

AN EVALUATION OF
POLICY APPROACHES
TO UPGRADING AND
INTEGRATING
PARATRANSIT IN
AFRICAN URBAN
PUBLIC TRANSPORT
SYSTEMS: RESULTS OF
THE FIRST ROUND OF
A DELPHI SURVEY

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An evaluation of policy approaches to upgrading and integrating paratransit in African urban public transport systems: Results of the first round of a Delphi survey

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Abstract

Most African urban public transport systems are heavily reliant upon minibus paratransit. Under the influence of international development agencies, over the past decade, a number of Sub-Saharan African city governments have embarked upon the initial phases, or at least proposed the installation, of high quality and technology bus rapid transit as a means of reforming public transport systems and replacing paratransit services. The aim of the study presented in this paper is to test a series of propositions regarding the likely outcome of contemporary public transport reform strategies, and to explore which approaches to upgrading and integrating paratransit services hold greatest promise. The means of pursuing this objective is through the administration of a two-wave Delphi expert panel survey. The paper reports upon the results of the first round of the (n=17) Delphi survey. The panel of experts was selected on the basis of their experience in designing and preparing paratransit upgrade and integration projects in Sub-Saharan African cities. The panel identified quality regulation, road space prioritisation and operator business training as particularly important in strategies to upgrade existing services, and identified connecting corridors, feeder area licensing and reward schemes as particularly promising for strategies to integrate paratransit with formal scheduled services. While contested, the majority view of the panel was that the prospect of comprehensive paratransit replacement in Sub-Saharan African cities in the short- to medium-term seems remote. It was forecast that cities able to install formal scheduled services will depend, for decades, on hybrid systems that combine both scheduled and paratransit operators. Sub-Saharan African city government formulating much-needed strategies to reform their public transport systems should recognise the enduring presence of paratransit services, not ignore them.

1. Introduction

Across most Sub-Saharan African cities, a broadly similar model of large-scale monopolistic bus operations existed during the first half of the twentieth century, in the form of large bus fleets operating on networks of scheduled routes, with harmonised fares, passenger information and livery. In the second half of the twentieth century this model came under increasing pressure from rapid and

unplanned urban growth, limited organisational capacity, and an inability of governments to provide sufficient capital and operating funding support. In many cases bus companies were nationalised as part of the decolonisation processes in the 1960s. In this immediate postcolonial era, fares were regulated and governments were often reluctant to increase them. Initially, many state-owned bus companies were able to operate without subsidy, but as operating deficits grew and subsidy budgets stagnated, they had difficulty in maintaining and replacing vehicle fleets. The result was steady decline in both the quantity and quality of service. Most of the public bus companies eventually failed, with many of the bankruptcies occurring in the 1990s when structural adjustment policies severely limited the availability of public funds for subsidy. (Finn 2008, Kumar and Barrett 2008)

In most cities, the degeneration and collapse of formal bus services allowed the establishment of large-scale partially regulated or unregulated paratransit¹ operations, typically in the form of mini-buses (e.g. *tro-tros* in Accra, *dala dalas* in Dar es Salaam, *danfos* in Lagos, and *matatus* in Nairobi). Some cities abandoned large-bus services altogether, and came to rely almost exclusively on paratransit services. With limited exceptions, this change did not result from a deliberate policy decision to deregulate public transport, but rather represented a localised response to growing unserved passenger demand and relatively unrestricted market entry in a regulatory vacuum. (Kumar and Barrett 2008, UATP 2010)

The paratransit that has emerged is heterogeneous, with a diversity of operators ranging from fully licensed minibus services run on prescribed routes by formalised businesses, to illegal sedan services run by informal businesses. Vehicle roadworthiness generally varies according to the enforcement capability of public authorities. Regulatory frameworks also vary widely, from public sector regulation of market entry and service quality, to self-regulation by fragmented route associations. Regulatory control by public agencies is generally weak, and in some cities corruption within regulatory authorities in fact rewards operator non-compliance. Despite this heterogeneity in regulation, there are some common operational characteristics, most notably a fare strategy in which vehicle owners claim a fixed daily revenue target from drivers, who in turn keep the balance of the daily fare box, less vehicle operating expenses, as income.

Most problems commonly associated with paratransit operations can be linked either to an inability of public authorities to formulate and enforce coherent regulatory regimes, or to the ‘target system’ fare strategy. In the case of the former, un- or under-restricted market entry can lead to overtrading on more lucrative routes, attempts to violently remove competitors, and unfair labour relations. In the case of the latter, strong incentives exist for drivers to compete aggressively for passengers in the road space, drive dangerously, and overload vehicles. When vehicles are not maintained and their replacement is not planned for, the result can be ruinous competition. Poor business viability in turn results in the withdrawal of services from less lucrative routes or during less lucrative times of the day.

¹ The term ‘paratransit’ conventionally describes a flexible mode of passenger public transportation that does not follow fixed routes or schedules, typically in the form of small- to medium-sized buses. In the ‘developed world’ paratransit services are often associated with demand-responsive ‘dial-a-ride’ systems provided for persons with movement disabilities. In the ‘developing world’ paratransit services are usually provided at a far larger scale for the general population, often by unregulated or illegal operators within the informal sector. For this reason paratransit in the ‘developing world’ is sometimes also referred to in the literature as ‘informal’ transport. The term paratransit is preferred to informal transport in this paper as these services are not necessarily provided by informal businesses or unregulated. However it should be noted that in instances where paratransit services are fully regulated and provided by businesses within the formal sector, they usually first emerged as unregulated and informal. For the purposes of the study presented in this paper ‘paratransit’ was defined as a flexible mode of passenger public transportation that does not follow fixed schedules, typically in the form of privately-owned small- to medium-sized buses.

So in Sub-Saharan African cities that are heavily reliant upon paratransit services there is an unanswerable case for improving the quality, reliability and coverage of public transport systems, and this is an important challenge facing city governments. Under the influence of international development agencies, over the past decade, a number of Sub-Saharan African city governments (most notably in South Africa) have embarked upon the initial phases, or at least proposed the installation, of high quality and technology bus rapid transit (BRT) as a means of reforming public transport systems and replacing paratransit services *in toto*.

The starting proposition of the study presented in this paper is that there are path dependencies and constraints that limit the extent of possible public transport system reforms, however, and that paratransit operations indeed have some inherent advantages with respect to demand responsiveness and service innovation that should not be discarded. They are flexible, penetrative, and free of direct operator subsidisation. They can also offer an important source of income and poverty alleviation to a segment of the population that often finds itself superfluous to the formal economy. ‘Gold standard’ BRT systems developed in Latin America may not be well suited to local institutional frameworks, urban environments and resources. Attempts to eradicate paratransit, therefore, may be neither pragmatic nor strategic. As an extension of this proposition, it is argued that (beyond a ‘do-nothing’ scenario) two public transport reform outcomes are likely: hybrid scheduled-paratransit service systems in cities that have the capacity to install formal high capacity services; and upgraded paratransit service systems in cities that do not. A review of international experience yields a variety of policy alternatives in engaging these two scenarios.

The aim of this study is to test the above propositions, and to explore which approaches to upgrading services and managing hybridity hold greatest promise in the Sub-Saharan African context. The means of pursuing this objective is through the administration of a two-wave Delphi expert panel survey. The selection of this method was motivated by a concern that the views of experts with local experience in paratransit reform are under-represented in current debates on public transport reform in Sub-Saharan African cities. This paper will report upon the results of the first round of the (n=17) Delphi survey. The panel of experts was selected on the basis of their experience in designing and preparing paratransit upgrade and integration projects in Sub-Saharan African cities generally, and in relation to three case cities more specifically. The three case cities – Cape Town (South Africa), Dar es Salaam (Tanzania) and Nairobi (Kenya) – reflect a diversity of institutional and socio-economic contexts.

The paper is divided into five sections. The following section discusses contemporary public transport strategies in Sub-Saharan African cities, and their antecedents. Section 3 describes the research method employed, and section 4 discusses the findings of the first Delphi survey round. Section 5 concludes with a critical discussion on the prospects of public transport reform, and identifies issues that require further exploration in the second Delphi survey round. Appendix A provides brief historical background on the development of public transport systems in the case cities.

