

Government of Rwanda

Republic of Rwanda  
Data Collection Survey on Development  
of Urban Transport System in Kigali City

March 2019

Japan International Cooperation Agency

NIPPON KOEI CO., LTD.

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Government of Rwanda

# Data Collection Survey on Development of Urban Transport System in Kigali City



## FINAL REPORT




March 2019

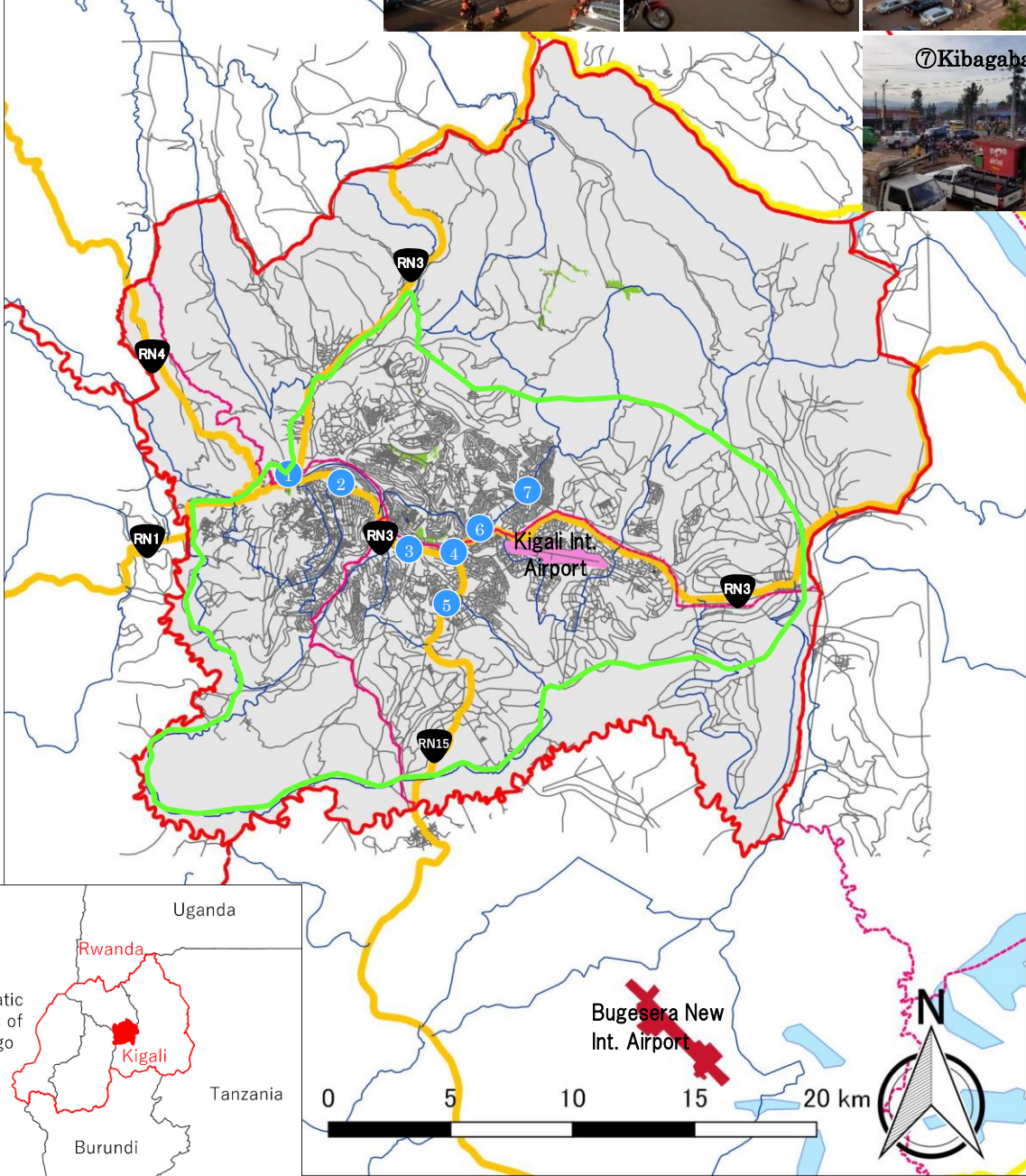
Japan International Cooperation Agency (JICA)

NIPPON KOEI CO., LTD

The exchange rate used in this report is  
1USD = 860 RWF  
(as of July 2018)

**Legend**

-  Administration Boundary (City)
-  Administrative Boundary (District)
-  National Road (Paved)
-  National Road (Unpaved)
-  Ring Road (Plan)
-  Intersection Improvement (Plan)







Location Map of Kigali City

## 1 : Road Network

	
<p>1-1      Kicukiro</p>	<p>1-2      Nyabugogo</p>
<p>Traffic queue headed by slow heavy truck on the uphill road</p>	
<p>Overview of the bus terminal</p>	
	
<p>1-3      KN3</p>	<p>1-4      Kimironko</p>
<p>Under construction by Chinese Contractor</p>	
<p>Unpaved streets</p>	
	
<p>1-5      KG774</p>	<p>1-6      KK15</p>
<p>Flooding on the road</p>	
<p>Commuters on the logistics road</p>	

	
1-7 Sopetrad	1-8 Gishushu
Signal systems on 6 intersections	Existing signal controller with fixed phase



## 2 : Intersections

	
2-1 Chez Lando Intersection	2-2 Chez Lando Intersection
Evening conditions	Traffic congestion at evening peak hours
	
2-3 Chez Lando Intersection	2-4 Giporoso Intersection
Overview in the night	Overview of the intersection

			
2-5	Giporoso Intersection	2-6	Giporoso Intersection
Pedestrian crossing on the intersection		Manual operation by a traffic police officer	
			
2-7	Gishushu Intersection	2-8	Gishushu Intersection
Overview at daytime		Overview at evening	
			
2-9	Gisozi Intersection	2-10	Gisozi Intersection
Less adequate sight distance at the intersection		No road marking on the intersection	


	
<p>2-11   Kibagabaga Intersection Heavy congestion at the intersection</p>	<p>2-12   Kibagabaga Intersection Overview at daytime</p>
	
<p>2-13   Kicukiro Intersection Overview at daytime</p>	<p>2-14   Kicukiro Intersection CCTVs at the intersection</p>
	
<p>2-15   Kicukiro Intersection On-road bus bay near the intersection</p>	<p>2-16   Kicukiro Intersection Layby condition</p>



	
2-17      Nyabugogo Intersection	2-18      Nyabugogo Intersection
Road widening works by Chinese contractor	Overview of the intersection

### 3 : Public Transport

	
3-1      DownTown Bus Terminal	3-2      DownTown Bus Terminal
3 bus operators at the terminal	Overview of the terminal
	
3-3      Kimironko Bus Terminal	3-4      Nyanza Bus Terminal
Overview of the terminal	Overview of the terminal

	
<p>3-5 Nyabugogo Bus Terminal Queue space for Royal Express Operator</p>	<p>3-6 Nyabugogo Bus Terminal Parking space for intercity buses</p>
	
<p>3-7 Nyabugogo Bus Terminal Parking space for intercity mini buses</p>	<p>3-8 Nyabugogo Bus Terminal Bus shelter at the terminal</p>
	
<p>3-9 Remera Bus Terminal City buses</p>	<p>3-10 Remera Bus Terminal City buses</p>

## 4 : Discussions

	
4-1   RTDA	4-2   RTDA
1 <sup>st</sup> Working Group Meeting on 2018/5/24	2 <sup>nd</sup> Working Group Meeting on 2018/5/28
	
4-3   MININFRA	4-4   MININFRA
3 <sup>rd</sup> Working Group Meeting on 2018/7/12	4 <sup>th</sup> Working Group Meeting on 2018/9/11
	
4-5   City of Kigali	4-6   MININFRA
DFR Explanation to the Mayor of City of Kigali on 2019/1/15	DFR Explanation to the Minister of MININFRA on 2019/1/18

Data Collection Survey on Development of Urban Transport System in Kigali City  
Final Report

