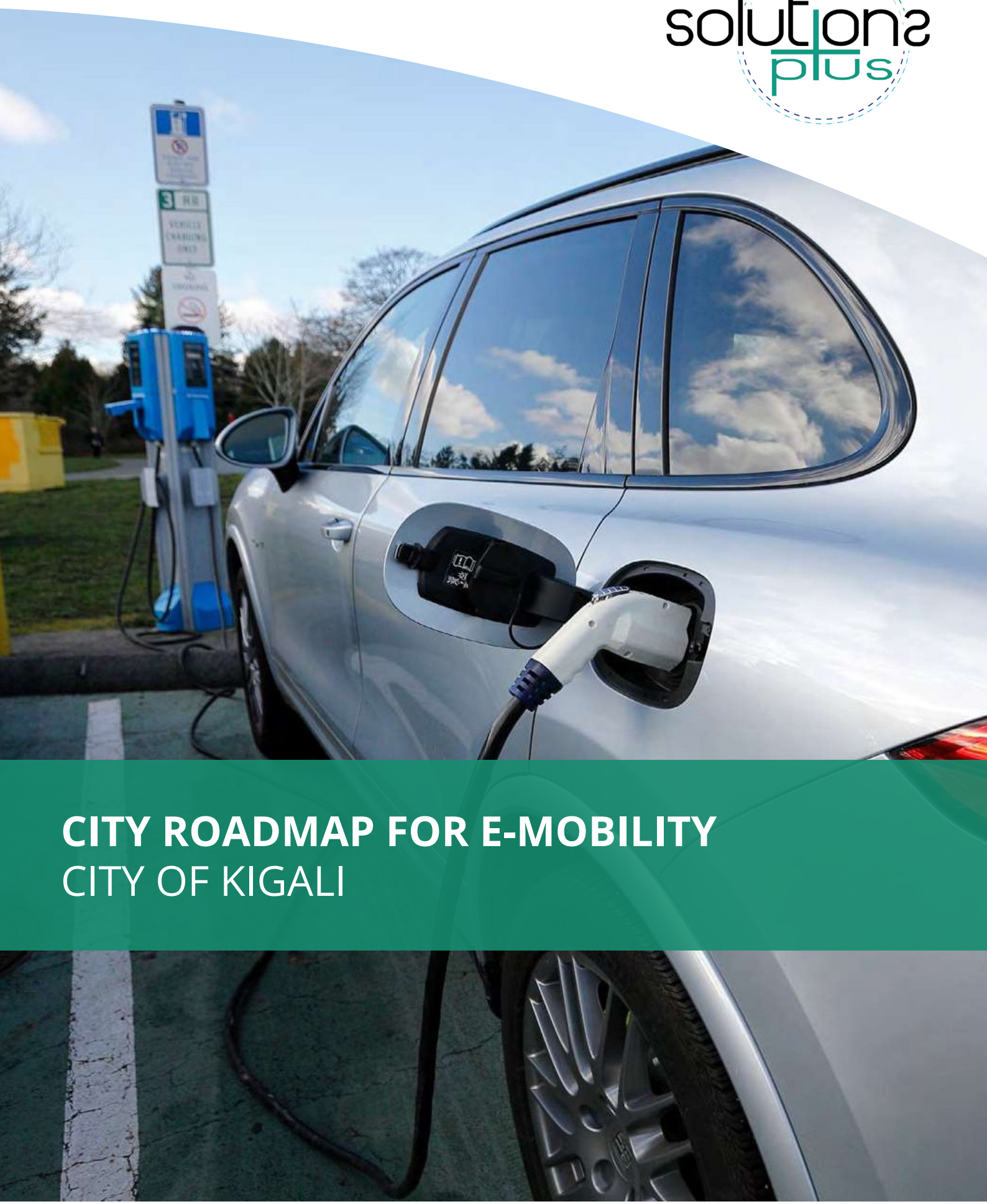

CITY ROADMAP FOR E-MOBILITY
CITY OF KIGALI

This project has received funding from the European Union Horizon 2020 research and innovation Programme under grant agreement no. 875041

PROJECT PARTNERS

ABOUT

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TITLE

City Roadmap For E-Mobility: City Of Kigali

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DISCLAIMER

The views expressed in this publication are the sole responsibility of the author named. It is a proposal submitted to Rwandese authorities and does not engage the City of Kigali, nor the Ministry of Infrastructure. It does not necessarily reflect the view of the European Commission.

LAYOUT

Yasin Imran Rony, WI

PICTURES

All the pictures are provided by the SOL+ partners

June, 2024

City Roadmap for E-mobility

City of Kigali

March 2023

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Message from His Worship Mayor, City of Kigali

In response to global climate change, electrification of transportation system has become a global trend. Adoption rate of electric vehicles (EVs) has been surging under relentless promotion from governments around the world. Many countries have also announced their intention to boost the adoption of EVs in the coming decade, as well as plans to reduce or even terminate the production of fuel-propelled vehicles.

Kigali is a green oriented City. The leadership is determined to improve air quality and develop Kigali to be a smart city, and at the same time has set a target of striving for attainment of carbon neutrality before 2050. To reach these goals, promoting the use of EVs is a very vital measure. The Technical Committee on Promotion of Electric Vehicles that the City of Kigali chairs has been actively promoting the use of EVs. After consulting the Committee and other stakeholders, the City of Kigali has formulated the strategy on Popularization of EVs to comprehensively strengthen our efforts to push ahead the use of EVs and make preparation on all fronts to meet the new era of rapid and wide adoption of EVs, advancing towards zero vehicular emissions before 2050.

