



Africa Urban Mobility Observatory

Action Plan - Kigali

Big Data to Enable Inclusive, Low-Carbon Mobility

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Africa Urban Mobility Observatory/40001

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| Abstract | |
| The key objective of the Africa Urban Mobility Observatory (AUMO) research project is to promote inclusive, low-carbon mobility in African Low-Income Country (LIC) cities, by piloting Big Data applications to generate data, benchmark performance, and draw policy insights in six African cities. These insights will be used to develop Action Plans in two of these cities, and catalyse broader uptake via a Web Data Platform, workshops, and research. This document is the first draft of the Kigali city level action. It is informed by the data collected during the AUMO project implementation process and supplemented by other trusted data sources and existing policy frameworks. This living document is intended to support and inform future policy development and investment in inclusive, low-carbon mobility in the City of Kigali. | |
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CONTENTS

| | |
|---|-----------|
| 1. Introduction | 5 |
| 1.1 Report objectives | 5 |
| 1.2 Research background and objectives | 5 |
| 1.3 Project activity streams and deliverables overview | 5 |
| 2. City Action Plan on Inclusive Low Carbon Mobility | 6 |
| 2.1 Action plan development | 6 |
| 3. Mobility Landscape | 7 |
| 3.1 Status of urban mobility in Kigali | 7 |
| 4. Vision for a Sustainable Mobility future | 10 |
| 4.1 Summary Kigali Action Plan | 11 |
| 4.2 Governance and strategy | 12 |
| 4.2.1 Create enabling policy and regulatory frameworks for promoting sustainable mobility | 12 |
| 4.2.2 Increase investment in inclusive and safe mobility systems | 12 |
| 4.2.3 Accelerate delivery and implementation of existing plans and strategies | 13 |
| 4.3 Inclusivity in urban mobility | 13 |
| 4.3.1 Improve civil society organisations and community engagement in decision making | 13 |
| 4.3.2 Accelerate delivery of complete walking and cycling networks, which prioritise universal access in the city centre with connections to areas outside of the city centre | 14 |
| 4.3.3 Address personal security concerns for women due to sexual harassment | 15 |
| 4.3.4 Improve road safety | 15 |
| 4.4 Climate change and environment | 16 |
| 4.4.1 Reduce reliance on personal motor vehicles (PMV) | 16 |
| 4.4.2 Continue to deliver on commitments to compact mixed use design in green network planning | 17 |
| 4.4.3 Increase bicycle mode share | 18 |
| 4.4.4 Prioritize clean and efficient mobility | 18 |
| 4.4.5 Monitor and improve air quality | 19 |
| 4.5 The role of paratransit | 20 |
| 4.5.1 Professionalisation and regulation of the motorcycle and bicycle taxi paratransit transport system | 20 |
| 4.5.2 Construction and maintenance of paratransit support infrastructure | 21 |
| 4.6 Sustaining data efforts | 21 |
| 4.6.1 Improve capacities for holistic data collection and straightforward procedures to collect and access data | 22 |
| 4.6.2 Partner with local universities, research institutions and transport operators to conduct studies on sustainable transport systems for the city | 22 |
| 5. Monitoring and Evaluation | 23 |
| 6. References | 27 |



TABLES

| | |
|---|----|
| Table 1: Action plan timeline..... | 6 |
| Table 2: Means of verification for the Kigali Action Plan | 23 |

FIGURES

| | |
|---|---|
| Figure 1: Research activity flow | 5 |
| Figure 2: Distribution of bus stops and areas served within 500m walking distance, Kigali | 8 |
| Figure 3: Kigali transport modal split (14) | 9 |

ACRONYMS AND ABBREVIATIONS

| | |
|------------------|--|
| ATPR | Association des Transporteurs des Personnes au Rwanda |
| AUMO | African Urban Mobility Observatory |
| BRT | Bus Rapid Transit |
| CBD | Central business district |
| EV | Electric vehicle |
| GDP | Gross Domestic Product |
| GGGI | Global Green Growth Institute |
| GHG | Green House Gas |
| HVT | High Volume Transport |
| ICT | Information Communication Technologies |
| MININFRA | National Ministry of Infrastructure |
| MIPTR | Ministry of Infrastructure, Public Works, and Reconstruction |
| NGO | Non-Governmental Organisation |
| NLUDMP 2020-2050 | National Land Use and Development Master Plan |
| NMT | Non-Motorized Transport |
| NTP | National Transport Policy and Strategy |
| NUA | New Urban Agenda |
| RURA | Rwanda Utility Regulatory Authority |
| RTDA | Rwanda Transport Development Agency |



| | |
|------|---|
| SDG | Sustainable Development Goals |
| SPVS | Small Public Service Vehicles |
| SUMP | Sustainable Urban Mobility Plan |
| TOD | Transit-Orientated Development |
| UEMI | Urban Electric Mobility Initiative |
| UN | United Nations |
| USSD | Unstructured Supplementary Service Data |
| UMA | User Movement Analytics |
| WHO | World Health Organisation |



1. Introduction

1.1 Report objectives

This action plan falls under Activity Stream 4 of the HVT Africa Urban Mobility Observatory (AUMO) project. The primary objective of this living document is to define policy measures, processes, and packages of projects to be developed, which correspond to the sustainable mobility vision of Kigali, including time frame and responsibility of each measure, impact assessment, and relations between measures. It also includes detailed descriptions of activities and tasks ready to be implemented during a defined timeframe.

1.2 Research background and objectives

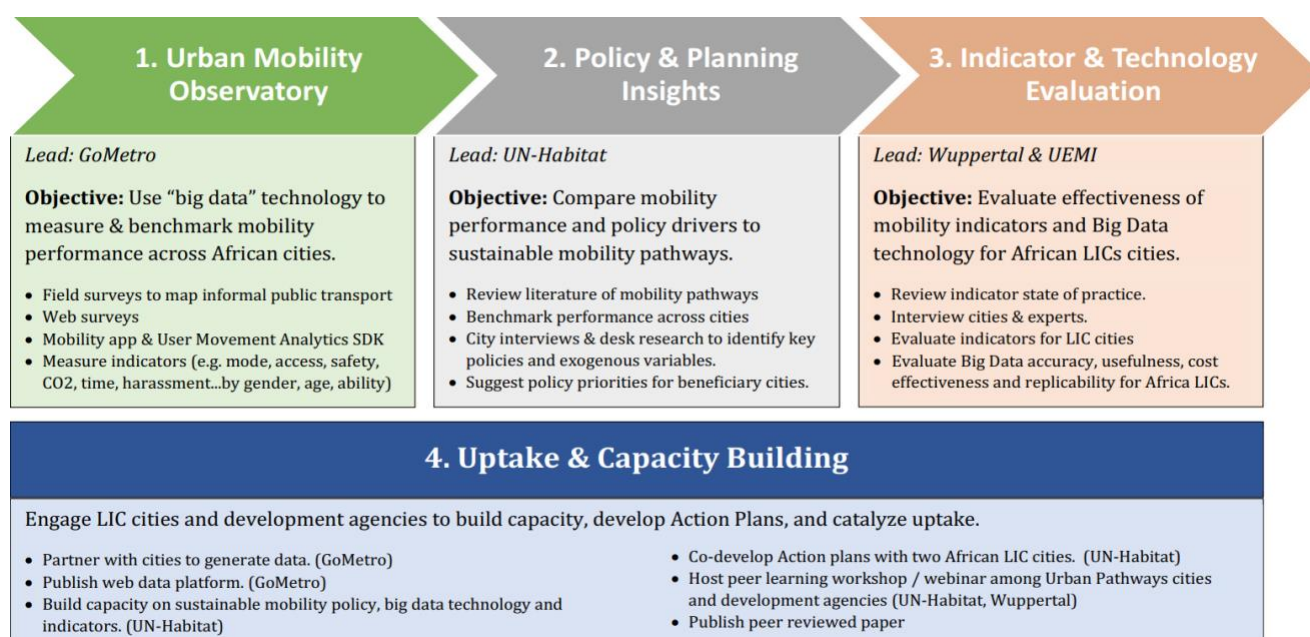
The Africa Urban Mobility Observatory (AUMO) research project is a component of the second phase of the United Kingdom's Foreign, Commonwealth and Development Office (FCDO) High Volume Transport (HVT) Applied Research Programme. More specifically, in the context of the impact that urban transport planning has on climate change and inclusion in LIC (Low Income Countries) in Africa, this research intends to address the following three research questions:

1. Big Data Technology: What are the opportunities and risks of big data applications in HVT cities?
2. Informal Paratransit: What is the role of informal transport in the global South and how to enable transition towards a clean, affordable, and efficient solution for HVT?
3. Policy Levers: What are the main levers for mode share and what is the role of data?

