### Abstract

While providing essential access for large portions of city populations, the quality of paratransit services in Sub-Saharan African cities is poor. Poor quality of service can be attributed to two features of the paratransit business operating model: driver remuneration on the basis of a daily ‘target system’; and cash-based business management in which vehicle depreciation is ignored as an operating expense. In Kenya, the voluntary organisation of fragmented inter-city *matatu* businesses into Savings and Credit Cooperatives (SACCOs) has resulted in improved service, regulatory compliance and technology adoption, but little is known of how they operate. The aim of this paper is to gain insight into how the Kenyan inter-city SACCOs have addressed the root causes of poor service quality by shifting the remuneration of drivers from daily cash targets to salaries, and by requiring vehicle depreciation costing through compulsory contributions to the cooperative's capital savings from which vehicle acquisition and repair loans can be derived. Due to the particular shuttle-like nature of inter-city services and the considerable institutional support that exists in Kenya for cooperatives, the direct transfer of successes to other contexts is likely to prove difficult. Identifying the features of the inter-city SACCO model that have led to paratransit service improvements, and attempting to replicate these, may therefore be more effective than attempting to replicate the model in its entirety. These features are argued to be operator consolidation, accompanied by salaried drivers, systematic vehicle monitoring and compulsory vehicle depreciation costing. They can be adopted in other forms of paratransit organisation and regulation, but will require considerable adaptation to context.

### 1. Introduction

The decline of scheduled large bus services in most Sub-Saharan African cities in the latter half of the previous century led to the establishment of extensive paratransit operations. These offerings typically took the form of mini- and midi-bus services provided by small informal businesses, subjected to varying degrees of market entry regulation. While providing essential access for large portions of city populations, the quality of paratransit services in Sub-Saharan African cities is widely regarded by passengers to be unsatisfactory (see, for instance, Ayemang, 2013; Behrens and Schalekamp, 2010; Govender, 2014; Koimur et al., 2014). While the reasons for poor service quality are no doubt complex and contextually variant, a common underlying cause is the nature of the paratransit business operating model that is found in many, if not all, cities on the sub-continent. It is posited that many problems can be attributed to two main features of this operating model. The first is the basis for driver remuneration. Vehicle drivers either keep cash fare revenue less fuel expenses and a daily ‘target’ rental payment to the vehicle owner, or are paid a commission by the vehicle owner in the form of an agreed portion of weekly fare revenue (McCormick et al., 2016a; Joubert, 2013). These driver remuneration practices create strong structural incentives for drivers to compete aggressively for passengers in the road space, overload vehicles, speed as they attempt to increase the number of service trips during peak periods, and delay departures from termini until the vehicle is full during off-peak periods.
The second feature of the operating model to which problems might be attributed is the day-to-day, cash-based nature of business management. Operating costs are typically perceived to be routine labour, fuel and vehicle maintenance expenses. Vehicle depreciation is seldom included as an operating expense, and consequently when vehicles reach an optimal age for replacement, reserves with which to purchase a new vehicle or secure affordable credit are not available, and vehicles remain in use in an increasingly unroadworthy and unsafe condition.

It was against this particular framing of the public transport problem that a research project was undertaken to study public transport cooperatives operating out of Nairobi (McCormick et al., 2015a). As in other parts of Sub-Saharan Africa, the general quality of paratransit services in Kenya is notoriously poor, and in need of improvement. These services are known colloquially as matatus, from the Kikuyu term (mangotore matatu) for the 30 cents flat fare that was charged when the mode first became popular. In around 2010 the Kenyan public transport authorities observed that the voluntary organisation of some fragmented inter-city matatu businesses into Savings and Credit Cooperatives (SACCOs) in the 1990s and 2000s had resulted in improved service quality, technology uptake and regulatory compliance. As will be demonstrated in the following section, a review of the literature in 2014 indicated that, while there might be a considerable literature on the cooperative movement and matatus in general, there is comparatively little on how public transport SACCOs work and the benefits they offer. The aim of the research undertaken was therefore to investigate how the Kenyan SACCO model works with respect to public transport, and to explore its value as a means of managing paratransit operations and of improving service quality.

This paper reports upon the findings of the inter-city matatu SACCOs study, and has two main aims. The first is to expand what is known of matatu SACCOs with respect to how they are organised, how drivers are employed, how SACCO members benefit (particularly with respect to vehicle acquisition and maintenance), and how service operations management has been improved. The second aim is to explore the transferability of the Kenyan inter-city matatu SACCO experience, and the lessons it offers for paratransit service quality improvement in South Africa and in other contexts where similar paratransit systems prevail.

