



The case for investing in paratransit

Strategies for regulation
and reform

Volvo Research & Educational Foundations

This research synthesis summarizes, updates and presents the main messages in the book publication *Paratransit in African Cities: operations, regulation and reform*, edited by Roger Behrens, Dorothy McCormick and David Mfinanga (Routledge, 2016).

The synthesis was produced by Gail Jennings and Roger Behrens, in cooperation with the Volvo Research & Educational Foundations. We encourage readers to refer to the book publication for greater detail on the issues discussed in this synthesis, obtainable at <https://www.routledge.com/Paratransit-in-African-Cities-Operations-Regulation-and-Reform/Behrens-McCormick-Mfinanga>.

The authors wish to thank the Volvo Research and Educational Foundations (VREF, www.vref.se) for the generous funding awarded to the Universities of Cape Town, Dar es Salaam and Nairobi to initiate the research projects which formed the basis of this research. These research projects formed part of a broader research programme conducted by the African Centre of Excellence for Studies in Public and Non-motorised Transport (ACET, www.acet.uct.ac.za).

CITATION

Jennings, G & Behrens, R (2017) *The case for investing in paratransit strategies for regulation and reform*. Volvo Research and Educational Foundations (VREF). May 2017

Layout and design: Colleen Mulrooney

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Relatively new paratransit vehicles at a formal rank in Cape Town, South Africa. Credit: Rodger Bosch



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We have not included individual references or citations in this synthesis which have already been included in the book publication.

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*Minibus-taxi vehicles seldom have spare seating for children.
Credit: Rodger Bosch*

Paratransit: the dominant mode in Sub-Saharan cities



In Sub-Saharan African cities the pressure to provide affordable transportation, and match the needs of the entire and rapidly expanding urban population, has placed formal public transport systems under such strain over recent decades that they have largely collapsed or disappeared altogether. Paratransit emerged to fill the gap.

The appearance of paratransit was seldom the result of a deliberate policy, but rather, a localized response to growing numbers of unserved passengers, and a regulatory vacuum that placed few restrictions on entry into this market.

Today paratransit accounts for between 50-98% of passenger trips in Sub-Saharan cities.

Paratransit vehicles are known by different names in different countries: *daladalas* in Tanzania, *danfos* in Nigeria, *matatus* in Kenya, *trotros* in Ghana, *car rapides* in Senegal, *gbakas* in Côte d'Ivoire, *chapas* in Mozambique, and 'minibus-taxis' in South Africa.

“Where paratransit and formal public transport systems duplicate services, they are ‘non-complementary’ and can undermine each other’s operations in the competition for passengers.”

The advantages and disadvantages of paratransit

Paratransit provides essential services for the majority of urban dwellers, but it is not without its particular challenges and failings.

Small-scale individual ownership enabled paratransit to develop in an adaptive and flexible manner; fares are inexpensive, and the services are flexible enough to rapidly respond to changes in demand and passenger needs. Yet it is



‘Paratransit’ refers to demand-driven, unscheduled public transport provided by small operators, typically in mini- to medium-sized buses. Paratransit is sometimes called ‘informal’, but operators are not always informal businesses, and they are not necessarily unregulated.

precisely this independent nature of paratransit, the multiple individual owners and irregular operations, that makes it difficult for authorities to manage the industry and co-ordinate and plan the network.

Demand-responsiveness has its downside. A flexible approach to providing services is often accompanied by unsafe operations, and a disinclination to comply with transport policies, traffic safety regulations, and more general legal requirements (such as conditions of employment and the payment of taxes).

There are structural incentives to poor customer service and dangerous paratransit driver behaviour. The target system – where drivers keep whatever remains of the fare revenue after they have paid the owner for the use of the vehicle, and fuel costs – encourages aggressive competition for passengers, speeding, vehicle overcrowding, the ‘fill-and-go’ system, and the provision of poor or no service during off-peak periods and on low-demand routes.

The paratransit industry is at times a tenuous one, operating and surviving on marginal profits. Managing businesses on a cash-basis and ignoring vehicle depreciation means that vehicles are often kept in service longer than they should be. It is common to find vehicles that are old, poorly maintained, and dangerous.

The paratransit and formal public transport systems are often duplicative and ‘non-complementary’, undermining each other’s operations and competing for passengers.

*Evening peak in Cape Town, South Africa. The bus and minibus taxi (BMT) lane is visible centre right.
Credit: Rodger Bosch*

‘Demand-responsiveness has its downside. Flexibility is often accompanied by unsafe operations, and a disinclination to comply with transport policies, traffic safety regulations, and more general legal requirements, from conditions of employment to paying taxes.’

Paratransit: a critical part of the transport mix

Across Africa, transport reform is high on the agenda as cities confront the multiple challenges of congestion, pollution, long commutes, high road crash and fatality rates, transport costs – to users and service providers – and inequitable access to and allocation of public resources.

Bus Rapid Transit (BRT) is the most commonly proposed intervention. With notable exceptions in West Africa, the most popular reform initiative is that of phased (corridor-by-corridor), comprehensive Bus Rapid Transit (BRT) implementation – influenced by this mode's widely acclaimed successes in public transport improvement in Latin American cities.

An anticipated outcome of BRT is that it will replace paratransit, corridor by corridor. The initial intention of most BRT initiatives is to replace paratransit services, first by corporatizing incumbent operators, then through their phased incorporation into contracted, BRT-operating companies as part of an integrated network. The vision is that once all BRT corridors are constructed, the majority of the city would fall within the catchment of formalized services, and the existing paratransit services will become superfluous.

Experience in Sub-Saharan Africa and in some instances within the Global South has shown, however, that there is little prospect of replacing paratransit *in toto* with BRT. The established interests of incumbent paratransit operators are powerful, and the financial and regulatory capacities of responsible government agencies are often weak. In all likelihood, Sub-Saharan cities will depend, for decades to come, on paratransit modes.

■ Firstly, this is because paratransit business owners or operators have historically resisted comprehensive replacement – and are likely to continue to do so. Operators are often well organised, have a history of violent engagement with competitors and authorities, and are capable of rendering new BRT services inoperable

through illegal means. Phased BRT may simply displace paratransit to other corridors of a city, and the problem of dealing with these operators is deferred.

Ignoring paratransit operators, or insufficiently engaging with them in finding complementary and inclusive solutions, ultimately risks transport reform as a whole. As later project phases become increasingly more difficult to negotiate and implement as a result of incumbent resistance, so the risk increases that improvements are not extended beyond demonstration corridors.