1.3 Project activity streams and deliverables overview

This project comprises four interlinked Activity Streams (see Figure 1). Activity Streams 1, 2 and 3 are led by GoMetro, UN-Habitat, and Wuppertal/UEMI, respectively. Activity Stream 4 is led collaboratively. These Activity Streams run in parallel, and the outputs generated under one Activity Stream are used as inputs to the others. This report, Deliverable 8, falls under Activity Stream 4. A total of 10 deliverables are associated with the four Activity Streams.

Figure 1: Research activity flow





2. City Action Plan on Inclusive Low Carbon Mobility

2.1 Action plan development

In August 2022, government officials, civil society, and partners of the African Urban Mobility Observatory Project (AUMO) met in Kigali, Rwanda, to discuss the present and possible futures of mobility and data in the land of a thousand hills. During the two-day workshop and subsequent validation meetings, stakeholders co-developed pathways to sustainable mobility and developed a work plan for inclusive and climate resilient transport futures, contained in this document. The goals, targets and action items identified in this action plan are informed by the data collected during the AUMO project implementation process and supplemented by other trusted data sources and existing policy frameworks. This document is intended to support and inform future policy development and investment in inclusive, low-carbon mobility in the City of Kigali.

The development of this action plan has seen engagement with a diverse group of stakeholders from national and local government, public institutions, and interest groups. National and local government has been represented by participants from the Ministry of Infrastructure, Ministry of Environment, Rwanda Transport Development Agency (RTDA) and Rwanda Utility Regulatory Authority (RURA) and the City of Kigali. Public institutions, private sector and interest groups had stakeholders from the University of Rwanda, Association des Transporteurs des Personnes au Rwanda (ATPR), Global Green Growth Institute (GGGI), Healthy People Rwanda, Guraride, Safiride, Jali Transport and Rwanda Electric Mobility were also involved in the formulation of this text.

Although this action plan has been codeveloped, Kigali City is responsible for coordinating and implementing the Action Plan on Inclusive Low-carbon mobility in line with other national and city level strategy documents. The plan outlines key focus areas related to inclusivity, climate change, and data management systems. It includes measures to be implemented and monitoring processes to measure outcomes. Kigali city authorities will consider annual updates to the action plan, ensuring that they continue to drive innovation in data-driven decision-making to solve local mobility challenges.

Table 1: Action plan timeline

| Date | Item |
|----------------|---|
| August 2020 | Key meetings with stakeholders |
| April 2021 | Data collection in Kigali begins |
| February 2021 | Web Data Platform Launched |
| August 2022 | Action Planning Workshop The workshop entailed six sessions key to delivering inclusive low-carbon mobility for Kigali. The first session was on defining a vision for a sustainable future for the city. The successive sessions were on action planning for inclusiveness and road safety, climate change mitigation opportunities and adaptation need, the role of paratransit, validating indicators reflected in the AUMO platform, and the identification of strategies and actions towards sustaining data collection and monitoring initiatives. |
| September 2022 | Action planning review and validation meetings |
| October 2022 | Draft Action plans finalised |

AUMO is a research project that aims to generate and publicly avail urban mobility data using big data applications. The goal of the initiative is to promote inclusive, low-carbon mobility policies and action plans, catalyse broader uptake via web data platforms, workshops, and research across urban areas in low-income African countries. The project activities in Rwanda aim to support Kigali in planning, regulating, and financing more inclusive, safe, and climate-friendly mobility. The project promotes engagement and discussion in



mobility-related issues and enhances the capacity to develop, implement, and monitor transport policies locally.

AUMO has collected data on several indicators to support Kigali in making data-driven decisions about the city's urban future. The data collected includes indicators on mode share, access to public transport, congestion, the experience of sexual harassment, and safety. The data and policy analysis and workshop activities have been used to develop this action plan for Kigali. The success of the action planning was robust engagement from project commencement with stakeholders from Rwanda on both city and national level that have strategic roles in mobility policy and action planning.

This plan aims, amongst other things, to enable better cooperation among authorities, professionals, social organisations, and users and to engage development agencies and Kigali around data. It is intended that this work assists Kigali to access finance and opportunities for sustainable mobility projects in the future.

3. Mobility Landscape

Kigali, the administrative and economic capital of Rwanda, is situated in the centre of the country. Home to approximately 1.26 million inhabitants in 2018, it has an annual growth rate of 4% (1). The city has some of the highest population densities in Africa, with approximately 1,060 inhabitants per km² (1). According to the National Land Use and Development Master Plan (NLUDMP 2020-2050), Kigali has grown significantly in recent years through annexation of adjacent towns and agricultural land (2). The city's increased urbanisation and rapid expansion requires robust urban and transport planning informed by comprehensive data sets (2), particularly if the country is to reach its sustainable urbanisation targets (3).

According to the Rwanda Housing Authority, Government of Rwanda aims to create 150,000 new dwellings annually to meet the projected demand of 5.5 million dwellings by 2050 (4). There is an unprecedented opportunity to deliver on mobility needs in tandem with this development by focusing on transit orientated development and integrated, low carbon mobility systems. However, there is still some work to be done to ensure that the mobility systems of the present and the future meet the needs of (5)users. As indicated in the National Transport Policy and Strategy (NTP), "insufficient affordable and accessible transport systems in both urban and rural areas constitute a major constraint to the national economic development." The NTP highlights some of the current challenges in transport which include inadequate public transport, lack of facilities for pedestrians and cyclists, poor road safety, climate change vulnerability, inadequate capacity, and a lack of an appropriate system for data storage, management, and open access for the transport sector.

3.1 Status of urban mobility in Kigali

The City of Kigali has a Transport Master Plan, developed in 2020 that aims to ensure the city has an integrated transport network, supported by well-planned policies and guidelines that are budgeted for in line with the city's growth (6). The Master Plan places emphasis on non-motorised transport (NMT) and NMT infrastructure, mass rapid transport with a focus on Bus Rapid Transit (BRT), effective implementation of transport policy, the introduction of a functioning hierarchy for operation of moto taxis, and the realignment of major projects to harmonise transport development. It sets high standards for transport and is interwoven into other policy aspects in urban planning (7).

The plan anticipates that the mobility conditions in Kigali will deteriorate if drastic measures are not taken (6). It recommends sweeping measures that include planning and implementation of large-scale public transport and prioritization of NMT in the city.

