



Increasing the acceptability of a congestion charging scheme



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ABSTRACT

Congestion charging is currently being considered as an important public policy in an increasing number of cities around the world, but evidence shows the importance of gaining public acceptability prior to its implementation. We analyse which factors should be considered to increase acceptability in the case of the Spanish city of Las Palmas de Gran Canaria. We applied a three-stage methodology: first a qualitative survey using focus groups, second Likert scales and exploratory factor analysis on a sample of 89 individuals, and finally, a stated choice (SC) experiment to a different sample of 206 respondents to value their preferences. The SC experiment was designed as a cordon-price scheme, including system features and considering three different uses for revenues: improving the current bus transport system, creating an underground line and increasing green areas in the city. Our qualitative analysis shows the previous resistance to accept any charging system, the lack of confidence on politicians and stresses the importance given to the use of revenues. On the other hand, values obtained from the SC experiment suggest that that public acceptability relies on the characteristics of the congestion charging scheme. In particular more than one third of the population would be willing to pay a daily fare of €2.22 if revenues from the system were used to increase the size of green areas instead of reinvesting this into the transport system.

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1. Introduction

The construction and operation of roads has several negative impacts, such as traffic congestion, noise, air pollution, accidents and others. Experience has demonstrated that new road investments are not the solution since any extra capacity provided is rapidly absorbed by induced demand (Goodwin, 1996). Most specialists in the field agree that road pricing represents the way forward to address the negative impacts of transport, since drivers are charged such that they can perceive the social (marginal) costs associated with their driving decisions (Pigou, 1920; Knight, 1924; Walters, 1961; King et al., 2007; Anas and Lindsey, 2011). Additionally, this charging instrument has also been justified as a means to raise revenues (De Palma et al., 2007) that could be used to support public transport, and fund the construction of new infrastructure and the maintenance of existing road networks (Manville and King, 2013).

In the case of Spain, the Spanish Ministry of Transport specifically considered (within the document *Spanish Strategy for Sustainable Mobility*) the use of road pricing as a measure to abate congestion (see Bigas et al., 2006). Furthermore, the Spanish Government proposed the adoption of urban mobility plans that could potentially use road pricing as an instrument to reduce CO₂ emissions. Despite the fact that these plans should be compulsory for cities with a population greater than 100,000 inhabitants (eventually more than 50 cities in Spain), there is not even a single case study analysing their effects in the Spanish context. The objective of our work is to analyse the public reaction to congestion charging in a medium size city in Spain.

Since the pioneering experience of Singapore, few other applications of the principles of efficient road pricing have been reported. In particular, some North American highways and some cities in Europe: Trondheim, Oslo, Bergen, Rome, Milan, Durham, most notably London, Stockholm and Valetta. Although the number of applications is still rather limited, with their success there has been an increase in the number of cities adopting and/or trying to evaluate the effect of road pricing (e.g., Copenhagen, Budapest, Gothenburg, San Francisco, Santiago de Chile, Sydney and Jakarta). Also noticeable in this respect are the road charging

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(or rush hour rewarding) programs in the Netherlands and the current trials and discussions about the introduction of road pricing in Belgium. The CURACAO Project, funded by the European Commission, shows also this increasing interest in this issue, including 20 cities interested in pursuing road user charging (May et al., 2010). Among these experiences, there is not a single study about public responses to urban road schemes in Spanish cities.¹

The limited use of road pricing in practise has been generally justified on the public rejection and concerns, among politicians, about the possible loss of votes as a consequence of such a controversial measure. Both public and political acceptability are considered essential to guarantee the success of a congestion-charging (CC) scheme (Sikow–Magny, 2003; CEPAL, 1999). Great public opposition and active group's resistance were evident in some cases, such as New York (Schaller, 2010) and Manchester or Edinburgh (Ryley and Gjersee, 2006). Based on this lack of support, authors such as Ben–Elia and Ettema (2009; 2011) have considered rewarding commuters for rush-hour avoidance as a second-best alternative to CC for managing congestion. Although positive incentives seem to be considered more acceptable and fair than charging systems, they are generally less effective in changing car use (Gärling and Schuitema, 2007).

The recent literature has shown a growing interest on the acceptability issue both by the general public and politicians (Chorus et al., 2011; Hensher and Bliemer, 2014). A first group of studies extracted lessons learnt from previous experiences in cities where CC had been implemented or was planned (some reviews are included, for example, in Albalade and Bel, 2009; Odeck and Kjerkerit, 2010; May et al., 2010; Noordegraaf et al., 2014). Generally, these studies show the importance of the level of information given to users about the characteristics of the scheme, its potential benefits and the use given to the revenues raised by tolls. The Stockholm CC experience usually appears as a particularly successful case in demonstrating that acceptability is likely to increase with familiarity as users experience the benefits from the system (Schuitema et al., 2010; Eliasson and Jonsson, 2011).

