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Public Value Creation through Smart Cities Mobility

Research in Progress Paper

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Abstract

ICT-enabled incremental innovations can aid governments in service delivery and in improving stakeholder engagement. In the 21st century context of explosive urban population growth and strained public finances, public managers have been tasked with devising new tools and strategies to address the byproducts of these developments, one of which is the increased challenge of urban mobility. This study explores to what extent, and in which ways, public value is created in smart city mobility projects. We tested the applicability of several conceptual models in different contexts, to analyze four microtransit pilot projects: two from the United States and two from Brazil. Data was collected via secondary sources and in-depth interviews with public and private sector managers directly involved in these projects. The findings reveal evidence that public-private partnerships contribute to public value creation in smart city mobility contexts.

Keywords

Public value, smart cities, microtransit, mobility, public-private partnership, innovation

Introduction

As populations worldwide gravitate towards cities, the question of how citizens will move around their physical environments has surged to the forefront of public policy discussions. Urban population swelling has resulted in notable increases in traffic congestion, recognized as a major drain on economic productivity, main contributor to air pollution and a leading cause of traffic accidents, reinforcing the need for innovative solutions to promote mobility. However, the ability of public managers to address this need has been hindered by exhausted public budgets and chronic underinvestment in transportation around the world, with few exceptions (Graehler et al., 2019). In addition, citizen support for conventional public transportation seems to be declining, contributing to the widespread shortfalls and, subsequently, diminished service quality. Yet, the vital role of transportation in society, especially with respect to sustainable development and its economic, social and environmental impact, exacerbates the need for efficient and flexible transportation systems geared toward improved quality of life via access to employment, education, entertainment and other urban amenities (Song et al., 2017). Although the public sector plays an essential role in the provision of transportation options in cities worldwide, the rise of private, on-demand services has proven to be a major challenge (Graehler et al., 2019) to their operations.

In the age of smartphone apps that enable on-demand access to services ranging from grocery shopping to laundromats, dog-walkers to food delivery, transportation has not escaped this trend. Around the world, people now expect to be able to summon a vehicle to pick them up from their location and drop them off at their destination in a matter of minutes, with seamless, efficient payment and a high standard of service. Understandably, traditional public transportation providers have struggled to determine how to “compete” with on-demand ridesharing, in order to stem the steady outflow of traditional public transportation riders to private, on-demand services.

The research undertaken in this study stems from a lack of consensus in the literature regarding the enablers of public value creation and the contexts in which it is most enhanced (Welch et al., 2015). There is limited discussion of tools and strategies available for the creation of public value, and similarly little discussion of public value creation, particularly as related to mobility, in smart city contexts. So, this research aims to bridge gaps between separate bodies of literature, combine frameworks, and exemplify with case studies, to contribute a higher degree of integration of highly related, yet hitherto distinct theoretical bases. The intention is to promote a greater understanding of public value creation in the context of smart cities, in order to encourage best practices for public managers and to unify theoretical frameworks. The overarching question we aim to address in this study is to what extent, and in which ways, is public value created in smart city contexts, particularly in the area of mobility.

Literature Review

What is Microtransit?

Microtransit is a type of medium-scale demand-responsive transit characterized by shared vans or minibuses that operate on flexible routes. Cervero (1997) identified it as a technologically enhanced version of a transportation mode that had already existed for decades, particularly in the Global South. Microtransit has been labelled as a niche service, meant for commuters in some cases, for the elderly or people with disabilities in other contexts, for transportation to and from airports or other transportation hubs and for immigrants or low-income groups that traditionally lived far from traditional fixed public transportation systems. The vehicles used in microtransit operations typically have higher capacity than a car, but lower capacity than a bus, train, subway or light rail. Service areas are geofenced, that is, restricted to specific geographical boundaries defined by the microtransit provider. On a spectrum of transportation services ranging from private (car, taxi, rideshare company) to public mass transportation, microtransit fits somewhere in the middle. It aims to reduce the downsides of public transportation, such as low speed, reliability, crowding and lack of individual control, while maximizing the benefits of ridesharing, such as superior user experience, reducing pollution and improving connectivity without the widespread necessity of private car ownership. The increasing ubiquity of smartphones with data access around the world has enabled unique opportunities for collaboration in microtransit projects between private companies and the public sector (Shared Use Mobility Center).

