro lines in all their phases, as well as the influence of political decisions when talking about these kinds of investments. Also the analyses of the actual proposals for each city, with its weak and strong points, paying special attention to the future L9 of Barcelona. Finally, comparing the metro’s planning for both cities and suggesting some improvements in Barcelona, if necessary.

The thesis is made up of four main sections. It starts with a theoretical introduction according to some courses about transport planning and simulation followed at Denmark Technical University (DTU) of Copenhagen when doing an exchange program. These courses are traffic models, train simulation and Geographical Information Systems (GIS), and the idea is the application of these concepts for the planning system of the metro. These tools are essential to understand the initial development of traffic planning, both for private and public transport.

Secondly, a thorough study about the Copenhagen’s metro is made, analyzing the actual line and the future circular one. The main subjects are the analysis of alternatives between different urban railways systems, the safety system, the development of Ørestad region, the decision to locate the stations or the benefits that metro contribute to the Danish society. Moreover, the controversy and negative points of the metro are also analyzed.

The third main section is the Barcelona’s metro. The large experience of the city in metro planning is analyzed, explaining the backgrounds and the existing lines, as well as the role that the Metropolitan Transport Authority (ATM) is carrying out within the last years to develop a better public transport network to the whole Barcelona Metropolitan Region. For that reason, ATM has created the Infrastructure Master Plan 2001-2010 (PDI), which plans some approaches in a frame of 10 years. Its best feature is the construction of the new metro line L9.

Basically, it is explained the layout of this L9, as well as the troubles along its planning procedure, especially in terms of alternatives and location of some stations such as Campus Nord. The benefits that L9 will give to some forgotten districts when talking about urban railways system are also analyzed. These areas are the northern part of Barcelona, the Zona Franca Industrial Estate and cities like Badalona and Santa Coloma de Gramenet. Besides, there is an analysis of the pros and cons of the line.

Once both cities and their metros are dealt with separately, last section gathers real data from studies carried out in order to plan these metro lines. Aside from that, it is analyzed the comparison of the differences between them and the proposal of improvements in terms of planning. Basically, data are coming from surveys and passengers’ estimations from prognoses in a future. Moreover, stations and their catchments’ areas and parameters are analyzed.

Finally, big infrastructures such as metro lines are determined by political decisions and economical factors. Both cities have their political influence.