■ Secondly, many Sub-Saharan cities currently do not have the institutional capacity to implement BRT. This has led, for example, to significant errors in the estimation of capital costs, operating subsidy requirements, and implementation timeframes.



Ignoring paratransit operators, or insufficiently engaging with them in finding complementary and inclusive solutions, ultimately risks transport reform as a whole.

Cape Town's BRT system, MyCiTi – Table View route.
Credit: Rodger Bosch

A hybrid public transport system is one where formal and informal systems co-exist. This co-existence is referred to as 'complementary' (or as exhibiting 'operational complementarity') when each service has an identified and integrative role in the system.

■ Thirdly, in most instances, Sub-Saharan cities cannot afford full-specification BRT (with *in toto* paratransit replacement) beyond the initial corridor phases. Most high-spec formal public transport systems around the world are subsidized; where such systems are unsubsidized, they operate within urban forms and socio-demographic situations significantly different to most Sub-Saharan cities. Few SSA countries have the fiscal resources to heavily subsidize public transport systems sustainably over the long term. Thus the exposure to financial risk at municipal level is high, and the prospects of advancing beyond initial BRT corridor phases are limited.

Hybrid public transport systems are therefore inevitable – it is best to plan for them from the start. Even in cities able to initiate projects to install formal, scheduled services, paratransit operations are likely to remain. Hybrid public transport systems, where formal and informal systems co-exist, are the most likely outcome.



‘ Experience in Sub-Saharan Africa has shown... that there is little prospect of replacing paratransit *in toto* with BRT. ’

Preparing for public transport reform: institutional overhaul

Sub-Saharan African experience indicates that institutional reform is a pre-requisite to public transport reform. This reform is likely to include:

- an accountable urban transport authority (able to plan the service network, administer regulation, and guide the development of the sector);
- an empowered regulatory framework (providing the legal basis to impose an appropriate mix of obligations and incentives, with safety and consumer protection safeguards);
- a secure source of funding (for fleet renovation, for infrastructure improvements, and to finance against business contracts, rather than just the security of assets and other collateral); and
- a public transport industry amenable to regulatory control, ready to compete for the right to operate specified services, and willing to invest in fleet capacity and quality.



Matatus and boda bodas (motorbike taxis) in Nairobi, Kenya.
Credit: Roger Behrens

CASE STUDY

INSTITUTIONAL REFORM

The Lagos Metropolitan Area Transport Authority (LAMATA), Lagos, Nigeria

The Lagos Metropolitan Area Transport Authority

(LAMATA) was established in 2003 to create institutional capacity to plan and manage the state's transport system. Its first goal was to execute the Lagos Urban Transport Project (LUTP), and ultimately to promote the coordinated development of all public transport modes in the metropolis. In 2007 a revised LAMATA Law was passed that included the function to: '... regulate rail and other modes of transportation'.

LAMATA developed the public transport system principally through the introduction of higher-order bus services under franchise agreement and the launch of the Lagos BRT-Lite system. The latter involved a public / private partnership with the state chapter of the National Union

of Road Transport Workers, the dominant paratransit operator in the metropolis, which procured the requisite buses and delivers the BRT services.

One key factor in LAMATA's durability and independence has been its financial security. Its inception was directly supported financially and technically by the World Bank, but this has now been supplanted through a lien on all vehicle licence and permit fees in the state granted by the Motor Vehicle Administration Law (2007). Further, LAMATA is empowered to levy franchise fees and access charges for the BRT infrastructure to defray the costs of managing the system management and maintaining the route infrastructure.

CASE STUDY

INSTITUTIONAL REFORM

Executive Council of Urban Transport (CETUD), Dakar, Senegal

The centrepiece of institutional reform in Dakar is CETUD, the *Conseil Exécutif des Transports Urbains à Dakar* (Executive Council of Urban Transport in Dakar), which was established in 1997. Its most important role is public transport planning, and it prepared the *Plan de Déplacements Urbains de Dakar* (Urban Mobility Plan) 2002-06.

CETUD is responsible for:

- determining routes, licencing quotas, and technical operating terms;
- assembling tender documents, signing agreements with service providers, and overseeing contract implementation;
- proposing tariff policies to the appropriate authorities;
- developing market entry criteria;
- preparing research, training and information

- regarding urban public transport;
- coordinating different types of public transport, and arbitrating the division of profits in the case of tariff integration;
- developing and supporting financing mechanisms to improve infrastructure, traffic, and road safety services; and
- improving the condition and quality of the transport fleet to mitigate air pollution.

Like with LAMATA, CETUD has been supported by funding from World Bank urban transport projects. In parallel to CETUD, a financial structure has been created in order to finance CETUD's current budget and actions in the sector; the *Fonds de Développement des Transports Urbains* (Urban Transport Development Fund), benefits from a yearly contribution from the state.

Sub-Saharan African experience indicates that institutional reform is a pre-requisite to public transport reform.



The formal bus service (UDA) in Dar es Salaam, Tanzania, is now part of the BRT operating company, together with two dala dala associations.

Credit: Khalfan Said

CASE STUDY

INSTITUTIONAL REFORM

Urban Transport Agency (AGETU), Abidjan, Côte d'Ivoire

Although Abidjan's Urban Transport Agency, Agence des Transports Urbains (AGETU), was created in 2000 as a state body (controlled by the Ministry of Transport), it has only operated since 2005 when supporting taxation laws were adopted by the Ivorian Parliament.

AGETU deals with both the regulated bus operator and the unregulated paratransit operators, under various franchise or permit schemes.

Among other tasks, it:

- defines urban transport networks;
- issues operating licences to the operators;
- approves fares;

- manages tenders for new urban transport services;
- manages new investments; and
- monitors the application of concessions to the bus company SOTRA.

One of AGETU's main tasks is to manage the licence documents and fee receipts for the mini-buses (*gbakas*) and shared-taxis (*woro-woros*). However, from the beginning, there has been conflict with the municipalities (districts) within the conurbation, which were reluctant to relinquish the receipt of taxes they receive from the shared-taxis.

Like with LAMATA and CETUD, key is their recognition of the need for funding support and financial sustainability.

