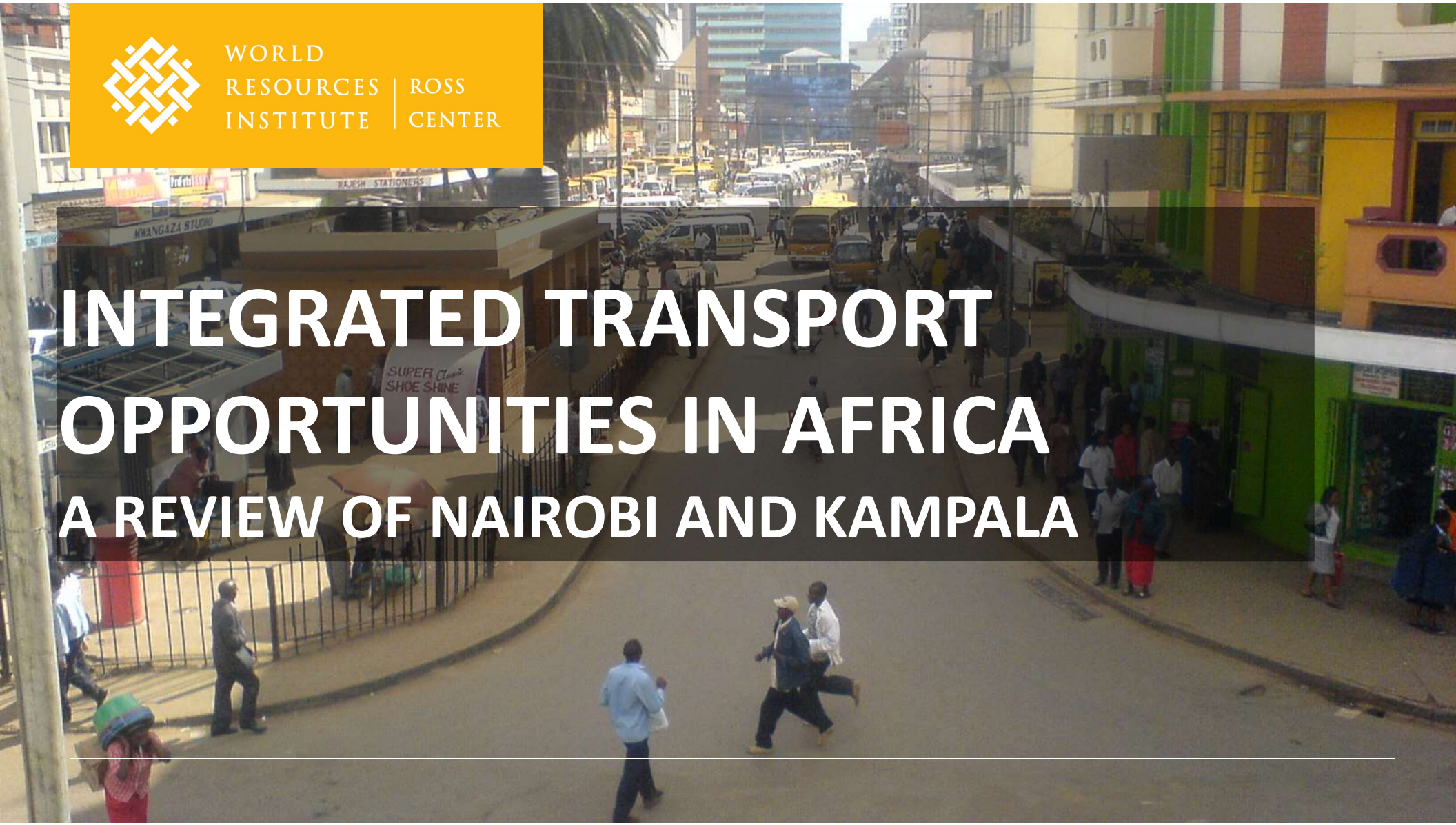

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INTEGRATED TRANSPORT OPPORTUNITIES IN AFRICA

A REVIEW OF NAIROBI AND KAMPALA

SUMMARY

African cities face many urban mobility challenges

- Africa has the highest rate of road fatalities in the world.
- Public transport is largely limited to minibus taxi systems
    - Serve population well
    - Not part of transport planning considerations
- Walking is dominant form of transport
    - Not reflected in walkability.
- Motorization is low but growing and congesting cities.

Mobility enterprises, data and innovation are changing the mobility landscape in African cities.

- 120 operational mobility companies in Nairobi and Kampala
- The most popular (57%) are shared-mobility companies.
    - Includes motorcycle ride-hailing apps and services like SafeBoda and Dial Jack and Tugende.
- Mobile technology allows for digital mapping of public transport
    - Allows transit users to plan route in GoogleMaps
    - Provides necessary data for mobility planners
    - Initiatives to provide cashless payment on paratransit, though some have clearly failed.

Wikimedia

SUMMARY

Mobility innovations have the potential to improve low-income access to opportunities

- Resident access to the city through the city's matatu network is quite extensive
- Matatus provide less access than private cars, they are far better than walking.
- Areas for improvements, particularly in how residents may connect to the network.
    - Could motorcycle ride-hail apps help connect residents to public transport?
    - How can pedestrian and bicycle infrastructure be improved around public transport transfer hubs to provide a seamless, integrated transport experience?

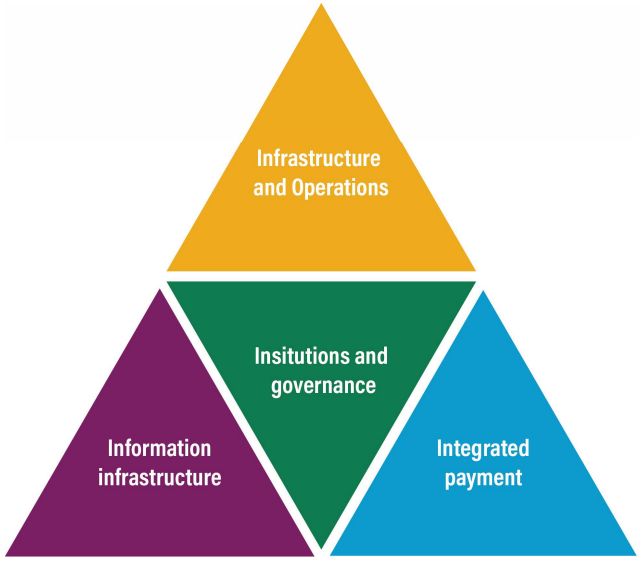
Could enterprises and public sector together create a new form of integration to increase access?

- There can be a role for entrepreneurs and startups, as well as existing operators, in improving access.
- Cities will need to create a sound governance ecosystem that allows such innovation to occur and that supports sustainable mobility. While this is an emerging area, as with most innovation-driven change.

SUMMARY

4 key considerations for integrating transport systems and improving transit services

- **Infrastructure and operational integration** – Different transport services must be in proximity to each other to enable commuters to safely and efficiently transfer. This requires physical and operational integration.
- **Information integration** – Commuter decision making is significantly improved when information about routes, schedules, transfers, vehicle real time location, and estimated time of arrivals (ETA) is integrated across transport services and is available for consumption via a single interface.
- **Integrated payments** – Cash has long been a common currency accepted across all modes of transport. With the shift to digital payment systems by mass transit services, there is a need for integrated payment solutions that allows seamless payment regardless of the service provider.
- **Institutions and governance**—coordinated governance is an enabling condition for cross-sector collaboration and regulation



IN THIS PRESENTATION

1. **General overview of urban mobility in sub-Saharan African cities**

2. **Current conditions in Nairobi and Kampala**
   - Getting around
   - Social and environmental costs
   - Data availability
3. **Mapping needs of low-income transport users in Nairobi**
   - Sustainable Development Goals (SDGs)
   - Access and Income
   - Improving low-cost transportation modes
4. **Private sector-led initiatives for public transport in Nairobi and Kampala**
   - Tracking emerging markets
   - Market readiness
   - Shared mobility
   - Product innovation
   - Commuter experience
   - Data-driven decision making

5. **Public sector transport strategies, policies, and investments**
    - Government organization
    - Regulatory strategies and policies
        - Toward vehicle operations
        - Toward new mobility trends
    - Infrastructure investments

6. **Concepts, challenges, and opportunities for Integrated Transport**
    - Key reflections
    - Rank suitability of different transport solutions with respect to investment required, affordability, level of service, impact, cost-efficiency etc.
    - Make recommendations on which solutions to prioritize in both cities.
    - Identify enabling conditions that would support the implementation and adoption of these solutions and the roles played by private and public sector.
    - Comment on the ways in which publicly and privately provided transport services can integrate, enhancing both sets of services.

ABOUT THIS PRESENTATION

This presentation is intended to initialize future transit-related pilots to be launched in East Africa. Findings presented in this presentation are not intended to be authoritative, but rather prompt discussion on potential public and private sector transit improvements in SSA.

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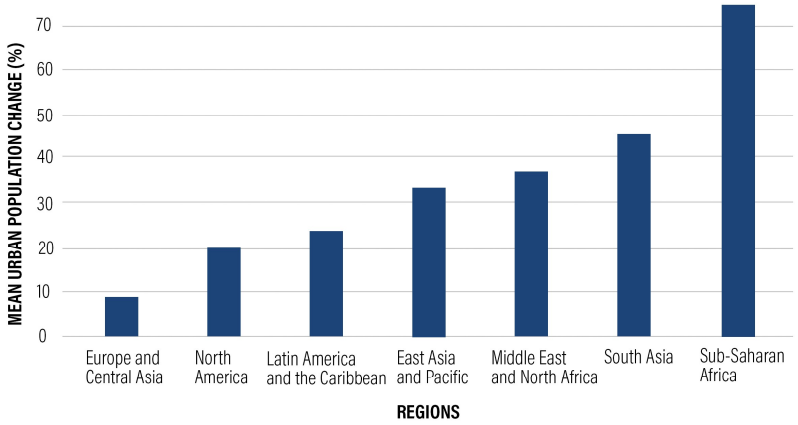
GENERAL OVERVIEW OF URBAN MOBILITY IN SUB-SAHARAN AFRICAN CITIES

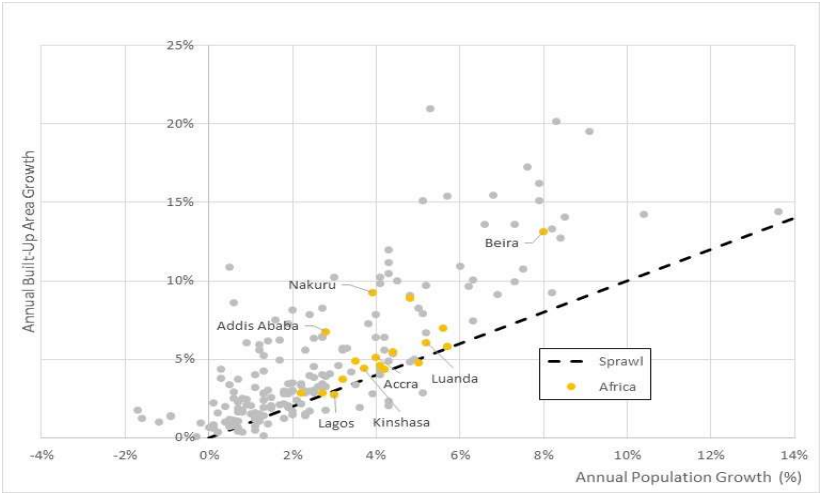
AFRICA EMERGING

African cities are growing fast, with sub-Saharan Africa showing the highest percentage growth in urban populations.

- 90 percent of urban growth between now and 2050 will be concentrated in African and Asian cities [1].
- African cities more sprawling in nature, with growing populations spread out in disconnected places[2].
- How people move in these cities is a growing challenge to provide sustainable economic development and quality of life to urban residents.



NOTE: 1,692 Urban Agglomerations: ECA (302), NAM (151), LAC(206), EAP(546), MENA (130), SA(207), SSA (150)
Source: Oxford Economics, 2016; United Nations, 2014; World Bank country classifications



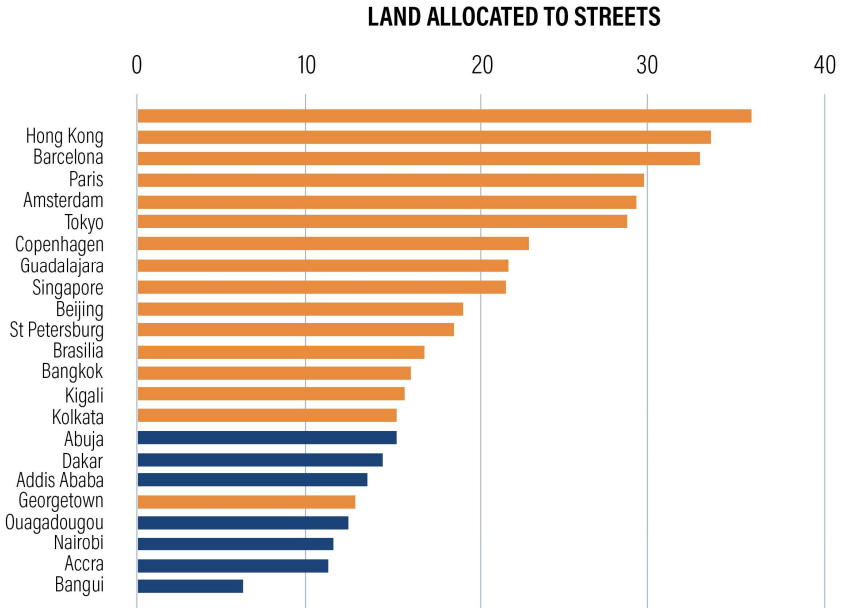
Source chart: World Bank

CHALLENGES IN MOBILITY

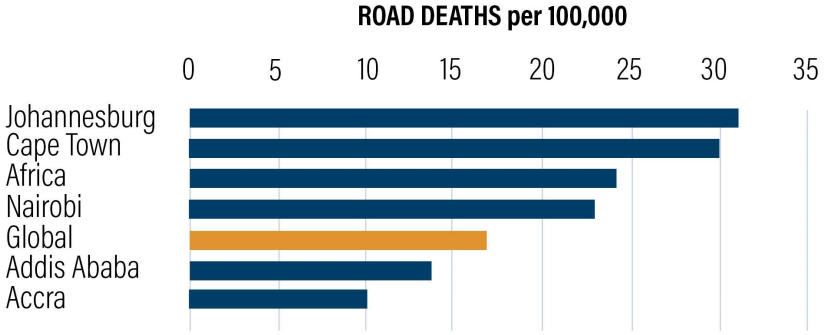
African cities face a number of challenges in urban mobility, such as a low allocation of land devoted to streets, meaning connectivity is limited, traffic concentrated on a select number of clogged roads and walking routes are often indirect and poorly provided for.

- Region hosts the worst performance in terms of road fatalities [3].
- Average of 23 road death per 100,00 thousand residents
    - 43% higher than global average
    - 850% higher than North American cities like Washington, D.C.

- Addressing these mobility challenges will not only improve access and economic opportunity across the continent, but save countless lives.
- Doing so requires a closer look at Africa's most predominant form of public transport, privately-owned minibus taxis or paratransit.



Source: UN Habitat 2016



Source: Cities Safer by Design and Vanderschuren (2017)

OTHER FORMS OF PUBLIC TRANSPORT—PUBLIC MASS-TRANSIT

In Africa, more conventional forms of public mass-transit, like Bus Rapid Transit (BRT), are becoming increasingly popular among city officials.

- BRT is a high-capacity, bus-based transit system that delivers similar service to metro-rail but at a far lower price point.
    - BRT requires dedicated, right-of-way bus-lanes and stops for express services[5].

- Kampala, Nairobi, Addis Ababa, Lagos, Dar es Salaam, Accra and a number of cities in South Africa are either piloting or currently operating BRT or BRT-lite schemes.

MyCiti is a BRT service in Cape Town that has been operating since 2010.

Photo: https://www.galetti.co.za/blog/2013/10/new-myciti-routes-dated/

ADVANCING ‘NEW MOBILITY’ TECHNOLOGY

The increasing availability of smartphones and internet access means innovations in urban mobility technology are beginning to take root.

PUBLIC TRANSPORT IN AFRICA OVERVIEW

- Paratransit provides a much-needed mobility service for urban residents at virtually no cost to the city.

- Paratransit also brings a host of challenges to African cities.

- Addressing these challenges requires planners and entrepreneurs to seek solutions that complement and improve the quality of transport services for those that depend on them, especially low-income residents.

- It is increasingly crucial to look towards integrated transport solutions that address the realities and practical transport needs of city residents—combining positive aspects of existing transport modes with the potential that future improvements hold.

- Learn more from CityFix Learn's Learning Guide, "Toward Efficient Informal Urban Transit"

SOURCES

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2. https://wriorg.s3.amazonaws.com/s3fs-public/upward-outward-growth.pdf
3. https://wri.org/sites/default/files/CitiesSaferByDesign_final.pdf
4. http://www.vref.se/download/18.162aeb5015e73a8dc15e5e92/1506333871611/Investing+in+Paratransit+-+Jennings&Behrens+-+August+2017.pdf
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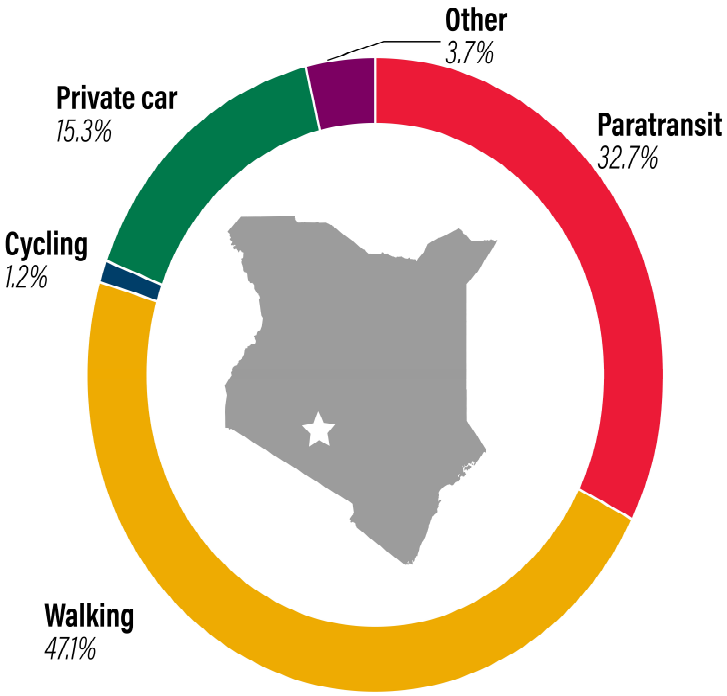
CURRENT TRANSPORT CONDITIONS IN NAIROBI AND KAMPALA

Nairobi, Kenya

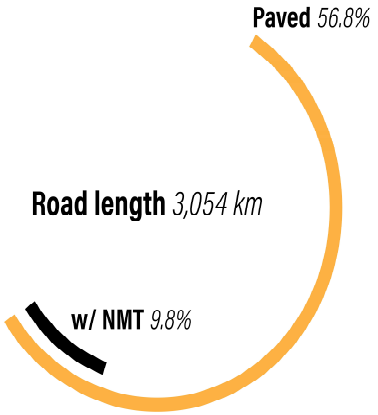
Transport Mode Share



Demographics

Population	3.1 million
Area	695 km²
Annual growth rate	4.17%
Trips per day	7.8 million
Travel Demand (2030)	6.0 million

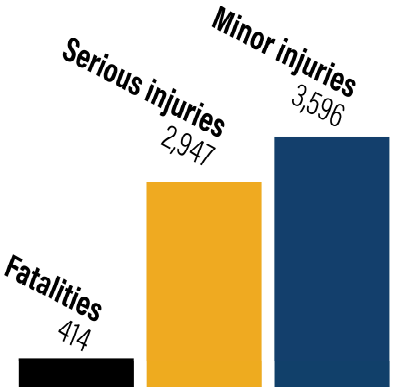
Road infrastructure



Road safety*

Avg. speed (peak hrs)	30 km/hr
Avg. speed (non-peak hrs)	40 km/hr

*Values for 2017



Paratransit & Governance

Ministry of Transport and Infrastructure is the regulatory authority responsible for road, air, and water transport in Kenya. The Ministry issues licenses to matatu owners once they are part of SACCOs.

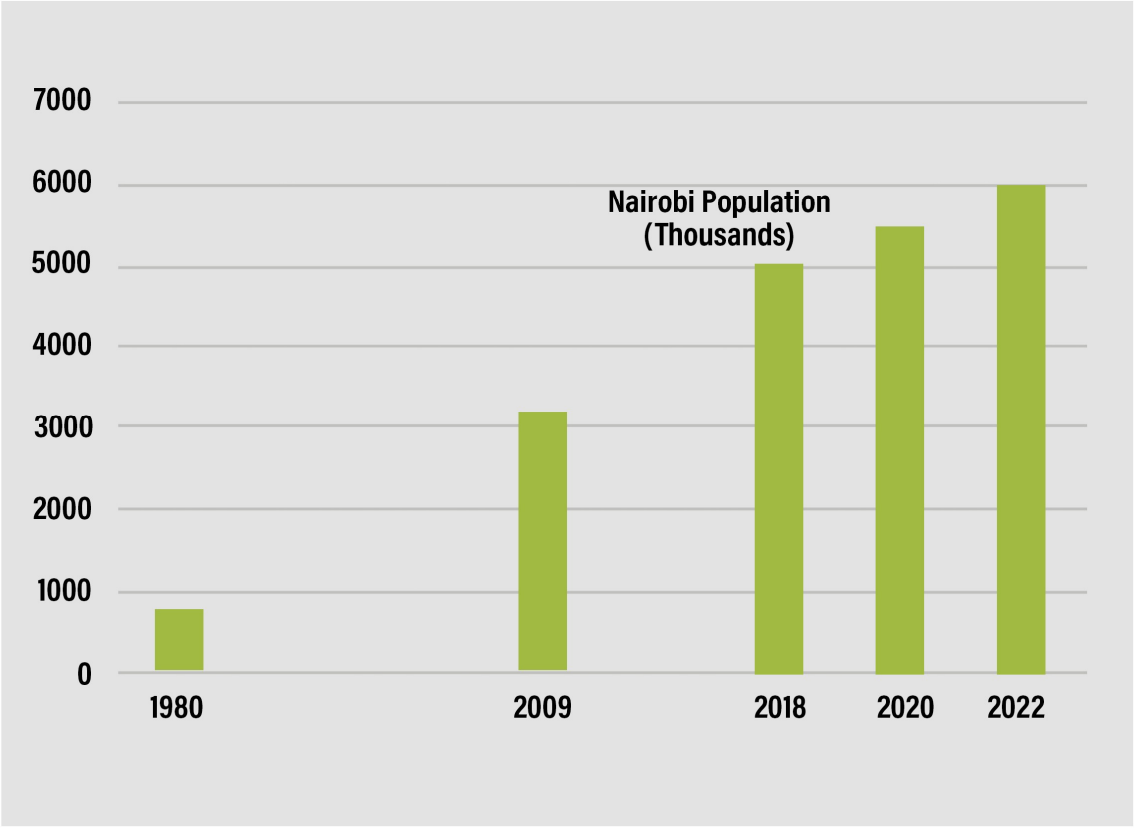
New Urban Mobility

Ride-hailing apps (e.g., Uber, Taxify, Little cabs) operate in Nairobi. Mainly used by middle- and high-income earners.

Source: WRI-conducted mobility survey

Shared mobility companies are among the most popular technology-based, mobility start-ups.

A GROWING CITY

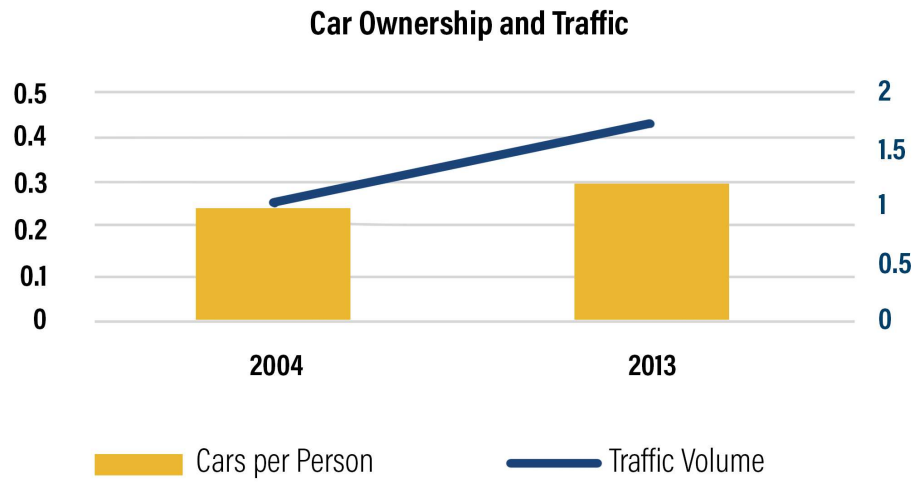


Nairobi is a growing city of nearly 5 million people and expected to grow to 6 million or more by 2022.

The city represents around half of the total GDP for Kenya, and is a regional center for business, international organizations and a growing tech sector.

