



Who benefits from bus rapid transit? Evidence from the Metro Bus System (MBS) in Lahore

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ABSTRACT

Bus rapid transit (BRT) is a popular mode for government investment in public infrastructure, particularly in developing countries where capital resources are scarce. Enthusiastic evaluations of BRT systems worldwide are perhaps premature given that most such systems have been operational for only a short time. Further, little research on BRT systems from the user perspective is evident in the literature. The latter is problematic because one justification for government investment in BRT is the social benefit such systems bestow on groups who are traditionally without access to private modes of transportation. In order to explore the purported social benefits of a BRT system two series of multiple logistic regression models are fit. The first uses disaggregate data from inside a BRT service area and the second uses disaggregate data from inside and from outside a BRT service area. The rider and the commuter data sources, respectively, help to understand who benefits from the new Metro Bus System (MBS) in Lahore and how. To that end, descriptive results show that women are less representative of riders and of commuters, but inferential results show that females are more likely to commute via the MBS. In addition, usage patterns show that females are more habitual users and that they benefit greatly from the fare subsidy. Finally, efforts to further integrate the MBS with the greater public transportation network in Lahore will help to mitigate the monetary and the temporal costs of MBS usage which more so affect females.

1. Introduction

Bus systems operate either in traffic without priority, in traffic with priority or with no traffic interaction (IEA, 2002). The latter systems prioritize the rapidity of buses and therefore are known as bus rapid transit (BRT) systems. Presently, BRT is in operation in 165 cities, in expansion in 55 cities and planned/in construction in 121 cities worldwide (BRT Centre of Excellence, 2018a). Most of the cities where BRT is in operation are in Latin America (33%), in Europe (27%) and in Asia (26%). Further, of the worldwide total passengers per day (32,063,374) and the worldwide total length in kilometers (4888), Latin America ranks first (61% and 36%, respectively). The predominance of Latin America in the worldwide supply of BRT reflects the fact that the first BRT system in the world was in Curitiba in Brazil.

The literature is replete with analyzes of the effectiveness of BRT systems a few years out from the commencement of operations. Gilbert (2008) and Hidalgo et al. (2013) evaluate the effect of the partial system and the impacts of Phase I and of Phase II, respectively, of *Transmilenio* in Bogotá, Delmelle and Casas (2012) evaluate accessibility to and accessibility from the Masivo Integrado de Occidente

(MIO) in Cali, Deng and Nelson (2013) evaluate the performance and the impacts of the first line of the Beijing BRT and Yazıcı et al. (2013) evaluate the effect of the Metrobüs in Istanbul. The *Transmilenio*, the Beijing BRT and the Metrobüs are the first BRT systems in their respective countries. Overall, such research suggests that the advantages of the BRT concept will not necessarily accrue to every system (Filipe and Macário, 2013). One area of research which requires more attention is on the benefits of BRT systems from the perspective of the individual. For example, little research on individual usage by income is evident in the literature (Venter et al., 2018). Such research is vital because user satisfaction with BRT is not universally positive (Nikitas and Karlsson, 2015). And, Vermeiren et al. (2015) argue that individuals who are extremely poor rather than poor, middle class or rich are the most vulnerable to exclusion from new BRT systems because of affordability constraints.

In order to address the void in the international literature on the BRT concept, the study attempts to answer the following questions on the first BRT system in Pakistan known as the Lahore Metro Bus System (MBS) from a user perspective. First, who uses the MBS and why? For example, mass rapid transit in the form of BRT purportedly benefits the