2. Contemporary public transport reform strategies

An important challenge facing Sub-Saharan African city governments is the formulation of strategies, and the introduction of regulatory frameworks, capable of transforming existing fragmented public transport systems into systems that are safe and accessible to urban populations. Under the influence of international development agencies – particularly the Institute for Transportation and Development Policy (ITDP), the German Technical Corporation (GIZ, formerly GTZ) and the World Resources Institute Center for Sustainable Transport (EMBARQ) – over the past decade a number of Sub-Saharan African city governments have embarked upon the initial phases, or at least proposed the installation, of BRT as a means of reforming public transport systems (Gauthier and Weinstock 2010,

Hidalgo *et al* 2010, Wright 2001, 2011).² These proposals have been modelled upon exemplary South American cases. In particular, the widely-acclaimed TransMilenio system in Bogotá has been presented as a ‘best practice’ case. BRT systems have been argued to be suited to resource-constrained Sub-Saharan African cities on the basis of their substantially lower capital cost and similar passenger capacities compared to rail-based systems.

To aid the spread of BRT systems these agencies have disseminated considerable technical guidance, most notably the ITDP’s *Bus rapid transit planning guide* (Wright and Hook 2007) and the GTZ’s *Sourcebook Module 3b: Bus rapid transit* (Wright 2003). To promote high quality BRT systems, ITDP and GIZ have more recently published *The BRT Standard* which defines what constitutes ‘best practice’ in BRT system design, and proposes a scoring method that celebrates high-quality systems (ITDP and GIZ 2012). City BRT systems are awarded ‘gold’, ‘silver’ or ‘bronze’ on the basis of the scores they achieve.

The case cities focussed upon in this paper reflect different stages of BRT technology transfer. In Cape Town, BRT services have begun operation.³ In Dar es Salaam, BRT infrastructure is under construction.⁴ In Nairobi, BRT plans are being formulated.⁵ Other Sub-Saharan African cities that have started operating BRT-type services include Johannesburg (McCaul and Ntuli 2011) and Lagos (Dairo and Brader 2009), while cities at advanced stages of planning, or that have begun construction, include Durban (Moodley *et al* 2011), Rustenburg (Hancock 2011) and Tshwane (Odendaal 2012).

The model of ‘best practice’ BRT advocated is essentially one in which existing direct paratransit services are replaced by a trunk and feeder network, and operators converted into formal bus companies contracted to provide trunk and feeder services. Thus, with notable exceptions in West Africa (Accra and Dakar), many of the Sub-Saharan African BRT proposals envisage, explicitly or implicitly, *in toto* replacement of paratransit services as an outcome of the transformation process, albeit gradually or in phases.

3. Research method

As stated earlier, the aim of the study presented in this paper is to test a number of propositions with respect to the barriers to, and the likely outcomes of, paratransit reform in the Sub-Saharan Africa, and to explore which approaches to upgrading services and managing public transport system hybridity hold greatest promise in this context. The means of pursuing this objective is through the

² Within the region, the African Public Transport Association (UATP) has begun lobbying for BRT investment among African governments and their donors, suggesting it may present a ‘miracle solution’ to the problems of mass transport in African cities.

³ Planning of BRT services – branded as MyCiTi – began in 2006, spurred in large part by the need for public transport improvements to serve the 2010 Soccer World Cup (CoCT 2007). Construction of the first phase corridor and associated infrastructure began in 2009. Starter trunk and feeder services were launched in 2011, operated by three contracted bus companies, two of which were formed out of the incumbent paratransit route associations operating within the corridor (Schalekamp and Behrens 2012).

⁴ Planning of the system – branded as DART – began in 2002, with a BRT proposal formulated by ITDP and endorsed by Dar es Salaam City Council. A BRT concept design was completed in 2005, and the Dar es Salaam Rapid Transit Agency was established in 2006. Following the approval of loan by the World Bank in 2008, construction of the first phase corridor began in 2010 (Gauthier and Weinstock 2010).

⁵ The African Development Bank funded a feasibility study for a Nairobi Metropolitan Mass Rapid Transit System in 2008. In 2011 GIZ funded a BRT corridor identification exercise and review of the Nairobi Metropolitan Mass Rapid Transit System feasibility study.

administration of a two-wave Delphi expert panel survey. This section describes the rationale for selecting the Delphi method, the Delphi expert panel recruited, and the administration of the first round Delphi survey.

3.1 Delphi surveys

The selection of the Delphi method was motivated by a concern that the views of experts with local experience of, and valuable insight into, paratransit reform in Sub-Saharan African cities are under-represented in current debates on public transport reform. The method offers a means of tapping this experience and insight, and of focussing policy attention onto the most probable future scenarios and the most appropriate approaches to dealing with them. The method also enables the academic authors of study to test their interpretation of current realities and policy discourses with experienced practitioners.

The Delphi method – named after the mythical Greek Oracle of Delphi – was originally developed in the 1950s by the Rand Corporation in the United States for technology forecasting (Dalkey 1969). The method takes the form of a sequence of two or more surveys which gather the informed opinions of a panel of experts in order to gain insight into a complex problem. The method is especially useful in long-range forecasting exercises in which expert opinions are the only source of information available. Expert panel interaction is structured around rounds of survey and feedback, providing opportunity for individuals to modify their earlier views, and for groups to shift towards a considered consensus. In the later round(s) panellists are provided with the results of the earlier round so that they can either revise their original opinion if they are influenced by the opinions of others, or stick to their original position.

For the method to be effective, the anonymity of panellists is essential. Advocates of the method hold that direct confrontation can either lead to the irrational defence of a position once it is taken in order to avoid losing face, or to a predisposition to be swayed by the persuasively stated opinions of others without sufficient independent thought. Anonymity is argued to promote independent and unbiased thought, and to avoid ‘bandwagon’ and ‘halo’ effects. Therefore panellists do not meet or correspond with each other, and respond to propositions and questions unbiased by the identities and pressures of others. (Linstone and Turoff 2002)

3.2 Panel recruitment

Clearly for a Delphi study to have validity, the recruitment of a panel with sufficient expertise is essential. The (n=17) panel of experts in this study was selected on the basis of their experience in designing and preparing paratransit upgrade and integration projects in Sub-Saharan African cities generally, and in relation to the three case city countries more specifically. Twenty-four experts were invited to participate in the study: six from each of the three case city countries; and six with experience of paratransit regulation and reform in other parts of Sub-Saharan Africa. Of the 24 experts invited, 22 agreed to participate. Of the 22 experts who agreed to participate, 17 completed the first round questionnaire.

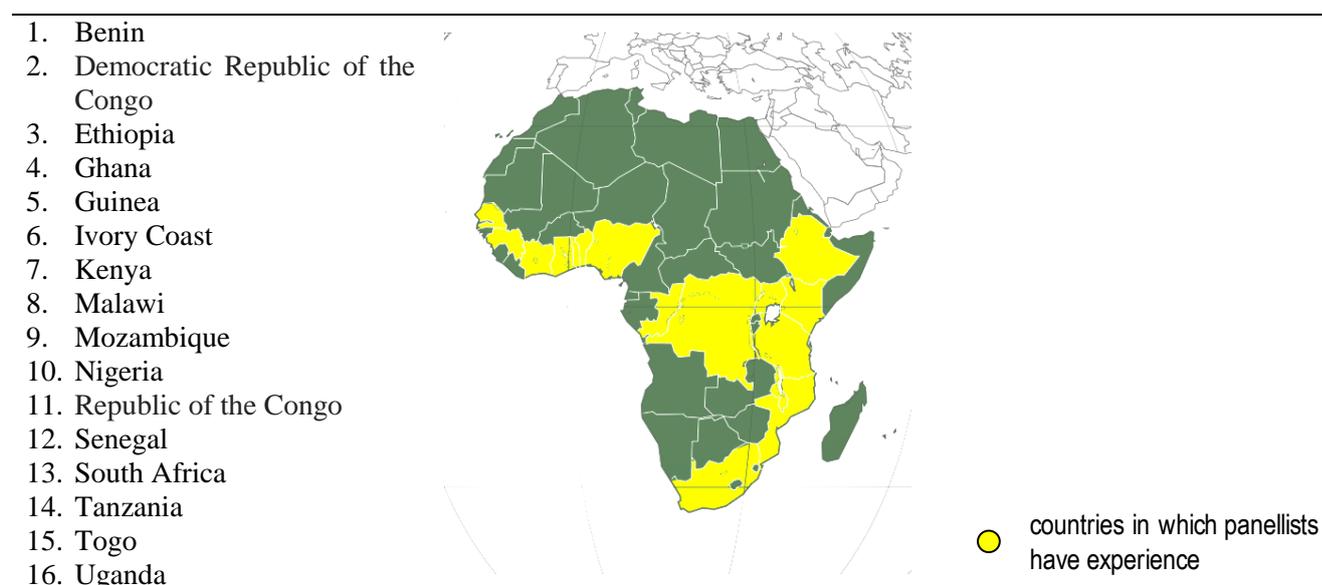
The collective expertise and experience of the (n=17) Delphi panel is presented in figure 1. The dominant areas of expertise are in planning and financing public transport system improvements (44%), regulating operators (18%), and negotiating around the integration of incumbent operators into new public transport systems (12%) (see figure 1[a]). Collectively the panel has experience in large parts of the region (see figure 1[c]), and particularly in the case city countries (24% in Kenya, 24% in South Africa and 29% in Tanzania) (see figure 1[b]).