After the formulation of the strategy, we will strengthen engagement of stakeholders, which will respectively elaborate on the leadership's overall measures to improve air quality and strive to achieve carbon neutrality so as to address climate change, driving City of Kigali in pursuit of green and sustainable development.

Looking ahead, the City of Kigali will continue devoting necessary resources and get prepared for the popularization of EVs. I also look forward to the collaboration between all sectors of the society and the Government to make Kigali a more livable, green and smart city.

Pudence RUBINGISA

Mayor, City of Kigali

March, 2023

Executive Summary

This residents of the city of Kigali are mainly transported by private cars, buses, and moto-taxis. Despite determined efforts made by the government and private sector over the last 10 years, the number of buses has not increased vis à vis the population growth, hence resulted in a rise in latent demand. The government has put in place planning documents for transport improvement which include the National Transport Policy and Strategy for Rwanda (2021) as well as the Kigali Transport Master Plan (2020).

The primary source of air quality issues in Kigali is road transport (REMA, 2020). A number of studies were conducted on e-mobility such as electric mobility in Rwanda (2019) and the electric bus concept validation in Kigali, Rwanda (2021). A related project is also ongoing, namely the SOLUTIONSplus project.

The Government of Rwanda is strongly driving the transition to electric mobility as a lever to decarbonize the transport sector, and has introduced new policy and adjustments to policy and regulations to reflect this. A number of fiscal and non-fiscal incentives have been approved to accelerate the uptake of electric mobility, including an electricity tariff for charging stations to be capped at the industrial tariff level and exemptions on VAT and import and excise duties on electric vehicles and related components are reduced, among others.

The Electric Mobility Strategy as proposed in this paper is intended to support a rapid transition to electric vehicles including e-bicycles in the city of Kigali. It contains different proposals for actions in five focus areas:

1. Electric Vehicles (EVs)
2. E-bicycles
3. Home and Workplace Charging
4. Public Charging Network
5. City Leadership

These actions are intended to support the following_city of Kigali green transport targets set with reference to the study of electric mobility in Rwanda (MININFRA, 2019): 20% electric buses; 30% of electric motorcycles; 25% for electric taxi cabs; 25% for light duty vehicles; 8% of electric bicycles; and 8% of electric cars by year ?.

This strategy focuses on light duty electric vehicles and e-bicycles because these are most readily available and will have the biggest impact on Kigali's greenhouse gas emissions. As more medium- and heavy-duty vehicles become available, strategies to support a transition to these vehicles must also be developed.

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Abbreviations

EV	Electric vehicle
GGGI	Global Green Growth Institute
GHG	Greenhouse gas
NDC	Nationally Determined Contribution
RTDA	Rwanda Transport Development Agency
ZEV	Zero-emission vehicle

1. Background – Where are we now?

1.1. Electric mobility context in Kigali

In this strategy, "electric mobility" refers to the use of electric vehicles (e-motor vehicles, e-motorcycles and e-bicycles) as well as supporting charging infrastructure. This strategy focuses on electric vehicles (including e-buses, e-motorcycles, light delivery motor vehicles and e-cars) and electric bicycles (e-bicycles) because they are most prevalent in Kigali.

Electric mobility is critical for reducing greenhouse gas emissions and combating climate change. Electric mobility has other benefits too, including:

- Increased affordability;
- Improved air quality;
- Reduced noise;
- Health benefits.

To combat climate change, the city of Kigali has set the target to reduce greenhouse gas (GHG) emissions by 38% by 2030 (NDC).

The City of Kigali is focusing resources on implementing both the National Transport policy and strategy as well as the Kigali Transport Master Plan. They include actions to improve the public transport service, non-motorized transport and electrification of transport in order to encourage residents to use other more sustainable modes of transportation. However, in Kigali, most travel is still taking place by personal vehicle and road transportation is the largest source of GHG emissions.

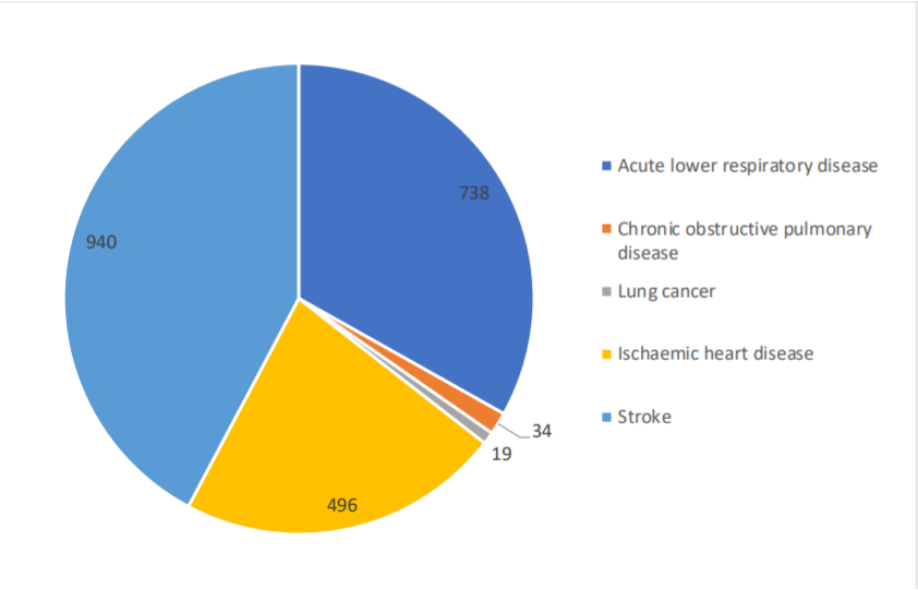

Figure 1: Deaths in Rwanda, attributed to ambient air pollution in 2012 (WHO, 2016)

As a result, the National Transport Policy and Strategy identifies the transition to electric vehicles as the most important strategy for reaching GHG emission reduction goals, and could reduce community-wide GHG emissions by 38% by 2030 (NDC).