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### LIST OF ABBREVIATIONS

7YGP	Seven Years Government Program	MRT, UMRT	(Urban) Mass rapid Transit
AADT	Average annual daily traffic	MW	mega watt
AASHTO	American Association of State Highway and Transportation	NISR	National Institute of Statistics of Rwanda
AEMS	Area Energy Management System	NLC	National Land Center
AfDB	African Development Bank	NMT	Non-motorized traffic
ATL	Aviation Travel and Logistics Holding Ltd	NST	National Strategies for Transformation
BAC	Bugesera Airport Company	OD	Origin & destination
BADEA	Arab Bank for Economic Development in Africa	ODA	Official development assistance (by JICA)
BD	Basic design	OM, O/M	Operation and maintenance
BIA	Bugesera International Airport	OPEC	Organization of the Petroleum Exporting Countries
BNR	Central Bank of Rwanda	OSBP	One-stop border post
BRT	Bus rapid transit	PCU	Passenger car unit
CBD	Central business district	PEZ	Prime Economic Zone
CCC	City control center	PIDA	Programme for Infrastructure Development in Arica
CCTV	Closed-circuit Television	PPP	public-private partnership
CDS	Kigali City Development Strategy	PSF	Private Sector Federation, Rwanda
CoK	City of Kigali	RAMS	Road Asset Management System
COMESA	Common Market for Eastern and Southern Africa	RAMSMP	Road Asset Management System Master Plan
CRBC	China Road and Bridge Corporation	RBS	Rwanda Bureau of Standards
CS	Construction supervision	RCA	Rwanda Cooperative Agency
DD	Detailed Design	RCAA	Rwanda Civil Aviation Authority
DRC	Democratic Republic of the Congo	RD	District Road
EAC	East African Community	RDB	Rwanda Development Board
EDPRS 2	Second Economic Development and Poverty Reduction Strategy for 2013-2018	REMA	Rwanda Environment Management Authority
EIA	environmental impact assessment	RFTC	Rwanda Federation of Transport Cooperatives
EICV	Integrated Household Living Conditions Survey, Enquête Intégrale sur les Conditions de Vie des Ménages	RHA	Rwanda Housing Authority
Exim Bank	The Export-Import Bank of China	RMF	Rwanda Maintenance Fund
FDI	Foreign Direct Investment	RN	National Road
FS	Feasibility Study	RNP	Rwanda National Police
GDP	Gross Domestic Product	RPHC 4	Fourth Population and Housing Census, 2012
GoR	Government of Rwanda	RRA	Rwanda Revenue Authority
GRDP	Gross regional domestic product	RSTMP	Rwanda Strategic Transport Master Plan
HCUR	High capacity urban road	RTDA	Rwanda Transport Development Agency
ICT	Information and Communication Technology	RURA	Rwanda Utility and Regulatory Authority
IRNMS	Integrated Road Network Management System	RwandAir	flag carrier airline of Rwanda
ITS	Intelligent Transport Systems	RWF	Rwandan Franc
JICA	Japan International Cooperation Agency	SDGs	Sustainable Development Goals
KBS	Kigali Bus Service	SEZ	Special Economic Zone
KIA	Kigali International Airport	SGR	Standard gauge railways
KTA	Kigali Transport Authority	SME	Small and medium enterprise

KVCS	Kigali Veterans Cooperatives Society	SMS	Short Message Service
LOS	Level of Services	TCC	Traffic control center
LRT	Light rail transit	TDM	Transportation demand management
MINALOC	Ministry of Local Government	TOD	Transit oriented development
MINECOFIN	Ministry of Finance & Economic Planning	UN	United Nations
MINICOM	Ministry of Commerce, Trade, Industry, Cooperatives and Tourism	VISUM	German transport simulation software
MININFRA	Ministry of Infrastructure	WB	World Bank
MINITRACO	Ministry of Public Service, Transport and Communication	WG	Working Group

# Executive Summary

## **Executive Summary**

### **1. Introduction**

#### **Background**

The Republic of Rwanda (hereafter referred to as “Rwanda”) is located at the crossing point of the “Northern Corridor of East Africa” and “Central Corridor”. After 2010, the growth rate of real gross domestic product (GDP) has been sustained at a high ratio of 6.9%~8.8%. With regard to population, it is predicted that there will be a growth from 1.06 million in 2010 to 4.3 million in 2040 as mentioned in the Kigali City Master Plan 2013. Future population growth and increase of vehicle ownership are projected in the near future, leading to traffic congestion and it is considered that traffic congestion will become worse.

According to the traffic situation mentioned above, the Rwandan government formulated the economical strategic plan and urban transportation plan, which are named the “Second Economic Development and Poverty Reduction Strategy for 2013-2018 (EDPRS2)” and “Strategic Transport Master Plan for Rwanda”, respectively. From these two plans, the Rwanda government aims to develop public transportation network and improve the congested intersections.

Furthermore, Kigali City also intends to alleviate traffic congestion and improve urban transport system by formulating the Kigali City Transportation Master Plan (KTMP). Additionally, the feasibility study for the expressway between Nyarugenge and New Bugesera International Airport (BIA) and the study of improving seven congested intersections have been conducted but further detailed study is needed for project implementation since the traffic congestion area has a high population density coupled with geological restriction.

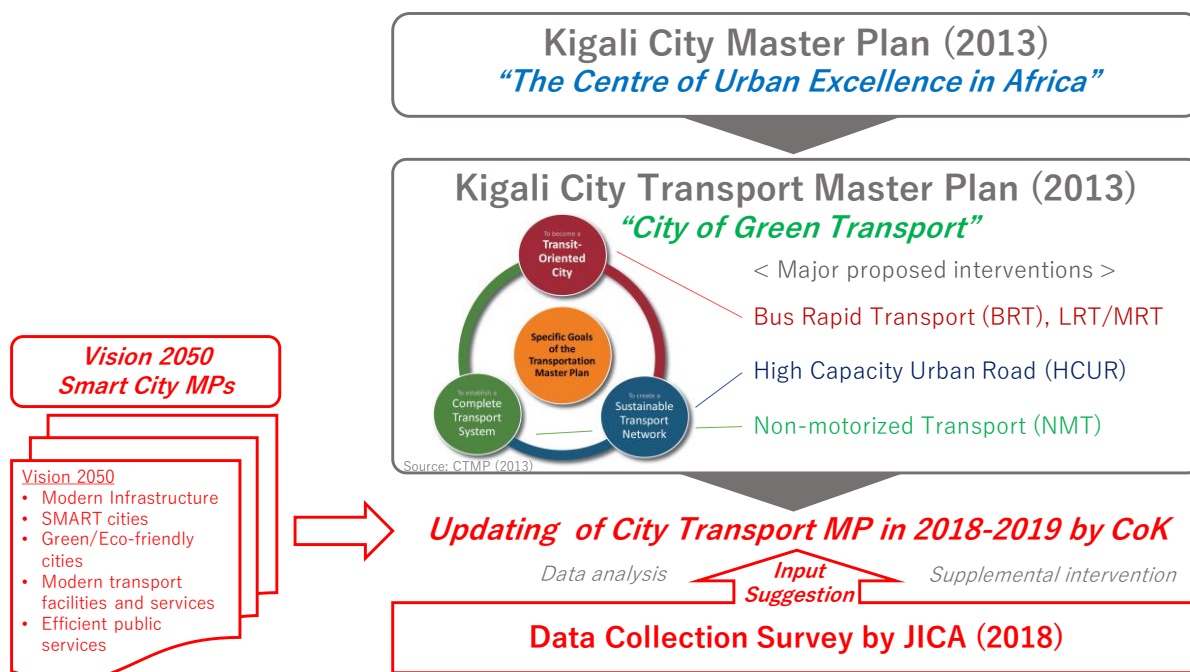
#### **Objectives**

The objectives of the JICA Survey are as follows:

- Collect and analyze the following qualitative data: government’s development strategy, development-based master plans, and information on other donor-aided projects;
- Undertake a study for possible Japanese ODA projects which is based on the analysis of current traffic characteristics and traffic demand forecast;
- Undertake a study on the project component for urgent intersection improvement and its validity evaluation; and
- Undertake a study on an approach that combines grant aid, technical assistance, and loan aid.

#### **Basis and Correlation of Data Collection Survey by JICA**

This JICA Survey was implemented with respect to and honoring the existing KTMP. Accordingly, it is expected that the results of the survey will become a valuable input for the updating works of the existing KTMP. The figure below indicates the relationship between the JICA Survey and the related development plans by the Rwandan government.



Source: JICA Survey Team

**Figure 1.1: Basis and Correlation of Data Collection Survey by JICA**

When considering the development of the urban transportation sector in Kigali City, it is requisite to pay attention to the Vision 2050, which is the national development policy of Rwanda. In addition to the basic human needs (BHN), the development plan shall be fully conscious of the keywords in the vision to meet the advanced needs of the Government of Rwanda as well as the sustainable development goals (SDGs).

## 2. Related Development Plans

The KTMP was developed by the Rwandan government in 2013 and is currently being updated. The ultimate goal of KTMP was set as “City of Green Transport” consisting of three specific development goals and eight strategic objectives.

Ultimate Goal	City of Green Transport							
Specific Goals	To become a Transit Oriented City		To establish a Comprehensive Strategic Road Network			To create a Sustainable Transport Network		
Objectives	Public/Private Transport Modal Split of 70:30	Average Public Transport Commuting Time of 60 minutes	Construction of Urban Roads to a Minimum Density of 6 km/km <sup>2</sup>	Seamless Intermodal Transport Connectivity	Construction of Intercity Freight Routes and Infrastructure	Integrated Non-motorized Transport Infrastructure	100% of Public Amenities and Facilities Served by Public Transport	Establishment of Green Network and Pedestrian-friendly Streets

Source: Kigali City Master Plan and Kigali City Transportation Master Plan Report, 2013

**Figure2.1: Overall Structure of Kigali City Transportation Master Plan 2013**

### 3. Status of Urban Transport in the City of Kigali

#### Road Network

Kigali has an arterial road network consisting of four national radial roads, namely: RN1, RN3, RN4, and RN5.

**Table 3.1: Major Roads in Kigali and Connected Cities/Areas**

Road Class	Road Name	Connected Major Cities	Location
National Highways	RN1	Butare (Burundi)	West direction of Kigali
	RN3	Byumba (Uganda)	North direction of Kigali
		Rwamagan (Tanzania)	East direction of Kigali
	RN4	Ruhengeri (DRC)	Northwest direction of Kigali
	RN5	Bugesera (Burundi)	South direction of Kigali

Source: JICA Survey Team

The current road network in Kigali City consists of 2,851 km of roads, only 16% of which is paved. The majority of unpaved roads become water-logged during the wet season and dusty during the dry season.

**Table 3.2: Classification of Roads in Kigali City in 2018**

Earth Road	Asphalt Pavement Road	Concrete Pavement Road
2,400 km	428 km	23 km

Source: JICA Survey Team based on Hearing from Kigali City

#### Public Transport

There are public transport systems in Kigali City, such as bus, taxi, motorcycle taxi, and bicycle taxi. Private operators are responsible for bus operations. Due to the unpaved and steep road network in undulating terrain, the accessible route for bus service is limited. The citizens are queueing at bus stations. Necessary passenger information has not been provided to bus users and the service level is still quite low. Also, public transportation that complements the major bus routes is mainly motorbike taxi that can be accessed even on unpaved steep streets.