Source: WRI mobility profile for Nairobi by University of Nairobi

GETTING AROUND NAIROBI—MOTORIZED VEHICLES

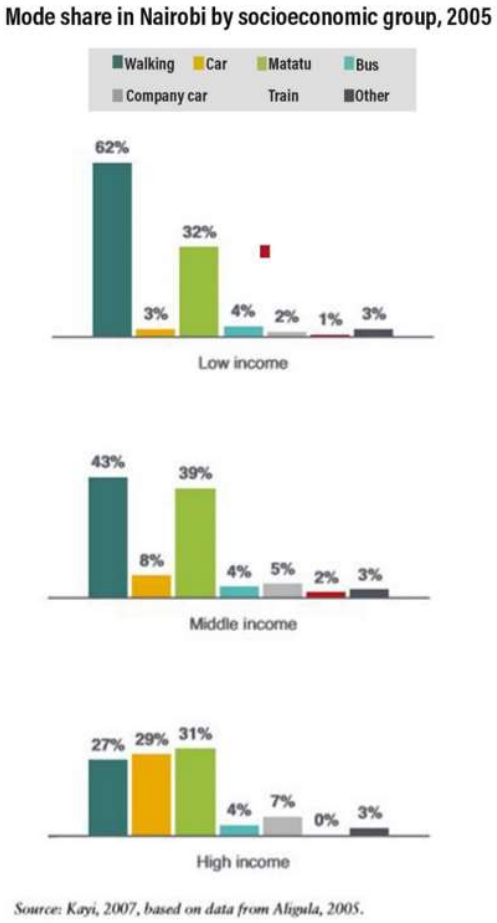


Walking and minibus taxis, or *Matatus*, comprise the large majority of trips in Nairobi.

- The city is known for its notorious traffic, though private cars account for only around 15 percent of trips, due to poor street connectivity and density. However, because of a lack of choices, those who can afford to use private cars are doing so more and more. And a growing number of trips take place via motorcycle, or motorcycle taxi.

NUTRANS 2005: Nairobi Urban Transport, 2005, The World Bank, WRI Road safety Survey

GETTING AROUND NAIROBI—WALKING IS DOMINANT

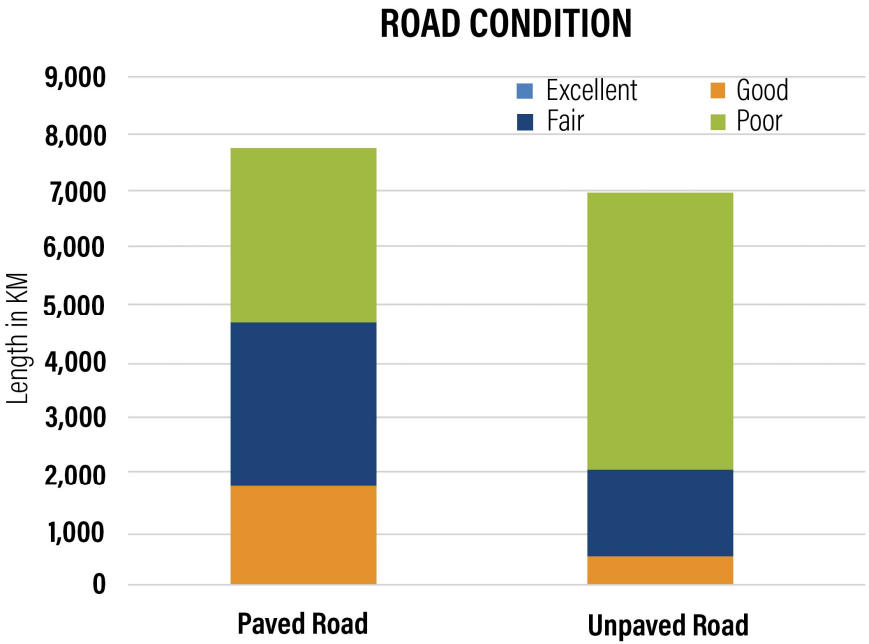


Among low-income residents, walking is the dominant mode, along with matatus.

- Middle income residents tend to walk and use matatus equally and higher income groups, able to buy cars, using them over public transport [1]

As presented in https://www.odi.org/features/securing-safe-roads/road-safety-nairobi

GETTING AROUND NAIROBI—ROAD CONDITIONS



- **53% (7,730km) of city roads are paved;**
- **55% of roads are in poor condition;**
- **Thika Superhighway opened in 2012 - *already congested*.**

Source: Kenya Roads Board, 2009.

SOCIAL COSTS—COST OF TRAVEL

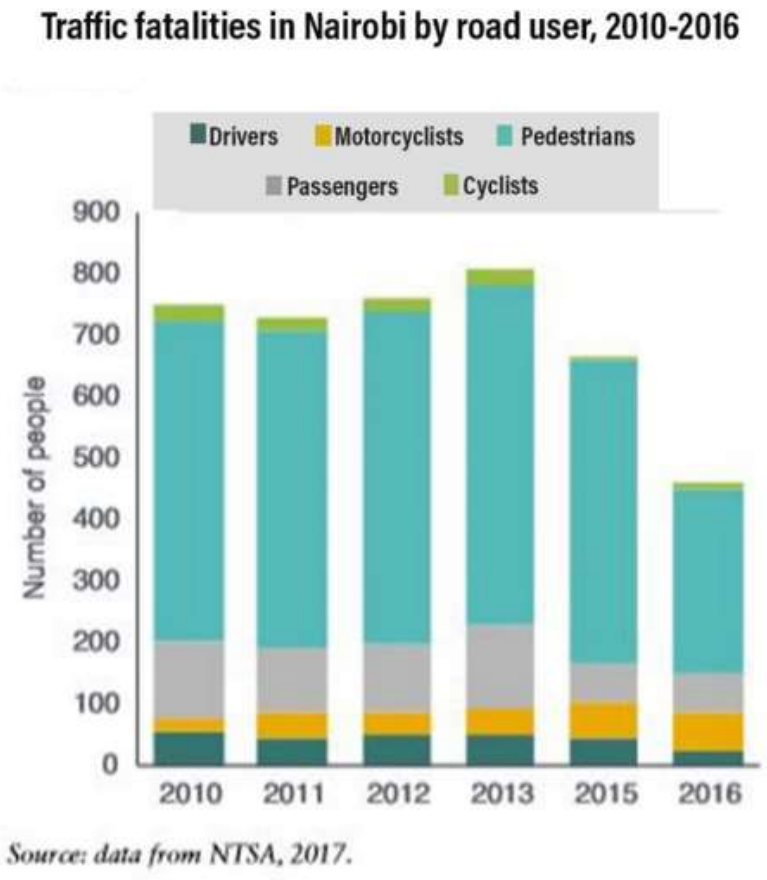
Mode	KES per 30km
Commuter Train	50
Matatu	60-100
Moto (fuel)	150
Private Car (fuel)	500-700
Moto-taxi	750-1000
Ride-hail (Uber, etc)	1,500-2,000
Taxi	2,500-3,000

1 KES = 0.0099 USD October 2018

Many residents walk for commuting in Nairobi because the cost is low.
While the train is cheap, the service is limited. This means that the least expensive and ubiquitous way to travel through motorized transport is via matatus, which explains why so many residents use this mode of transport. However, these trips are often out of reach for many, as a 60 shilling trip equates to around $0.50 USD.

Source: Analysis supported by WRI

SOCIAL COSTS—TRAFFIC FATALITIES AND SERIOUS INJURIES

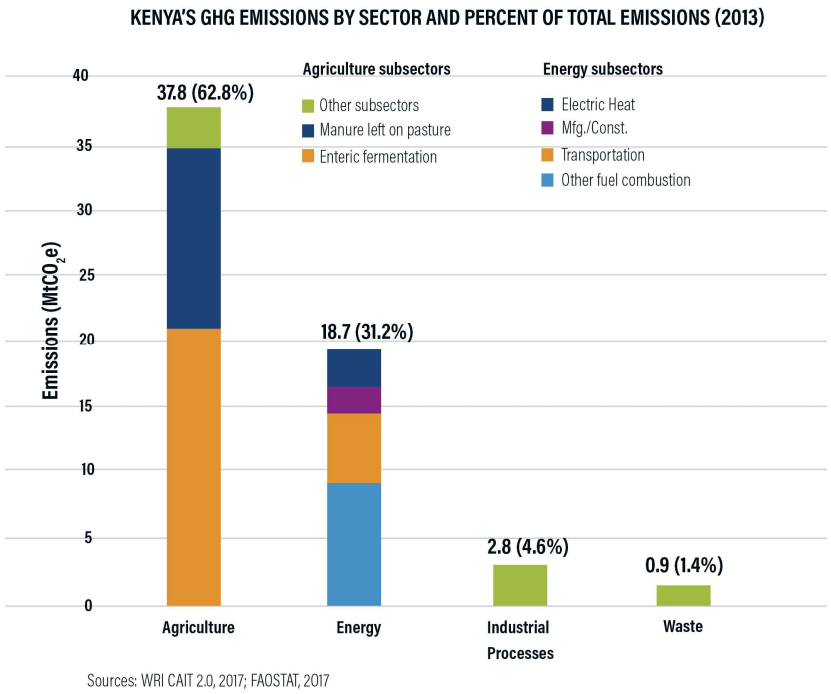


Current reporting of road traffic fatalities shows that over the three years from 2013 – 2016 there were an average of 500-600 road fatalities per year.

- This amounts to a reported rate of approximately 15 fatalities per 100,000 residents. Kenya, on the national level, according to WHO has a rate of 34 fatalities per 100,000 residents [1]. A large percentage of fatalities are pedestrians, with motorcycle rider deaths growing since 2010.

Source: NTSA Compiled Statistics

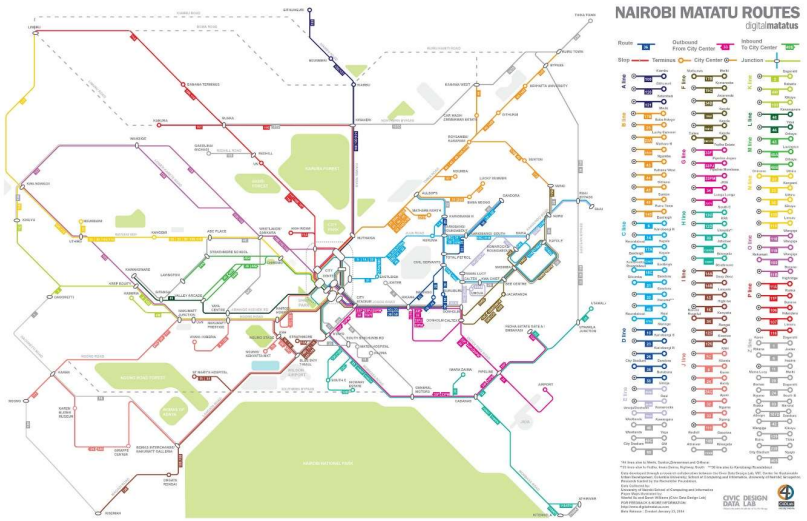
SOCIAL COSTS—CLIMATE CHANGE



Sources: WRI CAIT 2.0, 2017; FAOSTAT, 2017

- While data isn't available on the city level on GHG emissions, in Kenya as a whole, the energy sector comprises over 31 percent of emissions with transport taking around 10 percent.
- With half of the country's economic output and the center of motorization, Nairobi transport likely provides a major contribution to the transport emissions contributing to climate change.

DATA AVAILABILITY—DIGITAL MATATUS



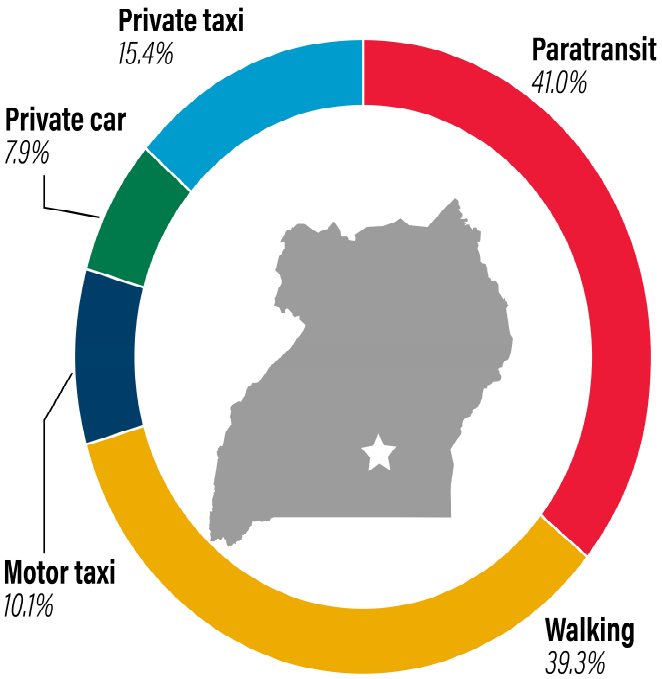
Data infrastructure is an important enabling condition for transportation planning projects.

- In 2013, Digital Matatus, a team of researchers and students from MIT, Columbia University, and University of Nairobi, set out to create a map of Nairobi's matatu minibus network [2]. Digital Matatus cleaned and formatted the data to meet General Transit Feed Specification (GTFS), a data format originally developed by Google in 2006 and has since become the standard for recording and formatting complex transit data.

- Digital Matatus made their data easy-to-use and open-source, allowing anyone to create maps, do analyses, or develop navigation and transit modeling applications.

Kampala, Uganda

Transport Mode Share

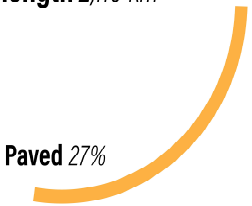


Demographics

Population	1.6 million
Area	970 km^2
Annual growth rate	4%
Trips per day	1 million
Travel Demand	-

Road infrastructure

Road length *2,110 km*

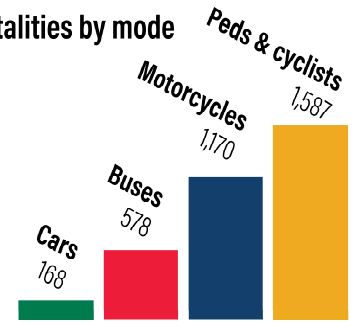


Road safety*

Avg. speed (peak hrs)	14 km/hr
Avg. speed (non-peak hrs)	30-50 km/hr

**Nation-wide values for 2016*

Fatalities by mode



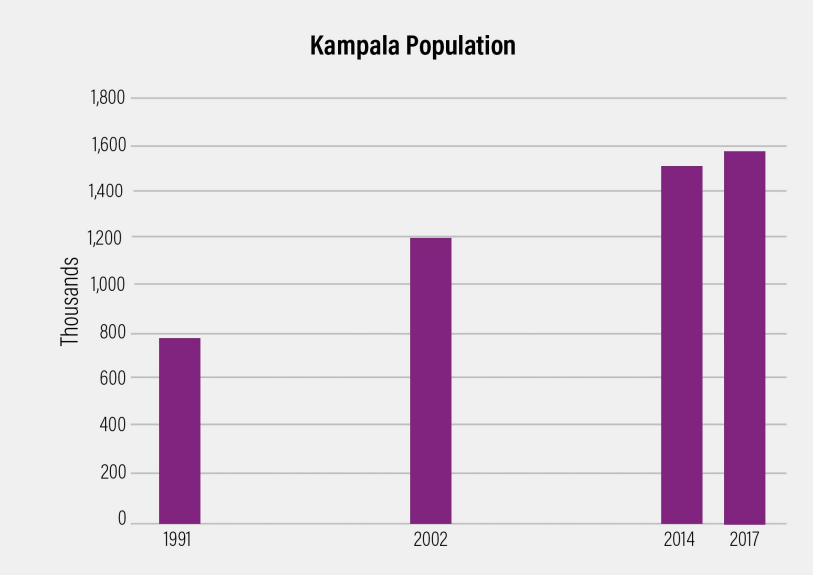
Paratransit & Governance

Ministry of Works and Transport (MoWT) and *Kampala Capital City Authority (KCCA)* are primary regulatory bodies for road infrastructure. Paratransit routes are regulated by private transport authorities. Kampala is also looking at becoming the fifth city in Africa to implement a BRT system. MoWT and

New Urban Mobility

There are number of app-base ride-hailing services operating in Kampala, encompassing both motorcycles and cars. These enterprises include Uber, Safeboda, Quick Taxi, Taxify, Friendship Taxi, Spesho, Spe Cabs and Transport.Me. Kampala has approved tax regulations on mobile money transaction apps, which may serve as an obstacle for the proliferation of integrated,

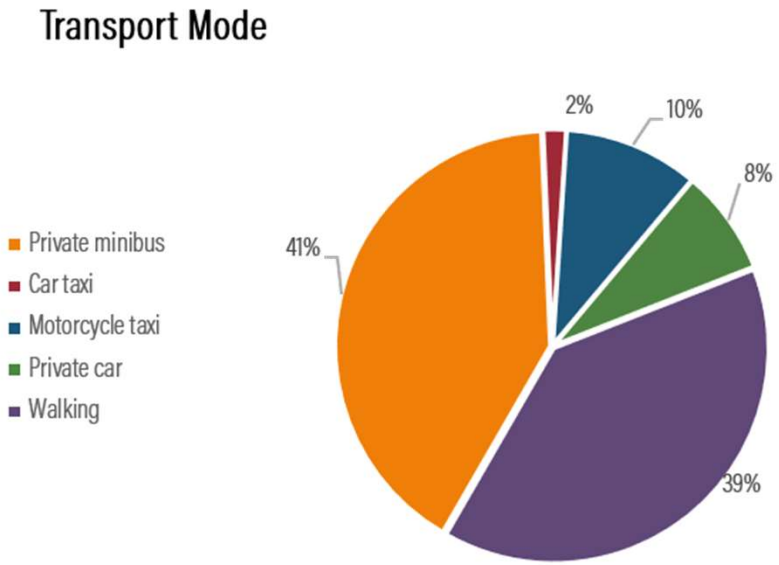
GETTING AROUND KAMPALA—A GROWING CITY



Kampala, Uganda's largest city and capital, like other African cities is growing at a steady and fast pace.

- Since 1991, the population has increased from around 800,000 people to over 1.6 million, expected to reach over 3 million by 2050. The increase in population and urban expansion has put a strain on mobility in the city.

GETTING AROUND KAMPALA—WALKING IS DOMINANT, BUT BODA-BODA U IS HIGH



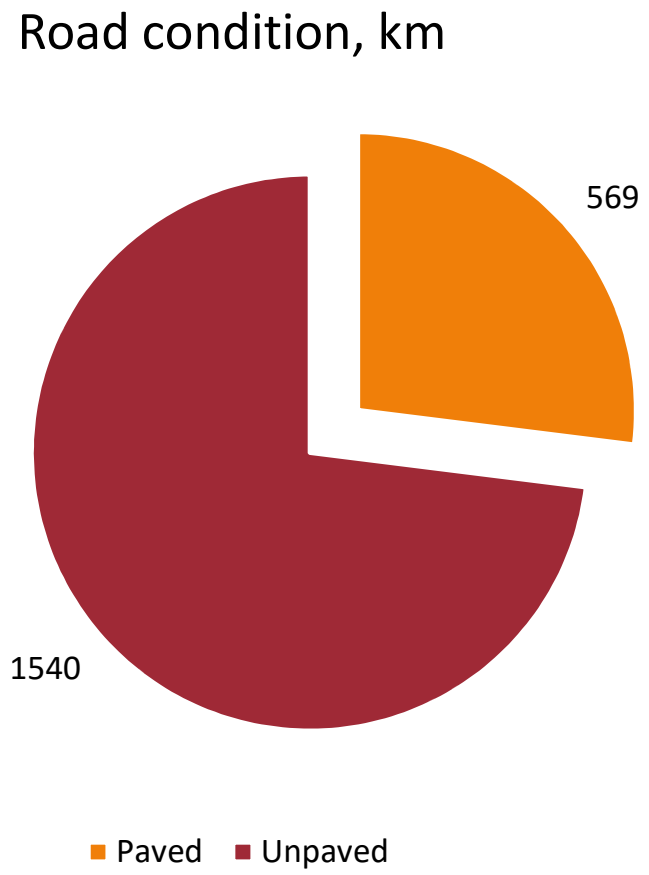
Like its peers in sub-Saharan Africa, most residents move around by two modes – walking and paratransit.

- Kampala, however, is one of a few African cities with a higher rate of motorcycle taxis, or *boda bodas*, that constitute around 10 percent of trips.

Iganga Foundation. 2014. Smart Moving Kampala: Design of NMT-zone in Namirembe Road and Luwum Street.

GETTING AROUND KAMPALA—ROAD CONDITIONS

Almost 75% of roads in Kampala are unpaved



Source: MoWT. 2017. Works and Transport Development Plan 2015/16 – 2019/20. Ministry of Works and Transport, Entebbe Uganda.

SOCIAL COSTS—COST OF TRAVEL

Estimated Cost of Travel in Kampala (UGX)

Mode	Distance		
	>3km	*>12km*	*>30km*
Matatu	750	1,365	3,100
Bus*	1,000	1,000	
Moto-taxi	3,300	7,675	
Uber**	4,100	9,725	21,350
Taxi	8,375	25,650	55,375

$1 USD = 1,610 UGX (December 2018)

Adapted from Table 1 of *Kamuhanda, R., & Schmidt, O. (2009). Matatu: a case study of the core segment of the public transport market of Kampala, Uganda. Transport Reviews, 29(1), 129-142.* Estimated to 2018 costs using the Uganda Transport Consumer Price Index from https://tradingeconomics.com/uganda/cpi-transportation and rounded to the nearest quarter.

*Refers to the flat price of the Pioneer fixed route bus system

**Estimate based on published Uber rates

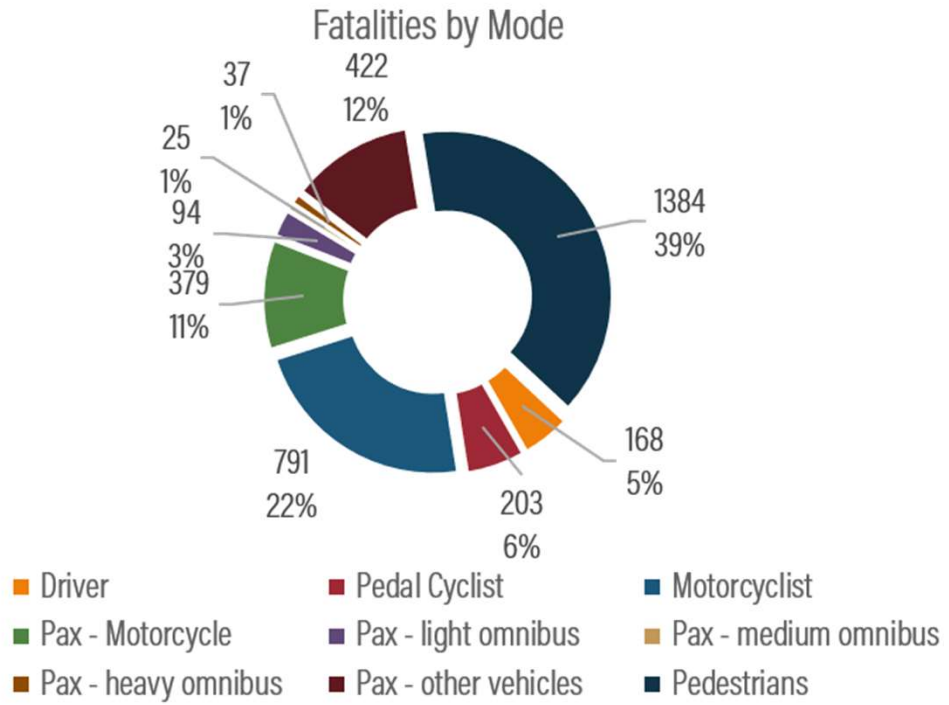
- In Kampala, transport commuter costs are high compared to income.
- The least expensive way to travel through motorized transport is via minibus taxi/matatu, which explains why so many residents use this mode of transport. But as in Nairobi, it may be cost prohibitive to many, opting them to walk long distances.

SOCIAL COSTS—ROAD FATALITIES

While we don't have access to the road safety statistics in Kampala, on the country level, around 61 percent of fatalities are made up of pedestrians and motorcyclists.

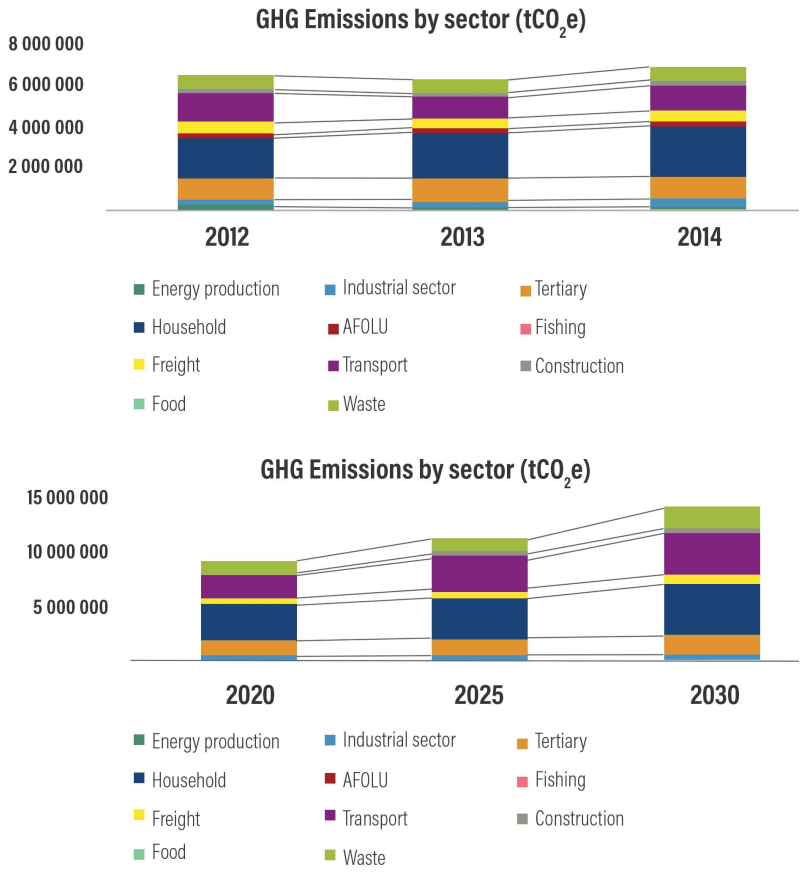
As in other countries in the region, conditions for vulnerable road users are very poor, with a lack of infrastructure for walking, and motorcyclists mixing with other fast-moving traffic, often without helmets.