Currently, hydroelectricity provides more than 50% of total electricity supply in Rwanda, so a car powered by electricity has much lower GHG emissions than a gasoline-powered car. Additionally, electric engines are approximately 5 times more efficient than internal combustion engines, reducing energy use overall (International Council on Clean Transportation, 2019).

EVs do not burn fossil fuels, so they do also not create exhaust-related air pollution such as particulates or smog. Like other motor vehicles, wear of the tires and brakes of EVs and of the road surfaces they drive on create particulate air pollution. However, the regenerative braking of EVs means that their brakes have less wear than other vehicles. Because EVs do not have an internal combustion engine, they are much quieter than gasoline- or diesel-powered vehicles.

Despite the current low uptake of electric vehicles, it is expected that the purchase price of EVs will continue to drop and achieve parity with internal combustion engine cars around 2025 (International Council on Clean Transportation, 2019). While electric vehicles currently tend to cost more than comparable gasoline- or diesel-powered vehicles, they are cheaper to operate. This is for two reasons, namely fuel cost is lower and less need for maintenance - EVs have fewer and simpler components, they do not require oil changes, and regenerative braking means that EV brakes wear down much less.

1.1.1 Sustainable transportation modes in Kigali

Electric Vehicles (EVs) are part of a sustainable transportation system, which involves:

- creating compact communities to reduce the need for vehicle travel;
- shifting transportation choices from single-occupant vehicles to walking, biking, and public transport;
- improving the efficiency of vehicles as well as how they are used, for instance through right-sizing vehicles to the need; and
- switching the fuel used in vehicles to low-carbon renewable choices such as electricity.

Active transportation

Walking, cycling, wheeling, and other human-powered forms of transportation (often referred to as "active transportation") are the most sustainable modes of transportation. They have no GHG emissions (except for the GHG emissions associated with constructing, maintaining and disposing of the bicycle, for example, or the related infrastructure such as roads and sidewalks, etc.) and they also support health, safety, equity, community building and local businesses.

E-bicycles are part of active transportation. Although there are some small GHG emissions associated with their operation (from the electricity used to charge their batteries, which is 97% renewable), e-bicycles otherwise have all the benefits of active transportation and can make cycling possible for more people and more trips. Other kinds of electric active transportation include electric scooters and electric skateboards. Electric wheelchairs and scooters improve accessibility and make active transportation more feasible for people with mobility challenges.

In areas where there is traffic congestion and limited parking and curbside access, e-bicycles can be a cost-effective solution for deliveries. An analysis of different scenarios of package delivery methods found that the combination of local micro-hubs for distribution of delivery packages and e-bicycles for delivery of those packages was faster and cheaper than use of larger "urban consolidation centers" combined with conventional delivery vehicles (trucks or step vans). This is largely because the e-bicycles are easier to park and unload than conventional delivery vehicles. Additional cost savings are achieved because e-bicycle drivers are typically paid less than drivers of conventional delivery vehicles.

Public transportation

Public transit is the next most sustainable form of transportation. Transit moves more people using less space and resources than personal vehicles, making transit essential for moving people efficiently in urban areas. Even for buses that are fueled by diesel or gasoline, the fuel (and GHGs) per person for a trip by bus is less than for the same trip by single-occupant vehicle (unless there is extremely low ridership). The case for public transit is even stronger when the buses are powered by renewable energy.

E-motorcycles

Motorcycles are widely used in the City of Kigali to transport passengers, thanks to their door-to-door services and flexibility to maneuver in congested routes. It is very important to electrify these

motorcycles to reduce emissions. The electrification requires both motorcycles and charging/swapping stations.

Integration of different transportation modes can support sustainable transportation choices. One example is to provide end of trip bicycle facilities (such as secure bicycle parking and e-bicycle charging) at major transit stations or park-and-ride lots. Another is to locate sharable bicycles or e-bicycles next to EV charging stations, so that drivers can use a bicycle for trips they need to make while their EV is charging.

Private vehicles and car-sharing

If people need to travel by personal vehicle, the GHG emissions are much lower when those vehicles are electric. Investing in EVs can also improve air quality and reduce noise pollution in the community.

Car sharing reduces the need for people to purchase and maintain their own vehicles and can provide more affordable transportation choices. Because car-share vehicles tend to be used more intensively, the business case for switching to EVs can be stronger for car share vehicles than for private vehicles. Additionally, car-share vehicles are used by many people, providing an opportunity for those people to gain familiarity and experience with driving an electric vehicle.