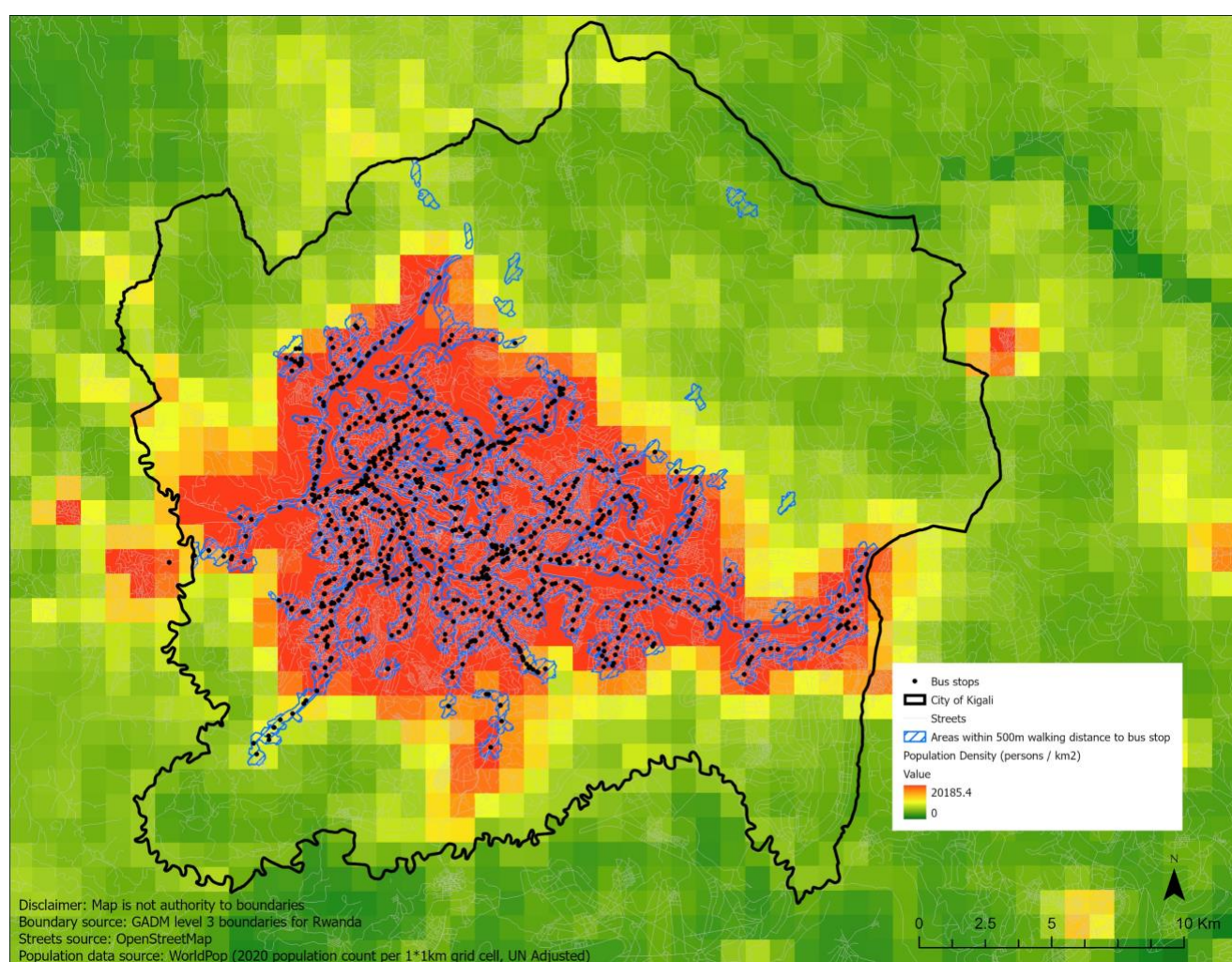
The Kigali city transport master plan is aligned with Rwanda's Vision 2050 which provides long term strategic direction towards economic prosperity and social transformation to establish self-reliance and a modernised high-quality life (8). The vision outlines various overarching actions, which relate to sustainable mobility. They include:

- Establishing sustainable pathways that build resilience to climate change and improve the quality of the environment.
- Universal access to quality services and amenities.

- Efficient transport and ease of mobility by establishing reliable, affordable, and accessible mass public transport.
- Management of spatial transformation and the improvement of linkages with development, land use, and master plans.

According to the Transport Master Plan, only 55% of the population and 24% of the city's area is within 400 metres of a bus lane. A mapping of public transport stops from high resolution imagery and open source data from OpenStreetMap and Google re-affirms these statistics¹, and indicate that only 50.24% of the city population is within 500 meters walking distance along a street network to a bus stop, while only 15.1% of the city area is within 500m walking distance to a bus stop (9). As is evident in Figure 2, some sections of the highly densely populated part of Kigali remain unserved by the bus public transport system, while the sparsely populated areas lack dedicated transport stops. The latter could imply a more informal system of stopping along the street networks within these areas.

Figure 2: Distribution of bus stops and areas served within 500m walking distance, Kigali



Moto-taxis have taken up 12% of the city's modal share. Most of the employed residents live within two kilometres (km) of their workplace and most commuter trips in the city are less than 5 kilometres, an acceptable distance for walking and cycling. 52% of residents use non-motorised modes, 17% use public transport and 31% use personal vehicles (10).

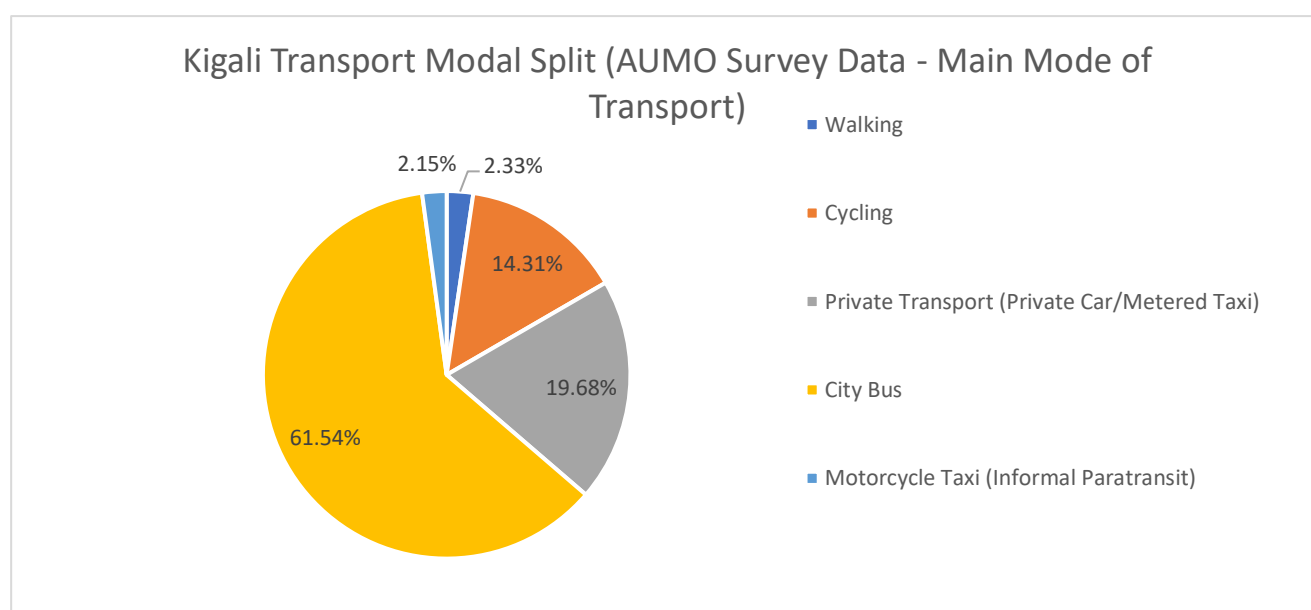
¹ Note: while the mapping of public transport stops is based on existing open-source data, and while all attempts were made to ensure as many stops as practical were captured (including through visual interpretation of very high resolution imagery), the analysis may have missed existing informal public transport routes (along which minibuses can randomly stop/pick up/drop passengers)

According to surveys conducted by AUMO, buses account for the highest main mode share among respondents (61.5%). The high reliance on city buses can be attributed to the ongoing bus sector reforms in the city. NMT infrastructure, however, is underdeveloped in the city as many roads lack sidewalks, safe intersections and connected cycling networks. The lack of continuous NMT infrastructure and the topography discourages some commuters from walking and cycling as their mode of choice. The topography makes walking and cycling more strenuous than in flatter cities. This poses a challenge to achieving universal access, especially given that the gradient of separate bicycle lanes and footpaths must be no more than 5% (11).