Figure 1. The Delphi panel's collective expertise and experience in interacting with paratransit systems

(a) Nature of experience in working with paratransit operators (weighted, question 2) (b) Most familiar city (question 4)

official or consultant in public transport system planning or design	(5)	32%	Dar es Salaam	(5)	29%
official implementing policy and regulations	(3)	18%	Nairobi	(4)	24%
intermediary in negotiations between operators and transport authorities	(2)	12%	Johannesburg	(2)	12%
official or consultant in public transport system financing	(2)	12%	Lagos	(2)	12%
researcher	(2)	10%	Cape Town	(1)	6%
business development consultant	(2)	10%	Port Elizabeth	(1)	6%
paratransit operator association leader	(1)	6%	Accra	(1)	6%
			Dakar	(1)	6%
	(17)	100%		(17)	100%

(c) Countries in which panellists have experience interacting with paratransit operators (question 3)



3.3 Survey administration

The purpose of the first round of the Delphi survey was to seek expert insight into:

- the likely outcomes of current public transport reform strategies and associated impacts on incumbent paratransit operators;
- priority interventions required to upgrade paratransit services; and
- appropriate approaches to integrating paratransit with scheduled services.

The purpose of the second round of the Delphi survey will be to:

- explore, in greater depth, issues thrown up by the first round as required; and
- seek considered consensus on the barriers to, and prospects of, implementing the approaches to paratransit reform that emerged as most appropriate in the first round.

The first round survey instrument took the form of a (24-question) questionnaire, broken into four

parts. In the first part, panellists were asked questions relating to their fields of expertise, and the Sub-Saharan African contexts within which they had greatest experience. In the second part, panellists were asked questions relating to the nature of contemporary public transport reform strategies, and their forecast of the likely outcomes of these. In the third and fourth parts, panellists were asked questions relating to paratransit service upgrade, and the complementary integration of paratransit services with formal scheduled services, respectively. Questions were either open-ended (46%), closed (25%), or took the form of Likert scale agreement or disagreement with a stated proposition (29%). The survey was administered on-line (using SurveyMonkey software). Panellists were provided with an electronic copy of the questionnaire in addition to website long-in information. Some panellists chose to submit their responses via email instead of on-line. Participant anonymity was maintained throughout the recruitment and data collection process.

4. Findings

The findings of the first round of the Delphi survey are discussed in terms of panellists' views with respect to: the outcomes of contemporary public transport reform strategies; appropriate strategies to pursue in improving the quality of service provided by incumbent paratransit operators; and appropriate strategies to pursue in integrating paratransit services with formally planned higher capacity public transport services. As no consistently different patterns of response emerged across the areas of expertise and geographical contexts represented in the Delphi panel, the findings presented in this section are not disaggregated on this basis to any significant extent.

4.1 Panel views on contemporary policy outcomes

Views on the outcomes of contemporary public transport reform strategies are discussed in terms of: paratransit service attributes in need of improvement; barriers to reform; and the prospects of BRT-based strategies.

4.1.1 Service attributes improvement needs

Panel responses to a question on which aspects of paratransit service are most in need of improvement (question 6) identified a wide range of problematic service attributes. Across all contexts unsafe and illegal driver behaviour (resulting from the 'target system' fare strategy) and safety (resulting from unroadworthy vehicles) were identified as major concerns. The South African and Tanzanian panellists identified passenger information and customer care, service availability, overloading and route shortening as further problems. The panellists with expertise in other Sub-Saharan African countries identified off-peak delays (resulting from a 'fill and go' system at ranks), fare fluctuation and affordability during adverse weather and severe congestion (particularly in relation to Lagos), inadequate passenger facilities at ranks, slow commercial speeds and long queuing time, as further problems. The panel was unanimous that existing paratransit services are in need of significant improvement, as illustrated in the following response (referring to Nairobi):

“Virtually all of it needs improvement. There is something of a formal bus system but it is a mere shadow of one. For all intents and purposes, matatus are the effective public system. The system is largely self-organized and self-regulated by the suppliers. The relationship with government varies from adversarial to corrupt. As a result the ability of government to project public concerns on to route structures and fares is severely limited.” (Panellist #14)

4.1.2 Barriers to reform

While some panellists (13%) identified the vested interests of well-organised paratransit associations

in response to a question on what the main barriers to paratransit and public transport reform are (question 8), the overwhelming consensus of the panel was that the primary barrier was institutional (more specifically, weak regulatory frameworks, weak institutional capacities to implement them, and weak political will). This sentiment is reflected in the following response (referring to Johannesburg):

“[D]espite the commitment at political level to restructure the taxi industry, the process has proved very cumbersome ... [t]here has been a lack of funding [which has] discouraged some of the initiatives and programs for public transport reform. ... At times the interests of the three levels of government are not always the same. [There is a] lack of commitment of officials to the project and belief that the taxi industry can be reformed. The officials sometimes feel it is better to go to tender instead of embarking on a negotiated process. ... Most officials and politicians have no understanding of the taxi industry, [and] ... officials are not willing to engage in new and innovative ways of engaging with the taxi industry.” (Panellist #1)

4.1.2 BRT-based reform

Panel responses to a proposition that high quality and technology BRT is perceived by decision-makers as a panacea without adequate consideration of alternatives (question 11) were not unanimous (see table 1). The majority of panellists (76%), however, agreed with the proposition, while 18% disagreed.

Table 1. Delphi panel views on perceptions of bus rapid transit in Sub-Saharan African cities (question 11)

Proposition:			
‘Gold standard’ BRT is being promoted by its international proponents, and is being perceived by local decision-makers, as a panacea in Sub-Saharan African cities without adequate consideration of mode alternatives.	strongly agree	(5)	29%
	agree	(8)	47%
	neutral	(1)	6%
	undecided		
	disagree	(2)	12%
	strongly disagree	(1)	6%
			(17)

The sentiments of panellists who agreed are reflected in the following response:

“Lobby-groups, such as ITDP, are certainly promoting 'gold standard' BRT – and are gaining traction with governments as providing a 'solution' to their urban transport problems. However their figures are questionable (to say the least), and they fail to explain how even Bogota is struggling to get beyond its second line. Fortunately some sector specialists in the World Bank recognise that BRT must be appropriate to context (physically and financially), and is only ever likely to affect a minority of travel in the city. As such, they place greater emphasis on regulatory reform and lower-scale infrastructure investments for improved bus operations.” (Panellist #16)

The view of a panellist who disagreed with the proposition was that:

“In the cities I know in Western Africa (even Central Africa) BRT is not [widely] considered as a solution. The proposal made by ITDP in 2003 in Dakar was not well received and it [was] only in 2012 [that] a new BRT project [was] launched in this city. ... Decision makers are more interested by tramway projects, without measuring the involved costs. I personally pledge for BRT projects which have to be suited to African cities and are not the BRT scheme

from Latin America.” (Panellist #17)

The noteworthy contrary view of the undecided panellist was that:

“There is nothing wrong with identifying the ‘ideal’ as long as it is understood that: (a) it as a reference point, perhaps unattainable in full; (b) there are other possible reference points; (c) not [achieving] ‘gold standard’ does not imply that a solution is poor quality or wrong; (d) the best solution is the one that best meets the requirements of the city; and (e) nothing is a panacea. Experience with so-called BRT in the cities of Indonesia (and to a lesser extent in USA!) is a salutary lesson in why someone needs to set a standard.” (Panellist #13)

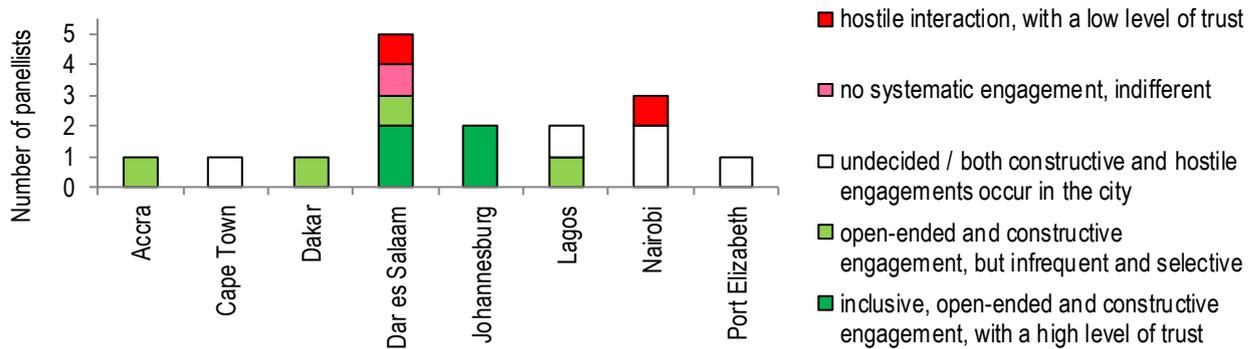
Panel responses to a proposition that most BRT-based reform strategies envisage the comprehensive replacement of paratransit services (question 12) were also not unanimous (see table 2). The majority of panellists (71%), however, agreed with the proposition, while 18% disagreed. The reasons advanced for disagreeing with the proposition included: the heterogeneity of policy discourses across the continent and a view that francophone city authorities had not embraced BRT in the same way as their anglophone counterparts had (Panellist #17); and while there might be an objective to comprehensively replace along BRT corridors this is not necessarily true throughout entire urban areas (Panellist #13).

Table 2. *Delphi panel views on the intended impacts of reform strategies on paratransit operators (question 12)*

Proposition:			
With notable exceptions, most BRT-based public transport reform strategies in Sub-Saharan Africa envisage, explicitly or implicitly, the comprehensive replacement of paratransit services as an outcome of the reform process, albeit gradually or in phases.	strongly agree	(4)	24%
	agree	(8)	47%
	neutral	/ (2)	12%
	undecided		
	disagree	(3)	18%
	strongly disagree	(0)	0%
		(17)	100%

While many of the cities panellists are most familiar with (see figure 1[b]) have experienced conflicts between public authorities and paratransit operators, responses to a question on the nature of engagement between these groups (question 9) revealed that in most cases panellists felt that engagement was at least partially constructive (see figure 2). Least constructive engagement was reported by the East African panellists: none of the Kenyan panellist viewed engagement with *matatus* in Nairobi as wholly constructive, and 40% of Tanzanian panellists viewed engagement with *dala dalas* as hostile or indifferent.

Figure 2. *Delphi panel views on the nature of engagement between planning authorities and paratransit operators on public transport reform (n=17, question 9)*



Panel responses to a question on the likely outcomes of city specific public transport reform strategies, and the envisaged impacts on paratransit operators (question 10) revealed widespread agreement that change will be slow, and, noting a mix of optimism and pessimism in responses, that the final outcomes are uncertain. The uncertainty of future outcomes is reflected in the following responses (referring to Johannesburg, Dar es Salaam and Accra respectively):

“There are various scenarios. One is that a steady pace of reform will be initiated with ongoing and gradual improvements that will take a 30 to 40 year period, and that sources of funding will be secured to ensure the momentum is maintained. In this scenario ... the 23% share that paratransit has of the total mode mix will reduce to lower levels over time as these operators are absorbed into formal contracted standard bus and BRT systems on high-volume corridors. A large share of the market will nevertheless continue to be held by paratransit as standard bus and BRT are not appropriate in many lower density situations. Quality improvements through enhanced regulation, more concerted integration with contracted services, and passenger information should be striven for. Another scenario is that short-sighted financial crisis and lack of planning and securing of funding sources will put the brakes on any change ... and a continuation of the status quo in most respects for paratransit. Without contracting services (and related higher costs to [the] state) there is not a lot of scope for any reform of paratransit. In the current period scenario 2 looks more likely. But things change according to political mood.” (Panellist #2)

“Implementation of [the] BRT system ... may face political resistance due to the fact that ... it is obvious that the current paratransit operators will provide some resistance to the implementation of the project. Due to the above ... I expect that implementation of [the] BRT system should take into consideration of existence of paratransit operators and incorporate them in the reforms. In this case reforms will take longer ... than expected ... and paratransit operators will ... continue providing services.” (Panellist #5)

“BRT is at risk in the absence of deep commitment from national Government coupled with an understanding of what BRT is other than infrastructure. The higher quality bus routes have better prospects due to the clearer market opportunity and lower investment requirements. However, they are also dependent on ... supporting elements being put in place, and avoidance of the process being frustrated by various self-interests. Paratransit operators willing to comply will benefit. ... Illegals, floaters, and those not willing to maintain/improve their vehicles will be squeezed out of the sector.” (Panellist #13)

The 14 (82% of) panellists who indicated that they agreed with the proposition that most BRT-based reform strategies envisage the comprehensive replacement of paratransit services (question 12) were presented with a further proposition relating to the outcomes of such strategies (question 13). Panel

responses to the further proposition that the most likely outcomes of BRT-based reform strategies that envisage comprehensive paratransit replacement are hybrid systems were not unanimous (see table 3). A slim majority of panellists agreed with the proposition (57%), while 21% disagreed.

Table 3. *Nested Delphi panel views on the likelihood of hybridity as an outcome of reform strategies aimed at comprehensive paratransit replacement (question 13)*

Proposition:			
The prospect of achieving comprehensive replacement of paratransit services in the short- to medium-term seems remote. There are two likely common outcomes. The first is that complex negotiations with existing operators and budget constraints will result in comprehensive paratransit replacement occurring only after a much extended period of time. The second is that paratransit replacement will simply not occur. In either case, cities will depend, for decades, on a hybrid public transport system that combines both scheduled and paratransit services.	strongly agree	(2)	14%
	agree	(6)	43%
	neutral	/ (3)	21%
	undecided		
	disagree	(1)	7%
	strongly disagree	(2)	14%
		(14)	100%

Three noteworthy undecided and contrary views, reflecting the contested response to the proposition, were:

“The restructuring of the taxi industry will eventually occur ... [t]he hybrid system as I understand it ... will be one company operating both scheduled and unscheduled in different areas ... dictated by the number of passengers.” (Panellist #1)

“I think either of [no or much delayed paratransit replacement] is reasonable but I would add what I think is[a] third and equally likely outcome: ... the potential for this rests on the fact that the introduction of BRT is going to be extremely limited in terms of places it can work given the configuration of streets in Nairobi. Since it can only run in few places, the design of feeder routes that become the turf of the matatu operators organised in co-operatives or cartels, becomes a more permanent reality.” (Panellist #14)

“The risk is that the scheduled services [will not] survive – may not even be introduced – leaving no hybridity, and a low-quality outcome.” (Panellist #16)

4.2 Panel views on policy alternatives for paratransit service improvement

Views on appropriate strategies for improving the quality of paratransit services are discussed in terms of: the importance of upgrade as a reform strategy; essential upgrade measures; and the importance of open-ended engagement.