However, access to charging is a challenge for car shares because the charging infrastructure is an additional capital expense, adding to the already generally higher up-front cost to purchase an EV compared to an internal combustion engine vehicle. And the need to access charging may place constraints on where car share EVs can park, for example only at car-share parking spaces with EV chargers rather than any car share parking space. Moreover, while an EV is charging it is not available for use and the more kilometres EVs are driven, the more charging they need.

Ride-sharing

Ride-sharing includes carpooling, taxis, and ride-hailing services such Yego cabs and Move. In the City of Kigali, new or expanded taxi fleets must be eco-friendly vehicles, which are defined to include electric and gas-electric hybrid vehicles as well as any vehicle that meets fuel-efficiency requirements. Carpooling and ride-hailing services rely on private vehicles, which can be electric, gas or diesel-powered, depending on the owner's preference.

Ride-hailing and taxis can have additional negative impacts if they displace trips that otherwise would have been taken by active transportation or transit. However, ride-hailing and taxis can foster the use of transit by providing connections to transit routes from areas with limited local transit, helping to foster low carbon transportation and increase mobility.

The negative impacts of taxis and ride-hailing can be reduced by electrification of these vehicles, and the higher distance traveled by ride-hailing vehicles and taxis provides a good business case for using EVs, due their lower fuel and maintenance costs. Additionally, promoting pooled rides and providing connections to transit can further reduce their negative impacts.

Charging infrastructure

Table 1 provides an overview of the charging infrastructure currently installed in Rwanda.

SN	Company Name	Number of charging stations	Number of electric vehicles services per day
1	Ampersand Rwanda LTD	9 active charging/swapping stations	700 E-motorcycles
2	Volkswagen Rwanda	2 charging stations	20 e-motor vehicles
3	SAFIRIDE & SAFIRUN Ltd	One charging station and one swapping station	-40 e-scooters and 12 e-motorcyles. -2 e-vans
4	Rwanda Electric Motorcycle Company (REM)	1 charging station and 3 battery swapping stations.	500 Operating
5	Greenleaf Autofast Rwanda Limited/ Victoria Motors Rwanda Limited	2 fast public chargers and 30 domestic chargers	30 e-motor vehicles
6	MTN Rwanda	2 public chargers	10 e-motor vehicles

Table 1 Charging facilities and Electric vehicles as of 2022

Equity

A sustainable transportation system provides safe, affordable, convenient and reliable mobility for everyone. In developing and implementing policies and actions to support electric mobility and sustainable transportation,

it is important to evaluate their equity implications. Who will benefit from the policy or action? Will it improve mobility for people who have had less access to safe, affordable, convenient and reliable transportation? Will it improve the access to employment, education, childcare and services for the people who need improved access?

This strategy considers how to support the transition to electric mobility in Kigali, including through supporting the uptake of EVs. EVs are only accessible to people with enough money or borrowing capacity to buy them, which means that public investments in infrastructure for EVs, such as public charging stations, really only provide a direct benefit to these people. However, these investments provide an indirect benefit to everyone by reducing the pollution associated with personal vehicles. And, to the extent that they support an expanded market for EVs, they can make EVs accessible to more people through lower prices for new EVs and increased supply of used EVs.

As discussed in the benefits section of this strategy, EVs have much lower operating costs than fossil-fueled vehicles. As the purchase price of EVs becomes comparable to or less than other vehicles (due to purchase incentives or a maturing market), EVs will become an increasingly affordable personal vehicle option. "Price parity" with conventional cars is currently expected to be met around 2025.

Equity considerations can also location choices for new public EV chargers and training for local workers to work on EV cars.

Other public investments, such as in transit and active transportation, benefit anyone who can get to them. Expanding the active transportation network geographically provides access for more people and improving active transportation infrastructure can increase the safety and enjoyment of using active transportation modes. Investing in transit can provide better access and improved service, helping to improve the quality of mobility for people who use transit and making it a more viable option for getting around.

E-bicycles make biking possible for a wide range of ages and capabilities, helping more people to enjoy the benefits of active transportation. However, e-bicycles cost considerably more than pedal bicycles and may not be an affordable option for some people. Incentives that reduce the purchase price of e-bicycles will make them accessible to more people.

While e-bicycles cost more than pedal bicycles, they are typically only a fraction of the cost of purchasing a car or truck and have very low operating costs, making them a more affordable transportation option than personal vehicles, provided that e-bicycles are suitable for the kinds of trips people need to make.

Other forms of electric mobility, such as electric scooters and electric skateboards, provide transportation options that may be more suitable for certain people, or help people to access other modes of transportation.

As the actions in this strategy are implemented, and as new actions and policies are identified, their equity implications will be evaluated. Emphasis will be placed on improving the access to sustainable mobility options for people who have had relatively less access, to help ensure that everyone in the City of Kigali has equitable access to transportation options that meet their needs.

1.2. Current policy framework and market readiness for deployment of e- mobility

The National Transport Policy and Strategy (2021) outlines actions to accelerate penetration of EVs, which include:

- Develop technical standards for e-vehicles, including environmental standards and regulations for the recycling of batteries and electronic waste.
- Provide incentives for electric mobility users and early adopters. Incentives can include a reduction of import duty on specific components and attractive electricity tariffs for charging stations.
- Document experiences from demonstration projects on electric mobility. Collect statistics on electric mobility to document progress towards targets.
- Develop sound business models for charging infrastructure and vehicles.
- Develop plans for the efficient placement of charging infrastructure.
- Improve the reliability of the electric grid.