The paper is divided into seven main sections. In the following section the relevant literature on paratransit service improvement is briefly reviewed. Section 3 goes on to describe the cooperative movement and the key policies that have been introduced to regulate matatu operators in Kenya. Section 4 explains the method of the study. Section 5 presents the main findings of the study, focusing on SACCO organisation and membership, driver employment, member benefits, and advances in operations management. Section 6 discusses the transferability of the successes that can be observed in the Kenyan inter-city SACCO experience. Section 7 concludes with reflection on the lessons that can be learned, and with a discussion of further research needs.

2. Literature review

Scholarly publications on paratransit services in developing world cities first emerged in the 1980s and 1990s, with South-east Asian cities receiving the greatest attention (e.g. Rimmer, 1984; Roth, 1987; Cervero, 1991, 2000). The main arguments advanced in the literature from this period were essentially that paratransit modes perform an important role in passenger transport systems, often providing niche services under conditions in which conventional scheduled services cannot be sustained. In perhaps the most comprehensive publication of this period, Cervero (2000) presented potential strategy options for rationalising and improving paratransit services, ranging from operator organisation, to regulation, financial support, infrastructure improvement, traffic management and operator training. From a spectrum of policy responses to ‘informal transport’ ranging from ‘acceptance’, to ‘recognition’, ‘regulation’ and ‘prohibition’, he argued that ‘recognition’ policies (in which rules and minimum standards focussed largely on safety and insurance are enforced without public sector mediation of levels of supply) and ‘regulation’ policies (in which market entry and exit is publically controlled) are most commonly appropriate. Some authors from this period argued that the developing world offered commercially successful models of demand-responsive service provision that, with modification, could be transferred to developed world cities (e.g. Silcock, 1981; Roth and Shephard, 1984; Chuijoh, 1989; Cervero, 1997).

The literature on paratransit in developing world cities from the 2000s onwards, however, raised concerns around the potential dangers of unbridled ‘in the market’ competition (e.g. Sohail et al., 2006; Cervero and Golub, 2007; Golub et al., 2009). The paratransit industry was not advanced by authors like Golub et al. (2009) as an alternative to mass public transport system improvement, but as an important auxiliary upon which many poor households will continue to depend. Sohail et al. (2006) noted the importance of the capacity of the industry to self-regulate in conditions of weak government regulation and enforcement capacity, and argued for regulatory frameworks that strike a balance between avoiding the negative externalities of paratransit, while avoiding overly detailed or ‘heavy’ regulations that increase the potential for non-compliance and corruption.

Scholarly publications on paratransit quality of service improvement in developed world cities predate those on developing world contexts. The first publications emerged in the early 1970s in the United States in which various authors argued that the eradication of ‘jitneys’ had robbed American cities of an important complementary public transport service, and that a variety of unscheduled, demand-responsive shared services should be allowed to re-establish (e.g. Saltzman, 1973; Kirby et al., 1974; Orski, 1975). The main arguments advanced in this literature were essentially that existing regulations presented a major obstacle to the emergence of innovative paratransit services, and that allowing freer market entry and fare deregulation would enable a rich mix of new services to emerge as well as fare structures that better reflected actual operating costs. Reducing the barriers to market entry was argued to increase the supply of, and competition between, services, and thereby reduce fares, incentivise service quality improvement and eliminate illegal operations.

More recently, research into technology-supported ‘demand-responsive transit’ in developed world city contexts has grown fairly rapidly, as these cities sought alternatives to private car dependency in lower density environments in which conventional public transport systems are not viable, and sought to cope with mandates to provide services for the disabled (e.g. Mageean and Nelson, 2003; Enoch et al., 2004; Palmer et al., 2004; Brake and Nelson, 2007). Despite the significant innovations in this research, flexible transport services have not been widely implemented, and there remains a service offering gap between conventional public transport and the private car. Echoing earlier authors from the 1980s, Finn (2012) suggests that paratransit operations in the developing world may hold lessons on how some of the barriers to their implementation (see Mulley et al. (2012)) might be overcome.

In both the developing and developed worlds, the paratransit field, and how paratransit services might be improved, remains under-researched at present relative to other public transport modes. This is particularly true in the Sub-Saharan African context, despite the heavy dependence of contemporary city public transport systems upon this mode, and the centrality of paratransit to current public transport reform processes. The limited literature focused on paratransit in Sub-Saharan Africa has focussed on the emergence, violent competition and
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