

Abstract

This chapter synthesises current knowledge of informal paratransit services in cities of the Global South and discusses prevailing policy issues and emerging trends. The scope of the chapter is limited to unscheduled public transport and for-hire services operating in whole, or in part, within the informal economy. The chapter focuses on three regions of the Global South: Africa, Asia, and Latin America. It reviews current knowledge in relation to business models, regulatory regimes, and operating practices. While illustrating that the sector is heterogeneous across, and within, these regions, this review shows that informal paratransit services are usually operated by small businesses organised into associations that exert varying degrees of self-regulation. Service operations are seldom free of state regulation, but the extent can vary. Operating environments often have considerable infrastructure deficits, and driver employment conditions can be exploitative.

18 Informal paratransit in the Global South

Services are, in many cases, a response to gaps left by formal public transport undertakings. Prevailing business models, however, make operators demand-responsive, often providing the only service available to vulnerable groups. It is argued that important policy issues relate to integration with other public transport modes, service quality, and safety improvement. These challenges are compounded by poorly resourced regulatory authorities, often subjected to pervasive corruption. An important emerging trend identified takes the form of potentially disruptive technologies, most commonly in the form of ride-hailing apps. These platforms may have a significant impact on operating practices, and few cities have regulatory frameworks in anticipation of this change. Experience suggests that attempts to change business models and operating practices can be met with resistance. Policy intervention in this sector therefore requires careful analysis of local contexts and options.

Keywords: paratransit, informality, business models, regulation, operating practices, policy challenges.

18 Informal paratransit in the Global South

18

INFORMAL PARATRANSIT IN THE GLOBAL SOUTH

Roger Behrens, Saksith Chalermpong and Daniel Oviedo

Introduction

The term ‘paratransit’ is used in this chapter to describe flexible modes of passenger transportation that do not follow fixed schedules or adhere to specified service spans. In the Global North, paratransit services are most commonly associated with demand-responsive transport systems provided for persons with disabilities (see also Chapter 17). In the Global South, however, paratransit services are provided for the general population. The extent to which these services operate with public authority sanction, declare income, and are tax compliant determines whether they are ‘informal’. The scale of paratransit operations is also significantly larger in the Global South. With notable Latin American exceptions, in many, if not most, cities, paratransit services carry the majority share of the passenger market. Informal paratransit is therefore the norm rather than the exception, and the attention it receives in the academic literature relative to mass fixed-route public transport is disproportionately small.

While providing essential access for large portions of city populations, the quality of paratransit services in the Global South is often poor (Cervero, 2000; Cervero & Golub, 2007). While the nature and severity of service quality problems are no doubt contextually variant, there are some commonalities: drivers can compete aggressively for passengers in the road space, overloading vehicles and disobeying traffic laws; more lucrative routes can be overtraded, while service on less lucrative routes or times of the day is not supplied; vehicles can remain in service too long, becoming increasingly unsafe and polluting; and in-lane vehicle boarding and alighting can reduce already limited road capacities.

18 Informal paratransit in the Global South

The scope of this chapter encompasses two forms of paratransit. The first are public transport services, typically provided by minibuses with around 15 seats but ranging from 4-seater sedans to midi-buses with 35 seats. The second are for-hire services, typically provided by motorcycles but including a range of non-motorised and motorised two- to four-wheeler vehicle types. This rich diversity of services takes many different forms and is called many different names. 'In the market' competition sometimes results in elaborate decoration to attract passengers, as can be found amongst 'jeepneys' in Manila, 'jingle buses' in Karachi, and 'tap taps' in Port-au-Prince. Colloquial names are often derived from the initial fare (e.g. Mexican 'peseros' and Tanzanian 'daladals'). The chapter's scope excludes 'formal' forms of paratransit (e.g. 'dial-a-ride' buses for the disabled and metered taxis) insofar as they operate with government sanction and are fully compliant with tax and employment regulations.

The intent of the chapter is to synthesise what is known of informal paratransit services in cities of the Global South, to consider what causes common service quality problems, and to discuss prevailing policy issues and emerging trends. The chapter is divided into several sections. The next three discuss business organisation, regulatory regimes, and operating practices, respectively, considering variations across the major regions of the Global South (Africa, Asia, and Latin America). This is followed by reflections on similarities and differences across these regions in discussions of current policy challenges and emerging trends before final conclusions are drawn.

Business organisation

Current knowledge of informal paratransit business organisation – how owners and drivers organise themselves collectively, who owns vehicles, and how drivers are remunerated – is discussed in the contexts of Africa, Asia, and Latin America in the following subsections.

Africa

Paratransit organisation and business models in African cities take a variety of forms. Operators are organised collectively at varying geographical scales and with differing levels of public authority sanction and support. In the case of public transport services, in some countries, there are national or regional associations established to represent collective owner interests (e.g. the Matatu Owners Association in Kenya), some of which are supported and sanctioned by government agencies (e.g. the South African National Taxi Council) (Klopp & Mitullah, 2016; McCormick et al., 2016). A more ubiquitous form of collective organisation are route associations formed by operators to protect and self-regulate their markets. In South Africa, affiliation to a registered owner association is a mandatory requirement for an operating

18 Informal paratransit in the Global South

license, as is membership in either a co-operative or a transport management company for a public service vehicle license in Kenya (Behrens et al., 2017a). For-hire services also have some national operator associations to advance collective interests (e.g. the Uganda National Boda Boda Association). More prevalent are area or route associations (Bishop & Amos, 2015; Bishop et al., 2018; Ehebrecht et al., 2018), although the literature suggests that the prevalence of operators not affiliated to a route association is higher in motorcycle-taxis than in minibuses (Kisaalita & Sentongo-Kibalama, 2007; Mutiso & Behrens, 2011).

Vehicle ownership patterns among public transport services range from owner-drivers to small fleet owners and in a few instances to collectively owned midi-buses (e.g. larger savings and credit co-operatives [SACCOs] in Nairobi) (Behrens et al., 2017a). In instances where vehicle owners are government or police officials, regulatory capture can occur (Klopp & Minallah, 2016). Because of the smaller economies of scale and lower market entry costs associated with motorcycles, for-hire services typically have a higher proportion of owner-drivers, although this varies from country to country (Ehebrecht et al., 2018; Schalekamp & Saddier, 2019).

Driver employment conditions are seldom formalised and can be exploitative (Diaz Olvera et al., 2016). Driver remuneration amongst public transport services is commonly based on a 'target system' in which drivers essentially keep cash fare revenue less fuel (and, if applicable, vehicle crew and minor maintenance) expenses and a daily or weekly vehicle rental payment to the owner (Behrens et al., 2016; Schalekamp & Saddier, 2019). Alternative, less common, remuneration models take the form of a commission based upon an agreed-upon portion of weekly farebox revenue and salaries (typically with a ridership bonus incentive, as in the case of City Hoppa in Nairobi). The greater proportion of owner-drivers amongst for-hire operators means that such remuneration models are less pervasive, but in instances where motorcycle-taxi drivers are employed, similar target or commission systems prevail (Diaz Olvera et al., 2016).

Asia

The business organisation of paratransit operators in Asia is determined in part by vehicle type. Smaller vehicles, such as human-powered pedicabs and motorcycle-taxis, tend to be owned by drivers. One exception is cycle rickshaws in India, where an operator may own a large fleet of vehicles (Kumar et al., 2016). For larger vehicles, including passenger vans and minibuses, greater capital requirements often mean that vehicle owners and drivers are different individuals, although the owner-driver model of large paratransit vehicles is also common (Chalermpong et al., 2016; Kumar et al., 2016). Operators who are fleet owners are sometimes registered as limited companies or partnerships, but some are private individuals. Some operators

18 Informal paratransit in the Global South

employ drivers to operate the vehicles, while others rent vehicles to individuals (Wicaksono et al., 2015; Kawaguchi et al., 2013).

