



Parking at the UC campus: Problems and solutions

Eduardo Barata*, Luis Cruz, João-Pedro Ferreira

GEMF and Faculdade de Economia, Universidade de Coimbra, Av. Dias da Silva, 165, 3004-512 Coimbra, Portugal

ARTICLE INFO

Article history:

Received 19 October 2010

Received in revised form 30 March 2011

Accepted 5 April 2011

Available online 8 May 2011

Keywords:

Parking
Parking policy
University campus
Urban transportation
Public transport
Logistic regression

ABSTRACT

This study underscores the importance of adopting integrated parking management policies that ensure not only more rational use of the available parking spaces, evenly balancing supply and demand and bringing in revenues to cover the parking facilities costs, but also the improved attractiveness of alternative transportation modes. Parking supply and demand flows within the UC campus are estimated. The results indicate that the parking facility is underpriced and that there is overcrowding. To reflect critically on these issues and identify research areas to address their socioeconomic implications, a survey regarding the characterization of campus commuters and their travel options is presented. Logistic regression modelling is applied to determine the relative importance of UC campus commuters' attributes in their level of willingness to pay to have reserved parking on the campus. Finally, some policy proposals are discussed.

© 2011 Elsevier Ltd. All rights reserved.

Introduction

Parking is a central topic in urban transportation planning and traffic management research (Davis, Pijanowski, Robinson, & Engel, 2010; Khodaii, Aflaki, & Moradkhani, 2010; Shoup, 2006). Anyone who has parked in the downtown area of a major city during the business day will attest to its high socio-economic cost. Parking in a convenient spot tends to be expensive, while finding available curbside parking normally entails spending time and walking some distance (Anastasiadou et al., 2009; Marsden, 2006; Vianna, Portugal, & Balassiano, 2004). Cars cruising for parking further exacerbate traffic congestion and noise problems, originate accidents, waste fuel and other resources, pollute the air, degrade the pedestrian environment, and restrain levels of accessibility.

The problems generated by the lack of parking spaces are becoming more acute, particularly in more densely populated areas or at locations with significant restrictions on their ability to implement a sound planned parking supply (Arnott & Inci, 2006). As a location that provides all staff and students with a place for their working, studying and even living, the provision of parking constitutes one of the most troublesome transportation problems at many university campuses, all over the world (Alshuwaikhat & Abubakar, 2008; Balsas, 2003; Shang, Lin, &

Huang, 2007). This is true also for the University of Coimbra (UC) campus (Polo I).

The UC is the oldest academic institution in the Portuguese-speaking world and one of the oldest in Europe. Situated on a hill overlooking the city, the UC comprises a cluster of historical buildings, which has grown and evolved over more than seven centuries, and which unquestionably constitutes its own noble and well-defined urban area within the city. The meaningful examples of a significant cultural heritage cluster which expressively illustrates an outstanding artistic and architectural value are confirmed by an ongoing candidacy to UNESCO world cultural heritage site. The need to ensure a balance that does not jeopardize the normal fruition and preservation of these cultural heritage goods constitutes a challenging research agenda. This paper intends to establish an 'integrated modelling approach', from which can be derived some significant contributions concerning parking issues within the UC campus. The analysis is organized as follows. Section Literature provides a review of the literature on the economics of parking. In section Method different methodologies will be combined in a complementary way, i.e. following the analysis of parking supply and demand within the UC campus, a survey concerning the socio-economic characterization of campus commuters and their travel options will be presented. Then, the survey data are used to test different multinomial logistic regression models to examine which characteristics of the individuals have a major impact on the willingness to pay to have reserved parking at the UC campus. Section Discussion and conclusions concludes the paper analyzing the main results and anticipating some directions for future research.

* Corresponding author. Address: Faculdade de Economia da Universidade de Coimbra Av. Dias da Silva, 165, 3004-512 Coimbra, Portugal. Tel.: +351 239 790 581; fax: +351 239 790 514.

E-mail addresses: ebarata@fe.uc.pt (E. Barata), lmgcruz@fe.uc.pt (L. Cruz), joao.pr.ferreira@gmail.com (J.-P. Ferreira).

Literature

In spite of recent contributions, the literature on the economics of parking is still not abundant (Arnott & Inci, 2006). Early work on the economics of parking argued that parking, like any other commodity, should be priced at its social opportunity cost (Vickrey, 1954). For decades, parking was largely ignored by economists in modal choice studies, being treated simply as a component of the fixed cost of a trip (Arnott & Rowse, 2009). An economic analysis of the intricacies associated with the effects of regulatory parking policies as a potentially decisive instrument for influencing traffic flows, was originally proposed by Verhoef, Nijkamp, and Rietveld (1995). These researchers suggested that, despite important fundamental objections, regulatory parking policies are likely to offer an interesting alternative for urban traffic regulation. Later, Arnott and Rowse (1999) suggested a formal economic analysis which provides a conceptual basis to study the potential efficiency gains from parking fees or the effects of parking on congestion. The authors conclude that the parking fees should be set at the value of the parking congestion externalities (Arnott & Rowse, 1999, p. 122). Underpriced curb parking leads to mismanagement of scarce urban land, with widespread ramifications for transportation, land resources, the economy, and the environment (Dorsey, 2005). As a means to remove this distortion, Shoup (1999, p. 570) suggests that cities should price on-street parking rather than require off-street parking.