In terms of electric mobility, a few e-motos are operating in Kigali and their number is likely to increase due to the presence of Ampersand, Safi, and Rwanda Electric Mobility in the market. An electric vehicle (EV) study (12) recommended that the government of Rwanda should aim to convert 30% motorcycles, 8% of cars, 25% minibuses and 20 buses to electric vehicles by 2030, and the government is committed to a faster transition especially in e-motos (13).

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Figure 3: Kigali transport modal split (14)





KIGALI ACTION PLAN

The City of Kigali government will:

- Take steps to achieve the sustainable and inclusive mobility vision for the city;
- Implement localized actions aimed at both climate change mitigation and adaptation;
- Address the main challenges in paratransit and codevelop solutions;
- Sustain data collection and monitoring efforts;
- Promote safe and inclusive multi-modal mobility.

4. Vision for a Sustainable Mobility future

The City of Kigali aims to "build and sustain a city of character, vibrant economy and diversity through strong partnerships with stakeholders to provide responsive, rapid and effective urban development." The goals of the city government include a city of green transport, sustainable resource management, enchanting nature and biodiversity and endearing character and unique local identity. In line with this vision and the core values identified in the Rwanda Vision 2050, the Kigali Transport Master Plan and the City of Kigali, a vision for inclusive low-carbon mobility has been co-developed for Kigali city. Inspired by a collaborative evaluation of the mobility status of Kigali, the vision is:

"A well-planned city with an integrated multi-modal, safe, smart, inclusive, reliable, affordable low-carbon transport system powered by efficient public transport infrastructure and systems."

The city will achieve this goal through defining, monitoring, and achieving the goals and targets outlined in this action plan specifically around governance and strategy, inclusivity, climate change and the environment, improving paratransit and sustaining data efforts.



4.1 Summary Kigali Action Plan





4.2 Governance and strategy

4.2.1 Create enabling policy and regulatory frameworks for promoting sustainable mobility

The city of Kigali Transportation Master Plan directs multi-modal planning in the city (6). Despite the city having well developed policy and legal framework to guide urban growth, many reforms and further policy development is required towards sustainable mobility aligned to the city's envisioned urban growth future. There is evidence of progressive implementation of the master plan, significant investment in NMT, and existing institutional planning capacity. However, there is a lack of prioritization for public transport in the city and NMT safety especially at intersections, and Kigali still faces the challenge of congestion, unequal distribution of road space and urban sprawl.

It is imperative for the City of Kigali to strengthen its policy and legal framework for safe, inclusive, accessible, efficient, and affordable low carbon mobility, to ensure integrated and effective coordination in planning and implementation of sustainable mobility in the city. The policies and legal frameworks should align their targets to Rwanda's sustainable development targets. The government of Rwanda announced ambitions to electrify 20% of minibuses and bus fleets by 2030 (13), but there are no clear set evidence-based policies to guide the transition.

Targets:

- i. Transport administration services are decentralised by 2024;
- ii. Distinct allocation of planning, contracting and regulatory functions for transport by 2027;
- iii. A strategic framework for active travel and public transport to support Kigali to achieve a 50% reduction in carbon emissions by end of 2030 in line with national targets;
- iv. Reduce emissions by transitioning at least 20% of public transport buses and small public service vehicles (SPVS) to zero or low emission vehicles by 2031.

Activities:

- A. Review regulatory provisions that enable the importation of e-bicycles and other electric vehicles;
- B. Conduct research on decarbonisation strategies for long-distance bus services and SPVS to promote the transition of fleets to low or zero emission vehicles;
- A. Establish a clear inter-government urban mobility governance and management framework;
- B. Explore alternative funding solutions including climate instruments and green energy initiatives;
- C. Training workshops for capacity building of personnel on urban governance and management in the areas of urban planning, development regulations, urban management, and stakeholder engagement;
- D. Lobby for the legislation of the allocation of the planning, contracting and regulatory functions;
- E. Partner with 4 secondary cities to develop capacity building materials and knowledge products by 2026.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Ministry of ICT and Innovation, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, Rwanda Environmental Management Authority, Special interest groups (Women, PWD), associations for transport operators, national and international development partners, e-mobility companies, and the private sector

4.2.2 Increase investment in inclusive and safe mobility systems

Adequate funding for sustainable urban mobility infrastructure is a vital necessity for the city of Kigali. It is vital that the City of Kigali explores alternative dedicated funding sources for urban mobility, to support the scaling up of investment in inclusive and safe non-motorised and public transport. A key strategy of the Kigali transport master plan is to develop a city-wide NMT network to support public transport systems and utilise open spaces (6). Available financing is insufficient, and the financial gap is widening given climate change mitigation and adaptation needs. It is imperative that City of Kigali optimises scarce public resources and leverages private sector to finance fiscally, environmentally, and socially sustainable mobility systems.



Targets:

- i. Develop an incentive program for urban road projects that focus on universal access, safety, and complete streets principles by 2024.

Activities:

- A. Develop flexible financing solutions, for example tax subsidies, grants, or flexible loans to support the leasing and purchasing of zero-emission fleets;
- B. Review and update City of Kigali public expenditure laws to include minimum and maximum expenditure on sustainable mobility and PMV expenditure respectively;
- C. Create a dedicated local transport fund to manage resource for the city's transport system.

Stakeholders involved:

Ministry of Infrastructure, City of Kigali, Ministry of Finance and Economic Planning, national and international development partners, development banks, investors, and the private sector.

4.2.3 Accelerate delivery and implementation of existing plans and strategies

A liveable Kigali with integrated mobility and urban development components guided by an improved master plan was among the visions identified for the city by the stakeholders engaged in the AUMO process. The Kigali Master Plan acknowledges that the city is guided by robust urban growth policy but highlights the need for continued reforms towards sustainable and coordinated implementation of the plan (6).

City of Kigali should strengthen its urban management institutional framework to integrate and effectively coordinate planning and implementation, anchored in a participatory approach in planning, design and implementation phases to become a public transport orientated city with a complete transport system and sustainable mobility network.

Targets:

- i. 25% extension of public transport routes networks by 2027;
- ii. Implementation of NMT infrastructure on 40% of primary NMT routes by 2028;
- iii. 12.3 kilometres of BRT corridor constructed at main corridor by 2025;
- iv. Bus Rapid Public transport (BRT) corridors as identified in the Master Plan, constructed by 2030.

Activities:

- A. Conduct studies on corridors and intersections beyond those identified in the 2020 Master plan to reduce congestion throughout the city;
- B. Ensure the usage of climate resilient materials in construction of new corridors and routes.

Stakeholders involved:

City of Kigali, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, National Institute of Statistics of Rwanda, Rwanda Environmental Management Authority, Rwanda Land Management and Use Authority, special interest groups and the private sector.

4.3 Inclusivity in urban mobility

4.3.1 Improve civil society organisations and community engagement in decision making

Inclusive transport can be defined as transport that is planned, designed, managed, and operated so the system can be used by everyone irrespective of income, race, age, gender, or ability. Three main components make transport inclusive: Policy frameworks, Evidence base, and the representation of interest groups.