There are various forms of collective organisation. Route associations or driver unions are common for route-based services, such as passenger vans in Thailand and Indonesia, 'jeepneys' in the Philippines, and shared auto rickshaws in India (Chalermpong et al., 2016; Kawaguchi et al., 2013; Kumar et al., 2016; Rañosa et al., 2017) and location or area-based driver's associations for for-hire services, such as motorcycle-taxis in Thailand and Philippines and tricycles in Cambodia (Ratanawaraha & Chalermpong, 2015; Phun et al., 2015). With the exception of motorcycle-taxis in Thailand, these associations have no legal status. One of the main reasons for the formation of associations is to gain an exclusive right to operate in a certain area. An individual with connections to the authority may establish an association and accept members in an area or route who wish protection (Chalermpong et al., 2016). Public officials, who are paid off by the 'owner' of the association, loosely enforce laws on association members and prevent non-members from operating in the area. Members may pay daily, weekly, or monthly dues to the association for operational expenditures, including parking space rental, utilities, insurance, and management fees (Ratanawaraha & Chalermpong, 2015).

Paratransit operators who employ drivers normally pay a wage on a per-trip or daily basis (Cervero, 2000; Chalermpong et al., 2016). Some have a daily target of fare revenue, with a bonus payment to drivers who exceed the target. Drivers receive no other employment benefits but may receive a bonus for reliability or a good driving record (Ratanawaraha & Chalermpong, 2019). Operators may rent their association membership rights for short-term operations and may also sell the membership with association approval.

Latin America

In Latin America and the Caribbean (LAC), forms of informal paratransit have diversified from minibuses and shared five-seater taxis or slightly larger vehicles (e.g. approximately ten-seater 'camionetas' in Caracas or 'gualas' in Cali) to more individualised services such as motorised and human-powered two- and three-wheelers (Heinrichs & Bernet, 2014; Inuregui-Fung et al., 2019). While the first type of services has been an almost ubiquitous feature of LAC cities, the latter have emerged more recently as a response to limited connectivity and gaps in the market (Cervero, 2000; Oviedo & Titheridge, 2016; Sengers & Raven, 2014). Like the organisation of paratransit in Africa and Asia, the model of separate vehicle owner and driver(s) is common, with many owners and even more drivers making it an industry difficult to coordinate and negotiate with.

Three models are identified across the breadth of informal paratransit supply in the LAC context: owner-driver (where the vehicle owner operates

18 Informal paratransit in the Global South

the vehicle), owner-employer and driver-employee (where the owner hires the driver), or owner-employer and driver-renter (where the owner rents the vehicle to the driver). Such arrangements are, however, more common in the case of low-capacity vehicles providing unrouted services such as shared taxis and motorcycle- and bicycle-taxis (Gamble & Puga, 2017; Heinrichs et al., 2017). In the more consolidated routed services, larger fleet owners are registered as private firms, or associations of owners and drivers form to strengthen their capacity to negotiate with local authorities. Similarly, in some cases such as the jitney service operators in Peru, Mexico, and Colombia, associations have been created to represent the interests of specific groups and improve their standing to tender for formalised services (Hidalgo & Huizenga, 2013; Venter et al., 2019; Willoughby, 2013).

Employment conditions for many workers are precarious, resulting from decades of operational arrangements with perverse incentives and uncontrolled competition. In a handful of cases of large fleet owners and registered companies and associations, formal employment with social security is provided. However, in most cases in the owner-employer and driver-employee/driver-renter category, vehicles are rented to drivers for a fixed daily fee with all revenues after rent and operating costs determining driver income. This incentivises drivers to work long hours and compete for passengers in what has been called locally *guerra del centavo* ('the penny war') and leads to rapid deterioration of vehicles, decreased quality of service, and marginal profits (Ardila & Rodríguez, 2000; Ardila, 2007; Estache and Gómez-Lobo, 2005). In Tláhuac, a recent study has found that motorcycle-taxi drivers have no employment rights or access to social safety nets, with adverse impacts on quality of life and work (Berrones-Sanz, 2018).

Regulation

Current knowledge of informal paratransit regulation – what regulatory regimes are imposed by public authorities and how operator associations regulate themselves – is discussed in the contexts of Africa, Asia, and Latin America in the following subsections.

Africa

In most African cities, paratransit operations are subjected to two regulatory systems. The first takes the form of 'self-regulation' imposed by operator associations. The primary purposes of self-regulation are usually market entry control, although this is often related more to kinship and community than to balancing supply with demand and protecting routes from competitors. On occasions, route protection can become violent (e.g. the 'taxi wars' in South Africa following market entry deregulation in the late 1980s) (Dugard, 2001). In some instances, recognising that there is overtrading, associations seek to

18 Informal paratransit in the Global South

ration member access to the market through controlling vehicle order in rank queues (e.g. at Mitchells Plain in Cape Town) (Behrens et al., 2017b). In some cities, operator associations collude in the setting of fares, while in others, drivers engage in opportunistic dynamic pricing. In better-organised and better-resourced associations, driver recruitment and management and vehicle tracking functions can be transferred from individual vehicle owners to association officials (e.g. in some larger SACCOs operating out of Nairobi) (Behrens et al., 2017a). The transport management companies in Nairobi (e.g. Kenya Bus Services and City Hoppa) also enter into franchise agreements with vehicle owners concerning branding and operating rules (McCormick et al., 2013).

The second regulatory system takes the form of the rules imposed by the public authority. The complexity of regulatory regimes varies widely, according to the powers, capacity, and resources of the authority. In least-resourced contexts, open markets prevail, and regulation is reduced to whatever traffic law enforcement may exist. A common regulatory regime is the issuing of quantity operating licenses via licensing boards, but in the absence of adequate market entry enforcement, this defaults to a form of quality licensing relating to vehicle specification and driver requirements. Some authorities set fares (e.g. ‘chapas’ fares in Maputo and ‘daladala’ fares in Dar es Salaam). Some innovative regulation regimes take the form of franchises (e.g. in Dakar as a condition for vehicle renewal funding), service contracting (e.g. in Mitchells Plain, Cape Town, as part of a network rationalisation), and performance incentives (e.g. a driver financial incentive scheme in Durban) (Kumar & Diou, 2010; Sadiet et al., 2019; Schalekamp & Klopp, 2018).

Asia

In many Asian countries, including India, Indonesia, the Philippines, and Thailand, fixed-route paratransit services are regulated by local authorities (Institute for Transportation and Development Policy, 2019; Kumar et al., 2016; Ratanawaraha & Chalermpong, 2013; Regidor et al., 2009). To obtain an operating license or a franchise, similar to bus regulation regimes, the operator must meet various conditions, including vehicle standards and maintenance record keeping, driver’s training and licensing, and parking permits. The authorities nominally plan and regulate routes, stops, service span, and number of vehicles, as well as fare. The main objective of the regulation in some cases is to prevent traffic congestion caused by the operation of paratransit vehicles (Armado et al., 2017). For-hire paratransit operations, such as motor tricycles and pedicabs, are also regulated in some countries, mostly to limit their numbers and to control congestion (Wicaksono et al., 2015). However, motorcycle-taxis are unregulated in most countries, except for Thailand, where an operating license and a commercial driving

18 Informal paratransit in the Global South

license are required (Cerio, 2017; Ratanawaraha & Chalermpong, 2015). In lower-income countries where a regulatory system has not yet been adopted, such as Laos and Cambodia, regulation of paratransit operations is limited to vehicle registration and driving licenses.