Microtransit in the World

The notion of publicly operated microtransit has been spurred in recent years by technological advances that facilitate dynamic routing. Several companies have surged to the forefront as pioneers in developing this technology and selling it to local transportation agencies and operators to allow them to experiment with on-demand components in their network of fixed public transportation routes. The largest company in this industry is Via Transportation, Inc., founded in 2012 by Israeli entrepreneurs Daniel Ramot and Oren Shoval, inspired by the *monit sherut* shared taxi system in Israel. Via is present in more than 20 countries, in North America, Europe, Asia, Oceania and, most recently, South America. They have more than 90 partners around the world, including public transit operators and municipal governments, universities and school districts, private companies and operators. Via's proprietary technology assists in service model design, system launch planning and support, marketing efforts and performance optimization. This study will analyze the linkages between private companies such as Via, and local governments or transit agencies in their efforts to create smarter transportation options tailored for 21st century cities.

Microtransit in Brazil

The concept of a shared taxi is especially familiar to citizens in the Global South. These systems are typically privately owned and operated and provide vital transportation options, often in places that do not have publicly provisioned fixed route transportation available. These systems have different names in different geographical regions, such as *kombi*, *matatu*, *tuktuk* and the aforementioned *monit sherut* in Israel. In 2019, Brazil became the first country in South America to be selected for one of Via's mobility partnerships, creating CityBus 2.0 in Goiânia (an agricultural hub of 1.3 million, 200 km from the capital, Brasília) in conjunction with the municipal government and the public consortium responsible for public

transportation in the city. Given the early popularity of the system, Via announced a second microtransit pilot project in Brazil, in the northeastern city of Fortaleza (population 2.6 million), dubbed “TopBus+”, in partnership with the city government and the public consortium responsible for the city’s transportation. Early results have shown that these systems have been effective in removing single occupancy vehicles from the streets and contribute to a sizable reduction in CO₂ emissions, crucially important in the context of cities of this size, and as a complementary service to fixed route public transportation, expanding the overall system’s utility for a wider range of the population. In the Brazilian context, these projects can be thought of as incremental innovations – technology-enhanced shared taxis with public sector governance mechanisms.

Theoretical Lens

The theoretical lens chosen for this research is public value. The discussion begins with the work of Moore (1995), considered to be the seminal study in this field. Moore introduced the Strategic Triangle framework to test for the presence of public value in public organizations’ strategic initiatives, and also presented the Public Value Scorecard, useful in identifying public value and creating a mechanism through which to account for it.

Meynhardt (2015) expands on the Public Value Scorecard, specifically posing it as a practical tool for public managers to use as a parallel to the private sector’s Balanced Scorecard (Kaplan & Norton, 1992). This work also proposed five dimensions along which public value can be assessed: utilitarian-instrumental value 1 (usefulness), utilitarian-instrumental value 2 (profitability), moral-ethical value (decency), political-social value (political acceptability) and hedonistic-aesthetic value (experience positivity).

Harrison et al. (2012) focuses on the range of possibilities from the perspective of a public manager as to the types of public value that can be created through their initiatives. These types include financial, political, social, strategic, ideological and stewardship. The public value types lead to the identification of public value “generators”, namely: efficiency, effectiveness, intrinsic enhancements, transparency, participation and collaboration.

Finally, to complete the theoretical lens, we introduce Brinkerhoff (2011), which identifies typologies of public-private partnerships (policy, service delivery, infrastructure, capacity building and economic development) and their potential to create public value: political, financial, social, strategic, ideological and stewardship. The purpose is to explore additional tools available to public managers, potentially already being generated through microtransit pilot projects that could be applied to other types of smart cities initiatives to enhance public value.

Research Method

How is the research being conducted?

The research is being conducted using case studies - two from the United States and two from Brazil. To illustrate the theoretical concepts discussed, and to serve as a practical means of demonstrating the appropriateness of their fusion in future academic contexts, the researcher identified the case study method as a suitable approach. Drawing from Dyer and Wilkins (1991), Feagin et al. (1991) and Yin (1994), case studies are appropriate when a “holistic, in-depth investigation is needed” in order to “substantiate important theoretical generalizations, and to refine and extend them”. For the purpose of establishing theoretical generalization upon which to build the research, then, multiple case studies, not just one, were deemed relevant to explore. Case studies can be useful to “explain, describe or explore events or phenomena in the everyday contexts in which they occur” (Yin, 2009).

The case studies included in this research were selected based on a survey of microtransit pilot projects worldwide that incorporate some level of cooperation between public entities and private companies, and overall integration into smart cities agendas. These case studies encompass geographical areas in North America, Europe, Asia, Oceania, and, most recently, South America. Ultimately, the case studies chosen to examine in depth were meant to facilitate data collection for the researcher, while preserving the theoretical conceptualizations upon which the research is based.