The city of Kigali has taken steps towards more inclusive transport planning, policy development, and implementation of transport projects. The city involves the public in transport planning and has rolled out specific measures to improve inclusivity and promote safer mobility. For example, the new transport master



plan included a comprehensive participatory process aimed at involving many key stakeholders, capable of providing valued inputs and feedback (7). All public transport buses include a toll-free number for people in distress. Individuals can report sexual harassment and other personal security concerns.

The stakeholders engaged in the AUMO action planning process indicated that effective and sustained engagement of civil society organisations and the community in decision-making on transport matters is vital for the delivery of inclusive low-carbon mobility (15). Rwanda, and the city of Kigali have not achieved 100% citizen participation, but the national government has doubled down on the commitment to improve the levels of citizen participation in local government development planning and budgeting processes. In this commitment, local readers are also required to indicate how previous citizen identified priorities were implemented and achieved (16).

Forums for inclusivity and sustainable mobility in Kigali city are essential to advocate for transport policies and plans that promote accessible, available, affordable, and acceptable mobility for all within the city. These forums will also be critical in ensuring that data and information collected and used for making gender-sensitive, inclusive transport decisions is comprehensive, standardized and fits the Kigali city model. Sustained advocacy will ensure that mobility initiatives in the city adequately respond to its residents' needs, including the needs of women, youth, children, the elderly, and people with disabilities.

Targets:

- i. Establish baseline stakeholder information on key mobility stakeholders and potential interest by 2023;
- ii. Develop a comprehensive stakeholder engagement framework by 2025;
- iii. Establish dedicated forums for inclusive and sustainable mobility planning by 2027.

Activities:

- A. Conduct initial analysis of the initial citizen participation situation including stakeholder analysis;
- B. Establish a robust participatory culture with strong political support;
- C. Set up review mechanisms for stakeholders to rate their satisfaction with services and infrastructure provided;
- D. Baseline survey(s) to gather and analyse on key mobility stakeholders and their potential interests;
- E. Identify and engage a citizen engagement coordinator at the city level, to coordinate the information and consultation activities;
- F. Encourage peer learning on inclusive policy, planning, and investment in active mobility and road safety, as well as the needs of vulnerable groups.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Education, Ministry of Health, Ministry of Gender and Family Promotion, Ministry of ICT and Innovation, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, Rwanda Environmental Management Authority, Rwanda Land Management and Use Authority, special interest groups, private sector, and associations of public transport operators.

4.3.2 Accelerate delivery of complete walking and cycling networks, which prioritise universal access in the city centre with connections to areas outside of the city centre

According to data from the AUMO project, NMT infrastructure in Kigali is underdeveloped especially in remote parts of the city (14). An integrated approach to planning should be adopted for the planning, design, and implementation of NMT facilities and networks, in particular the integration with human settlements. Walking and cycling account for a huge percentage of modal share split in Kigali, thus increasing NMT infrastructure will maintain or increase the mode share for walking and cycling, improve inter-modality of the city's transport systems and facilitate low-cost mobility especially to low-income communities in the city.



Targets:

- i. 110 kilometres of direct, consistent, and joined walking and cycling routes to and from the city centre and its periphery by 2028.

Activities:

- A. Urban roads study to identify roads that provide direct and continuous routes based on pedestrian and cyclist desire lines;
- B. Ensure transport linkages with the Rwanda Affordable Housing Fund and planned affordable housing units;
- C. Connect origin and destination with most direct routes due to high detour sensitivity amongst pedestrians and cyclists;
- D. Develop mixed-use neighbourhoods with a mixed of housing, commercial, recreation, transport facilities and employment opportunities.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, Rwanda Environmental Management Authority, Rwanda Land Management and Use Authority, special interest groups, national and international development partners, and the private sector.

4.3.3 Address personal security concerns for women due to sexual harassment

Unsafe public transport limits freedom of movement for women and girls denying them equal access to education, employment, and social activities. The City of Kigali commits to ending sexual harassment in the public transport system and dedicates financial and human resources to the implementation of identified actions.

Targets:

- i. Establish an efficient and effective processes for registering and prosecuting cases on sexual harassment in public transport by 2024;
- ii. At least 2 Training and awareness-raising forums on gender and women's rights for public transport staff annually by 2025;

Activities:

- A. Roll out awareness campaigns and education on sexual harassment in transport systems to create awareness on what constitutes sexual harassment and promote higher reporting rates;
- B. Increase security at stops and public transport stations including providing lighting, hiring more security personnel, and installing CCTV;
- C. Increase street network connectivity and adapt clear and direct routes to transit to provide safe access even for people living in the city periphery.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Finance and Economic Planning, Ministry of Education, Ministry of Health, Ministry of Gender and Family Promotion, Ministry of ICT and Innovation, Rwanda Transport Development Agency, National Institute of Statistics of Rwanda, Rwanda National Police, Public transport operators and special interest groups.

4.3.4 Improve road safety

Rwanda has a traffic fatality rate of 29.7 per 100,000 people (17), which is the third highest traffic death rate among the AUMO project countries. Police data reveals that road-based accidents remain higher in Kigali than the rest of Rwanda (5).



Road safety issues are broader and more complex than just collision fatalities. Speeding traffic, aggressive driver behaviour behaviours and fear of getting involved in traffic collisions are barriers to people walking and cycling, and key reasons why separated space for nonmotorized road users are important (18).

Targets:

- i. Pedestrian and cyclist fatalities reduce by 80% from 2022 levels by 2027;
- ii. At least 40 primary schools with low-speed zones by 2030.

Activities:

- A. Provide separate dedicated pedestrian and cycling lanes demarcated by physical barriers;
- B. Provide schools, health centres, community centres, open spaces etc. at walking distance for everyone to have easy and equal access to these social facilities;
- C. Deliver low traffic neighbourhoods in areas they will have the greatest impact, considering the street network functions, route availability, and location of key destinations;
- D. Physical design of key intersections to clearly indicate right of way for pedestrians and cyclists, and including traffic calming interventions;
- E. Strengthen enforcement and control of traffic law.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Ministry of Health, Ministry of Gender and Family Promotion, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, National Institute of Statistics of Rwanda, Rwanda Environmental Management Authority, Rwanda National Police, national and international development partners, special interest groups and the private sector.

4.4 Climate change and environment

At the national level, per 2018 World Bank records, Rwanda produces 0.088 metric tons of CO₂ per Capita. Rwanda ranks among the bottom 20 countries on the ambient air pollution index at 125.42 ug/m³ (19). The transport sector remains a key source of carbon emissions in Kigali (20). The Rwanda Green Growth and Climate Resilience strategy identifies high density walkable cities as a solution to prevent urban sprawl and mitigate GHG emissions from motorized transport (21). The strategy advocates for the design of compact cities with pedestrian and cyclist corridors and green public spaces to reduce the need for energy intensive transport and improve the quality of life.

The action plan identifies measures for implementation to decarbonise transport in Kigali by reducing the need to travel, promoting a shift to more efficient modes, and improving the efficiency of mobility through vehicle technology.

4.4.1 Reduce reliance on personal motor vehicles (PMV)

The number of vehicles in Kigali is comparatively low, but the increasing fleet, especially motorcycles, poses a challenge to achieving efficient mobility, good air quality, and a higher quality of life. Infrastructure investment in Africa generally has been biased in favour of motor vehicles, with less systematic consideration of more sustainable and inclusive modes, liveability, or human scale travel patterns (22). It is forecast that private car growth for the city of Kigali will increase by at least 20% from 2017 to 2050 to 52% with the Bus Rapid Transit System (BRT) and 60% without it (6).