#### Traffic Management

Traffic management systems such as traffic signals and roundabouts exist in urban areas. Currently, majority of road intersections in Kigali City have no installed traffic signal.

There are only six signalized intersections in Kigali City, and signal cycles are operated at fixed intervals. Also, these are standalone signals without cooperation between signals. During traffic congestion especially in the morning and evening peak hours, the signal system does not function properly and police officers control the traffic flow by manual hand signal.

#### Traffic Safety

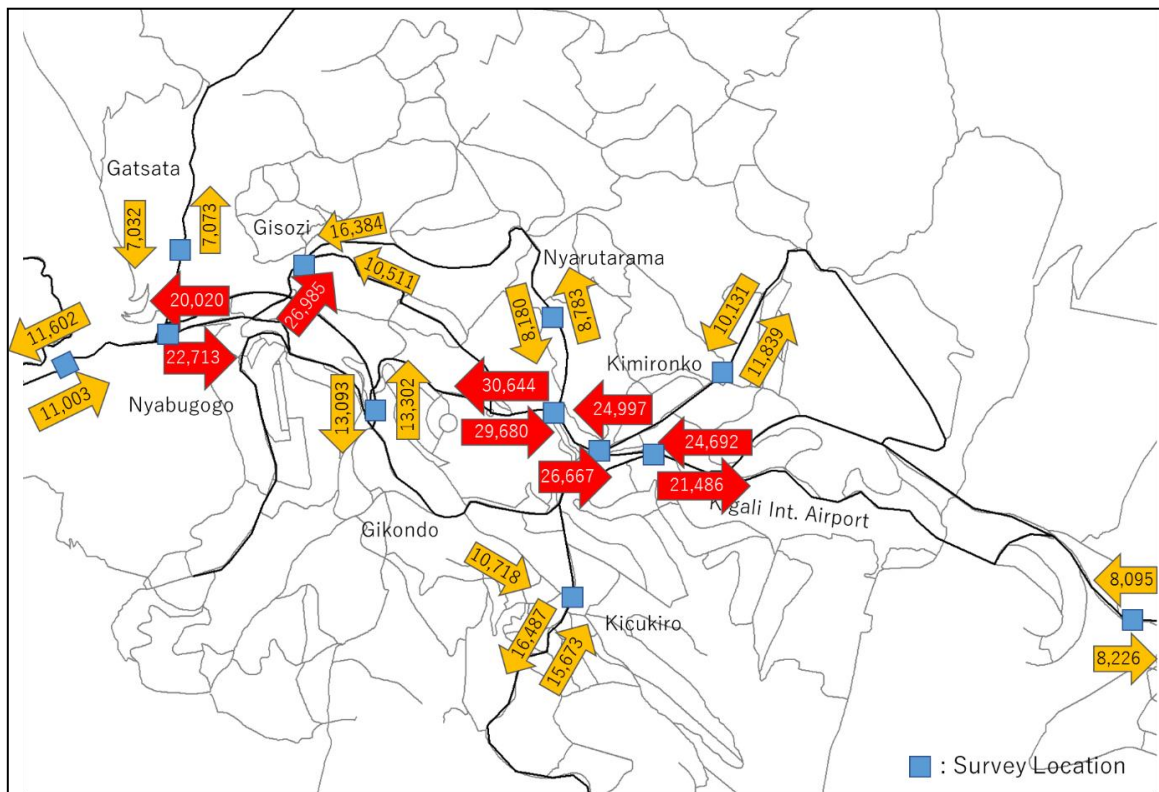
Accidents occur frequently in Kigali City. The major cause of accidents is that there are many motorcycle taxis in Kigali City. The traffic accidents by motorcycles account for 60% of total traffic accidents, which is a problem in the urban area.

The death rates are higher in the city area than in the suburban area. The reason being that there are limited regulations by police and thus, vehicles are running at high speed and in addition, sidewalks are not installed especially in the suburban area. The death of pedestrians

by accident accounts for 46% of total death by accidents, and improvement is urgently necessary.

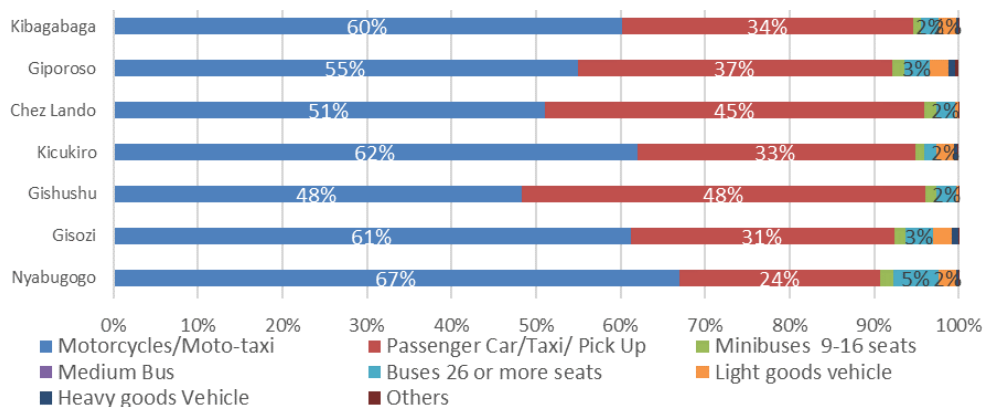
#### 4. Traffic Survey

To understand the traffic condition in Kigali City, a traffic survey was conducted by the JICA Survey Team. Figure 4.1 shows the result of the traffic count survey during weekday period. The high traffic volume was observed at major intersections. High traffic volume was observed especially in the east-west direction. The value of PCU/day is less than the traffic volume (volume/day) in all survey locations since motorcycle occupies high ratio in all locations. PCU factor of motorcycle is 0.5; therefore, value of PCU/day is less than that of volume/day.



Source: JICA Survey Team

Figure 4.1: Traffic Count Survey Result (PCU/day)



Source: JICA Survey Team

Figure 4.2: Vehicle Composition at Each Location



## **5. Challenges on Urban Transport in the City of Kigali**

### **Improvement of Unpaved Road**

The current road network of Kigali City has more than 80% unpaved road. These unpaved roads become water-logged during the wet season and dusty during the dry season. Therefore, unpaved roads are a cause of various traffic issues such as rough ride, cargo damage, and increase of travel time, among others.

### **Improving the Convenience of Public Transport**

Public transportation in Kigali City has the following issues resulting in a low service level:

- No one knows the bus arrival time because there is no timetable.
- No one knows the bus departure time since buses do not leave until there are full passengers on board.
- Bus users cannot get on the bus from the bus stop near the bus terminal because buses leaving the origin bus terminal have full passenger capacity already.
- No one knows which route the bus will go through because there is no bus route map.
- It takes long time to get on and off minibuses since minibuses have folding spare seats on the aisle of the buses.

### **Development of Signalized Intersection**

The signalized intersection in Kigali City operates on fixed timing and it has become a cause of traffic congestion. In addition, traffic capacity is insufficient especially during peak hours in some intersections. For existing signals, signal control system is installed and signal cycles shall be applied according to traffic demands to reduce traffic congestion. The existing roundabout shall be improved to a signalized intersection and traffic congestion shall be reduced by incorporating it into the signal control system.

### **Countermeasure for Traffic Accident**

There are many traffic accidents caused by motorcycles in Kigali City. At first, it is necessary to find out the cause of motorcycle accidents. It is assumed that excessive lane changing, passing and overtaking, and excessive speed on a steep downhill slope are causes of motorcycle accidents.