In practice, however, even in countries with a formal regulatory system, such as Thailand, India, and Indonesia, regulations are loosely enforced by officials due to, among other reasons, the difficulty of enforcement, lack of personnel, corruption, and regulatory capture (Institute for Transportation and Development Policy, 2019; Kumar et al., 2016). For this reason, in countries with high levels of corruption, unauthorised paratransit operations can be rife. In addition, vehicles or drivers licensed for one service but operating another are also common. To be able to operate in a certain area, these unauthorised operators must still belong to an operator's association in that area and must generally follow the rules set by that association. In countries with weak regulation, misuse of vehicles is rampant, including modification and overloading of passenger vans and extending motorcycle-taxi passenger seating through a wooden plank (Cerio, 2017; Kumar et al., 2016).

Self-regulation is usually practiced at the operator association level. For example, in India, drivers operating on the same routes make collective fare-setting decisions, subject to some government regulation (Kumar et al., 2016). In Thailand, since most associations are dominated by the association's owner (i.e. the well-connected person who established the association), rule-setting decisions, including to accept new members, to set fare, and dispatching rules, are generally up to the owner, but members are often consulted (Ratanawaraha & Chalermpong, 2015, 2019). In some associations, these rules are made by a board of member representatives. In yet other associations, the decisions are made by all members through a vote. Failure to follow the rules, in most cases, can result in expulsion from the association.

Latin America

In LAC, public authorities have developed regulations and controls and promoted initiatives to integrate semi-formal buses and minibuses into a fully integrated system with clear targets of access, affordability, and service quality (Rodriguez et al., 2017; Willoughby, 2013). Such transitions have required an overhaul of operations, as well as a reorganisation of incumbent owners and drivers into co-operatives or unions to guarantee their participation after strong tensions and demonstrations (Rodriguez et al., 2017). An example of such a reform is the vehicle circulation restriction for motorised rickshaws in Barranquilla, where three-wheelers are available only in two colours (orange and blue) and this distinction is used as a basis to restrict the operation of half the fleet during different days of the week.

Self-regulation of operations is also commonplace in both routed and unrouted informal and semi-formal services. In local paratransit in informal

18 Informal paratransit in the Global South

settlements on the peripheries of cities such as Bogota, community leaders define the alignments of the main routes serving their neighbourhoods, usually seeking to maximise coverage but also sometimes seeking to exclude neighbourhoods because of frictions between local leaders (Dviedo & Titheridge, 2016). In Quito, evidence suggests that self-regulation leads to increased service quality attention to features like fares, waiting time, vehicle condition, and safety (Gamble & Puga, 2017).

Operation

Current knowledge of informal paratransit operating practices – how route networks are arranged, where passengers board and alight, when and how frequently service is provided, and how fares are set and collected – is discussed in the contexts of Africa, Asia, and Latin America in the following subsections.

Africa

Few studies have been undertaken on paratransit network organisation and operation practices. Amongst public transport services, the extent of paratransit service networks has been mapped in several cities (e.g. AccraMobile in Accra, Experimental Transit in Cairo, Mapa Dos Chapas in Maputo, and Digital Matatu in Nairobi), revealing extensive geographical coverage (Klopp & Cavoli, 2017; Saddier et al., 2016). Fewer studies (in Accra, Cape Town, and Lubumbashi) have collected data on route typologies and operating practices such as headways, layovers, boarding and alighting, spans, and fare collection (Saddier & Johnson, 2018; Du Preez et al., 2019; Behrens et al., 2017; Kerzhner & Martens, 2018). These studies reveal a high level of demand responsiveness. Consequently, even when prohibited by operating license restrictions, route deviations occur in response to passenger requests, and service headways during peak periods tend to be small. While on-route stopping is common, boarding and alighting tends to be concentrated at ranks, as drivers are reluctant to risk an unviable trip by departing without a full passenger load. In the off-peak, passenger waiting times can therefore lengthen considerably as vehicles fill more slowly and layover times are longer. Service spans are usually determined by periods when trip-making is profitable; hence, spans can differ from those of scheduled mass public transport. While there have been numerous attempts to introduce cashless systems, the dominant means of fare collection remains cash (Tinka & Behrens, 2019).

Amongst for-hire services, service networks have also been mapped in some cities (e.g. Dar es Salaam, Kampala, and Yaoundé), but there is less literature on detailed operating practices (Goletz & Ehebrecht, 2019; Evans et al., 2018; Kemajou et al., 2019). Trip distances tend to be shorter than minibus services,

18 Informal paratransit in the Global South

seldom further than 6 km, providing door-to-door service as well as links to higher-capacity modes (Ehebrecht et al., 2018; Goletz & Ehebrecht, 2019). Both passengers and goods are transported. Drivers operate out of numerous small stations distributed across the city, and given a prevalence for overtrading, inactivity rates can be high (Kemajou et al., 2019; Schalekamp & Saddier, 2019). While fare collection remains predominantly cash-based, cashless fare collection (CFC) systems (e.g. Gozem in Lomé, SafeBoda in Kampala, and YegoMoto in Kigali) have achieved greater success than minibus paratransit (Tinka & Behrens, 2029). The greater proportion of owner-drivers means that the battle for farebox control between owners and drivers, which has disrupted CFC initiatives in minibus paratransit, is not as prevalent.

Asia

Fixed-route paratransit services in Asia are generally operated out of major activity centres, such as markets, shopping malls, transportation hubs, and commercial and employment centres in central business districts, as well as community centres in suburban areas. Routes are usually concentrated along arterials that serve commuter travel demand. Route lengths may range from less than 5 to over 20 km in the case of jeepneys in Philippines (Regidor et al., 2009). In Thailand, the lengths of passenger van routes range from 15 to 50 km. In some countries, such as Cambodia and Indonesia, pick-up and drop-off can occur anywhere along the route (Cities Development Initiatives for Asia, 2011), while in others, such as Thailand and Philippines, boarding and alighting should occur, at least on paper, only at designated locations. In countries where operating licenses are required for fixed-route services, operators must follow the designated routes or risk being fined by the authority.

Paratransit services are generally not operated according to a predefined schedule but dispatched on a fill-and-go basis, although some associations may specify a maximum headway to limit passengers' waiting time. Driver unions in some fixed paratransit routes in India collectively determine minimum service frequency and penalise non-compliance (Kumar et al., 2016). Fare collection is usually done on board by cash payment directly to the driver or sometimes to a conductor. In Thailand, the fare collection of many passenger van services is done at the boarding station by a cashier of the route association, also in cash.

Like fixed-route paratransit operators, for-hire paratransit operators usually wait for passengers at major activity centres. In addition, some operators cater to tourists and make agreements with hotels to provide services for guests (Cities Development Initiatives for Asia, 2011). Motorcycle-taxis in Thailand are operated out of a 'win', a location-based association to which the operator belongs. Members of a motorcycle-taxi win wear an orange-coloured vest that

18 Informal paratransit in the Global South

shows the 'win' location (Ratanawaraha & Chalermpong, 2015). Each driver must enter a queue and is dispatched to serve customers in that order. According to a self-imposed rule, motorcycle-taxi drivers are not allowed to pick up a passenger outside their 'win' territory and must return to their own station and re-enter the queue to pick up the next customer. Violent conflicts between members of different 'wins' often break out when this operating rule is violated. Motorcycle-taxi drivers in other countries, such as Vietnam and the Philippines, are far less self regulated and can pick up and drop off passengers anywhere. These operators must usually pay protection fees to government officials to avoid law enforcement. Despite having a license to operate, motorcycle-taxi drivers in Thailand also have to pay off officials, through the 'win' association, to avoid prosecution.

