AFRICA MOBILITY Network of 4 City Regions

Mobility in African City-Regions: Discussion Document

A discussion document of the AfricaMobility Network reflecting the outcomes of the project "Mobility in African City-Regions: Towards better indicators and improved metropolitan governance".

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Introduction

Globally cities are urbanizing at unprecedented rates. By 2050 it is expected that nearly 70% of the world's population will live in urban areas (UN DESA, 2018). Some of the fastest rates of growth are occurring within Africa. African cities are going to expand rapidly in their geographical footprint and their population.[1] However, unlike the industrial age urbanization that occurred in the Global North over the last century, much of the growth in Africa will be what Pieterse (UN-Habitat, n.d.) refers to as slum urbanism, i.e., "—a pattern of urban development that manifests in sharp urban divides, the privatization of key urban services and infrastructure linked to large-scale slum neglect over long periods of time".[2]

African urbanization is likely to be largely unmanaged and catered for in large urban centres. The challenges associated with slum urbanism in areas such as the economy, infrastructure, security and governance are well established, as are the social, economic and political consequences it entails.

From a mobility and transport perspective, the impacts of urban growth are significant. Where unplanned settlements are established, the travel demand patterns of cities change dramatically without the necessary infrastructure and services to support the mobility needs of people living in rapidly growing areas (Welle & Kustar, 2022). The service results are often based on the private paratransit operators, who respond quickly to the emerging travel demand without state regulation, and although motorization rates are relatively low, heightened congestion results from limited road infrastructure. It is often the most marginalized and vulnerable groups in cities who face the most severe consequences of poor mobility and transport planning, which makes travel inaccessible, inconvenient, unaffordable, unsafe and unpleasant (Vasconcellos, 2001).

To compound the challenge, the rapid geographical expansion of urban areas resulting from urban growth means that urban functional areas (and their commuting routes) often traverse multiple municipal jurisdictions. The municipal governments, which might historically not have had to contend with the high volumes of cross-boundary travel demand, are now facing the institutional challenges of having to work in new integrated ways to ensure the regional mobility of people.

However, rapidly growing city-regions across Africa are responding to mobility in transport challenges at both an institutional and an infrastructural level. Many African city-regions have established transport authorities to improve regional transport and mobility services, and they also invest in public transport infrastructure and services such as light rail transit, bus rapid transit (BRT) and trains.[3] These interventions are often constrained by limited state resources and, like many urban challenges in Africa and in the Global South in general, the state is having to demonstrate an ability to be resourceful and innovative in addressing challenges.

It is within this context and against the backdrop of these common situations that the Africa Mobility Network (AMN) was established in June 2020. The Barcelona Metropolitan Area (AMB) International Cooperation Department, in discussion with the Gauteng City-Region Observatory (GCRO), shared insights on the mobility challenges experienced in the metropolitan regions of the cities of Maputo

[1] https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html

[2] https://unhabitat.org/how-can-we-transcend-slum-urbanism-in-africa-edgar-pieterse-university-of-cape-town

[3] https://www.engineeringforchange.org/research/african-commute-city-transport-trends/

(Mozambique), Dakar (Senegal) and Gauteng (South Africa). The discussions evolved into an idea of bringing together mobility and transport practitioners, local authorities and research entities from the four aforementioned city-regions (Dakar, Gauteng, Maputo and Barcelona) in order to share their experience and practices with regard to mobility and its governance. Barcelona and the AMB, while obviously not representing an African city-region, has an international cooperation department with a strong interest in the development of African cities. Together with the transport and mobility department of the AMB, Barcelona has supported the convening and served as a mobility governance reflection and learning partner from a different context. The final aim of the network is to help develop, implement and monitor more successful, sustainable and inclusive public transport policies in these African cities. Within this framework, the project "Mobility in African city regions: Towards better indicators and improved metropolitan governance" was proposed to Metropolis and was accepted and approved for funding.

During the implementation period of the project, practitioners across these city-regions have shared and discussed their mobility contexts, opportunities, challenges and solutions. Resulting from these gatherings, three consistent issues have emerged as particularly relevant, namely: dealing with informal transport; implementing BRT solutions; and mobility governance arrangements. Another cross-cutting aspect of the project is the potential role of improved mobility indicators in supporting the work across these three main issues.

During the course of the project, representatives from the participating regions have met on six occasions to share and discuss experiences related to the identified themes.

The first two online workshops, held on 20 October 2021 and 1 June 2022, respectively, focused on the mobility and indicator contexts of the respective regions, with the challenges of informality and governance as cross-cutting features of much of the discussion in the early engagements.

As COVID restrictions were eased, the network held its first in-person gathering in Barcelona from 17 to 21 October 2022, hosted by the AMB. The AMN Workshop in Barcelona coincided with the Metropolis Solutions International Congress organized by the AMB in the same week, which allowed the AMN delegates to attend both the Congress and the AMN project Workshop (20 and 21 October 2022). During this meeting, discussions focused on better understanding informal transport and the BRT experiences in each region. The concept and role of mobility governance in supporting improved mobility outcomes was also discussed, along with three critical mobility indicators that could support improved mobility. The representatives of the AMN also had the chance to exchange views and experiences around the BRT solutions implemented in other Latin American city-regions such as Belem do Parà (Brazil) and Mexico City (Mexico) in a seminar on sustainable and inclusive urban mobility strategies (BRT) held on 19 October 2022.

In March 2023, an online workshop was held to allow each region to present an indicator that could be piloted to support improved mobility governance and outcomes in each region.

In October 2023, representatives from the AMN met again in person in Gauteng (South Africa) from 1-6 October 2023 for the second on-site workshop of the group. The meeting was jointly hosted by the Gauteng Department of Roads and Transport (GDRT) and the GCRO, and it coincided with the Smarter Mobility Africa Summit hosted by the GDRT. Delegates had the opportunity to attend the Summit from 1 to 4 October, when the AMN was responsible for the opening plenary panel discussion on mobility governance in African cities. Thereafter, the meeting of the AMN project was held from 5 to 6 October 2023.

The main focus areas of the Gauteng workshop were the mobility governance arrangements and the role of transport authorities that have been established in each region, along with a discussion on the selected indicators to be piloted.

This report pulls together the work carried out by the AMN according to the three shared interest themes that have emerged over the course of the project. Each of the themes forms a chapter of the report and is structured by way of a brief discussion of the subject followed by a comparative perspective of the participating regions as they relate to the theme.

What has emerged clearly from the project has been the value gained by the practitioners in learning from each other.

While the report discusses the three shared themes as distinct, it must be acknowledged that they are all interconnected. Governance in particular is a cross-cutting aspect impacting all the themes that are discussed. Mobility governance structures and systems underpin how mobility networks are established, managed and improved.

The section which follows this introduction provides a brief overview of the mobility context of each of the four participating city-regions.

Participating city-region mobility contexts

Each of the participating regions has their own contextual conditions. This section will provide a brief outline of each context. The four participating city-regions are Dakar (Senegal), Maputo (Mozambique),[4] Gauteng (South Africa) and Barcelona.

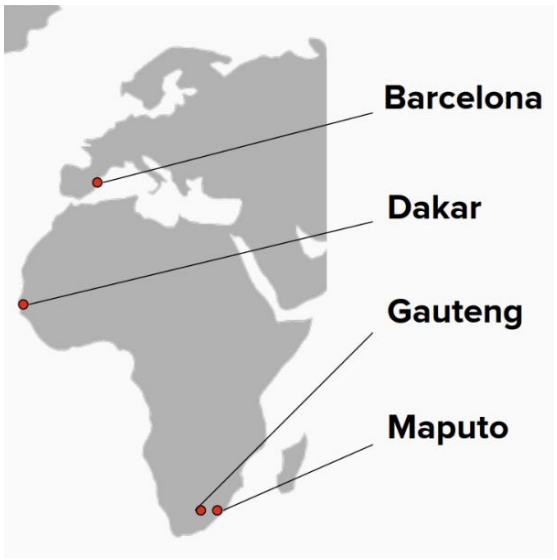


Figure 1: Location of the participating city-regions

Dakar

Dakar is the capital City of Senegal and is situated on the west coast of Africa. The Metropolitan Area of Dakar comprises five local municipal areas with an estimated population of 4 million in 2023[5] and an area of 550 square kilometres. Dakar is the smallest of the participating city-regions in land size but has the highest population density.

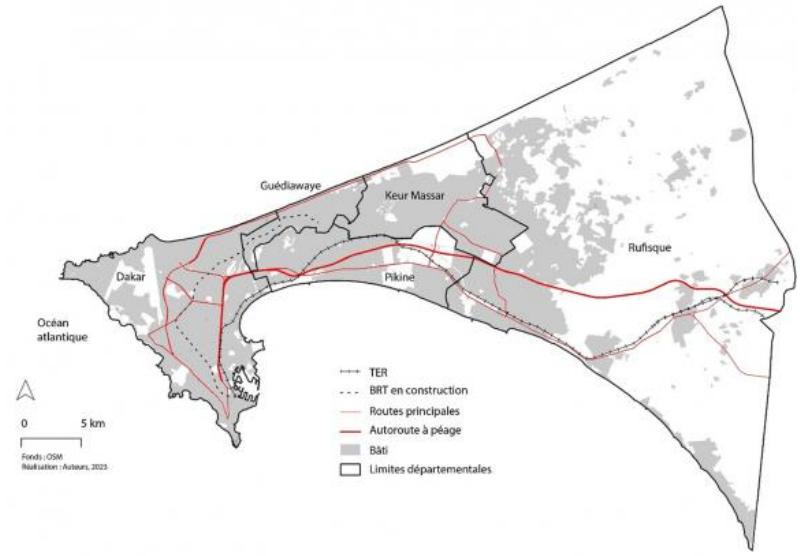


Figure 2: Metropolitan Area of Dakar. Source: https://journals.openedition.org/eps/13899?lang=en

[4] Even though Maputo is not yet a member of the Metropolis Association, its strong collaboration ties with the AMB International Cooperation service in the area of mobility highlighted the importance of including it to the Network.

[5] https://www.ansd.sn/Indicateur/donnees-de-population

Cambiar en la figura:

Océan atlantique = Atlantic Ocean
TER = Regional Express Railway
BRT en construction = BRT in construction
Routes principales = Main routes
Báti: Built-up area
Limites départementales = Departmental boundaries
Fonds: OSM = Source: Open Street Map
Réalisation: auteurs = Author's own elaboration

Dakar's modal split

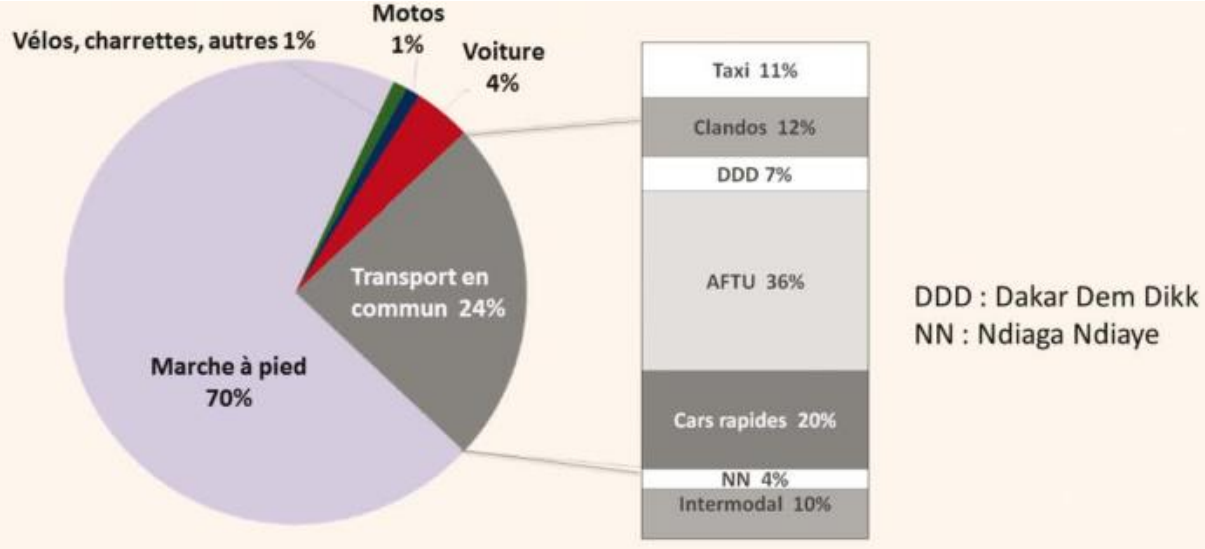


Figure 3: Dakar modal split based on the 2015 Household Survey

Cambiar en la figura:
Vélos, charrettes, autres = Bicycles, carts, others
Motos = Motorcycles
Voiture = Cars
March à pied = On foot
Transport en commun = Collective transport
Cars rapides = Rapid buses
Dakar Dem Dikk = Dakar Dem Dikk bus
Ndiaga Ndiaye = Ndiaga Ndiaye bus

In Dakar, walking is the main mode of moving around. As much as 70% of trips are made on foot. Of the remaining 30% of motorized trips, 80% are made by public transport, mainly different types of buses, BRT, taxis (both legal and clandestine, *clandos*) or a combination.