Successful hybridity: planning for both paratransit and formal modes



Cape Town, South Africa: afternoon light filters into a jam-packed paratransit vehicle. Credit: Rodger Bosch

On the basis of Sub-Saharan African and developing world experiences, it seems clear that a hybrid model, including both formal and paratransit systems, is inevitable, because of a combination of incumbent resistance, institutional capacity, and fiscal resources. In many instances, paratransit incorporation has proved unworkable and paratransit thus continues to function.

When reform projects fail to progress beyond initial phases, and end up covering only limited parts of the city, the benefits are not shared equally. Thus public transport reform strategies that recognize the continued presence of paratransit modes from the start are more likely to produce effective transport systems and more equitable allocations of limited public resources, than those strategies that ignore their continued existence. Further, it can be argued that it is unjust to force the closure of businesses developed by poorer sections of society.

Feeder-trunk-distributor models

Feeder-trunk-distributor services offer particular promise for complementary hybrid public transport systems, and the successful incorporation of paratransit incumbents. In such a system, different operators within the public transport network use appropriately sized vehicles to provide different services.

Larger buses more efficiently serve high-volume routes, while smaller buses best serve low-volume routes. Models exist where vehicles share the same lane, use adjacent lanes, or, such was the case in the Delhi BRT corridor, share the busway.

Feeder-trunk-distributor services offer the scope for complementary hybrid public transport systems that incorporate paratransit operators, using appropriately sized vehicles, to provide different services.

Paratransit operators, with smaller capacity vehicles, are typically assigned to routes with lower passenger volumes. These feeder and distribution services are usually in residential areas, where public transport demand is dispersed, or where access for large buses is a challenge (e.g. steep gradients or narrow roads). Services are provided in mixed traffic operating environments.

'Formal' operating companies are contracted to provide trunk route services, and road-space prioritization measures enable higher operating speeds. Trunk services are typically assigned to routes with higher densities of commercial and employment activity, and therefore with higher passenger volumes.

Paratransit operators may need convincing to change from direct line-haul to feeder service operations. Some paratransit operators may perceive feeder services as less lucrative than line-haul services. Cost modelling research in Cape Town suggests, however, that the opposite is often the case. Because of an increase in passenger trips per service kilometre, individual paratransit businesses would be more profitable if they provided only shorter distance feeder services, but achieving these improved operating efficiencies would entail reducing the minibus fleet and associated jobs. The 'BRT-lite' service in Lagos has an unplanned feeder-trunk-distributor arrangement in which some paratransit operators have effectively modified their routes to serve as feeders to the trunk service.

...public transport reform strategies that recognize the continued presence of paratransit modes from the start are more likely to produce effective transport systems...

A feeder-trunk-distributor service, as an alternative to comprehensive, corridor-by-corridor implementation of BRT, is able to provide a complementary network that covers the entire city. Not only would this offer a more equitable time-frame and allocation of public resources, but it would incorporate the efficiencies of larger vehicles on higher-volume corridors as well as the demand-responsiveness of paratransit in rapidly growing city edges.

CASE STUDY

HYBRIDITY

From comprehensive paratransit replacement to a planned hybrid model, Cape Town, South Africa

In Cape Town, the local authority set out to develop a high-specification BRT system in 2007, which was to eventually cover the entire city and fill gaps in the urban rail network. MyCiTi, as the project is known, was planned in a phased manner. The first trunk and feeder services commenced operations in 2011, while the full first phase of the project was completed in 2013. Existing bus and paratransit operators were given the opportunity to become the operators of MyCiTi, but the transition process has proved to be fraught with difficulties, including disgruntlement, violent opposition, and legal challenges from operators.

Construction progress outpaced operator incorporation, and the first phase's capital and operating costs have overshot estimations by some margin. In the upcoming phase the system's specification level will therefore be lowered.

In 2015 Transport for Cape Town (TCT), the transport authority for the City, announced a new model whereby paratransit operators would be contracted for the provision of MyCiTi services, or for services at public transport interchanges (taxi ranks)

The announcement stated that 'the City has, over the past six years ...learned a number of valuable lessons, including that it is not always desirable to replace all of the taxis on feeder routes with buses as minibus-taxis can offer a more frequent and adaptable service. Likewise, it is not always cost-effective to replace the taxis with a formal bus service on all of the feeder routes.'

Thus, instead of replacing minibus-taxis, the City is considering a hybrid model that combines MyCiTi buses and minibus-taxis to provide scheduled and unscheduled services alongside each other, without competing for passengers.

The new operating model includes the establishment of association-based transport operating companies (TOCs), whereby the TOC rather than the individual owns the operating licence. Individual minibus-taxi operators will be required to transfer their licences to the TOC in exchange for

shareholding in the company. The TOCs will own the vehicles and employ and train the drivers and other workers.

Because profits in the new model accrue to the TOCs as opposed to the individual operator, the assumption is that it will be in the TOC's interest to curb illegal minibus-taxi operations and to self-regulate the routes. The assumption further is that it will be in the TOC's interest to ensure that the drivers comply with the rules of the road and that their vehicles are roadworthy.

These TOCs will also be able to contract for services such as:

- Security at public transport interchanges;
- Cleaning services at public transport interchanges;
- Undertaking minor maintenance at public transport interchanges;
- Managing the advertising rights at public transport interchanges;
- Managing the land provided for depots and fuelling facilities.

The precise form of hybridity remains undetermined as yet, as Transport for Cape Town (in late 2016 renamed TDA, the Transport and Urban Development Authority) continues to model a number of scenarios. On the dedicated trunk routes of phase 2, the uncertainties are whether or not to introduce a peak-lobbing system (see page 13) – weighing up the costs of managing peak-lobbing with the reduced operational costs.

In terms of the phase 2 feeder routes, TDA is considering whether to introduce scheduled services at all, or to both introduce scheduled buses and continue to permit paratransit along the same route – essentially giving the passenger the choice between modes (each of which have their own advantages).

The important lesson from the Cape Town case is its continuous evaluation of the finance and business model, and its recognition of certain inadequacies or inefficiencies of its initial system.

Rea Vaya ("We Are Going") was conceived as a full-specification, phased BRT system in Johannesburg, the first phase of which was launched in 2009. Credit: Mobility



CASE STUDY

HYBRIDITY

Moving from Bus Rapid Transit to Integrated Public Transport, Johannesburg, South Africa

Key features of the City of Johannesburg's revision of the BRT model have been its use of passenger preference data to revise demand forecasts, and to reassess the system based on the global context and specific local needs.