For Uganda:



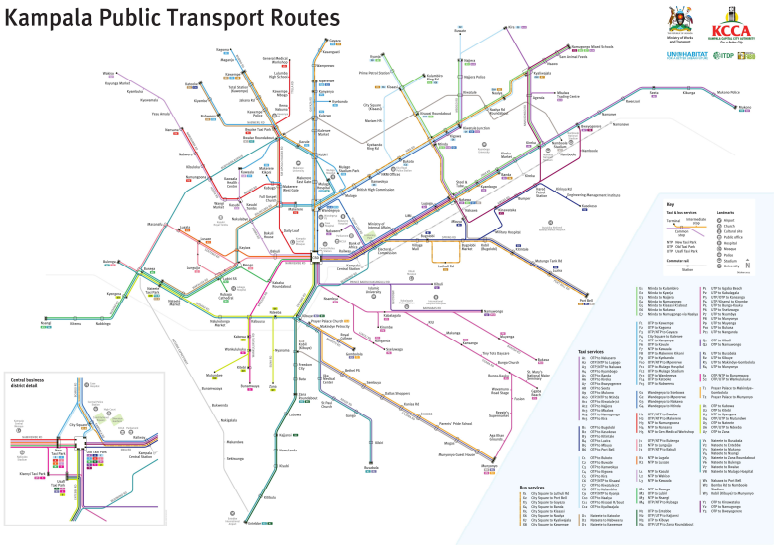
Iganga Foundation. 2014. Smart Moving Kampala: Design of NMT-zone in Namirembe Road and Luwum Street.

SOCIAL COSTS—CLIMATE CHANGE



According to the Kampala Energy & Climate Profile, transport represents a significant share of local greenhouse gas emissions and is expected to grow by 2030 to one of the top two contributors, along with households [3].

DATA AVAILABILITY—KAMPALA PUBLIC TRANSPORT MAP



- In 2015, the Institute for Transportation & Development (ITDP) partnered with local Makerere University to map Kampala's matatu network [4]. A year later, engineers from Stellenbosch University duplicated ITDP's original efforts and mapped Kampala's matatu system [5].

- Riders can use the resulting data to navigate their transit system using the OpenTripPlanner or GoMetro Pro app.

- Though useful, it is unclear whether both of these data can be openly accessed or readily updated. This makes it difficult to include paratransit in mobility planning.

SOURCES

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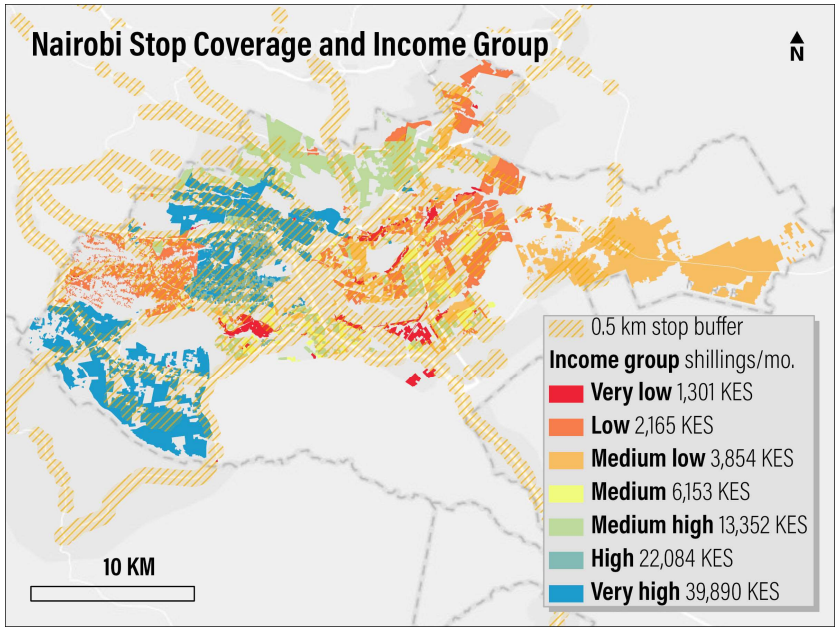
MAPPING NEEDS FOR LOW-INCOME TRANSPORT USERS IN NAIROBI

SDGS—TRANSIT ACCESS BY INCOME*



Including land use data reveals income groups' varying levels of access to matatu stops.

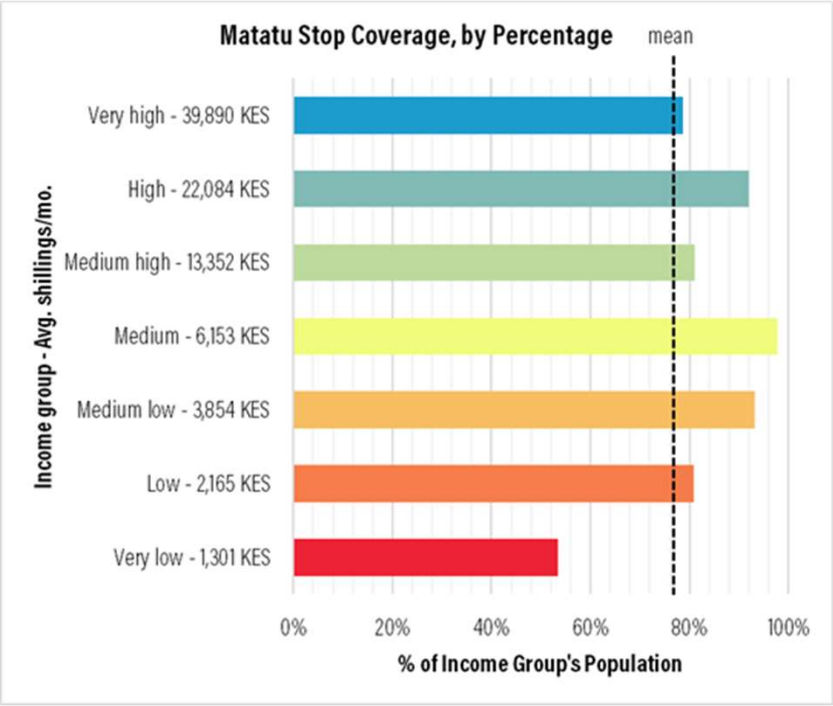
In Nairobi:

- **1.1 million** *low* (2,165 KES/mo) and *very low* (1,301 KES/mo) income residents live within 0.5 km of a matatu stop.
- **876 thousand *medium low*** (3,854 KES/mo), *medium* (6,153 KES/mo), and ***medium high*** (13,352 KES/mo) income residents live within 0.5 km of a matatu stop.
- **222 thousand *high*** (22,084 KES/mo) and ***very high*** (39,890 KES/mo) income residents live within 0.5 km of a matatu stop.

*Research based on 2019 WRI paper submitted for review in the *Transport Research Record*

Map: Matatu data provided via Digital Matatus, 2015, population data Provided via WorldPop, 2015

SDGS—WHO LIVES NEAR MATATU STOPS



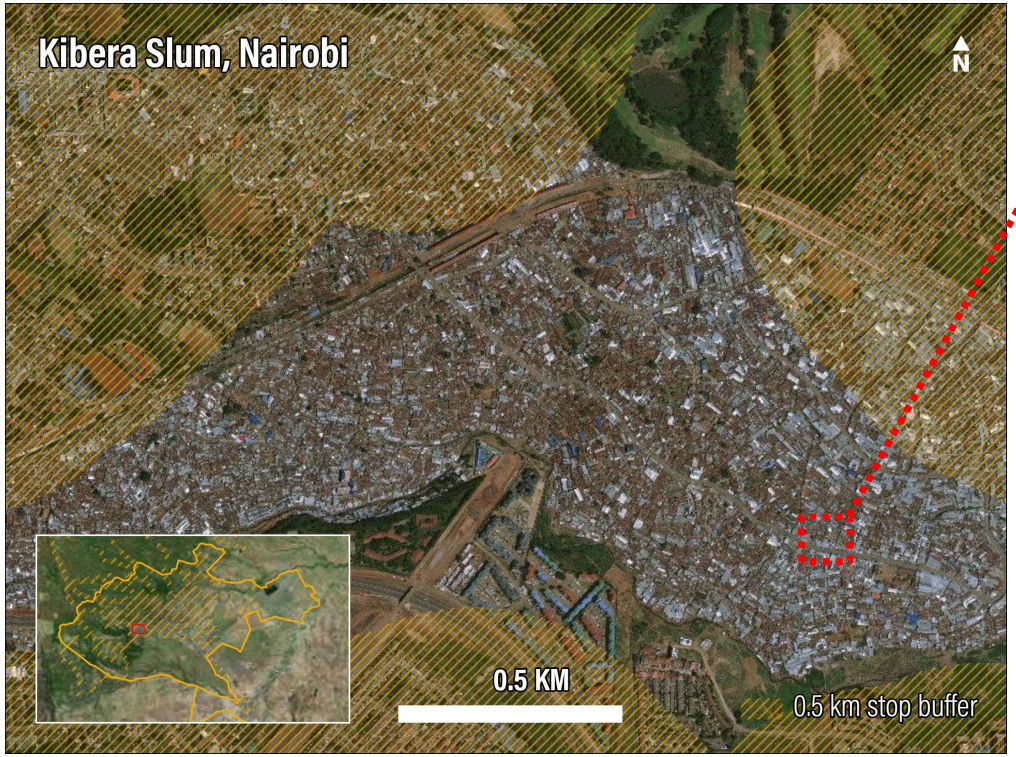
Lower-income residents are less likely to live near matatu stops.

- Despite an average of 79% of the city living within 0.5km of a matatu, only **50% of low-income residents** are located near stops. Meanwhile, the group with highest access to matatus is medium to high income communities.

Matatu fares are cost prohibitive to low-income group.

- The lack of matatu coverage in low-income areas can be due to a number of reasons. In Nairobi, as well as in Kampala, transit fares are highly cost-prohibitive causing low-income residents to be consistently under-served by the matatu system.

ACCESS & INCOME—POOR TRANSIT FOR POOR RESIDENTS

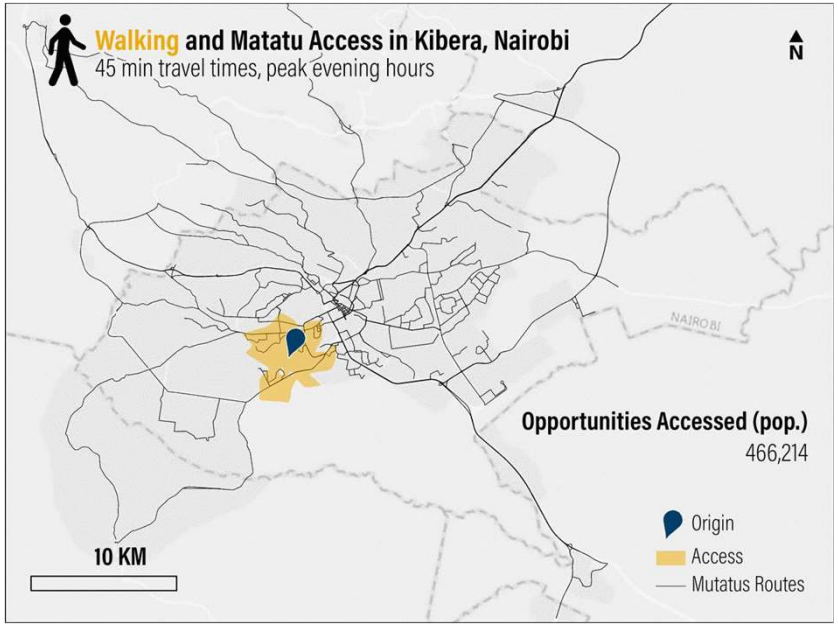


- In Kibera, for example, a densely populated slum with over 336 thousand residents, there are no matatu stops. However, **dense networks of footpaths indicate that residents move by other, non-motorized means.**

- **Lack of transit stations does not indicate lack of access to opportunities.** We must look for more robust indicators for measuring integrated transport system effectiveness

ACCESS & INCOME—ACCESSIBILITY AND CONNECTIVITY IN KIBERA

**view below GIF in slide show mode*



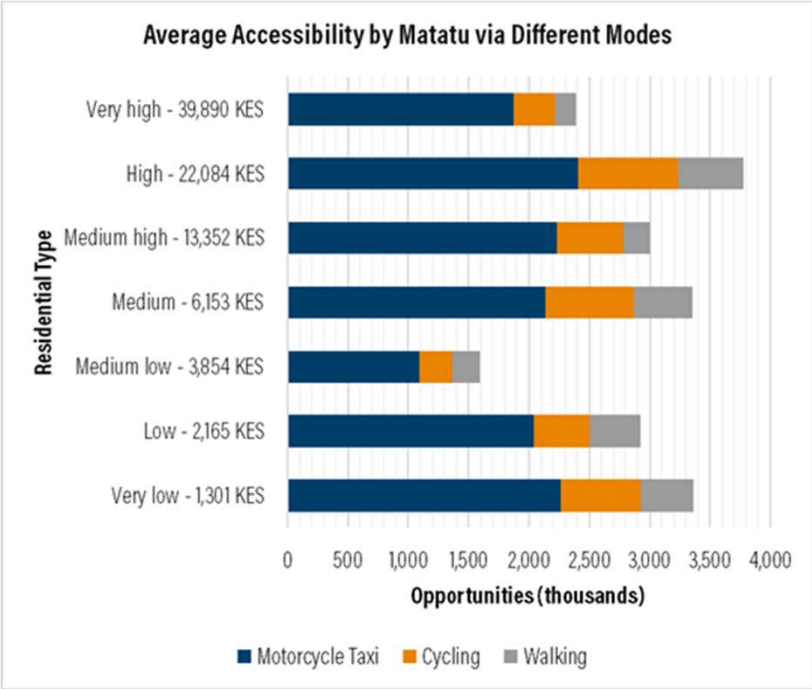
Accessibility is the ease at which individuals can reach opportunities like jobs, health or education [1].

- In the case of transit, we can measure the population reached by using matatus and various modes of transport to access and egress to/from matatu stops.
- In Kibera, **466 thousand opportunities** (i.e. people in this case) can be accessed by walking to matatus stops within 45 minutes total travel time.

Integrating matatus with cycling and motor-cycle taxis have the potential to greatly increase accessibility.

- By connecting to matatus via cycling and motor-taxis during the first-/last-mile, we see the number of **accessed opportunities increase to 942 thousand and 1.78 million**, respectively.
- That said, the modal share for cycling is relatively low (only 3%). Though motorcycle-taxis, also called *boda-boda,* are faster than matatus, they are more expensive and generally cost-prohibitive to low-income users

ACCESS & INCOME—WHO HAS POOR ACCESS?



Low-income residents have high access and low, quality mobility options

- Despite the lack of matatu coverage, low-income residents in Kibera do not necessarily experience poor accessibility. Due to the high-density of potential job sites, they are well-situated to reach opportunities via non-motorized or low-cost modes of transport.

Medium-low residents have low-access and high potential for mobility improvements

- Meanwhile, medium-low income residents, residents living in scattered small-plot housing, or mid-income areas have the lowest levels of job accessibility, despite having access to more matatu stops.

Accessibility, more so than SDG indicators, help us measure integrated transport networks as a whole.

- We must look towards measures other than transit stop distance to explain transit usability. Prohibitive fare costs, housing density, transit service quality, and pedestrian/cycling infrastructure all impact various income groups' ability to use transit. Accessibility measures, which incorporates these various factors, provide a more complete picture of a city's integrated transport network.

LOW-COST MODES—WALKING AND EQUITY

Adding more transit stops is not always the answer to improving urban accessibility, especially in Nairobi where walking is dominant among low-income residents.

- For low-income residents (and even more so for low-income women) matatus are not an affordable transportation option.
- In Kampala and Nairobi, fares [2] comprise of 13 to 25% to median household expenditures
- According to one survey [3] the percentage of low-income men and women who walk to work is 53 and 67%, respectively, compared to 36 and 47% of non-poor working men and women.

Low-income residents are less likely than medium income residents to travel outside their settlements for work.

- This may be because jobs are located within or nearby their settlements, adding context to why low-income neighborhoods experience higher accessibility despite their low mobility.
- 43% low-income men—and 31% of women—still walk longer distances outside of their settlement to reach jobs. For residents who do take matatus, walking is by far the dominant mode for first-/last-connections.

Pedestrians are dangerously underserved by their road infrastructure.

- Walking in Nairobi is often a matter of life and death. Pedestrians account for 80% of road crash fatalities. Improving walking infrastructure will not only see great improvements in multi-modal connectivity and accessibility, but save lives.

LOW-COST MODES—CASE FOR PEDESTRIANS

While the far east end of Ngong road shows paved, buffered walkways and separate bicycle lanes, the far west end has limited pedestrian infrastructure. Photos courtesy of Google Maps.

Despite the dominance of walking as a primary and intermediary means of urban transport, pedestrian are overlooked when designing road infrastructure.

- Walking infrastructure in Nairobi can range from good to poor. This is especially true on Ngong Road, a bustling, 9.6 km vehicle corridor connecting the highly-populated, low-income neighborhoods of Kibera and Kawangware [4]. Though some segments have paved pedestrian pathways, marked crossings, and separated cycling lanes, other segments put pedestrians in conflict with vehicles and market stalls. Due to poor buffer mechanisms and narrow, unpaved pathways, pedestrians are often forced to walk in the road, with matatus frequently invading the walkway during traffic congestion.

Two-wheeled infrastructure is an essential component and opportunity for Nairobi's integrated transport network.

- Though motorcycle-taxi and cycling make up a small modal share in Nairobi, these modes show tremendous potential for improved accessibility, especially in low- and medium- income areas. Brazil and Columbia have experienced success in integrating sustainable, equitable cycling programs into the urban transport systems of low-income neighborhoods [5]. This includes adding long-term bicycle storage and maintenance infrastructure and cycling right-of-ways near major transit stations as well as encouraging safe bicycle usage through education, art, and incentive programs. Building safe cycling infrastructure has the potential to shift public perceptions on the risks of cycling and generate more modal usage of bicycles [6].

SOURCES

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PRIVATE SECTOR-LED INITIATIVES IN NAIROBI AND KAMPALA

WHAT IS NEW MOBILITY?

New mobility is a loose term for models using technology to deliver transport in new ways. The most talked about disruptions are:

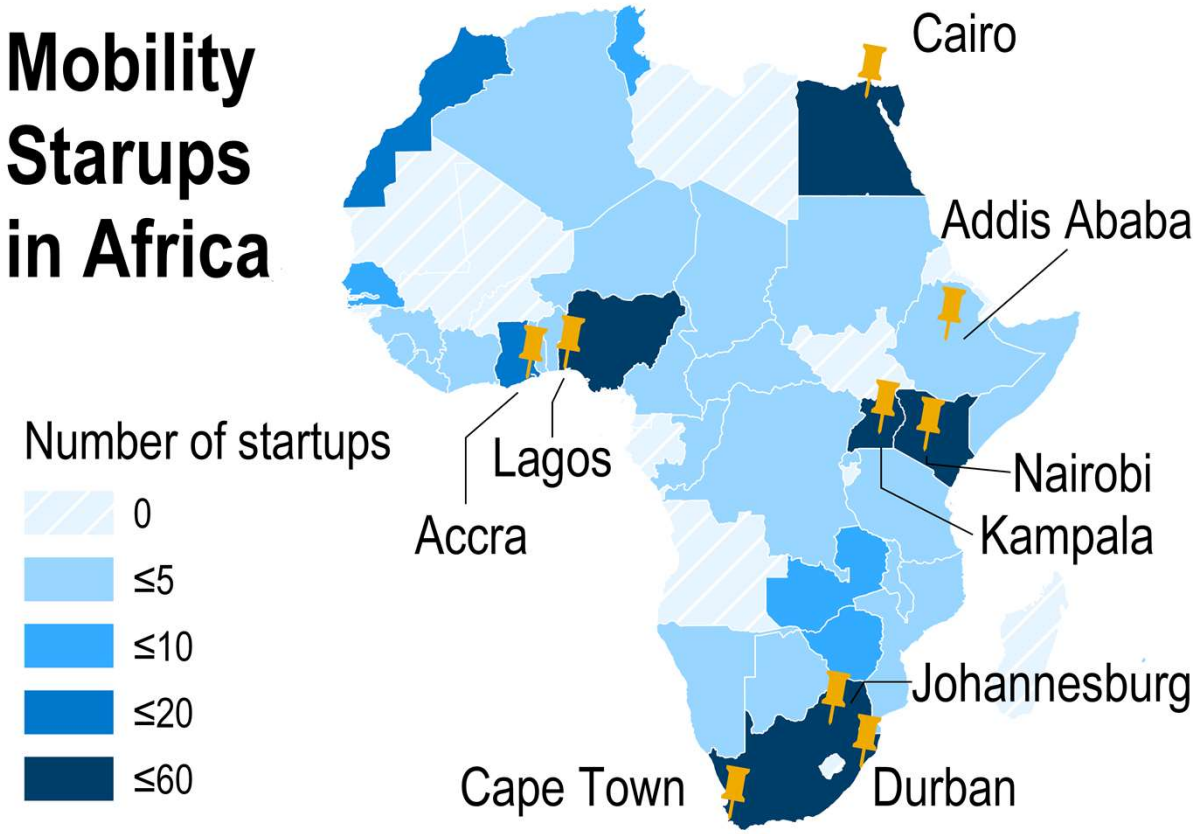
WHAT IS NEW MOBILITY? CONT.

There are 4 categories of New Mobility

- ***Shared Mobility (SM):*** Models in which vehicles are shared among multiple users. E.g. ridesharing, bike-sharing
- ***Product Innovation (PI):*** Models that enhance the technology of transportation assets to improve performance across various parameters (cost, emissions, etc.). E.g. electric vehicles, Battery technology
- ***Commuter Experience (CE):*** Models that improve the mobility experience for users, via information sharing. E.g. Mobile ticketing, trip planning.
- ***Data Driven Decision Making (D3M):*** Models that use technologies to provide insight for better transport planning. E.g. Traffic flow management, fleet tracking.

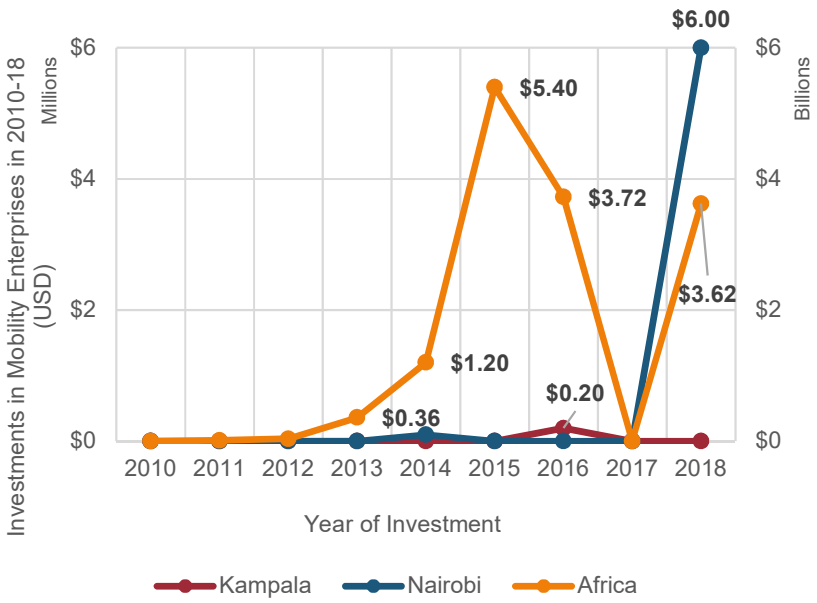
Source: Traxcn, 2018; Database of Mobility Enterprises in 6 African Cities, WRI India; Connected Urban Growth: Public-Private Collaborations for Transforming Urban Mobility, NCE 2017

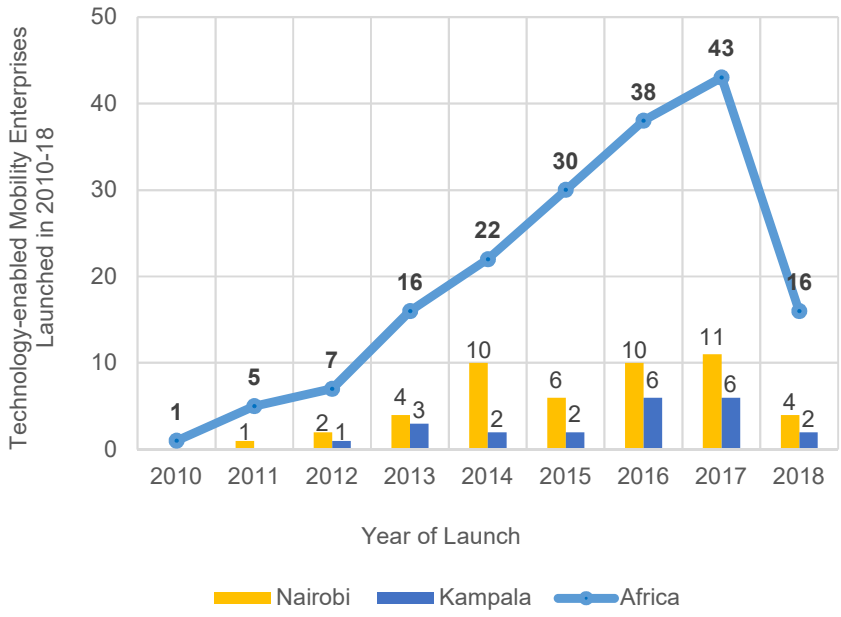
THE EMERGENCE OF NEW MOBILITY ENTERPRISES IS CONCENTRATED IN MAJOR CITIES OF SUB-SAHARAN AFRICA



A database of companies and their cities of operation was put together from multiple sources. Base Map: yourfreetemplates.com; https://tracxn.com; https://angel.co/Africa; https://www.crunchbase.com/; https://vc4a.com/

MOBILITY ENTERPRISE INVESTMENTS AND LAUNCHES





New mobility enterprises in Africa

- There have been over 180 technology-enabled mobility enterprises launched across Africa between 2010 and 2019.
- This includes 40 enterprises exclusively in Nairobi, 14 exclusively in Kampala and 8 across both cities.

