Transport: Toward a more inclusive, safer and cleaner mobility in African Cities

AfDB Sustainable Urban Development Action Plan (SUDAP)
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This report may be cited as follows: Benjamin Welle and Anna Kustar - Transport: Toward a more inclusive, safer and cleaner mobility in African Cities - African Development Bank 2022.

Acknowledgment

The African Development Banks would like to thank the authors, Benjamin Welle and Anna Kustar, our partners Cities Alliance and the World Resource Institute, as well as Julian Baskin, Alice Nabalamba, Neji Larbi, Marcus Mayr, Charly Andral and Hamad Massa for their contributions.

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African cities are growing fast and in sprawling ways that have resulted in the unequal provision of transport. A preponderance of investments into road and transport infrastructure has supported private vehicles with a lack of financing or investments for sustainable mobility and equitable access to opportunities for all residents. Currently Africa has fast rising greenhouse gas emissions, the highest rates of road fatalities in the world, air pollution, and transport systems that fail to provide enough residents with access to jobs, education, and services within a reasonable amount of time.

Since the early ‘90s, researchers have been gathering evidence of the distinct travel patterns of women and the barriers they face to access public transport (Uteng, 2019). For instance, women’s trips may be shorter in distances than men. The reasons for making these trips also differ, as women take far more trips for care-related activities. However, urban mobility options may not accommodate these distinct travel patterns, leading to accessibility issues such as inefficient public transport routing and lack of last-mile connectivity. Inefficiencies in public transport also translate into higher proportional costs for women. In most countries, women constitute a higher proportion of low-income groups and work lower-paying jobs. Women end up spending a higher proportion of their income on average than men on transportation (Babinard et al., 2010). As a result, low-income women in African cities are more likely to commute long-distances on foot than their male counterparts (Salon and Gulyani, 2010). The prevalence of sexual harassment and threats to personal security against women on public transport perpetrated by male passengers and drivers add to social exclusion from public transport and opportunities in African cities (Lucas et al., 2019). Additionally, women are far less likely to participate in the transport labour force, creating fewer job opportunities and contributing to spaces that are often more hostile to women.

Climate change. While globally, the transportation sector represents 14% of total greenhouse gas emissions and 24% of carbon emissions, land transport emissions in sub-Saharan Africa are among the fastest growing in the world. (Slocat 2018) Compared with other
regions, Africa experienced the second highest growth of absolute transport emissions (84%) between 2000 and 2016, driven primarily by increases in passenger and freight transport activity. (Slocat 2018) Transport emissions in Sub-Saharan Africa increased 75% from 2000 to 2016 to a level of 156 metric tons (Mt) CO2, while transport emissions in Northern Africa increased 95% during the same period (though at a lower absolute level of 135 Mt in 2016). Total transport CO2 emissions increased in major economies of Africa between 2000 and 2016, including 161% in Algeria, 153% in Ghana, 123% in Kenya, 73% in Egypt, 40% in South Africa and 19% in Nigeria. (Slocat, 2018) In addition, climate change is already increasing drought, flooding, and heat in Africa, with consequences for urban transport around the ability of infrastructure to withstand these changes and to move people safely and effectively.

Health. In 2016, there were an average of 26.6 road deaths per 100,000 residents in SSA—a roughly 2% increase from 2013 and 32% higher than the global average. (WHO 2018) Urban pedestrians are especially vulnerable. Between 2010 and 2015, pedestrians accounted for 88% of road fatalities in Addis Ababa. (AATB 2017) Without strategic intervention, vulnerable road user deaths will continue to increase as more SSA commuters opt for private vehicles. In Addis Ababa, over 60% of fatalities are pedestrians and over 60% in Accra and Nairobi.

Air pollution is also a deadly and growing problem in the region, with transport as a major contributor in urban areas where residents, and particularly children, are exposed most. Respiratory tract infections caused by air pollution resulted in over half a million deaths of children under five in 2016. Air pollution is a growing challenge for Africa. Deaths in Africa from outdoor air pollution have increased from 164,000 in 1990 to 258,000 in 2017 – a growth of nearly 60%. (UNICEF 2019) Due to the number of high polluting aged vehicles, fuel and vehicle standards, importation of used vehicles, and other factors, addressing air quality will require strategies in the transport sector.

Current approaches to transportation and mobility of RMCs

Urban growth patterns and preponderance of investment into vehicle infrastructure. African cities face several challenges in mobility from urban planning and land use policies and practices. African cities tend to be more sprawling, and their urban form often results from development around a few arterial roads rather than a connected network of city streets. A report by UN-HABITAT found that sub-Saharan African cities have significantly less land allocated to streets, particularly the local streets that connect residences, retail, and services. (UN HABITAT 2013) For example, cities such as Paris, New York and Tokyo have upwards of 25 -30 percent of their land allocated to a network of city streets that allow multi-modal transport to flourish, yet cities such as Nairobi and Accra have just over 10 percent of land allocated to streets. (See Figure 1) This creates conditions where a few roads may be carrying the large majority of traffic, worsening congestion, and also preventing more direct connections for walking and cycling. In addition, in cities such as Kampala, in addition to fewer roads, roads can also be too narrow to implement Bus Rapid Transit systems without road widening or closing them to private vehicles. Walking and cycling.