In 2006, Johannesburg, in the Gauteng province of South Africa, embarked on a BRT project (Rea Vaya). Conceived as a full-specification, phased BRT service, operations were to be transferred to shareholders (formerly paratransit operators) once compensation had been successfully negotiated. Infrastructure roll-out began in 2007, and in 2009 Phase 1A started operating, with 40 buses and an interim company.

In 2003, three years previously, an Integrated Transport Plan (ITP) had been conducted for Johannesburg, and a Strategic Public Transport Network recommended. Routes for all modes were identified, but most were not implemented due to a policy switch to BRT.

Ten years later, however, a Strategic Integrated Transport Plan (SITP) Framework was approved, and in 2016 an Integrated Transport Network was prepared. A household and stated preference survey conducted for the SITP meant a revision of passenger demand forecasts, and revealed that

of the 50% of road users willing to shift to public transport, price would have a greater pull than travel time. Significant fiscal constraints and reduced grants were also of concern, and global exchange rates meant that BRT vehicles and ITS equipment had become more expensive since the project inception. Transformational complexities and ongoing paratransit industry instability didn't make things easier for the relevant authorities.

Thus, the Integrated Public Transport Network (IPTN) has learned from the initial BRT phases and looked instead at the best mode for each route, to cater for a wide range of demand realities. A public transport network hierarchy rather than a full-spec BRT will now be the focus, and be differentiated in terms of demand, right-of-way, frequency of stops, land-use and density, mode, and degree of investment required, and would include rail, single-articulated buses, conventional buses, double-decker buses and, importantly, minibuses-taxis.

Such a hierarchy will still ensure rapid transit over specific routes to address the apartheid legacy of long travel times and distances, and include paratransit where the most appropriate mode.

Paratransit drivers would need to abandon their 'fill-and-go' practice (i.e., departing from the rank only once the vehicle is full or near-full), or transferring passengers might be forced to endure excessive transfer times.

A feeder-trunk-distributor service, as an alternative to comprehensive, corridor-by-corridor implementation of BRT, is able to provide a complementary network that covers the entire city. Not only would this offer a more equitable time-frame and allocation of public resources, but it would incorporate the efficiencies of larger vehicles on higher volume corridors as well as the demand-responsiveness of paratransit in rapidly growing city edges. According to UN

Department of Economic and Social Affairs (2015), the annual urban population growth rate of Africa is by far the highest in the world.

Where paratransit supplies feeder services, there is however, a risk of uneven passenger supply, where some departing trunk service vehicles might have insufficient capacity to carry all the waiting passengers, leading to some passengers enduring excessive transfer times. Empirical analysis of paratransit departure headways at the Mitchells Plain public transport interchange in Cape Town has revealed that, while mean headways are responsive to fluctuations in demand in a systematized way, the daily service spans of paratransit and

trunk train and bus services do not match. Mitigating public sector intervention will be required in such instances to address service complementarity problems by incentivizing service provision throughout the daily duration of trunk service supply. The private sector is unlikely to produce a fully coordinated hybrid service network on its own.

Peak-logging

Peak logging is a hybrid model which permits paratransit operators into a formal, scheduled system for a limited part of the day, providing additional capacity in high-demand peak periods. Scheduled service operators plan their fleet size based on the spike in passenger demand during peak periods. This translates into significant vehicle acquisition and maintenance costs, yet much of these fleets are superfluous during off-peak periods when passenger demand is lower and fleet requirements are less. A peak-logging alternative is able to create a mutually beneficial and complementary relationship between scheduled and paratransit service operators in the peak period. The challenge, however, is that when such arrangements are established across the entire network it could result in viability problems for paratransit businesses during off-peak periods. If scheduled services cover the network demand in the off-peak, the role of paratransit in this period is unclear.



The Jammie shuttle saw three minibus-taxi associations amalgamating to form the Amalgamated Transport Services (ATS) to provide a scheduled, 'peak-logging' service for the University of Cape Town students and staff. Credit: UCT

‘A peak-logging alternative is able to create a mutually beneficial and complementary relationship between scheduled and paratransit service operators in the peak period.’

CASE STUDY

HYBRIDITY

‘Peak logging’: Permitting paratransit to ply ‘formal’ routes during peak periods only, Cape Town, South Africa

A **peak-logging arrangement** has been implemented in Cape Town, in the form of the University of Cape Town’s fareless student and staff bus service (branded as the Jammie Shuttle).

When first implemented, Jammie Shuttle services were perceived by paratransit business owners as a cause of ridership loss along established routes, and a threat to business. Following the intimidation of Jammie Shuttle drivers, affected services were suspended.

The impasse was resolved by implementing a peak-

logging arrangement that defined strict operational conditions for paratransit service providers. The contractual arrangement in this case was a private initiative, limited to bus services for the university. The peak-logging services run only during the morning peak period, on a limited number of specified routes linking a rail-to-road public transport interchange with stops near the university campus. Contractual arrangements prohibit the paratransit operators from picking up fare-paying passengers during the in-service period.

Achieving complementarity: finding the right match



There are various ways in which to regulate or facilitate hybridity through a feeder-trunk-distributor network, each with varying requirements for the prior corporatization and formalization of the paratransit sector.

The key trade-off emerging from case studies regarding regulating or facilitating hybridity is greater change/greater control vs less change/more demand-responsiveness.

Regulatory approaches that do not require corporatization or formalization usually involve the provision of feeder services within an open market, or under some form of licensing framework.