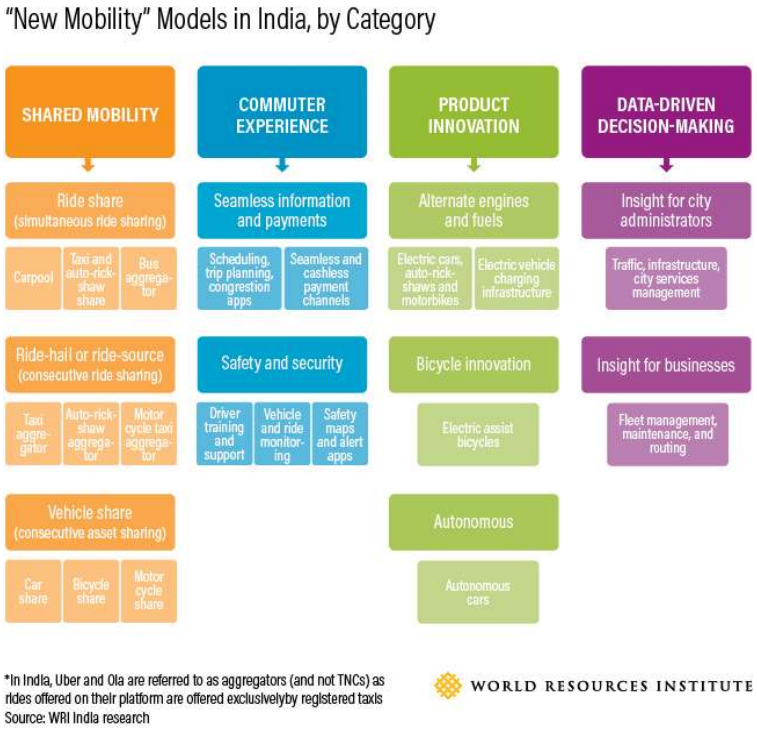
Source: Traxcn, 2018; Database of Mobility Enterprises in 6 African Cities, WRI India; Connected Urban Growth: Public-Private Collaborations for Transforming Urban Mobility, NCE 2017

TRACKING EMERGING MARKET PATTERNS

- To track this emerging market and identify patterns, WRI conducted research on technology-enabled mobility-focussed companies across capital cities of 6 African countries – Addis Ababa, Ghana, Kenya, Nigeria, South Africa and Uganda.
- The research was structured to identify the diversity of these emerging enterprises: products, services and technologies, activity in different geographies, and the business models used to cater to the needs of local customers.

Building the database

- Conducted over a period of 6 months, from June to November 2018, this continent-wide scan resulted in the assemblage of a database.
- It captured several details including the number of businesses, launch year, cities of operation, business model trend, category and subcategory, funding, whether the service supports cashless transactions, and operational information on supply, demand and pricing where available.
- Our sources of information, primarily, were four major online databases on start-up companies – Traxcn, AngelList, Crunchbase & VC4Africa – chosen for their breadth and level of detail they offer on mobility enterprises.



Categorization of New Mobility business models or mobility focused enterprises as they've emerged in Indian cities.

Sources for the database: https://tracxn.com; https://angel.co/Africa; https://www.crunchbase.com/; https://vc4a.com/; Infographic from Beyond Uber: How the Private Sector Is Disrupting Mobility

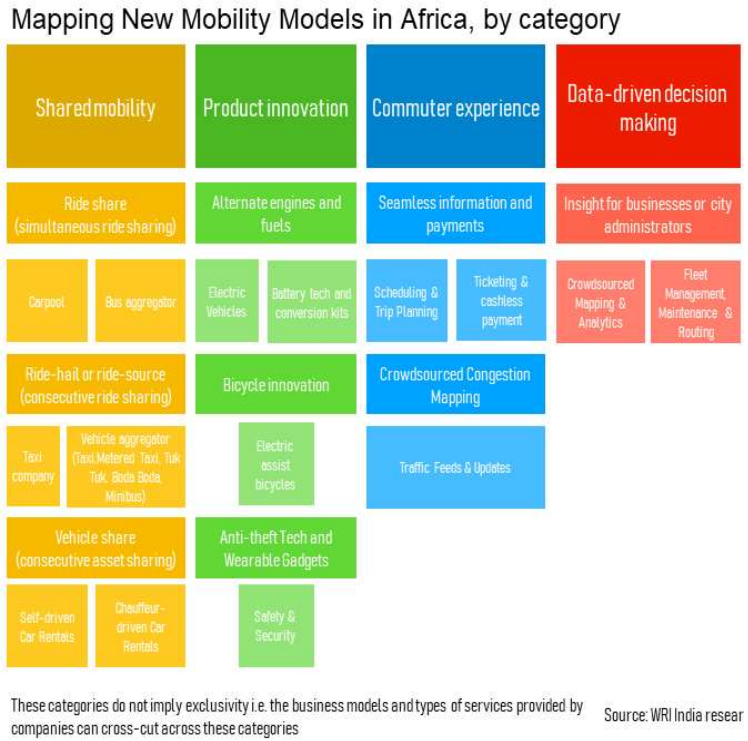
INTERVIEWS WITH ENTERPRISES

Interviews

- WRI India also conducted in-depth interviews with several mobility enterprises (12+) operating in Nairobi and Kampala and extensively reviewed news articles and publicly available industry updates.
- Interviews were conducted over call between September and November 2018 and helped in vetting the database and in gaining insight into the market potential of business models, current scale of companies, plans for expansion/ raising investments, regulatory barriers if any, and so on.
- Given that reliable information about the market shares and number of users of many of the companies was not available, anecdotal figures were obtained via these interviews.

Limitations

- Although the captured information may not correspond perfectly to all services in the new mobility space, their coverage is exhaustive, and up-to-date till November 2018.
- Though, new companies may have launched or shut operations since then, the database represents a primer, to derive insights into the overall development of the new mobility services market in sub-Saharan Africa.



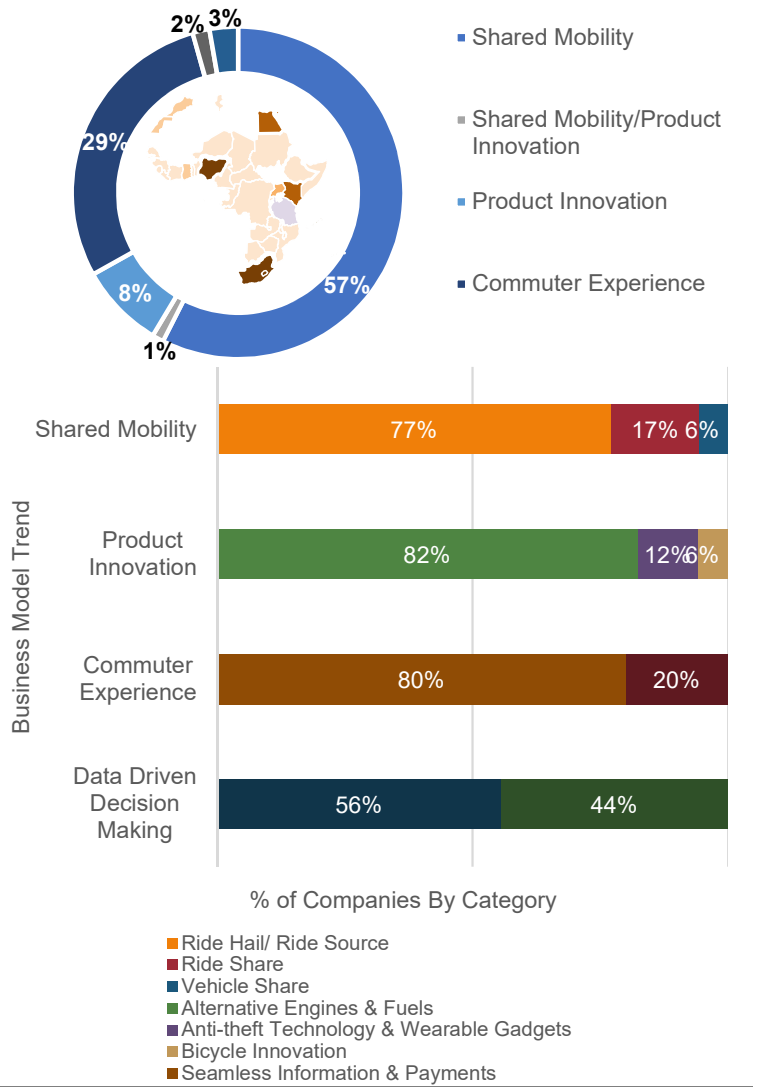
An adapted categorization of New Mobility business models or mobility focussed enterprises as they've emerged in cities across the African Sub-continent.

Sources for the database: https://tracxn.com; https://angel.co/Africa; https://www.crunchbase.com/; https://vc4a.com/; Infographic adapted from Beyond Uber: How the Private Sector Is Disrupting Mobility

KEY INSIGHTS

Shared Mobility Models see the Highest Traction

- 103 out of 181 companies launched between 2010 and 2019 offer rides to customers in vehicles of different sizes – i.e. **57% of companies in the database offer shared mobility services**. This is followed by Commuter Experience (CE) services (29%), Product Innovation (PI) models (8%), and services enabling Data Driven Decision Making or D3M (3%).
- A few companies also offer services that cut across these categories as seen in the alongside chart.
- Among the SM models, a majority offer ride-hailing services (77%), followed by ride-share or carpool (17%) and self-driven rentals services (6%).
- Similarly, most services categorized as PI manufacture electric vehicles and batteries or provide charging infrastructure services (82%), followed by anti-theft technology & wearable gadgets (12%). One company offers an electric assist bicycle.
- CE models on the other hand, offer seamless information and digital payment technologies (80%) and crowdsourced congestion mapping services (20%) while D3M models comparably offer insights to businesses and city administrators.



Sources: Database of Mobility Enterprises, WRI India

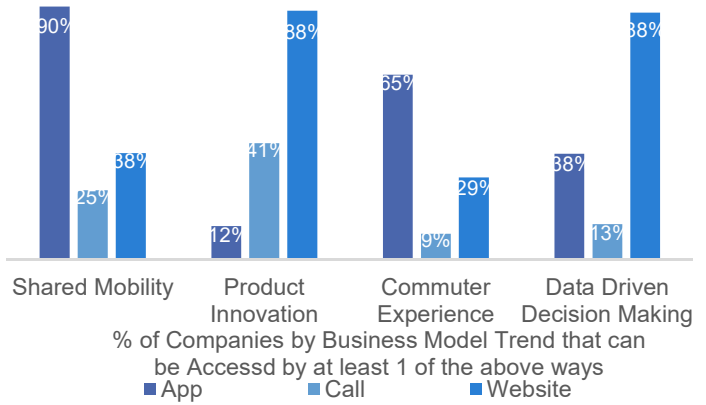
KEY INSIGHTS

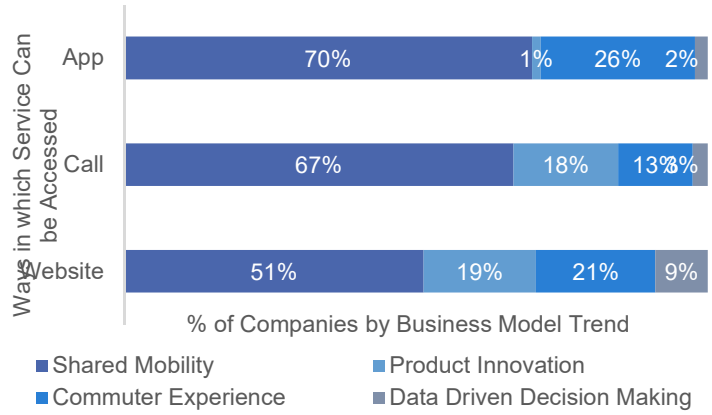
An Evolving Market

- The way in which technology-enabled mobility enterprises can be accessed in Sub-Saharan Africa is still evolving.
- Of the commuter-facing business models like Shared Mobility (SM) and Commuter Experience (CE), 90% of all SM services can be accessed by a smartphone app as opposed to 65% of CE services.
- Several SM services are also accessible via call (38%), as the market evolved as an upgrade on the call-a-taxi model.
- In the case of business and government-facing models like Product Innovation (PI) and Data Driven Decision Making (D3M), 88% of companies in both cases are accessible through a website, barring a few D3M models (38%) that also offer a smartphone-based dashboard and 2 yet-to-launch PI models offering electric vehicle aggregator services for trips.
- When seen from the perspective of proportion of business models accessible through different mediums, SM models emerge as most easily available, having web, call and app presence.

Most of our bookings come from calls rather than the app; about 80-85 % of bookings are via phone and another 15-20 % is via the app.

– Vaidehi Tambekar (Founder, Busy Boda)



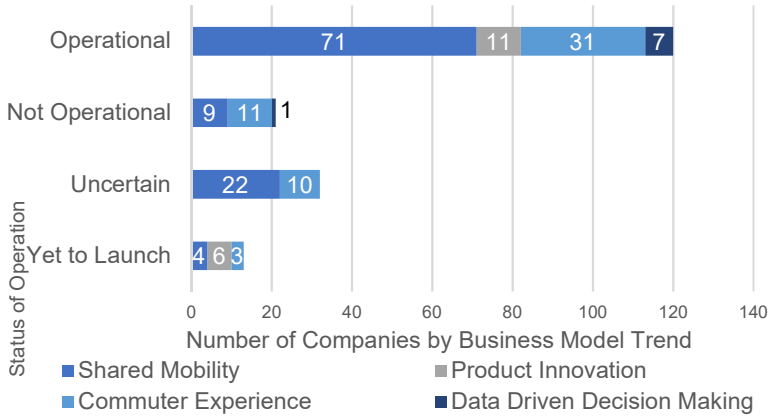


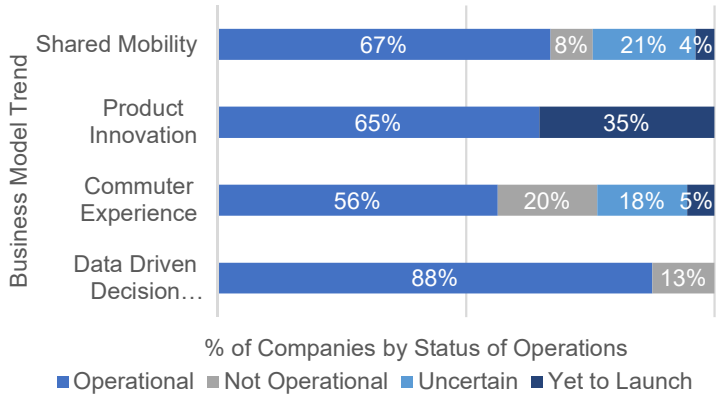
Sources: Database of Mobility Enterprises, WRI India

KEY INSIGHTS

Attrition Rates are Highest for Commuter Experience Models

- Of the 181 companies, launched in or after 2010, **65% continue to remain operational today** while 6% are yet to launch services.
- Remaining 30% have either shut operations (12%) or their status is uncertain (18%)*.
- Of the 65% i.e. 120 operational companies, 71 offer shared mobility services, while 31, 11, and 7 companies offer commuter experience, product innovation, and data driven decision making services, respectively.
- Almost half (46%) of the 13 companies yet to launch services correspond to the product innovation category**.
- Examined from the lens of business model trends, the attrition rate or rate of failure – that is when a company shuts operations or discontinues services – is highest for commuter experience models (38%), followed by shared mobility (29%).
- Reasons for this are unknown but could be influenced by a lack of funding or clear revenue models in the commuter experience segment, and the influx of global players such as Taxify and Uber that are able to pull in large investments and offer competitive and predatory pricing to customers in the shared mobility segment.





* With company websites under maintenance, no social media activity and a lack of coverage in industry news;
** Largely manufacturers of electric vehicles, including two electric vehicle aggregators that are currently piloting services in South Africa & Nairobi, Kenya.
Sources: Database of Mobility Enterprises, WRI India

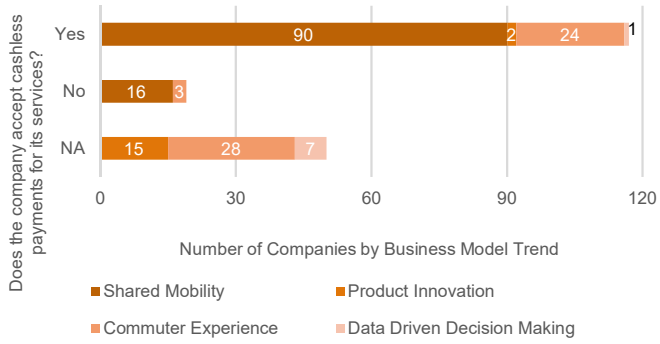
KEY INSIGHTS

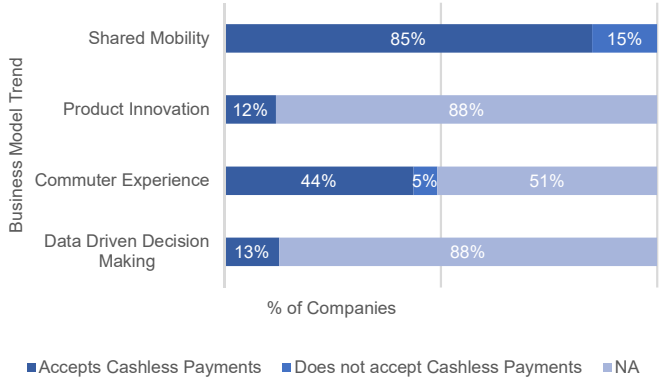
Digital Payments in Transport Services Continue to Grow

- While 121 customer facing companies continue to accept cash as mode of payment for services, over **60% of companies also accept payments via cashless mechanisms.**
- The growing trend of digital payments in transport services is concomitant with the growth of shared mobility and commuter experience models – with 85% and 44% of services accepting cashless payments, respectively.

4 types of cashless payment mechanisms

- ***In-app wallets:*** A digital wallet within the company's app that can be used to pay for rides or services and can be recharged periodically (e.g.MaxGo's MaxWallet in Lagos)
- ***3rd party app integration:*** where the service enables payments via different digital wallets, not in-app or owned by the same company (e.g. Flutterwave's integration with Nigeria's Holla Cabs)
- ***Banking integration:*** where debit/credit card can be swiped at an on-board point-of-sale (PoS) terminal or card details stored within the app, used to pay for rides and services (e.g.PoS on ZebraCabs in Midrand).
- ***Mobile money*:*** where money is transferred from one account to the other via a mobile phone or the charge is billed to the mobile phone carrier (e.g. M-pesa, MTN, Airtel Money accepted on Mondo, Little, & QuickTaxi in Nairobi & Kampala etc.).





* Mobile money has been critical in extending financial services to the 'unbanked' in developing countries; can also be availed by feature phones users.
Sources: Database of Mobility Enterprises, WRI Inda

KEY INSIGHTS

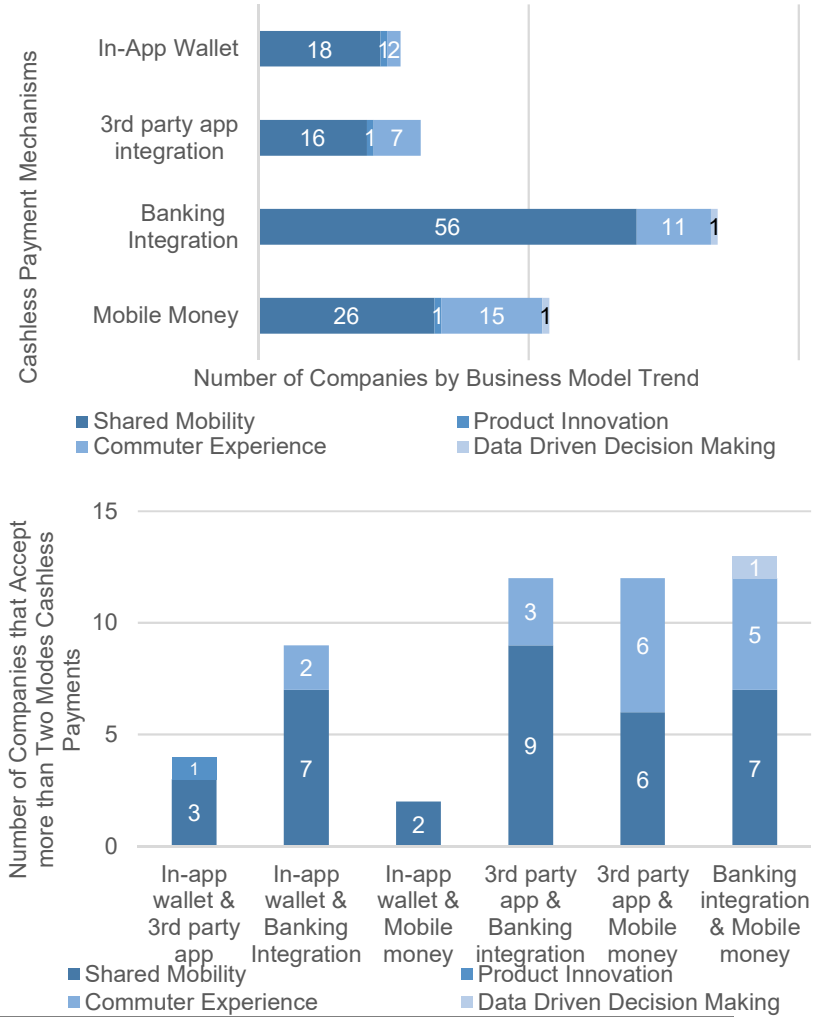
- Among the 4 cashless payment options adopted by emerging mobility enterprises in sub-Saharan Africa, banking integration (40%) and mobile money (27%) has been more popular with mobility enterprises enabling cashless payments.
- However, integration with 3rd party wallets or payment apps has been low, despite their ability to support quicker product development
- Several enterprises also enable multiple cashless payment options – 54 companies i.e. 35% accept 2 or more cashless payment methods as seen in the graph alongside.
- The **potential** for cashless payments in transport, rising prominence of smartphones and internet use, play a crucial role in the development of the mobility enterprise market, as we shall see in the next segment on Market Readiness.

"We accept all of cashless payment modes, but a considerable number of people still pay by cash. Local customers who pay by cash do so through mobile money while most foreign customers pay by card."

– Mark Karegyesha (MD, Spe-Taxi Cabs)

"At the moment we accept cash and mobile money. Credit cards are not popular here especially with our target market. So we haven't integrated it yet, but with MPesa we don't really need to."

– Vaidehi Tambekar (Founder, Busy Boda)



Sources: Database of Mobility Enterprises, WRI India; Interviews with enterprises in Nairobi & Kampala

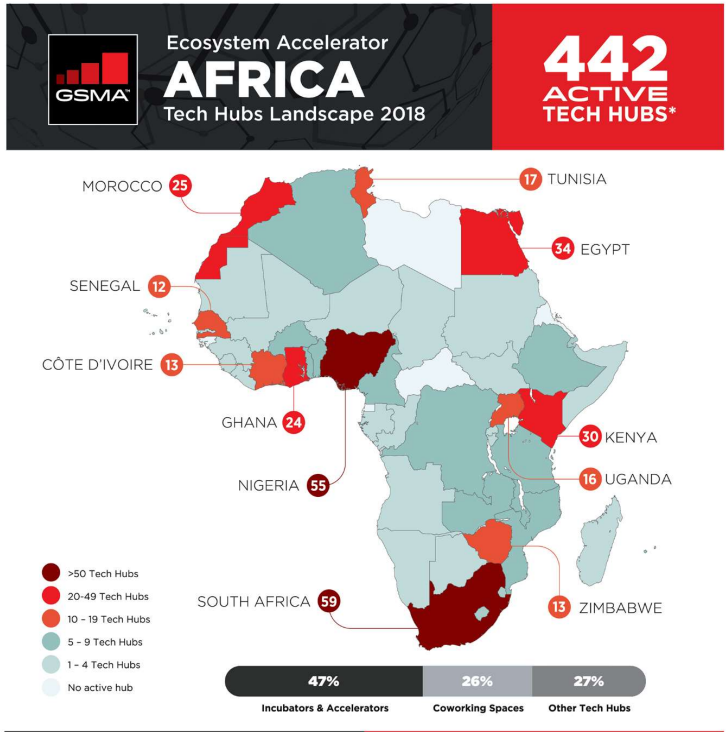
MEASURING MARKET READINESS

"There are certain hubs in Nairobi – like co-working spaces which host events, masterclasses and mentorship programmes, helping entrepreneurs with their business models. You interact with companies at different levels of growth, fostering an environment of cross-learning. Through such places – Nairobi Garage, iHub and Meta – we were able to build partnerships, get exposed to different businesses and also access advisors who helped us formulate our growth strategy."