According to Yin (2009), the researcher “should be sufficiently familiar with the study domain to understand the main concepts and theoretical/methodological issues relevant to the study”. The researcher should also “be able to interpret the information in real-time and adjust their data collection activities accordingly to suit the case study”. The United States case studies come from the researcher’s hometown of Sacramento, California and the neighboring town of West Sacramento, while the Brazilian case studies were selected due to their novelty, being the first projects of their kind in Latin America, and relevant to the researcher’s master’s degree studies in Brazil. Fluency in English and Portuguese, coupled with prior professional experience in dealing with both government and private sector reporting documentation, were understood to legitimize and enhance the researcher’s familiarity and interpretation skills for this research.

The first stage of the research was the identification of microtransit as a novel transportation mode that is functionally distinct from both the service provided by Transportation Network Companies (TNCs) such as Uber, and the publicly-funded public transportation options that are present in cities around the globe. The researcher conducted extensive exploratory research on different types of smart mobility initiatives, and identified microtransit as one mode that severely lacked academically-oriented analysis, regardless of the theoretical angle from which it was approached. While the concept fits characteristics of smart cities technologies and the public-private collaboration component of these projects appears to be theoretically and practically relevant, in the observation of the researcher, these connections had not yet been made, resulting in a misunderstanding of the phenomenon and a lack of theoretical cohesion between the bodies of literature in the form of a consolidated framework.

Content Analysis

Another technique utilized by the researcher to establish the topic and scope of the research, which consequently led to the identification and addressing of gaps in the literature, is content analysis. Defined by Bardin (1977) as “a set of techniques of analysis of communications aiming to obtain by systematic procedures and objectives of description of message content, indicators (quantitative or not) that allow the inference knowledge of the conditions of production/reception (inferred variables) of these messages”, content analysis was deemed appropriate for the research in order to identify key terms that were and were not being used to describe microtransit, as well as the lack of theoretical consistency between microtransit, public value and public-private collaboration in smart cities contexts. Qualitative analysis tool Atlas.ti will be used to categorically analyze the data following the planned interviews.

Interviews

In the coming weeks, the researcher intends to conduct virtual interviews, with company representatives from Via, the private company responsible for the microtransit projects in Sacramento (USA), West Sacramento (USA), Goiânia (Brazil) and Fortaleza (Brazil). Additional interviews are planned with representatives from Sindionibus, the public consortium responsible for public transportation operations in Fortaleza, HP Transportes, the comparable public consortium in Goiânia, the City of West Sacramento, responsible for public transportation in West Sacramento, and with Regional Transit, the public transportation agency in Sacramento. The intention of the interviews is to gather additional information on enablers and barriers to the microtransit projects, their goals in operating the projects, and whether or not, and to what extent, the representatives measure their success in terms of public value and see their work as part of an integrated smart cities solution.

Preliminary Results

The research so far, which includes secondary source analysis, provides strong evidence that public-private partnerships (PPPs) as a tool are capable of enhancing public value in smart cities contexts, given the appropriate PPP configuration and a sharpened focus as to the types of value they intend to create. The results point to “instrumental value 1 - usefulness”, “political-social value – political acceptability”, and “hedonistic-aesthetic value – relative positivity of experience” (Meynhardt, 2015), being created, through “policy”, “service delivery” and “capacity building” PPPs (Brinkerhoff, 2011). For Harrison (2012), public value as created via PPPs would seem to encompass the “strategic”, “ideological” and “stewardship” dimensions, leading to the value generators “effectiveness”, “participation” and “collaboration”. Testing for

the presence and taking account of public value in the microtransit projects following Moore's Strategic Triangle and Public Value Scorecard frameworks present similarly promising results.

Conclusion

This study aims to add breadth and cohesion to the smart cities and public value literature. In order to properly demonstrate the merits of combining the literature and to provide practical value as to the tools a public manager might use to create public value, the researcher developed case studies of a specific type of smart city initiative. In order to provide particular insight into the importance of context in developing smart city solutions, case studies from two different geographical regions were presented to explore whether or not different types of public value could be created and what the governance implications of this value would be with respect to the appropriate public-private partnership configuration. It is hoped that this research provides future studies with a starting point to discuss specific tools and strategies public managers wield in their arsenal to create smarter services that generate public value, meeting citizens' changing expectations and demands.

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