Latin America

Studies of informal and semi-formal paratransit in LAC have mapped routed services at different scales and in different contexts, highlighting the adaptability and demand-responsive nature of their operation. In cities such as Lima and Quito, paratransit routes respond to needs to access areas unserved by formal transport supply, as well as appearing in corridors where they engage in direct competition with formal services in the absence of sufficient enforcement (Gamble & Puga, 2017; Lauregui-Fung et al., 2019). Analyses of the evolution of routed semi-formal and informal paratransit in the region suggest that there is little restriction on operating times, frequencies, and headways and that whenever pricing is regulated, groups of operators tend to apply pressure on local authorities to adjust fares to cover increasing operating costs (Lauregui-Fung et al., 2019; Rodríguez Baquero et al., 2003; Yañez-Pagans et al., 2018). There is also a high incidence of support economies arising around informal paratransit that serve as support structures for their operation. Many minibus routes have 'calibrators' located at different points of the journey, who keep track of the time vehicles pass a given point (usually an intersection) and inform the next driver of the estimated headway to adjust speed and frequency (Parra et al., 2005).

Research exploring informal paratransit without fixed routes suggests that these services play different roles, depending on the level of operator consolidation, available infrastructure, topography, and sociospatial distribution of the population and income (Heinrichs et al., 2017; Oviedo & Dávila, 2016; Suárez et al., 2016). Moreover, there is a high degree of complementarity and interoperability between shared taxis, jitneys, motorcycle-taxis and bicycle-taxis, and higher-capacity modes such as bus rapid transit (BRT) systems (Heinrichs et al., 2017). In mid-sized Colombian cities, the services motorcycle-taxis provide range from last-mile trips to the majority of city-wide trips, such as in Montería (Goldwyn & Vergel-Tovar, 2018). Motorcycle-taxis in Mexico tend to operate without insurance and

18 Informal paratransit in the Global South

often do not provide helmets to passengers, resulting in high vulnerability and an inability to deal with post-crash liability (Berrones-Sanz, 2018). In Colombia and Cuba, bicycle-taxis are forced to negotiate for road space and compete for short-distance passengers. In Colombia, they set their own fares, while in Cuba, there is a complex negotiation with local authorities, despite being considered informal (Heinrichs et al., 2017; Warren & Ortega-Sanchez, 2016).

Policy challenges

In the context of the common service quality problems outlined earlier, across all regions of the Global South, there have been public sector plans to either formalise incumbent operators or replace them with formal, scheduled public transport undertakings, often BRT. Institutional reorganisation to facilitate public transport reform has also been common. In Thailand, for example, due to high crash injury and fatality rates, the government announced the phasing out of passenger vans that are licensed as fixed-route transit vehicles (Mahitthirook & Nuanam, 2017). In the Philippines, the Public Utility Vehicle Modernisation Program introduced in 2017 required jeepney operators to replace vehicles in poor condition and sought to devolve route planning and franchising responsibilities from the central to local governments (Land Transportation Franchising and Regulatory Board, 2017).

Experiences from the first cities in Africa to attempt to replace paratransit services (e.g. Rea Vaya in Johannesburg, MyCiTi in Cape Town, and UDART in Dar es Salaam) suggest that comprehensive replacement is neither feasible nor perhaps even desirable, particularly given the demand responsiveness of paratransit entrepreneurs compared to formal, scheduled modes in the context of forecast rates of unprecedented African urbanisation. Thus, as an alternative to the replacement of informal paratransit, a key policy challenge is now improving paratransit integration into complementary 'hybrid' public transport networks, composed of trunk trains, large buses, and paratransit feeders. In instances where smaller paratransit vehicles provide linehaul services better suited to scheduled larger vehicle operations, the policy process to introduce willing changes in service routing is likely to be fraught with difficulty both in terms of operator willingness as well as entrenched and outdated regulations.

Irrespective of whether city authorities attempt to integrate paratransit with new scheduled mass public transport services, a further policy challenge is how best to improve the quality of paratransit services. At the root of service quality problems lies an exploitative remuneration model in which drivers are incentivised to drive recklessly as they attempt to fit as many service trips in the peak as possible and a cash-based business in which vehicle depreciation is not costed as an operating expense and cost inefficiencies are difficult to identify. In the case of motorcycle-taxis in particular, improving road safety

18 Informal paratransit in the Global South

through improved compliance with traffic laws presents a further considerable challenge. It is unclear at present whether policy interventions aimed at mandatory change, as in the case of contracts with associations imposed on members, or voluntary change, as in the case of financial incentives for desirable operating behaviour, are likely to be more successful. Current policies of these types require careful monitoring and evaluation.

While there is broad support for paratransit formalisation and replacement in Asian cities, implementation requires strong political commitment, legal power, expertise, and resources that may not be available. For example, although provisions for financial assistance such as soft loans are usually included in the reform proposal, small paratransit operators generally oppose fleet modernisation, citing an unacceptable financial burden (David, 2019). A lack of political will to carry out the reform also threatens implementation, as is evident in the case of Thailand's uncertainty in its policy to ban passenger vans (Hongtong, 2019). To further complicate the situation, institutional barriers are also common, since the reforms often involve many agencies in different ministries, in which silo thinking generally prevails (Wu & Pojani, 2016).

Policy interventions also often must occur within the context of debilitating corruption and compromised enforcement capacity (Gwilliam, 2011; Klopp & Minallah, 2016; Rasmussen, 2012). In some instances, it makes greater economic sense for operators to remain noncompliant, because bribes equivalent to fines are elicited by traffic police even when operators are compliant. Further, any policy attempt to realign paratransit service routes to a more complementary 'hybrid' public transport network or to change operating practices to improve service quality requires a sound understanding of the base business models and operating practices. Without a grounded understanding of base conditions, windows of opportunity, path dependencies, and vested interests capable of derailing policy interventions are unlikely to be recognised. The structural workings and business models of paratransit services are often insufficiently understood to inform the design of public transport reform projects.

With respect to formalisation and replacement, Latin American cities have experienced more success. Experiences like those of Transantiago in Santiago and Transmilenio in Bogota have facilitated the transfer of ideas around how to deal with various degrees of resistance and the operational and social challenges in achieving full regularisation (Hidalgo & King, 2014). Some cities in LAC have introduced a more active role for authorities in determining the structure of the transport network, levels of service, and frequencies, forcing a separation between revenue collection and operating activities (Estache & Gómez-Lobo, 2005).

As city authorities improve their ability to address structural deficits in infrastructure and their capacity for planning and delivery of public transport services, new policy positions have been adopted in relation to informal public

18 Informal paratransit in the Global South

transport. In Lima, recent efforts at introducing new forms of public transport governance and regulation have operationalised new standards for pricing and employment and improved enforcement (Lauregui-Fung et al., 2019). However, initial efforts on the ground, in the form of pilot corridors, have been met with resistance by both passengers and incumbent operators. One of the main challenges that new policies and regulations face is potential resistance from incumbent informal and semi-formal operators to be absorbed or replaced by integrated public transport systems and to lose control of farebox revenue collected in cash.