Many of the large investments in urban transport have not been on expanding these networks, but instead on building urban highways or flyovers that cater to the minority of residents who own or use private vehicles. While interurban roads and rural-urban roads are necessary to improve the access of goods to market and people to economic centres, the concentration on highways within cities has resulted in neglected investment in a network of complete streets and public transport that accommodate all road users, and thus a lack of improving access to opportunities for most residents. This is further exacerbated by the sheer number of other challenges created by rapid organization, such as sanitation or energy issues, and many cities are seeking to address these issues alongside each other with limited resources.
Public transport: a limited set of rapid transit projects implemented but lack of attention to the paratransit sector and equity. In sub-Saharan African cities, demand-responsive, privately-owned minibus taxis, sometimes referred to as 'paratransit,' are the predominant public transport mode. Paratransit owes its massive popularity to its demand-responsive flexibility, its middle-class affordability and its wide coverage. In many cases, paratransit is also the only motorised transit option besides motorcycle taxis. Overall, paratransit represents anywhere from 40 to over 90 percent of all surface public transport trips. (See Figure 2)

Despite paratransit’s widespread use, it brings a host of environmental and societal challenges to sub-Saharan African cities. Paratransit’s aging vehicles are a leading source of transport-related pollution, they can be unpredictable in price and service, and are often unsafe for riders and road users (Jennings and Behrens, 2017). Additionally, many poor communities, especially poor women, struggle to afford fares, access services and are limited to walking as their primary mode of transport, even if their job destination is 10-15 km away (Salon and Gulyani, 2010; Klopp, 2012). Often paratransit vehicles are owned by those with influence, such as politicians, which can make change difficult. Given walking and paratransit’s high modal share, improving paratransit operations, regulations and integration along with walkability is essential to supporting low-carbon, cleaner and inclusive transport. (Bakker et al., 2019)
Many cities across the region are implementing new rapid-transit projects, such as Bus Rapid Transit (BRT) and Light Rail Transit (LRT). Africa has roughly 350 km of BRT, LRT, and metro across the entire continent, with 70% of this built since 2007. (Slocat 2018) To put this in perspective, consider that the London underground length is around 402 kilometres over its eleven lines. In Northern Africa, Cairo and Algiers have had established metro lines since the 1980’s and are continuing to expand to meet the needs of growing urban populations. (Inclusive Infrastructure, 2019; Oxford Business, 2016) By 2030, Greater Cairo is expected to have six metro lines, although the project’s completion will depend on available funding. The cities Tunis and Casablanca rely on LRT lines for public transport, established in 1985 and 2012, respectively (Troin, 2015) While Tunis is investing in modernizing its light rail for improved efficiency, Casablanca is planning for expansion from two to four lines in 2022. (Casa Transport, 2019) There are also multiple BRT routes and projects across Africa in Abidjan, Dakar, Marrakesh, Lagos, Dar-es-Salaam, and multiple routes in South Africa. (Klopp et al., 2019; Viva UN, 2010) In sub-Saharan African cities where BRT and LRT systems are being built, paratransit still provides the bulk of trips.

Commonly, large-sized cities are trying to replace paratransit with mass-transit systems such as BRT and LRT with remaining paratransit serving as “feeders” (Jennings and Behrens, 2017). Other cities are completely or partially prohibiting paratransit operations or placing unsuccessful regulations on minibuses in a largely punitive approach (Gathara, 2018). While BRT has the potential to address some of these issues, serious concerns are emerging around the slow pace of these reforms and whether such interventions will provide a safe, clean and widely
accessible transport alternative outside of a few corridors (Klopp et al., 2019). For instance, Kampala first proposed BRT corridors in 2010 with initial pilots still being scoped (Ministry of Works and Transport, 2010) and Addis Ababa has been seeking to implement BRT since around 2014. There are also concerns over the costs and subsidies needed for BRT, and a potential increase in fares for BRTs over the incumbent systems – a potential huge burden to lower-income public transport users who spend significant amounts of income on transport.

Additionally, much of Africa’s urban growth is happening in medium- and small-sized cities that rely heavily on paratransit and are unable to afford BRT. Some of these cities may want more paratransit, instead of reliance on two- and three-wheelers.

Active Mobility: African cities are walking cities but they are not “walkable” cities. Along with paratransit, the other dominant mode of transport in African cities is walking. In 2015 the share of combined share of walking and cycling trips was 49% in Nairobi, 45–70% in Dar es Salaam, and 34% in Cape Town, with the clear majority (99%) of these being walking trips. In major other cities like Kampala and Addis Ababa, walking constitutes over 40 percent of all commutes compared to bicycling’s modal share at roughly 1%. (Vanderschuren and Jennings 2017, UNEP 2016) Walking is a near zero-cost transport mode. In Kampala, low-income residents spend 25 percent of their median household income on public transport. (Kamuhanda and Schmidt 2009) As such, walking is the only option for many low-income commuters, especially low-income women. A travel survey of 4,375 slum residents in Nairobi conducted by the University of California, Berkeley reveals that the percentage of low-income men and women who walk to work is 53% and 67%, respectively, compared with 36% and 47% of non-poor working men and women. (Salon and Gulyani 2010).

Yet despite the high rate of walking among many African urban dwellers, cities are not “walkable.” To anyone in or visiting many African cities, the eye can see that footpaths are often nonexistent, even in the core of some cities. One study from Freetown showed the residents routinely encounter steep routes that were a potential for mudslides, potholes, open electrical wires and abandoned construction material along walking routes. In many cities, open sewers are more common along city streets than footpaths. (Oviedo et al 2021).