– Sonia Kabra (Co-founder & Director, Buu Pass)

Ecosystem enablers: Technology Hubs

- Innovation or technology hubs are a key influencer to the growth and prosperity of start-up ecosystems, functioning as platforms that provide infrastructure (internet and work space), opportunities for skill-development, networking, mentoring and financial support.
- These include incubators, accelerators, co-working spaces, fab labs, makerspaces, hackerspaces, and other innovation centres.
- Supported by respective Ministries of Information and Communication Technology, tech-hubs in Africa have grown exponentially – from 120 in 2014 (World Bank) to 314 in 2016 (GSMA Ecosystem Accelerator) to 442 tech-hubs in 2018 (GSMA Ecosystem Accelerator) [1, 2, 3]

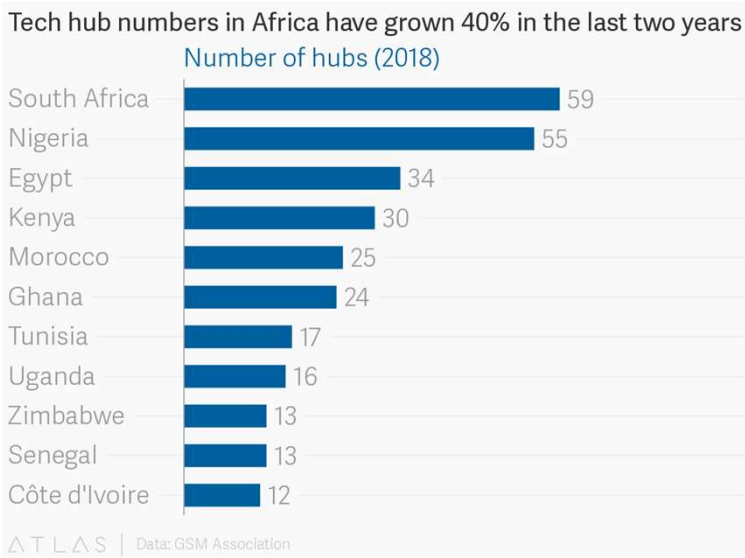


This map shows the concentration of technology or innovation hubs across the African Continent

Sources: Industry News (See end notes); GSMA, 2018; Interviews with enterprises in Nairobi & Kampala

MEASURING MARKET READINESS: TECH HUBS

- Almost 50% of tech-hubs are located in 5 countries – led by South Africa (59), then Nigeria (55), Egypt (34), Kenya (30), and Morocco (25). Uganda comes in at 8th position with 16 tech-hubs [4].
- Top cities in terms of active tech hubs are Lagos with 31 hubs, Cape Town (26), and Nairobi (25)[5].
- iHub in Nairobi has been a pioneer in the space – supporting the growth of several tech companies. Nailab has been instrumental in incubating mobility enterprises, particularly Go Eco Tuk Tuk and Cladlight, in Nairobi. Other hubs include – MEST in Accra, Co-creation Hub in Lagos, and Innovation Village and Venture Labs in Kampala.
- Other than these ecosystem enablers, several other parameters have been identified that impact this growing market of technology-enabled mobility enterprises:
  - **Device Penetration** i.e. use and ownership of smartphones and feature phones, and **Digital Inclusion** i.e. use of internet and mobile internet , both critical for the growth of new mobility enterprises and determine the multiple ways in they can be accessed/ availed by customers.
  - **Financial Inclusion** i.e. bank account penetration and mobile money subscriptions influence the myriad of ways in which people can pay for services
  - And **Access to Funding** which is a key parameter impacting the ability of business models to scale.



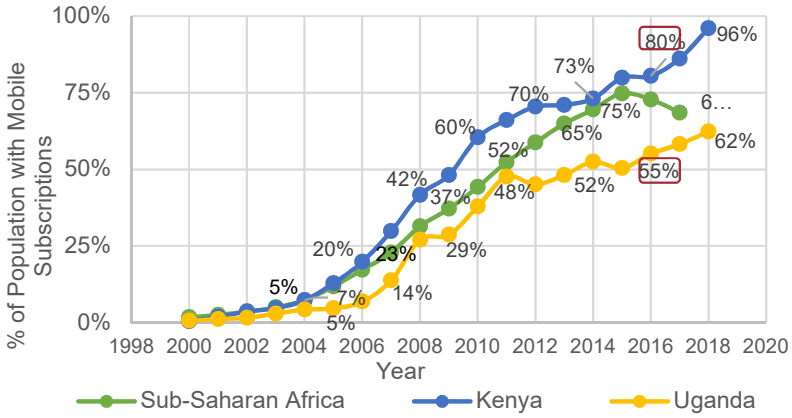
Source: GSM Association, 2018

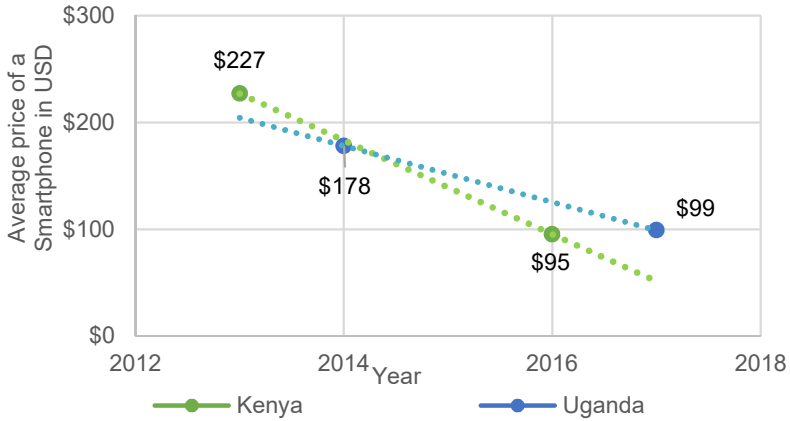
Sources: Industry News (See end notes); GSMA, 2018

MEASURING MARKET READINESS: HANDSETS

Device Penetration: Mobile & Smartphone

- World Bank data from 2000 to 2017 shows that subscriber growth across Sub-Saharan Africa has slowed in recent years; penetration levels dipping from 75% in 2015 to 69% in 2017.
- Kenyan and Ugandan markets however, continue to register a growth in mobile phone subscribers. According to market research firm, Global Web Index, **96% of Kenyans in 2018 had a subscription as compared to 62% Ugandans**[6]
- **Smartphone adoption is rapidly growing in the region** with a total of 250 million smartphone connections in 2017, equivalent to a third of the total mobile connections base [7]
- GSMA forecasts a growth to 690 million smartphone connections by 2025 [8]
- According to a Pew Research Centre survey, smartphone penetration in Sub-Saharan Africa rose from 15% in 2014 to 33% in 2018 [9] the growth often attributed to the increasing affordability of new devices and growing market for second-hand ones.
- Jumia Business Intelligence reports suggest that **33% of Ugandans owned smartphones [10] as compared to 60% of Kenyans in 2017-18 [11]**, largely due to a drop in prices of handsets as shown in the graph alongside.



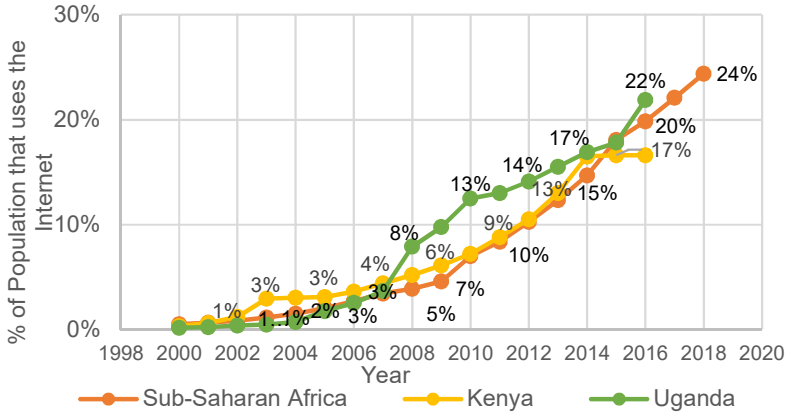


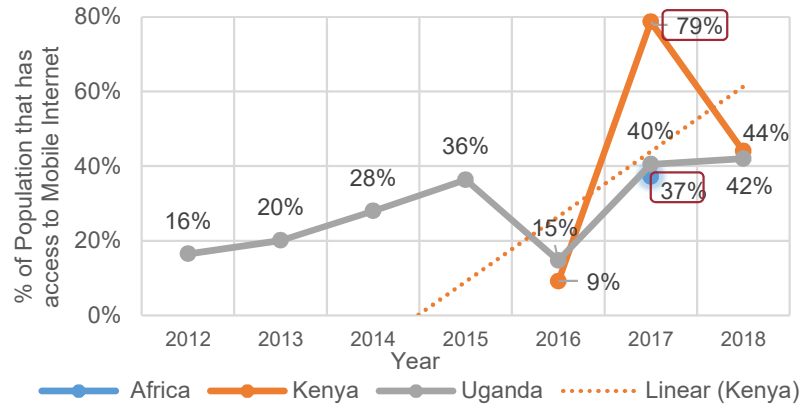
Sources: World Bank's World Development Indicators, 2018; Global Web Index, 2018; We are Social's 'Digtial in 2018; GSMA's Mobile Economy in Sub-Saharan Africa Report, 2018; Pew Research Center, 2018; Jumia Business Intelligence Reports; Industry News (See end notes)

MEASURING MARKET READINESS: INTERNET

Digital Inclusion: Access to Internet & Mobile Internet

- Internet adoption in Sub-Saharan Africa continues to grow, driven by mobile internet subscriptions, notable improvements in affordability, and mobile operators' direct investments in infrastructure deployments [12].
- By 2017, Sub-Saharan Africa had achieved near universal 2G coverage. However, for over 800 million people, belonging largely to underserved population groups (rural, women, low-income, and youth) the internet [13] remains inaccessible.
- Despite rapid uptake of mobile internet subscriptions, access to official data on mobile internet penetration levels remains challenging.
- The chart alongside was put together with data from Uganda's Telecommunications Industry report, and We are Social's Digital in 2018 report which puts mobile internet penetration in Africa at 37% and in Kenya at 79% in 2017, the latter contrasting with other sources for the previous and following years.
- Mobile operators have also played the roles of ecosystem enabler, incubator, competition organiser and mentor, and more recently through to direct investments and partnerships [14].



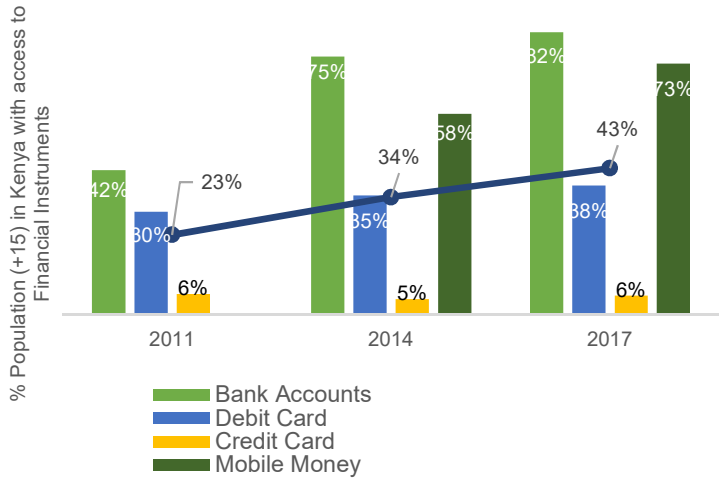


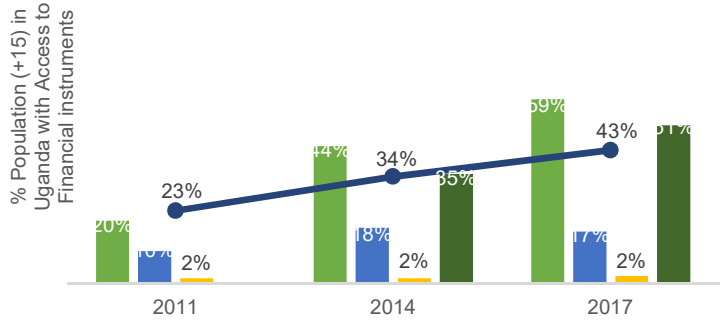
Sources: GSMA's 'The Mobile Economy Sub-Saharan Africa' Report, 2018; International Communications Union's ICT Indicator's Database, 2018; World Bank's World Development Indicators, 2018; We are Social's 'Digtial in 2018; World Economic Forum's Global Information Technology Report, 2017; Uganda Telecommunications Industry Report, 2017

MEASURING MARKET READINESS: BANKING

Financial Inclusion: Bank Account & Mobile Money Penetration

- World Bank data indicates a steady increase in **the proportion of adult (+15 years) populations that hold an account with a financial institution (including mobile money service provider) between 2011 and 2017.** Access to financial instruments such as debit and credit cards however, remains underwhelming.
- In Kenya and Uganda, while proportion of adults that own debit cards grow at a slow pace, credit card penetration has plateaued at an abysmal 6% and 2% respectively.
- Mobile money continues to expand rapidly across Sub-Saharan Africa with 122 million active accounts across 135 service providers, and the total value of transactions at $19.9 billion in 2017, up by 14.4% from 2016 [15].
- **East Africa remains the largest mobile money market, accounting for 56.4% of users in the region**. Within East Africa, Kenya has the highest penetration at 73%, also occupying the 10th highest position in Sub-Saharan Africa [16].
- However, both Kenya and Uganda [17] are **increasing taxes on mobile money transactions** both for operators and end users, despite opposition from civil society and respective market-share leaders M-Pesa (81%) [18] and Airtel (55%) [19].



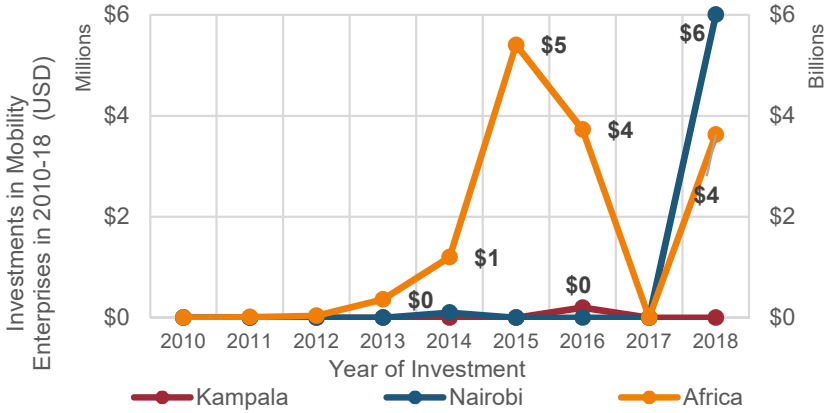


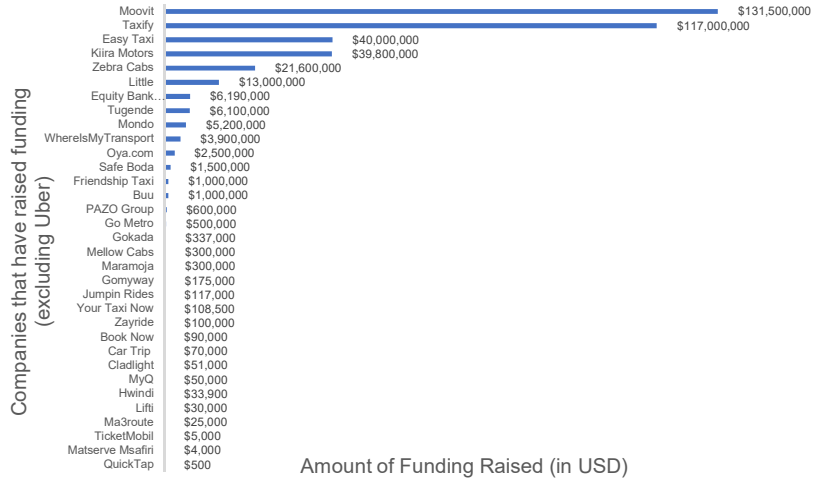
Sources: Demirgüç-Kunt, Asli et. Al., 2018. The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. World Bank: Washington, DC; World Bank's World Development Indicators, 2018; Uganda Communications Commission, 2017.

MEASURING MARKET READINESS: FUNDING

Access to Funding

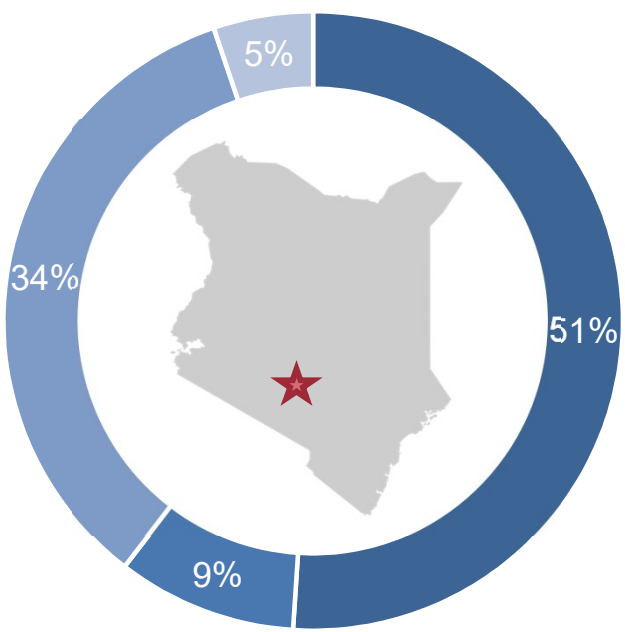
- According to Traxcn (chart alongside) investments in **transport-tech or mobility enterprises in the region saw tremendous growth between 2013 and 2016, and is on the rise again 2018-onward.** Total funding so far = $ 14.36 billion.
- South Africa, Nigeria, Kenya and Egypt remain popular investment destinations, in that order, with growing investor appetite for other markets such as Ghana, Uganda, Rwanda and Senegal [20].
- Our Database of Mobility Enterprises in 6 African Countries identifies 28% i.e. a little over 50 companies that have raised investments in the last decade. However, actual amount of funding raised was available only for 34 companies, cumulatively amounting to $12.9 billion. 6 of these 34 companies have shut operations, despite raising funds, while 4 are yet to start operations.
- Of the $12.9 billion invested, $12.5 billion was raised over the years by Uber alone, for their global operations. For a majority of companies (68%), no investment information was available through public sources.
- Of these 50+ companies identified in the database, 17 are in Nairobi, 12 in Kampala, 6 of which are in both cities. We explore them further in the next section.



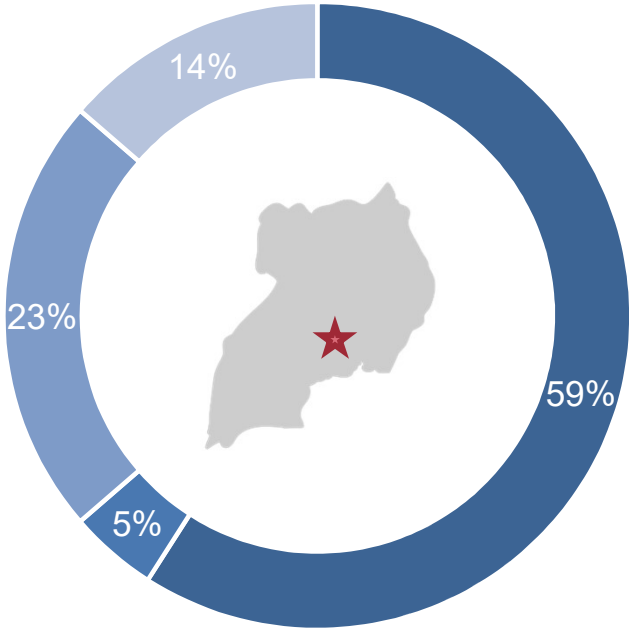


Sources: Traxcn, 2018 ; GSMA's 'The Mobile Economy Sub-Saharan Africa' Report, 2018; Database of Mobility Enterprises in 6 African Countries, WRI India

ENTERPRISES IN NAIROBI & KAMPALA



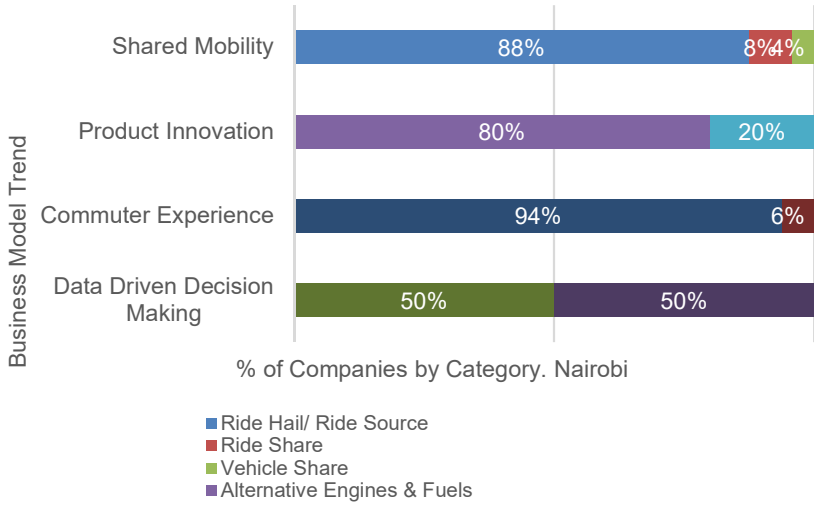
- Shared Mobility
- Product Innovation
- Commuter Experience
- Data Driven Decision Making

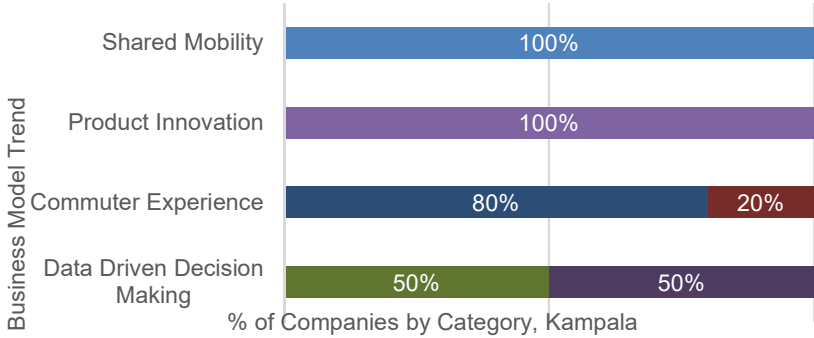


Sources: Database of Mobility Enterprises in 6 African Countries, WRI India

ENTERPRISES IN NAIROBI & KAMPALA

- **As seen from the previous slide, Shared Mobility continues to be popular in both Nairobi (51%) and Kampala (59%).** An overwhelming majority offer ride hail services (88% in Nairobi and 100% in Kampala), while a handful in Nairobi offer carpool (ride share) and self-driven car rental (vehicle share) services.
- This is followed by Commuter Experience models in both cities (Nairobi – 34%; Kampala – 23%) who largely offer seamless information and/or ticketing and digital payment services. 1 company in each city offers crowdsourced traffic information accounting for 6% (Nairobi) and 20% (Kampala).
- A total of 6 companies in both cities can be characterized as Product Innovation. 5 out of these 6 manufacture electric batteries (1) and vehicles (4), of which Nopia Ride seeks to be an electric vehicle aggregator. As of November 2018, the company was running pilot tests with a fleet of 100 electric cars in Nairobi.
- The 1 remaining company is Nairobi-based Cladlight which sells LED infused wearable jackets to motorcycle riders and manufacturers of 2 wheelers as a rider-safety gadget.
- Data Driven Decision Making models are few (5 – 2 in Nairobi; 3 in Kampala) each offers insights to businesses and city administrators.
- In the next few sections, these models are explored in greater detail.





Sources: Database of Mobility Enterprises in 6 African Countries, WRI India

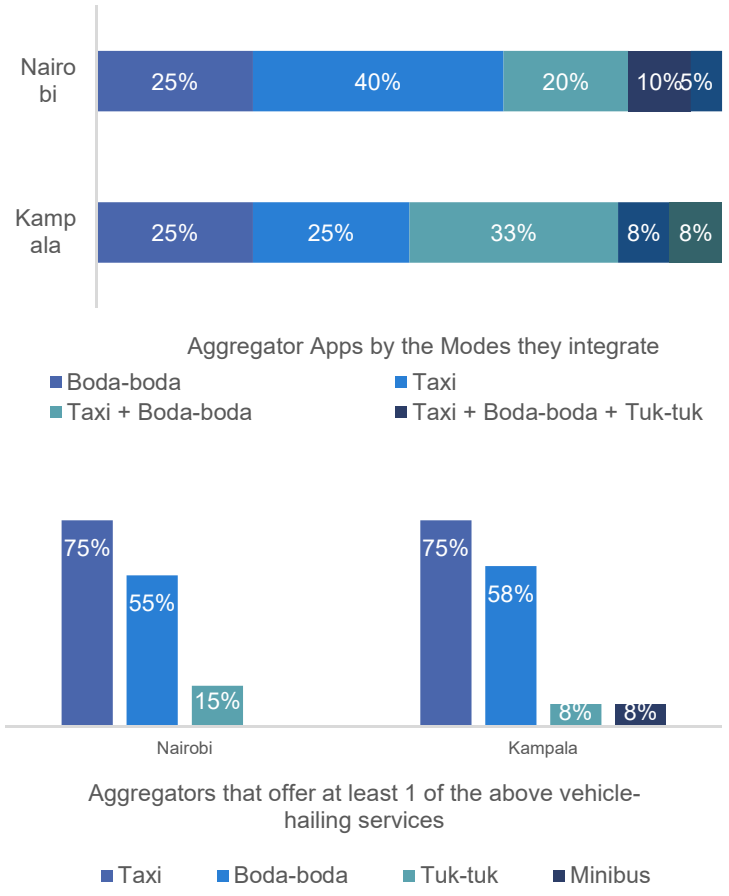
SHARED MOBILITY IN NAIROBI & KAMPALA

"The share of new-mobility service in Sub-Saharan Africa's transport market is barely breaking out of single digits. The total taxi market, at least in Nairobi, is a $1 million a day market, i.e. a $360 million something market annually. If you assume $5 per trip, that works out to 200,000 trips a day, which is not that many considering Nairobi has 4 million people. If you combine Uber, Taxify, Little, Maramoja & Mondo – which are the 5 apps that have any sort of meaningful volume – we are talking about 30,000 trips a day, about 1/6th of the total market. Right now, Taxify has the highest volumes."