An additional policy challenge in the LAC context is the role of informal and semi-formal operators in the adoption of new agendas for sustainable development and crash fatality reduction (Duduta et al., 2015; Hidalgo & Huizenga, 2013; Lauregui-Fung et al., 2019). Policies such as Vision Zero, which have been adopted in cities like Bogota, involve stringent controls over speed and safety in motorised transport, as well as calling for a combination of policy, design, enforcement, and regulation that are likely to affect paratransit. The successful adoption of such agendas will require high levels of recognition, participation, and negotiation between informal operators and public authorities in order to jointly develop strategies that contribute to the overarching objectives while reducing unintended consequences such as loss of livelihoods.

Emerging trends

Across the Global South, the dominant emerging trend amongst paratransit services is perhaps the mushrooming of potentially disruptive digital platforms related to their operation and use.

The widespread availability of mobile phones in Asian cities has altered the organisation and operation of paratransit services. Even before smartphones became ubiquitous, paratransit operators in some cities made use of cellular phones for vehicle dispatching and passenger hailing. The recent diffusion of smartphones has enabled ride-hailing apps to enter the market. Ride-hailing operators range from large regional players, such as Grab and GO-JEK, to small local operators, such as PassApp (Cambodia) and Angkas (Philippines) (Silalahi et al., 2017; Phun et al., 2018). These operators provide not only conventional sedan taxi ride-hailing services but ride-hailing services for motorcycle-taxis (GO-JEK) and other paratransit services (PassApp) as well.

In a 2019 survey of African cities, Boutueil and Quillerier (2020) identified in the region of 135 digital platforms. Briter (2018) similarly identified over 150 mobility companies on the continent. These digital platforms include, amongst others, journey planning (e.g. Ma3Route in Nairobi), ride-hailing (e.g. Swvl in Cairo), and cashless fare collection (e.g. Gona in Lagos). As in Asia, this growth has been fuelled by the diffusion of smartphones, accessible geo-location technologies, and portable connectivity (Schalekamp & Sadder,

18 Informal paratransit in the Global South

2019). Given the robust competition between emerging start-ups for market share, inevitably there will be a culling of digital platforms as some fail. As noted earlier, in the case of CFC initiatives, for instance, most initiatives amongst minibus services have failed (e.g. Bebpay in Nairobi, Faircard in Pietermaritzburg), while initiatives amongst motorcycle-taxis have proven more likely to endure (e.g. SafeBoda in Kampala, ZemExpress in Cotonou) (Tinka & Behrens, 2019). As in other parts of the world, technology disruptions have already occurred in for-hire services, with ride-hailing services gaining market share at the expense of metered taxis in many cities. It remains to be seen whether these digital platforms will find as fertile ground amongst informal paratransit operators. It also remains to be seen whether these digital platforms might facilitate the introduction of 'Mobility-as-a-Service' systems that include informal operators and enable better 'first-last mile' paratransit service integration with mass trunk public transport (see also Chapter 22).

In LAC cities, a fertile ecosystem for start-ups has given rise to either homegrown initiatives or adaptations of platforms from elsewhere to local conditions. Local and global entrepreneurs have introduced new forms of unregulated services such as microtransit and ride-hailing. Latin America is the fastest-growing and most profitable region for the ride-hailing company Uber, with the highest number of simultaneous trips, more than 25 million monthly active riders across 15 countries (Moed, 2018). Brazil is Uber's second-largest market in the world, with 500,000 drivers (Darlington & Londoño, 2017). Uber has developed new products for specific market needs in the region, such as Uber Lite (a less data-demanding version of the Uber app) for areas where internet connection is more costly or slower. The company also launched UberMoto for motorcycle-taxis in the Dominican Republic. Aside from Mexico and Chile, microtransit services have not gained significant market share in LAC. In Mexico City, there are a few companies, the most popular of which are Urbvan and Jetty. Urbvan started as a pilot in 2016 with only 5 vehicles, growing to 230 in 2020. Jetty was founded in 2016 and has recently expanded operations to Puebla. In Santiago, Urbvan started operating in 2018. The operation of these market entrants has been hampered by a lack of public sector regulation and violent acts on drivers by incumbent operators (Flores Dewey, 2019).

Digital platforms impact for-hire paratransit organisation and operation. Operators no longer need to gather at designated hubs to wait for passengers but connect directly via the app. Because of the apps, motorcycle-taxi drivers can be more productive and earn more income and can supplement income during the off peak by providing food and parcel delivery services (Phun et al., 2018). Relying on ride-hailing apps for access to passengers and other businesses, paratransit operators pay subscriptions to ride-hailing service providers rather than protection fees to the route- or area-based association, thereby removing the need to join the association. Some ride-hailing service

18 Informal paratransit in the Global South

providers in Asian cities also provide welfare and fringe benefits to drivers, such as liability insurance and loans for purchasing new vehicles.

Regulatory authorities have typically been slow to catch up with these technology disruptions. Several countries have enacted regulations for ride-hailing operators or are in the process of doing so, but most only target ride-hailing sedan cars competing with conventional metered taxis (Mutiarin et al., 2019; Li et al., 2018). In Asia, only Indonesia has introduced regulations for ride-hailing motorcycle-taxis, but effectiveness remains to be evaluated (Ford & Honan, 2017). In LAC, apart from Mexico and Brazil, ride-hailing has yet to be regulated on a national scale.

Conclusion

This chapter set out to synthesise current knowledge of informal paratransit services in cities of the Global South and to discuss prevailing policy issues and emerging trends. While illustrating that the sector is highly heterogeneous, a review of business, regulatory, and operating practices showed that paratransit services are usually operated by small businesses, organised into associations that exert varying degrees of self-regulation. Service operations are seldom free of state regulation, but the extent of the regulation and enforcement can vary considerably.

Across the three regions analysed, operating environments often have considerable infrastructure deficits. Services are, in many cases, a response to gaps left by formal public transport undertakings. Driver employment conditions can be exploitative, and it is not uncommon for drivers to bear the revenue risk. Prevailing business models, however, make operators demand responsive, often providing the only service available to socially vulnerable groups.

Common policy challenges include integration with other public transport modes and service quality and safety improvement. These policy challenges are compounded by poorly resourced regulatory authorities, often subjected to pervasive corruption. An emerging trend across the Global South takes the form of potentially disruptive technologies appearing in the informal paratransit sector, most commonly in the form of ride-hailing apps. These platforms may have a significant impact on operating practices. Few cities have regulatory frameworks in anticipation of this change. Experience suggests that attempts to change the business models and operating practices of incumbent operators through the overhaul of regulatory and enforcement frameworks will often be met with resistance. Careful analysis of local dynamics and policy options is therefore required in this sector.

As a final note, this chapter was written before the global outbreak of the COVID-19 pandemic and the lockdown regulations that ensued. At the time of writing this addendum, there is widespread conjecture on the lasting impact that the period of imposed social distancing may have on behaviours across a

18 Informal paratransit in the Global South

variety of sectors. This is particularly true for the passenger transport sector, where the impacts of lockdown regulations have been extensive. The purpose of this addendum is to discuss the possible long-term impacts of the COVID-19 pandemic on informal paratransit.