While governments are able to provide road infrastructure for vehicles, the dominant mode of transport, walking, may often have no plan in place for providing this critical infrastructure to movement and safety. Governments often lack adherence to basic design standards for pedestrian infrastructure.

Despite this, the lack of dedicated footpaths on many streets is not entirely negative, particularly on streets with less vehicular traffic. Such streets often function as shared facilities, where a mix of vendors, pedestrians, and some traffic calming measures can provide de facto pedestrian-priority streets.

Motorcycles: a growing mode without pragmatic policy response. Some cities have had high growth of motorcycle use. (See Figure 3.) While motorcycles pose safety and other issues, they provide access to locations where public transport and private cars are unable to reach and can weave through traffic jams. In most cities, this comprises motorcycle taxis, where riders offer hailed services to passengers.

As with paratransit, however, many policymakers are seeking punitive measures towards the motorcycle sector. Often policymakers highlight the pollution or road traffic accidents they bring and denigrate the service they provide, focusing on measures that seek to regulate operations rather than the causes of their development. (Diaz Olvera et al 2020) Efforts to ban riders from areas or enact licensing fees have not been met with much success. On another level, many motorcycles are also owned and rented to riders by officials in government who may not want to see change. The private sector has provided some organization to these fleets, with ride-hail apps such as SafeBoda and Uber Boda in Uganda supporting helmet wearing, vests worn by drivers, and the ability for cashless payment through the mobile app. Other companies have entered the market to finance vehicle ownership for riders, such as Tugende, and electrify fleets, such as Zembo.
Vehicle fleets: a reliance on second-hand vehicles. Currently, motorization is increasing in Africa. While most residents do not own cars, this number is steadily rise as income increases. However, most vehicles that are sent to Africa are used. In fact, 40% of the global exports of used light duty vehicles (cars, vans, SUVs and pickup trucks) go to Africa, compared with only 2% of new vehicles (Gaventa 2021). Meanwhile, some global estimates indicate that around 40% of Africa’s vehicle fleet will need to be electric by 2040 to meet climate goals. (ICCT 2019) This will be a challenge as Europe and the United States, as well as other geographies, may be increasing their export of used internal combustion engine vehicles as they electrify their own fleets. However, currently there are several startups and companies in the region focusing on the electrification of motorcycles and minibuses, which represent significant portions of total vehicle fleets and may find fewer challenges in creating charging infrastructure or energy supply.

Urban freight: an under-researched area. According to other studies, the role of urban freight in many African cities has largely been overlooked (Jennings 2019, Pirie 2013, SSATP 2015). There is a dearth of information on how urban freight functions, the extent of issues facing the sector such as road safety, security, relation to road expansion, last-mile deliver, and the informal sector. In addition, previous assessments have noted that freight planning in Africa tends to be on a regional corridor and national scale rather than an urban one (Jennings 2019, Pirie 2013).

Governance: advances in institutions with many gaps remaining on capacity and management of urban mobility. Constructing, maintaining, and managing transport infrastructure and services is critical to a well-functioning system. Establishing a transit authority consists of integrating all transport functions in one institutional structure at a local
level with the aim to deliver effective integrated, inoperable, and intermodal transport systems. Key examples of such transit authorities include AGETU (Abidjan), DRCTU (Bamako), CETUD (Dakar), DART (Dar), LAMATA (Lagos), and SUMATRA (Dar es Salaam), although some lack the necessary executive powers to implement their vision and must work through other agencies of government. (Kumar & Barrett, 2008) In Addis Ababa, a city-wide transport authority does exist, but it is not autonomous. Others, such as GAPTE (Accra) are unsuccessful because they must work with numerous other state and local agencies with diffused roles, and are unable to fulfill their intended responsibilities. (Brookins, 2019)

There are numerous combinations of transit authorities: in cities like Abidjan, Dar es Salaam, and Lagos separate agencies and ministries have been established for urban planning, transport planning, and maintenance of urban roads, while in other cities such as Kampala and Dakar there are only one or two agencies in place.

Regulation becomes more difficult with population and urban growth. The expansion of a metropolitan area over several jurisdictions complicates the task of planning, regulating, and operating urban transport services. Challenges also arise where the informal sector provides the majority of transport services. Bus services in Abidjan, Dakar and Douala are, in principle, tightly regulated by the Ministry of Transport allocating routes to a monopoly supplier. However, in practice, most public transport is provided by the informal sector, which is much more difficult to regulate. The shift to minibuses does not usually result from a conscious decision to deregulate public transport, but rather a response to growing demand.
SECTION 2
MAPPING THE WAY FORWARD

This section covers a review of practices that have had positive impact on urban mobility in Africa and beyond; a review of AfDB support initiatives and portfolio in urban transport, and a strategic direction in urban mobility for the SUDAP.

Identification of transportation support initiatives that have shown benefits in Africa and beyond

In this section we will identify a select number of initiatives in African cities that have had some success in improving transport. While we are revisiting some of the thematic areas described previously, we will provide more specific examples of work in cities that have shown promise. These practices are largely meant to reflect examples from Africa, we reference some examples globally of good practices.

Road safety: a shift in strategic approaches shows promise in Addis Ababa and elsewhere. Some cities have advanced comprehensive road safety plans that embrace a safe system approach. The Safe System approach is based on a more foundational understanding of the underlying causes of traffic fatalities and serious injuries, particularly human fallibility and vulnerability, and the responsibility of governments to protect their citizens. This approach is based on the principle that errors are inevitable but traffic fatalities and serious injuries should not be. The road system should be designed so that human error does not have a serious or fatal outcome. (Welle et al, 2019). With the high prevalence of pedestrian fatalities in African cities, shifting to a safe system approach means ensuring road networks that are designed for their safety.