– Jason Eisen (Chairman & Ex-CEO, Maramoja)

SM in Nairobi and Kampala is predominantly a Ride-hail market

- Other than Nairobi-based Just a Ride and United Kite that offer carpool services & Sifiri*, a peer-to-peer self-driving car-rental platform, all shared-mobility models in both cities are ride-hail companies
- Of the 21 and 13 ride-hail services in Nairobi and Kampala, 1 in each city is a traditional metered-taxi company, now also accessible via app and website. While , the status of Nairobi-based Sasa Cabs is uncertain, Friendship taxi in Kampala operates with 116 taxis in its fleet, cumulatively doing 20,000 km a day**.
- The remaining companies (20 in Nairobi & 12 in Kampala) are all aggregator services*** connecting passengers to riders/drivers across different vehicle types as shown in the graph alongside.
- More than 50% of ride-hail companies in each city offer at least boda-boda hailing; 75% in each city offer at least taxi hailing.



* Also in process of beta-testing a trip planning app; ** Caters largely to corporate carpool trips and tourists and other transient populations; *** company does not own vehicles
Sources: Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala; For a definition of ride hailing, see Shaheen et. Al. 2015, Shared Mobility: Definitions, Industry Developments, and Early Understanding.

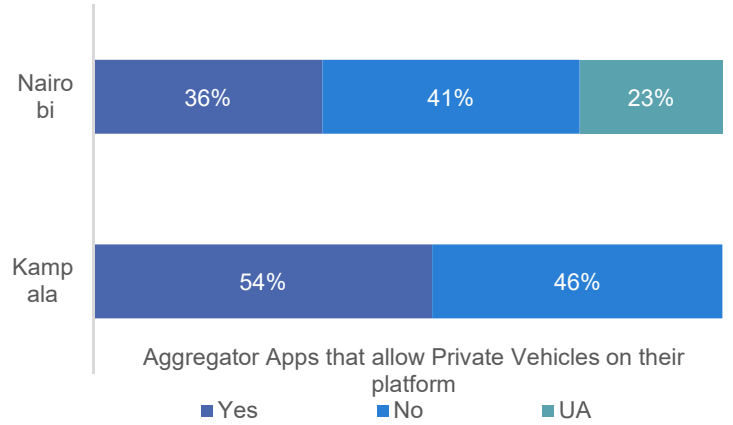
SHARED MOBILITY IN NAIROBI & KAMPALA

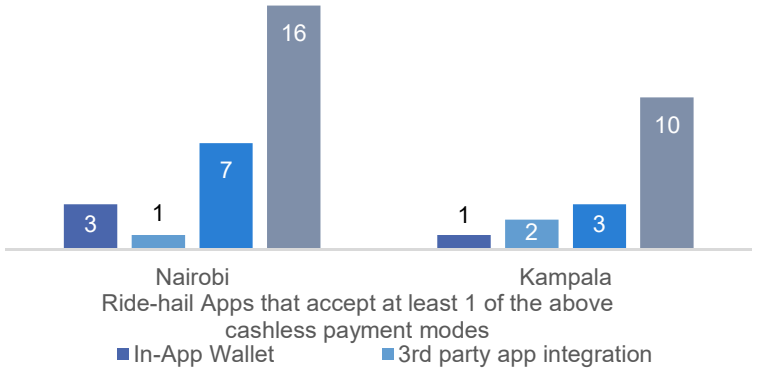
- **However, unlike ride hail services in India, many companies in Nairobi and Kampala also allow personal vehicles**, without Public Service Vehicle (PSV) badges, to offer rides to customers on their platform, much like Uber and Lyft in the US.
- All services that offer boda-boda hailing, allow private motorcycle riders to offer rides through their apps.

"In Kenya, to drive a matatu or a passenger bus, you must have a license and a Public Service Vehicle (PSV) badge. For boda-bodas there's no such provision. To become a boda-boda rider in Kenya, all you need is a driving license; no commercial license is required. All we ask of our drivers, is to register with the association".

– Kevin Mubadi (Chairman, Boda boda Safety Association of Kenya & Founder of Juu Boda App)

- Other than Nairobi-based carpool services – Just a Ride & United Kite, almost all other shared mobility models in both cities accept cashless payments in one form or the other.
- Mobile Money seems to be the most popular mode of cashless payment accepted by 77% and 73% of ride-hail services in Nairobi & Kampala respectively. Few companies accept payments through debit/credit cards or payment gateways, while very few companies have in-app wallets or partner with 3rd party wallets.





Sources: Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala; For a definition of ride hailing, see Shaheen et. Al. 2015, Shared Mobility: Definitions, Industry Developments, and Early Understanding.

SHARED MOBILITY IN NAIROBI & KAMPALA

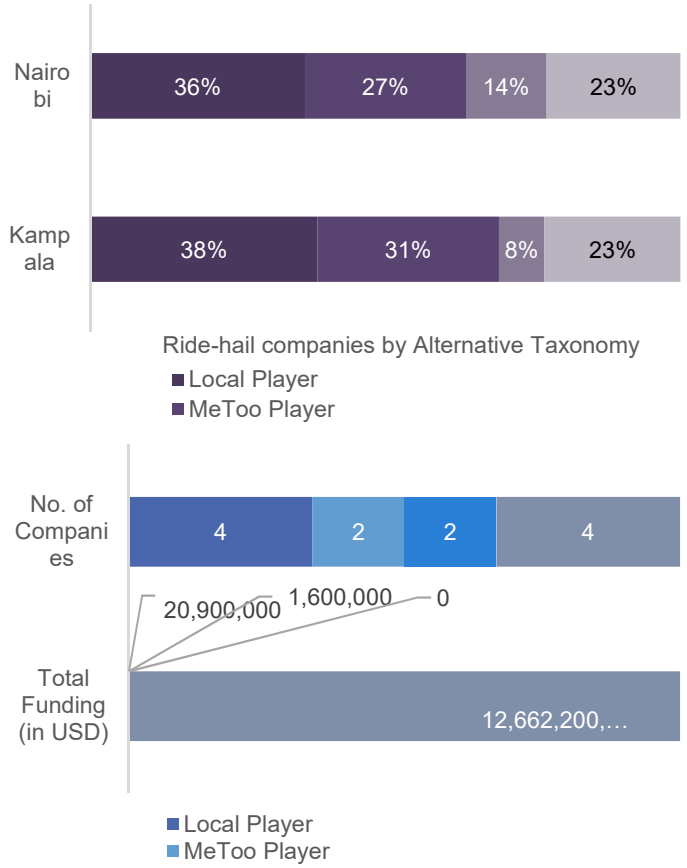
The Evolution of Ride-hail services in Sub-Saharan Africa suggests an alternative taxonomy which is particularly useful when looked at through the lens of funding*

"In 2012, we were the only company trying to build a taxi app in the region. Months later, few players came up in South Africa. Eventually, the big guys came; first Rocket Internet with Easy Taxi, then followed Uber, then Taxify.

Today, the market is incredibly crowded. Just in Nairobi, I can name 12 – 13 apps with varying levels of service across motorcycle taxis, regular taxis, or some sort of taxi concept mixture. Many have come-up and died. I'd group them into a few categories:

- ***Local Players:** that actually understand tech and mobility, and have put in serious efforts. I'd put ourselves and Little cabs in that category.*
- ***MeToo Players:** locals that came up saying, "look at all the money Uber & Taxify are making. Doesn't seem so hard, we can also put an app out there and make a lot of money". They don't really understand tech, so they'll just white-label an app and bring it to market. They too tend to die quickly.*
- ***Individual Owner/Driver's Groups**: that have come together or traditional taxi companies trying to modernize by developing their own app. This also doesn't usually work out too well.*
- ***Multinational Players:** The big players like Uber from the US, Taxify from Estonia, and Mondo from Saudi Araibia*

– Jason Eisen (Chairman & Ex-CEO, Maramoja)



* Of the 25 ride-hail companies across Nairobi & Kampala, funding information was available for only 10; Majority funding went to multinationals Uber, Taxify, Mondo, & Easy Taxi.(no longer active in Africa). While Local Players like Maramoja and Little were able to secure funding, they still identified funding as their no. 1 barrier to growth and expansion. Other local players like Busy Boda in Nairobi and Spe Taxi in Kampala have struggled to raise any funding.

Sources: Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala

SHARED MOBILITY IN NAIROBI & KAMPALA

Impact of Multinational Ride-hail Giants on Local Markets

- As seen from the last slide, $12.66 billion was invested in Uber*, Taxify, Easy Taxi** and Mondo – accounting for 88% of total investments in mobility enterprises in Sub-Saharan Africa between 2010 and 2018.
- Furthermore, the prominence of ride-hail companies (81 out of 181 i.e. 45%) is indicative of the fact that not only are they able to mobilize large amounts of funding, but are also significantly influencing the direction of innovation and character of business models in the region.

"We were already doing trips a year before Uber entered the market. But we were still figuring out what exactly we were doing. We had identified a problem and we knew we had a solution. So when Uber came, with very competitive pricing, we had to look for a niche to have a competitive advantage. And that niche became the airport transfers service.

– Mark Karegyesha (MD, Spe-Taxi Cabs)

"We operate in a market where Taxify offers 70% discount for boda-boda rides, sometimes even paying riders to be seen online even if they don't accept trips. We can't taken that route because we feel it's unsustainable in the long run. That's why such companies often face serious strikes from the drivers' end."

– Vaidehi Tambekar (Founder, Busy Boda)

"The overall effect of international taxi apps on the market has been both good and bad. Definitely the price of taxi transport in Kenya has come down dramatically, by almost 80%, in the last 5 years – from $1/km in 2012 to 14 cents/km today, thanks to Uber. So in some sense you can say that taxi transport has become more accessible.

However, the partner-side economics of these international apps is absurd, often abusive, putting a lot of pressure on the drivers, many of whom have outstanding loans. In that sense, they've been terrible actors for the ecosystem.

*We didn't want to take the Uber or Taxify strategy of subsidizing rides and buying customers. So, we changed our business model. Africa is not just one market, but a cluster of markets. We decided to franchise our technology and get it into the hands of local entrepreneurs across the continent. We do everything in terms of the platform – deploying the application, payment integration, communications, business intelligence, marketing and advisory services, while they pay a small upfront fee and a monthly revenue share***"*

– Jason Eisen (Chairman & Ex-CEO, Maramoja)

*$12.5 billion was raised by Uber alone for its global operations; **no longer active in African Market; *** We already have franchise agreements in place with 24 countries, 3 of which are launching locally branded apps soon in Ghana, Cameroon, and Ethiopia.

Sources: Traxcn 2018; Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala

SHARED MOBILITY IN NAIROBI & KAMPALA

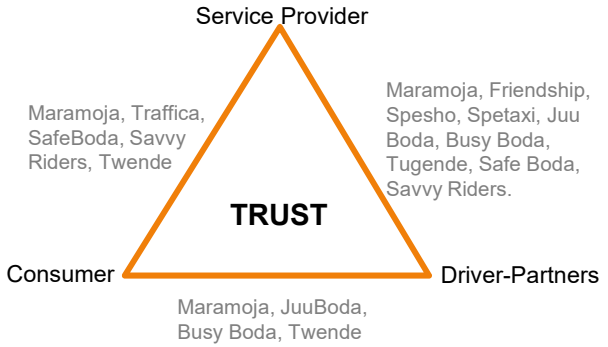
Towards a Market based on Trust

We realised that our expertise and also our competitive advantage was in our understanding the local market a lot better than the big international players. For instance, a market like Nairobi is built on trust where all drivers are not all the same. When I take a ride it's with 'my' driver, if not my driver then my friend's driver, and if not my friend's driver, then my driver's friend. There are these relationships. Why do all taxi apps ignore this? It's because most of them are not built in Nairobi, but in California, NYC or London where nobody cares.

And so we started building what we call a Trust Infrastructure as a Service (TIAS) – a proprietary recommendation algorithm that gets data from sources from your face book, phonebook, app usage history, from contents around you whether its day time or night time, raining or its sunshine, if you are in a safe place or a dangerous place – the algorithm looks at all of these factors and make recommendations about service providers from within the network.

– Jason Eisen (Chairman & Ex-CEO, Maramoja)

Association/ Relationship	Components
Service Provide & Driver-partner	Insurance, Microfinance, Loan eligibility
Driver-partner & Consumer	Matching algorithm, Driver behaviour training, Rating (Customer + Driver)
Service Provider & Consumer	Insurance, 24x7 Call centres, Safety provisions (helmets, vehicle type, driver trainings, GPS tracking, grievance redressal, panic button etc.)



Boda-boda riders don't get treated fairly and are often exploited because of their lack of knowledge of how things work. A lot of them, don't make that much money and are not trusted, making it difficult for them to get rides and also a loan from the bank when they need it. We wanted to come-up with something that could help them, and so Busy Boda was developed as an Uber-like app for boda-bodas.

But unlike Uber, we provide them with customer service training, safety training, easy access to insurance, microfinance loans and so on. Even when they need quick disposable cash during medical emergencies or to buy a smartphone, we give them cash and help them source the smartphone. And they pay us back in instalments.

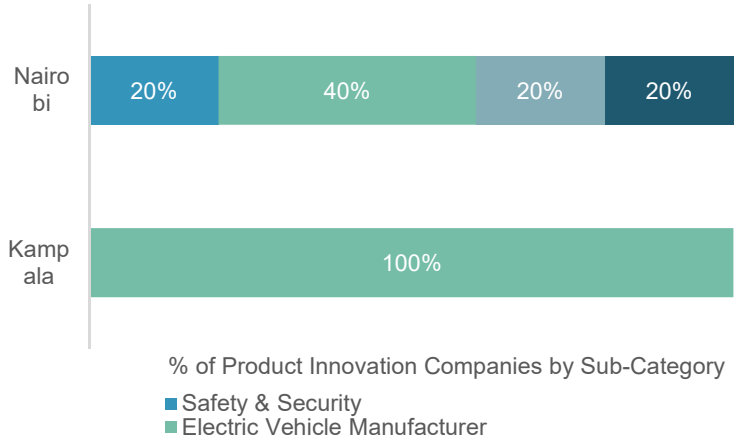
– Vaidehi Tambekar (Founder, Busy Boda)

Sources: Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala

PRODUCT INNOVATION IN NAIROBI & KAMPALA

Product Innovation is a nascent and evolving market

- Of the 17 companies characterized as Product Innovation (PI) across Sub-Saharan Africa, 5 are in Nairobi* and 1 in Kampala.
- Government of Uganda & Makerere University incorporated Kiira Motors Corporation is a manufacturer of alternative fuel vehicles. Their products include a solar bus, an electric sedan, and an hatchback. With an investment of $39.8 million from the Government & Makerere University in 2018, the endeavour hopes to create 2000 direct jobs and 12,000 indirect jobs in Uganda**.
- Of the 5 companies in Nairobi, 3 are yet to launch. These include Kuz Automotive*** – a 3-wheeler electric battery and conversion kit manufacturer, Netherlands-based Spike/Storm Mobility which manufacturers and assembles electric two-wheeler, and Nopia Ride – a subsidiary of Helsinki based EkoRent providing electric car aggregator service, currently running pilot tests in Nairobi.
- The other 2 already operational companies in Nairobi are Kibo Koneksie, a Netherlands based electric 2-wheeler manufactuer targeting the boda-boda market; and Cladlight, developer of LED base safety jackets for the 2-wheeler market.
- Cladlight raised $51,000 as seed funding from the tech hub Nailab in 2014. Their target customers are motorbike manufacturers, insurance companies and retail stores.



"In Kenya today, there's approximately 30,000 registered tuk-tuks. About 1000 tuk tuks are registered every month. Tuk tuk sales are slowly catching up with motorcycle sales. They are preferred for their passenger benefit i.e. operators of tuk tuks do so to gain revenue. They do not have 6-8 hours to charge the vehicle to run their business. That is why we shifted our focus from manufacturing electric tuk tuks to developing conversion kits for swappable batteries."

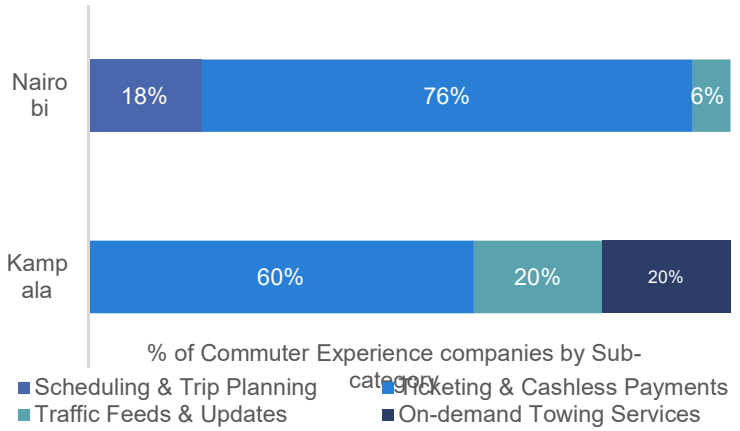
– Alex Makalliwa (Founder, Kuz Automotive)

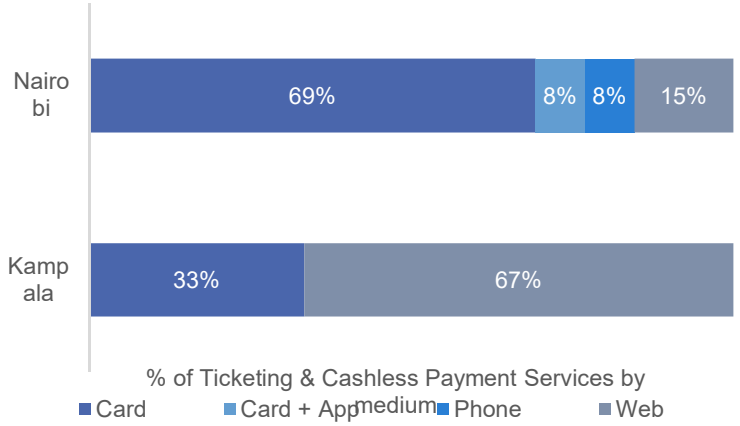
* There are 2 other companies, Go-Eco Tuk Tuk & Dave Tuk Tuk, that are in Mombasa, Kenya, but not in Nairobi. Both manufacture & develop electric tuk tuks; ** Estimated to reach full production capacity of 60,000 units/ year by 2029; *** still in prototype stage.
Sources: Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala

COMMUTER EXPERIENCE IN NAIROBI & KAMPALA

No Commuter Experience model offers both scheduling/ trip-planning and ticketing services

- Other than Nairobi-based Kuna Jam and Kampala-based Traffica – both app-based platforms that provide crowdsourced traffic updates to customers – a majority of the remaining companies (76% in Nairobi and 60% in Kampala) offer ticketing and cashless payment services.
- 3 companies in Nairobi offer scheduling and trip-planning services across web and app-based platforms, including Ma3route which offers matatu route information even on SMS and social media platforms.
- Kampala has no scheduling and trip planning service, but has Transport.me – a company that offers on-demand towing services to customers.
- Of the ticketing and cashless payment services, 13 are in Nairobi and 3 in Kampala.
- While the primary product of a majority of these companies are transit cards to be used on local matatu systems, a few are web-based platforms to pay for inter-city bus trips, and fewer still are accessible via app like the MobiTill Epsi Smart Transport App and phone/SIM based payment systems like M-Pesa.



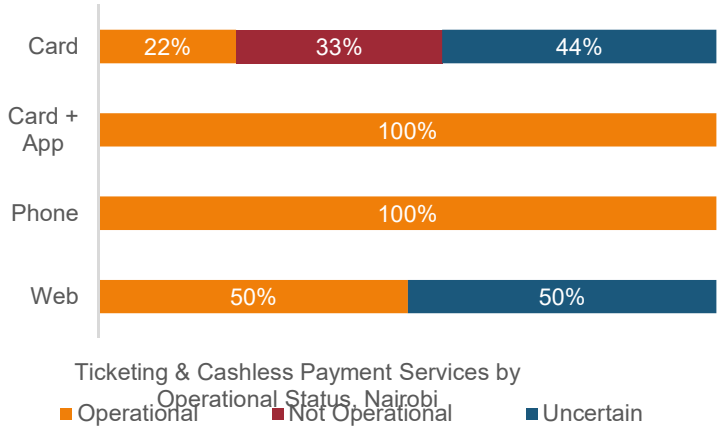


Sources: Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala

COMMUTER EXPERIENCE IN NAIROBI & KAMPALA

High attrition rates amongst transit card services in Nairobi

- Of the 3 ticketing and cashless payment services in Kampala, 2017-launched Quick Tap card and web-based inter-city bus booking platform Buu Pass* remain operational, while 2015-launched Uga Bus – a web-based intercity bus ticket booking platform has shut operations.
- However, in Nairobi, though card + app based Epsi Smart Transport and phone/SIM based M-Pesa are operational, the operational status of 1 of 2 web-based services is uncertain, while amongst the transit cards, a cumulative 77% are uncertain or not operational.



"Our first idea was to create an Uber of sorts for intra-city buses and Matatus. We chose Kenya due to high mobile money penetration and because cashless payments was a huge part of our value proposition. In 2016, we conducted a pilot in a Nairobi suburb, the results of which helped us win the HULT $1 million prize. However, when we came back we paused instead of going all in.

We did some research on the matatu industry, interviewed companies running card payments and found that they were struggling. It seemed like each stakeholder is incentivised by the inefficient yet predominant cash-based system. On the one-hand, the solution providers had a very top-down approach – they went directly to matatu owners' associations, SACCO managers and bosses, without understanding the needs of other stakeholders like conductors and drivers. On the other hand, because there was no cash in the system, certain stakeholders would deliberately sabotage the implementation. And then there are bigger companies like Uber and telecom providers, all with their own vested interests.

So we decided to pivot to long distance bus bookings."

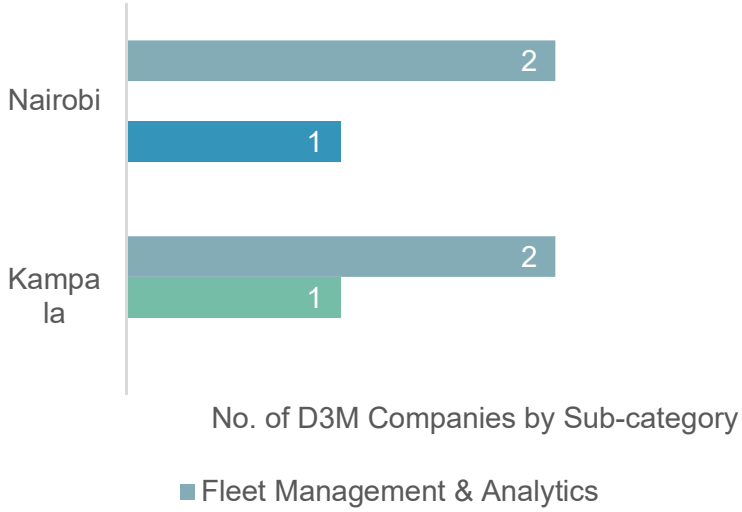
– Sonia Kabra (Co-founder & Director, Buu Pass)

* Also present in Nairobi. Buu Pass records Nairobi to Kampala as its most frequently booked route;
Sources: Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala

D3M IN NAIROBI & KAMPALA

Insights for Businesses and Insights for Cities

- Of the 8 companies characterized as Data Driven Decision Making (D3M) across Sub-Saharan Africa, 2 are in Nairobi, 2 in Kampala, and 1 in both cities – Bwala: an app and web-based platform for sourcing auto-parts, repair work, and servicing*.
- 4 out of these 5 companies in Nairobi & Kampala, including Bwala, offer fleet management and analytics as a service to both government agencies and businesses. This includes the now defunct Nairobi-based Matserve Msafiri app which was a road safety focussed app that helped traffic police to monitor matatu speeds.
- It also includes the multinational Mix Telematics – a SaaS**-based fleet management solution with vehicle monitoring systems, driver behaviour and diagnostics, crash alerts etc., and Nairobi-based MobiTil Epsi Smart Transport App – which other than offering fleet management services, also offers an integrated ticketing platform for matatu and bus systems with a flagship card – the Go Card***.
- The 1 remaining company is Kampala-based Ron outsourcing – a business-to-business (B2B) parking management solution provider.
- In the next section, we review the regulatory framework for transport services in Kenya & Uganda, while also gleaning insights into how they impact new mobility services.



*Uses their network to help companies to manage their fleet assets more efficiently throughout the supply chain. Also offers a self-driven car rental service; ** Software-as-a-Service;
*** They are currently working with National Police Service and National Transport and Safety Authority (NTSA) to set up a control centre..
Sources: Database of Mobility Enterprises in 6 African Countries, WRI India; Interviews with enterprises in Nairobi & Kampala

ENDNOTES

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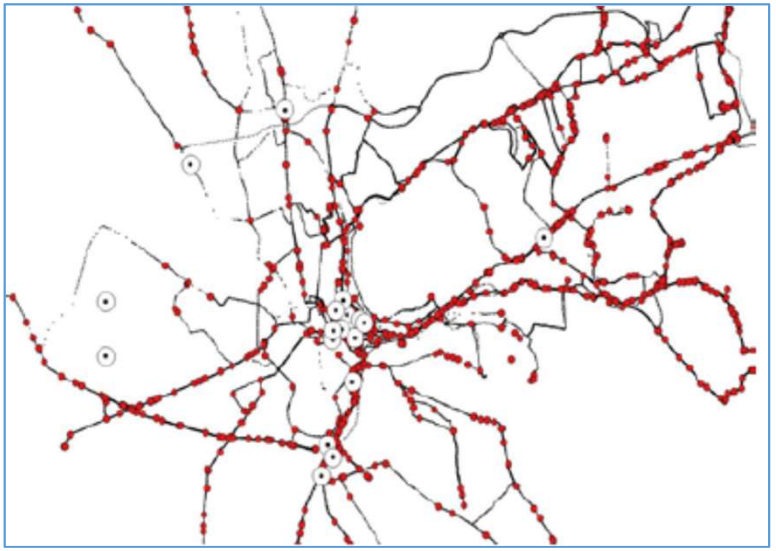
WORLD RESOURCES INSTITUTE | ROSS CENTER

PUBLIC SECTOR TRANSPORT STRATEGIES, POLICIES AND INVESTMENTS

GOVERNMENT ORGANIZATION AND PLANNING, KAMPALA

There is no central planning agency for the taxi services in Kampala.
New services are started or terminated sporadically, as drivers respond to demand opportunities.