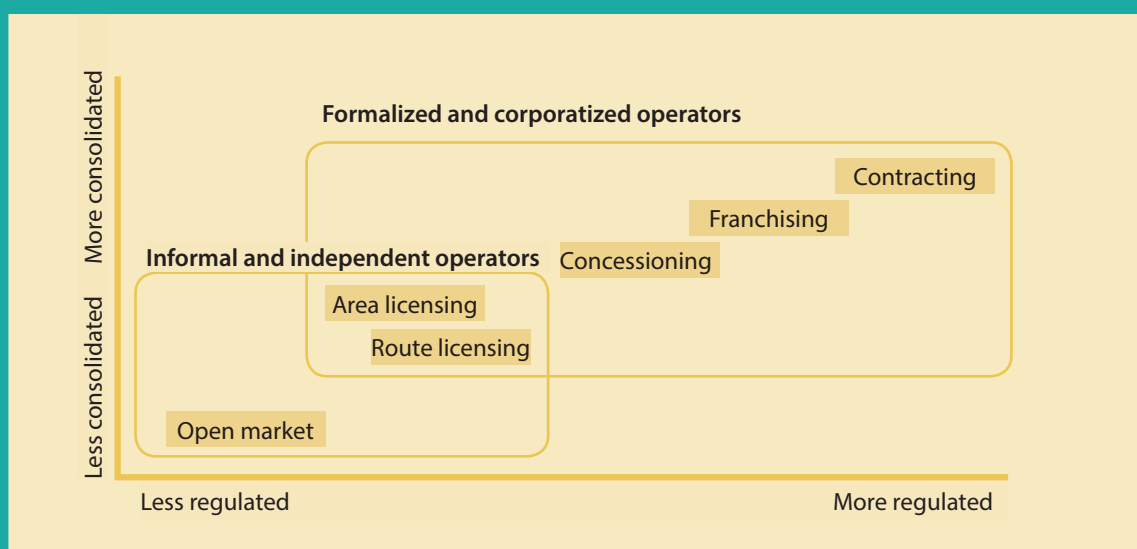
Regulatory approaches that do require paratransit businesses to undergo a process of corporatization and formalization include the provision of feeder services

through concessions, franchising agreements or some form of contract. These changes may be such that paratransit operations no longer strictly conform to the definition of paratransit (see page 5).

In an open market, services are provided without any constraint other than the need to conform to general legal requirements governing the safe operation of a registered vehicle. Paratransit business owners are under no obligation to provide feeder and distribution services.

The open market approach is avoided where possible in developing cities, as this can lead to destructive 'in the market' competition, with its associated service shortcomings. It should be considered only where the regulating authority lacks the capacity to regulate competition 'for the market'.

Alternative approaches to feeder and distributor service regulation





Paratransit at its capacity limits: Oshodi, Lagos. Credit: Robin Kaenzig, Integrated Transport Planning Ltd

Reward schemes can be offered to incentivize operators to provide feeder services.

Licensing

In the case of licensing, paratransit business owners apply for operating licences to provide services either on specified routes leading to and from trunk service stations, or within the feeder and distribution catchment areas of the trunk service. **This is a form of ‘quantity licensing’**, which moderates the number of licences to avoid overtrading and ruinous competition, while maintaining some competition in the market. Competition can serve as a motivation to keep operating costs down, and maintain service quality standards.

A quantity licensing system works only if the regulating authorities have sufficient administrative and enforcement capacity to monitor service supply and demand dynamics, and to ensure that only licensed services are in operation.

In cities where operating licensing frameworks already exist, a quantity licensing system clearly requires less change to incumbent paratransit operating practices than in cities where no such licensing is in place.

Reward schemes can be offered to incentivize operators to provide feeder services. Examples of such incentives are in Quito (see page 18). Examples of quantity licensing schemes applied on an area basis can be found in Recife, Brazil (see page 19) and, while not explicitly established to facilitate feeder service provision, in Hong Kong (see page 17).



The Latin American BRT corridors that produce ridership comparable to rail corridors are clear outliers (such as Bogota's Transmilenio). Current and projected passenger volumes in Cape Town, for example, are low in comparison to these exemplar BRT systems. Credit: Mobility



Concessioning

In the case of concessioning, 'for-the-market' competition is facilitated through the award of exclusive operating rights for a fixed time. The operator has complete commercial responsibility for operations within the concession area delimited by the regulating authority. The authority takes no commercial risk, and imposes only a few basic requirements in relation to issues such as vehicle safety standards and environmental controls.

Concessions are better suited to cities in which public sector institutional capacities are weak, and private operators can provide satisfactory qualities of service without high levels of public intervention (see Santiago, Chile, below).

CASE STUDY

HYBRIDITY

Area-based concessioning scheme, Santiago, Chile

In 2007, Santiago implemented its integrated public transport system (branded as Transantiago), whereby the city was divided into nine areas within which – through a tendering process – particular operators were awarded concessions to operate feeder bus services. These operators had previously formed formal operating companies (mostly during a 1990s bus reform process),

or were given a limited timeframe to switch from groups of paratransit associations to formally established bus companies. Routes inside the designated area operated by the concessionaire are feeder services connecting neighbourhoods to the trunk bus or rail network. This type of arrangement effectively eliminated competition 'in the market'.

Franchising

In the case of franchising, 'for-the-market' competition is facilitated through the awarding of rights to single or multiple operators for a fixed time period.

Franchising agreements are better suited to cities in which the regulating authority has planning and financial capacity, is prepared to take the associated commercial risk, and wishes to control service design. The role of the authority is to set fares and service parameters, and to monitor the performance of the franchisee.

Franchises can involve payment in either direction between the authority and the operators, depending on the strength of the public transport market, and the extent of cross-subsidization between more and less financially viable routes (see Hong Kong, below).

In many instances, paratransit operations resemble de facto concession arrangements: public authorities take little or no direct responsibility for financial risk or specifying operations, and paratransit services are left to serve passenger demand and expand along with the city's physical boundaries. Some degree of service quality monitoring may even be present.

Thus, **franchising and concessions both offer promise** as both match the territorial and self-deterministic nature of paratransit operations, and leave the relationships between individual paratransit businesses and their route associations largely untouched. Furthermore, paratransit is commonly grouped into some form of collective organization with a particular spatial basis or route basis, such as route associations or cooperatives.

CASE STUDY

HYBRIDITY

Quantity licensing and franchising schemes, Hong Kong

Hong Kong's licensed paratransit businesses developed in response to a lack of bus supply in certain parts of the city and surrounding areas. In 1969 legislation was passed to legalize them in a new category of 'public light bus' (PLB) with a maximum of 14 seats.

As the mass transit railway (MTR) opened new lines between 1979 and 1985, the PLB operators responded by adopting more stable, competitive fares and by switching capacity to routes that avoided competition with rail. Even in the MTR corridors, PLBs had the advantage of enabling passengers to avoid the long walk into and out of the stations as they operated at high frequency from many central points, and stopped on demand along their routes.

In contrast with the area licensing for PLBs, the stricter 'green minibus' (GMB) system was begun in 1976. GMBs operated on a fixed route, to a timetable, at fixed fares, all set by the government. In return for accepting the franchise obligations, they were usually given some protection from competition by PLBs, and some assurance of viability. GMB routes were generally in outlying or feeder areas, serving parts of the city where buses were uneconomic, or in some cases where a demand existed for higher quality, higher frequency

services than could be provided by buses.