While lockdown regulations have varied across countries, a common feature has been either the suspension of public transport services or the imposition of vehicle occupancy limitations. As noted in this chapter, a feature of informal paratransit services is their high vehicle occupancy and productivity, driven by small profit margins and driver remuneration models directly linked to ridership. When suspensions or occupancy limitations are imposed on formal mass transit services, there are a variety of contractual or fare policy mechanisms in place to compensate operators for the resultant loss of earnings. When suspensions or occupancy limitations are imposed on informal paratransit services, the brunt of the earnings loss is felt by the vehicle drivers and owners. Hence, lockdown compliance in some countries of the Global South has been weak, because to comply means running at a loss. Moreover, in many low-income neighbourhoods where residents are unable to work remotely or to substitute already precarious livelihoods, people have continued commuting despite lockdown restrictions, with informal paratransit as their main lifeline to maintain income.

The COVID-19 pandemic may have long-term impacts on technology disruption and state subsidisation. With regard to technology, the need to reduce contact between passengers and vehicle crews, as well as to manage occupancy through reserved seating, has aligned the objectives of some pilot technology projects, such as Jetty in Mexico City, closely to pandemic responses. This might accelerate their disruptive effect in the long term. With regard to subsidisation, there has been a longstanding call from informal paratransit owner associations for operating subsidies, usually motivated by an equity argument to level the playing field with other public transport modes. These calls have generally been resisted by regulatory authorities on the grounds that they cannot subsidise tax and labour non-compliant services, that subsidising informality would be counterproductive to policy objectives of industry formalisation, and that expanding public transport subsidisation is not fiscally feasible. However, the operating losses in a vulnerable economic sector resulting directly from lockdown regulations imposed by the state arguably represent a stronger case for some form of immediate state subsidisation or compensation. It is possible that regulatory authorities may be forced to soften their earlier reluctance to subsidising paratransit during lockdown, and this may lead to innovative forms of subsidy that endure beyond COVID-19. Some commentators have, for instance, suggested that subsidies might take the form of subsidised fuel costs, to the benefit of drivers, or subsidised vehicle purchase repayments, to the relief of owners. An important policy challenge will be to ensure that any such state support

18 Informal paratransit in the Global South

benefits quality of service to the passenger rather than subsidising operating inefficiencies.

References

- Ardila, A. (2007). How public transportation's past is haunting its future in Bogotá, Colombia. *Transportation Research Record*, 2038, 9–15. doi:10.3141/2038-02
- Ardila, A., & Rodríguez, D. (2000). How chaos does not destroy ridership: Operations of an exclusive busway carrying more than 35,000 passengers per hour per direction. *Transportation Research Record*, 1726, 1–7. doi:10.3141/1726-01
- Arnado, J. D. D., Gogo, H. B., & Abocejo, F. T. (2017). *Public utility jeepneys (PUJs) in Cebu City, Central Philippines: Regulations and implications to traffic congestion*. International Conference on Law, Business, Education and Corporate Social Responsibility (LBECSSR-17), Manila.
- Behrens, R., McCormick, D., & Mfinanga, D. (2016). An introduction to paratransit in sub-Saharan African cities. In R. Behrens, D. McCormick, & D. Mfinanga (Eds.), *Paratransit in African cities: Operations, regulation and reform* (pp. 1–41). Routledge. www.routledge.com/Paratransit-in-African-Cities-Operations-Regulation-and-Reform-1st-Edition/Behrens-McCormick-Mfinanga/p/book/9780415870337
- Behrens, R., McCormick, D., Orero, R., & Ommeh, M. (2017a). Improving paratransit service: Lessons from inter-city matatu cooperatives in Kenya. *Transport Policy*, 53, 70–88. doi:10.1016/j.tranpol.2016.09.003
- Behrens, R., Zuidgeest, M., Hawver, H., & Birungi, C. (2017b). *Case study investigation of unscheduled feeder and scheduled trunk service relationships in Cape Town*. Paper presentation. 36th Southern African Transport Conference. <http://hdl.handle.net/2263/62736>
- Berrones-Sanz, L. D. (2018). The working conditions of motorcycle taxi drivers in Tláhuac, Mexico City. *Journal of Transport and Health*, 8, 73–80. doi:10.1016/j.jth.2017.04.008
- Bishop, T., & Amos, P. (2015). Opportunities to improve road safety through 'boda-boda' associations in Tanzania. *Final Report. AfCAP project TAN2015G*. Africa Community Access Partnership (AfCAP).
- Bishop, T., Barber, C., Adu, J., Afukaar, F., Muhia, G., Mwaipopo, H., Ekirapa-Kiracho, E., Rettie, N., Krasnolucka-Hickman, A., Divall, D., & Porter, G. (2018). *Enhancing understanding on safe motorcycle and three-wheeler use for rural transport, RAF2114A*. Africa Community Access Partnership (AfCAP).
- Boutueil, V., & Quillier, T. (2020). *The rise of paratransit digital platforms in large African metropolises: Competitive strategies between*

18 Informal paratransit in the Global South

international and local platforms. Paper presentation. Transportation Research Board Annual Meeting.

- Briter. (2018). *Digitising mobility in Africa*. Retrieved January 1, 2020, from <https://briterbridges.com/innovation-maps>.
- Cerio, C. T. (2017). The motorcycle taxi phenomenon in the Philippines: Is the demise of jeepney possible? *International Journal of Tourism and Hospitality Reviews*, 4(1), 44–52. doi:10.18510/ijthr.2017.421
- Cervero, R. (2000). *Informal transport in the developing world*. UN-HABITAT.
- Cervero, R., & Golub, A. (2007). Informal transport: A global perspective. *Transport Policy*, 14(6), 445–457. doi:10.1016/j.tranpol.2007.04.011
- Chalermpong, S., Ratanawaraha, A., & Sucharitkul, S. (2016). Market and institutional characteristics of passenger van services in Bangkok, Thailand. *Transportation Research Record*, 2581(1), 88–94. doi:10.3141/2581-11
- Cities Development Initiatives for Asia. (2011). *Informal public transportation network in three Indonesian cities*. Retrieved December 4, 2019, from <https://cdia.asia/publication/informal-public-transportation-networks-in-three-indonesian-cities/>
- Darlington, S., & Londoño, E. (2017). *Brazil becomes Uber's latest regulatory battleground*. Retrieved November 11, 2019, from www.nytimes.com/2017/11/05/world/americas/uber-brazil-regulation.html
- David, L. M. (2019). A day in the life of a jeepney driver: Why modernization cuts deep. *ABS-CBN News*. Retrieved December 11, 2019 <https://news.abs-cbn.com/spotlight/multimedia/slideshow/09/30/19/a-day-in-the-life-of-a-jeepney-driver-why-modernization-cuts-deep>
- Diaz Olvera, L., Guézéré, A., Plat, D., & Pochet, P. (2016). Earning a living, but at what price? Being a motorcycle taxi driver in a sub-Saharan African city. *Journal of Transport Geography*, 55, 165–174. doi:10.1016/j.jtrangeo.2015.11.010
- Duduta, N., Adiazola, C., Hidalgo, D., Lindau, L. A., & Jaffe, R. (2015). Traffic safety in surface public transport systems: A synthesis of research. *Public Transport*, 7(2), 121–137. doi:10.1007/s12469-014-0087-y
- Dugard, J. (2001). *From low-intensity war to mafia war: Taxi violence in South Africa, 1987–2000* (Vol. 4). Centre for the Study of Violence and Reconciliation.
- Du Preez, D., Zuidgeest, M., & Behrens, R. (2019). A quantitative clustering analysis of paratransit route typology and operating attributes in Cape Town. *Journal of Transport Geography*, 80. doi:10.1016/j.jtrangeo.2019.102493

