



Understanding bike-sharing acceptability and expected usage patterns in the context of a small city novel to the concept: A story of ‘Greek Drama’

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ABSTRACT

Developing initiatives that allow societies to embrace more sustainable travel behaviour patterns is a prerequisite for creating more livable urban futures. Bike-sharing, a measure designed to inspire modal shift from short car-trips, despite its recent exponential growth, is still understudied. This paper discusses a quantitative survey of 640 responses examining road users' attitudes towards bike-sharing and its possible introduction to Drama, a small Greek city resembling many others in terms of size, transport culture and socio-economic characteristics, which has never been exposed to a similar intervention. Most of the respondents recognised that bike-sharing is a mode with pro-environmental, cost-effective and health-improving qualities and the potential to promote a greener identity for the city. Evidence is provided that people would support a bike-sharing investment even in cases where the frequency of their current bicycle use and the regularity with which they intend to use an eventual scheme is low. Age, gender, the primary factor for modal choice, its perceived effectiveness in reducing traffic congestion and their usage expectations were all factors influencing the respondents' acceptability of such an introduction. The lack of cycling infrastructure and road safety concerns were identified as possible usage barriers but the pro-social potential of bike-sharing combined with policy efforts to create a more pro-cycling culture could outweigh them. The present analysis suggests that bike-sharing can go beyond, what is typically regarded as its primary function, that of a last-mile solution for metropolitan areas, and be a publicly acceptable investment for smaller cities.

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1. Introduction

A car-dominated transportation has been the foundation of urban development on a worldwide scale for decades now. This is a foundation that despite its merits, has been associated with severely adverse effects on the grounds of social, environmental and economic sustainability. The approach for alleviating these is multidimensional and requires input from a wide spectrum of stakeholders and actors, and must include technological innovation, changes in the physical infrastructure and land use, and social, cultural, and institutional changes (Vergagt & Szejnwald Brown, 2007). Promoting a more resource-efficient travel behaviour can be achieved via a variety of ‘stick’ and ‘carrot’ measures to tug and tempt people out of their

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cars, respectively (Kenyon & Lyons, 2003). One of the latter measures is the shared use of mobility resources on an 'as-needed' basis.

Bike-sharing (or public bicycles) is a characteristic example of these shared use mobility mechanisms and one that effectively brings together some of the better qualities that active transportation and public transit have to offer. Bike-sharing refers to a short-term bicycle rental service for inner-city trips that provides bikes at special hire stations or at any available bicycle rack within their catchment area if the system is GPS-based and thus stationless. Bike-sharing has been introduced thus far mostly in large cities, primarily for extending the reach of public transportation to final destinations or as DeMaio and Gifford (2004) quote 'to make it easier for commuters to use a bicycle on the last leg of their public transport journey'. Shaheen, Guzman, and Zhang (2010) summarises the potential benefits of bike-sharing as flexible mobility, emission reductions, physical activity benefits, reduced congestion and fuel use, individual financial savings and support for multimodal transport connections. These benefits nevertheless, especially the pro-environmental ones, are difficult to measure and to be quantified *per se*. As Pucher, Dill, and Handy (2010) suggested bicycling and its positive impacts have increased in cities that have implemented bike-sharing programmes but these results reflect simultaneously the impact of improvements in bicycling facilities implemented at the same time as the bike-sharing programmes.

On the other hand, problems usually associated with bike-sharing include: (i) systematic underuse, (ii) vandalism and theft, (iii) complicated planning procedures, (iv) sluggish or over-ambitious scheme expansion usually referring to station-based and station-less systems respectively, (v) a one-bike-fits-all business model which may not be ideal for all populations, (vi) strict cycling regulations including compulsory helmet use for some countries (e.g. Australia) that make schemes impractical or at least reliant to a supporting rent-a-helmet mechanism, (vii) political friction if local authorities (or residents) are unwilling to forsake street parking space for bike stations, (viii) road traffic safety concerns generated by the co-existence of bicycles in a heavily car-dominated environment but also the pedestrians versus bicycles narrative in mixed usage situations and (ix) lack of adequate cycling infrastructure (e.g. bike lanes, cycle paths, parking racks) that could complement and promote a bike-sharing scheme.