Maputo

Maputo is the capital city of Mozambique and is situated on the east coast of Southern Africa. Currently, the Maputo Metropolitan Area comprises five local municipalities: Maputo City, Matola City, Matola Rio City, Boane City and Marracuene City. The metropolitan area is estimated to have a population of 2.5 million people and an area of 2200 square kilometres.

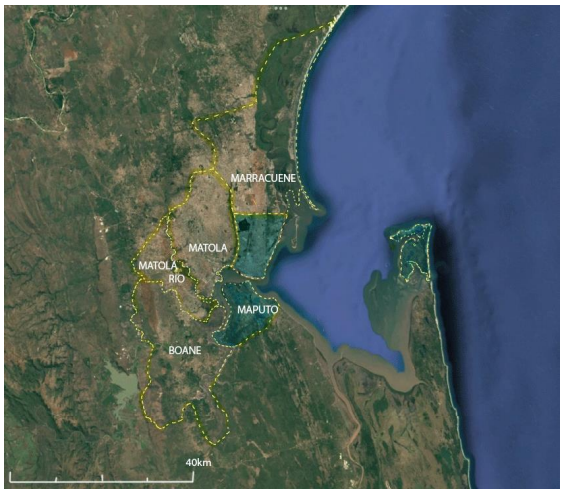


Figure 4: Maputo Metropolitan Area

Maputo's modal split

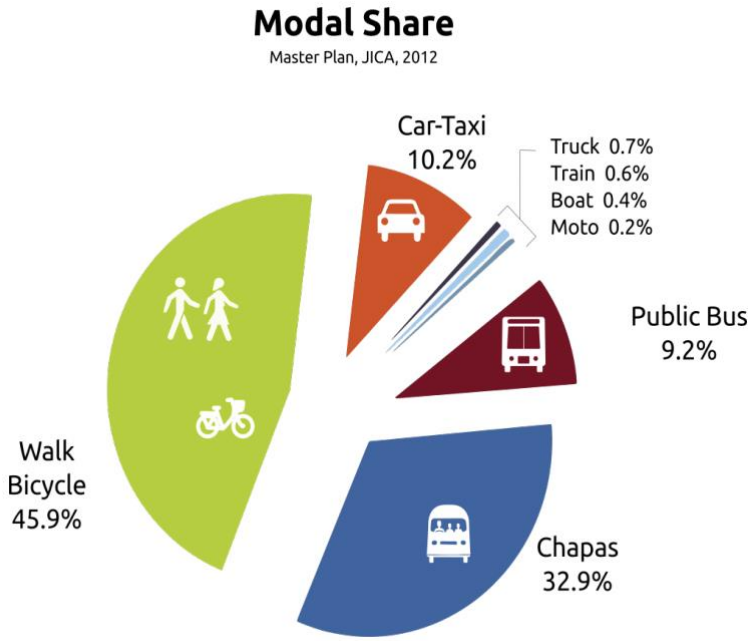


Figure 5: Maputo's modal share

Cambiar en la figura:
Modal Share = Modal share
Moto = Motorcycle
Walk = Walking
Public Bus = Public bus

In the metropolitan area of Maputo several types of transport coexist. Nearly 46% of mobility is done on foot or by bicycle. The rest of the routes are covered mostly by public transport modes: buses, the semi-collective transports known as *chapas*, the railway network, the metro-bus, taxis, *txopelas* (motorized rickshaws) and *Myloves* (unlicensed open-box trucks).

Gauteng

Gauteng is a province in South Africa and contains the capital city Pretoria located in the Metropolitan Municipality of Tshwane (the economic engine of the country), the Metropolitan Municipality of Johannesburg, and another metropolitan municipality, Ekurhuleni. The urban growth of these three metropolitan municipalities has resulted in a single large functional urban area known as the Gauteng City-Region. Within the province, there are three metropolitan municipalities, six local municipalities and two district municipalities. Gauteng had an estimated population of 16 million in 2022 and a land area of 18 000 square kilometres. Gauteng is the largest city-region in the project in land size and population and has the lowest population density.

Figure 6: Gauteng city-region

Gauteng's modal split

In terms of modal split, private vehicles are the primary mode, making up 33% of the trips, followed by walking (28%) and minibus taxis (21.3%). Public transport accounts for about 28% of all trips in the province and the minibus taxi makes up the greatest proportion.

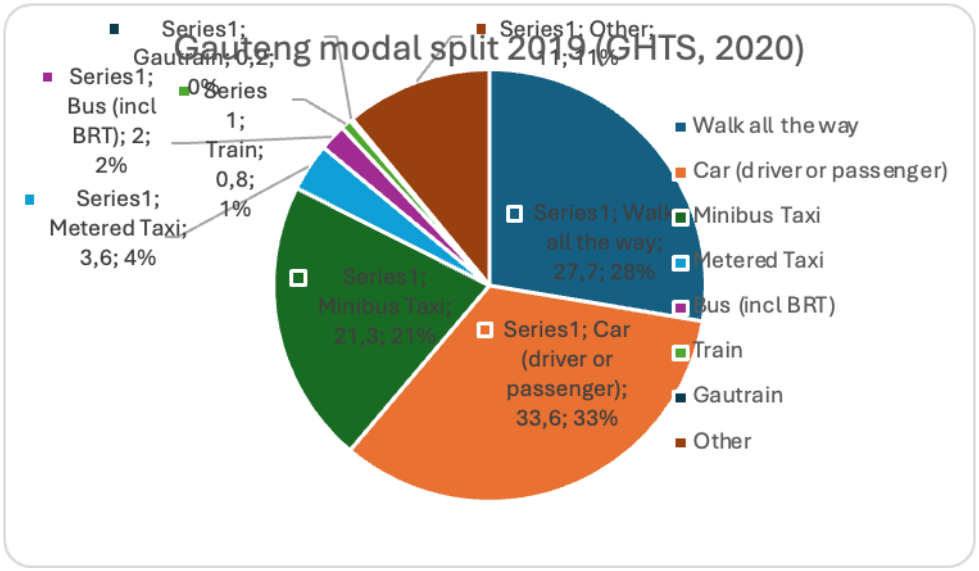


Figure 7: Gauteng's modal split. Source: GHTS, 2020.

Cambiar en la figura:
Minibus Taxi = Minibus taxi
Metered Taxi = Metered taxi

Cambiar comas decimales a puntos

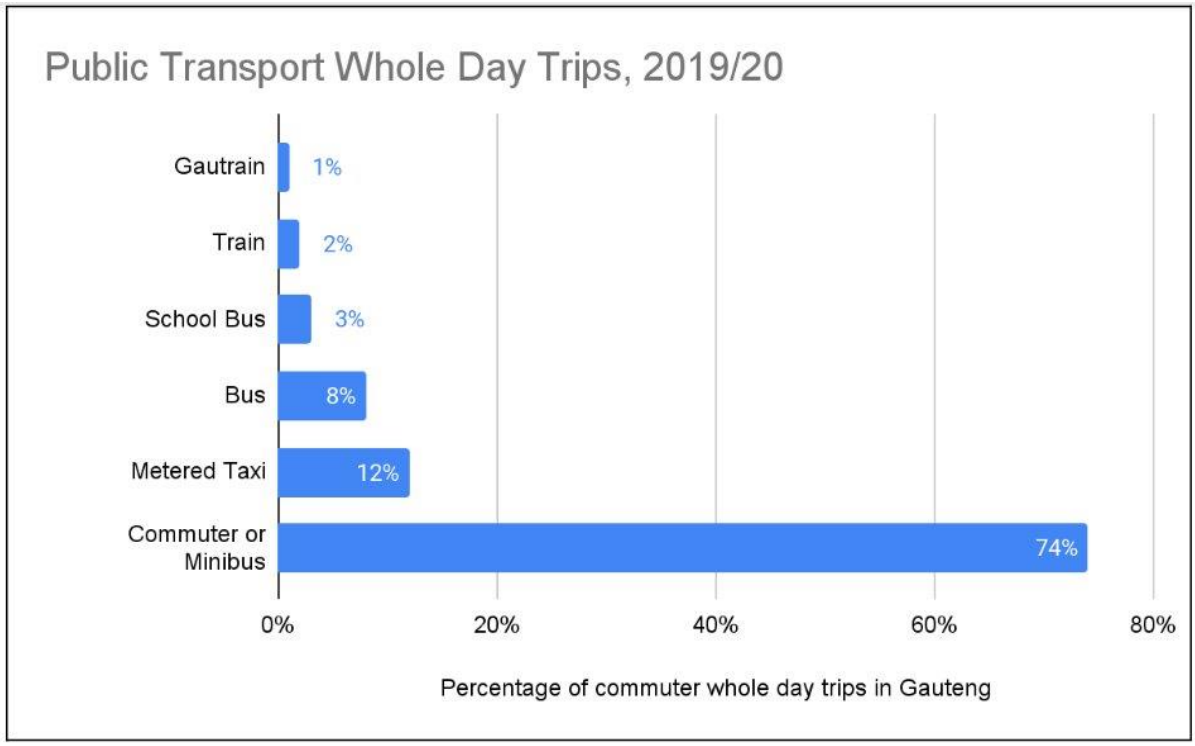


Figure 1: Public Transport Modes Whole Day Trips Percentage Split, Gauteng, 2019/20
Source: CSIR GHTS (on request), 2019/20

Figure 8: Public transport mode whole day trip percentage split, Gauteng, 2019-20. Source: CSIR GHTS (on request) 2019-20.

Cambiar en la figura:
Public Transport Whole Day Trips = Public transport whole day trips
School Bus = School bus
Metered Taxi = Metered taxi
Commuter or Minibus = Commuter or minibus
Public Transport Modes Whole Day Trips Percentage Split = Public transport modes whole day trips, percentage split
Eliminar referencia a "Figura 1"

Barcelona

The Barcelona Metropolitan Area, made up of 36 municipalities, embraces a land area of 636 square kilometres containing a population of over 3.3 million. Barcelona has a similar urban density to Dakar. However, as the only city-region outside of Africa in the project, with very different contextual factors, it has an established history of public transport and mobility systems and is much more advanced in governance arrangements and funding models.