- The **Transport Licensing Board** (Ministry of Works and Transport, National Government) regulates the use of public transport vehicles at the national level. But its role is limited as far as operations management is concerned.
- At the city level, **Kampala Capital City Authority (KCCA)** is the main regulatory body, though its role is limited on planning and operational aspects, such as determining routes, fixing schedules, etc. It does regulate, for example, on
  - Designated taxi ranks
  - Which vehicle(s) and driver(s) ply on a particular route
  - Pricing



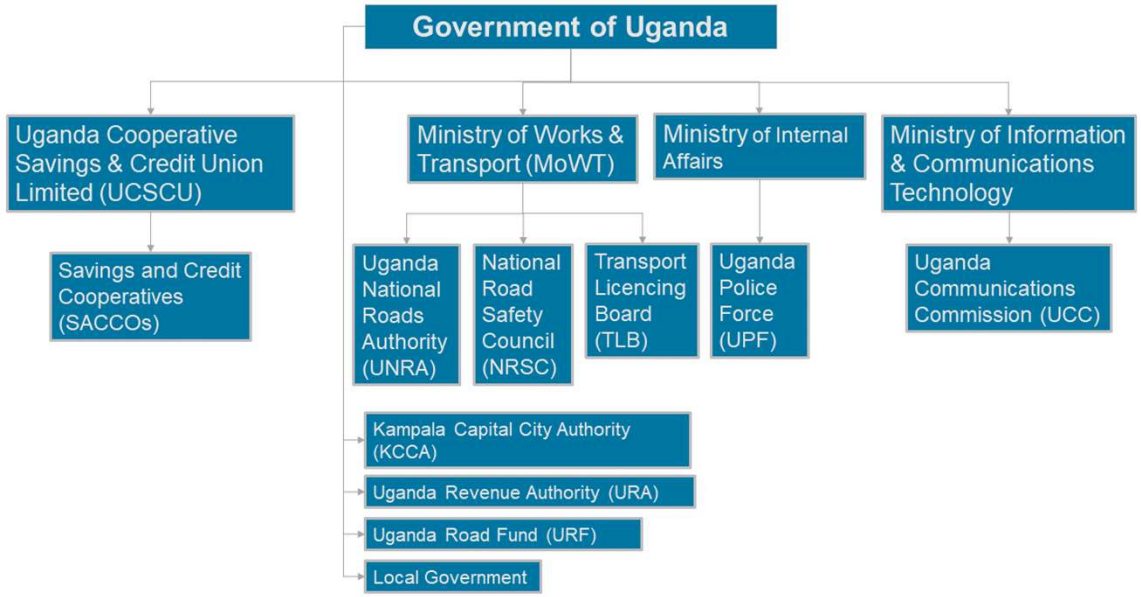
Minibus stops and stages in Kampala
Source: Ndibatya, 2016 [1]

INSTITUTIONAL ROLES & RESPONSIBILITIES, UGANDA

Agency	Level	Head	Associated Legislation	Roles & Responsibilities
Ministry of Works & Transport (MoWT)	Cabinet	Minister of Works and Transport	-	Lead Agency for implementing Works & Transport Sector Development Plan (WTSDP). Other responsibilities: legislation, policy, standard setting, strategic planning, and M&E.
Uganda National Roads Authority (UNRA)	National	Board Chairman	National Authority Act, No. 15 of 2006.	Develop, maintain, operate the national roads network; & advise Govt. on road policy
National Road Safety Council (NRSC)	National	Permanent Secretary of the Ministry (Dept of Transport)	National Road Safety Act, Act 9 of 1972.	Oversee road safety activities – planning, coordination, advocacy, resource mobilization; education, publicity, M&E.
Transport Licencing Board (TLB)	National	Board Chairman	Sec. 61, Traffic and Road Safety Act, 1998	Regulate use of public transport vehicles; private minibuses & goods transport vehicles throughout Uganda; & inspect and license Inland Water Transport Vessels.
Kampala Capital City Authority (KCCA)	City	Mayor	KCCA Act	Plan, develop and manage transport and traffic infrastructure in Kampala city including: a) Maintaining roads; b) Building & maintaining major drains; c) Installing & maintaining street lights; d) Organizing traffic; e) Carrying out physical planning and development control; f) Regulate the provision of transport services in the city
Uganda Road Fund (URF)*	National	Board Chairman	URF Act 2008	Collect road user charges (RUCs) to finance road maintenance programmes.
Uganda Revenue Authority (URA)*	National	Commissioner General	URA Act	Collect vehicle and road transport taxes; Oversee licensing with TLB
Ministry of Internal affairs (MIA)	Centre	Minister	Constitution	Facilitate the legal and orderly movement of persons to and from Uganda; Enforcement of Traffic and Road Safety Act and Regulations
Uganda Police Force (UPF)	National	Inspector General of Police (IGP)	Article 211 of Constitution; Police Act Cap 303	Protection of individuals and property; Maintain security and enforce laws
Ministry of Information & Communications Technology (MoICT)	Centre	Minister	Constitution	Provides strategic and technical leadership, overall coordination, support and advocacy on all matters of policy, laws, regulations and strategy for the ICT sector.
Uganda Communication Commission (UCC)	National	Board Chairman	Communications Act 1997	Responsible for regulating the communications sector including broadcasting; efficient and effective management of scarce communications resources; fostering efficient/healthy competition; consumer protection etc.
Uganda Cooperative Savings and Credit Union Limited (UCSCU)	Centre	Board Chairman	Uganda Cooperative Societies Statute 1991 & UCS Regulations 1992	National apex organisation for Savings and Credit Cooperative Societies (SACCO) in Uganda. UCSCU is formed, financed, owned and controlled by Savings and Credit Cooperative Societies (SACCOs).

* Operates under Ministry of Finance
Sources: Mobility profile report Uganda, 2018; Official website of the Ministries and agencies (see end notes)

INSTITUTIONAL ROLES & RESPONSIBILITIES, UGANDA CONT.



Institutions & agencies concerning the transport sector under government of Uganda

* Operates under Ministry of Finance
Sources: Mobility profile report Uganda, 2018; Official website of the Ministries and agencies (see end notes)

GOVERNMENT ORGANIZATION AND PLANNING, NAIROBI

A significant reform attempt in matatu industry took place around 2010. Since then, Kenya government requires every matatu owner to be part of Savings and Credit Cooperatives (SACCOs) or another management company to be eligible for a matatu license from Ministry of Transport and Infrastructure [2].
SACCOs, in turn, are required to register with the Directorate of Cooperatives under the Ministry of Industrialization. In 2013, a new agency called National Transport Safety Authority (NTSA) was established and the authority came with up performance indicators to be able to regulate SACCOs more effectively.

Stakeholders of the Matatu industry include:

- **Ministry of Transport and Infrastructure** is the regulatory authority responsible for road, air, and water transport in Kenya. The Ministry issues licenses to matatu owners once they are part of SACCOs. In theory, they are responsible for allocating routes to matatu owners, but this is, in reality, done by local route associations and powerful owners.
- **Ministry of Industrialization – Directorate of Cooperatives** is responsible for overseeing SACCOs.
- **SACCOs/ Management Companies** are route associations, of which all matatu owners are members. They represent matatus owners and drivers to the government. SACCOs collect certain fees from members and conduct vehicle inspections as a membership perquisite. These associations also provide loans for vehicle purchase, maintenance and personal needs (such as children's education), etc.
- **Matatu owners,** regardless of the route they operate, need to be associated with SACCOs.
- **Matatu crews (drivers and conductors)** mostly work on daily wages without fixed salaries from the owners.

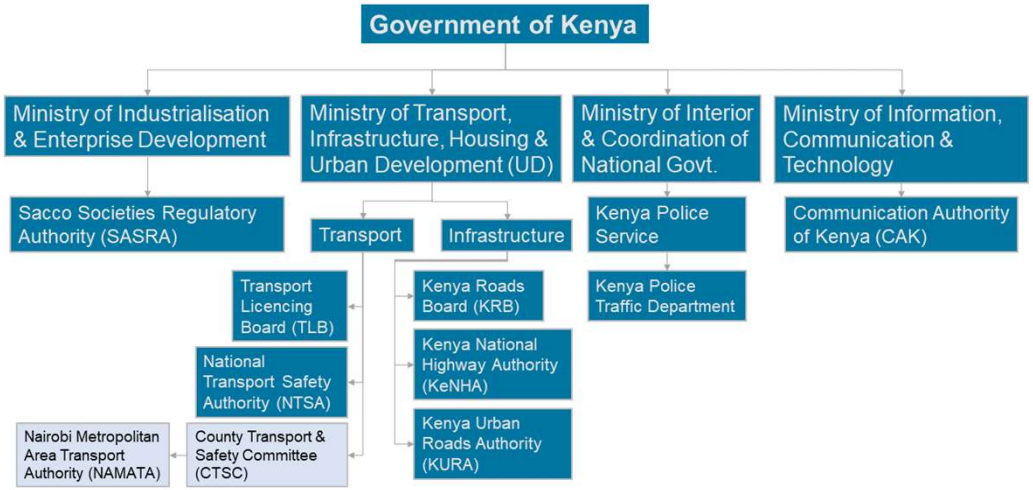
EMBARQ. 2014. "Mainstreaming Informal Public Transport (IPT) Systems into Formal Bus Transport: Stage 1 - Case Studies of Ipt Sector Reforms." Delhi: The World Resources Institute.

INSTITUTIONAL ROLES & RESPONSIBILITIES, KENYA

Agency	Level	Head	Associated Legislation	Roles & Responsibilities
Ministry of Transport, Infrastructure, Housing & Urban Development (UD)	Cabinet	Minister	-	Lead agency for developing & maintaining sustainable transport infrastructure. Responsible for enforcing regulations & standards, mobilizing resources & building capacity.
National Transport Safety Authority (NTSA)	National	Board Chairman	National Transport & Safety Authority Act, 2012	Registration & licencing of private & commercial (PSV) motor vehicles, developing, coordinating & implementing road transport policies & road safety strategies.
Transport Licencing Board (TLB)	National	Board Chairman	Transport Licencing Act, 2012	Responsible for periodic motor vehicle inspections, maintenance of integrated database of vehicle registrations, & provision of road service licences
Kenya National Highway Authority (KeNHA)	State Corporation	Board Chairman	Kenya Roads Act, 2007	Responsible for the management, development, rehabilitation and maintenance of international trunk roads (Class A road), national trunk roads (Class B roads) & primarily roads (Class C roads).
Kenya Roads Board (KRB)	National	Board Chairman	Kenya Road Board Act, 1999	Coordinates maintenance, rehabilitation and development of road network. Also administers funds from Road Maintenance Levy Fund (RMLF), & monitors implementations by other road agencies.
Kenya Urban Roads Authority (KURA)	State Corporation	Director	Kenya Roads Act, 2007	Core mandate is development, rehabilitation & maintenance of National urban trunk roads.
County Transport & Safety Committee (CTSC)	County	County Commissioner	Sec. 21 of NTSA Act, 2012	Oversees management & regulation of the road transport system at county level, prepares audit reports and advises NTSA on matters regarding road transport.
Nairobi Metropolitan Area Transport Authority (NAMATA)	Nairobi City*	Cabinet Secretary in charge of Transport	State Corporations Act, 2016/ 2012	To develop coherent transport policy sensitive to development within Nairobi Metropolitan Area, & oversee strategy & implementation of integrated transport master plan & integrated mass rapid transit system.
Ministry of Interior and Coordination of National Govt.	Cabinet	Minister	-	Responsible for coordination between the national government & the counties; disasters and emergency response; policy on Training of Security Personnel; Citizenship and Immigration Policy and Service; Border control Point Management and others
Kenya Police Service	National	Inspector General of Police	National Police Service Act, 2011.	Protect individuals & property , provide leadership for efficient administration, facilitate & coordinate policy implementation, & strengthen institutional capacity
Kenya Police Traffic Department	National		Section 24 of the National Police Service Act, 2011	Ensure free flow of traffic, work towards prevention & investigation of accidents; enforce laws, rules & regulations; initiate road safety sensitization to the members of the public.
Ministry of Industrialisation and Enterprise Development	Cabinet	Minister	-	Oversee policy, legal & regulatory frameworks for industries, special economic zones, micor & small enterprises & the co-operative sector.
Sacco Societies Regulatory Authority (SASRA)	State Corporation	Board Chairman	Sacco Societies Act, 2008	Core responsibility is to licence and supervise Deposit Taking Sacco Societies in Kenya.
Ministry of Information, Communication & Technology	Cabinet	Minister	-	Responsible for formulating, administering, managing and developing the information, broadcasting and communication policy in Kenya i.e. the National ICT policy.
Communication Authority of Kenya (CAK)	National	Board Chairman	Kenya Information and Communications Act, 1998	Licensing services in the communications industry, development of e-commerce, protecting consumer rights, managing competition and regulating tariffs for communications services.

* And also Kiambu, Muranga, Machakos & Kajiado counties.
Sources: Mobility profile report Kenya, 2018; Official website of the Ministries & Agencies (see end notes)

INSTITUTIONAL ROLES & RESPONSIBILITIES, KENYA CONT.



Institutions & agencies concerning the transport sector under government of Kenya

* Operates under Ministry of Finance
Sources: Mobility profile report Uganda, 2018; Official website of the Ministries and agencies (see end notes)

REGULATING TRANSPORT IN KAMPALA

- In Kampala, the Transport Licensing Board (TLB), and Kampala Capital City Authority (KCCA) regulate the number of taxis, private buses and paratransit services in the city. Regulations governing taxis include designated taxi ranks/parks and their fee, vehicle or driver's route and pricing, among others.
- While KCCA is also responsible for overseeing and ensuring road safety within the city, it is also the jurisdiction of the National Road Safety Council (NRSC), and the Uganda Police Force (UPF).

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

REGULATING VEHICLES, DRIVERS & OPERATIONS, UGANDA

Vehicle Requirements:

- KCCA regulates taxi parks at 2 UGX per taxi on entry.
- URA charges 35% as environmental levy on imported vehicles of 5-10 years from date of manufacture; 50% on 10+ years; while vehicle below 5 years pays 0% tax.

Driver Requirements:

- PSV drivers need a Class 'A' license for Motorcycle, Class 'B' for motorcars and dual-purpose (private & commercial) motor vehicles.
- The Traffic & Road Safety Act, 1998 mandates PSV licence holders to bear the PSV badge during police inspections.

Operations:

- Transport Licensing Board requires PSV holders of Boda bodas (Class 'M'), rental vehicles/ airport taxis (Class 'R'), Country & Town Taxi (Class 'C & T'); each to submit proof of Advance Income Tax* and third party insurance.

Tax compliance:

- Under 'Advanced' Tax', an amount of 20,000 UGX is charged per seat for passenger vehicles and a flat 50,000 UGX is charged to goods vehicles.
- Since Boda boda are licenced to carry passengers, operators are needed to pay 20,000 UGX as tax every year.

UGANDA				
Type of Service	Govt. norms	Taxi hailing	Taxi company	Boda boda hailing
PSV Permit	✓	✓	✓	×
Route	×	×	×	×
Driver training & verification	✓	✓	✓	✓
Driving experience & age verification	✓	✓	✓	×
Third party insurance	✓	✓	✓	✓
Vehicle type requirements	✓	✓	✓	×
Vehicle parking	✓	×	✓	×
Govt. regulated Fares/Pricing models	✓	×	✓	×
Safety management & complaints redressal (Quality of service)	×	✓	✓	✓

Govt. mandated norms transport vehicles v/s what ride hail companies already adhere to for good customer service (source: from interviews)

* Advance tax is a yearly tax for Boda Bodas (motorcycles) commuter taxis, buses and goods vehicles;
Source: Interviews with enterprises in Nairobi & Kampala

REGULATING TRANSPORT IN NAIROBI

- In Nairobi, the transport regulatory framework is guided by two main acts of Parliament namely the Traffic Act, 1953 Chapter 403 and associated amendments and legal notices, the National Transport and Safety Authority Act, 2012.
- Together, these acts deal with licensing of motor vehicles, specific conditions for the issuance of regular and commercial licenses (i.e. public service vehicle licenses), traffic penalties and exemptions, conditions to maintain road safety and so on and so forth.

REGULATING VEHICLES, DRIVERS & OPERATIONS, KENYA

Vehicle Requirements:

- Kenya Bureau of Standards requires imported vehicles to be fewer than 8 years old form the year of registration to be certified as roadworthy.
- For meeting the PSV standards or to procure Class A3 permit[22]; the engine capacity has to be a minimum 100 cc, and the vehicle should be able to carry a minimum load of 100 kg (equivalent to 1 passenger).

Driver Requirements:

- NTSA mandates Boda-Boda operators to carry two helmets and safety vests for driver and customer.
- To procure Class A3 permit the driver needs to be 21 years old and hold 1-year experience of A2 class license.

Operations:

- Drivers operating PSVs needs to have Taxi Cab Driver licence, Taxi-Cab Drivers Permit, Registration with Sacco/ Company certificate, Driver Uniform.

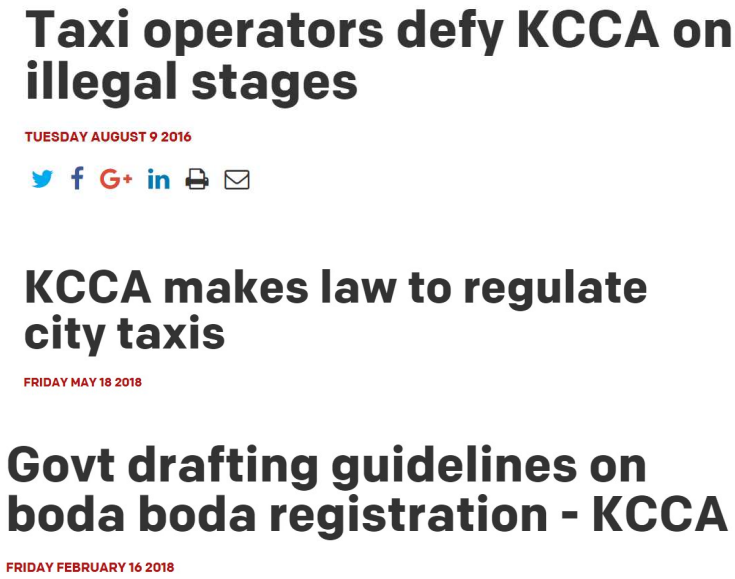
Tax compliance:

- 'Advance tax' rates are different for goods and passenger vehicles. Tax amount of 60 KES (per passenger capacity) per month; about 2400 KES per year; 1,500 KES (per ton of load capacity) minimum of KES 2,400 per year**.

KENYA				
Type of Service	Govt. norms	Taxi hailing	Taxi company	Boda boda hailing
PSV Permit	✓	✓	✓	×
Route	✓	×	✓	×
Driver training & verification	✓	✓	✓	✓
Driving experience & age verification	✓	✓	✓	×
Third party insurance	✓	✓	✓	✓
Vehicle type requirements	✓	✓	✓	×
Vehicle parking	✓	×	✓	×
Govt. regulated Fares/Pricing models	✓	×	✓	×
Safety management & complaints redressal (Quality of service)	✓	✓	✓	✓

Govt. mandated norms transport vehicles v/s what ride hail companies already adhere to for good customer service (source: from interviews)

REGULATING ACCESS—KAMPALA ATTEMPTS PARATRANSIT BAN



Taxi operators defy KCCA on illegal stages

TUESDAY AUGUST 9 2016

KCCA makes law to regulate city taxis

FRIDAY MAY 18 2018

Govt drafting guidelines on boda boda registration - KCCA

FRIDAY FEBRUARY 16 2018

Kampala has made several unsuccessful attempts to directly regulate paratransit operations

- The government in Uganda, through KCCA, has attempted several regulatory efforts aimed at minibus taxis and boda bodas.
- Efforts were made at banning certain staging areas but were largely ignored by private operators, who stated that the government did not conduct any outreach regarding new staging options.
- Likewise, efforts have been made to register all boda boda taxis. Concerns among labor conditions for drivers, and infiltration of certain rent-seeking officials have hampered such efforts.
- Among several regulatory schemes undertaken by government, there seems to be a lack of understanding from actual drivers and operators about how regulations may better be formed.

REGULATING ACCESS—NAIROBI ATTEMPTS MATATU BAN

Successive governments of Nairobi have attempted various forms of matatu bans in order to make the city less congested. Nevertheless, matatus being the only travel option for many Kenyans, the bans have never worked.

Recent History of Matatu Bans

- **December 3, 2018**: Governor Mike Sonko implemented matatu bans from Nairobi's central business district (CBD), citing lack of space to accommodate high number of public service vehicles in various city routes. The ban only lasted one day following commuter chaos and public outcry.
- **September 19, 2017**: Governor Sonko was forced to abandon his planned ban because of immense opposition from the Matatu Owners Association.
- **March 15, 2015**: Previous governor, Dr. Evans Kidero banned all matatus from CBD area, and his decision was publicly opposed by then Nairobi senator and critic-in-chief of City Hall (and current governor). The ban ceased to take effect after Dr. Kidero agreed to have dialogues with the leaders of matatu association.
- **2008**: Local Government Minister Uhuru Kenyatta announced planned to move matatus on the Jogoo road to Muthurwa after the completion of a bus terminus. The plan failed after Mr Sonko opposed and went to court.
- **2004**: Christened "Michuki Rules", after the former Transport minister John Michuki, were thus far the most effective in bringing order into mass transport in Nairobi. Michuki came up with a code of conduct for Public Service Vehicles (PSVs), including seat belts requirements, uniforms for conductors, fare charts etc. However, the minister also failed to phase out matatus from Nairobi city center.

https://www.citylab.com/perspective/2018/12/nairobi-kenya-bus-business-district-ban-mike-sonko/578737/

https://www.nation.co.ke/counties/nairobi/Matatu-CBD-ban-timeline-of-failures/1954174-4880128-13rmhngz/index.html

REGULATING NEW MOBILITY TRENDS

Transportation regulations in Nairobi and Kampala are guided by national level acts and agencies on one side and county specific policies and rules on the other.

- While no regulations are in place to specifically govern 'new mobility' services that we've extensively reviewed in previous slides, governments in both cities are considering policies and debating amendments to existing laws and acts to better account for these new services.
- For instance, the Ugandan Ministry of Works and Transport (MoWT) seeks to amend the Traffic and Road Safety Act, 1998, to **mandate online taxi-hire services to provide the ministry with profiles of their drivers.** Uber has been asked to provide a list of drivers for biometric inspection, which will be further verified by the Ugandan Revenue Authority (URA), and checks will be carried out on their conduct, professionalism and competence*.

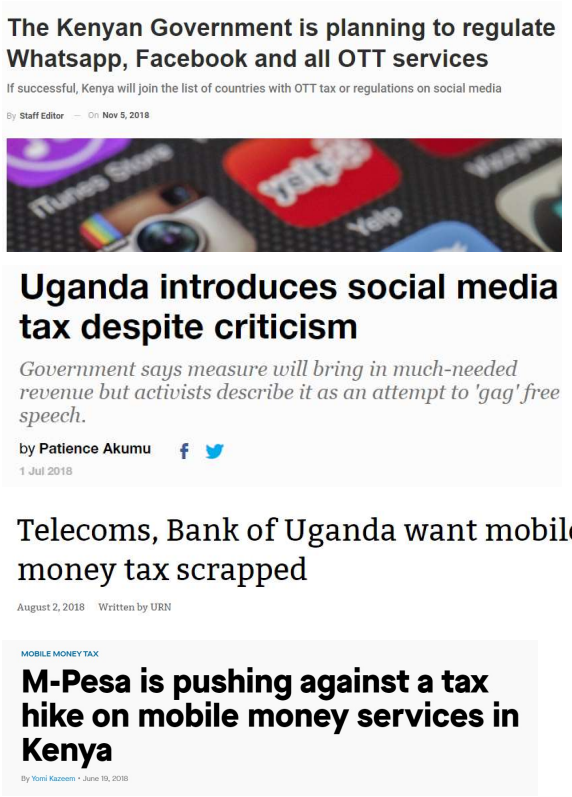
* Mobility Profile Report for Uganda, 2018, WRI; ** Mobility Profile Report for Kenya, 2018, WRI

REGULATING INTERNET ACCESS & MOBILE MONEY

- In both Kenya & Uganda, respective parliaments are considering imposing a tax on mobile money transactions and on the use of social media platforms.
- While Uganda has already amended its Excise Duty Bill 2018[30] to reflect these changes in the tax structure, Kenya is debating the enforcement of a similar amendment[31].
- The Excise Duty Bill, 2018 includes the following changes:
  - 'Over the Top' (OTT) Tax of 200 Shillings (0.5 USD)[32] per user per day on access to social media platforms
  - Additional 0.5% tax (initially 1%) on mobile money withdrawals[33].
  - Excise duty on mobile money increased from 10% in 2018 to 15% in 2019[34].
- In Kenya, Excise duty on mobile money transfers has been increased from 10% in 2013 to 12% in 2018[35]. Duties in airtime and data services have been increased from 10% to 15%[36].

"In Uganda, the government has issued a tax called OTT on a package of social media apps. This includes WhatsApp, Twitter, Facebook and so on. In Traffica app version 2-point O, we have a direct link with Twitter for real time traffic updates. You see, many people use Twitter for traffic updates. But before we knew, the government introduced this tax".