4.2.1 The importance of paratransit upgrade

Panel responses to a proposition that in some Sub-Saharan Africa cities the most appropriate path to reform will be through the upgrade of existing paratransit services (question 14) were not unanimous (see table 4). The majority of panellists (65%), however, agreed with the proposition, while 18% disagreed.

Table 4. Delphi panel views on the appropriateness of existing paratransit services upgrade in cities without capacity to install scheduled services (question 14)

Proposition:			
Some large cities in Sub-Saharan Africa lack the capacity and resources to install networks of formal scheduled public transport services, so in these contexts the most appropriate path to reform will be through the upgrade of existing paratransit services.	strongly agree	(3)	18%
	agree	(8)	47%
	neutral	/ (3)	18%
	undecided		
	disagree	(3)	18%
	strongly disagree	(0)	0%
			(17)

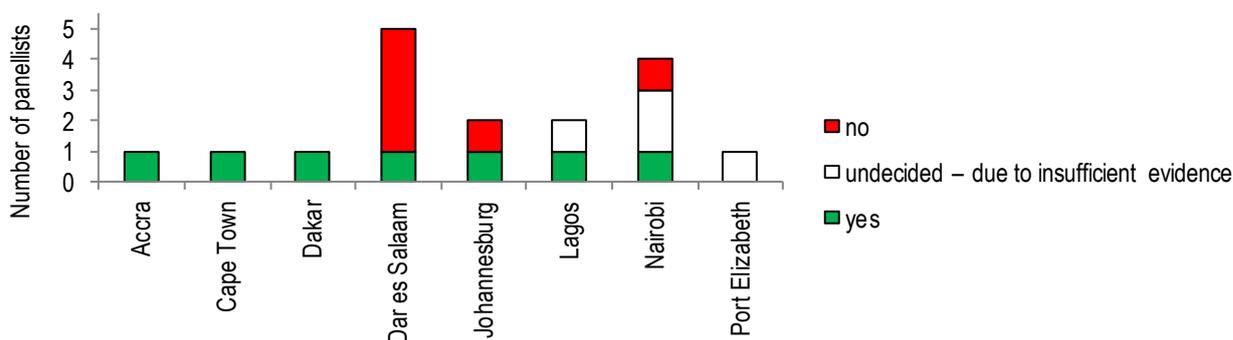
Two noteworthy undecided and contrary views were:

“[The proposition] should be split into two [parts]. ... I strongly agree with the first [relating to a lack of capacity and resources to install networks of formal scheduled public transport services]. I disagree with the second [relating to the most appropriate path to reform being through paratransit service upgrade]. This is just as dependent on the capacity of the authorities, albeit requiring different skills. I consider that it is no less certain than the first part. [Therefore] I must disagree with the total statement, which is phrased as ‘either/or’ and does not appear to consider the possibility of yet other paths.” (Panellist #13)

“I do not like the formulation [of the proposition] because ... one has to think complementarity. That means one can have a reduced formal [public transport] network in cities where there is a lack of resources, combined [with] a dynamic paratransit sector one will try to upgrade.” (Panellist #17)

Panel responses to a question on whether the city they know best has the capacity and resources to install networks of formal scheduled public transport services (question 15) were mixed amongst the East African panellists (see figure 3).

Figure 3. Delphi panel views on the capacity of city authorities to install formal scheduled services (question 15)



4.2.2 Essential upgrade measures

Panel responses to a question on which public sector interventions are essential to achieving the upgrade of existing paratransit services (question 16) identified a wide range of interventions (see figure 4). Other suggested interventions, not reflected in figure 4, included the provision of passenger

information, the establishment of institutional frameworks that integrate currently disjointed institutions, the improvement of road infrastructure to improve the productivity of the buses, and network planning for at least core routes. Three (18% of) panellists argued that no interventions are appropriate as existing institutional conditions dictate that paratransit services cannot be improved, and intervention should therefore focus on incorporating paratransit operators into formal bus companies. The remaining 14 (82% of) panellist were then asked to prioritise which of the interventions identified in question 16 is the most important first priority (question 17). Figure 5 presents the responses to this question, revealing strong support for quality regulation (32%), road space prioritisation (21%) and operator business training (13%). Many panellists were unable to select a single priority intervention however, reflecting a common view that service upgrade strategies need to be multi-faceted.

Figure 4. *Nested Delphi panel views on public sector interventions essential to upgrading paratransit services (weighted, n=14, question 16)*

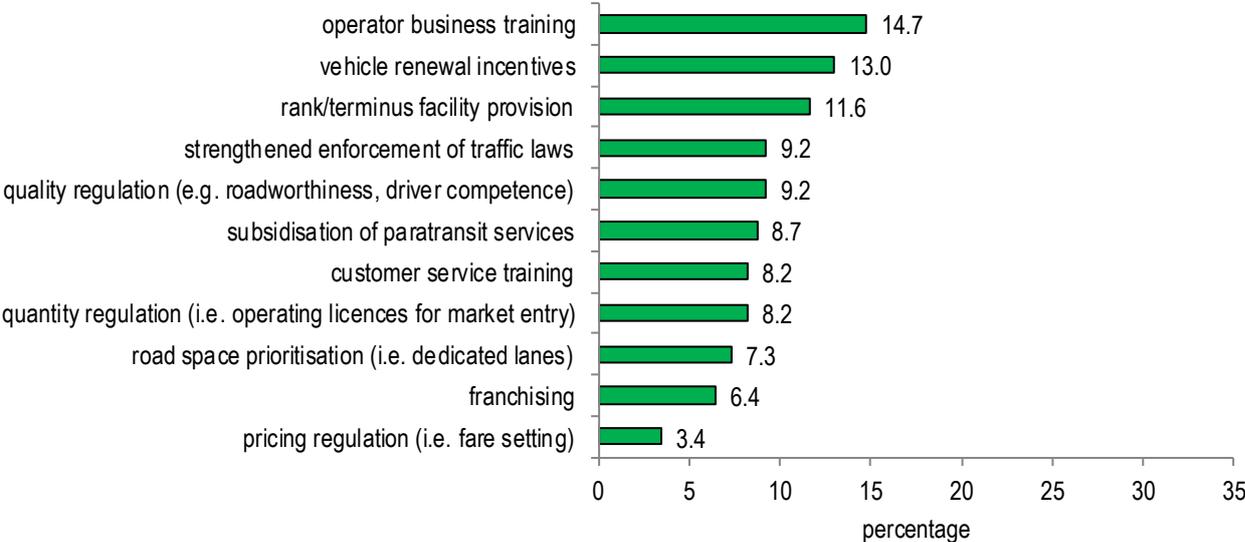
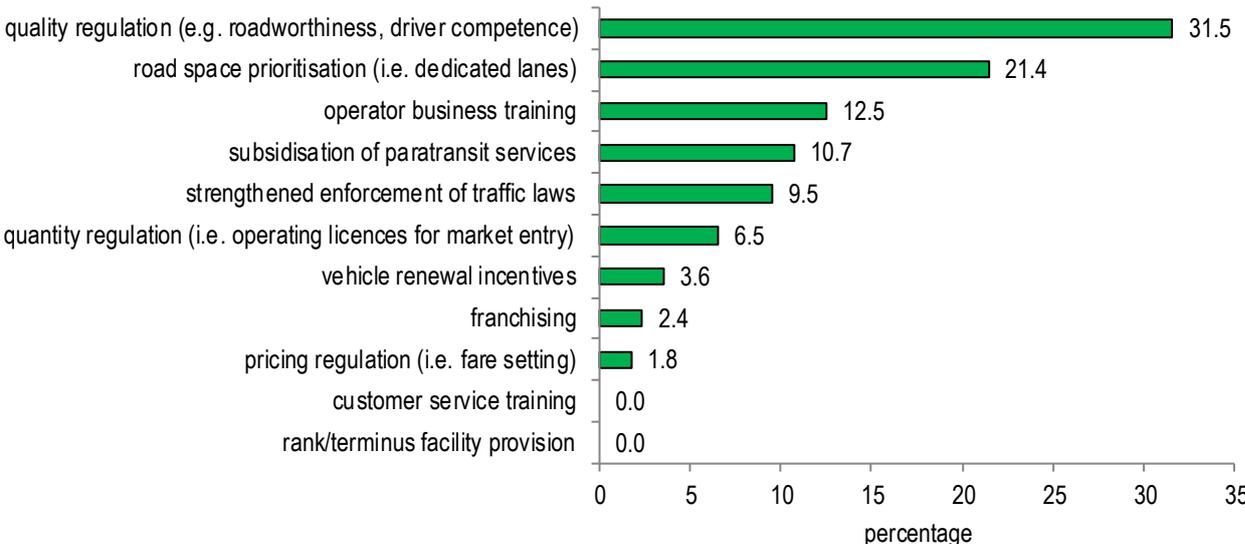