Figure 9: Barcelona Metropolitan Area. Source: https://www.researchgate.net/figure/Map-of-the-Metropolitan-Area-of-Barcelona_fig5_342534377

Barcelona's modal split

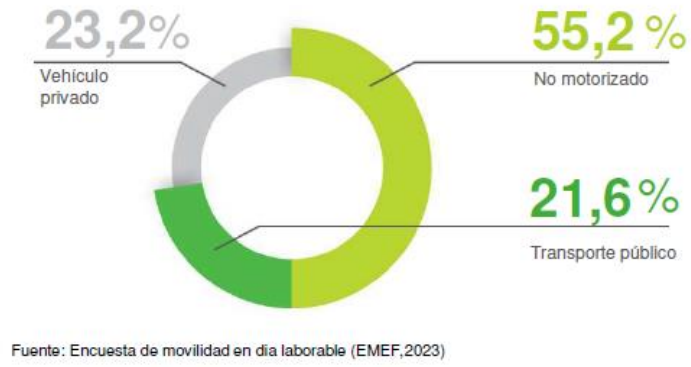


Figure 10: Barcelona's modal split. Source: Encuesta de movilidad en día laborable (EMEF, 2023).

Cambiar en la figura:
23,2 = 23.2
55,2 = 55.2
21,6 = 21.6
Vehículo privado = Private vehicles
No motorizado = Non-motorized
Transporte público = Public transport
Eliminar referencia a la fuente en la figura

Of the 12.7 million trips undertaken daily within the Barcelona Metropolitan Area, more than three quarters are done via sustainable mobility modes of transport: 55.2% of non-motorized active mobility (52.4% on foot, 2.1% by bicycle and 0.7% by other private means) and 21.6% via various modes of public transport (mainly metro, bus and tram).

Mobility governance in city-regions

Introduction

In the rapidly urbanizing and often under-resourced and under-capacitated government environments in African city-regions, the role of governance is critical, but conventional approaches requiring extensive investment and multiple systems are simply unattainable (Christie, Smith, & Conroy, 2013). This chapter seeks to bring mobility governance into focus and highlights in particular the rise of transport authorities as an increasingly popular approach to mobility governance in African city-regions.

Understanding governance

Most definitions of governance are applied at the level of an organization. Governance can be defined as "the system by which entities are directed and controlled. It is concerned with structure and processes for decision-making, accountability, control and behaviour at the top of an entity. Governance influences how an organization's objectives are set and achieved, how risk is monitored and addressed and how performance is optimized."[6] This is a useful definition, yet in the context of urban mobility there is no single organization responsible for urban mobility outcomes. On the contrary, many organizations with different governance structures work in a complex system to provide mobility solutions.

However, urban governance definitions provide for an expanded understanding. According to UN-Habitat, in the urban context governance is "the process by which governments and stakeholders collectively decide how to plan, finance and manage urban areas".[7] Here the concept of governance extends beyond organizations to the level of institutions to indicate that there are clear systems and processes for organizations and other stakeholders to make collective decisions. Urban mobility governance is located within the realm of urban governance.

Framing urban mobility governance

The distinction between organizational governance and urban governance is critical because it calls for an investigation into the extent to which processes and systems exist to enable collective decision-making and establish coherence between government entities, organizations and other stakeholders (including users) to shape and support mobility policies and plans. Without an urban mobility governance framework, entities can in theory achieve excellent corporate governance results, but their parts might not be aligned, coordinated and integrated to result in improved mobility systems. This raises an important dimension regarding organizational governance for the entities and stakeholders operating in an urban mobility context, namely, how do their own respective governance frameworks reflect and enable interaction with the wider urban mobility context?

Transport governance contains two main components: ownership and operations (Jean-Paul Rodrigue, 2024). Those who own the infrastructure and assets are often responsible for the ongoing maintenance and re-investment in infrastructure. Those who operate the services and systems are

[6] https://www.calqrisk.com/governance/what-is-good-governance/
[7] https://unhabitat.org/topic/urban-governance

responsible for providing the systems. Ownership and operating models are not universally the same across different contexts; they are a mix of public and private.

The reality is that all of these are critical matters from both an organizational and a broader urban systems perspective, as indicated by (Jean-Paul Rodrigue, 2024):

> *The governance of transport infrastructure is particularly relevant because of its **strategic, economic, and social importance** and the cross-jurisdictional character of many infrastructures, such as highways, rail and telecommunication networks. Transport is not a mere convenience but a fundamental infrastructure that must systematically and continuously be available to its users. This is where governance plays the important role of ensuring continuity in operations. Effective governance is complex to assess since it is not linked with a specific governance structure.*

To address the complexity of cross-jurisdictional issues with multiple governance structures, transport authorities operating at the city-region scale have become a popular vehicle for leading mobility governance.

The rise of transport authorities in African city-regions

Kumar & Barret called for the urgent establishment of metropolitan transport authorities in Africa (Kumar & Barrett, 2008). Over the past decade, one of the clear emerging trends across African city-regions in the governance of mobility is the introduction of transport authorities. However, as discussed above, their establishment and incorporation depend on many country-specific contextual factors. The primary aim of the establishment of transport authorities is similar: to improve the integration of the many disconnected projects and services in the current mobility system. However, the UITP (2022) suggests that there is no “one size fits all” format for transport governance, as Bray indicates, “to do so would be to ignore the reality of the distinctive historical, cultural, political and geographical context in which transport governance sits in each metropolitan area” (Bray, 2022). Mobility governance cannot be considered separately from the wider urban context in which transport and mobility systems exist. Thus, it is not possible to simply replicate a transport or mobility governance model from another city-region.

Bray (2022) argues that there are generic benefits of transport authorities for metropolitan areas:

- Mapping of actual travel demand: building a functional view of where people are travelling from and to across a metropolitan area.
- Creation of sustainable ways of funding urban transport: drawing on institutional credibility and scale to potentially draw on multiple sources of funding to support the sustainability of a transport system rather than only a specific mode.
- Integration across modes and systems: given the scale at which transport authorities operate, they are well positioned to facilitate integration across services, ticketing, information, service standards and decision-making of owners and operators.
- Alignment of public transport with other modes: allowing public transport provision to consider other modes in the wider mobility network such as active travel (walking and cycling), logistics and highways.
- Enhancement of the quality of places: intentionally integrating with land-use planning and spatial policies to create more people-centred places.

- Achievement of social and environmental objectives: a transport authority can establish the activities and standards that promote broader social and environmental objectives and can measure and evaluate performance in this regard.
- Promotion of resilience through the ability to respond at the level of the system: many factors can impact transport system performance. A transport authority would be able to detect and respond impacts and decide on ways forward.
- Ability to drive innovation and responsiveness: well-capacitated transport authorities have shown the ability to drive innovation in mobility interventions.
- Providing leadership: transport authorities can provide the leadership required to ensure that mobility is effectively facilitated across a metropolitan region.

Bray's 2022 account illustrates that transport authorities have a clear role to play at the urban governance level of transport governance, as a critical stakeholder that has a unique vantage point for establishing the framework and performance criteria of metropolitan-scale transport and mobility system.

Each of the city-regions participating in the AMN have established transport authorities. Their establishment and structure differ substantially and will be discussed in the section that follows.

Naniopoulos, Genitsaris, & Balampekou provide a perspective on how to design metropolitan transport authorities (TAs) (Naniopoulos, Genitsaris, & Balampekou, 2012). Although this is based within the European contexts, the design principles are likely to be generically applicable. The following design criteria considerations are suggested:

- Service area and geographical territory: Over what services and physical area will the entity have authority?
- Legal regime: How will the entity be established?
- Management partners: Who are the entities that will be involved in the management of the TA?
- Consultation procedures and cooperation forms regarding citizen participation in the management of the TA.
- Tasks and responsibilities: Is what the TA will do clearly defined?
- Financial resources: What are the sources of funding and revenue?
- Staffing and expertise: What skills are required and where will the TA source expertise to populate the entity?
- Organizational chart: Does the entity have an organizational structure?

These sets of design criteria will be applied to the transport authorities of the AMN participating regions to provide a comparative assessment of their establishment and structuring.

Transport governance structures in the participating regions

Dakar

The transport functions in Dakar are split across levels of government. At the national level the Ministry of Infrastructure, Land and Air Transport is responsible for implementing the state transport policy and projects. The Executive Council of Urban Transport (CETUD) is the agency of the Ministry in charge of implementing the urban transport policy in the regions of Dakar and Thiès and also has

the role of the transit authority. Projects implemented include the BRT and the modernization of the minibus fleet in the region. The local municipalities are responsible for the capital works and maintenance of municipal road infrastructure. In Dakar the National Ministry and its transport agency CETUD play a significant role in mobility governance.

Maputo

The public transport functions in Maputo are split across levels of government as well as across ministries. The Maputo Metropolitan Transport Agency (AMT) was established by the National Ministry of Transport and Communications in 2018 and is attached to the Ministry. According to the Maputo City Council (Massangaie, 2023), "The Maputo Metropolitan Transport Agency is a public entity with administrative and financial autonomy that aims to plan and manage the integrated transport system in the [Maputo Metropolitan Area]." Currently, the AMT carries out activities such as responding to the interests of the municipalities in terms of transport, ensuring the financial and budgetary management of the metropolitan transport system (subsidies, compensation and external financial support), approving routes and timetables for public transport, systematizing information and supporting operators.

The Maputo City Council has a transport department that is responsible for a range of public transport and mobility functions within the municipal area (Table 2).

Table 1: Maputo Metropolitan Area transport entities

Central Goverment	Ministry of transport and communications	National road transport institute
		Transport and communications development fund
		Maputo metropolitan transport agency
	Ministry of state administration and public service	**Maputo City Council**
		Matola City Council
		Boane City Council
		Marracuene District
	Ministry of public works, housing and water resources	Roads fund
		National Highway Administration
	Ministery of Interior	Traffic police

Cambiar en la tabla:
Ministry of transport and communications = Ministry of Transport and Communications
Ministry of state administration and public service = Ministry of State Administration and Public Service
Ministry of public works, housing and water resources = Ministry of Public Works, Housing and Water Resources
National road transport institute = National Road Transport Institute
Maputo metropolitan transport agency = Maputo Metropolitan Transport Agency

Table 2: Maputo Metropolitan Area transport entity responsibilities

CENTRAL GOVERMENT					
INSTITUTION	**COMPETENCE**	**POWER/AREA OF ACTIVITY**	**YEAR OF ESTABLISHMENT**	**MANDATE**	**FINANCING**
Ministry of transport and communications	Management of policies and entities in the area under its supervision	National	1975	5anos	State's budget
National Highway Administration	Management of national roads	National	1999	N/A	State's budget
National road transport institute	National Road Safety Management	National	1993	N/A	State's budget
Transport and communications development fund	Financial resource management	National	2003	N/A	State's budget
Traffic police	Ensures compliance with the implementation of road safety policies	National	1975	N/A	State's budget
Maputo metropolitan transport agency	Management of the metropolitan public transport system	Maputo metropolitan transport agency	2018	5anos	State's budget
LOCAL GOVERMENT					
INSTITUTION	**COMPETENCE**	**POWER/AREA OF ACTIVITY**	**YEAR OF ESTABLISHMENT**	**MANDATE**	**FINANCING**
Municipalities	Management of the transport system in municipalities	Municipalities	1997	5Years	State budget and own revenues
Municipal public transport companies	Management of the public transport system in municipalities	Municipalities	1936	5Years	State and municipal budget
Municipal Mobility and Parking Company	Parking management and support infrastructures (parks, silos, terminals)	Maputo Municipality	2015	5Years	State and municipal budget
Municipal Police	Ensures compliance with the implementation of road safety policies	Municipalities	1997	5Years	State and municipal budget

Cambiar en la tabla:
Ministry of transport and communications = Ministry of Transport and Communications
National road institute = National Road Institute
Transport and communications development fund = Transport and Communications Development Fund
Maputo metropolitan transport agency = Maputo Metropolitan Transport Agency (x2)
CENTRAL GOVERMENT = CENTRAL GOVERNMENT
LOCAL GOVERMENT = LOCAL GOVERNMENT
State's budget = State budget (x6)
Parking management and support infrastructures (parks, silos, terminals) = Parking management and support infrastructure (parks, silos and terminals)
5años = 5 years (x2)
5Years = 5 years

Gauteng

The public transport and mobility functions across the Gauteng City-Region are split across the three spheres of government in South Africa. The Gauteng Transport Authority was established through the Provincial Gauteng Transport Authority Act in 2019 and sought to "consolidate transport functions of organs in the province".[8] The local municipalities are also responsible for a host of public transport and mobility functions within their municipal areas.