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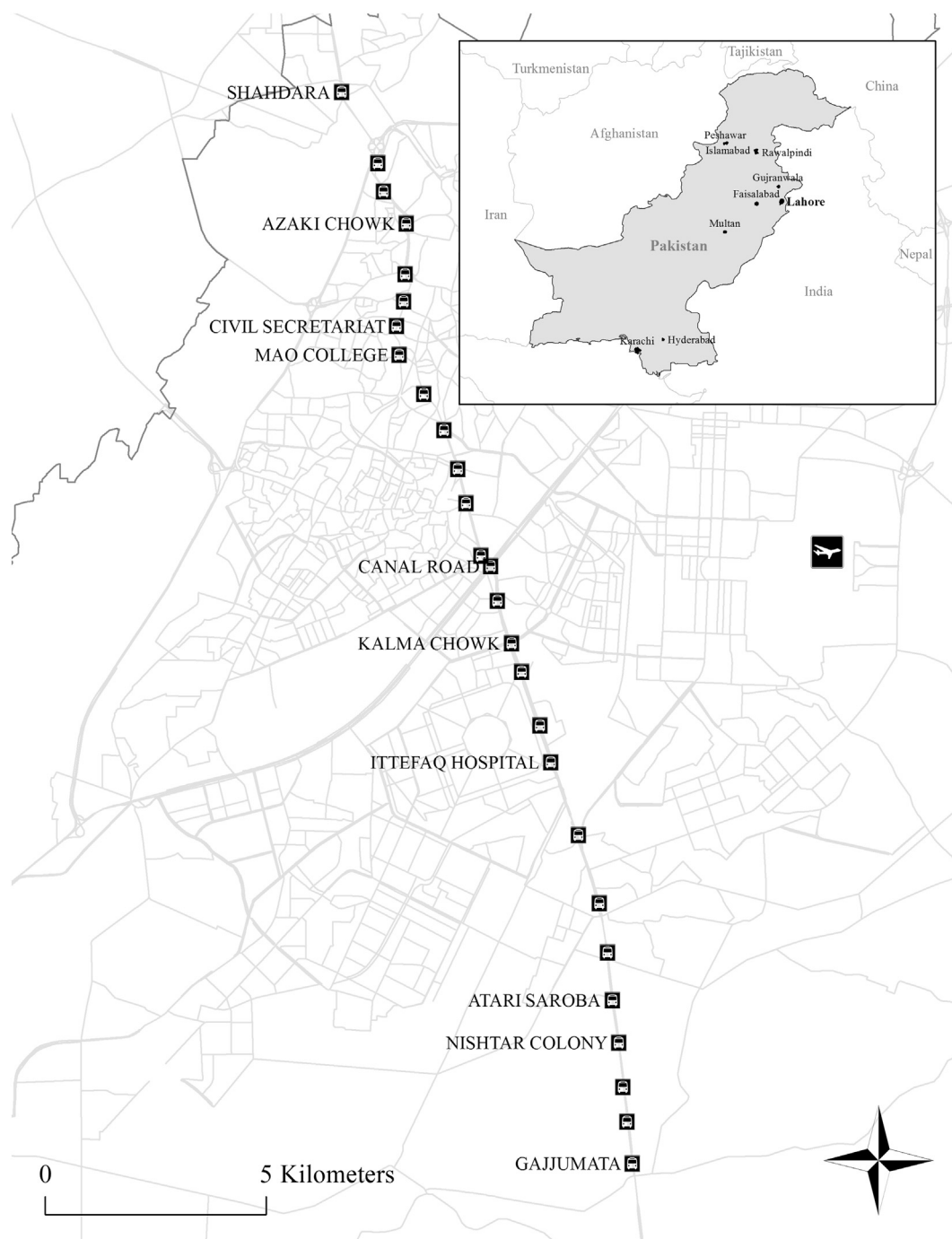


Fig. 1. Metro Bus System (MBS) in Lahore.

poor the most. Given the fare subsidy on the MBS, are the poor actually users? Second, “[g]ender confers some particular disadvantages in terms of diffused trip patterns and timings, as well as particular vulnerability to safety and security problems” (World Bank, 2002, p. xvi). The latter is of particular concern in a developing country like Pakistan (ADB, 2014) where the social benefits of mass rapid transit like BRT affects not only disaggregate vocational and educational outcomes (for women), but aggregate economic growth (for men and for women). To that end, are women who work and who go to school actually users of the MBS?

The organization of the study is as follows. The background section reviews the worldwide literature on BRT systems and BRT cases. The next section on the MBS describes the history of the system as well as

the research on the system. The data section presents the sources of information on users of the MBS. The methodology section presents the statistical approach to specify inferential models of MBS users. The results section presents the results from the rider and the commuter models, respectively. The discussion section discusses the results as well as their implications. Finally, the conclusions section highlights the contributions of the results to the international literature on the BRT concept, the limitations of the study as well as the most fruitful direction for future research.

2. Background

The worldwide diffusion of BRT from Latin America reflects the

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