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The impact of transportation demand management policies on commuting to college facilities: A case study at the University of Trieste, Italy



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ABSTRACT

Universities, like other types of public and private institutions, when located in a city, have both positive and negative impacts on the area where they are situated. On the one hand, they contribute to the prestige of the area; on the other hand, they are large generators/ attractors of traffic. The ability to successfully balance the pros and cons of the urban location of these large traffic-generating institutions is crucial for their success and for the livability of the city. In this paper this issue has been analyzed selecting as a representative case the University of Trieste.

The aim of the research is to understand: (a) how mode choice decisions are made by the teaching and administrative staff and by the students at the various locations where academic activities take place, and (b) how they would be affected by 8 different transport management policies. It is found that changing the parking regulations (via the annual permit cost, the hourly parking fee, the number of parking spaces and the location of the parking lots) greatly influences mode choice in favor of bus use, especially for teaching and administrative staff and in the suburban locations. The students would be impacted by such changes only if an hourly parking tariff is introduced. The alternative approach of fully subsidizing the bus services would also have a large impact on bus ridership, affecting the mode choice in particular of the teaching staff and in the main university suburban sites.

Since the implementation of these bus-favoring policies could face the opposition either of the university staff or of the bus company, two more balanced policy mixes were tested: the first one, increasing parking price and imposing new parking restrictions, would increase bus ridership by 19%; the second one, reducing both bus and parking subsidies, would increase bus ridership by 13%.

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1. Introduction

Italian cities suffer from severe traffic congestion and air pollution. Vehicles' speed in major city centers is about 15 km per hour, dropping to 7–8 km during peak hours (Confcommercio, 2012, p. 3). In 2010, the PM₁₀ average daily concentration limit beyond which it is necessary to adopt traffic restrictions was exceeded, on average, 45 days (Istat, 2012, p. 9), while the violations of the noise pollution limits rose from 42.8% in 2009 to 57.2% in 2010 (Istat, 2012, p. 13).

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In 2011, 30% of the trips made within urban areas were due to people commuting to their place of study or work. Although these trips are generally short (41% of them are less than 2 km and 49% between 2 and 10 km), only a small percentage of them are made by public transport. In fact, 37% of short distance trips (less than 2 km) and 70% of medium distance trips (between 2 and 5 km) are made by private vehicles and only 12% by public transport. Similarly, long distance trips are made mostly by private vehicles (74%), while only 15% of them are made by public transport (Isfort, 2012a, p. 60). The striking strong preference for private transport is further testified by the very high motorization rate characterizing Italian cities. In 2010, the rate was equal to 615 cars per 1000 inhabitants, with 10 towns having more than 700 cars per 1000 inhabitants (Istat, 2012, p. 15).

A university located in an urban environment, like other types of public (hospitals, courts, schools, administrative offices) or private (shopping centers, banks, headquarters of large firms) institutions, has both a positive and a negative impact on the surrounding area. The positive one is that it contributes to the prestige of the area. Bars, shops and other commercial and professional activities benefit from its presence. Apartments and houses gain in attractiveness and increase their value. In fact, in Italy most of the urban revitalization policies are based on using historical buildings located in the city center for university activities. The negative one is that it is a large generator/attractor of traffic¹. Although public transport (mostly bus transport) is in Italy normally available and of good quality, students and employees generally prefer to use the car, the motorbike or the bicycle.

The ability to successfully balance the pros and cons of the urban location of a large traffic-generating institution is crucial for their success and for the livability of the city. An alternative solution would be to locate it in a suburban area: on the one hand, it would alleviate congestion and pollution in the city center but, on the other hand, it would negatively impact the attractiveness of the inner city and, due to the reduced parking constraints and the usually more difficult accessibility via public transport, would further shift the modal split towards the private car.

In this paper this issue has been analyzed selecting as a case study the University of Trieste. Trieste is a city located the northeast of Italy, close to the Slovenian border. The University of Trieste represents an interesting case study because it is organized over 7 locations in different areas of the city: 3 in the historical city center (Via Lazzaretto Vecchio, Via S. Anastasio/Via Filzi and Ospedale Maggiore), 2 in the semi-periphery (Piazzale Europa and S. Giovanni) and 2 in the outskirts of the city (Via Valmaura and Cattinara).

Currently, the University of Trieste provides its employees (administrative and teaching staff) with a cheap annual parking permit (€40 a year) for the parking lots owned by the university, while the students are not allowed to park in these facilities and must compete with the city residents for the available public parking places. This discriminatory approach, common to many universities, solves (at least partially) the parking problem for the employees, but creates discontent among the students and the residents. Similarly, other institutions such as hospitals, courts or private firms tend to favor their employees (especially managers) at the expenses of the other users. In the case of the students, they react by asking for more parking places or more frequent (and possibly subsidized) bus services, shifting the burden to the city-owned bus companies.

The aim of the paper is twofold: (a) to describe the transportation time, costs and mode split between car and bus with respect to each university location; (b) to estimate how the modal split would be affected by 8 different transport demand management policies, paying special attention to how they would differently impact employees and students in the different university locations.

Since transport demand policies have both efficiency and distributional consequences, having a clearer picture of both these effects could provide the university mobility managers with information useful for their decision making and for overcoming potential acceptability issues.

2. Literature review

Since the transport demand management policies analyzed in this paper mainly concern parking and bus regulation, the literature review is exclusively focused on these two topics.

Charging the parking facilities at the marginal or average cost is the travel demand management policy most frequently suggested for the American universities (Balsas, 2003; Shoup, 2005). Already in 1990, Willson and Shoup showed that subsidizing the cost of parking, regardless of the location of the place of work (central or suburban), the type of employment (public or private) and the type of job (administrative or professional), greatly increases the number of trips by solo drivers. According to Willson (1992, p.144) “between 25 and 34 percent fewer cars would be driven to work if commuters had to pay to park”. Verhoef et al. (1996) further clarified that parking regulation is more effective if implemented at larger spatial scale, whereas Marsden (2006) underlined that the effectiveness of parking regulation and pricing is greatly affected by trip purpose and availability of public transport. A further important suggestion came from Shoup (1997, 2001, 2005) who showed that “cashing out the employer-paid parking” could reduce single occupant vehicles while increasing the use of carpooling and public transport. Up to now, however, Shoup’s suggestion has been only rarely implemented (United States Environmental Protection Agency, 2005).

Numerous studies focus on the price elasticity of parking (Axhausen and Pollak, 1991; Clark and Allsop, 1993; Hensher and King, 2001; Washbrook et al., 2006; Watters et al., 2006; Hensher, 2008; among the most recent reviews cited are:

¹ The relationship between the built environment and travel is specifically analyzed by Cao et al. (2009).

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