The increasing competition offered by formal buses, which by the mid-1990s were more likely to be air-conditioned, modern vehicles (although frequencies were much lower), led the PLBs to upgrade their vehicles to larger models and to maintain a newer fleet.

Highlighting one of the challenges of franchising, by contrast, the GMBs, protected from competition, lacked incentives to raise service quality. The vehicles used on GMB services tended to be older (often previously used on PLB services), and they were slower in adopting air-conditioning.



The franchise Green Minibus (GMB) service in Hong Kong began in 1976. Credit: Wiki



BRT-Lite, with paratransit in the service lane: Barracks, Lagos. Credit: Robin Kaenzig, Integrated Transport Planning Ltd.

‘Gross cost contracts can make service integration easier to achieve.’

Contracting

In the case of contracting, ‘for-the-market’ competition is facilitated by the awarding of negotiated or competitively tendered contracts to operators to provide specified services for a fixed period of time.

Operating contracts can take a variety of forms. In ‘net cost contracts’, the operator bears most, if not all, of the commercial risk. Operator revenue is determined by passenger volumes and derived directly from the fare box. Net cost contracts have the advantage of incentivizing performance, but they can make service integration across the entire network difficult because there is no central clearinghouse through which fare revenues can be easily redistributed.

CASE STUDY

HYBRIDITY

Route-based contracted feeder bus services, Quito, Ecuador

Somewhat uniquely in Latin America, Quito’s route-based feeder bus services are contracted to individual bus owners, not to companies or owner associations. For each route, multiple rudimentary operating contracts are entered into. The need for a consolidation of paratransit operators into bus companies – as was the case of Santiago – was therefore avoided, and the integration of numerous smaller incumbent operators into the reformed public transport system was made considerably less complex compared to processes in which multiple operators are merged into a single company. The operating contracts are negotiated, and services are specified in a timetable. Operators receive a monthly payment that can be increased if the demand along a certain route increases significantly.

This arrangement evolved out of an earlier, less structured paratransit feeder scheme, implemented on Quito’s second

BRT corridor (Ecovia). In this scheme, incumbent paratransit businesses were rewarded according to the number of passengers they delivered to the BRT terminal station.

Cash payments to operators were made on site. This enabled the local authority to avoid the cost of investing into feeder service infrastructure and vehicles, while still providing a form of feeder service to BRT passengers. The arrangement was, however, relatively short-lived, and was replaced by a more formal contractual relationship largely because of issues of reliability and control. As the initial arrangement had been relatively informal, both parties could terminate it easily, potentially leaving the public transport network without essential feeder service links at short notice. The regulating authority had no means of ensuring the availability of paratransit buses at any particular time, nor the duration and frequency of service.

Area-based quantity licensing scheme, Recife, Brazil

An **area-based quantity licensing** scheme was introduced in Recife in 2003. At the time, a decline in large-bus ridership was attributed to emergent smaller, unregulated midi- and mini-buses that duplicated some 83 per cent of formal, large-bus routes. These new services focused on areas where formal public transport supply was inadequate and, in 2000, they were responsible for carrying approximately 19 per cent of the public transport passenger market.

In an initial response, the local authority attempted to remove these vehicles through a series of municipal laws. These laws were quickly superseded by another municipal law seeking to integrate rather than eradicate paratransit services. The new law, concerned with vehicles in the 12- to 20-seater range, aimed to complement the large bus services with paratransit services. Initially two interventions were considered: to include line-haul paratransit routes to supplement capacities along existing large-bus corridors; or to

create new feeder paratransit routes inside neighbourhoods. The latter was chosen.

In terms of the municipal law, midi- and mini-buses were to reorganize their routes to integrate with the existing formal large bus network. Routes were allocated to 13 'tracks' (i.e. operators grouped together on the basis of the neighbourhoods they served) by means of an auction. The outcome was the implementation of 26 new smaller bus routes, using 252 vehicles, to act as feeders to the 35 formal, large-bus service routes. After the reorganization of paratransit service routes, existing large bus stops were transformed into transfer stations where paratransit vehicles could transfer passengers.

One of the results of the initiative was an increase of 31 per cent in large-bus ridership, as well as a general reduction in trip times. Not all incumbent paratransit businesses were incorporated into the new system, however, and as result were displaced to the outskirts of the city.



Credit: Rodger Bosch

Net cost contracts have the advantage of incentivizing performance, but they can make service integration across the entire network difficult because there is no central clearinghouse through which fare revenues can be easily redistributed.

In 'gross cost contracts', the commercial risk is transferred to the contracting authority. Fare box revenue is collected by the authority or its agent, and distributed to operators on the basis of vehicle kilometres of service.

Gross cost contracts can make service integration easier to achieve.

Working with what we have: harnessing the paratransit dividend

A successful hybrid feeder-trunk-distributor network has the potential to provide extensive urban coverage, with an improved operating environment and service offering. But at the same time, there is much that can already be done to develop current paratransit businesses and improve the availability and quality of their service. Without a focussed effort to do so, the challenges of unsafe operations, non-compliance with regulations, and poorly maintained vehicles (contributing to poor air quality and road crashes), for example, will continue.

The paratransit industry itself already drives many strategies for development and service improvement. Many of these need the support of relevant national or local authorities, while others will need to be driven by these authorities themselves (see box page 21).

Only a few of these measures have been implemented for any length of time, and many of the potential measures identified are therefore under-researched with respect to the benefits they can or have yielded.

Strategies devised by national or local authorities have a greater chance of success if they are aimed at improving the profits and income security of paratransit operators. In many cities the industry and the authorities have a history of distrust and adversarial relations, and strategies that appear to aim to regulate and control are less likely to find acceptance.

For many of the initiatives aimed at improving quality of service, some form of consolidation of fragmented small operators is required. Operator associations, for example, bring order and avoid inefficiencies and redundancies within a spatially defined service area, and can be used as an instrument of organisation and can assist regulatory bodies by providing for self-regulation of the operators. In Kenya, the Savings and Credit Cooperatives (SACCOs) are credited with bringing some order to the sector, in terms of self-regulation and safety, helping members to save and borrow from the cooperatives, facilitating bulk purchasing and business diversification (see page 25).