A second group of studies comprises those focused on public opinion about congestion charging. Although different methodologies have been used, stated preference (SP) approaches seem adequate since we are dealing with the acceptability of hypothetical charging scenarios. Li and Hensher (2012) made a comprehensive review of 20 published papers using SP or opinion surveys about road pricing, and identified acceptability as one of the key issues to tackle when implementing a CC scheme. With the exception of Jaensirisak et al. (2005) there seems to be no previous work that considers the differences between drivers and non-drivers in the context of urban cordon pricing and SP choice. Some conclusions can be drawn from a substantial number of studies analysing acceptability of congestion charging schemes:

a. General opposition to road pricing can be often based on lack of trust in government use of funds (Kim et al., 2013). Referendum voting, when implemented, shows a general *ex-ante* rejection to CC, with just a few exceptions (Hensher and Li, 2013). Studies analysing the relations between voting intentions and scheme acceptability (Hensher, 2013; Eliasson and Jonsson, 2011) have underlined the importance of providing the public with information about the potential impacts of the scheme and “marketing” appropriately the benefits of the changes (Cools et al., 2011). Regarding information, Ardiç et al. (2013) emphasise the important role played by the news media as a non-objective policy actor.

- b. The public perception about the problems arising from car use and about the benefits of a charging scheme appears as additional factors to consider. Acceptability is expected to increase as general awareness of the negative car use effects increases along with the perception of the effectiveness of CC in solving traffic-related problems (Jones, 2003; Schade and Schlag, 2000; 2003; Steg, 2003). Perceptions of costs and benefits also depend upon people's characteristics (Gehlert et al., 2011). For example, opposition to urban tolls is expected to be higher among car owners rather than public transport users (Cain, 2005; Jaensirisak et al., 2005; Kottenhoff and Brundell–Freig, 2009), and people with a higher concern about the environment are more likely to accept a congestion pricing scenario (Jaensirisak et al., 2005; Janssens et al., 2009).
- c. People are likely to support a toll system when it is presented as a package including clear information about the final use of revenues (Albalade and Bel 2009) in such way that the benefits from the system can clearly be observed. Nevertheless, although support increases as individuals expect benefits (Steg, 2003), collective benefits appear to be more important for acceptability than individual ones (Schuitema et al., 2001). Thus, collective outcomes, such as public transport (Kottenhoff and Brundell–Freig, 2009; Rentziou et al., 2011) and environmental improvements (Loukopoulos et al., 2005), appear as the preferred toll revenue allocation, as they are also related to equality and environmental justice (Schuitema et al., 2001).
- d. Equity issues are considered as some of the most relevant objections to CC (Levinson, 2010), since pricing schemes may be interpreted as regressive in terms of income distribution (Teubel, 2000). In this sense, public and political acceptability relies crucially on the distribution (and the perceptions about it) of gains and losses of the measure (Jakobsson et al., 2000; Ittner et al., 2003; Bartley, 1995); this may be a reason that explains the support to charging systems that allocate revenues to the improvement of public transport.
- e. Finally, certain characteristics of the charging scheme, such as toll charge, period and area of charging (Kockelman and Kalmanje, 2005) clearly influence acceptability. Also, evidence suggests that where a complex scheme is implemented an important part of the rejection is explained by the fact that people do not understand it (De Palma et al., 2007). As stated by Li and Hensher (2013), scheme complexity can lead to higher rates of rejection as happened in Edinburgh and Manchester. The experience of Milan also shows a preference for simplicity in pricing systems (80% of the voters accepted to change to a new simpler charging regime in 2011).

As mentioned above, our objective is to contribute to the literature about factors determining road pricing public acceptability by adding, for the first time, a Spanish city to the list. With this aim, we combined an exploratory analysis arising from focus groups with a SP approach in Las Palmas de Gran Canaria, a medium-size Spanish city in the island of Gran Canaria. Unlike most cities where CC has been applied, Las Palmas does not present high congestion levels for long periods of time, so it seems interesting to explore the acceptability issue in a context where the users' benefits from traffic reduction are potentially small.

The rest of this paper is structured as follows. Section 2 gives a brief description of the characteristics of the city. In Section 3 we study the attitudes towards CC using content analysis and an exploratory factor analysis. In Section 4 we comment on the design of a SP survey considering the results of the previous stage, and use this data to estimate the willingness-to-pay (WTP) for different features of a hypothetical CC scheme. Finally, in Section 5, the main conclusions of our analyses are drawn.

¹ To the authors' knowledge, there is only one study attempting to estimate the effects of a cordon pricing system in Madrid, but it does not consider users' preferences or attitudes (Valdes et al., 2012).

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