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Transport legacy of mega-events and the redistribution of accessibility to urban destinations

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ABSTRACT

Local governments increasingly justify the hosting of mega-events because of their legacy value, assuming that all local residents benefit from those events. Yet, little attention has been paid to the distributive question of who benefits from the transport legacy left by those events. This paper reflects on the delimitation of transport legacies and its social impacts in terms of how such developments can reshape urban accessibility to opportunities. It analyses the transformation in the transport system of Rio de Janeiro (Brazil) in preparation for the 2014 World Cup and the 2016 Olympic Games. That transformation involved substantial expansion in public transport infrastructure, followed by cuts in service levels and a reorganization of many bus lines to streamline the transport system. The paper examines whether those recent changes have increased the number of people from different income levels who could access Olympic sports venues and healthcare facilities by public transport within 15, 30, 60 and 90 min. The analysis uses a before-and-after comparison of Rio's transport network (2014–2017) and a quasi-counterfactual scenario to separate the effects of newly added infrastructure from the reorganization and cuts of transport services. The results show that the infrastructure expansion alone would have increased the number of people who could access the Olympic sports venues, but it would have only marginally improved people's access to healthcare facilities. Nonetheless, the findings indicate that the streamlined bus system have offset the benefits of infrastructure investments in a way that particularly penalizes the poor. The analysis of both the implemented changes to the public transport network and the counterfactual scenario show that the accessibility benefits from the recent cycle of investments and disinvestments in Rio generally accrued to middle- and higher-income groups, reinforcing existing patterns of urban inequality.

1. Introduction

There is a growing debate about whether sports mega-events, such as the FIFA World Cup and the Olympic Games, can foster urban development in host cities by boosting their local economies and leveraging investments in infrastructure (Chalkley & Essex, 1999; Gratton, Shibli, & Coleman, 2005; Hiller, 2000a). The infrastructure projects associated with such events and its promised legacy usually play a key part in the justification used by local and national governments in bids for hosting mega-events (Paddison, 1993; Rubalcaba-Bermejo & Cuadrado-Roura, 1995; Zhang & Zhao, 2009).

The strategy of using mega-events to fast-track urban development is commonly backed by pro-growth discourses (Burbank, Andranovich, & Heying, 2002), which rely on the assumption that all local residents invariably benefit from the trickle-down effects of economic growth and improvements to urban infrastructure (Baade, 1996; Baade & Matheson, 2004; Jones, 2001; Kasimati, 2003; Müller, 2015). Yet, this assumption has been questioned by several studies, which claim that the evaluation of the legacy of sports mega-events should incorporate an equity perspective of how the benefits and burdens of their purported legacies are distributed (Horne & Manzenreiter, 2006; Smith, 2009). Various studies, for example, have also noted how the organization of mega-events often leads to negative impacts on local communities. In many occasions, thousands of families have had to be evicted from their homes to make room for new infrastructure (Armstrong, Hobbs, & Lindsay, 2011; Shin & Li, 2013; Vanwynsberghe, Surborg, & Wyly, 2013), mega-events have caused significant environmental impacts (Collins, Flynn, Munday, & Roberts, 2007; Collins, Jones, & Munday, 2009; Death, 2011; Gaffney, 2013), they have bypassed democratic decision-making processes (Andranovich, Burbank, & Heying, 2001; Gold & Gold, 2011; Raco, 2014; Roche, 1994) and they have concentrated economic and political power in the hands of small

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interest groups attempting to rewrite urban planning priorities (Broudehoux, 2007; Sánchez & Broudehoux, 2013).

However, scholars have devoted much less attention to the equity implications of the transport legacies of mega-events, overlooking the distributive aspects of who benefits from these new transport developments.[2] Most of the literature on mega-events and urban transport has focused on the short-term challenges of delivering transport services during the actual events – in terms of traffic management and contingency plans to address peak demand and congestion (Currie & Shalaby, 2012; da Silva & Portugal, 2016; Hensher & Brewer, 2002; Liu, Mao, Huang, et al., 2008; Mao, 2008; Minis & Tsamboulas, 2008; Robbins, Dickinson, & Calver, 2007; Xu & Gonzalez, 2016). Only a handful of studies have focused on the lasting transport benefits derived from mega-events (Kassens-Noor, 2012), and little attention has been paid to how these transport legacies subsequently change the daily transport conditions of local residents from different social groups (see Section 2).

This paper focuses on the distributional effects of the transport legacies of mega-events looking at how such investments affect different income groups' access to Olympic sports sites and health-care facilities in host cities. It analyzes the city of Rio de Janeiro (Brazil), where transport planning has been largely driven by mega-events for almost two decades (Kassens-Noor, Gaffney, Messina, & Phillips, 2018). In particular, the study looks at the transformations implemented in the city's public transport system in preparation for the 2014 World Cup and the 2016 Olympic Games, which included two new high-capacity Bus Rapid Transit (BRT) corridors, a new light-rail system, and a subway extension. These investments were also followed by a reorganization of bus lines to streamline the transport network and, more recently, by cuts in service levels in response to a drop in passenger demand (see Section 3).