With support from SSATP and others, Addis Ababa released its road safety strategy in 2017, including a detailed analysis of the city’s traffic crash data, and focusing many of the guiding principles around pedestrian safety. Analysis for the strategy revealed that over 80 percent of traffic fatalities were pedestrians, with an overwhelming majority of these deaths occurring on main roads. The plan included clear directions to improve the city’s safety management system. As a result, the city revised its speed limits, allowing no more than 50 kmh on most roads, and changing the speed limit to 30 kmh on many roads. It has also been introducing traffic calming measures, reconstructing junctions to enhance pedestrian safety, and undertaking enforcement and communications campaigns aimed at reducing drink driving and speeding. Other cities have been creating more robust road safety strategies, including Accra, Kampala and Freetown, that can provide a basis for shifting investments, design standards, revising speed limits, and conducting campaigns.

Clean Transport: Electric BRT has had a successful start in Marrakech. In 2017, ten electric “tram-buses” were put into circulation on a line that extends about 10 kilometers, connecting the neighborhoods of Massira, Douar El Askar, Gueliz, Bab Doukkala, and Jemaa El Fna. (Toufik, 2021) The buses are equipped to operate as trolleys, but only part of the system is fitted with overhead wiring, with the vehicles operate on battery power over the other sections.

More than three years after their commissioning, Marrakech’s electric buses now carry nearly one million passengers a year, with an average of 2,500 people per day. (Toufik, 2021) The implementation of buses was coupled with the installation of a 1 MW solar farm based on HCPV technology to power the buses, and has proven that integrated low-carbon transport can be replicated in other cities. (GEF, 2017) Further plans for BRT lines are under way in Morocco—two lines in Casablanca and one in Agadir.
Active Mobility: Kampala opens signature project while active mobility gains global momentum. Some cities have advanced initiatives to improve conditions for walking and cycling. These include dedicated streets for walking and cycling, intersection upgrades, provision of and improved footpaths.

In 2020, Kampala opened its NMT zone. The Non-Motorized Transport Pilot Corridor is a complete remodeling of a 2-kilometer stretch of road that cuts through the center of the city. The busy street is home to shopping malls, offices, theaters, is adjacent to a main transportation hub, the Old Taxi Park, and was until recently a main artery for car traffic. (Abubaker et al, 2020) The project was financed by the Ugandan government at a cost of 4 billion Ugandan shillings, with advisory support from UNEP and UN-HABITAT, and has transformed a car-choked key commercial corridor into one full of pedestrians and cyclists. (Musoke 2020) The project is part of a wider strategy to decongest Kampala. The project and wider efforts to fund walking and cycling infrastructure, however, have faced considerable challenges in funding and community support since the idea first launched in 2011, showing the need for leveraging the success of it to scale up such infrastructure in the city.

Other cities around the world have been introducing emergent bicycle facilities, particularly in response to the global pandemic. An exploratory analysis of COVID-19 mobility responses collected by the Pedestrian and Bicycle Information Center identifies 390 interventions that reallocated or built public spaces that impact bicyclists and pedestrians, with around 100 of them to likely last indefinitely (PedBikeInfo 2020; Combs and Pardo 2021). One example is Bogota, Colombia, which created 84 km of emergency bicycle lanes on the eve of COVID-19 shut-downs to help essential workers, and it has announced a four-year plan to add 280 km of bike lanes to the existing 550-km network (Jaramillo 2020).

Public transport: Dar es Salaam BRT shows promise with caveats, and lessons from the global stage. The Dar es Salaam BRT opened 2016 with support from the World Bank. Phase I of the project includes a 21-km corridor that carries approximately 180,000 passengers per day, and a peak load of 18,000 passengers per hour per direction. The project is the first true BRT in East Africa, and aside from features such as dedicated lanes, at-grade boarding, covered stations and pre-paid ticketing, includes surrounding infrastructure for pedestrians and cyclists. Phase I is the first of six planned corridors that hope to be accessible to most people in the city.

The BRT has been shown to have positive impacts on key travel indicators, though it is important to recognize its shortcomings in equity issues and inclusion of the incumbent daladala network. A survey of households and commuters using the BRT found that waiting time for passengers’ stations/terminals was reduced to more than 50%, delays in journey reduced by 60% and savings of fare cost to passengers is 28% compared to previous daladala mode. However, the study notes that the system lacks connection beyond its own corridor, recommending that more connections should be established. (Chengula and Kombe 2017) It also notes that to serve a large group of people, fare prices should be adjusted to 77% of the current fare price. Another recent study further supports that the BRT has helped to reduce commuting times and enhance access to basic services, but that there is potential for improvement in expanding the bus network beyond the corridor, and to address potential vulnerability to natural extreme events, especially flooding. (Krüger et al 2021) Another review of the BRT is more critical, noting that the BRT created tensions around the displacement of existing paratransit (daladala) operators, employment destruction, a lack of affordability, and other issues. (Rizzo 2017)

A total of five cities in Africa have BRT corridors. Aside from Dar es Salaam, these are Lagos, Cape Town, Johannesburg, and Pretoria. BRT was first introduced in Latin America in the early 1970s in Curitiba and expanded dramatically after being introduced in Bogota in late 2000. BRT has been largely found to have positive benefits in reducing road fatalities, improving travel times, and cutting carbon emissions and air pollution. (Carrigan 2013) While globally BRT projects have been found to include benefits to low-income groups, they are often skewed toward medium-income users because of insufficient spatial coverage and inappropriate fare policies. (Venter et al 2018) BRT projects have been used as technical and
governance restructuring tools, that have not fully considered the informal sector that coexists alongside other public transport; improving access for all citizens means investing in informal transportation services—and integrating them with the formal services when feasible. (Tun et al 2021) While we note BRT is a solution that has shown benefits, including in Dar es Salaam, as featured, these caveats on equity and integration are important.