If the rise in private motor vehicles is not properly managed and proper investment and planning for low carbon mobility is not prioritised, the expected traffic growth is estimated at 2.20% per year up until 2050. Noting the issues related to congestion, pollution and accessibility, the city is committed to actively promoting public transportation, walking, and cycling as more desirable and accessible modes of transport.



Targets:

- i. Smart parking management system by 2024;
- ii. Vehicle kilometres travelled (VKT) by private motor vehicles (PMVs) by 2029 are lower or same as 2023 levels;
- iii. Reduce average travel distances by 20% by 2029.

Activities:

- A. Promote compact city development and mixed land use for Kigali city to reduce travel distance and commuting times for city residents and promote a shift from a reliance on vehicles for movement;
- B. Ensure affordable high density housing projects have walkable access to public transport and other essential services;
- C. Create parking management zones based on existing city administrative zones;
- D. Introduce parking charges for all parking slots and price based on location, demand, time of day, vehicles size and parking duration;
- E. Eradicate minimum parking requirements for new developments;
- F. Dedicate funding to provision of complete, physically separated and universally accessible walking and cycling infrastructure.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of ICT and Innovation, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, National Institute of Statistics of Rwanda, Rwanda Environmental Management Authority, Rwanda Land Management and Use Authority, special interest groups, national and international development partners.

4.4.2 Continue to deliver on commitments to compact mixed use design in green network planning

The National Land Use Guidelines emphasizes on the need for an integrated and mixed-use approach to land use planning and human settlement. The plan also recommends adoption of medium to high levels of densification focused on alignment with existing and proposed public transport routes for improved access, located within areas of activity, and access and proximity to public open spaces. The gazetted land use planning law also necessitates that land use prevents urban sprawl and maximises mixed zoning and land use integration (23). It is imperative that City of Kigali continues to implement land use planning that promotes compact city development with multi-modal mobility integration.

Beyond spatial planning, car free initiatives can reduce the pollution and health burden of cars including reducing vehicle accidents, decreasing air and noise pollution, and promoting opportunities to expand transport. Car-free days also contribute to building social cohesion, and economic growth by increasing foot traffic for local businesses. Car-free zones have been launched in the city centre namely the Imbuga City Walk and in Biryogo, and car-free zone has been proposed for Huye Secondary City. City of Kigali should double down on its efforts to pedestrianise streets to encourage active transport, redistribute urban space and improve the quality of life.

Targets:

- i. Implement the extension Imbuga City Walk to the University Teaching Hospital of Kigali by 2024;
- ii. 10% increase in household cost savings from spatial proximity by 2028;
- iii. Dedicate at least 10% of the annual city budget to street pedestrianisation by 2028;
- iv. Increase in modal share for NMT to 60% by 2031.

Activities:

- A. Update the land use master plan to integrate mixed-use, transit-oriented development and affordable housing as development concepts to reduce vehicle miles travelled;



- B. Increase connections between residential areas, workplace, and commercial zones to encourage active modes of transportation and promote effective land use;
- C. Develop zoning ordinances, building control regulations and land use policies and by-laws to align with TOD concepts;
- D. Identify 10 kilometres of new road networks to pedestrianise;
- E. Partner with local restaurants and commercial outlets to identify possible locations for future car free zones.

Stakeholders involved:

City of Kigali, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Ministry of Health, Ministry of Gender and Family Promotion, Ministry of ICT and Innovation, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, Rwanda Environmental Management Authority, national and international development partners, special interest groups and the private sector.

4.4.3 Increase bicycle mode share

The expected growth of traffic volume in Kigali is not proportional to the available road traffic management infrastructure (5). This will inevitably lead to increased congestion, especially in peak hours due to the lack of integrated public transport and the lack of connected infrastructure for safe and comfortable travel by bicycle or foot.

Although the city has taken great strides in improving conditions for people that cycle and there is a strong focus on NMT in the Transport Masterplan, cyclists face many challenges. These include safety hazards from high-speed traffic, few and inadequately sized cycling lanes, dangerous crossings, inadequate street lighting, and a fragmented urban cycling network. Increased use of NMT is likely to bring benefits to the city and residents of Kigali.

The planned network of bicycle tracks should cover key urban corridors, including arterial roads. These corridors are easily accessible and help connect high-density residential areas to commercial districts. Implementation phasing will affect priorities near mass transit corridors, streets with high cycle volumes, and streets with flat topography. The network will facilitate first- and last-mile trip connectivity to public transport terminals.

Targets:

- i. Women constitute 50% of cyclists by 2028;
- ii. 30% increase in the share of e-bikes as a percentage of the whole bicycle population by 2029;

Activities:

- A. Set an annual cycling infrastructure construction target;
- B. Expand bicycle share scheme;
- C. Integrate cycling network with existing and planned public transport stops and stations.

Stakeholders involved:

City of Kigali, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Ministry of Health, Ministry of Gender and Family Promotion, Ministry of ICT and Innovation, Rwanda Transport Development Agency, National Institute of Statistics of Rwanda, Rwanda Environmental Management Authority, Rwanda Land Management and Use Authority, national and international development partners, special interest groups, e-mobility companies, and the private sector.

4.4.4 Prioritize clean and efficient mobility

Rwanda does not impose any age restrictions on the import of used vehicles and has no vehicle emission standards. The Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC) is providing expertise and technical assistance to the Government of Rwanda to develop new emission standards for internal combustion engines (24).



Rwanda has priority areas to advance sustainable urbanisation and access to infrastructure and services, and efficient electric mobility has been earmarked as a pillar for the prosperity of urban areas in Rwanda. There are number of electric mobility initiative in Rwanda including renewable energy generation, introducing electric moto-taxis, electric Volkswagen golf pilot, and incentives for electric vehicle adoption (14).

Targets:

- i. 15 EV charging station each with at least three charging points by 2026;
- ii. 25% increase in electric vehicle and motorcycle taxis by 2026;
- iii. At least 50% of the city council motorised fleet to be electric by 2030.

Activities:

- A. Scoping and pre-feasibility study for the provision of electric mobility charging infrastructure;
- B. Coordinate with the Ministry of Infrastructure to assess future demand for motor vehicles to establish baseline that will guide priority actions;
- C. Formulate fiscal policies that favour use of electric vehicles and support associated industries;
- D. Provide financial incentive for the acquiring and operation of electric vehicles especially in the paratransit industry;
- E. Localise national guidance on e-mobility;
- F. Build awareness on fuel economy and electric mobility options;
- G. Review and update the public procurement regulations to require that EVs be used to renew City of Kigali fleet.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Ministry of Health, Ministry of Gender and Family Promotion, Ministry of ICT and Innovation, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, National Institute of Statistics of Rwanda, Rwanda Environmental Management Authority, Rwanda Land Management and Use Authority, special interest groups, e-mobility companies, national and international development partners.

4.4.5 Monitor and improve air quality

Kigali has reliable air quality data acquired under the Rwanda Environment Management Authority (REMA). It is imperative that city commits funds towards sustained annual air quality monitoring programs and the establishment of an air quality unit, within an existing suitable city department, to spearhead the continuous monitoring, processing, storage and dissemination of air quality data, and coordination with REMA. Air quality data is specifically important to inform decision makers on priority action areas for air quality control, pollution reduction and climate action.

Targets:

- i. Air quality in the city is within WHO ambient air quality norms 350 days a year by 2030;

Activities:

- A. Expand real time active and passive continuous air monitoring across the city;
- B. Conduct emission inspections twice a year for all motor vehicles;
- C. Develop emissions testing facilities for inspection of ICE vehicles;
- D. Establish engagement and collaboration with the Rwanda Environment Management Authority on sustaining air quality monitoring in Kigali.



Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Ministry of Health, Ministry of ICT and Innovation, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, National Institute of Statistics of Rwanda, Rwanda Environmental Management Authority, special interest groups, national and international development partners, private sector.

4.5 The role of paratransit

The City of Kigali has a modal share of public transport which accounts for approximately 80% of the total travel of the city (25). The NPT emphasizes that there have been several innovations to improve public transport including Electronic Ticketing Systems for inter-city buses, Mobile phone-based Booking Systems for some inter-city bus companies, Automated Fare Collection used in buses in the city, Taximeters in taxi cabs, Free Wi-Fi internet in Kigali City Buses, Motorcycle Taxis and taxi cabs booking systems.

Kigali specifically has made significant progress in converting its paratransit to formalised scheduled bus operations. The paratransit reform entailed zonal clustering of public bus transport routes, organising minibuss taxi operators into companies or cooperatives, and contracting them to operate in specific zones, and introducing targets for the operators to shift from minibusses to high occupancy vehicles. The reforms further launched a cashless fare system in the bus services. The city, through second generation public transport contracts, aims to improve route planning, increase capacity, enforce strict scheduling, and align fares with distance. The city's goal is to reduce pollution, increase ridership, and improve passenger satisfaction (26).

4.5.1 Professionalisation and regulation of the motorcycle and bicycle taxi paratransit transport system

Motorcycle taxis are a key mobility option in Kigali, accounting for 200,000 daily trips, typically functioning as feeder services to the major bus routes. Although they play a key role in the mobility of many urban residents, the taxi-motor operators are often perceived as reckless violators of traffic light regulations, abusers of zebra crossings and being responsible for dangerous manoeuvres in accident hotspots (5).

Improvement and regulation of moto taxis is not being addressed at the same rate as the rapid growth and reliance on moto taxis as part of Kigali's urban transport system (1). The action plan notes that a lack of dedicated interventions targeting the improvement of the moto taxi environment, limits the City of Kigali's ability to establish moto taxis as efficient last-mile service provider, and to reduce their negative impacts on traffic flow and management, and to improve the safety of non-motorised road users.

Bicycle taxis provide a last-mile connection to residential areas. Kigali has seen a rapid rise in bicycle taxi numbers, but the lack of NMT facilities to accommodate bicycle taxis make them unsafe (as they have little alternative but to share road space with motorised vehicles). Bicycle taxis in Kigali are not regulated, but are organised into independent cooperatives, and restricted to operate within specified routes in the urban centre.

Targets:

- i. Hold 3 workshops with motorcycle and bicycle taxi operators to improve coordination and route planning by 2024;
- ii. Introduce capacity building and regular training of motorcycles and bicycle taxi operators by 2025;
- iii. Develop a public transport policy and strategy, that promotes paratransit as a public transport option for Kigali, by 2026.

Activities:

- A. Adopt and customise the bus reform methodology to modernise and regulate motorcycle and bicycle taxi operations;
- B. Introduce licensing and inspection mechanism for moto-taxi and bicycle operators;
- C. Route mapping and locating dedicated stations for moto and bicycle taxi operators;
- D. Engage with the operators and stakeholders through workshops and dialogues to spread awareness on the benefits of joining an association;



- E. Coordinate with the national government to establish an integrated licensing system;
- F. Coordinate with the national government to waive or reduce importation taxes for electric motorcycles and pedal-assist bicycle, and create loan facilities for the benefit of associations;
- G. Establish training programmes to teach riders on the revamped system, offer them licences and certificates of good conduct.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of ICT and Innovation, Rwanda Transport Development Agency, Rwanda Utilities Regulatory Authority, National Institute of Statistics of Rwanda, Rwanda Environmental Management Authority, special interest groups, national and international development partners, private sector, moto, and bicycle taxi operators.

4.5.2 Construction and maintenance of paratransit support infrastructure

Targets:

- i. At least 70% of buses stops include bicycle stations by 2027;
- ii. At least 80% of city population has access to paratransit stops within 500 metres by 2028.

Activities:

- A. Identify sufficient terminal space for the city's bus network;
- B. Map out existing bus stops, lay-bys and NMT infrastructure to identify existing gaps;
- C. Upgrade existing bus stops and lay-bys to conform to prevailing universal design standards.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Infrastructure, Ministry of Finance and Economic Planning, Ministry of Environment, Rwanda Transport Development Agency, national and international development partners, private sector.

4.6 Sustaining data efforts

The measurement and monitoring of the state of mobility is a crucial component required to support a better understanding of its complexity, as well as in aiding policy and investment decisions aimed towards achieving sustainability. Rwanda has policies and regulations, including the data protection law, and the national data revolution policy, that are supportive to sustained collection and maintenance of data. However, the country lacks in technical, technological and skill capacity, and has gaps in research and development, bureaucracy, limited funding for data initiatives, and lack of a centralised agency for data acquisition and management (15). There is also a gap in information and communication technology (ICT) and therefore a need to initiate the use of ICT to enhance service delivery, improve ICT literacy levels among citizens (27).

Rwanda's Vision 2050 outlines key indicators to continuously monitor the state of transport. The indicators are the ease and speed of movement, median time taken to commute to work, and the use public transport. The aspiration of the vision is to have a 45-minute median time to work and 24% public transport modal share by 2035, and access to public transport within 500 metres or less by 2050.

The AUMO project identified a set of indicators corresponding with the sustainability aspects of mobility. The indicators are aligned with relevant global, regional development-related processes, as well as relevant initiatives that focus on measuring urban mobility indicators. The City of Kigali should incorporate the indicators identified by AUMO in all its mobility planning, to improve its monitoring and evaluation of mobility interventions in the city. The City of Kigali should also continually enhance and expand the indicators based on identified gaps and arising needs.



4.6.1 Improve capacities for holistic data collection and straightforward procedures to collect and access data

Through data sharing and the analysis of mobility data, sustainable mobility objectives can be supported. For example, shared mobility solutions including ride hailing and bicycle sharing are built on dynamic data collection and processing. Mobility data offers an opportunity for governments and planners to generate analysis and new insights that accelerate the transition toward sustainable mobility and urban development. The City of Kigali should adopt data policies and strategies that promote mobility data sharing between and amongst private and public stakeholders, especially those that advance safe, accessible, inclusive, efficient, and green urban mobility systems.

Targets:

- i. By 2026, have a disaggregated, transparent data collection and digitalisation mechanism to support mobility systems.

Activities:

- A. Put in place a robust Local Government data management and dissemination system that will provide data for evidence-based decision making and planning;
- B. Prioritize skill development and capacity building in areas such as artificial intelligence, machine learning, and cloud computing, which are required for advanced data processing and sharing capabilities;
- C. Strengthen the use of ICT tools in data collection, data updating and analysis processes;
- D. Seek harmonisation of data across national, regional, and local levels to streamline scaling and data sharing and improve interoperability and cost efficiency;
- E. Adopt a collaborative approach for data sharing between policy makers, governments, citizens and civil-society members, businesses, and academia;
- F. Establish mechanisms for volunteered data to allow citizens contribute data on public transport and their experiences.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Finance and Economic Planning, Ministry of ICT and Innovation, Ministry of Education, National Institute of Statistics of Rwanda, special interest groups, national and international development partners, and the private sector

4.6.2 Partner with local universities, research institutions and transport operators to conduct studies on sustainable transport systems for the city

The advancement of transport related knowledge is essential to building better mobility systems in Kigali. Universities are concentrated communities of collective expertise and facilities, where breadth and depth of knowledge acquisition and development are delivered through training that ensures continuity of the research and development cycle. Kigali city has respected universities capable of steering research and development in the transport field. It is imperative that City of Kigali dedicates human and financial resources towards research and development in sustainable transport, by tapping into its abundant high education resources.