In the empirical analysis, a before-and-after comparison of Rio's transport system between 2014 and 2017 were conducted to calculate how the newly implemented transport investments and subsequent reorganization of the transport system have changed the number of people from different income groups who could access Olympic sports venues and healthcare facilities in the city. A quasi-counterfactual analysis was also conducted to investigate how these results would have been different had the expansion of public transport infra-structure in Rio had not been followed by a reorganization of bus lines. Census data and geolocated timetables of public transport services were combined to calculate the catchment areas of sports venues and healthcare facilities in terms of how many people from different income groups can reach those locations from their homes within 15, 30, 60 and 90 min using only public transport and walking. This allowed to estimate how recent modifications in Rio's public transport system have changed the size and income composition of the catchment areas of those facilities and to compare how accessibility gains vary across different income groups and areas of the city.

Olympic sports facilities have been chosen because they have immediate connection to the new transport projects in the city and because improving people's access to such venues is a key condition to promote sports participation and leave a sports legacy (Weed, Coren, Fiore, et al., 2015), which was one of the main goals purported by local authorities in their bids to host the Olympics (Rio de Janeiro, 2016). Health services were chosen for the analysis in this paper because they play an important role in the satisfaction of people's basic needs. Health services are considered in Brazil to be a basic constitutional right that should be accessible to all, regardless of personal income. Assessing the impacts of Rio' transport legacy on people's access to educational and employment opportunities would be equally important and this investigation is being developed on a separate study (Pereira, Banister, Schwanen, & Wessel, 2017).

A distributive justice discussion on who benefits from the transport legacies of mega-events is important for several reasons. These events require substantial public funds be directed to infrastructure investments, but the local population generally has little involvement in the relevant decision-making processes. Project evaluations of mega-events and transport investments are traditionally conducted using a cost-benefit analysis framework (Flyvbjerg & Stewart, 2012), which has been widely criticized for not taking into account the distributive aspects of who reaps the benefits and who bears the costs of such investments (Van Wee, 2012). Moreover, the transport legacies of such events can substantially change the organization of urban space, making it crucial to evaluate whether local governments mobilize these events in a way that redresses or reinforces existing patterns of urban inequality and segregation.

The remainder of this paper is divided into five parts. The next section reviews the concept of legacy as it is used in the mega-events literature and discusses how it translates into transport legacy and connects to transportation equity. Section 3 presents the context of Rio de Janeiro and the changes implemented to its transport system in the context of recent sports mega-events. Sections 4 and 5, respectively, present the data sources and methods used in the analysis and discuss the results. Section 6 presents the paper's conclusions.

2. Mega-events, urban development and transport legacy

The idea of leveraging mega-events to fast-track urban development and create lasting benefits for host cities has gradually been incorporated into the mega-events agenda and governments' discourse over the past decades (Gold & Gold, 2008; Leopkey & Parent, 2012; Tomlinson, 2014). In 2003, the International Olympic Committee (IOC) started officially requesting that candidate cities include legacy concerns in their bid proposals. The word legacy, however, often lacks conceptual consistency in bidding documents and across the academic literature (Andranovich & Burbank, 2011; Cornelissen, Bob, & Swart, 2011; Preuss, 2007). One comprehensive definition of legacy embraces *"the material and non-material effects produced directly or indirectly by the sport event, whether planned or not, that durably transform the host region in an objectively and subjectively positive or negative way."* (Chappelet & Junod, 2006, p.5).

Different authors generally recognize that legacy impacts tend to be greater in areas that are physically closer to the event sites and that they are more difficult to identify in the long term (Cornelissen et al., 2011; Preuss, 2007). The durable nature of legacies is the most prominent feature emphasized in the literature (Cornelissen et al., 2011; Gratton et al., 2005). Nonetheless, the definition of what qualifies as short or long term is often vaguely defined in cities' bids and in the literature, and yet this issue of temporal scale is crucial when assessing legacy impacts (ibid.). Kassens-Noor (2010, 2013) notes, for example, that only a few of the transport measures adopted during the Olympic Games between 1992 and 2012 (Barcelona, Atlanta, Sydney, Athens and London) have been sustained beyond the immediate years following the Games. Consideration of the spatial dimension of mega-event legacies is also particularly important when addressing concerns about their equity implications. Specifically, how are the benefits and costs of mega-events distributed across groups and neighborhoods in host cities? Official pro-poor discourses surrounding the transport legacy of the 2010 FIFA World Cup in South Africa, for example, were challenged by Pillay and Bass (2008), who claimed that improvements to the transport system would be spatially concentrated and offer limited benefits to peripheral urban areas.

All too often there are discrepancies between the plans laid down in bid books and the legacies that are left after the events (Stewart & Rayner, 2016). Müller (2015) points to a "mega-event syndrome" and

[2] The terms equity and distributive justice are used interchangeably throughout this paper. The idea of justice is a broader concept that encompasses moral and political concerns related to (1) how benefits and burdens are distributed in society (distributive justice); (2) the fairness of processes and procedures of decision (procedural justice); and (3) the recognition of rights and entitlements (Fainstein, 2010; Pereira et al., 2017).