A cashless fare system, integrated with that of other modes, could mitigate some of the structural incentives to unsafe operations and poor customer service. A cashless system is likely to reduce theft and ensure that the business owners receive their share of the fares collected, and remove the possibility of ad-hoc fare-setting by the crew (this, of course, means that the system is not universally welcomed, and to date in South Africa all pilots have ended unsuccessfully). Profit and loss could be more easily accounted, and longer-term maintenance plans more easily made.

Business education and training could go some way toward mitigating concerns about unsafe paratransit operations, and improve the service offered to paratransit customers. Research suggests that behind many of the paratransit sector's weaknesses lies the drive to maximize individual profit within a 'survivalist' business context. One of the key gaps in business planning, and the logical outcome of a survivalist business model, is the failure of operators to take into account vehicle depreciation costs and to set aside money to replace vehicles.

In Nairobi, it is fairly common for SACCOs to diversify beyond transport operations or financing. For example, fuel stations, insurance agencies, courier services, and tyre sales are services offered at a fee to members and the public. SACCOs also purchase land, buildings, and vehicles, and individual members share this ownership according to their share contributions, like any shareholding in a private company.

The provision of road-space prioritization measures and rank infrastructure as well as improved non-motorized transport (NMT) facilities are three infrastructure interventions particularly likely to improve service levels offered by paratransit operators. The costs of such developments and infrastructure would need to be borne by the relevant government authority.

Strategies devised by national or local authorities have a greater chance of success if they are aimed at improving the profits and income security of paratransit operators.



Touts in operation at Ubungu bus station, adjacent to a DART terminal (Dar es Salaam, Tanzania).
Credit: Brendan Finn

Non-punitive measures for improving paratransit services

What can be done to develop paratransit businesses?	What can be done to improve paratransit's operating environment?	What can be done to modernize fleets and improve roadworthiness?	What can be done to improve paratransit service operations?
<ul style="list-style-type: none"> ■ Business consolidation (including cooperatives and route associations) ■ Business skills training ■ Business diversification (including fuel, tyres, insurance, financial services, advertising) ■ Bulk purchasing discounts 	<ul style="list-style-type: none"> ■ Rank/terminus provision ■ Road space prioritization, including minibus and bus lanes, or high occupancy vehicle lanes, queue jumpers, and signal priority ■ Embayments (including signage) 	<ul style="list-style-type: none"> ■ Vehicle renewal incentives ■ Cooperative loans (including vehicle purchases and repairs) 	<ul style="list-style-type: none"> ■ Driver training ■ Salaried drivers ■ Consolidated driver recruitment and management (including passenger complaint systems, driver discipline, vehicle crew uniforms) ■ Consolidate vehicle management (including vehicle tracking) ■ Speed governors ■ Cashless ticketing systems ■ Passenger information (including via mobile phones, vehicle route stickers) ■ In-vehicle wi-fi (customer experience)

Measures that could enable paratransit business development or improve paratransit services include: business organization and consolidation; cashless payment systems, vehicle management systems, speed governors and other information communication technology; driver development and business training; business diversification and generating additional income streams; vehicle renewal incentives such as loans for vehicle purchases and repairs, and improving the operating environment through, for example, infrastructure provision and road space prioritization.



CASE STUDY

SERVICE IMPROVEMENT

Making it easier for people to find and use paratransit, the Cape Town Taxi Project

In Cape Town in late 2016, start-up WhereIsMyTransport completed a three-week mapping project to capture the routes, stopping points, fares, and frequencies of the 600+ paratransit routes that cover the city. The data has been made available through their open platform, and integrated with the data for other modes such as BRT, bus and rail.

WhereIsMyTransport contends that while regular minibus-taxi users know and largely understand the route network, a route map might reposition user perceptions of the mode, and attract new users who are less comfortable with word-of-mouth navigation. In this sense, maps can be

powerful signallers of legitimacy.

Mapping could potentially assist the regulatory processes and route rationalization – in the Cape Town instance, the mapping team discovered that some routes exist on paper in city registries or licences, but in fact are no longer operational.

In line with research that suggests profitability as a key motivator for improvements, WhereIsMyTransport reported that the paratransit industry welcomed their data collection once they understood that the purpose was to make it easier for customers to find and use minibus-taxis, and that the mapping information could help their businesses.

“A cashless fare system, integrated with that of other modes, could mitigate some of the structural incentives to unsafe operations and poor customer service.”

CASE STUDY

SERVICE IMPROVEMENT

The potential for cashless fare collection in South Africa

Research in Cape Town recently explored the potential of cashless fare collection, and reviewed the available technology alternatives (including smart cards, vouchers, and mobile apps). The criteria included user acceptability; the installation and operating costs to operators; the potential to restructure labour relations and remove incentives for unsafe driver behaviour; the potential for modal integration; the

potential to support passenger-side subsidy schemes; and the potential for data collection.

Preliminary findings suggest that apps are probably the best option for cashless fare collection, and that the vehicle crew play a vital role in the success of any system. Implementation must be rolled-out collaboratively and incrementally, to ensure that all stakeholders are on board.

SMS-based ticketing platform in Nairobi, Kenya

In Kenya, cashless payment systems were to become mandatory for public transport services in July 2014, in terms of the National Transport and Safety Act, 2012.

One of the aims of cashless fares is to reduce or eliminate the amount of cash handled by matatu crew, and thus reduce the bribes routinely paid by drivers to police officers.

Among the cashless payment options was a local SACCO (Savings and Credit Cooperative) product MY1963 partnering with Fibre Space Ltd and sponsored by Kenya Commercial Bank. Cards can be topped up with cash or by using M-Pesa ('pesa' is Swahili for 'money'), a mobile phone based money transfer system, supported by Safaricom and Vodacom mobile telephone providers.

A new product, originally called 'Magic Bus' and now called BuuPass, is a Nairobi-based proof-of-concept SMS-

based ticketing platform for commuters to pre-book matatus and pay using mobile money. No internet access is necessary - commuters dial a shortcode from any analog or smartphone, select a vehicle, fare and estimated arrival time. They then enter a pin, pay with their mobile money account number, and show the confirmation number to the driver.

The pilot phase saw 2000 commuters use the system – which aims to reduce waiting times and improve fare predictability for commuters, and to allow for more strategic daily operations for drivers. The app reportedly aggregates the demand for busses through its pre-booking system, enabling drivers to travel directly to where commuters are, rather than wait for their vehicle to fill up. Early reports claim that drivers have been able to make two extra trips a day, and double their daily income.