18 Informal paratransit in the Global South

- Ehebrecht, D., Heinrichs, D., & Lenz, B. (2018). Motorcycle-taxis in sub-Saharan Africa: Current knowledge, implications for the debate on 'informal' transport and research needs. *Journal of Transport Geography*, *69*, 242–256. doi:10.1016/j.jtrangeo.2018.05.006
- Estache, A., & Gómez-Lobo, A. (2005). Limits to competition in urban bus services in developing countries. *Transport Reviews*, *25*(2), 139–158. doi:10.1080/0144164042000289654
- Evans, J., O'Brien, J., & Ch Ng, B. (2018). Towards a geography of informal transport: Mobility, infrastructure and urban sustainability from the back of a motorbike. *Transactions of the Institute of British Geographers*, *43*, 674–688. doi:10.1111/tran.12239
- Flores Dewey, O. (2019). *App-based collective transport service in Mexico City: A start-up case study*. *International Transport Forum Discussion Papers* (No. 2019/01). OECD Publishing.
- Ford, M., & Honan, V. (2017). *The Go-jek effect*. ISEAS-Yusof Ishak Institute.
- Gamble, J., & Puga, E. (2017). *Is informal transit land-oriented? Investigating the links between informal transit and land-use planning in Quito, Ecuador*. Lincoln Institute of Land Policy (Working Paper WP19JG1).
- Goldwyn, E., & Vergel-Tovar, E. (2018). *Mapping the unmapped transit network of Bogotá, Colombia*. Paper presentation. Transportation Research Board 97th Annual Meeting. <https://trid.trb.org/view/1495944>
- Goletz, M., & Ehebrecht, D. (2019). How can GPS/GNSS tracking data be used to improve our understanding of informal transport? A discussion based on a feasibility study from Dar es Salaam. *Journal of Transport Geography*. doi:10.1016/j.jtrangeo.2018.08.015
- Gwilliam, K. (2011). *Africa's transport infrastructure: Mainstreaming maintenance and management*. World Bank.
- Heinrichs, D., & Bernet, J. S. (2014). Public transport and accessibility in informal settlements: Aerial cable cars in Medellín, Colombia. *Transportation Research Procedia*, *4*, 55–67. doi:10.1016/j.trpro.2014.11.005
- Heinrichs, D., Goletz, M., & Lenz, B. (2017). Negotiating territory: Strategies of informal transport operators to access public space in urban Africa and Latin America. *Transportation Research Procedia*, *25*, 4507–4517. doi:10.1016/j.trpro.2017.05.346
- Hidalgo, D., & Huizenga, C. (2013). Implementation of sustainable urban transport in Latin America. *Research in Transportation Economics*, *40*(1), 66–77. doi:10.1016/j.retrec.2012.06.034
- Hidalgo, D., & King, R. (2014). Public transport integration in Bogota and Cali, Colombia: Facing transition from semi-deregulated services to full regulation citywide. *Research in Transportation Economics*, *48*, 166–175. doi:10.1016/j.retrec.2014.09.039

18 Informal paratransit in the Global South

- Hongtong, T. (2019). *Old van replacements no longer required*. Retrieved December 5, 2019, from www.bangkokpost.com/thailand/general/1729679/old-van-replacements-no-longer-required
- Institute for Transportation and Development Policy. (2019). *Public transport reform guideline for Indonesian cities*. Retrieved December 5, 2019, from www.itdp.org/publication/public-transport-reform-guideline-indonesian-cities/
- Jauregui-Fung, F., Kenworthy, J., Almaaroufi, S., Pulido-Castro, N., Pereira, S., & Golda-Pongratz, K. (2019). Anatomy of an informal transit city: Mobility analysis of the metropolitan area of Lima. *Urban Science*, 3(3), 67. doi:10.3390/urbansci3030067
- Kawaguchi, H., Kuromizu, K., & Yagi, S. (2013). *A minibus supply control measure in Indonesia*. 13th WCTR, Rio de Janeiro.
- Kemajou, A., Jaligot, R., Bosch, M., & Chenal, J. (2019). Assessing motorcycle taxi activity in Cameroon using GPS devices. *Journal of Transport Geography*, 79, 102472. doi:10.1016/j.jtrangeo.2019.102472
- Kerzhner, T., & Martens, K. (2018). *The role of labour informality in paratransit services: Case study of Lubumbashi, Democratic Republic of the Congo*. Paper presentation. Transportation Research Board 97th Annual Meeting. <https://trid.trb.org/view/1495748>
- Kisaalita, W., & Sentongo-Kibalama, J. (2007). Delivery of urban transport in developing countries: The case for the motorcycle taxi service (boda-boda) operators of Kampala. *Development Southern Africa*, 24(2), 345–357. doi:10.1080/03768350701327319
- Klopp, J., & Cavoli, C. (2017). Mapping minibuses in Maputo and Nairobi: Engaging paratransit in transportation planning in African cities. *Transport Reviews*, 39(5), 657–676. doi:10.1080/01441647.2019.1598513
- Klopp, J., & Mitullah, W. (2016). Politics, policy and paratransit: A view from Nairobi. In R. Behrens, D. McCormick, & D. Mfinanga (Eds.), *Paratransit in African cities: Operations, regulation and reform* (pp. 79–99), Routledge. www.routledge.com/Paratransit-in-African-Cities-Operations-Regulation-and-Reform-1st-Edition/Behrens-McCormick-Mfinanga/p/book/9780415870337
- Kumar, A., & Diou, C. (2010). *Bus renewal scheme in Dakar: Before and after* (No. 66939, pp. 1–95). World Bank.
- Kumar, M., Singh, S., Ghate, A. T., Pal, S., & Wilson, S. A. (2016). Informal public transport modes in India: A case study of five city regions. *IATSS Research*, 39(2), 102–109. doi:10.1016/j.iatssr.2016.01.001
- Land Transportation Franchising and Regulatory Board. (2017). *PUV modernization*. Retrieved December 5, 2019, from <http://ltfrb.gov.ph/index.php/puv-modernization-2/>