– Jacob Wasawa (Founder, Traffica)



The Kenyan Government is planning to regulate Whatsapp, Facebook and all OTT services

If successful, Kenya will join the list of countries with OTT tax or regulations on social media

By Staff Editor — On Nov 5, 2018

Uganda introduces social media tax despite criticism

Government says measure will bring in much-needed revenue but activists describe it as an attempt to 'gag' free speech.

by Patience Akumu

1 Jul 2018

Telecoms, Bank of Uganda want mobile money tax scrapped

August 2, 2018 Written by URN

MOBILE MONEY TAX

M-Pesa is pushing against a tax hike on mobile money services in Kenya

By Yomi Kazeem • June 19, 2018

News articles depicting the introduction and criticism against 'OTT' Tax and taxes on mobile money transactions in Kenya & Uganda

Source: Interviews with enterprises in Nairobi & Kampala; News sites

REGULATING CASHLESS PAYMENTS IN NAIROBI

- **There are many benefits to a cashless transport system**--including reducing waiting time from collecting cash fares, eliminating wastes from paper tickets, and offering city officials with richer macro data to better understand customer behaviors and bus route allocations. For developing cities like Nairobi, **eliminating physical money could potentially mean reducing fare evasion, operators and police corruption and other inefficiencies**, thereby resulting in a fully accounted and consistent revenue stream.
- To materialize the promises of a cashless transport system, Kenyan lawmakers initiated a program in 2013, and mandated that all Nairobi matatus become cashless in the following year. As a result, many private sector vendors swarmed to the city. **In April 2013, Google partnered with Equity Bank, and introduced BebaPay, cashless payment cards** that could be prepaid or topped off in various locations.
- After 1.5 years, it became obvious that **the matatu cashless system was a failed experiment**. There are two main reasons:
- (1) **The regulation was very much top-down** and not all relevant stakeholders were involved in the decision-making process. While the Kenyan government, private vendors and matatu owners were consulted on the matter, the incentives for the actual implementors--I.e. the matatu operators—were not considered.
- (2) In the first year, there were several competing transit cards that were introduced to different bus lines. Due to **the lack of system-wide integration**, passengers had to use several cards or wait for specific buses that accepted their particular card.

"The [matatu] operators … say the [BebaPay] system is denying them 'their fair share' of the day's proceeds. As a result, the operators sabotage it."

-quoted in the Kenya Wall Street Journal (August 3, 2018)

https://blog.mondato.com/cashless-transportation-kenya-rwanda/
https://kenyanwallstreet.com/guest-opinion-how-nairobi-matatus-defied-the-will-of-kenyas-cashless-policy-makers/

IMPACT OF REGULATIONS ON NEW MOBILITY SERVICES

Regulatory Framework as an Enabler and/or a Barrier to the growth of New Mobility services

Service type	Measures undertaken	Reason	Impact
Shared Mobility	City Council's ban on company-run boda bodas from entering the Central Business District (CBD)	Increased accidents and congestion in the CBD. Complaints of boda boda riders not adhering to the traffic rules	Enterprises resort to using vehicles without company branding and other mechanism to by pass the ban.
	Limit on *matatus* entering the CBD	Reduce congestion	Fleet utilization low; passenger waiting time increased
	Limit on car parking provisions in the city centre	Reduce congestion, Promote usage of other modes of transport	Shared mobility services that 'owns vehicle' are impacted for those that don't own this regulation doesn't apply
	Fluctuation in fuel prices	Market changes.	Tariffs increased for ride hail services,
	Car models before 2001 not allowed to ply on the road	Control on emissions from vehicular sources	Increased costs of importing newer vehicle.
Commuter Experience/ Data Driven Decision Making	Govt. tax on Internet 'Over the top' (OTT) services	To generate revenue, improve internet services, & regulate social media usage[38]	Traffic update apps that share information on twitter have to bear additional costs
Product Innovation	Cost of conversion rate in Uganda is high for import of goods (batteries/ electric motors)	Most of the component parts are imported.	Unable to bring the vehicle cost down; leading to unaffordability at the manufacturer & customer end
	No incentive or separate category for registration of electric vehicles.	No standards for electric vehicles has been developed	People's increased preference over gasoline and diesel run vehicles

* Interviews with enterprises in Nairobi & Kampala

BUILDING BUS RAPID TRANSIT (BRT) IN KAMPALA

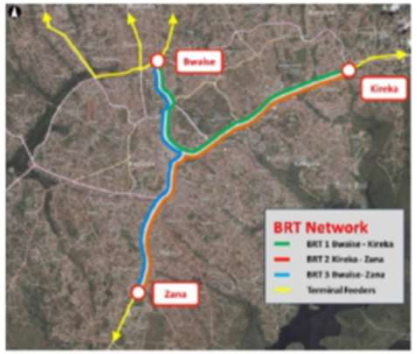
BRT

- A BRT for Kampala was envisaged many years ago, but as of now, it has still not been implemented.
- A new detailed engineering design for the Kampala BRT Pilot Phase was completed in 2014.
- The plan is to open 8 routes by 2030.
- The capacity is planned for between 9,000 to 12,000 passengers per hour per direction. It will carry over 130 million passengers per year, and pick up about 20% of the public transport demand in the Greater Kampala Metropolitan Area.
- KCCA is working with MoWT to ensure that the BRT Pilot project is implemented soon, and both World Bank and French Development Agency are re-engaged on this investment.

Other initiatives

- KCCA plans to reconstruct and restructure the Old Taxi Park and Usafi Park with funding from donor agencies.
- Awakula Ennume is planning to add another 180 buses to serve 6 new routes under a five-year concession. The association has entered into a joint venture with an international bus manufacturer who has agreed to deliver buses and maintain them for 3-years.

Planned BRT in Kampala



BUILDING BRT IN NAIROBI

BRT

- In 2018, bus lanes were marked on the busy Thika highway
- The project represents a precursor to Phase 1 of a multi-phased BRT implementation project.
- Serious questions on the effectiveness of these lanes, hasty implementation without review

Marked BRT lane along Thika Hwy (photo courtesy of Nairobi News)

http://africa.itdp.org/wp-content/uploads/2017/03/Nairobi-BRT-Phase-I-Infrastructure-Intersection-Recommendations-Detailed-Report.pdf

ENDNOTES: OFFICIAL & AGENCY WEBSITES

Uganda

1. Ministry of Works & Transport: https://www.works.go.ug/
2. UNRA: https://www.unra.go.ug/en/welcome
3. TLB: http://www.works.go.ug/transport-licensing-board/
4. KCCA: https://www.kcca.go.ug/
5. URA: https://www.ura.go.ug/
6. URF: http://roadfund.ug/
7. Ministry of Internal affairs: https://www.mia.go.ug/
8. Uganda Police force: https://www.upf.go.ug/
9. Ministry of Information & Communications Technology: https://ict.go.ug/
10. UCC: https://www.ucc.co.ug/
11. Uganda Cooperative Savings and Credit Union Limited: https://ucscu.coop/; https://ucscu.coop/index.php/faqss

Kenya

1. Ministry of Transport, Infrastructure, Housing & Urban Development: http://www.transport.go.ke/
2. TLB: http://www.vertic.org/media/National%20Legislation/Kenya/KE_Transport_Licensing_Act.pdf
3. NTSA: http://www.ntsa.go.ke/index.php
4. CTSC : http://www.ntsa.go.ke/index.php?option=com_content&view=article&id=202&Itemid=768
5. NAMATA: http://www.president.go.ke/2017/02/10/executive-order-the-nairobi-metropolitan-area-transport-authority-namata/
6. KRB: https://www.krb.go.ke/; https://fortuneofafrica.com/kenya/kenya-roads-board-krb/
7. KeNHA: http://www.kenha.co.ke/
8. KURA: https://kura.go.ke/
9. Ministry of Interior & Co-ordination of National Govt. : http://www.interior.go.ke/
10. Kenya Police Service: http://www.kenyapolice.go.ke/
11. Kenya Traffic Police Dept: http://www.kenyapolice.go.ke/2015-09-07-17-41-13/traffic-police-department.html#
12. Ministry of information, Communications & Technology: http://www.ict.go.ke/
13. CAK: https://ca.go.ke/; https://www.linkedin.com/company/communications-authority-of-kenya-ca-/?originalSubdomain=in
14. Ministry of Industrialization & Enterprise Development: http://www.industrialization.go.ke/
15. SASRA: http://www.industrialization.go.ke/index.php/state-corporations/81-sacco-societies-regulatory-authority-sasra

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CONCEPTS, CHALLENGES, AND OPPORTUNITIES FOR INTEGRATED TRANSPORT

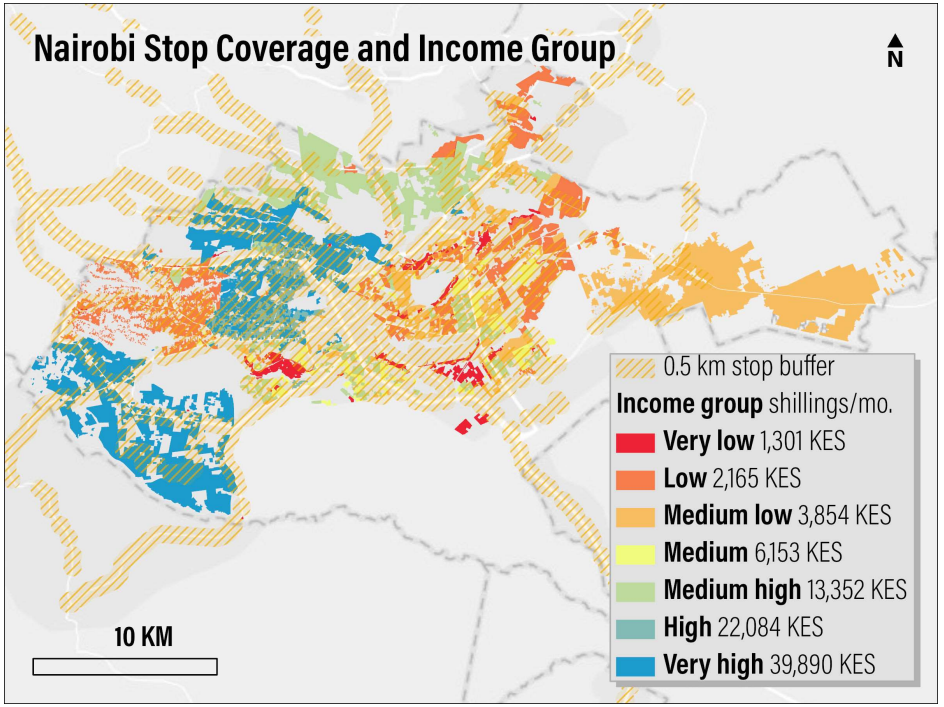
KEY REFLECTIONS—TRANSPORT COSTS

Transport in Nairobi and Kampala creates some of the following environmental, health and household costs:

- **Road safety has a profound economic impact.** In Nairobi, residents endure a high 15 fatalities per 100,000 inhabitants, and a similar rate in Kampala. This compares, for example to 6 fatalities per 100,000 residents in cities such as Bogota or Sao Paulo.
- **Transport is a climate contributor, but not a big one, yet.** Transport represents around 10 percent of emissions, as opposed to just over 20 percent globally. However, with motorization on the march, higher emitting vehicles, this poses a risk of significant growth. A key will be keeping residents in public transit and away from single occupancy vehicles.
- **Pollution is also a significant problem**, especially on the street level where measurements show PM2.5 levels at 120 micrograms per cubic meter. (The US EPA daily limit of "safe" exposure is 35).
- **Finally, transport is not affordable to many residents.** A trip of under 30km costs 60-100 shilling in Nairobi (~60 cents to $1 USD). This can be out of reach for many residents, and puts other modes such as boda boda certainly out of reach.
- **There are large institutional obstacles.** City-level authorities lack power, or lack consolidated transportation agencies, especially on the metropolitan level.

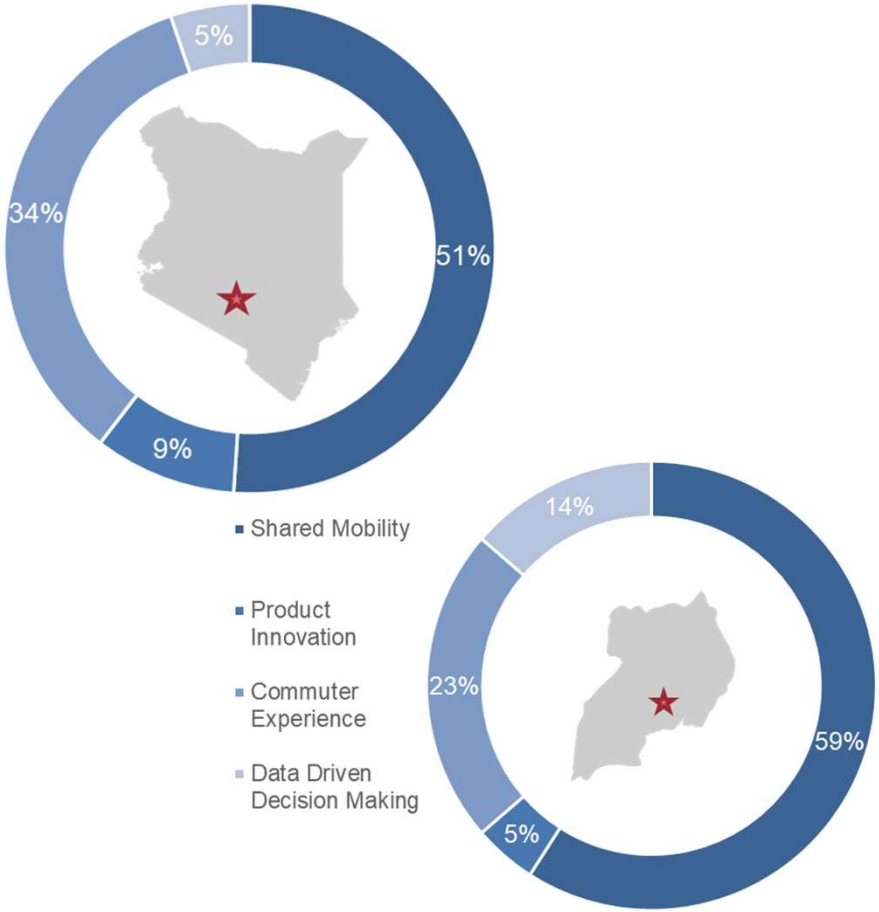
KEY REFLECTIONS—ACCESSIBILITY, NONMOTORIZED MODES

- **The matatu system is the spine for motorized transport for residents of Nairobi (and likely in Kampala)**, providing an option that is cheaper, though less accessible, than private cars, but much faster than walking.
- Only 50% of low-income residents are located within a half kilometer of a matatu stop;
- However, compared to middle-income groups, **low income residents have comparatively high access**, due in part to their central location and high density.
- Most middle-income residents rely on matatus for transport, while **low-income residents rely on walking**, likely because they cannot afford otherwise.
- The prices for travel by matatus, boda boda and especially private car are unaffordable to low-income residents, in addition to their low access to the routes.
- Ride-hailing apps for bodas or matatu user experience apps holds promise for an integrated system, but may be limited mostly to middle income residents, who can afford these services and who have better access to services.
- Non-motorized infrastructure investments and policies should take precedent to address low-income mobility and safety needs



KEY REFLECTIONS—EMERGING PRIVATE-SECTOR LED INITIATIVES

- Shared mobility entrepreneurs represent the most common, enduring start-ups in Africa
  - In Nairobi and Kampala these enterprises are primarily ride-hailing services using personal vehicles
- Although proliferation of cashless banking models remain low, there is high future potential for digital and integrated payment schemes to grow—especially given the accelerating penetration of smartphones and internet access.
  - However, past cashless ticketing attempts—especially in Nairobi—experience high attrition rates
- Investments in transportation technology are seeing tremendous growth
  - Ride-hailing especially attracts large amounts of funding and influence direction of innovation in the region



EXAMPLES OF ACTIONS TO PURSUE FOR INTEGRATED TRANSPORT

Infrastructure and operational integration

- Improved staging areas in consultation with operators.
- Physical integration of taxi stands with new BRT, public space between modes.
- Pedestrian access and "complete streets" pilots, policies.
- Cycle share opportunities.

Information integration

- Create capacity for sustained, open map of routes.
- Pilot options for real-time arrival.
- Visual mode integration.

Integrated payments

- Revisit efforts on cashless fares, leveraging mobile and cashless payment usage in the cities.
- Explore partnerships for modal integration, such as fare payment for minibus taxi to BRT, or boda boda to bus.

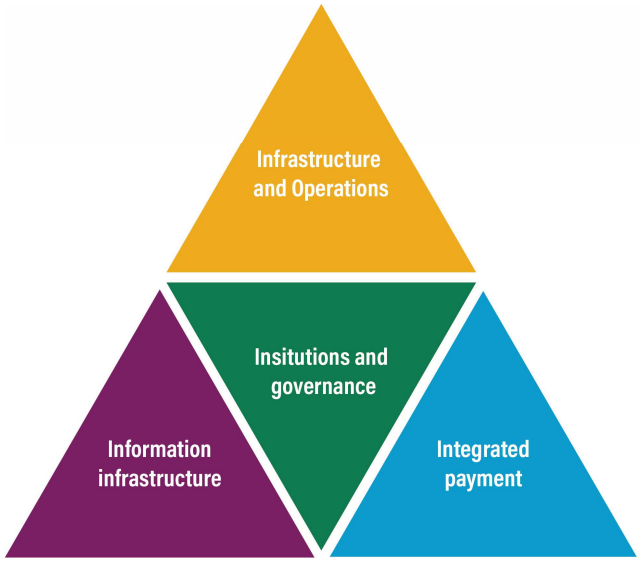
Institutions and governance

- Study and consider the political economy or transport.
- Create an institutional map of how decisions are made and opportunities for partnerships where quick wins may be achieved.
- Better understand operations and the business of paratransit in the city.
- Connect with development agencies, such as World Bank, French Development Agency, GIZ, and others that may be investing in public transit. For example, the coming BRT in Kampala represents an opportunity to connect on the issue of integrated transport.
- Gather enterprises and connect them in forums to create dialogue and basis for future collaboration.

https://www.sutp.org/files/contents/documents/News/2018_March/3f_Transit_Alliances_SUTP_TUMI_GIZ_final.pdf

TOWARDS INTEGRATED TRANSPORT

- **Infrastructure and operational integration** – Different transport services must be in proximity to each other to enable commuters to safely and efficiently transfer. This requires physical and operational integration.
- **Information integration** – Commuter decision making is significantly improved when information about routes, schedules, transfers, vehicle real time location, and estimated time of arrivals (ETA) is integrated across transport services and is available for consumption via a single interface.
- **Integrated payments** – Cash has long been a common currency accepted across all modes of transport. With the shift to digital payment systems by mass transit services, there is a need for integrated payment solutions that allows seamless payment regardless of the service provider.
- **Institutions and governance**—coordinated governance is an enabling condition for cross-sector collaboration and regulation



RANKING SUITABILITY OF INTEGRATED TRANSPORT ACTIONS—INFRASTRUCTURE AND OPERATIONAL INTEGRATION

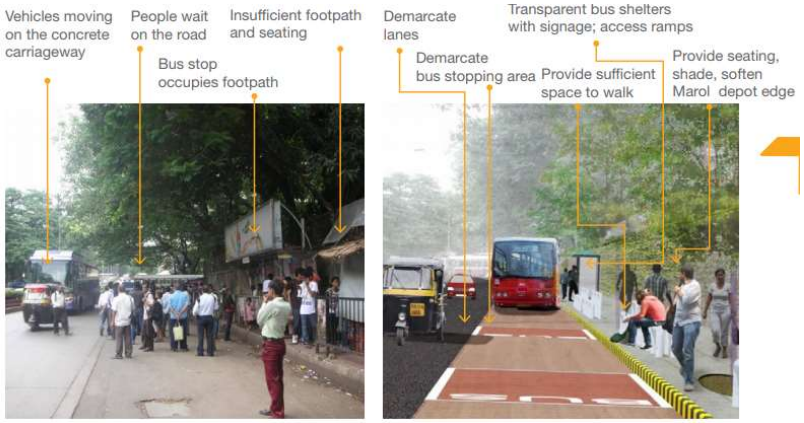
	Activities	Investment level	Human capital
Infrastructure and operational integration	Improved staging areas in consultation with operators.	High	High
	Physical integration of taxi stands with new BRT, public space between modes.	Medium	High
	Pedestrian access and “complete streets” pilots, policies.	Medium	High
	Cycle share opportunities	High	High

Notes & Recommendations

Physical infrastructure improvements tend towards high levels of investment and subsidy, but with great potential for immediate benefits in service quality, safety and integration. Providing safe and convenient access to terminals and stops for pedestrians and bikers is crucial, for instance, since they tend to be the locations where different modes of transport and passengers interact.

Infrastructure for traffic calming or speed management can also improve pedestrian and passenger safety. Cities can focus on making paratransit safer by employing clear signage and good lighting at night hours. Planned infrastructure that promotes convenient and safe transfer between transit and NMT modes, like bicycle storage, is also important.

In Kampala and Nairobi, investments in BRT infrastructure present new, critical opportunities to apply integrated transport solutions for both paratransit, boda- boda and NMT users.



Existing and re-designed bus shelters in MIDC Marol, Mumbai

RANKING SUITABILITY OF INTEGRATED TRANSPORT ACTIONS—INFORMATION INTEGRATION

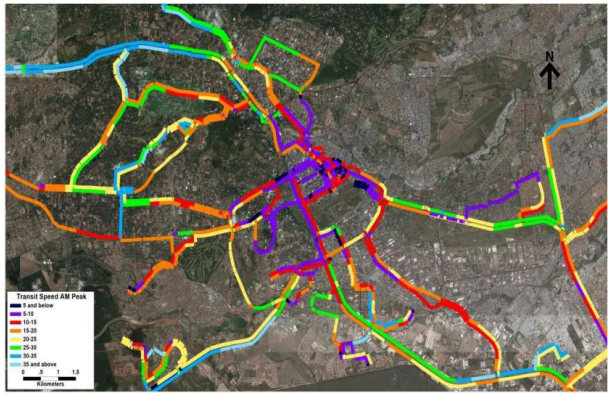
	Activities	Investment level	Human capital
Information integration	Create capacity for sustained, open map of routes	Low	Low
	Pilot options for real-time arrival.	Medium	Medium
	Visual mode integration.	Low	Low

Notes & Recommendations

From the mapping of matatus in Nairobi, Kenya (known as Digital Matatu project) in 2013, a whole series of paratransit mapping exercises have taken place all over the world. While government officials have yet to discern values in these data, an ecosystem of services and products that can in turn improve the paratransit systems (such as paratransit routing and accessibility analysis) has emerged in the private, non-profit, and academic sectors.

Entrepreneurs and private-sectors can also take advantage of open data, creating products that can help users navigate and model their transit networks. For instance, Digital Matatus was able to put their data on Google Maps, allowing Nairobi users to navigate their paratransit systems. **Creating non-digital visuals that convey route, timetable and fare information is also crucial for non-mobile users.**

In Kampala, there has been a number of efforts to map and track transit networks (see notes). The data, however, is not openly available with no immediate intention to update and maintain it. **Capacity must be built on-the-ground to enable Universities and city governments to continue creating and receiving value from quality, up-to-date and useable data.**



Morning Peak Hour Mean Matatu Speeds *(Created by University of Nairobi, Columbia University, and MIT, 2013)*

RANKING SUITABILITY OF INTEGRATED TRANSPORT ACTIONS—INTEGRATED PAYMENTS

	Activities	Investment level	Implementation
Integrated payments	Revisit efforts on cashless fares, leveraging mobile and cashless payment usage in the cities.	High	High
	Explore partnerships for modal integration, such as fare payment for paratransit to BRT, or boda boda to bus.	Low	Medium

Notes & Recommendations

Cashless and digital fare payment systems require considerable start-up investment outside the transport sector. It also requires a baseline digital banking infrastructure that may make adoption of tap-n-go card or app-based payment schemes difficult—**especially in Uganda where adoption of smartphones and bank accounts is lower than in Kenya.**

Fare alliances or partnerships exploring fare integration would likely require lower levels of resource investments and high levels of cross-sector engagement. In Kampala and Nairobi, fare integration between paratransit, boda-boda and future BRTs presents opportunities for unifying and reducing costs between modes.

https://usa.visa.com/dam/VCOM/global/visa-everywhere/documents/visa-cashless-cities-report.pdf

RANKING SUITABILITY OF INTEGRATED TRANSPORT ACTIONS—INSTITUTIONS AND GOVERNANCE

	Activities	Investment level	Implementation
Institutions and governance	Study and consider the political economy of transport.	Low	Low
	Create an institutional map of how decisions are made and opportunities for partnerships where quick wins may be achieved.	Low	Low
	Better understand operations and the business of paratransit in the city.	Low	Low
	Connect with development agencies, such as World Bank, French Development Agency, GIZ, and others that may be investing in public transit. E.g., the coming BRT in Kampala represents an opportunity to connect on the issue of integrated transport.	Low	Low
	Connect enterprises in forums for future collaboration.	Low	Low

Notes & Recommendations

In Kampala, more is needed to identify appropriate stakeholders (e.g., operator unions, BRT development team, international development groups, entrepreneurs, etc.) to engage in the integration of transit services.

ENABLING CONDITIONS FOR REFORM

With the policy attitude of many public officials positioned towards banning matatus and boda boda, the opportunity for discussion on how to create integrated transport systems is limited.

Efforts may be more beneficial, initially, through an approach to change the discussion about how these modes serve the city.

- Explore opportunities for increasing access to the most affordable form of motorized transport, minibus taxis.
- Identify opportunities for increasing affordability of last-mile connectivity or short-trip providers such as boda boda applications.
- Assess opportunities to increase bicycling network in the city and pedestrian connectivity.
- Consider how to increase integrated transport through new enterprises, starting with middle-income residents who use them most, while scoping initiatives that could increase low-income residents' ability to use them.
- Unlike past efforts, engage with operators of minibuses and bodas, to better understand business models, operations, and paths to reform.
- While investing in BRT, develop a paratransit plan for the city, acknowledging the services and their inevitable role in the system.