Public transport: measures to improve paratransit. Public investment and non-punitive measures are emerging that involve working with the existing stakeholders to improve services. In a review of policies in South Africa, one study noted the potential for a broader and potentially promising policy shift away from a reform approach centred on minibus displacement and replacement and towards a more holistic focus on integrated public transport systems with improved minibus and bus services. (Schalekamp and Klopp 2018). While these efforts in the region are still emerging, they include but are not limited to some of the following initiatives.

Dakar is a notable example in terms replacing minibus fleets. Undertaken by the city’s transport authority, CETUD, and supported by the World Bank, the city’s minibus business was restructured through fleet financing. A recent World Bank report features the example as follows:

For operators to access financing for new vehicles, they had to form into economic interest groups; they were then allocated defined routes within the urban network on a preferential basis. Investment incentives were also provided in the form of generous scrappage allowances for withdrawn vehicles, and repayment holidays on the primary financing agreement to settle deposit financing issues. The key to the success of the program, though, was the coincidental introduction of a new ticketing system. This had the effect of transferring the true earning potential of each route from the driver to the owner who could thereby increase the owner’s net revenue to the level necessary to meet the required financing cost. (Kumar et al, 2021).

There are fewer examples of governments moving towards subsidizing operations of the paratransit sector, in exchange for more formalized arrangements in licensing, operations and labor standards; however, due to the economic impact of the global COVID-19 pandemic, some governments have offered subsidies to the paratransit sector. For example, Nigeria committed almost $200 million to compensate informal and small-scale public transport operators for lost revenues and has invested in higher-capacity, more fuel-efficient buses (HVT 2020). While Nigeria has made efforts to cushion those who rely on and are employed by public transport, one Nigerian research group points out that speed limit reductions and mass transit integration are also necessary to ensure sustainable outcomes (John 2020). Moreover, interviews in Nigeria suggest that drivers, especially women drivers who had to balance household and health-related tasks, were unable to apply due to the lengthy application process and requirement for formal operating licenses, which were often incomplete (Jennings 2020) Nevertheless, this is a sign that government may be able to earn cooperation from the minibus industry if they can provide some support to it.

Some cities are advancing in so-called hybrid systems that include BRT but actively work to integrate or incorporate paratransit and public bus services alongside BRT. This has mainly advanced in South Africa. For example, after the Johannesburg BRT launched 2009, after lower-than-expected ridership, the local authorities adopted a plan for an Integrated Public Transport Network (IPTN). The system is differentiated in terms of demand, right-of-way, frequency of stops, land-use and density, mode, and degree of investment required, and includes rail, single-articulated buses, conventional buses, double-decker buses and, importantly, minibus-taxis. (Jennings and Behrens 2017) Other steps are being explored in Cape Town to create a hybrid system of minibuses and BRT that may also include significant outreach to minibus operators and potential government support of the operators. For example, in Cape Town, an example includes three ranks where minibus-taxi associations offered unscheduled feeder/distributor services that mirrored trunk-feeder service integration envisaged in a hybrid network.
model, with a study finding that passengers are relatively satisfied with the ‘hybrid’ trunk-feeder service integration. These examples lend some early indication that more projects are needed to explore hybrid models of service.

Other cities are upgrading fleets to provide larger capacity buses with assigned routes through a set of contracted operators that the city has helped create. Kigali, Rwanda has introduced more formal public bus services through three companies that are under contract with the Rwanda Utilities Regulatory Authority. The companies, the largest of which is an association of former private minibus owners, have salaried employees, operate high-capacity buses, and offer fare payment through smart cards. (Mimano 2020) In addition, new bus shelters and terminals have been constructed. The changes have also allowed for labor improvements, with drivers offered salaried contracts, medical insurance, and standard working hours introduced, and are expected to bring about further changes in contracting with the bus operators that can allow service monitoring and improvement. (ITDP et al, 2020)

Other cities have had success in mapping public transport, including the minibus routes for which few data exist. The 2018 Africa Sustainable Development Report notes that data on the proportion of the population with access to public transportation in African cities are difficult to access, outdated or non-existent. (UNECA 2018) The World Bank estimates that 35% of the world’s largest cities and 92% of the largest low and middle-income cities do not have complete transportation maps. (Krambeck 2015) Missing data infrastructure is a barrier to implementing sustainable transport systems, including proper analysis and planning for upgrading and integrating multi-modal systems, building passenger information systems and instituting better network management and fleet operations. Around 15 African cities have mapped their public transit and minibus taxi networks and formatted their data into GTFS—the prevailing transit data format that allows for ease of sharing and use in navigation and planning applications. The maps can be used for routing apps, placed into Google or other online maps, and may also be used by cities to track licensing and route assignments in a digital format.