- Establish a protocol of cooperation with countries and companies to facilitate technology transfer related to electric vehicles.

The government also provides incentives for purchasing new and used EVs and installing EV charging infrastructure.

1.2.1. Barriers to EV adoption

There are several barriers to EV adoption identified in the City of Kigali, which are outlined below.

Purchase price

Different studies indicated that the high purchase price of EVs is an important barrier to EV adoption. To help address this barrier, the Government of Rwanda provides both fiscal and non-fiscal incentives for purchases of new and used EVs, intended to partially offset their higher purchase price. It is expected that EV prices will fall over time.

Lack of knowledge and experience with EVs

EVs are a relatively new technology and are still unfamiliar to many people. Providing opportunities for people to learn about this and test-drive EVs will help to remove this barrier, as will increases in EV ownership over time so that they become more common. The city of Kigali in partnership with different organization such GGGI, IGC and SOLUTIONSplus consortium, frequently host events to help increase awareness and understanding of electric vehicles.

Lack of variety and model types

Lack of variety of EV models is also a barrier to purchasing an EV. However, it could still impact more widespread EV adoption as people who are looking for larger family vehicles or pick-up trucks may find limited EV choices. There can be limits on the availability of some EV makes and models, reducing opportunities to test-drive these vehicles and requiring sometimes lengthy waits for delivery.

Range anxiety

Range anxiety is the fear of running out of battery power before being able to recharge an EV. As the battery range of EVs increases and as the network of charging stations expands, range anxiety should fall. Most new battery-electric models available have ranges of 235 km or more.

The average daily driving distance is 15 km in the city of Kigali. This suggests that a typical Kigali driver does not need to have range anxiety for local trips and might be able to go a few days on a single charge. However, it is important to recognize that a wider network of EV charging infrastructure is needed for longer road trips.

Increasing the number of public charging stations both locally and as part of a larger City network also helps to address range anxiety, so that EV drivers know they have options to recharge if needed.

Inability to charge at home or work

Lack of charging opportunities at these locations can be important barriers to EV ownership. Having charging equipment at home might help people choose an EV for their next vehicle purchase.

Retrofitting existing buildings to include EV charging is far costlier than incorporating "EV-ready" electrical infrastructure at the time of development.

Apartments should be encouraged to optimize the electrical capacity of their building and plan for 100% of units to have access to charging through the use of energy management systems (shared circuits).

The practice of installing one or several stations on dedicated circuits runs the risk of "eating up" the electrical capacity and making it more difficult for all building residents to have access to charging in the future.

Lack of public charging stations

A lack of public charging stations can be an important barrier to EV adoption. More public charging might help people choose an EV for their next vehicle purchase.

By providing access to EV charging, public charging stations are important for reducing range anxiety. They can also provide access to charging for EV owners who are not able to charge at home or work.

1.2.2. Approaches to support EV adoption

Twenty-five cities around the world lead EV adoption, accounting for 42% of global passenger EV sales through 2018. These cities tend to use several different approaches for supporting EV adoption (The International Council for Clean Transportation, 2019. "Electric vehicle capitals), including a focus on the following actions and measures:

- Areas that are only accessible by zero-emission vehicles
- Exemption from licensing restrictions or quotas
- Financial incentives for EV purchases
- Financial incentives for charging station infrastructure
- EV-ready building requirements
- Non-financial incentives such as priority road access or parking benefits
- Support for electric ride-sharing and car-sharing
- City fleet electrification
- Zero-emission bus targets
- Consumer awareness programs

These approaches provide best practice examples to inform development of actions to support electric mobility in the City of Kigali. Many have already been implemented in the City of Kigali, such as fiscal incentives for EV purchases and charging station infrastructure, namely tax exemption and reduced electricity tariff.

In the early stages of the transition to EVs, government incentives, local manufacturing/assembly targets, infrastructure requirements, non-financial incentives, and other supports help to spur the

development of a market for EVs and the charging infrastructure needed to support them. In Rwanda, the Government provides a strong support for EVs, such as taxes exemption as well other non-fiscal incentives.

As the EV market matures and EV prices fall, there will be less of a need to provide incentives to offset their higher purchase price. And as EVs begin to become progressively larger shares of total personal and commercial vehicles, it will make less sense to provide non-financial incentives to EVs, since the non-financial incentives will be enjoyed by more than a small minority of early adopters. As the number of EVs increase, so too will the need for EV charging infrastructure. Fortunately, the development of EV charging equipment and electric vehicle energy management systems, which allow multiple EV chargers to share a single electrical circuit, reduce the cost of installing EV charging infrastructure.

The nature of government support for EVs may therefore shift as the market matures, with scaled-back financial and non-financial incentives to spur EV adoption and stronger policies, to ensure a continued shift to EVs as well as ensuring there is a charging network in place to support EVs. This transition is occurring in leading EV jurisdictions around the world. For instance, many cities in China have stopped providing city-level financial incentives for purchase of EVs.

The City of Kigali will support the transition to electric vehicles by implementing EV-ready building requirements for new buildings and supporting retrofits of existing buildings, providing public charging infrastructure and showing leadership by electrifying their fleets and providing workplace charging.

The City of Kigali can also provide non-financial incentives as dedicated/preferential parking, provide support for electric ride-sharing and car-sharing, establish green mobility zones, and implement consumer awareness programs.

However, this is offset by people who purchase an e-bicycle so that they can use it for trips they were less likely to make on a conventional bicycle, such as for long trips, hilly routes, or hauling children or cargo.