Figure 5. *Nested Delphi panel ranking of the most important first priority in public sector intervention to upgrade paratransit services (weighted, n=14, question 17)*



The rationale for the prioritisation of these interventions is reflected in the following responses:

“I do not see how a single measure can transform the sector. In my opinion, there are prerequisites, and there are improvement measures. On that basis, I do not see how any [strategy] can succeed in the absence of quality regulation. Reasons: removes the most dangerous vehicles and ... drivers (the ‘cowboys’) from the system; encourages a culture of change, so you are not seen to be a fool to comply; provides some visible reward for those willing to comply ... in part by thinning out the numbers [so] the compliant get a bit more work and revenue; ... can form part of franchise conditions, either for the individual vehicle or for the collective of operators on a route/franchise; [and] ... can be gradually increased over time, providing incentives for improvements to vehicle quality, driver quality, comfort and customer care.” (Panellist #13)

“This is difficult to decide. I would [select] business training, except that this might get tied up in other issues. One of those, in a regulated system, is ‘protection’ from new entrants. This is often promised by government in return for participation in regulatory schemes. So the first priority should perhaps be a programme of genuinely effective quality control.” (Panellist #4)

“Road space prioritisation - a difficult choice, because all are required in a holistic strategy. However the key determinant of commercial fares is the speed of operation, and road space prioritisation is the most effective way of achieving this. Also it is a visual indication of the public sector’s commitment to the reform process, and therefore more likely to elicit support than regulation and enforcement measures – though access to the road space would clearly be made conditional on those.” (Panellist #16)

“Training is probably the first priority. But [conventional] training [may] not be suited. One needs to design training [interventions that] integrate the real practices of paratransit operators before [recommending] ‘good management’. [This implies a need for] training of the trainers, [as well as] the experts and technicians in charge of the sector.” (Panellist #17)

4.2.3 The importance of open-ended engagement

The 14 (82% of) panellist who responded to question 17 (relating to priority upgrade interventions) were presented with a further proposition relating to importance of open-ended engagement in formulating upgrade strategies (question 19). Panel responses to this proposition were fairly unanimous (see table 5), but with some caveats as noted in the following response:

“Agreed, but [with] two caveats: (1) Discussion with the paratransit sector is invariably discussion with those who have gained control of the sector. They have their own interests, and their means of benefitting may be based on their ability on [the] one hand to exploit the membership and extract rent from them, while on the other to mobilise the membership to resist changes that would threaten their personal position. Almost by definition, agreements that satisfy the leadership are likely to have inherent problems. (2) The authorities are the mandated authorities, and should not be constrained from acting until everyone is happy”. (Panellist #13)

Table 5. Nested Delphi panel views on paratransit engagement in service upgrade (question 19)

Proposition:			
Comprehensive and open-ended engagement with operators is essential to the success of paratransit service improvement strategies.	strongly agree	(9)	64%
	agree	(4)	29%
	neutral	/ (0)	0%
	undecided		
	disagree	(0)	0%
	strongly disagree	(1)	7%
		(14)	100%

4.3 Panel views on policy alternatives for paratransit service integration

Views on appropriate strategies for integrating paratransit services with formal scheduled services are discussed in terms of: the importance of achieving complementarity; promising approaches to integration; and the importance of incrementalism.

4.3.1 The importance of complementarity

Panel responses to a proposition that in those Sub-Saharan African cities with the capacity and resources to install formal scheduled public transport services, complementing these services with paratransit is more likely to benefit a large proportion of city residents than reform strategies that set out to comprehensively replace paratransit (question 20), were fairly unanimous (see table 6). The majority of panellists (88%) agreed with the proposition, while 12% disagreed.

Table 6. Delphi panel views on the appropriateness of complementary paratransit services in cities with capacity to install scheduled services (question 20)

Proposition:			
In those Sub-Saharan African cities with the capacity and resources to install formal scheduled public transport services, complementing these services with paratransit is more likely to benefit a large proportion of city residents than reform strategies that set out to comprehensively replace paratransit.	strongly agree	(9)	53%
	agree	(6)	35%
	neutral	/	
	undecided	(0)	0%
	disagree	(2)	12%
	strongly disagree	(0)	0%
		(17)	100%

The sentiments of panellists who agreed are reflected in the following response:

“Paratransit will always be the most appropriate form for responsive local services affecting a high number of passengers (though not necessarily a high number of passenger kilometres), especially as cities continue to grow in spatial as well as population terms.” (Panellist #16)

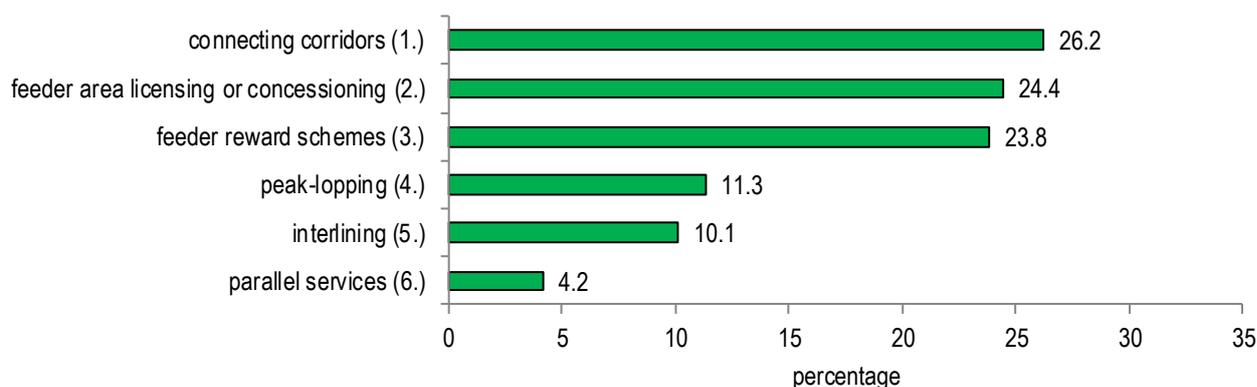
The view of a panellist who disagreed with the proposition was that:

“All African cities can implement comprehensive reforms. It only has to do with getting our priorities right and putting our citizens in the forefront. Reflect on the various investments by our Governments [and] you will ... disagree [with the proposition].” (Panellist #6)

4.3.2 Promising approaches to integration

Panel responses to a question on which approaches to the integration of paratransit and formal scheduled services hold greatest promise of achieving complementarity (question 21) identified a range of alternatives. Three (18% of) panellists argued that no approaches are appropriate as existing institutional conditions dictate that paratransit services and formal scheduled services cannot operate together in a complementary way, and intervention should therefore focus on replacing paratransit completely. Figure 6 presents the responses of the remaining 14 (82% of) panellists, revealing strong support for connecting corridors (i.e. modal interchange facility provision to facilitate transfers between modes serving different parts of the city) (26%), feeder area licensing or concessioning (i.e. scheduled trunk services, with feeder and distribution services provided by paratransit operators with area licenses or concessions) (24%), and feeder reward schemes (i.e. scheduled trunk services, with feeder and distribution services provided by paratransit operators incentivised by rewards) (24%). As in the case of service upgrade interventions, most panellists noted that a combination of approaches will be required.

Figure 6. *Nested Delphi panel views on which modal interactions hold the greatest promise in achieving complementarity (weighted, n=14, question 21)*



Notes:

1. 'Connecting corridors' were described in the questionnaire as modal interchange facility provision to facilitate transfers between modes serving different parts of the city.
2. 'Feeder area licensing or concessioning' was described in the questionnaire as feeder and distribution services (serving scheduled trunk services) provided by paratransit operators with area licenses or concessions.
3. 'Feeder reward schemes' were described in the questionnaire as feeder and distribution services (serving scheduled trunk services) provided by paratransit operators incentivised by rewards for bringing passengers to the trunk service stations.
4. 'Peak-logging' was described in the questionnaire as paratransit operators contracted to provide supplementary scheduled services in the peak period.
5. 'Interlining' was described in the questionnaire as open busways shared by scheduled and paratransit services.
6. 'Parallel services' were described in the questionnaire as no attempt to prohibit or compensate paratransit operators along trunk corridors.

The rationale for the selection of the top three approaches is reflected in the following responses:

"[Connecting corridors and feeder-trunk arrangements] ... [b]ecause meeting the transport need of typical major cit[ies] of Sub-Saharan Africa cannot be served by just one mode or approach. Pragmatism is necessary and avoidable duplication of services should be avoided. Cost effectiveness is important and there are different ways of achieving this depending on local setting." (Panellist #15)

“Connecting corridors [because] ... [t]here is need for paratransit to be incorporated to complement other modes such as BRT and scheduled bus operators. A central hub [for] interchange is the ideal way of improving connectivity. Paratransit can feed and be fed by trunk lines at these interchanges. Feeder reward schemes [because] [p]aratransit [operators] are profit driven. ... Feeder area licensing or concessioning [because] [t]his is the only way to minimise wasteful and unfair competition within a territory” (Panellist #10)

“As a generalisation, big buses are more efficient and more cost-effective on axes of highest demand, and are the best use of scarce road space. Intensive paratransit operations invariably clog up the streets, with degeneration of themselves, big bus operations, freight operations and general traffic. In my opinion, a hierarchy is required, and paratransit should not be allowed to use big bus priority facilities under any circumstances. Smaller vehicles and flexible organisation are better suited to local, lower demand, district-to-district and peripheral services, and to niche markets. In fact, such travel probably constitutes the majority of the travel market. It is not a case of marginalising or diminishing paratransit, it is a matter of assigning the appropriate roles to the modes. The modes can be complementary at the network level, each contributing in a different way. The point of intersection is covered by designated feeders, local routes which also function as feeders, and district-to-district or peripheral routes which also function as feeders. The options I selected [the first three approaches in figure 6] are variants on how this would work.” (Panellist #13)

“A planned passenger network based on planned interchange, rather than just direct services, is inherently far more efficient in matching demand to supply and minimising total transport resource consumption – and hence minimising fares or necessary public support. The measures selected [the first four approaches in figure 6] all contribute to that aim.” (Panellist #16)

4.3.3 The importance of incrementalism

Panel responses to a proposition that incremental paratransit reform strategies (i.e. stepped progression from operational improvements, to collective fleet ownership, to corporatisation) have greater prospects of success than strategies that seek to convert or incorporate paratransit operators into large bus operating companies in one step (question 23), were fairly unanimous (see table 7). The majority of panellists (82%) agreed with the proposition, while none disagreed, but the following caveats were raised. Firstly that there may be situations where it is appropriate to incorporate paratransit operators into large bus operating companies in one step (e.g. where BRT is introduced in an environment with no formal bus undertakings) (Panellist #16). Secondly that the long timeframe over which incremental improvements are likely to occur could present problems with respect to fluctuating political support and services continuing to match changing passenger needs (Panellist #13).

Table 7. Nested Delphi panel views on the appropriateness of incremental paratransit operational improvements (question 23)

Proposition:			
Public transport reform strategies that propose a stepped process entailing incremental paratransit operational improvements, collective fleet ownership and corporatisation with the aim of paratransit operators eventually becoming the companies contracted to operate future large bus services, has greater prospects of success in the Sub-Saharan African context than strategies that seek to convert or incorporate paratransit operators into large bus operating companies in one step.	strongly agree	(6)	35%
	agree	(5)	29%
	neutral	/	
	undecided	(3)	18%
	disagree	(0)	0%
	strongly disagree	(0)	0%
		(14)	100%

5. Conclusion: towards a second first round of a Delphi survey

The aims of this paper were to test a proposition regarding public transport reform in the Sub-Saharan African context – in essence that there are path dependencies and constraints that limit the extent of possible public transport system reforms, that the likely outcome of attempts to comprehensively replace paratransit with BRT systems is emergent or continuing hybridity, and that attempts to eradicate paratransit may be neither pragmatic nor strategic – and, if this proposition was supported, to explore which approaches to upgrading services and managing hybridity hold greatest promise.

With regard to the proposition tested, it was found in the first round survey that the Delphi panellists were broadly, but not unanimously, in agreement. With regard to which approaches to upgrading services and managing hybridity that hold greatest promise, while noting that upgrade and integration strategies should be multi-faceted in nature, the Delphi panel identified quality regulation, road space prioritisation and operator business training as particularly important in strategies to upgrade existing services, and identified connecting corridors, feeder area licensing and reward schemes as particularly promising for strategies to integrate paratransit with formal scheduled services. The next round of survey will need to explore the barriers to, and prospects of, implementing these interventions, and how should they fit together in a multi-faceted strategy.

The contestation and absence of consensus in panellist responses suggests that the Delphi survey method selected for the purposes of the study may have value in shifting expert opinions towards considered consensus. The next survey round will seek consensus through a refinement of the study's propositions regarding appropriate policies for paratransit reform. Drawing final conclusions, or claims of expert consensus, at the mid-point of a study of this nature would therefore clearly be premature. For now, it is perhaps most appropriate to conclude with the following tentative and cautionary commentary of unfolding public transport reforms, informed in part by the authors' interpretation of current policy discourse, and in part by the majority expert views solicited in the Delphi survey to date.

So in conclusion, it is argued that the established interests of paratransit operators, and the financial and regulatory capacities of responsible government agencies present deeply embedded constraints to policy choices and path dependencies that should not be ignored. With regard, more specifically, to reform strategies based upon the *in toto* substitution of paratransit with BRT feeder-trunk-distributor services, resistance by existing operators with well-established vested interests and reluctance to surrender control of their businesses and livelihoods *en masse* to what are likely to be uncertain prospects associated with transformed systems, as observed in South African cities in these processes to date (Cape Town, Johannesburg and Port Elizabeth), potentially present a significant obstacle to change. Further, the appropriation of 'best practice' BRT models that have not been fitted adequately to specific local institutional frameworks and urban environments, and as a result have not accurately anticipated and secured the substantial capital and operating expenses required by these systems, may well prove unaffordable without a major diversion of scarce public resources. These models may also offer a poorer benefit-to-cost ratio than originally expected.

While the South American BRT experience generally, and the Bogotá experience more specifically, undoubtedly provides inspiration and some important lessons for Sub-Saharan African cities, it must be questioned whether they offer a model that can be transferred directly and uncritically into a different context. It does not necessarily follow that the processes and technologies that have enabled successful outcomes in one context, will achieve, or indeed surpass, this level of success when transferred to another.

The prospect of achieving the sometimes explicitly stated, or implicitly implied, ambitious objective of total paratransit replacement in Sub-Saharan African cities in the short- to medium-term seems remote. Cities will depend, for decades, on a hybrid public transport system that combines both scheduled and paratransit operators – possibly in what Gwilliam (2008) refers to as an optimum state

of ‘delicately balanced chaos’. Sub-Saharan African city governments formulating much-needed strategies to reform their public transport systems should recognise the enduring presence of paratransit services, not ignore them.