Meanwhile, there are a growing number of enterprises—including startups, entrepreneurs, companies and transit operators—using disruptive technology and innovative operations to address urban transportation problems. These technology-based, “new mobility” services range from shared mobility providers (e.g., SafeBoda), commuter experience improvements (e.g., trip planning apps, cashless fare payments), data-driven decision-making platforms (e.g., GoMetro), product innovations (e.g., electric vehicles) and asset financing schemes (Canales et al., 2017). For all these developments data is a critical infrastructure, especially in a context where paratransit remains a dominant player in a multimodal system that requires data-driven and people centred planning (Klopp and Cavoli, 2019).

Governance: improving institutions and regional coordination on transport. As African cities face rapid urbanization, there is a need for a designated division to manage mobility and organize the development of public transit systems. Organizing urban mobility systems is a complex issue as it depends on the local context but establishing a Public Transport Authority (PTA) to deliver sustainable and organized public transit is a promising opportunity. Despite its success in Western economies, African governments have been hesitant to grant institutional power to a PTA due to fears of financial instability and inefficiencies. (UITP, 2018)

CETUD was established in Dakar in during a time of crisis within the public transit sector. (UITP, 2018) The existing infrastructure was outdated, inefficient, dangerous, and did not serve the needs of the city’s growing population. With law N° 97-01 of 1997, the republic of Senegal established an executive council of urban transport of Dakar to organize and regulate the supply and demand of public transport, and to create a safe economic environment for healthy and stable competition. (Republic of Senegal, 1997) Before its establishment, no government authority felt responsible for urban transport issues, but now a single authority could plan new systems, initiate projects, and request funding. It is placed under the technical supervision of the Ministry of Land Transport and under the financial supervision of the Ministry of Economy and Finance.
For an effective PTA, the various levels of government must coordinate: the Central Government plays a role in the organization of transport according to laws and funding of infrastructure. The local city/metropolitan government has oversight over the PTA to ensure it delivers on the long-term goal of effective, integrated public transport that fits local needs. Finally, the PTA operates at “arm’s length” from the government, with the focus on regulatory issues such as timetables, routes, managing various operators, regulating performance standards, and ensuring that commuters are protected.

**Identification of an operational gap for the AfDB including areas that need scaling up**

Based on a partial review of the AfDB portfolio, a preponderance of AfDB’s transport projects in urban areas appear to support road building and upgrading. We do not have a sense of the percentage of total funding that this may represent, though given the cost of these investments it is likely that most funds are also applied to these projects.

Such projects appear to mostly comprise infrastructure and works such as junction improvements, road upgrading, or highway projects. For example, the Abidjan urban transport project includes the construction of 87.9 kilometres of urban expressways, a 1,400-metre-long bridge and 6 interchanges, as well as some other infrastructure and planning support. The total cost of the project is estimated at UA 610.94 million. The AfDB indicates that the project is intended to ensure vehicle flow of the increasing volume of traffic, and at least in part, is necessary due to the decline of public transport systems. The AfDB project portfolio also indicates that this infrastructure will reduce road accidents and greenhouse gases, though it is not explained how the construction of urban expressways accomplishes this, which is unlikely.

Another example of urban expressways within AfDB portfolio is the Namibia Transport Infrastructure Improvement Project, which supports the construction of a new road alignment, described as a freeway, between the capital city Windhoek and the Hosea Kutako International Airport, and conversion of the existing road to be used for local traffic. (It should be noted the freeway project is part of a loan package that also includes rail investments in the country.)

Other road projects within the AfDB are less focused on expressways and more on road connectivity and improving local access, such as Ghana’s Awoshie-Pokuase Road, a 15-km segment in northwest Accra that also included investments in schools, health centres, a market, and a lorry park.

AfDB has also made a few recent investments in public transport. This includes the Phase 2 corridor of the Dar es Salaam BRT system. According to AfDB, the project includes construction of 20.3 km of exclusive BRT lanes and Non-Motorised Transport (NMT) facilities in the city and will connect with the already completed Phase 1 of the BRT system, the first high-rated BRT corridor in East Africa. (AfDB 2021) AfDB has also financed numerous rail projects across Algeria, Morocco, and Tunisia to build, modernize, and improve rail access for passengers and freight. (AFDB, 2016)

In addition, another project in South Africa is aimed at supporting small and medium enterprises (SMEs) in the minibus/paratransit sector that may otherwise not be able to access financing. This includes an AfDB loan of US$10 million and an associated facility of ZAR 1.4 billion (about US$$97 million) to support the 90% of SA Taxi clients that do not qualify for the formal banking sector. With the funding, SMEs will acquire fuel efficient, environmentally friendly, quality vehicles (minibus taxis) to be used for mass transit across South Africa. The Project will catalyze funding for approximately 8,000 commuter transit vehicles, or nearly 7% of the current need in the country. (AfDB 2021)

There is also some evidence of how AfDB may be starting to smartly bundle more diverse needs such as active mobility and road safety into larger packages. For example, the Kampala City Roads Rehabilitation Project, which includes $276 million in financing for improvements to
22 junctions, 67 km of roads, 134 km of non-motorized traffic facilities, and the provision of street lighting and scheduled eco-bus services. (AfDB 2021)

Gap assessment along measures of sustainable transport

In 2015, AfDB joined a group of multi-lateral development banks in a joint commitment to ramp up action on sustainable transport. (World Bank 2015) While AfDB may have made progress in shifting its activities towards sustainable mobility since then, this brief assessment reveals some potential gaps and opportunities to establish AfDB’s support more firmly for sustainable mobility.