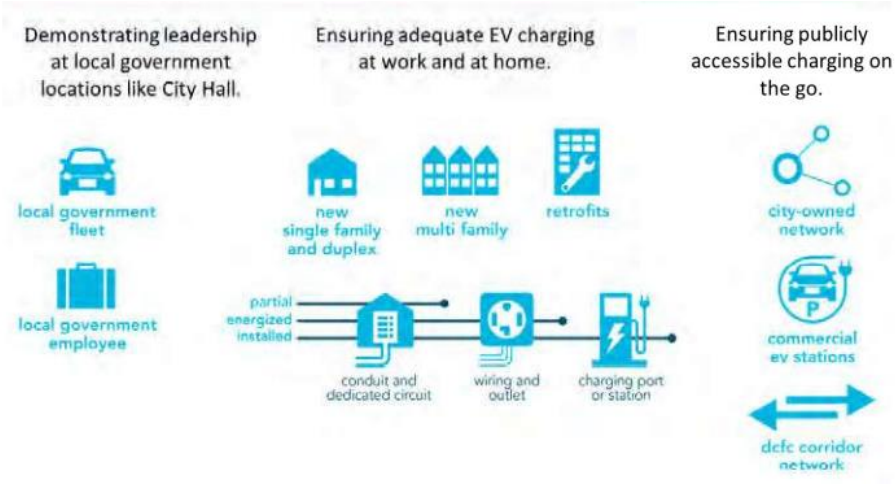

Figure 2: Roles for the local government in supporting the transition to electric vehicles

2. Approach – Methodology

The Electric Mobility Strategy is developed in a 6-step process, as shown in Figure 3 below.

Step 1

Definition of the scope of the strategy and process for strategy development and development of an engagement strategy.

Step 2

Revision of previous engagement findings, conduct research on best practices and the experiences of leading jurisdictions, and analyze relevant data.

Step 3

Invite the public and stakeholders to review and provide feedback on the proposed actions.

Step 4

Incorporate Public and stakeholder feedback into a draft Electric Mobility Strategy.

Step 5

Invite the public and stakeholders to review and provide feedback on the draft Electric Mobility Strategy.

Step 6

The Electric Mobility Strategy was revised to address feedback and then finalized.

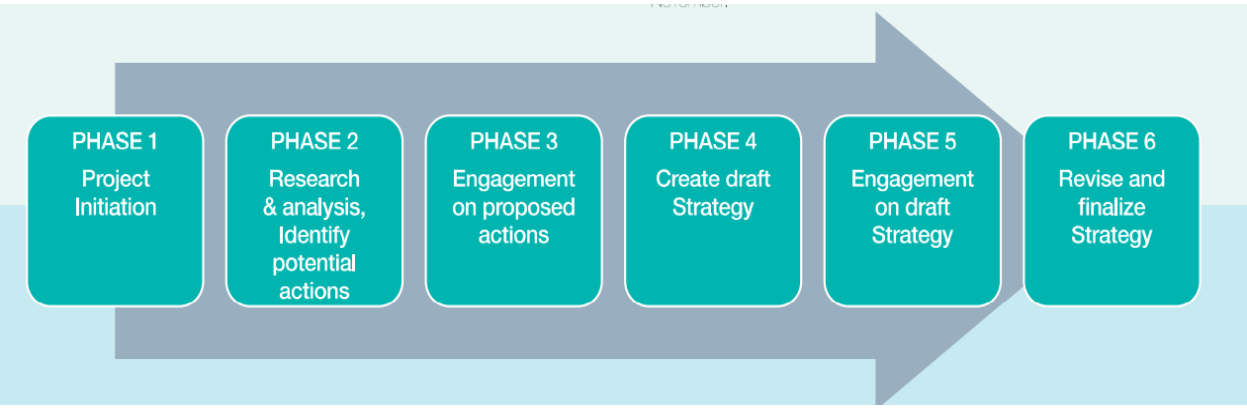

Figure 3: Process for Electric Mobility Strategy Development

Implementation and monitoring of the Electric Mobility Strategy will be led by the City Engineering Department, working in collaboration with both internal staff and external organizations. Implementation will require support from other divisions and departments including Urban Planning Department, and Planning Division.

Progress on implementation of the Electric Mobility Strategy will be reviewed annually and the Action Plan will be updated on a rolling basis in consultation with relevant departments. Requests for financial and other resources required for implementation of this strategy will be included within the City annual financial planning and budget processes.

The City Engineering Division will monitor and report on implementation of the Electric Mobility Strategy.

The Electric Mobility Strategy will be reviewed by the City Engineering Department every year to ensure it is still relevant and to take advantage of new opportunities and technologies. Significant updates to the strategy will be presented to Council for approval. However, the first review will be done in 2026 to pave way for achieving 2030 targets.

3. The Roadmap – Where are we going?

3.1 Vision

The development of the Electric Mobility Strategy and its actions was guided by the following principles:

- **Be bold -** Be ambitious and courageous, and lead by example.
- **Be evidence-based -** use available science and policy research to make proactive and informed decisions about effective actions while being adaptable and responsive to future developments. In the case of uncertainty, the precautionary principle will guide decision-making.
- **Share the benefits -** ensure that benefits and burdens of the transition to electric mobility are shared equitably.
- **Improve wellbeing -** design policies and actions to support electric mobility to achieve multiple benefits.
- **Be collaborative -** engage, collaborate and partner with departments across the City of Kigali and with residents, businesses, institutions and senior levels of government.
- **Prioritize active transportation first,** then shifting to EVs.
- **Act internationally -** transportation systems cross municipal borders, so the transition to electric mobility is best achieved through international collaboration.

3.2 Objectives

The measures and actions drafted below as part of this Electric Mobility strategy reflect best practices and the experiences of leading jurisdictions as well as analysis of relevant data. They aim to address the barriers identified in this strategy and have been informed by stakeholder and public engagement on electric mobility.

Four focus areas have been defined for this Electric Mobility strategy, for which concrete actions and measures are proposed:

1 Electric Vehicles
2 Electric Bicycles
3 Home and Workplace Charging
4 Public Charging Network
5 City of Kigali Leadership

4. Implementation plan and timeline – How do we get there?

In this chapter five focus areas are defined which could be areas of prioritization for the Kigali city council to focus on when developing an Electric Mobility Strategy for the city. For each focus area concrete measures and actions are proposed, including a suggested timeline for implementation and an indication of the level of priority for each of these actions.

4.1. Focus area 1: Electric Vehicles

Action/Measure	Description	Timeframe	Priority
Advocate to provincial and federal governments to maintain EV incentive programs	Advocate to the Central Government to maintain EV incentive programs until the purchase cost of EVs is on par with the cost of fossil-fueled vehicles, and to prioritize making EVs more affordable for people who might otherwise not be able to purchase EVs. Incentives should increase affordability of EVs for lower-income residents	2024-2026	High
Increase awareness about EVs through a comprehensive communications campaign.	Increase awareness of EVs through a comprehensive communications campaign, ideally in collaboration with other partners, for example: Information materials such as short videos, testimonials, presentations, sound-bytes and images on the benefits of EVs and charging network. Free, earned and paid media promoting EVs and the EV charging network. Promotional and educational opportunities such as "ride and drive" events and 'commuter challenges' in collaboration with relevant organizations.	2024-2026	High
Encourage and support organizations to convert their fleets to Zero Emission Vehicles (ZEVs)	In collaboration with Central Government, encourage schools, businesses, and other organizations in the City of Kigali to convert their fleets to zero emission vehicles (ZEVs): Provide information to schools, businesses, and other organizations in the City of Kigali on the advantages of converting their fleet vehicles to	2024-2027	Medium

Action/Measure	Description	Timeframe	Priority
	ZEVs and support the reduction of barriers identified.		
Support car sharing organizations to electrify their fleet	Support car sharing organizations to electrify their fleets: • Engage with car-share organizations in the City of Kigali to understand the barriers they face to electrifying their fleets. • Where feasible, pursue actions that help reduce or remove these barriers.	2024-2025	Medium
Advocate that higher levels of government work to remove barriers to EV adoption	Monitor barriers to EV adoption and provide feedback and advocacy to higher levels of government or organizations as needed.	2024-2026	Medium
Explore the potential for EVs to act as backup power supply	Work with research institutions, and other stakeholders to explore the potential for EVs to act as a backup power supply during power outages.	2025-2027	High

4.2 Focus area 2: Electric bicycles

Action/Measure	Description	Timeframe	Priority
Urban planning: plan compact, complete communities and focus density in nodes and corridors	Prioritize land use planning for compact, complete communities so that work, amenities and key services are available within the typical 6km e-bicycle trip range. Through the local area plan amendments and future corridor studies, focus additional growth and density on key nodes and corridors with access to frequent transit	2024-2027	High

Action/Measure	Description	Timeframe	Priority
Identify and plan for infrastructure to ensure the safety and security of e-bicycle riders and others	In collaboration with concerned partners, identify and plan for the infrastructure needed to ensure the safety of e-bicycle riders as well as other active transportation users. This could include: • Add separate bike lanes, starting with the main roads. • widening multi-use roads that are becoming congested, and adding bike lanes. • creating pull-outs and parking for cargo/delivery e-bicycles. • providing secure bicycle/e-bicycle parking in commercial areas. posting and enforcing speed limits on congested areas.	2024-2027	High
Advocate to the Central Governments for an e-bicycle incentive program.	• Advocate to the Central Governments to provide an e-bicycle incentive program.	2024	High
Provide 'top-up' incentives to augment Central e-bicycle incentive programs	Monitor the development of the Central Government e-bicycle incentives program and provide additional "top-up" incentives to support city up • take based on assessed need.	2025-2027	High
Pilot an e-bicycle incentive/ trial program	Pilot an e-bicycle incentive/trial program that complement Central Government e-bicycle incentive program, ideally in collaboration with other development partners.	2023-2025	High
Increase awareness of e-bicycles through a comprehensive communications campaign	Increase awareness of e-bicycles through a comprehensive communications campaign, ideally in collaboration with other partners. As part of this effort, link residents with opportunities to learn e-bicycle safety skills through community partners and/or recreation centers.	2023-2024	High
Support lower speed limits on residential streets	Support changes to legislation to lower default speed limits on residential streets to improve safety for all transportation modes including pedestrians and cyclists	2023	High
Review zoning to consider amendments that support e-bicycles	Review zoning to consider amendments that support e-bicycles, such as the standard, size, location and quantity of bicycle parking considering increased bicycle size, e-cargo bicycles, charging, shelter, security and end of trip facilities.	2025-2027	High