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Appendix A: Case city historical backgrounds⁶

A.1 Cape Town (South Africa)

Public transport services in Cape Town were first introduced in the nineteenth century. The first (privately operated) mode of public transport took the form of horse-drawn omnibuses. These were progressively displaced from 1863 onwards by horse-drawn trams. In the 1860s two (privately financed) passenger rail lines were constructed, which shaped the physical growth of the city beyond its historical monocentric core over subsequent decades. These rail lines were incrementally expanded over many years into, by South African standards, an elaborate intra-city network. Electric trams (i.e. streetcars) were introduced in the 1890s to replace and extend the earlier horse-drawn tram technology, and rapidly proliferated to serve the suburban growth of the city alongside the gradual extension of the passenger rail system. The electric trams were in turn replaced by trackless trams (i.e. trolley buses) and conventional diesel buses in the 1930s. The advent of these road-based modes across Cape Town and other South African cities introduced competition with passenger rail services which, by that time, were operated by a public monopoly. (Dewar *et al* 1990, Wilkinson 2010)

This road-rail competition triggered the introduction of market entry regulations that, with some modifications, have endured to the present time. Legislation passed in 1930 required that road-based operators acquire ‘motor carrier certificates’ (known as ‘permits’ and ‘operating licenses’ in subsequent legislation). It was at around this time also that the first black-owned paratransit services emerged. Between the 1920s and 1960s black entrepreneurship was subject to complex legal restrictions, resulting in great difficulty in acquiring operating permits for paratransit operations. A quota system allowed only a limited number of permits to be issued each year, which resulted in around 90% of permit applications being rejected. (Barrett 2003, Dugard 2001)

In the 1970s paratransit permits remained difficult to acquire, and, in the face of a growing demand for paratransit to fill gaps in scheduled public transport networks, services were increasingly operated illegally. The apartheid spatial planning policies of the 1960s had resulted in widespread relocation of

⁶ The descriptions of historical developments in Dar es Salaam and Nairobi draw heavily from Wilkinson *et al* 2011.

black and ‘coloured’ populations⁷ away from commercial and industrial centres, and, consequently, bus and train transport became increasingly expensive for both passengers and the state (through the subsidies required), and service coverage and frequencies declined. A policy shift in the late 1980s towards deregulation resulted in an explosion in the number of paratransit permits issued, and extensive ‘in the market’ competition resulted – the consequences of which are still felt today. The present structure of Cape Town’s public transport system is made up of three main modes: rail, bus and paratransit (known as ‘minibus-taxis’). Recent estimates suggest there are some 6,359 minibus-taxi owners, with an estimated 7,467 registered vehicles in the city. (Clark and Crouse 2002, Schalekamp and Behrens 2010)

A.2 Dar es Salaam (Tanzania)

Urban public transport in Dar es Salaam – consisting entirely of road-based services – dates back to the British colonial era when, in 1949, a privately owned company known as the Dar es Salaam Motor Transport Company (DMT) established the first bus services in the city. Following independence in 1964, and the Arusha Declaration of 1967, DMT was nationalised in 1970 and subsequently renamed *Shirika la Usafiri Dar-es-Salaam* (UDA) in 1974. UDA was not expected to operate commercially, since the government maintained low fares to promote the welfare role of public transport. Proposed fare increases had to be approved by the Cabinet and there was no mechanism in place to compensate the companies for the difference between economical fares and fares approved by the government. An increasing operating deficit (operating costs doubled from 1974 to 1982, while passenger fares remained stable), together with an aging vehicle fleet, a shortage of qualified maintenance technicians, and a lack of foreign exchange to purchase spare parts, inevitably resulted in service deterioration. (Kanyama *et al* 2004, Kumar and Barrett 2008)

The period after 1983 saw a liberalisation of public transport and the subsequent emergence of large numbers of private paratransit operators, in the form of 16- to 36-seater *dala dalas* (named after the Kiswahili word for the five shilling coin, the common fare in 1981) with permission to operate fixed routes. Most *dala dalas* operated on the most profitable routes radiating out of the city centre. By 1989, private operators had captured 90% of the passenger market, whereas UDA’s share declined (to just 2%, with only 12 buses operating in 2000). Recent estimates suggest there are some 7,000 *dala dalas* in operation, of which approximately two-thirds are illegal – covering some 190 routes that can vary in length from 3km to 30km. (Diaz Olvera *et al* 2003, Transport Research Laboratory 2002)

The Surface and Marine Transport Regulatory Authority (SUMATRA) was established in 2004 to regulate rail, road, and maritime transport services, and is responsible for *dala dala* licensing. *Dala dala* owner interests are represented by the Dar es Salaam Commuter Bus Owners Association (DARCOBOA). Entry into the market is largely unrestricted, although capital finance can be difficult to raise. SUMATRA does impose some quality regulation with respect to driver training, and vehicles are numbered and allocated to a specific route which is identified by a colour coding system on each vehicle. (Sohail *et al* 2004)

A.3 Nairobi (Kenya)

Formal public transport operations in Nairobi date back to 1934 when the Overseas Motor Transport Company of London (later known as the United Transport Overseas Service) was granted a monopolistic franchise (renewed in 1953 and 1966) to operate a bus service in the city, and established Kenya Bus Services (KBS). The franchise renewal in 1966 was awarded by the Nairobi City Council (NCC) in exchange for a 25% share of KBS. Under this agreement, the NCC was to provide and maintain infrastructure, and control fares. KBS grew from 100 buses in 1963, to 166 buses by 1970.

⁷ The term ‘coloured’ in South African racial nomenclature refers to persons of mixed ethnic origins drawn mainly from first nation Khoi and San peoples, slaves from present-day Indonesia and European colonialists.

The elevated oil price in the early 1970s and the unwillingness of the NCC to increase fares from 1966 levels, however, made operating conditions difficult for KBS, and the quality and quantity of service declined as a consequence. With Kenyan independence in 1963, urbanisation restrictions imposed on the black African population were removed and the demand for public transport increased. *Matatus* (in the form of 18- to 35-seater paratransit mini- and midi-buses, named after the Kikuyu term for 30 cents, the standard fare at the time) emerged to satisfy this demand. (Kumar and Barrett 2008, Transport Research Laboratory 2002)

In 1973, President Jomo Kenyatta, responding to lobbying from *matatu* operators and businesses, issued a presidential decree declaring *matatus* legal and enabling them to carry fare-paying passengers without obtaining public transport service licenses from the Transport Licensing Board (TLB). As a result of this legalisation Nairobi experienced an increase in *matatu* services, growing from 375 vehicles in 1973, to 1,567 in 1979. A Matatu Vehicle Owners Association (MVOA) was formed in 1982 to allocate *matatu* routes. The MVOA was banned in 1988 by the government for political reasons, which had the effect of fragmenting the industry. Officially recognised *matatu* associations re-emerged, however, in the late 1990s with the registration of the Matatu Welfare Association (MWA) in 2001 and the formation of the Matatu Owners Association (MOA) in 2003. In 1999 legislation was passed requiring that *matatus* obtain licenses from the TLB. Regulations (known as the 'Michuki Rules') were imposed on *matatu* operators in 2004 by the Minister for Transport, John Michuki, which resulted in a fairly short-lived period of improved control and service quality improvements. The regulations included the installation of speed governors, seat belts, and improved enforcement of roadworthiness and vehicle loading, but compliance with these regulations declined sharply when Minister Michuki left office in 2009. (Khayesi 1999, McCormick et al 2010, Mutongi 2006)

Further competition in the public transport sector was introduced in 1986 when the Kenyan Government started the Nyayo Bus Service Corporation as a parastatal, but it proved unable to compete with private operators, and was wound up in 1992. Similarly, after being sold and resold to different international and local investors, and losing market share to *matatus*, KBS services, together with two other private large bus companies, City Hoppa and Express Connections, were eventually reduced to playing a minor role in Nairobi's public transport system relative to *matatus*. KBS has a current fleet of approximately 300 vehicles covering 50 routes, while recent estimates suggest there are some 15,000 *matatu* vehicles in operation. In early 2011 measures were introduced to phase out 14-seater *matatus* by ceasing to issue Public Service Vehicle (PSV) licences for this size of vehicle, and to consolidate the industry by making membership of a Savings and Credit Co-operative Society (SACCOS) or a company mandatory. (Aligula *et al* 2005, Graeff 2008, McCormick et al 2010, Opiyo 2002)