Targets:

- i. Set up a knowledge sharing platform/centre for urban mobility by 2026;
- ii. Collaborate with research institutions to develop at least 10 knowledge products on the status of mobility by 2028.

Activities:

- A. Advocate for an update to all university curriculums to ensure low carbon mobility and courses that focus on mobility data collection and analysis, and technology-based solutions are incorporated;
- B. Identify leading learning, and research institutions with transport faculties or transport hubs;



- C. Identify focal points within the city council to guide collaboration with academic and research institutions;
- D. Ensure synergies between departments of urban planning, architecture, and engineering and explore collaboration with academic institutions outside of Rwanda, that are leading in transport studies;
- E. Set up professional development programs for city officials.

Stakeholders involved:

City of Kigali, Ministry of Local Government, Ministry of Finance and Economic Planning, Ministry of ICT and Innovation, Ministry of Education, National Institute of Statistics of Rwanda, special interest groups, national and international development partners, and the private sector.

5. Monitoring and Evaluation

To monitor the delivery of the Kigali City Action plan, The City of Kigali will conduct annual assessments of the public transport, walking, cycling, street lighting, safety, and other targets to establish the progress made and compare with expected targets. The results will be used to identify any gaps between existing and desired data, public transport, walking and cycling landscape. City authorities will review targets every second year and determine whether any updates are required. Data on the experience should be supplemented by citywide data collection initiatives that supplement mode shares and travel patterns obtained from periodic household surveys.

Table 2 summarises the targets contained in the Kigali City Action Plan together with means of verification to ensure proper monitoring of the targets.

Table 2: Means of verification for the Kigali Action Plan

| Goal | Target | Means of verification |
|--|---|--|
| 4.1 Governance and strategy | | |
| 4.1.1 Create enabling policy and regulatory frameworks for promoting sustainable mobility | Transport administration services are decentralised by 2024. | Draft decentralisation strategy |
| | Distinct allocation of planning, contracting and regulatory functions for transport by 2027. | Annual budgets |
| | A strategic framework for active travel and public transport to support Kigali to achieve a 50% reduction in carbon emissions by end of 2030 in line with national targets. | Draft strategy document |
| | Reduce emissions by transitioning at least 20% of public transport buses and small public service vehicles (SPVS) to zero or low emission vehicles by 2031. | Percentage of zero or low emission public transport vehicles |
| 4.1.2 Increase investment in inclusive and safe mobility systems | Develop an incentive program for urban road projects that focus on universal access, safety and complete streets principles by 2024. | Terms of reference for incentive program |
| | 25% extension of public transport routes networks by 2027. | City endorsed map of transport routes |



| | | |
|--|--|--|
| 4.1.3 Accelerate delivery and implementation of existing plans and strategies | Implementation of NMT infrastructure on 40% of primary NMT routes by 2028. | Percentage of primary NMT routes constructed |
| | 12.3 kilometres of BRT corridor constructed at main corridor by 2025. | Main BRT corridor constructed |
| | Bus Rapid Public transport (BRT) corridors as identified in the Master Plan, constructed by 2030. | BRT corridor system complete |
| 4.2 Inclusivity in urban mobility | | |
| 4.2.1 Improve civil society organisations and community engagement in decision making | Establish baseline stakeholder information on key mobility stakeholders and potential interest by 2023. | Stakeholder database |
| | Develop a comprehensive stakeholder engagement framework by 2025. | Draft stakeholder engagement framework |
| | Establish dedicated forums for inclusive and sustainable mobility planning by 2027. | Forum meeting minutes |
| 4.2.2 Accelerate delivery of complete walking and cycling networks, which prioritise universal access in the city centre with connections to areas outside of the city centre | 110 kilometres of direct, consistent, and joined walking and cycling routes to and from the city centre and its periphery by 2028. | Percentage of walking and cycling routes constructed |
| 4.2.3 Address personal security concerns for women due to sexual harassment | Establish an efficient and effective processes for registering and prosecuting cases on sexual harassment in public transport by 2024. | Registration and prosecution system terms of reference |
| | At least 2 Training and awareness-raising forums on gender and women's rights for public transport staff annually by 2025. | Training workshop minutes |
| 4.2.4 Improve road safety | Pedestrian and cyclist fatalities reduce by 80% from 2022 levels by 2027. | Number of reported incidents in police records |
| | At least 40 primary schools with low-speed zones by 2030. | Number of low-speed school zones created |
| 4.3 Climate change and environment | | |
| 4.3.1 Reduce reliance on personal motor vehicles (PMV) | Smart parking management system by 2024. | Smart parking system |
| | Vehicle kilometres travelled (VKT) by private motor vehicles (PMVs) | Block, weighted population, and land use density |



| | | |
|--|---|---|
| | by 2029 are lower or same as 2023 levels. | |
| | Reduce average travel distances by 20% by 2029. | Average travel time by mode |
| 4.3.2 Continue to deliver on commitments to compact mixed use design in green network planning | Implement the extension Imbuga City Walk to the University Teaching Hospital of Kigali by 2024. | Imbuga City Walk extension complete |
| | 10% increase in household cost savings from spatial proximity by 2028. | Percentage of household income spent on transport |
| | Dedicate at least 10% of the annual city budget to street pedestrianisation by 2028. | Percentage of budget allocated to pedestrianisation |
| | Increase in modal share for NMT to 60% by 2031. | Total number of passenger trips by walking or cycling per inhabitant and per year |
| 4.3.3 Increase bicycle mode share | Women constitute 50% of cyclists by 2028. | Modal share disaggregated by gender |
| | 30% increase in the share of e-bikes as a percentage of the whole bicycle population by 2029. | Percentage of bicycles that are electric |
| 4.3.4 Prioritize clean and efficient mobility | 15 EV charging station each with at least three charging points by 2026. | Number of EV charging stations |
| | 25% increase in electric vehicle and motorcycle taxis by 2026. | Percentage of the vehicles and motorcycles that are electric |
| | At least 50% of the city council motorised fleet to be electric by 2030. | Percentage of the council motorised fleet that is electric |
| 4.3.5 Monitor and improve air quality | Air quality in the city is within WHO ambient air quality norms 350 days a year by 2030. | Number of days per year on which WHO defined levels are exceeded |
| 4.4 The role of paratransit | | |
| 4.4.1 Professionalisation and regulation of the motorcycle and bicycle -taxi paratransit transport system | Hold 3 workshops with motorcycle and bicycle taxi operators to improve coordination and route planning by 2024. | Workshop meeting minutes |
| | Introduce capacity building and regular training of motorcycles and bicycle taxi operators by 2025. | Number of trained operators |
| | Develop a public transport policy and strategy, that promotes paratransit as a public transport option for Kigali, by 2026. | Draft public transport policy and strategy |



| | | |
|--|--|---|
| 4.4.2 Construction and maintenance of paratransit support infrastructure | At least 70% of buses stops include bicycle stations by 2027. | Number of bicycle stations at bus stops |
| | At least 80% of city population has access to paratransit stops within 500 metres by 2028. | Percentage of population with access to public transport within 500 metres using SDG indicator 11.2.1 methodology |
| 4.5 Sustaining data efforts | | |
| 4.5.1 Improve capacities for holistic data collection and straightforward procedures to collect and access data | By 2026, have a disaggregated, transparent data collection and digitalisation mechanism to support mobility systems. | Mobility database |
| 4.5.2 Partner with local universities, research institutions and transport operators to conduct studies on sustainable transport systems for the city | Set up a knowledge sharing platform/centre for urban mobility by 2026. | Knowledge sharing platform |
| | Establish 10 knowledge products on the status of mobility, in collaboration with research institutions by 2028. | Knowledge products |



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