Action/Measure	Description	Timeframe	Priority
Advocate to RTDA to update their infrastructure design guidelines to support e-bicycles	Advocate to RTDA to update their infrastructure design guidelines to consider amendments that are supportive of e-bicycle facilities (e.g. secure parking, shelter, larger spaces, charging) at park and-ride lots, major transit stops, and other sites to support multi-mode use.	2023-2024	Medium
Develop policies and infrastructure to support other kinds of e-mobility in collaboration with stakeholders	In collaboration with stakeholders, develop policies and infrastructure to support other kinds of electric mobility devices, such as electric scooters, electric skateboards and electric unicycles as well as electric wheelchairs that improve accessibility and make active transportation feasible for people with mobility challenges.	2023-2025	Medium

4.3 Focus Area 3: Home and Workplace Charging

Action/Measure	Description	Timeframe	Priority
Put in place EV Infrastructure requirements for new real estate developments	Put in place implementation of City Electric Vehicle (EV) Infrastructure Requirements for new real estate developments.	2024-2028	High
Advocate for Right to Charge legislation	Advocate to the Central Government to enact Right to Charge legislation (a requirement that strata councils and landlords accommodate reasonable requests from residents to install EV charging) that supports a 100% EV-ready approach in multi-unit residential buildings.	2024-2026	High
Create guidelines for 100% EV-ready feasibility studies in existing multi-unit residential buildings	Create guidelines for undertaking 100% EV-ready feasibility studies/ plans in existing multi-unit residential buildings.	2024-2027	High
Promote incentives for EV charging infrastructure	Promote Central Government incentives for installing EV charging infrastructure in existing homes and workplaces.	2024-2026	High
Provide 'top-up' incentives to augment Central Government EV charging	Determine whether there is a need to augment Government incentives for installing EV charging infrastructure in existing multi-unit residential building (MURBs) in the City of Kigali, and, if so, provide the	2024-2027	High

Action/Measure	Description	Timeframe	Priority
infrastructure incentives	required additional 'top-up' incentives to the extent that is feasible.		
Explore the need for and provide incentives for EV charging infrastructure feasibility studies in existing MURBs if required	Determine whether there is a need to provide financial incentives to help offset the cost of feasibility studies for installing EV charging infrastructure in existing multi-unit residential buildings (MURBs) in the City of Kigali, and, if so, provide the required additional incentives to the extent that is feasible.	2024-2027	High
Provide EV charging infrastructure education for MURBs	Provide EV charging infrastructure education and resource materials to rental apartment building owners and to support EV charging in existing multi-unit residential buildings (MURBs).	2024-2027	Medium
Identify and address potential policy barriers to EV infrastructure in existing buildings	Identify and address potential City of Kigali procedural or policy barriers to installing EV infrastructure in existing buildings.	2024-2027	Medium
Support off-site EV charging for MURBs	Identify and pursue opportunities to support EV charging access for multi-unit residential buildings (MURBs). This could include the installation of curb-side charging stations, or working with public and community institutions to install EV chargers that can be used overnight by residents in nearby MURBs.	2025-2030	Medium
Support workplace EV charging	Identify and pursue opportunities to support and promote installation of workplace charging stations at existing buildings.	2024-2027	Low
Support dedicated EV charging access for car shares near MURBs	Consider approaches to support dedicated EV charging access for car -sharing organizations in or near multi-unit residential buildings (MURBs)	2024-2027	Low
Explore various financial approaches to overcome the capital cost barrier to EV charging	Explore various financial approaches to help overcome the capital cost barrier for installing EV charging infrastructure in existing buildings. Pursue promising approaches where feasible.	2024-2028	Low

4.4 Focus Area 4: Public Charging Network

Action/Measure	Description	Timeframe	Priority
Identify priority areas in the city of Kigali for the provision of additional public EV charging stations	Identify priority areas in the city of Kigali for the provision of additional public EV charging stations	2024-2028	High
Work with central government, private sector, and development partners to install more DC fast charging stations in the City of Kigali	Work with central government, private sector, and development partners to install more DC fast charging stations in the City of Kigali, in locations that are convenient for travelers and residents of existing multi-family buildings and as part of a national network.	2024-2028	High
Explore how to encourage private sector investment in new EV charging infrastructure	Explore how to encourage private sector investment in new EV charging infrastructure, for instance by allowing installation of charging infrastructure in the public right of way.	2024-2026	Medium
Embed EV charging considerations in the city of Kigali planning processes	Embed EV charging considerations in the city of Kigali planning processes so opportunities to identify gaps or expand or upgrade infrastructure are assessed at key planning junctures.	2024 - 2026	Medium

4.5 Focus Area 5: City of Kigali Leadership

Action/Measure	Description	Timeframe	Priority
Develop a fleet strategy to reduce corporate emissions	Develop a fleet strategy that includes the transformation of all fleet to 100% renewable energy. Considerations will be given to rightsizing the fleet, vehicle operation optimization, renewable fuel choices and emerging technologies.	2024-2030	High

Action/Measure	Description	Timeframe	Priority
Convert all light-duty fleet vehicles to zero-emissions vehicles	Convert all light-duty fleet vehicles to zero-emissions vehicles. Continue to replace light-duty internal combustion fleet vehicles with zero-emissions vehicles, and build fleet charging stations.	2024-2030	High
Develop an e-bicycle fleet program	Develop an e-bicycle fleet program.	2025-2030	Medium

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