## **6. Traffic Demand Forecast and Evaluation of Proposed Road Traffic Projects**

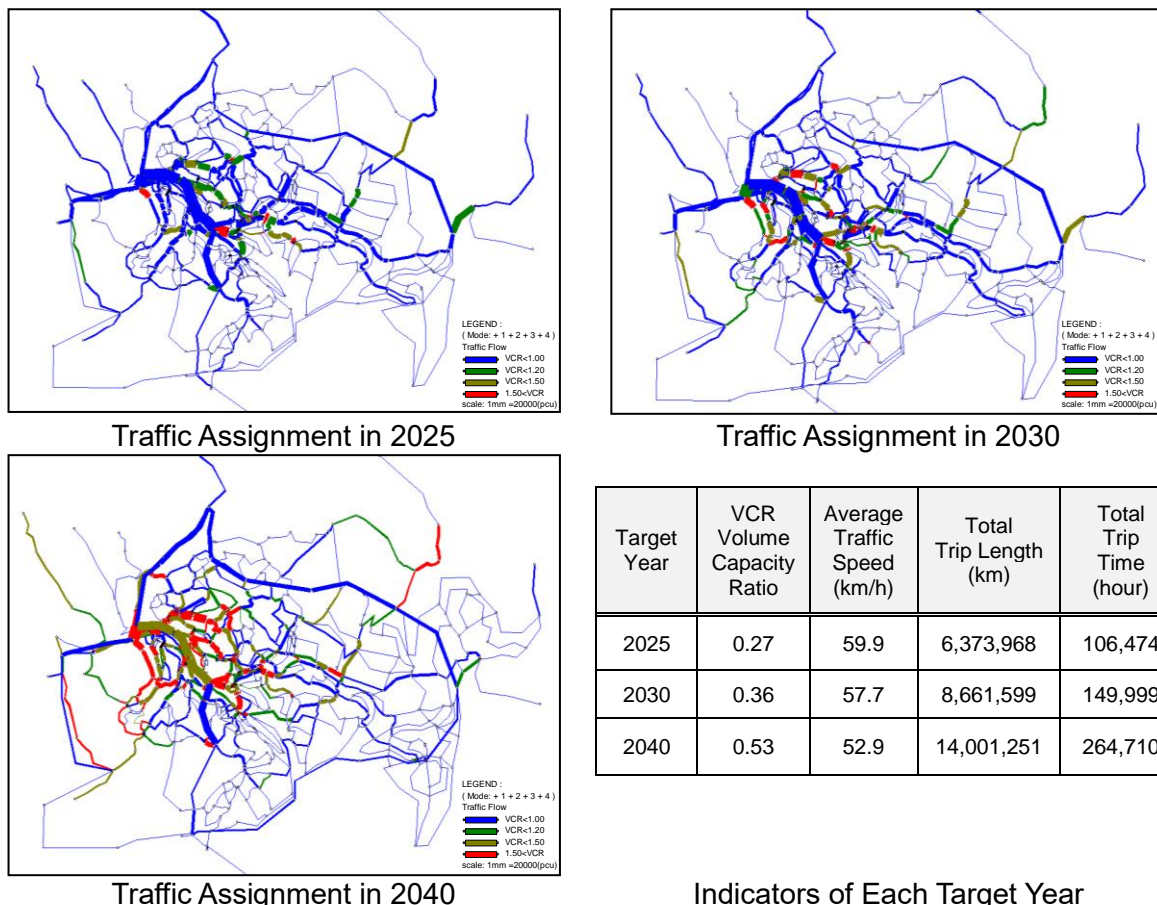
The future traffic demands in 2025, 2030, and 2040 were forecasted based on the result of the traffic survey and socio-economic framework. In conducting the traffic demand forecast, existing road development plan was reflected into the road network data, and forecasting the “with” intervention case, which was proposed by the JICA Survey Team, was also conducted. The effectiveness of the proposed interventions was evaluated by comparing the “with” and “without” intervention cases.

### **Traffic Demand Forecast**

The traffic demand forecast has been conducted to understand the current traffic situation in Kigali City and to forecast future bottlenecks and congestion situations. Traffic demand forecast was conducted through a four-step methodology.

As a result of the traffic demand forecast, even though the newly constructed roads and the BRT development will progress towards 2040, the traffic congestion will become worse due to the rapid population increase.

High capacity urban road (HCUR) will be constructed from Nyabugogo to the southern part of Kigali, which is proposed in the KTMP. The proposed ring road was observed to have a large amount of traffic volume. It is expected that the ring road will surround Kigali City, but the traffic volume in the south will be quite small.



Source: JICA Survey Team

Figure 6.1: Result of Traffic Demand Forecast - Whole Kigali

## Evaluation of Validity of Transport Development Projects

### (1) Bus Rapid Transit (BRT)

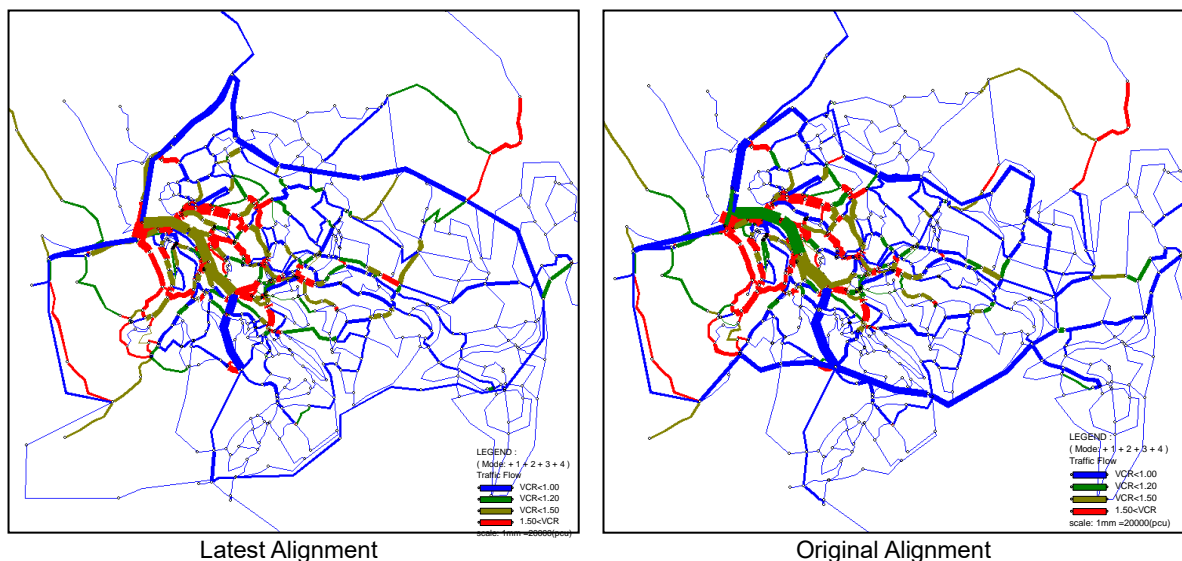
According to the feasibility study of the BRT system, the BRT infrastructure will be developed until 2050 and the ridership will increase gradually.

The BRT development is planned until 2050. The project period is set until 2075 and the economic benefit was calculated. The economic viability has been proved by the feasibility study.

### (2) Ring Road

As predicted in Figure 6.1, it is found that the development of the ring road will relieve the traffic congestion, but traffic volume in the south area is not high according to the traffic demand forecast by the JICA Survey Team. Accordingly, the future traffic volume in the original

alignment has also been studied. The original and the recently updated alignment are compared as shown in Figure 6.2.



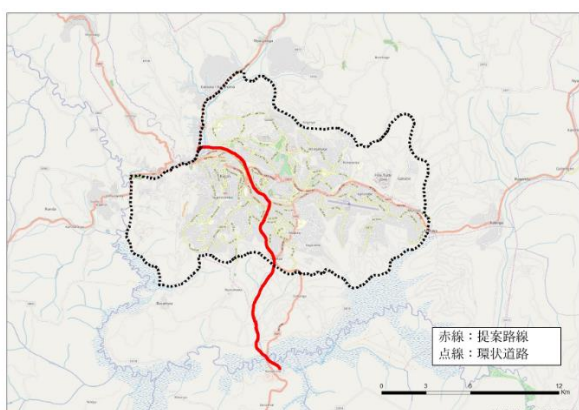
Source: JICA Survey Team

**Figure 6.2: Comparison of Ring Road Traffic Demand, 2040**

As examined in Figure 6.2, the original alignment could accommodate more traffic volume than the latest alignment since the original alignment passes near the center of Kigali and the traffic volume will be increased at the southern part especially. The total travel time and the total trip distance are superior in the original alignment. In conclusion, considering traffic situation in whole Kigali City and commercial viability as a toll road, the original alignment might be more financially feasible than the latest alignment.

### (3) North-South Bypass

The effects of the North-South Bypass proposed in KTMP have been assessed. The North-South Bypass is connected to the proposed ring road and will function as a high capacity urban road network. The North-South Bypass will contribute largely to the relaxation of the congestion degree (decrease from 0.57 to 0.53) in the entire Kigali City.



Road Title	Average Traffic Speed (km/h)	VCR	Traffic Volume (PCU)
North-South Bypass (4-lane)	87.6	0.74	67,107

Proposed Route

Result of Traffic Demand Forecast

Source: JICA Survey Team

**Figure 6.3: North-South Bypass Traffic Demand, 2040**

#### (4) Improvement of Intersections

Microsimulation has been conducted for the major congested intersections. The traffic conditions in the short, medium, and long terms were examined and the necessary improvement measures were proposed. The outline of the improvement of intersections is summarized below.

- Until 2020, traffic control will be conducted by the improvement of intersections with signal system. The JICA Survey Team has proposed to implement the installation of the advanced signal control system and improvement of the Chez Lando Intersection through the urgent grant donor scheme.
- Grade separation measures for three intersections will be implemented. In order to avoid overlapping with the elevated BRT route which is planned in KTMP, it is preferable to adopt the underpass structure. Since these three intersections are located close to each other, it is desirable to have a series of construction as much as possible.

Grade separation projects at these intersections are assumed as the candidates of grant and/or loan projects. These intersections are also candidates where signal system will be installed in the abovementioned grant project (installation of the advanced signal control system). However, although the traffic signals need some relocation when the construction of grade separation is conducted, it is possible to use the signal after the construction.

Intersection	Up to 2020	2025	2030	2040
Giporoso	● Installation of Traffic Signal (GP)		● Grand Separation: Underpass (LP)	
Chez Lando	● Intersection Improvement (GP) ● Installation of Traffic Signal (GP)		● Grand Separation: Underpass (LP)	
Gishushu	● Installation of Traffic Signal (GP)	●	● Grand Separation: Underpass (GP)	
Nyabugogo	● Installation of Traffic Signal (GP)			
Gisozi	● Installation of Traffic Signal (GP)	●	● Intersection Improvement (Own financing)	●
Kibagabaga	● Installation of Traffic Signal (GP)			● Intersection Improvement (LP)
Kicukiro	● Installation of Traffic Signal (GP)			
Others	● Installation of Traffic Signal (GP)			

GP: Grant Project, LP: Loan Project

Source: JICA Survey Team

**Figure 6.4: Implementation Schedule of Intersection Improvement Projects (Draft)**

## (5) Ridge Link Bypass

This project is newly proposed in this survey. The proposed route connects Gikondo and Kimironko and passes through ridges. As predicted by the demand analysis, there is traffic congestion at the connecting road to the North-South Bypass, and at the Kibagabaga Intersection. In order to solve these problems, further North-South Road was proposed. By improving the Ridge Link Bypass, the congestion degree of adjacent routes will decrease, which will alleviate the congestion. Considering the above, this project can be evaluated from the viewpoint of its contribution to congestion relaxation at alternative routes and substitution during disaster. Travel time is also shortened along with congestion relaxation at the alternative routes.