18 Informal paratransit in the Global South

- Li, Y., Taelhagh, A., & De Jong, M. (2018). The governance of risks in ridesharing: A revelatory case from Singapore. *Energies*, *11*(5), 1277. doi:10.3390/en11051277
- Mahitthirook, A., & Nanuam, W. (2017). Microbuses to replace passenger vans this year. *Bangkok Post*. Retrieved December 5, 2019, from www.bangkokpost.com/thailand/general/1175508/microbuses-to-replace-passenger-vans
- McCormick, D., Mitullah, W., Chitere, P., Orero, R., & Ommeh, M. (2013). Paratransit business strategies: A bird's-eye view of matatus in Nairobi. *Journal of Public Transportation*, *16*(2), 135–152. doi:10.5038/2375-0901.16.2.7
- McCormick, D., Schalekamp, H., & Mfinanga, D. (2016). The nature of paratransit operations. In R. Behrens, D. McCormick, & D. Mfinanga (Eds.), *Paratransit in African cities: Operations, regulation and reform* (pp. 59–78). Routledge. www.routledge.com/Paratransit-in-African-Cities-Operations-Regulation-and-Reform-1st-Edition/Behrens-McCormick-Mfinanga/p/book/9780415870337
- Moed, J. (2018). Uber's wild ride to make Latin America its fastest growing region. Retrieved February 24, 2020, from www.forbes.com/sites/jonathanmoed/2018/12/20/is-uber-operating-illegally-in-its-fastest-growing-region/#eb9f77d19251
- Mutiarin, D., Nurmandi, A., Jovita, H., Fajar, M., & Lien, Y. N. (2019). How do government regulations and policies respond to the growing online-enabled transportation service (OETS) in Indonesia, the Philippines, and Taiwan? *Digital Policy, Regulation and Governance*, *21*(4), 419–437. doi:10.1108/DPRG-01-2019-0001
- Mutiso, W., & Behrens, R. (2011). *Boda boda bicycle taxis and their role in urban transport systems: Case studies of Nakuru and Kisumu, Kenya*. 30th Southern African Transport Conference: Africa on the Move, Pretoria. <http://hdl.handle.net/2263/17308>
- Oviedo, D., & Dávila, J. D. (2016). Transport, urban development and the peripheral poor in Colombia: Placing splintering urbanism in the context of transport networks. *Journal of Transport Geography*, *51*, 180–192. doi:10.1016/j.jtrangeo.2016.01.003
- Oviedo, D., & Titheridge, H. (2016). Mobilities of the periphery: Informality, access and social exclusion in the urban fringe in Colombia. *Journal of Transport Geography*, *55*, 152–164. doi:10.1016/j.jtrangeo.2015.12.004
- Parra, F. R., Garcias, C. M., Rogers, R., Asher, F., Castells, M., Lerner, J., & Koolhaas, R. (2005). *El transporte público colectivo en Curitiba y Bogotá*. Revista de Ingeniería. Universidad de Los Andes.
- Phun, V. K., Masui, R., & Yai, T. (2015). The future prospects of paratransit service in Phnom Penh. *Proceedings of the 7th Regional Symposium on Infrastructure Development*, *20*(7), 221–226.

18 Informal paratransit in the Global South

- Phun, V. K., Masui, R., & Yai, T. (2018). Operational characteristics of paratransit services with ride-hailing apps in Asian developing cities: The Phnom Penh case. *Journal of Transportation Technologies*, 8(4), 291. doi:10.4236/jtts.2018.84016
- Rañosa, L. L., Fillone, A. M., & De Guzman, M. P. (2017). Jeepney service operation and demand in Baguio City, Philippines. *Proceedings of the Eastern Asia Society for Transportation Studies*, 11.
- Rasmussen, J. (2012). Inside the system, outside the law: Operating the matatu sector in Nairobi, *Urban Forum*, 23, 415–432. doi:10.1007/s12132-012-9171-z
- Ratanawaraha, A., & Chalermpong, S. (2015). Monopoly rents in motorcycle taxi services in Bangkok. Thailand. *Transportation Research Record*, 2512(1), 66–72. doi:10.3141/2512-08
- Ratanawaraha, A., & Chalermpong, S. (2018). How operators' legal status affects safety of intercity buses in Thailand. *Transportation Research Record*, 2672(31), 99–109. doi:10.1177/0361198118758286
- Ratanawaraha, A., & Chalermpong, S. (2019). *Operational models, drivers' compensation, and bus service quality in Bangkok*. Paper presentation. 98th Annual Meeting of the Transportation Research Board.
- Regidor, J. R. F., Vergel, K. N., & Napalang, M. S. G. (2009). Environment friendly paratransit: Re-engineering the jeepney. *Proceedings of the Eastern Asia Society for Transportation Studies*, 7, 272–272. doi:10.11175/eastpro.2009.0.272.0
- Rodriguez, C., Peralta-Quirós, T., Guzman, L. A., & Reyes, S. A. C. (2017). Accessibility, affordability, and addressing informal services in bus reform. *Transportation Research Record*, 2634, 35–42. doi:10.3141/2634-06
- Rodríguez Baquero, L. E., & Nuñez Cetina, S. (2003). *Empresas públicas de transporte en Bogotá: Siglo XX*. Alcaldía de Bogotá.
- Saddier, S., & Johnson, A. (2018). *Understanding the operational characteristics of paratransit services in Accra, Ghana: A case study*. Paper presentation. 37th Southern African Transport Conference. <http://hdl.handle.net/2263/69574>
- Saddier, S., McLachlan, N., & Dass, D. (2019). *Measuring the evolution of passenger satisfaction following the introduction of scheduled services: The case of the 7th Avenue Minibus-Taxi Association in Mitchells Plain*. Paper presentation. 38th Southern African Transport Conference. www.satc.org.za/assets/3a_06-saddier-mclachlan-dass.pdf
- Saddier, S., Patterson, Z., Johnson, A., & Chan, M. (2016). Mapping the jitney network with smartphones in Accra, Ghana: The AccraMobile Experiment. *Transportation Research Record*, 2581, 113–122. doi:10.3141/2581-14

18 Informal paratransit in the Global South

- Schalekamp, H., & Klopp, J. (2018). *Beyond BRT: Innovation in minibus-taxi reform in South African cities*. Paper presentation. 37th Southern African Transport Conference. <http://hdl.handle.net/2263/69575>
- Schalekamp, H., & Saddier, S. (2019). *Emerging business models and service options in the shared transport sector in African cities*. Volvo Research and Educational Foundation.
- Sengers, F., & Raven, R. (2014). Metering motorbike mobility: Informal transport in transition? *Technology Analysis and Strategic Management*, 26(4), 453–468. doi:10.1080/09537325.2013.870991
- Silalahi, S. L. B., Handayani, P. W., & Munajat, Q. (2017). Service quality analysis for online transportation services: Case study of GO-JEK. *Procedia Computer Science*, 124, 487–495. doi:10.1016/j.procs.2017.12.181
- Suárez, M., Murata, M., & Delgado Campos, J. (2016). Why do the poor travel less? Urban structure, commuting and economic informality in Mexico City. *Urban Studies*, 53(12), 2548–2566. doi:10.1177/0042098015596925
- Tinka, A., & Behrens, R. (2019). *Cashless fare collection in sub-Saharan African paratransit: A review of experiences*. Paper presentation. 38th Southern African Transport Conference. <http://hdl.handle.net/2263/74251>
- Venter, C., Mahendra, A., & Hidalgo, D. (2019). *From mobility to access for all: Expanding urban transportation choices in the Global South (Working Paper)*. World Resources Institute.
- Warren, J. P., & Ortegon-Sanchez, A. (2016). Designing and modelling Havana's future bus rapid transit. *Proceedings of the Institution of Civil Engineers – Urban Design and Planning*, 169(2), 104–119. doi:10.1680/jurdp.15.00015
- Wicaksono, A., Lim, I., Muromachi, Y., Vergel, K. N., Choocharukul, K., Tan, V. H., & Yai, T. (2015). Road-based urban public transport and paratransit in six Asian countries: Legal conditions and intermodal issues. *Journal of the Eastern Asia Society for Transportation Studies*, 11, 227–242. doi:10.11175/easts.11.227
- Willoughby, C. (2013). How much can public private partnership really do for urban transport in developing countries? *Research in Transportation Economics*, 40(1), 34–55. doi:10.1016/j.retrec.2012.06.038
- Wu, I., & Pojani, D. (2016). Obstacles to the creation of successful bus rapid transit systems: The case of Bangkok. *Research in Transportation Economics*, 60, 44–53. doi:10.1016/j.retrec.2016.05.001
- Yañez-Pagans, P., Martínez, D., Mitnik, O. A., Scholl, L., & Vazquez, A. (2018). *Urban transport systems in Latin America and the Caribbean: Challenges and lessons learned*. Technical Note N° IDB-TN-01518, Inter-American Development Bank.

18 Informal paratransit in the Global South