*A precursor to integrated ticketing across modes in a city is a cashless, smart card system.
Credit: Rodger Bosch*

CASE STUDY

SERVICE IMPROVEMENT

Operator development in Cape Town, South Africa

Education and training within the paratransit sector could go some way toward improving driving practices, and developing an understanding of the importance of savings, and business, customer-care and operations skills.

In 2015 the City of Cape Town developed a capacity building programme for paratransit operators, focussing on public transport planning and management. Essentially, the training was developed to equip the paratransit industry establish sustainable transport operations.

Essentially, the training was developed to equip the paratransit industry establish sustainable transport operations, which involved five key shifts in business practice.

- From a daily cash earnings model to one that calculates profit and loss;
- From a focus on having many, inefficient routes and/or vehicles, to having a few, efficient ones;
- From a one-size-fits-all to 'best-fit' fleet mix;
- From a peak hour commuter service to a scheduled or feeder service;
- From a business model focused on a single revenue source to one that has multiple revenue options.

223 candidates participated in the training programme over three years, which included opportunities to study company law and corporate governance, transport management, financial administration, electrical and bus body repair, facilities management, and human resources management.



Credit: Rodger Bosch

Learning from the cooperatives in Nairobi, Kenya

Whatever the form, there are clear benefits to consolidation: from managing fare fluctuation and competition, and raising finance, to buying in bulk, and the ability to enter into some form of contracting.

Since 2011, all licensed *matatu* operators in Kenya have been required by the Ministry of Transport to belong to a SACCO (a Savings and Credit Cooperative). The early SACCOs (in the 1990s) were formed by inter-city operators based in the same region, but later were successfully replicated by intra-city paratransit operators in cities such as Nairobi.

Each transport SACCO sets its own rules and procedures, within the broad provisions of the Cooperative Societies Act. Some SACCOs regulate and coordinate the activities of the members, manage routes, and in some cases pay drivers' salaries, vet new drivers, and monitor driving behaviour. Generally, members make daily contributions, sometimes calculated per vehicle trip; in some SACCOs, members are allowed to increase their contributions if they wish. This capital is the basis for member loans, for repairs and maintenance, health-care and school fees, and for the purchase of assets.

SACCO dividends from diversified business interests provide additional income, and member benefits and services reduce vulnerability to the risks that typically afflict small paratransit businesses. In recent years SACCOs have also demonstrated a readiness to adopt vehicle management and fare collection technologies, which dovetail government efforts to improve regulation and counter corruption, provided they make business sense.

The SACCO experience is not necessarily directly transferable in other contexts – particularly given the shuttle-like nature of inter-city services in Nairobi, and the considerable institutional support that exists in Kenya for cooperatives. The most successful SACCOs remain the earlier inter-city service versions, and the later, intra-city SACCOs have yet to achieve the same level of success and reform.

It is more useful to isolate the specific features of the inter-city SACCO model that have led to

paratransit service improvements and attempt to replicate these, rather than necessarily the model in its entirety.

These key features are:

- operator consolidation;
- salaried drivers;
- systematic vehicle monitoring; and
- compulsory vehicle depreciation costing.

The benefits of consolidation range from the management of destructive 'in the market' competition, to bulk purchasing benefits, and ultimately the ability to enter into some form of formalised service contracting. Properly incentivised and monitored salaried drivers are key to curbing dangerous driving practices and excessive in-vehicle passenger waiting times, while the compulsory daily member contributions to the SACCO approximate a form of vehicle depreciation costing, in so far as there is credit available to qualifying members when replacing or repairing their vehicles.

Many, if not all, of these features can be adopted in other forms of paratransit organization and regulation, but will require considerable adaptation to context.



It is a legal requirement that all matatu operators, above belong to a Savings and Credit Co-operative) in Nairobi, Kenya. GMK SACCO offices in Githuria, Nairobi, April 2014. Credit: Roger Behrens

SUMMARY

None of the approaches to hybridity or service improvement will be magic fixes to all of the problems common to paratransit services in their existing format. It may well be that a mixture of elements of each of them, matched to an in-depth understanding of local context and of local path dependencies, would offer the greatest chance of succeeding at improving or reforming paratransit services.

Plan for complementarity between paratransit operations and formal, scheduled services in service planning and regulatory reform processes.

*Paratransit terminal, organized by its operators: Kumasi, Ghana.
Credit: Brendan Finn*

The main recommendations to policy-makers overseeing public transport reform process are as follows:

Recognize paratransit in policy

- Acknowledge that paratransit is an important means of providing access for large sectors of Sub-Saharan city populations.
- Do not ignore, or wish away, paratransit in policy reform processes: recognize that it will continue to exist, and that it is able to contribute uniquely to the public transport network.
- Engage incumbent public transport operators in policy formulation processes.
- Plan for complementarity between paratransit operations and formal, scheduled services in service planning and regulatory reform processes.



Start with institutional reform

- Recognize the importance of capacitated local institutions in sustaining successful public transport reform.
- Where necessary, develop an accountable and legislatively enabled urban transport authority able to drive reform.
- Secure a sustainable source of funding for capital and operating cost requirements.
- Build an empowered regulatory framework able to support reform.

Plan for complementary hybridity

- Learn from the successes and failures of hybrid public transport networks around the world.
- Where applicable, understand your city's unique existing relationship between scheduled and paratransit services.
- Engage with the paratransit sector around understanding the passenger market, and developing regulatory controls and service plans.
- Support the consolidation of paratransit businesses, and craft public sector interventions to incentivize desired operating behaviours.

Support paratransit quality-of-service improvements

- Provide road space priority and rank facility infrastructure for paratransit services.
- Incentivize vehicle fleet renewal and maintenance.
- Support shifts from 'target system' remuneration, to salaried vehicle crews, and the associated reform of fare collection systems.
- Support the introduction of speed governors and vehicle fleet management systems.
- Support business development and training programmes which promote income-expenditure analysis, vehicle depreciation costing, best-mix vehicle fleets, improved labour conditions, and income diversification.



“...paratransit will continue to exist, and is able to contribute uniquely to the transport system.”



Published by VREF, the Volvo Research and Educational Foundations. VREF comprises four foundations based in Sweden that collaborate to finance research and education in the areas of transportation, environment, and energy. Since 2000 VREF has focused on Future Urban Transport (FUT), in particular, looking at how to deal with complexity in these fields.

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