Barcelona

The public transport functions are split across the different levels of government.

- Each level owns specific transport services and has the power to decide among them.

[8] https://www.gauteng.gov.za/News/NewsDetails/%7B9D49AEF9-5C32-4FCD-B09D-3C022604A174%7D

- The Metropolitan Transport Authority (ATM), the regional transport authority, was created by the regional and local government, including the Municipal Transport Company (EMT), which was the local transport entity (and was later incorporated into the AMB).
- The ATM coordinates the funding of the system, managing the ticketing revenues and the deficit of the whole system, but each administrative level retains the power among the transport services.

The ATM was established in 2003 by the Catalan Government and the local municipalities. A complicated governance system coordinates a host of private and public role players across national, regional, metropolitan and local government to provide an integrated transport system. This has taken many years to develop and evolve, and it continues to do so.

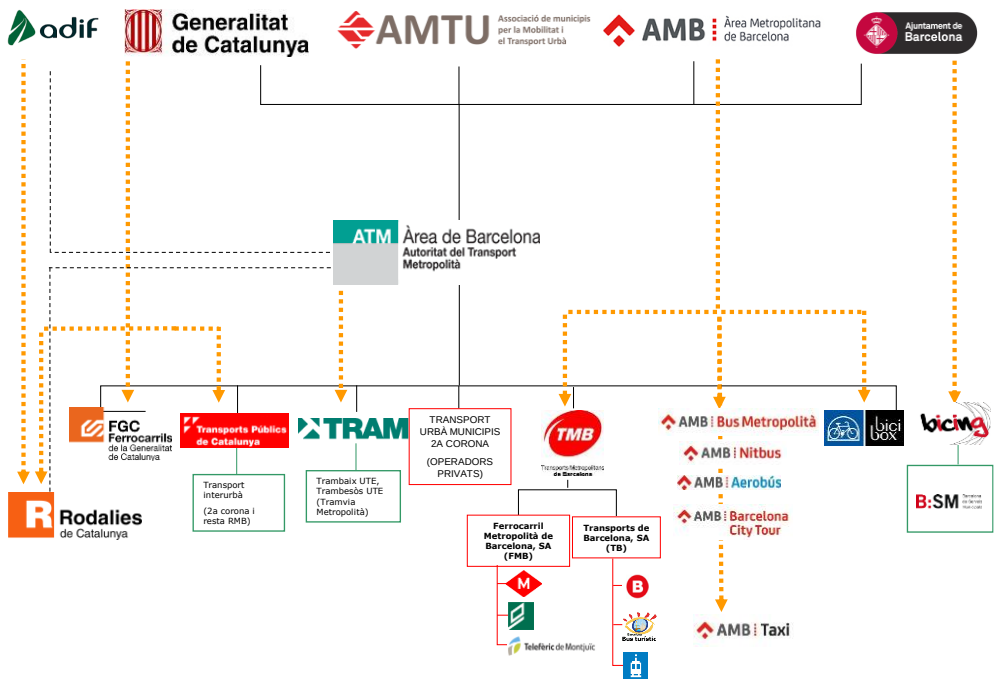


Figure 11: Outline of public transport governance structure in the Barcelona metropolitan area

Cambiar en la figura:
Àrea de Barcelona = Barcelona Area
Autoritat de Transport Metropolità = Metropolitan Transport Authority
Transport interurbà (2a corona I resta RMB) = Interurban transport (2nd ring and rest of metropolitan region)
(Tramvia Metropolità) = (Metropolitan tram)
TRANSPORT URBÀ MUNICIPIS 2A CORONA (OPERADORS PRIVATS) = URBAN TRANSPORT TOWNS IN THE SECOND RING (PRIVATE OPERATORS)

Indicators for improved mobility governance

The topic of establishing indicators to assist transport authorities in Africa towards improved governance is not new. Previous publications have sought to provide clarity on a set of indicators for improved mobility and transport in Africa. The purpose of this report is not to represent these findings but rather to highlight that the considerations are fairly obvious, relating to secure funding, clear regulation and legislation, clear divisions of roles and responsibilities, clear arrangements for participation and inclusion, clear frameworks of accountability, and available capacity (Christie, Smith, & Conroy, 2013). The extent to which these aspects are clarified or confused with the establishment of transport authorities becomes the critical factor towards improvement. Establishing a set of indicators that assists in the processes of monitoring progress is no doubt valuable, but do the resources exist to do so?

Informal, para- or popular transport? the challenges and opportunities of informal transport

Introduction

This short chapter will discuss the issue of dealing with what is referred to as informal transport. It seeks to locate the discussion within the broader context of informality and the phenomenon of informal transport in the Global South. It then makes a comparison between the informal transport context of the participating regions and their approaches to addressing the associated challenges.

Origins of informality

Informality in transport falls within the broader concept of the informal economy. So where does the term come from and what does it refer to? The term informality was coined by the British anthropologist Keith Hart in 1971 in a study of rural migrants in Accra, Ghana (WEIGO, 2023; ILO, 2013). The term was initially used to describe economic activities that occurred outside the formal economy. Formal, in this instance, refers to registered and licensed organizations trading goods and services.

The term informal employment emerged later to describe the situation of people working in informal activities. Informal employment became of growing interest for understanding labour dynamics and ways in which people were sustaining livelihoods, especially in countries where employment levels in formal sector jobs were low. It is estimated that 61% of global employment is informal (WEIGO , 2023).

In 2002 the International Labour Organization expanded an understanding of informal work to include a more nuanced range of informal employment categories (ILO, 2013). There are three useful distinctions to make around the term informality: 1) informal economic activity, the trading of goods and services that is not recorded and reported to relevant state authorities and compliance organizations; 2) informal organizations, those entities involved in economic activity that are not registered and licensed with state authorities; and 3) informal employment, the situation of people working without formal labour agreements, often in informal organizations or involving informal activities, but sometimes within formal organizations.

Informality as a term in the context of mobility

Here we want to discuss what has emerged in the AMN as a set of reflections about informality as a useful term for presenting what we are discussing. Is it really informal? If informal is operating without an official public transport operating licence, then it does not represent all the modes of non–state-owned and -operated transport. Minibus taxis in South Africa require a state-issued operating licence to be permitted to operate.

It is useful to unpack the notion of informality to highlight that it does not take a single form. The transport sector is similarly comprised of a range of informality. Many middle- and low-income countries and cities have struggled to provide the extensive infrastructure and transport services to

accommodate growing urban populations and to manage the spatial dynamics of urbanization. The demand for people to travel has generated great economic opportunity in these contexts. This has been the basis for the significant growth of informal transport services across the developing world.

The "businesses" are often (but not always) informal, are not registered business entities, do not pay tax and do not have the formal business licences to trade. However, the operators are usually acknowledged formally by governments through association structures, and services are often licensed in attempts to regulate them. The lines between formal and informal are often blurred in the transport sector, as in many other informal sectors.

The term paratransit has become popular to describe the services provided outside of state-owned or -controlled public transport. These are services designed and provided by private operators. Sometimes they are licensed and sanctioned by the state; other times they are operated without sanction and considered illegal. The two definitions of informality and paratransit provided below highlight the overlap and confusion of the terms:

> *A simple definition of informal transport is illicit paratransit. To the naked eye, the sector consists of minibuses, microbuses, station wagons, motorcycles, and tri–wheelers, modes often lumped together under the moniker "paratransit" – scaled-down versions of collective-ride transport that capture the full spectrum of service-price options that lie between conventional buses and single-passenger taxis. It is their illegal, non-sanctioned status that makes them illicit.* (UN-Habitat, 2000, p. 15)

> *Paratransit refers to demand-driven, unscheduled public transport provided by small operators, typically in mini- to medium-sized buses. Paratransit is sometimes called "informal", but operators are not always informal businesses, and they are not necessarily unregulated.* (Jennings, 2017, p. 5)

While the United Nations define informal transport as *illicit paratransit,* Jennings et al. indicate that paratransit is sometimes referred to as informal. There are in-fact a range of terms in circulation to describe the many private transport solutions provided to meet the mobility demands across the Global South. Additional terms include artisanal transport and popular transport.

The AMN has discussed the oversimplified language applied to the non–state-based transport and mobility services provided. We believe that the evolving and multiple terminology reflects the nuances in the services provided and their dynamic interface with the state, and that better, more accurately descriptive terminology is required. However, for the remainder of the chapter we will refer to paratransit as opposed to informal transport, as we believe that the range of services reflected is broader than the definitions of the informal economy. However, there are certainly

e-hailing as contemporary informality

The global rise of e-hailing (the process of ordering a car, taxi or any other form of transportation pick up via a computer or mobile device) can be seen to be a form of contemporary informality. It highlights that formal businesses using disruptive digital technology can introduce transport solutions that state policy and regulations have not yet considered. The many e-hailing apps that have emerged create challenges for regulators and transport authorities. The vehicles are sometimes not registered and licensed to carry public passengers, and the drivers are often not recognised as formal labour and thus operate informally. This is important to recognize, because informality is often seen to be associated with modes that involve lower-income earners in cities, which entails a particular stigmatisation of informality. Informality can be associated with global listed companies.

aspects of informality throughout the services.

The paratransit transport sector is significant across sub-Saharan Africa. From a mobility equity perspective, paratransit tends to serve the lower-income populations, but not necessarily the poorest. Walking is often the mode that the poorest citizens are forced to rely on, even when distances are long, and conditions are inconducive and unsafe.

Nevertheless, addressing paratransit has emerged as one of the most significant challenges in mobility in African City Regions. Both the benefits and the challenges associated with paratransit services are well reported. It is widely acknowledged that the paratransit services have filled a critical mobility gap left where the state has failed to provide public transport services and has thus enabled millions of often marginalized and low-income earners to access economic and social opportunities. On the other hand, paratransit services have also had negative impacts through poor maintenance and safety standards, profit-focused operations, poor levels of vehicle maintenance, problematic labour conditions, and violence embedded in turf and route wars (Baffi & Lannes, 2021). All of these impact on the public experience of paratransit services. Transport departments and agencies in Africa and the developing world are grappling with how to improve paratransit services and provide reliable, safe, integrated, affordable and accessible services to the public.

Contemporary challenges associated with paratransit in city-regions

Throughout the AMN discussions, the participating African regions have expressed the need to address informality as one of the single largest issues for improving mobility. Interestingly, Barcelona has also expressed a rising informal mobility challenge in its city-region, which the chapter will discuss. Most pressing from a policy perspective is that the vast majority of public transport users rely on informal or paratransit services in sub-Saharan Africa.

While paratransit services do enable mobility in ways that state-based public transport is unable to, a number of challenges persist in relation to paratransit services. Ultimately, improving the mobility experience of people is at the core of state intervention in the transport sector. The following set of issues are common and persistent across the paratransit sector.

Overall customer satisfaction

Most of the users travelling on paratransit services do not have any other transport options: they are referred to as “captive users”. Transport survey results often indicate high levels of dissatisfaction with paratransit services, but with no other viable alternatives users continue to make use of the services, and the operators have no incentive to improve service levels (Baffi & Lannes, 2021).

Safety of women and children

Women are typically more reliant on walking and on public transport, which in the global south is likely to mean the use of paratransit. The sense of vulnerability and insecurity that women experience in public transport services is well documented (ITF, 2018). The challenges associated with improved safety on paratransit is that criminal checks, behavioural standards and accountability arrangements related to the informal employment practices are not in place.