First, the tendency to fund urban highways may have negative climate, safety, and equity effects, despite having other economic benefits. The preponderance of investments in cities toward road infrastructure that benefits the movement of private vehicles may have wider implications that do not benefit society.

Second, there are investments form AfDB in public transport, and some evidence of innovative approaches such as funding fleet upgrades in the paratransit sector. However, these appear to outliers in a largely vehicle-infrastructure focused portfolio. AfDB may consider how it can increase its investments into public transport, as well as appropriately considering the role paratransit plays in African cities.

Third, the needs of Africa’s most dominant mode of transport, walking, is largely not present within the AfDB portfolio, despite some potential to bundle the upgrading of city streets to contain footpaths and improve road safety, as well as install dedicated infrastructure for bicycling. The example from Kampala is encouraging, as it appears not to create new urban expressways that burden the transport system with the induced demand of private vehicles and long-term maintenance issues. Instead, it seeks to invest in the upgrading and maintenance of what is an already strained system to fix some fundamental issues to mobility: adding footpaths (and hopefully shying away from pedestrian footbridges), infrastructure for bicycling, safer and more organized junctions, and the like.

Fourth, the world is expected to electrify its vehicle fleets in the coming decades. Africa is not excepted from this trend, with opportunities to electrify two and three-wheelers, public transport, including minibuses, and private vehicles. Furthermore, with electrification of private vehicles in high-income countries, there are needs to ensure that the importation of second-hand vehicles does not exacerbate the growth of transport emissions and poor air quality in Africa. AfDB may consider further efforts in these areas either through infrastructure or planning services.
SECTION 3
AMPLIFICATION OF INITIATIVES TO FUND EITHER THROUGH GRANTS OR LOANS THAT WILL IMPROVE THE MOBILITY AND TRANSPORTATION SERVICES AVAILABLE TO URBAN RESIDENTS

In this section we provide some key directions for AfDB in urban transport. This is based on the previously described sections and includes: 1) a theory of change; 2) definition of a clear strategic direction and recommendation for programmatic guidance.

Development of a city level theory of change that responds to the transport and mobility challenge and that underpins a city mobility and transportation strategy

This SUDAP includes a city level theory change to the transport and mobility challenge than may underpin AfDB’s urban mobility and transport strategy. This theory of change in urban mobility includes an overall impact to:

1. provide residents equal access to opportunities such as jobs, education, and services;
2. ensure the transport system is without fatal or severe injuries and secure; and
3. limit the amount of greenhouse gas emissions and air pollutants emitted from transport; and
4. create resilience in the urban transport system from disasters and weather events such as flooding and increasing temperatures.

As such the strategy is focused on the most equal, safer, low carbon modes of transport, and seeks to create outcomes of cities built around high-quality public transport and safe networks of bicycling and walking. The vehicle traffic that does exist is eventually electrified and is meant to provide key economic needs around the delivery of goods and mobility for those who must use private cars. Cities will need to create new rapid transit lines through BRT or other rapid transit, work with the existing paratransit sector and its operators to improve services and create private-public partnerships for public transport operations, implement measures that prioritize walking and cycling on city streets, and provide more local streets that can increase network connectivity.

Outputs can further include establishing internal metrics for AfDB that measure projects based on how well they perform around metrics on equal access to opportunities for residents, carbon emissions, air pollution, road safety, and gender inclusion. Meanwhile, activities will also require a proper set of plans and strategies to foster road safety, walking and bicycling, public transport, as well as vehicle electrification. Policy guidance will be necessary on urban freight.
Definition of a clear strategic direction and programmatic guidance in support of building a more efficient and effective transportation system nuanced across city size and the regions

We provide xx key strategic areas for AfDB in urban transport that may improve access to opportunities, ensure the transport system is safe and secure, and limit greenhouse gas emissions and air pollutants. Programs in these areas may include financing infrastructure, direct funding for strategic plans or other technical support, and other bank support options.

1. Avoid the financing of urban highways that will create unnecessary growth of vehicle travel. While certain urban road projects may be important to increase access of goods to markets, such as connecting ports, some roads, particularly urban highways and elevated flyovers in dense areas, can pose significant problems to road safety, public transport, and air quality. The AfDB should fully review its portfolio of urban road projects to create a policy that ensures road safety, access to jobs for residents, and improved urban growth patterns. Ultimately, this may also mean shifting investments from urban highways to key mobility needs in public transport, pedestrian and cycling infrastructure, road safety, and expanding road network through increased street connectivity. Highways should be measured on the key metrics we present on access, safety, carbon emissions, as compared with alternatives in public transport or other alternatives for road investments.

Divesting from urban highways will require better urban planning in concert with transport planning. As described in other areas of the SUDAP, urban growth should not be set by the investment into where expressways are located. An integrated approach to urban development is needed.

2. Undertake more robust action on public transport, working together with paratransit operators. Public transport can provide the most equal access to opportunities across a city. Rapid transit systems such as BRT are ways that cities can introduce high quality public transport, as are LRT and MRT given financial and planning capacity. The Dar es Salaam BRT is one example where AfDB has invested in this space. Exploring more investment in BRT, as well as other forms of rapid transit where appropriate, should be a priority in the region. Any such projects, however, should also consider the integration and inclusion of incumbent paratransit operators and their livelihoods.

Furthermore, AfDB can work more broadly on a set of issues that include the paratransit sector, particularly in non-punitive measures and fleets that work with operators to improve services. Given the history of distrust between informal/semi-formal operators and regulatory authorities, policy strategies that seek to control or eliminate the sector are unlikely to be widely adopted. Emerging data, technology, and models for operator engagements present new tools to strengthen non-punitive strategic planning, optimise paratransit operations, and improve service quality and multimodal integration.