The most distinctive function of public bicycles however is the very concept of 'sharing'. According to this, individuals use bicycles when they need them without the costs and responsibilities associated with bicycle ownership (Shaheen et al., 2010). By addressing these ownership-oriented responsibilities, bike-sharing programmes encourage cycling providing hassle- and maintenance-free bicycle access that enables individuals who may not otherwise use bicycles (e.g. tourists or individuals who do not own a bicycle) to enjoy cycling benefits (Shaheen, Martin, Cohen, & Finson, 2012a). This 'freedom' combined with the fact that public bicycles do not obey to any fixed time schedules or routing patterns gives them a state of flexibility and independence uncommon to conventional public transport alternatives (Nikitas, Wallgren, & Rahe, 2014).

Bike-sharing as a new 'exciting' mode is, according to Shaheen, Martin, and Cohen (2013), also drawing new populations to bicycling, which in theory has the capacity to reduce problems linked with car over-use and support healthier lifestyles (Shokoohi & Nikitas, 2017). Goodman, Green, and Woodcock (2014), actually makes the case that the introduction of bike-sharing systems is one way in which cycling may become normalised in low-cycling settings. This is because bike-sharing can be viewed as a powerful (and in some cases even iconic) on-street reminder 'advocating' that cycling is actively supported by local policy-makers. Thus the definition of bike-sharing, that will be adopted by this study, is describing it as *'a scheme referring to the provision of affordable short-term access to locally branded bicycles on an 'as-needed' basis that could extend the reach of public transit services to final destinations and be a door-opener for increased bicycle usage'*.

Despite the potential of bike-sharing and despite 1608 schemes already operating and 391 others 'in planning' or 'under construction' (Meddin & DeMaio P., 2018) in more than 50 countries worldwide, its impact has not been fully documented. There is a lack of evidence on existing schemes on whether they achieved their objectives. Ricci (2015) suggests that evidence on the positive impacts of bike-sharing schemes is still fragmented; there is evidence that users get some beneficial impacts but the user base is small and not socially diverse. Research is needed to better understand how these systems are affecting the transportation eco-system and their particular role in current and future planning. Furthermore, Fishman (2016) reports that there is a paucity of research with large numbers of people who are not bike-share users despite the fact that these studies are of critical importance to bike-sharing user growth. Thus, understanding how non-users 'value' bike-sharing and how they perceive or eventually materialise its potential is a timely and meaningful research topic.

Also while several studies exist on how bike-sharing schemes are changing mobility in bigger cities across the globe, few studies have looked at the dynamics of these schemes in smaller cities (Caulfield, O'Mahony, Brazil, & Weldon, 2017). The aim of the present study is to examine public attitudes to bike-sharing and its eventual introduction in a small European city with low bicycle usage rates and no previous exposure to shared use mobility initiatives. The paper intends to: (i) identify and put into context the significance of attitude and norm orientations of the potential bike-share users and non-users in cases when policy seeks to introduce it, not as a last-mile solution for a metropolis, but in a smaller city where such a system could be a 'novel' concept and (ii) identify existing barriers that could make people reluctant to use or even approve such a scheme. For this reason, the study was conducted in a city with a size, an economy and a socio-demographic profile not dissimilar with that of many small Greek, Balkan and South European cities. This local case study choice potentially maximises the extent to which the results of this work can be generalised into a wider context.

Hereafter, the paper provides an introduction of the city where the study was conducted, a description of the chosen methodology, a systematic analysis of the results, a discussion of the main findings, study limitations and complementing research and ends with a conclusions and policy recommendations section.

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