Gender inclusion and equity

As stated above, women are more reliant on walking and paratransit than men. Thus, they experience the low levels of service quality and poor accountability disproportionately (Foley, 2022). According to Messner’s (2020) study, paratransit work is male-dominated, as is the transport industry as a whole. In this context, the systems are seldom planned and operated considering a female perspective. An example of this is highlighted by a survey conducted in Senegal:

“According to the findings of the 2010 National Survey on the Informal Sector in Senegal (ANSD, 2013), the informal transport workforce in Senegal is calculated to total 83,538, comprising 80,464 men compared to 3,074 women, a ratio of 96.2 per cent to 3.8 per cent.” (Timera, 2020)

Accessibility

The lack of scheduling of paratransit services also provides accessibility limitations. The fill-and-go operating practice makes it challenging for the services to be predictable and available on the route and limits off-peak services (UN-Habitat, 2000). The competition for service on the most lucrative routes means that often there is over supply, while there is under-supply on routes that are perhaps not as busy.

Challenges of accessibility extend beyond the network and scheduling and include the ability of the paratransit services to enable people with disabilities to travel (Duri & Luke, 2022). Without clear regulations and service requirements, having paratransit actively cater for all transport users is a challenge that requires consideration.

Route planning, licensing and enforcement

Transit authorities are unable to plan and govern routes and schedules of paratransit services and are thus unable to account to citizens for the services provided by paratransit operators. However, they do issue operating licences that recognize and legitimize the services provided. Enforcement of route and licence compliance is challenging, and there are many reports of corruption as an evident culture between enforcement agencies and operators.

Illicit labour practices

The illicit labour practices of operators often mean that people employed in the industry contravene labour laws and regulations. Driving longer shifts than is allowed, driving under the influence of alcohol, no criminal record checks, inadequate and unequal payment structures, and harassment of and by staff are often reported within paratransit services. These result in adverse conditions and experiences for people reliant on the services.

Paratransit and the metropolitan scale

In the territorial operations of paratransit, “turf” structures exist. This situation results in mobility networks that are not coordinated optimally to service regional mobility demands, often resulting in users having to make multiple connections and pay multiple times for a single end-to-end trip.

Traffic congestion and air pollution

The bulk of paratransit services across Africa rely on petrol or diesel engine vehicles that emit a significant amount of CO_2. Many analysts also believe that the vehicle sizes are not optimized for the high-demand profiles on major routes (because of inability to access finance for larger vehicles), resulting in unnecessarily high volumes of paratransit vehicles on the roads, which worsen traffic congestion and increase greenhouse gas emissions.

Comparative assessment of informality across the regions

In the African city-regions that are working together on this project, paratransit services account for the vast majority of public transport trips. This section will provide a brief overview of how the paratransit across the city-regions in the AMN project compares.

Table 3. Comparative table of paratransit across AMN members

Region	Modal share of paratransit	Paratransit modes	Existing state responses

Dakar	**80%** of public transport trips (CETUD, 2021)	Cars Rapides	Corporatization–Urban Mobility Improvement Programme (PAMU)
		Ndiaga Ndiaye	
		Clandos	
Gauteng	**74%** of public transport trips (CSIR, GHTS 2019)	Minibus taxis	Fleet renewal–National Taxi Recapitalization Programme
			Corporatization–Municipal BRT systems
			Corporatization–Gautrain feeder services
Maputo	**61%** of public transport trip on *chapas* (JICA, 2014)	*Chapas* (minibus)	Corporatization–Plan 1000 buses
		Informal buses	
		Sedan taxis	
		MyLoves	
		Txopelas	
Barcelona	0.7% of total trips	Motorized scooters*	Capped licences to limited operators

* While not a form of paratransit, these are included because they represent a growing private mode that is not licensed in a city in the Global North

The strong reliance on paratransit services in African cities is well documented. The comparative table above highlights the significant role of paratransit services in the provision of public transport in the participating African city-regions. However, the context and details of the paratransit services differ per region, and each region has its own unique history, operating culture and future trajectory. The inclusion of the motorized scooters of Barcelona is a reminder of the ever-changing mobility landscape and the flux between formal, licensed modes and informal, unlicenced modes. Although they represent a relatively small share of the total transport trips, the use of e-scooters is rising rapidly, and the Metropolitan Authority will have to provide policy leadership on this issue. The section below will outline briefly how the African regions are addressing paratransit services. All of the regions are taking similar approaches, but there are clear differences in the details.

Dakar

The current transport policy position in Dakar focuses on the professionalization of informal services and structures a part of them around the formal public transport services: the Regional Express Railway (TER) and BRT. In Dakar the Minibus Fleet Modernization Programme (MFRP) focuses on corporatizing the informal operators and shifting to a scheduled, planned and regulated bus service operated by private operators (economic interest groups) but contracted by CETUD. Using a revolving fund to finance the fleet renewal, 2500 vehicles have been replaced since 2005. The project has demonstrated sustainable results and provided the basis for a transformation of the paratransit landscape in Dakar. While all the paratransit modes still exist and operate in the city, their share of trips has fallen as the private corporatized services have grown.

A BRT pilot line has been implemented and is planned to begin operation in 2023. A study was carried out to understand what the impact on existing transport workers will be (Timera, 2020). The study argues that the impact will be a significant loss of livelihood with the arrival of BRT. The BRT

operating model will see an international operating company partner forming a consortium with local shareholders. A 30% shareholding in the operating company will be held locally (Seck, 2023). The inclusion of local operators required extensive consultation and resulted in 14 feeder service lines in the first phase of operation and 32 lines in the full system.

WHAT IS INTERESTING ABOUT THE APPROACHES TO ADDRESSING PARATRANSIT IN DAKAR?

- CETUD is the agency leading Dakar's public transport reforms. It was created by the national government and supported with dedicated funding through the Urban Transport Development Fund (FDTU).
- The MFRP has a city-wide focus, inviting all interested operators.
- The MFRP has a skills development and training component to support professionalization alongside fleet renewal.
- A revolving fund has been created in partnership with the local banks to provide sustainable financing to the economic interest groups.
- CETUD set the fares for the economic interest groups.
- Studies have been conducted to confirm positive impacts for users and the environment.
- The BRT project seeks to contract experienced and credible operators to lead operations.

Gauteng

In South Africa, the national government implemented a taxi recapitalization programme. Unlike in Dakar, minibus taxi owners were not required to form corporate entities to receive the recapitalization funding. Instead, owners were only required to scrap their existing vehicles to qualify for the grant that would cover the cost of a new vehicle.

The BRT roll-out in South Africa has, however, targeted the operational transformation of minibus taxis. Johannesburg began BRT operations in 2009 with the first full BRT system in Africa. Minibus taxi owners and associations operating particular routes in Johannesburg were invited to form part of the first BRT bus operating companies. To do so, they had to scrap their proportionate share of existing minibus taxis and surrender their operating licences. To sweeten the deal, the state provided a compensation payment for those who agreed to join the system. The transition from many separate informal minibus taxi operators into a single formal bus operating company was fraught with challenges and resistance. However, the city government was able to work with the informal operators and establish the operating company. Both of the other metropolitan municipalities in Gauteng, Tshwane and Ekurhuleni, have implemented BRT. Tshwane launched an interim operation in 2014 operated by a bus operating company formed by previous minibus taxi operators, which has remained until today. Ekurhuleni was unable to begin operations, and the BRT infrastructure remains unused.

The slow and halted roll-out of BRT services across the city-region has meant that only the few associations operating along affected BRT project routes have been involved in the formalization to bus operating companies. The majority of minibus taxi operators in the region are operating as they did before the BRT system arrived.

The Gautrain has also made progress in working with the minibus taxi operators in the areas where Gautrain feeder services are required. Initially the Gautrain operated all the bus feeder services to Gautrain stations. However, through engagement the Gautrain was able to agree a process of corporatization with some minibus taxi associations to provide scheduled midibus feeder services along certain routes. This again represents a successful attempt to work with the minibus taxi industry to corporatize and contract with government as a formal public transport operator.

WHAT IS INTERESTING ABOUT THE APPROACHES TO ADDRESSING PARATRANSIT IN GAUTENG?

- A number of programmes implemented by different spheres of government at the same time are not necessarily integrated.
- Minibus taxi recapitalization by the national government has renewed fleets but not changed the operating practices or required corporatization of the operators.
- BRT systems were operated by new bus operating companies formed by previous minibus taxi operators, a direct effort to corporatize the industry.
- Focusing only on those taxi associations impacted by BRT routes has resulted in few avenues for other associations to enter corporatization transition arrangements with the cities.
- The Gautrain Management Agency has developed a model including opportunities for minibus taxi operators to form cooperatives and enter formal operating contracts on feeder routes.

Maputo

In Mozambique the Ministry of Transport and Communications created the Metropolitan Transport Agency (AMT) in December 2017 to "coordinate and implement the Maputo Metropolitan Area Transport and Mobility Master Plan" (World Bank, 2022). One of the instrumental interventions of the AMT was the creation of cooperatives of private bus and minibus operators. This was an effort to corporatize the services offered and ensure more coherent planning and contracting. Currently, 10 cooperatives are operating 350 large buses under agreement with the AMT and the Transport and Communications Fund. Operator business and management capacity is limited for different reasons in the cooperatives. The cooperatives are not currently availing of economies of scale, in part because they have a below-optimal fleet size, in part because they have not adapted to a more corporatized model, and in part because of their relative lack of experience in large bus operations. (World Bank, 2022). The plan is to bring new buses into the transport network through this arrangement.

Maputo is facing several challenges in relation to paratransit, the main ones being the management of *chapas.* Work is being done to improve the safety and quality of service for users and the correct execution of the routes assigned to them. There are 11 semi-coach transport associations in the Maputo Metropolitan Area.

A big challenge is *Mylove* vehicles (unlicensed open-box trucks). This is a very unsafe transport option for the population but offers a service that the public system does not provide. The municipality of Maputo banned the circulation of *Mylove* vehicles completely in 2020. The municipality introduced a service to deactivate the *Myloves*, but they have not yielded the desired results, so work is under way to introduce other strategies.

Recently, an app-based taxi system has appeared in Maputo. The municipality is studying how to proceed.

Maputo is busy with the conceptualization of a BRT system with an initial focus on a single corridor in the metropolitan area. The impact on minibuses is being studied to find alternatives.

Gradual progress needs to be made in the regularization, transformation and management of paratransit. In this line, work must be done to find appropriate strategies for each type of transport.

WHAT IS INTERESTING ABOUT THE APPROACHES TO ADDRESSING PARATRANSIT IN MAPUTO?

- Multiple organs of state share responsibility for public transport implementation in the of Maputo Metropolitan Area. Public institutions have different interlocutors: the bus operators and semi-collective transport associations.
- The AMT is working to corporatize operators: 10 cooperatives have been formed since 2016 and have received state-procured buses.

Barcelona

The Barcelona Metropolitan Area (AMB) is facing a rise in the use of motorized two-wheeler scooters throughout the city-region. The current model of operation is for companies to rent the scooters to riders. Current transport policy and regulation do not cater for this motorized mode. The Metropolitan Transport Authority (ATM) attempted to ban the use of these vehicles, but there was resistance from the public. This mode of transport is gaining prominence across many European cities. Countries are establishing regulations for e-scooters and the ATM has established a set of regulations regarding where they can be ridden and speed limits and conditions associated with their use.[9,10]

WHAT IS INTERESTING ABOUT THE APPROACHES TO ADDRESSING THIS INFORMALITY IN BARCELONA?

- It is a reminder of the ever-evolving transport landscape, which even governments in the Global North must respond to.
- The government has had to adapt its stance based on the demands of the people and has done so relatively quickly.
- Adapting a policy stance to better serve the public reality is an important lesson.

Policy reflections

A shared metropolitan vision

A shared vision on how best to address paratransit at the metropolitan scale is required. Without this vision, multiple agencies tend to engage in their own approaches to dealing with paratransit services. Dakar seems to be having good success (not without challenges), arguably because a single authority with designated sources of funding is responsible for implementing public transport reforms for the city-region. In Maputo and Gauteng there is a lack of a clear long-term vision, and multiple agencies adopt different approaches that often fail to integrate.

Gender approaches

None of the current approaches evident in the responses to informality are embedding gender inclusion. The societal benefits of having women included in the operations of transport systems are well articulated and argued for (ITF, 2018). Reform efforts need to move beyond only corporatization to caring, gender-sensitive services that make girls and women feel safe and welcome.