Murray (2001) argues that the critical challenge for urban planners and decision-makers is to identify effective strategies for dealing with resistance to travel by public transport. In many large cities, parking fees are being implemented mainly to rebalance the modal split between private car and alternative public transit systems, stressing the potential of parking pricing strategies as Transportation Demand Management (TDM) policies in congested urban areas (D'Acerno et al., 2011).

Few systematic reports can be found in the literature addressing University or College campus parking problems (Shang et al., 2007, p. 135). However, Universities seem particularly well suited for a TDM strategy that props up cost-effective solutions to parking problems (Shannon et al., 2006). They are communities where people of different backgrounds, incomes, lifestyles and attitudes come together to live, study, work, and recreate. Rye and Ison (2005) go farther and identify site specific reasons to demonstrate that parking charges can be successfully introduced at organisations such as universities and hospitals. According to Balsas (2003), one aspect often overlooked by campus administrators and planners is the college's potential to affect the transportation habits and the environmental awareness that students can develop in the long term, since students are more open-minded and have the potential to become 'movers and shakers'.

Dorsey (2005) presents an insightful revision of multiple TDM interventions, including the subsidized public transport pass (sometimes also called UPass, ClassPass, Eco Pass, or Ed Pass programme, but collectively referred to as Unlimited Access). Unlimited Access programmes are frequently based on partnerships between universities and public transit agencies. These 'free transit passes' might be funded with student fees, parking receipts, or through innovative partnerships with local municipalities. Besides being a truly integrated TDM strategy, the Unlimited Access programme potentially reduces the demand for parking, increases student access to housing and employment, helps universities recruit and retain students, increases societal benefits, as well as transportation equity (Brown, Hess, & Shoup, 2001). A survey of eight American University campuses (Balsas, 2003) showed that automobile trips have been reduced by 10–30% in some cases. Unlimited Access programmes have led to increases

in student ridership up to 400% during the first year of the programme operation. Dorsey's (2005) findings support earlier analyses and underline analogous successes. Research reports on parking management at university campuses, particularly from the USA, and several studies supervised by Litman at the Victoria Transport Policy Institute (<http://www.vtpi.org/tadm/tadm5.htm>) also provide important lessons.

Due to the requirements concerning the UC campus UNESCO candidacy process, increasing congestion, pressures to reduce traffic's impact on surrounding neighbourhoods, and constraints on financial resources, UC administrators should not discard the possibility of exploring a range of environmentally-appealing solutions to alleviate current parking deficits and improve the overall quality of life on campus. This research agenda must include solutions based on the concept of Transportation Demand Management, which indeed include market prices for parking, as well as expanded transit access, park and ride lots complemented by bus shuttles, rideshare programmes, bicycle and pedestrian facilities, etc.

Methodologies

Parking flows analysis

Firstly, an analysis was made concerning the existing places available for parking, their location and characteristics. Next, the inflow and outflow of vehicles was computed in order to assess the quantitative dimension of the potential parking problem at the UC campus.

The supply of parking places

The results of an ad hoc computation process concerning the available parking places within the study area can be found in Table 1. The figures are displayed according to the various types of parking places identified.

These data show that more than 45% of the parking places (TA1 and TC) do not involve any kind of parking charges. On-street paid parking places (TD), all located at Padre António Vieira Street, are managed by the Coimbra City Council. Parking places with conditional access to UC staff are managed by the university administration. Access cards, which are generally subject to the payment of an annual fee (160 € in 2010), in spite of being issued on an over-the-booking basis, are largely insufficient to meet the current demand.

The demand for parking places

The previous figures allow a quantification of the supply of parking places at the UC campus. The parking supply is mainly a function of the physical conditions and the existing infrastructures. On the other hand, the demand for parking computation is not so straightforward. Vehicles that circulate and park at the campus should be considered to explain the corresponding demand for parking. Accordingly, the empirical approach selected to describe, and quantify, the parking demand at the UC campus is the counting

Table 1
Parking places available at the UC campus.

Type of parking places	Number of places	% of total supply
(TA1) Free parking (legal)	484	35.8
(TA2) Reserved parking for occasional non-UC staff, and for people with disabilities	25	1.9
(TB) Conditional parking access for UC staff	574	42.5
(TC) Non-regular parking	136	10.1
(TD) On-street paid parking	132	9.8
Total	1351	100.0

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات