Planning for financially sustainable public transport
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WWF South Africa’s Policy and Futures Unit undertakes enquiry into the possibility of a new economy that advances a sustainable future. The unit convenes, investigates, demonstrates and articulates for policymakers, industry and other players the importance of lateral and long-term systemic thinking. The work of the unit is oriented towards solutions for the future of food, water, power and transport, against the backdrop of climate change, urbanisation and regional dynamics. The overarching aim is to promote and support a managed transition to a resilient future for South Africa’s people and environment.

The organisation also focuses on natural resources in the areas of marine, freshwater, land, species and agriculture.

This brief was produced under the auspices of the global WWF One Planet City Challenge, which recognises the efforts of cities and towns to provide sustainable housing, transportation and energy for their residents, and take ambitious and innovative climate actions.

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INTRODUCTION

It is not easy to finance public transport operations in cities where the urban form generates low passenger volumes and high peak-to-base (peak/off-peak) ratios.

In many sub-Saharan cities, the urban densities are substantially lower than those of European, Latin American or Asian cities, which typically result in low passenger demand. Segregationist spatial planning and rapid urbanisation on the city peripheries have resulted in long trip distances among public transport users; population densities along public transport corridors are low, and travel movements are tidal (Salazar-Ferro, 2017). Coupled with what is usually decades of under-investment in public transport, it is unlikely that services in these complex urban environments will be able to operate without subsidies.

Although resource-constrained developing cities are grappling with multiple and urgent unmet needs such housing, water, healthcare and education, there is little question of the importance and value of providing public transport.

Not only could more compact, better-connected cities with low-carbon transport save cities as much as $3 trillion in infrastructure investments over the next 15 years, but the consequence of transport disadvantage (also known as transport poverty) includes ill-health, maternal mortality and high infant mortality rates; unemployment, poverty and the inability to earn a living wage; time spent away from home; exposure to crime, noise and pollutants; poor education achievement; scholar fatigue, casualties and injury; poor access to healthy and affordable food; social segregation, high crime rates, and social alienation and disengagement (Jennings, 2015).

Although this paper focuses on South Africa, the challenges and possible solutions to funding public transport have value for every city grappling with similar urban forms, financial constraints and transport inequity. Almost every African city is planning some form of public transport improvement (SSATP, 2015). Like Cape Town and Johannesburg, many other sub-Saharan African cities are implementing, planning or considering what they hope to be transformative or catalytic Bus Rapid Transit (BRT) projects that replace the current paratransit industry. These cities include Lagos (Nigeria), Kampala (Uganda) and Dar es Salaam (Tanzania).

This brief provides a broad overview of some of the ways in which public transport planning and infrastructure have been funded and financed in various countries. It then notes that subsequent operational shortfalls are inevitable, and considers (1) ways in which these shortfalls could be met, and (2) alternatives to implementing the costly comprehensive, corridor-based approach to public transportation that is the most commonly proposed intervention in sub-Saharan Africa.

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1 Bogotá in Colombia (with its Transmellilo BRT system) is approximately 13 to 14 times denser than Cape Town, for example.


‘Paratransit’ refers to demand-driven, unscheduled public transport provided by small operators, typically in mini- to medium-sized buses. Paratransit accounts for between 50 and 90% of passenger trips in sub-Saharan African cities. Paratransit is sometimes called ‘informal’, but operators are not always informal businesses, and they are not necessarily unregulated (Behrens et al, 2016). In South Africa the services are known as ‘minibus taxis’, in Uganda as ‘matatus’, and in Tanzania, ‘dala dalas’.
The minibus-taxi terminus in Plettenberg Bay, Western Cape, is the main transport hub servicing the many communities around the town.
Experience in sub-Saharan Africa indicates that institutional reform is a prerequisite for public transport reform, and needs to include a secure source of funding for both capital and operational costs (Jennings & Behrens, 2017).

Public transport planning and infrastructure (capital costs) are funded largely through the national Treasury,\(^3\) or international grants and financing (loans). The African Development Bank, for example, finances transport infrastructure projects within the region that specifically contribute to the Sustainable Development Goals (SDGs). Transport-relevant goals include the reduction of poverty (SDG 1), climate change mitigation and adaptation (SDG 13), and the creation of inclusive, safe, resilient and sustainable cities (SDG 11).

To date in South Africa, for example, the Treasury has funded around R15 billion for BRT in Gauteng province alone. The local municipality of Ekurhuleni (Gauteng), on the other hand, used the Urban Settlements Development Grant (USDG) and the Neighbourhood Development Partnership Grant (NDPG) for transport-related expenses to develop its Integrated Public Transport Network (IPTN) (Von der Heyden et al, 2015). The City of Joburg (Gauteng), eThekwini Metropolitan Municipality (Durban, KwaZulu-Natal) and Polokwane Municipality (Limpopo province) used funding provided by the German Development Bank (KfW) and the national Department of Environmental Affairs to plan and implement non-motorised transport facilities linked specifically to public transport.

In Tanzania, the core of the first phase of Dar es Salaam’s BRT system, named DART, was implemented through a public-private partnership arrangement, financed through the World Bank to the Tanzania government.

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\(^3\) In South Africa, to support the implementation of BRT systems, the national Department of Transport created a conditional grant to the relevant municipalities, first called the Public Transport Infrastructure Fund, then the Public Transport Infrastructure and Systems Grant, then the Public Transport Infrastructure Grant and now the Public Transport Network Operations Grant (Von der Heyden et al, 2015). The latter is an amalgamation of the previous two grants.
The second phase was financed through two loans of $141.71 million provided by the African Development Bank; a further loan of $44.29 million was approved for the project from the Africa Growing Together Fund (AGTF), a Chinese trust fund managed by the African Development Bank. The Bank’s contribution to the project represents 88.9% of the total estimated cost of $159.32 million, while the government of Tanzania intends to provide the remaining 11.1% (AfDB, 2016). In 2016, the African Development Bank financed loans totalling $498 million within its urban transport sector.

In Nigeria, in 2013, the Climate Investment Funds (CIF) (World Bank Group) approved a grant of $950 000 to help the country plan the reform of Abuja’s mass transit system. The request for the project preparation funding was submitted to the CIF by the government of Nigeria and the African Development Bank. This was the first time that the CIF approved a sustainable transport project preparation grant in Africa (AfDB, 2016). The project component included infrastructure and related facilities for the pilot BRT corridor, as well safety and security aspects, a communication media strategy, the enhancement of the public engagement process, provision of segregated kerbing, traffic management, signal control, pedestrian bridges at bus stops, bus shelters and BRT terminals, and detailed engineering design study and project supervision (AfDB, 2016).

The Gautrain was built to relieve the traffic congestion in the Johannesburg–Pretoria traffic corridor and offer commuters a viable alternative to road transport.
FINANCING MECHANISMS FOR PUBLIC TRANSPORT SERVICES: OPERATING COSTS

During the course of 2017, South Africa’s National Department of Transport and the Treasury raised the alarm that the country’s BRT systems set up in major metros were making losses ‘significantly higher than anticipated’ (NDoT, 2016).

These systems were, at best, recovering 40% of their operating costs through fares (NDoT, 2016). Even the most-used BRT system (by daily ridership) in South Africa, MyCiTi in Cape Town, required a 75% operating subsidy in the 2016/17 financial year (Schalekamp et al, 2017): ‘this deficit takes into account the full cost of running the vehicles, stations and information technology (IT) costs – a major component of which is the fare collection system’. A preliminary analysis of current planning for BRT in South African cities suggests that revenue per kilometre remains over-estimated, operating costs are significantly under-estimated, and cities are at financial risk. The costs of compensating minibus-taxi operators4 had also proven more expensive than anticipated (Salazar-Ferro, 2017).

In other African cities, BRT has also encountered significant financial troubles. In Dar es Salaam, the DART BRT service is reportedly running at a substantial loss, and ‘has not reached peoples’ expectations’.5 The Simon Group of companies, purchaser of Dar es Salaam’s public transport company UDA, and with a controlling stake in DART, has been reported as having declared bankruptcy after failing to repay over TSh6.4 billion owed to TIB Development Bank Limited, formerly the Tanzania Investment Bank (TIB).6

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4 Minibus-taxi operators whose services are proposed to be replaced by a particular phase of BRT have the opportunity to surrender their operating licence and operating vehicle in return for compensation and participation as shareholders in the BRT Vehicle Operating Companies.

5 community.logisa.org/spaces/2/logisa-public/articles/infrastructure/3485/a-close-look-on-bus-rapid-transport-in-dar-es-salaam

6 allafrica.com/stories/201610190479.html
Initial expectations among South African authorities, based on passenger numbers from high-density Latin American cities, were that fare income from BRT passengers would cover at least the direct operating costs of the new systems (Von der Heyden et al, 2015).

It has since become clear that fares will not cover these costs, unless fares are increased significantly above the current costs of other existing public transport. Such an increase would not be economically feasible for passengers (Von der Heyden et al, 2015).

When responsibility for public transport operations rests with local government or a municipality, it is theoretically possible to raise funding to make up some of the shortfall from local rates or the local tax base (Von der Heyden et al, 2015), although this is seldom able to contribute substantially to the cost. In Cape Town, for example, the City of Cape Town agreed to a maximum of 4% (escalated to 6% in 2015) of the rates income to be allocated to the roll-out of MyCiTi.

Another, albeit limited, opportunity to cover the operating shortfall – but often only enough to cover maintenance of infrastructure – is to ring-fence the fuel levy; rent out retail or other space at transport interchanges; offer advertising space on vehicles or bus stops; charge parking fees at Park & Ride facilities, or hire out facilities (Von der Heyden et al, 2015).

Developer contributions and land-value capture mechanisms (such as ‘betterment’ taxes on property) are seldom considered when planning and financing transport infrastructure in the South African context, yet these might lead to significant revenue. Research (Lombard et al, 2017) has shown that property close to transport infrastructure has increased in value and that an opportunity exists to capture these additional values in increased property rates or taxes.

Congestion charges are a further potential source of income (Von der Heyden et al, 2015) but have been shown to be politically challenging and time consuming to implement.

Ultimately, however, the Treasury and the relevant implementing authorities have come to accept that, despite additional funding, operating shortfalls are likely to continue, and that the continued approach to public transport transformation constitutes a financial risk. An answer, suggests Ibrahim Seedat, chief director for Public Transport Network Development, National Department of Transport, is to reduce the cost of providing the service in the first place.

7 Ibrahim Seedat, personal interview, July 2017.
Operating public transport services: Subsidy models

Because providing BRT and other public transport services has proven to exceed cost estimates, and farebox income has not met expectations, these services continue to require operating subsidies. However, there are two substantially different subsidy models: one subsidises the contracted operator (supply-side) and is able to impose some measure of efficiency or cost-saving criteria; and the other directly subsidises the user (demand-side).

In gross contracting, the operator is paid in terms of a contract. The authority determines fares, receives the income from passengers and meets any shortfall. This is the model that has been used in BRT-based contracts to date.

In net contracting, the operator is contracted to provide services determined by the authority. The authority offers a predetermined subsidy. The operator must meet all costs from the fares paid by passengers plus the agreed subsidy. In other words, the operator is responsible for the financial success of the service. This is the format used in contracts with Putco (Gauteng), Golden Arrow Bus Services (Cape Town) and others (Browning, 2017).

Demand-side subsidies are defined by their targeting mechanism (Eichhorn, 2015) and are distributed to target groups in three key ways:

- means-testing or welfare instrument: beneficiaries are already receiving some sort of welfare payment or social grant, such as child support or a disability grant
- concessions by category or group, such as students, the disabled or pensioners: in South Africa, Golden Arrow Bus Services offers concessions to pensioners, scholars and disabled people, and MyCiTi offers free transport to job-seekers; in Kenya, students, scholars and disabled people travel free on paratransit modes, although this has proven difficult to enforce
- specific geographic regions (Eichhorn, 2015) such as flat-fare structures: flat tariffs are charged for every trip, no matter the distance travelled or the time of day. People who live on the periphery thus pay the same as those who live in the central city. In South Africa, public transport users pay distance-based fares, while in Dar es Salaam users pay a flat fare (one fare for a feeder trip, one for a trunk trip, and another fare for an integrated trip).

In 2016, South Africa’s national Department of Transport began the development of an ‘Accelerated Public Transport Turnaround Plan’, which develops an overarching public transport subsidy that incorporates all modes (including minibus taxis) and attempts to focus on subsidising users rather than operators.

User- or demand-side subsidies are complicated to implement, even more so when public transport services are cash-based, such as the paratransit or minibus-taxi sector. For example, in both Kenya and Tanzania, it is national policy that scholars and pensioners travel free or at reduced rates. Yet, without a mechanism to provide for payments between the authority and paratransit owners, the operators often simply do not pick up the passengers entitled to concessions (McCormick et al, 2016). The authorities would be more able to enforce the discounted services if the paratransit sector had some level of card- or cellphone-based payment system (Schalekamp et al, 2017) that bypassed the current cash-only system.
An appropriate subsidy model is a significant determinant in providing transport that is affordable to both the provider and the user. Operating public transport services: Subsidy models

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Just because public sector budgets are constrained, it does not mean that public transport should not be improved. Instead, what it means is that the available capital and operating funding should be spent wisely.

‘The answer lies in a mixture of better planning, more technical capacity, basing all decisions on thoroughly costed and calibrated business plans, avoiding tender manipulation and price escalation, rigorously managing all contracted suppliers, and putting in place effective and legally enforceable penalties and incentives,’ suggests Seedat8 – for example, provide province-wide contracted, regulated, scheduled bus services, incrementally improving services everywhere.

The low passenger volumes of African cities are not conducive to cost-effective infrastructure-heavy projects such as full-specification BRT systems (Salazar-Ferro, 2017). Less expensive modes, such as buses offering a better service and with intersection right-of-way, have been shown to be more suitable in these cities.

Until recently, heavy infrastructural projects rather than the gradual upgrading of existing modes were encouraged by the public transport funding mechanisms in South Africa (Salazar-Ferro, 2017). In 2016, however, South Africa’s national Treasury modified the wording of the purpose and outcomes of the Public Transport Network Operations Grant (PTNOG) – rather than requiring the installation of formalised, scheduled services, national funding support was required to result in safe, convenient and affordable public transport services. ‘This mode-neutral stance allows for investing in the upgrading of existing public transport services’ (Schalekamp et al, 2017).

The updated PTNOG also requires municipalities to prove that public transport projects funded through the PTNOG are fiscally and financially sustainable.

Unlike the exemplar BRT systems in Curitiba (Brazil) and Bogota (Colombia) – which were implemented incrementally – approaches to public transport transformation in sub-Saharan Africa have largely been comprehensive, corridor-based BRT. This means that public transport was to be upgraded to ‘world-class’ standards, one corridor at a time, with little or no intermediate interventions proposed for areas that were not part of the system (Hitge & Van Dijk, 2012).

8 Ibrahim Seedat, personal interview, July 2017.
Key components of full-specification BRT are high-capacity infrastructure and vehicles (raised median stations, reinforced busway pavements, and articulated buses for the trunk corridor); the trunk and feeder model; and the envisioned substitution of paratransit operations (Salazar-Ferro, 2017). Incremental upgrades could instead include traffic-signal priority rather than busways, hybridity (using both formal and paratransit modes), integrated ticketing and improved scheduling of all modes, and improved enforcement and security of all modes (Hitge & Van Dijk, 2012).