Public transport subsidy

Very few of the responses to paratransit include clear public transport operating subsidy regimes. In most African cities, formal public transport bus and rail services often receive the bulk of

[9] https://www.barcelona.cat/infobarcelona/en/tema/mobility-and-transport/the-ban-on-electric-scooters-on-public-transport-has-been-extended-for-a-further-three-months_1303668.html
[10] https://www.barcelona.cat/infobarcelona/en/tema/mobility-and-transport/helmets-to-become-obligatory-for-riders-of-electric-scooters_1246340.html

government subsidy to ensure that they can maintain operation at a relatively affordable cost to the user. However, most users are reliant on paratransit services for their mobility. With corporatization and professionalization, there should be clear subsidy policies to support improved user experience and incentivize operators to join professionalization schemes.

Local innovation, supplier and enterprise development

There is very little on offer in terms of understanding the local value chains that are disrupted by efforts to professionalize paratransit services as well as the potential economic strategies that could be invested in to support local corporatization efforts. The costs of corporatization remain high because technology is often imported, financing is expensive and the operational know-how on new fleets also needs to be imported. The costs of moving to renewable energy–based vehicles are also often very high and make it unfeasible because the technology has to be imported. Investing in local innovation and enterprise development in the transport value chain seems an important opportunity.

Mobility governance indicators linked to paratransit

A cross-cutting component of the AMN project is to explore the role of mobility indicators in improving transport and mobility services across African city-regions. Below we explore some of the indicators that are important for supporting work that is addressing paratransit services.

Policy indicators

Is there an overarching policy framework for paratransit services to operate within?

This provides the grounds upon which paratransit can exist.

Is there a paratransit decision-making structure, a steering committee/forum in which government, operators and the public are able to engage?

Performance indicators

Number of renewable energy vehicles

Demographic data on passengers

Number of passengers

Annual change in average travel time

Paratransit as a % of total trips

Planning indicators

Are routes mapped?

Progress indicators

Number of operators incorporated and transitioned to a formal company

% of females working in operations

% of clean energy vehicles

Considerations on indicators in relation to some challenges of paratransit:

- Vehicle safety/unsafe vehicles

- Non-compliance with public routes
- Exclusion of certain groups of users (women with children, people with loads and people with mobility difficulties)
- Informality in rates

Bus rapid transit in African city-regions

Introduction

Bus rapid transit (BRT) is increasingly being seen as a strategic transport investment in African cities. It is believed to offer similar mass-transit benefits to a metro or light-rail system at a much-reduced cost. This chapter seeks to critically discuss BRT, presenting the origins of the concept and its arrival and implementation in Africa. The chapter will then provide a brief comparative assessment of the state of BRT systems across the participating city-regions.

Origins of bus rapid transit

Bus rapid transit is a transport innovation that emerged in Curitiba, Brazil. The mayor of Curatiba at the time, Jamie Lerner, led the project and took an incremental set of steps towards formalizing the city's informal bus operators. First, buses were colour-coded according to routes. Then designated bus lanes were constructed to prioritize bus efficiency by preventing buses from having to travel in mixed-traffic lanes. Next, designated and elevated bus stations were built to improve boarding times through pre-purchase of tickets and same-level boarding and alighting. At the same time Lerner was championing changes in the city's land-use planning and management, only allowing development to take place along the BRT corridors and incentivizing development with higher-density licenses.

It is worth noting that the BRT advancements made in Curitiba were taking place within a broader set of urban innovation programmes (Bleviss, 2022) and projects being led by the mayor, including waste-recycling food vouchers for the poor, parks and environment improvement and business incubation, all co-located with the BRT service. It was a wider city transformation project and not an isolated transport initiative.

While Curitiba birthed BRT, it was another South American, Bogotá in Colombia, city, that arguably made BRT best known. Bogotá's Mayor at the time was Enrique Peñalosa, who championed BRT as a way to tackle access inequality faced by the poor, who were captive users of informal bus operators. The city placed major emphasis on formalizing the informal bus operations and improving the transport facilities and service experience for public transport users.[11] Bogotá provided an extensive design solution, increasing the size of stations and the volume of buses able to operate in the system so that it resembled a metro-like service. The Bogotá BRT system has been hailed for being a leading example of sustainable transport in the Global South.

Worth mentioning in this case is that the mayor who preceded Peñalosa was Antanas Mockus, a philosopher who championed citizen behaviour change led by "soft" campaigns ranging from putting a water bottle in the toilet cistern to having mimes shame poor driver behaviour on the streets. Some argue that the ability to introduce BRT was strengthened by the previous years of championed culture change.

The Bogotá experience led researchers and transport organizations to become increasingly interested in (and convinced of) the prospect of BRT as a global transport and mobility solution for low-and middle-income countries. Multilateral organizations like the World Bank, the United Nations and the Institute for Transportation and Development Policy (ITDP) began to endorse and promote

[11] https://use.metropolis.org/case-studies/transmilenio-bus-rapid-transit-system

the development of BRT services across the developed and developing world as an affordable mass-transit service.

These two early examples highlight the importance of understanding the political and economic context of the city. Both South American examples required mayors to champion the projects. In both cases, the projects took place within a wider urban innovation context. The context is important because it allowed the BRT not to arrive as an isolated project. However, these systems are not without their challenges and critiques: in both instances the systems have created new challenges. In Bogotá, corruption, overcrowding and lack of access for the poor have emerged as prominent critiques. In recent years it has been grappling with the introduction of metro lines and the extension of the BRT.[12]

In both South American examples, buses were the mode of transport being used within the informal operations. Thus, the culture of using buses was already in place in the cities, unlike in much of the African continent, where there are large volumes of minibuses or midibuses. As highlighted by (Bleviss, 2022, p. 4) in the case of Curitiba,

> *"It is important to recognize that buses were a logical choice for Curitiba when first designing its public transportation system. There was a long tradition of bus transportation in both Brazil and Latin America. Bus manufacturing plants were located near Curitiba. And the city's limited financial resources meant that its leadership had to look for low-cost transit options."*

BRT became packaged as a transport solution that could be implemented in any city and be more affordable than a rail-based system. However, the clear lessons from the leading cities in South America highlight that BRT alone is not the solution to improve mobility and requires a long-term commitment to integrated mobility solutions.

Critical lessons available from the African experience

African cities, like many other cities of the Global South, have been the target of BRT promotion and adoption. This section briefly outlines the history of BRT implementation in Africa.

Lagos, Nigeria

The first African City to adopt the BRT concept was Lagos, in 2008, although it did not develop a "full" BRT system but implemented what is termed "BRT lite". This means that the system includes only basic elements and not the sophisticated electronics and level boarding stations. Rather, the service provides dedicated bus lanes on high traffic sections of road, with paint demarcation on other road sections. The system includes basic kerbside stops. The BRT lite system is deemed to be more affordable in terms of both capital and operations than a full system.[1] What is interesting about the Lagos BRT is that in many ways it represents the initial stage of the Curitiba BRT system.

[12] https://www.infrajournal.com/en/w/bogota-mobility-public-transit

Figure 12: Lagos BRT light. Sources: (left image) https://www.infrahub.africa/case-studies/lagos-bus-rapid-transit-system-lite; (right image) https://www.bard.edu/cep/blog/?p=6968

Johannesburg and Cape Town, South Africa

In the post-apartheid era, South Africa had adopted a "public transport first" policy approach after many decades of little emphasis on and investment in public transport. The policy was in place from 1996, with little action in terms of increased investment in public transport. Cities in South Africa were exploring how to improve public transport, but similarly struggled to initiate projects and programmes. It was only when South Africa was awarded the 2010 FIFA World Cup that the South African government was compelled to act.

Johannesburg was the first city in Africa to implement a "full" BRT system, which began operation in 2009, complete with a fully dedicated trunk route (main arterials of the system fed by mixed traffic feeder routes). The ITDP certified the system as "gold standard". It comprised level-boarding median stations, following the Bogotá approach. One key feature of the South African BRT approach was to

transition existing minibus taxi owners and operators into formal BRT bus company owners and operators.

The city of Cape Town's BRT system was operational shortly after Johannesburg's, in 2010, also in time for the FIFA World Cup. This was part of a widespread initiative funded by the national government to implement BRT in 12 South African cities by 2019. Unfortunately, only four of the cities have managed to begin operation of their system to date. And the roll-out of the four systems has been very slow, with costs much higher than had initially been envisioned.

Cape Town has adapted the design of its system to include more low-floor boarding to reduce costs, while other cities in South Africa have decided to implement more typical bus systems and BRT lite versions.

Comparative approaches of AMN regions

Across the AMN regions, all the cities are operating or planning BRT systems and are in different stages of their experience. In Barcelona there is an extensive bus network, but one bus line with dedicated bus lanes is considered to be BRT and has been operational since 2007.[2] In Gauteng there are three adjoining metropolitan municipalities, all of which have invested in their own BRT systems. The most advanced is the city of Johannesburg's BRT system. The city of Tshwane operates an interim BRT line, and Ekurhuleni has built infrastructure but no operations have started. The city of Dakar is planning to launch full BRT operations in 2024. Maputo is in the early stages of planning a BRT system. What is interesting across the different city-regions is the range of design applications, financing arrangements and operating models and fare structures that characterize these systems. While BRT is proliferating across the African continent, the differences in their details is where interesting learnings are possible.

Table 4. BRT system details across AMN members

City-region	System details	Operational model	Financing arrangements
Barcelona	Length: 21.8 km	Fits within the bus network and is contracted in the same way as other bus services with private or public operators.	The metropolitan government and the EU[13]
Gauteng	Johannesburg: Length: 88 km Tshwane: Length: 16 km No. of buses: 277	Trunk and feeders. Operated by newly formed bus operating companies that comprise previous minibus taxi owners and existing bus operators.	National government grants fund the capital expenditure and a portion of the operating expenditure. Municipalities fund the balance of the operating

[13] https://ebrt2030.eu/barcelona/

			expenditure.
Dakar	Length: 18.3 km No. of buses: 144	Trunk operated by a newly formed bus operating company comprised of an international operator and local shareholders. Feeders to be operated by the operators who have undergone professionalization.	Capital expenditure funded by a World Bank loan and Ministry of Transport Fund.
Maputo	Proposed:[14] Length: 65 km, phase I, 22 km No of buses: 100	Proposed: The responsible entity is the Metropolitan Transport Agency, which depends on the National Ministry of Transport and Communications. Metropolitan vision. Operation unknown.	Proposed: Capital expenditure funded by World Bank Loan. Operations unknown

[Open Textbox]

BRT systems in Africa

BRT corridors are already up and running in Dar es Salaam, Lagos and the South African cities of Cape Town, George, Johannesburg and Pretoria. Another 10 are currently under planning or construction all around Africa. The World Bank is providing financial or technical assistance to eight of these projects, including Abidjan, Dakar, Dar es Salaam (phases 3 and 4), Douala, Kampala, Kumasi, Maputo and Ouagadougou.[3]

[14] https://news.goalfore.com/detail/64474/maputo-brt-feasibility-study-nears-completion.html

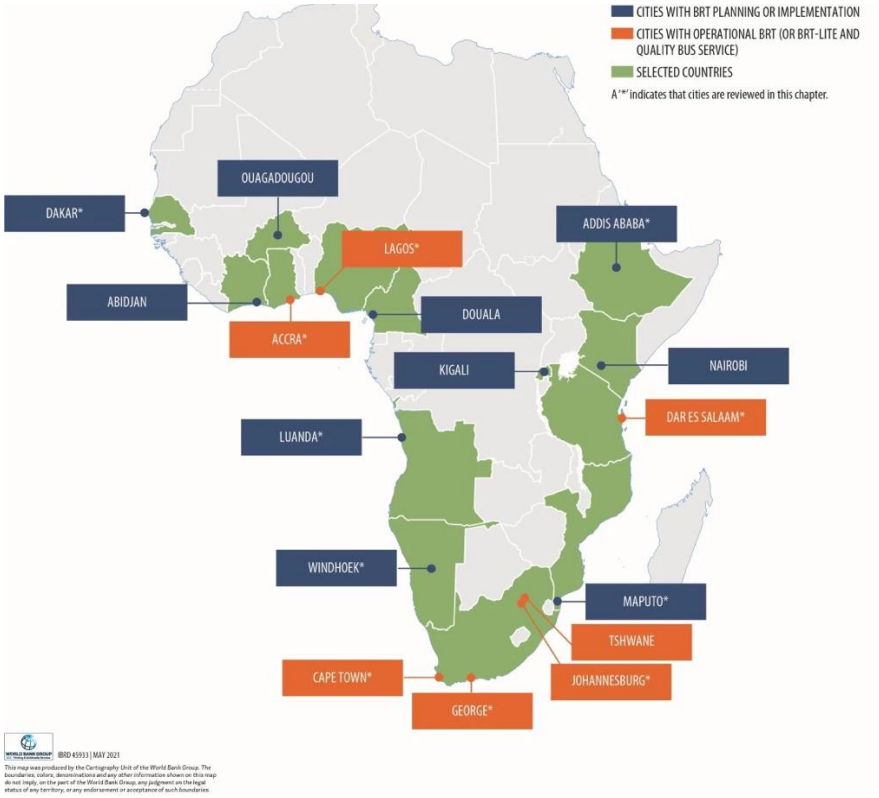


Figure 13: BRT in sub-Saharan Africa.
*Dakar has implemented BRT since this map was produced.
Source: World Bank, Cartography unit.

