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## Parking management policies and the effectiveness of public policy solutions

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### Abstract

For years, Portuguese public institutions, such as hospitals, offer free parking for employees, patients and visitors. Due to the economic pressure that the country is facing, public institutions are now being pressured to charge for parking. Such measure has been socially contested as free parking has been interpreted as a labor right. However, it is a fact that public institutions cannot keep buying additional areas to supply increasing parking needs. Along this paper, authors evaluate 4 alternative scenarios for parking management, demonstrating that it is possible to do more with fewer resources; there is to say, increase mobility with less consumption of resources. Using a real case study from a hospital area located in Algarve (Portugal), authors will perform an analysis of the effects of four parking management scenarios in terms of traffic and environment pollution. Those results will support the monetary quantification of the environmental externalities costs. The comparative results revealed that scenarios requiring the use of more resources and implying higher public expenditure are worst in terms of traffic, environment and externalities. When parking systems become controlled and restricted, the referring effects worsen, on the immediate term, with additional driving costs for users on the network up to 560 euros/workday, environmental externalities costs up to 102 euros/workday and CO<sub>2</sub> emissions increasing up to 4,6 kg/workday.

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### 1. Introduction

Parking provision and management has been an important issue both for public authorities and for the private operators running those facilities. The relevance of the subject is not corresponded by universal or even integrated strategies. There are few specific requirements or regulations, both at national level and higher levels (European or International). Parking is an issue that has been addressed mostly locally, with municipalities imposing minimum ratios requirements to developers. Those ratios are mainly dependent of the land use and activities that

will be served by the parking area. However, as there is no integration between parking policies, occasionally those minimum rations can lead to an oversupply of parking areas (Shoup, 1999).

Parking areas usually create an impermeable surface that increases water flows in urban areas, degrade landscape and contribute to the urban island effect (Feitelson & Rotem, 2004). The excessive offer of parking also ruins urban planning purposes and promote automobile dependency (Cuttera & Franco, 2012, Shoup, 1997b, 1999). Additionally, on-street parking and the search for a parking place can reduce the road capacity and cause congestion, lower the circulation speed and increase air pollution and noise. Moreover, on street parking also leads to an increase on cruising for parking. Shoup (2006) quantified this effect in congested downtowns and revealed that traffic cruising for parking can oscillate between 8% and 74% of the total traffic and that cruising time can vary between 3.5 and 14 minutes.

Presently, several cities in Europe are reversing their parking policy and introducing parking maximums in order to contain the number of parking places available in their cities, as they consider the existing offer of parking places excessive. In fact, countries like Switzerland, the United Kingdom, Portugal and Italy already set maximum parking requirements as national guidelines (Kodransky & Hermann, 2011). Additionally to the restriction of the parking areas requirements, most of the cities have payment systems for on-street, surface or structured parking under public management or concede to private parking managers.

Along this paper, authors explore four different alternatives to manage parking demand in a hospital area, either through restricting the access to parking areas, introducing a payment system or by creating an additional parking area. Authors will estimate the traffic, environmental and monetary effects of those alternative parking management scenarios. The effect of cruising will also be taken into account on the calculations as it leads to increasing negative effects, aggravated by the fact that it takes place in a hospital area. The comparison between the different scenarios will allow determining if parking management can be done with less resources and without worsen the mobility of the area, as well as the environmental effects and monetary revenues. The comparison will also include the quantification of external costs, for each of the scenarios, in order to evaluate the society interest. These estimations will explicit the direct and indirect effects of each of the solution for parking manager, users and society. Such disaggregation of results is determinant to explicit all stakeholders perspectives into the decision making process and to acknowledge the impact of their options.

## 2. Case Study

The case study refers to a real situation that took place at a district hospital in Algarve (Portugal), close to the main road (EN125) that crosses the most populated municipalities of the region (Fig. 1).



Fig. 1(a) Location of the Hospital; (b) Regional insertion of the Hospital

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