There seems some initial work in this space with the AfDB’s financing in South Africa of minibus fleets with SMEs. Other development banks in the region such as World Bank and AFD are exploring how to address paratransit more pragmatically, and AfDB can join with these entities on potential areas of collaboration.

3. Increase investment into walking and cycling to address fundamental mobility needs for Africa’s most common mode of transport. The African region needs more investment in cities to recognize its most common form of transport. There may be no other kind of investment that could improve mobility for many, if not most, urban residents by investing in pedestrian infrastructure. Installing footpaths on one street or a bicycle lane on another street may not be “bankable” projects, nor would they reach many people due to their scope. Yet active mobility can be funded in creative ways. One way is to bundle comprehensive upgrades of streets into one package, investing in a network of walking and bicycling facilities, as AfDB is doing at least to some extent in Kampala. Another way to address active mobility is to include it in
other large infrastructure projects, such as BRT. Investments in smaller and medium sized cities may also be the best way to improve mobility, while in larger cities such improvements may be done in tandem with broader sustainable mobility policies, such as rapid transport.

4. Explore opportunities for vehicle electrification in the African context and prepare for Africa’s role in global electrification. Currently the biggest opportunity for vehicle electrification in Africa is likely with motorized two and three wheelers, particularly motorcycle taxis. Ampersand, a Rwandan startup that claims to be the continent’s first electric motorbike company, provides affordable electric vehicles and battery swap stations for 5 million motorcycle taxi drivers. (Ampersand, 2020) Using solar energy reduces emissions by 75 percent, and fuel savings mean that taxi drivers can take home two to four times as much earnings at the end of the day ($4.40 compared to $1.60) UNEP has also launched the first public and private sector electric motorcycles pilots in Kenya. The pilot projects monitor and inform electric motorbike operation to better inform policymakers on sustainable mobility. (UNEP, 2021)

With international support, African cities may be able to successfully leapfrog public transit to electric vehicles. Considering that most cities have low private vehicle ownership and, in many cases, a high percentage of commuters walking to their jobs, there is a unique opportunity to build reliable and regulated public transit that lays the groundwork for electric vehicles for the long-term. However, it will also be critical to regulate private motorization and the import of used vehicles. Currently, at least 85% of Africa’s vehicle fleet are used vehicles. (Ayot et al., 2021) Individual countries that have published their regulations include South Africa, Egypt, Morocco, Ghana, Kenya, Nigeria, and Algeria, while some are regulating at the regional levels. In February 2020 all 15 countries of the Economic Community of West African States (ECOWAS) agreed tentatively to specific regulations to promote cleaner fuels and cleaner vehicles in the region. Although the widespread import of electric vehicles is unlikely in the near future, a well-structured vehicle testing regime is recommended to keeping used vehicles safe no matter the condition under which they were imported.

5. Integrate urban freight consideration into projects and determine unique issues to African context. There are many opportunities to explore more efficient systems that improve road safety, reduce emissions and increase access of goods to people and businesses. We suggest that AfDB explore the correct urban freight interventions for the African context. Addressing urban freight can be done through a more systemic way, including shifting goods movement to rail or allow creative delivery, such as nighttime hours, that could manage traffic demand. Freight should be organized in the city to reduce the need for large peak-hour urban highways that have other negative impacts. In addition, there are ways to reduce congestion on city streets, such as the nighttime deliver mentioned above. Cities may also want to explore the vehicle safety standards for delivery vehicles such as large trucks. Given the presence of large central and periphery markets in African cities, there may be more study into how to move goods more efficiently and safely from these locations. Specific attention may also be given to ports – sea ports, airports, and trucking centers – and the traffic management around such busy areas.

6. Increase investment to improve traffic management in urban areas. Cities in Africa have lack of traffic signals, challenging peak hour congestion, and a dearth of pedestrian and cycling safety. Traffic management is one way to address multiple issues around travel time delay, road safety, and control of motor vehicles using city streets. Traffic management is very important to all aspects of the mobility and transport in urban areas. AfDB should review how it may include traffic management planning and systems within new loans or credits with cities, and can also couple such activities into other projects, such as BRT or road improvement projects. Improving traffic management can include but is not limited to introducing traffic management plans, implementation of traffic signals at key intersections, developing road safety plans that follow a safe system approach and set safe speed limits citywide, and providing signal priority for public transport.
CONCLUSION

Africa’s cities, as shown throughout the SUDAP, are facing several challenges in which transport is just one of many important issues. City leaders are faced with addressing and prioritizing challenges with a limited set of resources and capacity. Yet investments are being made into transport that may need retooling to address the issues of our day around climate, health, and equity. Often investments in transport in Africa may be focusing on the intercity roads that are key to getting goods and people to markets and opportunity centers, yet this may also bridge into the city where concentrating investments on highways results in unequal, unsafe, and polluting transport systems. AfDB, however, can build on its experience in areas such as public transport, walking, cycling, road safety, and paratransit using the theory of change and strategic directions outlined in this section to set African cities on a sustainable path in transport.

Sponsored by the African Development Bank, the Senegal’s first regional express train has been inaugurated in 2021, connecting Dakar to Diamniadio. The thirteen stations that have been built along the line connect Dakar’s suburbs and provide fast, secure, reliable, and affordable means of transport.
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