Proposed Route

Source: JICA Survey Team

		Average Speed (km/h)	VCR	Average Traffic Volume (PCU)
Ridge Link Bypass (4-lane proposed)		57.2	0.79	29,771
Adjacent road (KG9)	"without"	53.4	1.28	44,428
	"with"	55.4	1.16	36,338
Adjacent roads (KN3,RN15, KG11)	"without"	55.4	1.61	42,821
	"with"	54.0	1.29	39,834

Result of Traffic Demand Forecast

**Figure 6.5: Ridge Link Bypass Traffic Demand, 2040**

## 7. Interventions to KTMP

This survey involves data and information collected and examined by the JICA Survey Team for the urban transport sector of Kigali City. The results of the survey will be utilized by JICA to examine the Japanese ODA direction for the sector. The development of Rwanda, especially the Kigali metropolitan area, has made remarkable and rapid progress. Hence, in this survey, it is expected to propose specific ODA candidate projects even at the earliest stage of the survey. In this chapter, based on the results of the survey progress as stipulated in the previous chapters, the JICA Survey Team will postulate the indicative direction for future ODA support by JICA. However, it is important to note that the proposed projects in this report have not been committed by the Japanese government. Both the Rwandan government and the Japanese government should continue further detailed discussions for realizing the project list.

### Major Issues to be Tackled

The issues to be addressed and challenged in the urban transport sector of Kigali City are summarized. These issues have been discussed during the series of the Working Group Meetings with the stakeholders.

These issues could be generally categorized into individual keywords of "ITS", "TDM", "Road Network", "Safety", "Capacity Development", and "General".

**Table 7.1: Major Issues to be Tackled for the Urban Transport Sector in Kigali City**

Key topics : Key indication to the direction and strategy

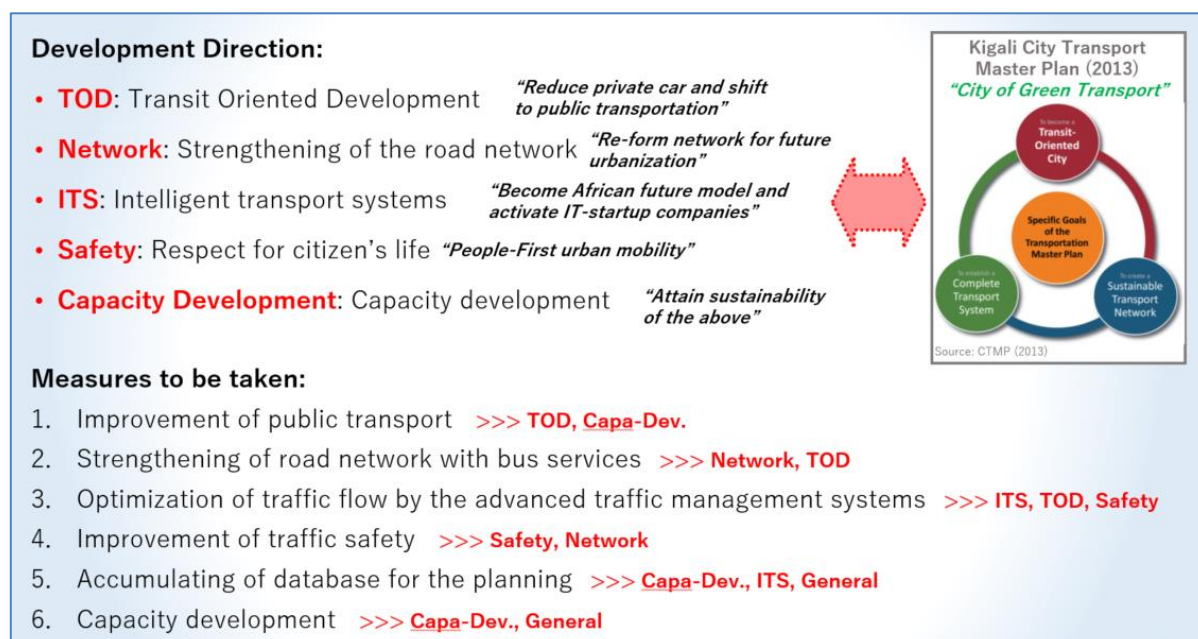
Road	Traffic	Public Transport	Others
Traffic jam at major junctions <span style="border: 1px solid red; padding: 2px;">ITS</span> <span style="border: 1px solid red; padding: 2px;">TOD</span>	Fixed signal phasing cycle <span style="border: 1px solid red; padding: 2px;">ITS</span>	Less bus network/route <span style="border: 1px solid red; padding: 2px;">Network</span> <span style="border: 1px solid red; padding: 2px;">TOD</span>	Massive increase of population <span style="border: 1px solid red; padding: 2px;">General</span>
No alternative route due to less road network <span style="border: 1px solid red; padding: 2px;">Network</span>	Manual operation by traffic police at peak hours <span style="border: 1px solid red; padding: 2px;">ITS</span>	Less frequency of bus service <span style="border: 1px solid red; padding: 2px;">TOD</span>	Urbanization axis toward east and south direction <span style="border: 1px solid red; padding: 2px;">Network</span>
Heavy vehicle inside the urban area <span style="border: 1px solid red; padding: 2px;">Network</span>	Less number of signalized junctions <span style="border: 1px solid red; padding: 2px;">Network</span>	No schedule/information of bus operation <span style="border: 1px solid red; padding: 2px;">ITS</span> <span style="border: 1px solid red; padding: 2px;">TOD</span>	Traffic flow/volume change by BIA development <span style="border: 1px solid red; padding: 2px;">Network</span>
Sole access bridge between Kigali and Bugesera <span style="border: 1px solid red; padding: 2px;">Network</span>	Less traffic information to the road users <span style="border: 1px solid red; padding: 2px;">Network</span> <span style="border: 1px solid red; padding: 2px;">ITS</span>	Old conventional style bus terminals <span style="border: 1px solid red; padding: 2px;">Network</span> <span style="border: 1px solid red; padding: 2px;">TOD</span>	Shortage of number of staff <span style="border: 1px solid red; padding: 2px;">Capa-Dev</span>
Unpaved surface behind the major arterial roads <span style="border: 1px solid red; padding: 2px;">Network</span> <span style="border: 1px solid red; padding: 2px;">Safety</span>	No accumulation of the traffic data <span style="border: 1px solid red; padding: 2px;">General</span> <span style="border: 1px solid red; padding: 2px;">Capa-Dev</span> <span style="border: 1px solid red; padding: 2px;">ITS</span>	No dedicated/priority bus lane <span style="border: 1px solid red; padding: 2px;">Network</span> <span style="border: 1px solid red; padding: 2px;">TOD</span>	Less cross sectional coordination <span style="border: 1px solid red; padding: 2px;">Capa-Dev</span>
Less pedestrian facility <span style="border: 1px solid red; padding: 2px;">Safety</span>	Less parking space <span style="border: 1px solid red; padding: 2px;">General</span>	Poor level of service for bus operation <span style="border: 1px solid red; padding: 2px;">TOD</span>	Response to the national ICT development policy <span style="border: 1px solid red; padding: 2px;">ITS</span>
No design guidelines for urban road <span style="border: 1px solid red; padding: 2px;">General</span> <span style="border: 1px solid red; padding: 2px;">Capa-Dev</span>	Traffic accidents/less pedestrian facility <span style="border: 1px solid red; padding: 2px;">Safety</span>	Excessive supply of 2-wheel taxi <span style="border: 1px solid red; padding: 2px;">General</span>	Increasing operational cost <span style="border: 1px solid red; padding: 2px;">General</span>

Source: JICA Survey Team

## Directions and Strategies for Future Transport in Kigali

The five keywords extracted from the issues mentioned above are set out as the development directions in this survey, and the development strategies are also proposed in order to attain the recommended directions.

These recommendations have been prepared to become consistent with the development policy of the existing KTMP and the related transport development plans.

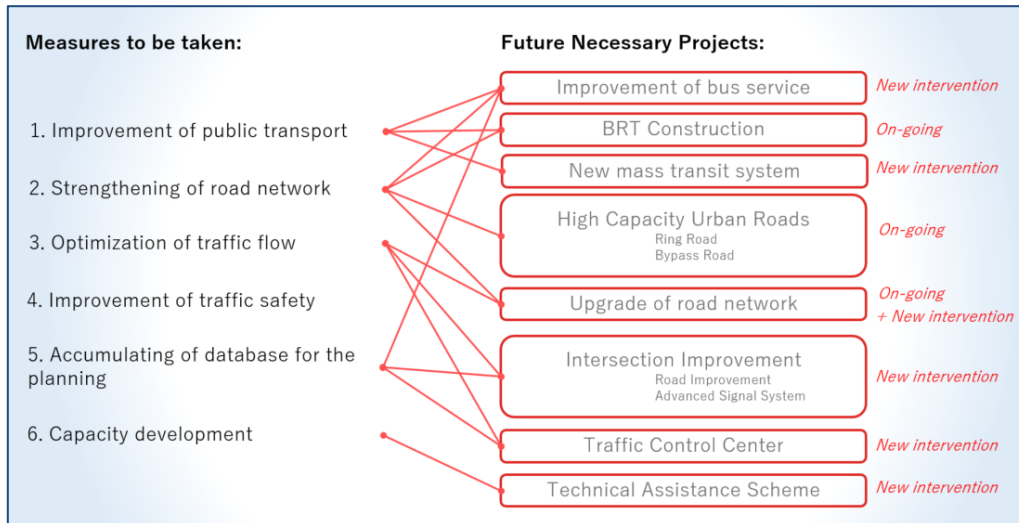


Source: JICA Survey Team

**Figure 7.1: Proposed Development Directions and Strategies**

## Proposed Interventions

The projects to attain the suggested directions and strategies have been proposed as the “interventions” to the updating of KTMP.

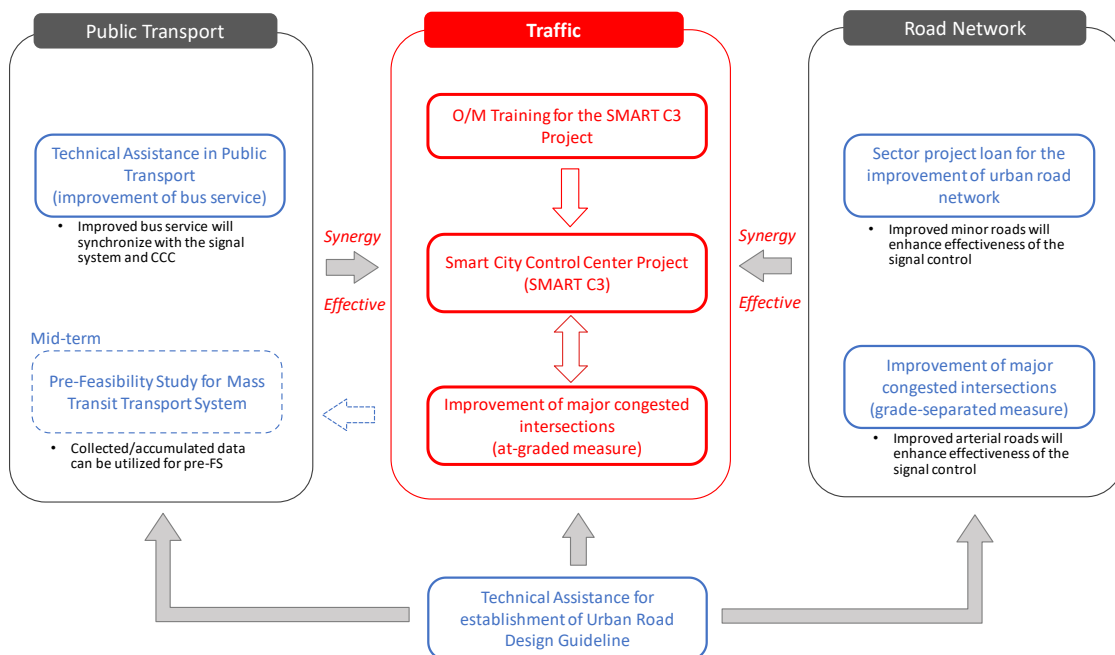


Source: JICA Survey Team

Figure 7.2: Outline of Proposed Projects

## Priority Programs among Interventions

The priority programs have been selected from the proposed interventions. The selection criteria are: 1) projects that can be implemented in a short term (within five years), 2) projects that need no or less land acquisition, and 3) projects to meet the development policy of the Government of Rwanda. Figure 7.3 indicates the correlation and synergistic relationship among the proposed short-term intervention projects as the priority programs.



Source: JICA Survey Team

Figure 7.3: Correlation and Expected Synergy among Interventions

As described above, Kigali City has many undulations and many roads in Kigali City have alignments along the ridge line of the hill. Roads which can be constructed newly are inevitably limited. Since the development of the Ring Road and the BRT, which are planned at present, takes time to complete, it is necessary to make efficient use of the existing roads as much as possible.

Therefore, traffic optimization by traffic management has been prioritized. There are only six existing signal intersections in Kigali City. From the viewpoint of traffic optimization, it is desirable to improve intersection capacity and to rectify the traffic flow by implementing intersection improvement and installation of advanced traffic signal along with the introduction of the signal control system.

In traffic management using intelligent transport systems (ITS), the measures should be matched with the initiative on Rwanda's encouraging ICT technology and the concept of Smart City envisaged by the government. The JICA Survey Team has proposed that Smart City Control Center (hereinafter "Smart C3"), which is "the facility which consolidates city management", should be developed as a priority project. This priority project of traffic management and the project for improving public transport and road network development complement each other, and the project effects are maximized. Details of priority project are shown below.

## **Recommendations**

The transit-oriented development (TOD) advocated by the KTMP is assessed as quite reasonable. Early implementation of the BRT is essential to complete the backbone of TOD measures. Furthermore, it is confirmed from the demand forecast by the JICA Survey Team that the road projects under planning are effective for strengthening the road network. It is urgent to realize these planned projects. Other recommendations from the JICA Survey Team are as follows:

- 1) Urgent measures should be taken against the current congested intersections. Improvement of the intersections with the advanced signal control system and introduction of the centralized traffic control system have been proposed as short-term measures.
- 2) The existing bus service has many issues to be improved. In order to tackle these issues, the technical cooperation program aimed at improving the service level of the existing bus service should be implemented as a short-term measure. The improved bus service shall be well-connected and synchronized with the future BRT network and the overall bus network can function more effectively.
- 3) Design standards specific to urban roads are not available in Rwanda. It might be difficult to simply refer to the international standards since the City of Kigali has unique conditions such as undulating terrain. The proposed design speed might be intentionally lower than the international standards. Rwanda's own design standards should be established such as allowing low speed and prioritizing traffic safety.
- 4) KTMP has proposed the high capacity urban roads. These projects should be realized as the medium-term measure to accommodate future traffic demand. However, further strengthening of the road network will be necessary according to the results of the traffic demand analysis in this report. It is expected that the proposed interventions in this survey will be referred in the updating of KTMP. As mentioned above, new development of the road network in the undulating terrain of Kigali City is subject to limitations. Introducing techniques such as elevated viaduct, underpass, and tunnel into Kigali City will be



applicable not only for Kigali City but also for other cities in Rwanda. Technology transfer to Rwandan contractors should also be taken into consideration.

- 5) The paving rate of Kigali City is extremely low. The expansion of the bus service network becomes difficult and citizens suffer inconvenience to access the public transport system. The projects to improve these unpaved urban roads (i.e., pavement, drainage facility improvement, etc.) should be implemented immediately. Since each component of the improvement works will be small-scale with lots of bidding packages, a flexible project scheme will be recommended to modify and adjust the contents of the project even during the implementation.
- 6) There are many stakeholders related to the urban transport sector and the management of the sector as a single-window function is nonexistent. The single-window organization to bundle these stakeholders is essential. The KTMP proposed to establish the Kigali Transportation Authority (KTA). Such cross-sectoral organization will contribute to appropriate traffic planning and prompt implementation of projects.
- 7) Traffic data is essential for urban transportation planning and urban planning, but no data has been collected or accumulated in Kigali. Introducing the signal control system can realize the data collection and accumulation in the centralized traffic control center. The control center proposed in this survey is a city control center oriented towards future "Smart City". Rwanda's role is to be the secretariat of "Smart Africa" (chaired by the President of Rwanda), which is greatly meaningful; and its responsibility is to promote the smart city concept. The proposed center should work closely with the proposed KTA. In the future, KTA might be responsible for the operation and maintenance of the center.
- 8) The JICA Survey Team visited the international donor agencies in Rwanda. There were no particular intentions to support the urban transport sector of Kigali. The World Bank is implementing a road improvement work as part of the urban quality of life improvement project. As mentioned in this report, the development of infrastructure will require a large amount of funding. It will be necessary to have the support of donor agencies for the urban transport sector.
- 9) The revision works of the KTMP will continue till March 2019. The revised master plan shall be appropriately shared with the donor agencies for the realization of the implementation of the plan.
- 10) This survey report is expected to be a reference for the revision works of the KTMP. It will be appreciated if the report could be shared and distributed to relevant stakeholders.

**Main Text**

## **Chapter 1: Background and Objectives of the Survey**

### **1.1 Background**

The Republic of Rwanda (hereafter referred to as Rwanda) is located at the crossing point of “Northern Corridor of East Africa” and “Central Corridor”. Therefore, Rwanda functions as a relay station of trade. After 2010, the growth rate of real Gross Domestic Product (GDP) has sustained high ratio of 6.9%~8.8% according to the Statistical Year Book 2016, National Institute of Statistics of Rwandan (NISR). With regard to population, it is predicted that there will be a growth from 1.06 million in 2010 to 4.3 million in 2040 as mentioned in Kigali City Master Plan 2013. Currently, several intersections of the city road and roads connected to it are congested due to lack of traffic capacity. Future population growth and increase of vehicle ownership are projected in the near future, leading to traffic congestion and it is considered that traffic congestion will even be worse than it is currently.

According to the traffic situation mentioned above, the Rwanda government formulated the economical strategic plan and urban transportation plan, which are named the “Second Economic Development and Poverty Reduction Strategy for 2013-2018 (EDPRS2)” and “Strategic Transport Master Plan for Rwanda”, respectively. From these two plans, the Rwanda government aims to develop public transportation network and improve the congested intersections.

Furthermore, Kigali City also intends to alleviate traffic congestion and improve urban transport system through formulating “Kigali City Transportation Master Plan”. Additionally, the feasibility study for expressway between Nyarugenge and New Bugesera International Airport (BIA) and the study of improving seven congested intersections have been conducted; however, further detailed study is needed for project implementation since the traffic congestion area has a high population density coupled with geological restriction.

In response to the aforementioned traffic congestion challenge, it is therefore necessary to evaluate the validity and prioritize the transport development projects based on the traffic demand forecast of Kigali City. Thus, data collection survey was commissioned through a Japanese Official Development Assistance (ODA).

### **1.2 Objectives**

The objectives of the Survey are as follows:

- Collect and analyze the following qualitative data: government’s development strategy, development-based master plans, and information on other donor-aided projects;
- Undertake a study for possible Japanese ODA projects which is based on the analysis of current traffic characteristics and traffic demand forecast;
- Undertake a study on the project component for urgent intersection improvement and its validity evaluation; and
- Undertake a study on an approach that combines grant aid, technical assistance, and loan aid.

### **1.3 Counterpart/Related Authorities**

Counterpart authority and other related authorities of this survey are as listed below.

a) Counterpart:

Ministry of Infrastructure: MININFRA

b) Related Authorities:

- Rwanda Transport Development Agency (RTDA)
- Rwanda Development Board (RDB)
- Municipality of Kigali City
- Rwanda ICT Chamber

### **1.4 Survey Area**

The survey area is Kigali City, the capital city of Rwanda, which covers 731 km<sup>2</sup> including traffic components as elaborated below.

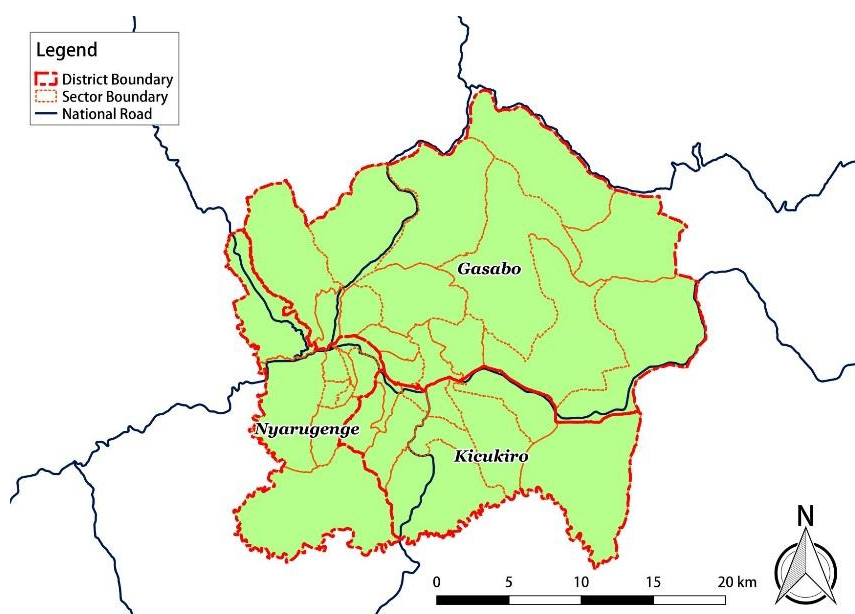
- a) Traffic congestion area in Kigali City including seven congested intersections;
- b) Considerable catchment area of National Roads 1, 2, 4, and 5 which connect the inner city and outer city of Kigali, including area along National Road 5 from New Bugesera International Airport (BIA) to the south of Kigali City; and
- c) Possible traffic signal installation areas in Kigali City.

## Chapter 2: General Information of Kigali City

### 2.1 General Information

#### 2.1.1 Administrative Boundary and the Population

Kigali City is the capital city of the Republic of Rwanda which consists of three districts, namely: Nyarugenge District, Gasabo District, and Kicukiro District. Administrative offices such as city hall and central/local governmental offices are located in Nyarugenge District, which also functions as a center of governance. The Nyarugenge District is divided further into lower administrative boundary and sectors which total up to ten sectors. Meanwhile, Gasabo District has 15 sectors and Kicukiro District has ten sectors.



Source: JICA Survey Team

**Figure 2.1.1: Administrative Boundary of Kigali City**

Based on the latest population census (Fourth Population and Housing Census: RPHC 4, 2012), the per district population is published as follows: 0.53 million in Gasabo District (highest), 0.32 million in Kicukiro District, and 0.28 million in Nyabugenge District, with a total population of 1.13 million people in Kigali City in 2012. On the other hand, regarding population density, Nyarugenge is the highest at 2,100 person/km<sup>2</sup> which is almost 5 times of the whole country average.

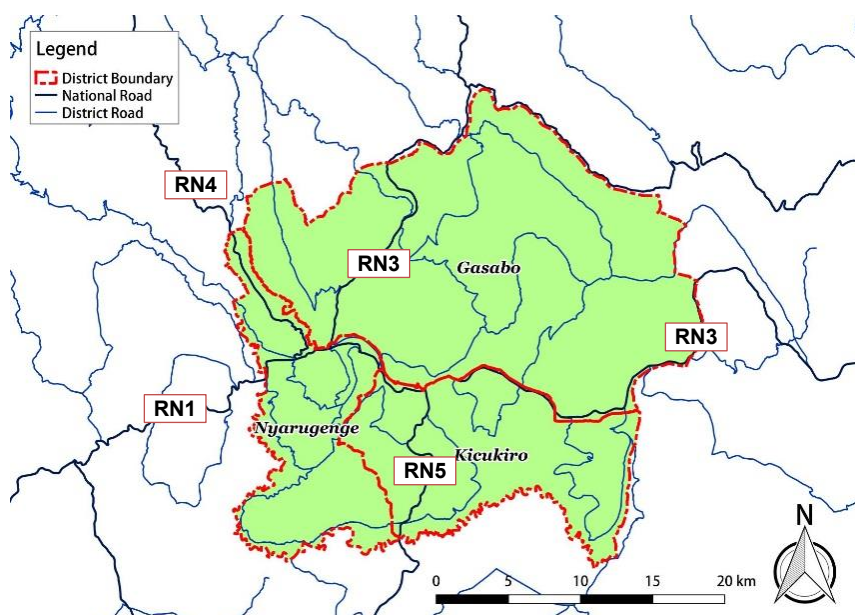
**Table 2.1.1: Existing Population of Kigali City**

Area/District	Both Sexes	Male	Female	% of Female	Population Share	Density (person/km <sup>2</sup> )
Rwanda	10,515,973	5,064,868	5,451,105	51.8		415
Kigali City	1,132,686	586,123	546,563	48.3	100%	1,552
Nyarugenge	284,561	148,132	136,429	47.9	25%	2,124
Gasabo	529,561	274,546	255,015	48.2	47%	1,234
Kicukiro	318,564	163,445	155,119	48.7	28%	1,911

Source: RPHC 4

## 2.1.2 Road Network

As shown in Figure 2.1.2, there are four national roads, namely; RN1, RN3, RN4, and RN5 that run through Kigali City as trunk road network. These national roads are paved by asphalt with four lanes, and the road surface is well maintained and quite smooth without any major cracks. These national roads are regulated and maintained by the Ministry of Infrastructure (MININFRA), while district roads are maintained by City of Kigali (hereafter referred to as CoK). It is imperative to note that the district roads in Kigali City are partially unpaved, and the pavement work or maintenance is frequently needed. Further detailed observation on the current road network is described in Chapter 5.



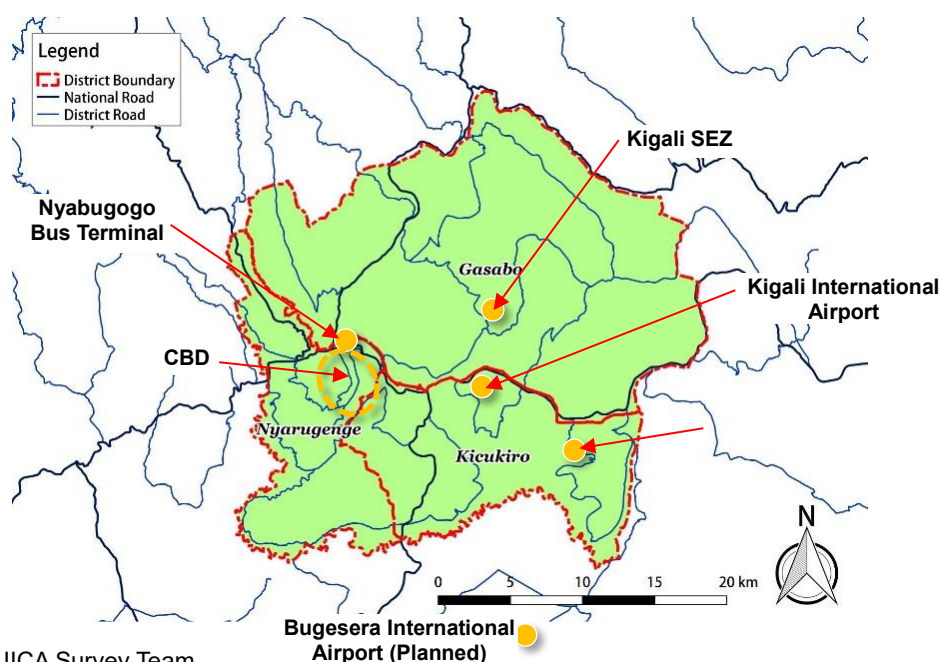
Source: JICA Survey Team

**Figure 2.1.2: Existing Road Network of Kigali City**

## 2.1.3 Major Facility

Currently, Kigali City has only one international airport, Kigali International Airport (KIA), which is located in the northern part of Kicukiro District, and it is about 5 km from the center of Kigali. The Central Business District (CBD) area is located in the eastern part of Nyabugenge District, and commuting traffic is generated to/from this area.

The first Special Economic Zone (SEZ) in Rwanda, the Kigali SEZ, and other major logistics parks are also located in the eastern part of Kigali. Logistics traffic to/from these areas is projected to increase according to their area development.