In Lagos, Nigeria, the city implemented a pared-down BRT specification, which allowed delivery of an operating system for $1.4 million/km rather than the $8–10 million/km of the City of Joburg’s BRT (Rea Vaya). One of the trade-offs was operating speed – where Lagos sees average vehicle speeds of around 20 km/h, Rea Vaya achieves travel speeds of approximately 28 km/h. But, significantly, Lagos’s ‘BRT-Lite’ was able to function without an operating subsidy (Mason-Jones & Cohen, 2012) and paratransit modes have continued to operate along the Lagos corridor.
Leveraging the paratransit (minibus-taxi) industry

South African cities and authorities are reaching consensus that not only is the minibus-taxi (paratransit) industry here to stay, but that it makes sense to make better use of this cost-effective complement to BRT. The WWF case study: Aligning public transport models with passenger needs9 presents the case for using minibus taxis as feeder services to trunk BRT, and highlights new operating models in both Cape Town and Johannesburg that propose to incorporate these modes more effectively.

In Accra, Ghana, transport authorities planned for continued paratransit involvement right from the start of their public transport transformation projects (Salazar-Ferro, 2017). Unlike South African cities, Accra’s transformational programme identified the urban environment as one where higher-capacity modes were not warranted immediately – and decided upon a progressive, or incremental, roll-out.

Thus, the initial phases of the Accra Urban Transport Project do not have the visual impact of a BRT, for example, as their approach to transformation does not intend a quick overhaul, but rather a gradual upgrade of the system by recognising some of the benefits of hybridity (both formal and unscheduled modes).

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9 Available online at wwf.org.za/report/public_transport_with_passenger_needs
The main minibus-taxi station in Cape Town is located on the roof of the railway station and between the MyCiTi bus and Golden Arrow Bus Services stations.
KEY MESSAGES

- The provision of public transport is expensive in cities where the physical characteristics of built-up areas (the urban form) generate low passenger volumes and high peak-to-base (peak/off-peak) ratios.

- Infrastructure-heavy projects such as full-specification BRT systems are not necessarily appropriate when passenger numbers are low. It is therefore essential to continuously analyse demand, revise modelling estimates, and tailor supply.

- There is substantial evidence, on the other hand, that the incremental implementation of network-wide public transport with BRT-like features (such as conventional buses with intersection right-of-way) has better cost ratios than a full BRT on a single line.

- A mixture of unscheduled but regulated feeder and direct services (using existing paratransit operators such as minibus taxis as well as formal higher-volume feeder and direct services is a possible alternative arrangement (see WWF case study: Approaches to incorporating paratransit in scheduled public transport\(^{10}\)).

- Mode-neutral financing conditions allow for investing in the upgrading of existing public transport services (in other words, upgrades do not necessarily need to include BRT).

- Strategic measures aimed at increasing the number of people who use public transport (known as Travel Demand Management, or TDM) are able to reduce operations requirements both off and during peak and increase farebox income (see WWF brief: Managing travel demand: Shifting the way in which we travel\(^{11}\)).

- South Africa’s national Treasury suggests an incremental increase in the cost of owning, driving and parking a vehicle, especially in peak periods – and the ring-fencing of this revenue is one way in which to secure increased income for public transport. Appropriating current vehicle lanes rather than building new busways is one way to achieve this end.

- Car-curbing measures can be supported by limiting new residential and employment developments to within 500 m of major transit hubs.

\(^{10}\) Available online at wwf.org.za/report/incorporating_paratransit_scheduled_public_transport

\(^{11}\) Available online at wwf.org.za/report/managing-travel-demand
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Worldwide cities are stepping forward to reduce their rapidly increasing carbon emissions from passenger or freight transport. African cities are tackling the provision of accessible and effective transport services in contexts particular to our developing economies and rapid urbanisation patterns. Our cities face issues such as changing lifestyle aspirations, spatial economies with the poor relegated to the peripheries, complementary or clashing interactions between formal and informal transport providers, lack of public investment in transport infrastructure and services, and inherited policies and planning that did not factor in emissions implications.

This is one in a series of publications produced by WWF South Africa’s Transport Low-Carbon Frameworks programme under the auspices of WWF’s global One Planet Cities Challenge (see wwf.org.za/what_we_do/opcc). The transport project aims to provide a platform, expertise and perspectives to support labour, business and government in engaging with the challenges implicit in the shift to a low-carbon economy.