[Close Textbox]

Interesting and stand-out facets across the city-regions

Dakar

With CETUD holding sole authority over all public transport in the Metropolitan Area of Dakar, the BRT system forms part of a broader restructuring of all public transport routes and services within the region around the two major structuring services of BRT and the TER, with 32 priority lines provided as feeders to the BRT and TER with fare integration and an additional 71 routes operated by the Association de Financement des Professionnels du Transport Urbain (AFTU) and Dakar Dem Dikk operators who have gone through the professionalization programme. While this is a long-term project, it provides a clear strategy and approach to improve the overall transport network within the city-region.

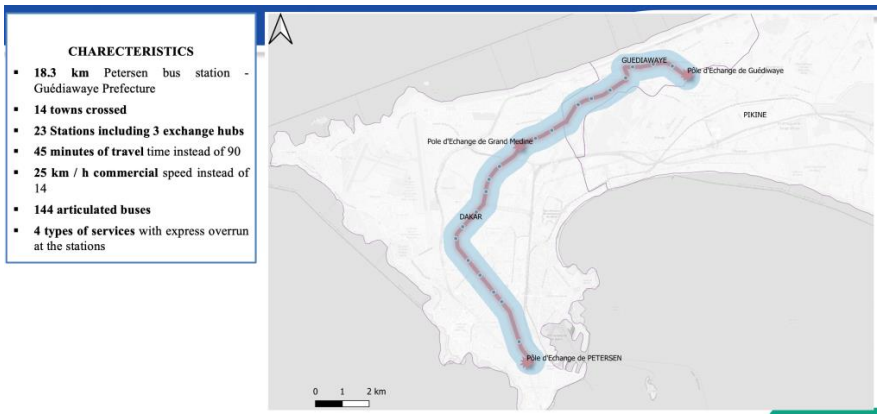


Figure 14: Dakar BRT

Cambiar en la figura:
CHARECTERISTICS = CHARACTERISTICS
Stations including = stations including
45 minutes of travel time = **45 minutes of travel time**
25 km / h commercial speed = **25 km/h commercial speed**

Figure 15: Dakar's public transport network

Another interesting aspect of Dakar's BRT system is the operating model. Drawing on the services of an experienced private international operator has increased the ability to ensure the services are well operated. There is also the potential over the long term to facilitate local operators' development to eventually be able to compete for the contract.

Barcelona

Barcelona's BRT line forms part of the existing bus network. By strict BRT definitions it would probably not be considered a BRT system. However, it is interesting to note that the benefits of dedicated rapid busways are being considered as part of the expanding public transport and mobility environment in a context where there are established public transport networks. The so-called BRT line in Barcelona provides a more regional, express-type bus service and connects the centre to outlying areas in the west of the city-region.

Gauteng

The BRT story across the Gauteng City-Region is unique in that BRT implementation has been led by the metropolitan municipalities contained within the province. At some 18000 square kilometres, the land size of the Gauteng City-Region is significantly greater than that of the other city-regions participating in the project, and the challenge of public transport provision is made greater by a relatively low density across the city-region. The metropolitan-scale result of the BRT

implementation efforts by the metropolitan municipalities of Johannesburg, Tshwane (Pretoria) and Ekurhuleni are a set of disconnected services that are unable to integrate services seamlessly, whether physically due to design differences or operationally due to a lack of fare and system integration. The first BRT line in South Africa was opened in 2009, but none of the metropolitan municipalities has been able to implement a full planned line of BRT. Johannesburg operates 88 km[15] of dedicated BRT lines and feeders operating in mixed traffic, Tshwane only operates an interim service of 16 km with some mixed-traffic feeder services (Preeze & Venter, 2021), and Ekurhuleni built some of the infrastructure for the first line but is not operating any services.

What has been interesting about the South African BRT story has been the deliberate effort to transform the minibus taxi industry through the delivery of BRT services and to corporatize the informal minibus taxi operators into formal bus operating companies. While this approach was well intended, the results have been mixed, and many of the informal practices have crept into BRT operations. This approach stands in contrast to the approach taken in Dakar.

In another experience in Gauteng, the provincially implemented and managed Gautrain Rapid Rail Project followed a similar approach to that of Dakar. An international operator was appointed as part of a local consortium on a build, operate and transfer basis. The current performance standards of the Gautrain are much higher than those of the BRT services in the province.

Unlike CETUD in Dakar, the Transport Authority of Gauteng is recently formed and does not hold sole authority for all public transport in the city-region. This compromises the ability to have a single vision and a rationalized public transport network functioning in an integrated way across the province.

Maputo

Maputo is still in the planning and feasibility stages of BRT implementation. Initially the BRT was being planned by the transport department of the municipality of Maputo. However, it was determined that the result was a BRT system that failed to meet the functional travel demand across the Maputo city-region, as has been the case in Gauteng. The BRT planning has now moved to be the responsibility of the Maputo Metropolitan Transport Agency (AMT), and a revised network has been designed that integrates the municipalities in the city-region.

The AMT depends on the National Ministry of Transport and Communications and maintains a dialogue with the municipality of Maputo and the metropolitan municipalities.

As part of the BRT project, there has also been an assessment of road safety for schools and children that seeks to understand how road safety measures can be implemented to enhance children's safety along the BRT corridors. This is an interesting initiative as it leverages the BRT investment to make improvements in other areas of the transport system.

Policy questions posed by BRT for mobility governance

Affordability

One of the largest transport policy questions that BRT poses in Africa is affordability. Typically, the financial models of BRT systems rely to a certain extent on farebox revenues to finance the capital and ongoing operational costs of the system. This translates to fares that are often unaffordable for

[15] https://africa.itdp.org/the-role-of-brt-in-post-pandemic-south-africa/

lower-income travellers, often the most marginalized in city-regions, who desperately require improved access.

Studies done in South Africa on the Johannesburg and Cape Town BRT systems indicate that the BRT caters for middle-class residents, and the project has not proved to provide enhanced mobility for poorer residents, who are unable to afford the tickets.

A critical policy question is the extent to which states are able to subsidize transport services to afford improved access to a wider range of income groups in city-regions.

A gender perspective

Another significant question is the extent to which women's mobility needs are considered in the planning of BRT and other transport interventions. It is well documented that women are more affected by discrimination and insecurity when using public transport and walking in cities than men. Discrimination and insecurity affect their daily mobility.

A city that is safe for women and girls is a city that is safe for all. A critical policy question to consider is how BRT interventions can be leveraged to incorporate a gender perspective. Mexico City's BRT system has deliberately invested in a gender perspective in the design and operation of the system. Many women are employed within the system, and deliberate and intentional elements have been designed to better accommodate women.[16]

Industry transformation

The question of the transition for informal operators to be part of BRT solutions in African cities is an important one. It relates to the risk and opportunity associated with introducing new services into existing mobility contexts. The strength of the South African model has been the transformation of the minibus taxi industry operators.

A reflection on indicators that relate to BRT

BRT systems are an intervention to improve mobility in cities. All BRT projects seek to advance mobility policy goals. A prominent goal is often improved accessibility, including a reduction in travel time, reliability of service, and an expanded network of transport with wider city coverage. Other goals that have been sought through BRT are an improved customer travel experience and service quality. Johannesburg had an explicit goal to restore dignity; reduce pollution through greener fuels and technology; and achieve broader urban growth and development alignment through the densification and integration of land use. Another sometimes-stated goal is that of affordability, but many studies have indicated that BRT does not make mobility more affordable in African cities, largely due to the user-pays cost-recovery model established to finance projects.

Possible indicators for consideration linked to BRT services:

- Accessibility
- Customer experience
- Environmental impact
- Dense and mixed-use urban growth
- Affordability
- Safety

[16] Presentation from Mexico City BRT at AMB Seminar (2022), AMB, Barcelona.

The World Bank has offered a reflection on its experience working on BRT in Africa and indicates a series of governance-related conditions that enable successful implementation and operation of BRT.[17] These link to the broader set of transport governance indicators established earlier in the report and are listed as:

- Fiscal capacity: Is there long-term funding support?
- Legal and regulatory frameworks: Are there legal institutional frameworks and structures in place to operate the BRT?
- Transport market dynamics: Do travel demand and local value chains exist to support the growth and maintenance of the BRT system?
- System design and business models: Is the system designed to fit the context?
- Policy and political will: Is there guaranteed long-term political support?
- Institutional capacity: Are there adequate institutional systems and skills to ensure the planning, implementation and operation of the service?
- Incumbent operator engagement: Have existing operators been engaged to understand the before and after?
- Risk-benefit participation model: Is there clarity in how the private sector (financiers and operators) will share the risk and benefits associated with the service?
- Adjacent land and corporate value: Does the land legal system allow benefits to be leveraged from the land value generated from the system?

These are a useful set of governance considerations when BRT services are implemented. They become especially important in the long term as systems seek to expand with further lines and investment. The experience in Gauteng presents interesting lessons in that BRT implementation has been halted, with very limited further investment since 2016; the result is large inefficiencies and an inability to capture the real value of the initial investment. Political support and will has been a major factor in the current situation, but so have many of the more structural and capacity-based issues reflected in the above.

[17] https://blogs.worldbank.org/en/transport/improving-viability-bus-rapid-transit-systems-nine-factors-sub-saharan-africa

Discussion on mobility indicators

This chapter provides a short reflection on the initial focus on indicators against the actual experience of working with the group on sharing the use of existing mobility indicators and the reality of trying to pilot sets of indicators in the project.

At the beginning of the project, it was intended to focus on developing a set of indicators that would promote sustainable and inclusive mobility in African city-regions and also be piloted in one or more of the participating city-regions. It was deemed important to incorporate indicators with a gender and diversity approach in order to better understand the complexity of the territory and the mobility of people within it. A complex understanding of mobility allows the development of public policies and strategies that are more appropriate to the context and guarantee safe, inclusive and equitable mobility for the entire population.

Upon exploring the topic further, previous investigations into the topic of transport and mobility indicators in Africa have been identified (Christie, Smith, & Conroy, 2013). There are many available lists of good practice transport and mobility indicators for transport policymakers and authorities to consider in their efforts to improve mobility governance. None of these existing indicator lists supports an explicit gender and inclusion approach.

In practice, the AMN experience in the project as it relates to selecting a list of implementable transport and mobility indicators has reflected the challenges associated with an indicator-led approach. In contexts where there is limited capability to carry these indicators out in systematic ways, it would be remiss of the project to simply develop a wish list of strong indicators, which have already been developed through other studies. This is not to undermine the importance and significance of having a strong sense of indicators for improved mobility governance and outcomes.

A few major factors constrain the ability of government transport entities to implement indicators, and especially to introduce new indicators.

Limited data

In many African city contexts, official data across a range of mobility aspects are not widely and readily available. In many cases transport entities and authorities are using outdated data or proxy data often collected by universities or NGOs. The prominence of paratransit increases data challenges, as there are seldom good data on paratransit operations and strong incentives for paratransit operators to not have good data and information available on their services due to their perceived risk of tighter regulation and control.

Limited capacity

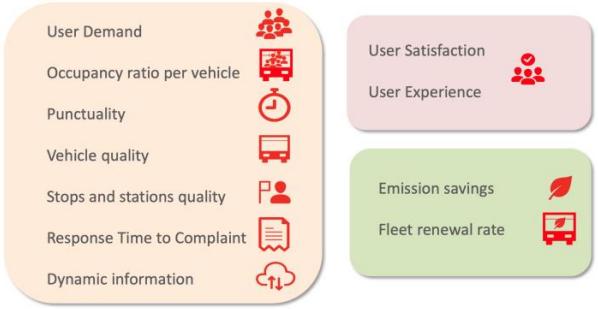
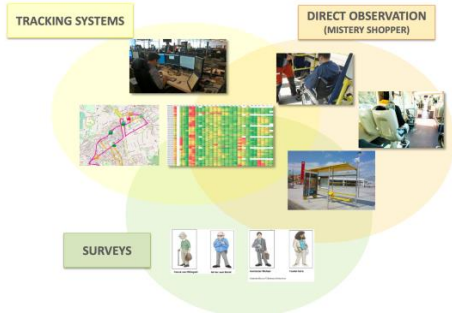
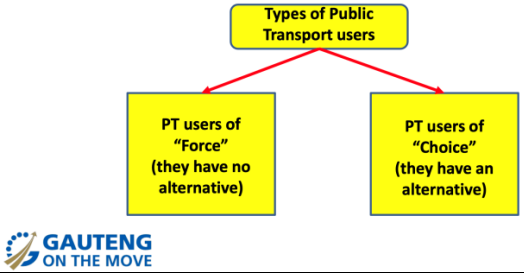
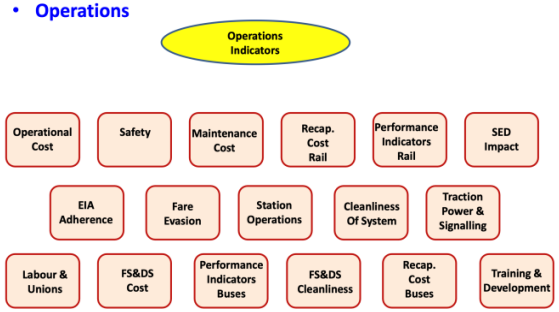
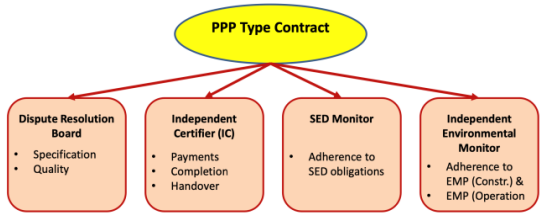
Many transport entities and authorities in African city contexts simply do not have the luxury of large multidisciplinary teams to implement, analyse and administer wide sets of indicators.

Participating region indicators

This is not to say that African city-regions are not using indicators to inform their decision-making or policy performance. As part of the Mobility in African City-Regions project, each of the city-regions presented the role of indicators in their contexts. What is clear is that each of the participating

entities understands the value and importance of data and indicators to support improved mobility. Barcelona is the most advanced in the use of indicators and presents a learning opportunity for the other regions in this regard. Barcelona also has a more established institutional environment and better capacity to implement indicators.

AFRICA MOBILITY *Network of 4 City Regions*

Region	Role of indicators	Indicators used	How data are collected
Barcelona			
Dakar	 • To measure the transit performance ; • To measure planning performance ; • To measure traffic performance ; • To plan for necessary studies ; • To report performance to authorities .	**Transit performance indicators** ○ Number of buses per 1000 inhabitants, ○ Average demand over capacity of buses, ○ Number of bus travelers per kilometer, ○ Commercial speed, **Traffic performance indicators** ○ AADT (Annual Average Daily Traffic), ○ Travel time, ○ Saturation ratio (V/C), ○ Level of service (section, intersection),	
Gauteng *Gautrain	• Customer centric approach • Source of Indicators 	• Operations 	– PPP Contractual Obligation – Mainly Manually collected – Social media monitoring 
Maputo	Indicated that they are at the beginning phases as AMT and do not have any operational indicators		

CETUD · DAKAR · AMT · GAUTENG PROVINCE ROADS AND TRANSPORT REPUBLIC OF SOUTH AFRICA · AMB Área Metropolitana de Barcelona · GCRO Gauteng City-Region Observatory · metropolis

Figure 16: Table of indicators and data collection system of the AMN members

Cambiar en la figura:
User Demand = User demand
Response Time to Complaint = Response time to complaints
User Satisfaction = User satisfaction
User Experience = User experience
How CETUD uses indicators (eliminar punto y coma y punto final de la lista)
Transit performance indicators and Traffic performance indicators (eliminar puntuación de las listas)
Number of bus travelers per kilometer = Number of bus travellers per kilometre
AADT (Annual Average Daily Traffic) = Annual average daily traffic
Saturation ration (V/C) = Saturation ratio (volume to capacity)
Methods of data collection (eliminar puntuación en la lista)
Household and trips surveys = Household and trip surveys
Transit operation data collection from pricate and public operators = Transit operation data collection from private and public operators
Mobile data collection from private telecom prividor = Mobile data collection from private telecom provider
Customer centric approach = Customer-centric approach
Source of Indicators = Source of indicators
Types of Public Transport Users = Types of public transport users
PT users of "force" = Forced public transport users
PT users of "choice" = Public transport users of choice
Operations Indicators = Operations indicators
Recap. Cost Rail = Recapitalization cost of rail
Performance Indicators Rail = Performance indicators rail
SED Impact = Social and economic development impact
EIA Adherence = Adherence to environmental impact assessment
Fare Evasion = Fare evasion
En el resto del gráfico, usar sólo mayúscula inicial
FS&DS = Feeder service and distribution service X 2
PPP Contractual Obligation = Public-private partnership contractual obligation
Mainly Manually collected = Mainly manually collected
PPP Type Contract = Public-private partnership type of contract
Independent Certifier (IC) = Independent certifier
SED Monitor = Social and economic development monitor
Independent Environmental Monitor = Independent environmental monitor
Adherence to EMP (Constr.) & EMP (operation = Adherence to Environmental management plan (construction & operation)

It is clear that Barcelona has an advanced approach to the use of indicators in comparison with the African city-regions. Primarily focused on public transport, the indicators implemented in Barcelona allow an ongoing management of public transport service performance by providing a strong view of how service operators are performing and how people are experiencing the services. Barcelona is also the only region actively working on indicators related to environmental impact monitoring. Throughout the project, the AMB Mobility Department are also exploring tangible ways to incorporate a gender and diversity perspective within their mobility indicator landscape.

CETUD's use of indicators focuses more on quantitative transit and traffic performance, looking more at vehicle and capacity performance. CETUD also runs a customer satisfaction survey periodically and has more innovative methods for data collection due to the challenges associated with obtaining data in resource-constrained environments.

Gauteng presented the example of the Gautrain, which is only one service in the province. Much of the data is collected through the operator reporting requirements.

All the regions expressed challenges related to accurate and timely data availability, especially within the paratransit environment. Interestingly, each region is interested in improving customer satisfaction and the overall customer experience. As Gauteng highlights, this becomes particularly important in dealing with "users of choice", but from a mobility equity perspective a good customer experience should be a mobility policy goal even for those who have little or no choice.

Reflections on indicators in African mobility

Every previous chapter of this report has reflected on how indicators could be used to assist in advancing improvement in each of the areas of mobility governance, dealing with paratransit and

BRT. From what the various regions have shared in their current use of indicators, there is room for inclusion of further indicators to support the strategic areas of improved governance, managing paratransit improvements, and implementing and operating BRT. The choices that must be made involve weighing up the value of investing in operationalizing indicators against other areas of investment.

Indicators have a clear and important role to play in improved mobility governance and transport performance management. The extent to which indicators can be implemented is a function of a wider set of governance conditions linked to funding, capacity, and roles and responsibilities. The reality for most transport authorities in Africa is that they are operating in limited data environments with limited resources to improve data especially within the paratransit environment. While no clear sets of “must have” indicators emerge from the project, it is clear that the transport authorities will have to establish a limited set of indicators that align with their respective strategic mobility policy goals. Whether these are indicators for improved mobility governance or improved mobility performance must be determined according to context.

Conclusion

African city-regions are growing at rates never experienced before. Managing urban growth is proving to be a challenge in many African cities. This report highlights the mobility challenges and responses in this urbanization context of three African city-regions: Dakar, Gauteng and Maputo. As part of the Mobility in African City-Regions project, Barcelona has provided a reflection and learning perspective from a different context and highlighted the ever-evolving landscape of mobility within the Global North.

In terms of mobility governance, the case of Barcelona has illustrated the long-term duration required to establish a mature transport governance system and the fact that mobility governance is never an end but rather a continuous process in response to a changing context. Each of the African city-regions is at a different stage of establishing its own approach to a regional transport authority as a means to improve the governance of urban mobility at the metropolitan scale. It is important to clarify the systems and structures of governance, and sustainable funding is essential.

The project has highlighted that having both stable financing sources and stable governance is critical for implementing transport programmes and projects

In this regard Dakar has provided a leading and interesting case regarding improved transport mobility governance in Africa. A long-term approach to improving urban mobility through CETUD as the entity responsible for all urban mobility has provided the foundation for systematically improving paratransit services and establishing the first BRT line in the Dakar city-region.

The project has highlighted the importance of having strong governance in the area of mobility, especially in order to:

- **develop and manage large-scale projects such as BRT infrastructure, and**
- **engage and transform informal services.**

Engaging and managing paratransit remains a prominent challenge and a clear opportunity within the African mobility context. BRT is emerging as a favoured solution that is seeking to drive and embed the transformation of paratransit operators within the implementation approach.

The project has highlighted the importance of having informal operators who are favourable to and supporting of the project in order to ensure a correct implementation of large-scale projects (this is linked to a strong or weak mobility governance).

In terms of BRT, the project has highlighted the long-term commitment and support required to ensure that it is effective and sustainable. In the case of Gauteng BRT, implementation has not been supported in the long-term, and major technical competence risks are related to the model of paratransit operators. In Dakar a different approach was taken, in which the operations are being provided by an international operating company in partnership with local stakeholders.

The project has highlighted the need to guarantee high technical competence to operate these high-complexity projects (the need to establish competent operators).

Reflection on the value of the project for the participating partners highlighted that there has been interest and value in understanding the different aspects and approaches of the respective mobility

contexts. Learning that other mobility practitioners are facing similar challenges and experiencing how different approaches to solutions are being taken has been a clear value for participants.

Beyond the mobility content and the technical aspects of the sharing that has taken place within the project, the practitioners have indicated that there has been immense value in developing relationships with other mobility practitioners. The nature of the network has been informal and casual, focusing on bringing mobility practitioners together. The partners felt that this more casual approach fostered a space in which practitioners could be more open, honest and reflective of their practice.

The project has highlighted the important role a more informal network can have in promoting idea-sharing and building the capacity of mobility practitioners.

The formation of the network of practitioners and the sharing of information has also provided practitioners with a more reflective opportunity. Participants have reflected that the network has afforded them the opportunity to locate and contextualize where their city-region is regarding their mobility governance journey. This time is seldom provided in their day-to-day work.

The project has highlighted that having a network at a technical practitioner level has allowed open and reflective comparison across contexts to identify similarities and appreciate different approaches taken to solving challenges.

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