Source: JICA Survey Team

Figure 2.1.3: Major Transport Related Facilities of Kigali City

## 2.2 Socioeconomic Condition

### 2.2.1 Social Conditions

#### (1) Population

The total population of Kigali City is about 1.1 million. About 11% of the total population in Rwanda live in Kigali City according to the Fourth Population and Housing Census, 2012 (hereafter referred to as RPHC 2012).

Table 2.2.1: Distribution of Resident Population of Kigali City in 2012

Area/District	Both Sexes	Male	Female	% of Female	Population Share (% of total population)	Density (inhabitants per km <sup>2</sup> )
Rwanda	10,515,973	5,064,868	5,451,105	51.8		415
Kigali City	1,132,686	586,123	546,563	48.3	100	1,552
Nyarugenge	284,561	148,132	136,429	47.9	25	2,124
Gasabo	529,561	274,546	255,015	48.2	46.7	1,234
Kicukiro	318,564	163,445	155,119	48.7	28.4	1,911

Source: RPHC 2012 (NISR)

The Integrated Household Living Conditions Survey (*Enquête Intégrale sur les Conditions de Vie des Ménages*: EICV) 1, 3, and 4 are sample surveys conducted in the years 2010/2011, 2012/2013, and 2013/2014, respectively. The estimates showed the numbers of household sizes and the total numbers of population.

<sup>1</sup> Integrated Household Living Conditions Survey, *Enquête Intégrale sur les Conditions de Vie des Ménages*

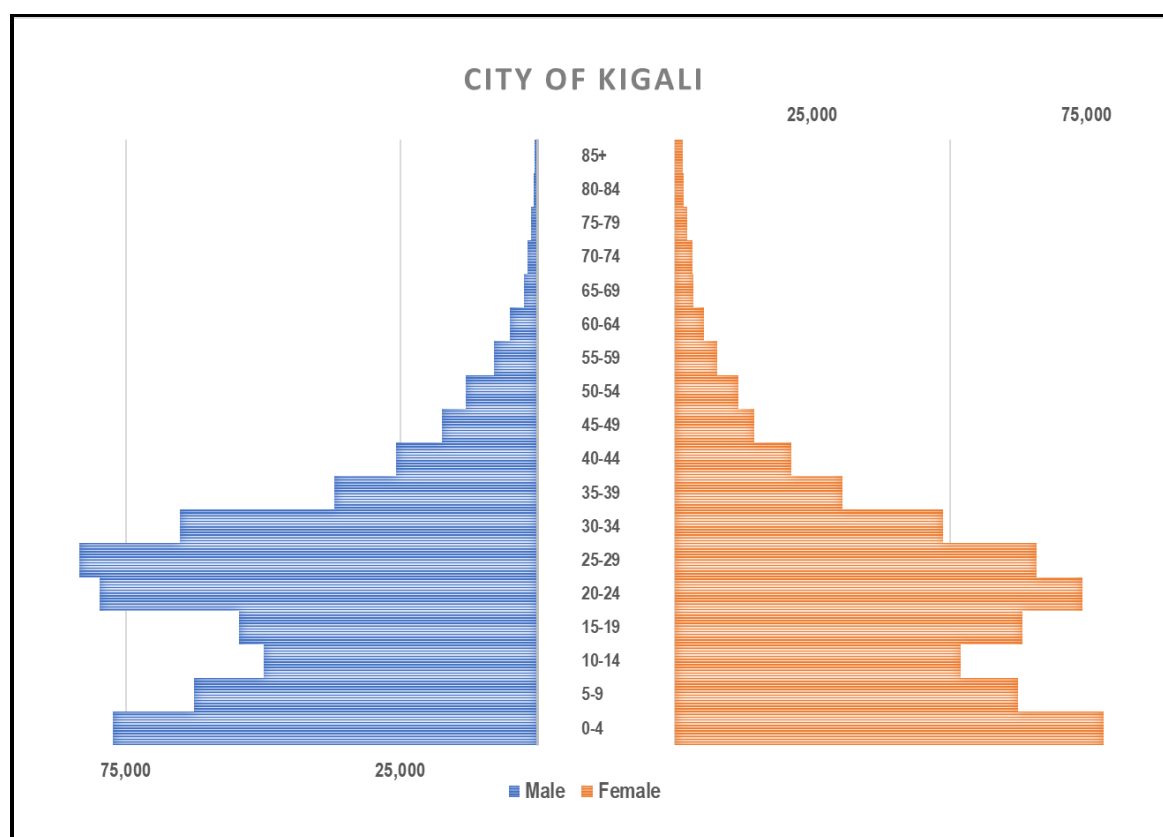
**Table 2.2.2: Household Size Changes**

Area		Mean Number of Persons	Household Size					Total	Total Number of Households (000s)
			1	2-4	5-7	8-10	11+		
EICV4	Rwanda	4.6	5.3	47.3	38	8.7	0.8	100	2,493
	Kigali City	4.5	8.5	47.5	33.1	9.3	1.7	100	295
EICV3	Rwanda	4.8	4.6	44.5	39.5	10.1	1.2	100	2,253
	Kigali City	4.7	6.9	44.9	33.6	12.6	2	100	223

Source: EICV 3, 4

## (2) Age Group Structure

The age structure of Kigali City has a pyramid shape with a dip at age 10 to 19. The population of those with age of 0 to 4 and 5 to 9 has recovered. In the districts of Gasabo, Kicukiro, and Nyarugenge, the same tendency is seen.



Source: Calculated from RPHC 2012 (NISR)

**Figure 2.2.1: Age Structure of Population of Kigali City in 2012**

The population of Kigali City by age group is shown in Table 2.2.3. And the subsequent Tables 2.2.4, 2.2.5, and 2.2.6 show the population of three districts by age group, i.e., Gasabo District, Kicukiro District, and Nyarugenge District, respectively.



**Table 2.2.3: Population of Kigali City by Age Group**

Five-year Age Groups	Count			Percentage (%)		
	Both Sexes	Male	Female	Both Sexes	Male	Female
Kigali City	1,132,686	586,123	546,563	100.0	100.0	100.0
0-4	155,453	77,422	78,031	13.7	13.2	14.3
5-9	125,035	62,546	62,489	11.0	10.7	11.4
10-14	101,794	49,860	51,934	9.0	8.5	9.5
15-19	117,678	54,400	63,278	10.4	9.3	11.6
20-24	153,918	79,712	74,206	13.6	13.6	13.6
25-29	149,185	83,413	65,772	13.2	14.2	12.0
30-34	113,813	65,092	48,721	10.0	11.1	8.9
35-39	67,513	37,071	30,442	6.0	6.3	5.6
40-44	46,943	25,794	21,149	4.1	4.4	3.9
45-49	31,868	17,408	14,460	2.8	3.0	2.6
50-54	24,610	13,115	11,495	2.2	2.2	2.1
55-59	15,631	8,022	7,609	1.4	1.4	1.4
60-64	10,375	5,118	5,257	0.9	0.9	1.0
65-69	5,930	2,521	3,409	0.5	0.4	0.6
70-74	5,122	1,917	3,205	0.5	0.3	0.6
75-79	3,432	1,274	2,158	0.3	0.2	0.4
80-84	2,354	801	1,553	0.2	0.1	0.3
85+	2,032	637	1,395	0.2	0.1	0.3

Source: Calculated from RPHC 2012 (NISR)

**Table 2.2.4: Distribution of Resident Population (Gasabo District)**

Five-year Age Groups	Count			Percentage (%)		
	Both Sexes	Male	Female	Both Sexes	Male	Female
Gasabo District	529,561	274,546	255,015	100.0	100.0	100.0
0-4	76,892	38,343	38,549	14.5	14.0	15.1
5-9	59,730	29,882	29,848	11.3	10.9	11.7
10-14	46,213	22,455	23,758	8.7	8.2	9.3
15-19	52,080	24,433	27,647	9.8	8.9	10.8
20-24	70,329	36,415	33,914	13.3	13.3	13.3
25-29	68,964	38,921	30,043	13	14.2	11.8
30-34	52,535	30,198	22,337	9.9	11.0	8.8
35-39	30,859	16,870	13,989	5.8	6.1	5.5
40-44	21,685	11,750	9,935	4.1	4.3	3.9
45-49	15,505	8,439	7,066	2.9	3.1	2.8
50-54	12,099	6,471	5,628	2.3	2.4	2.2
55-59	7,883	4,112	3,771	1.5	1.5	1.5
60-64	5,244	2,586	2,658	1.0	0.9	1.0
65-69	2,884	1,228	1,656	0.5	0.4	0.6
70-74	2,620	1,013	1,607	0.5	0.4	0.6
75-79	1,762	664	1,098	0.3	0.2	0.4
80-84	1,269	439	830	0.2	0.2	0.3
85+	1,008	327	681	0.2	0.1	0.3

Source: RPHC 2012 (NISR)

**Table 2.2.5: Distribution of Resident Population (Kicukiro District)**

Five-year Age Groups	Count			Percentage (%)		
	Both Sexes	Male	Female	Both Sexes	Male	Female
Kicukiro District	318,564	163,445	155,119	100.0	100.0	100.0
0-4	41,144	20,551	20,593	12.9	12.6	13.3
5-9	34,325	17,104	17,221	10.8	10.5	11.1
10-14	29,732	14,680	15,052	9.3	9.0	9.7
15-19	35,100	15,807	19,293	11	9.7	12.4
20-24	45,057	23,094	21,963	14.1	14.1	14.2
25-29	42,061	22,936	19,125	13.2	14.0	12.3
30-34	31,830	17,819	14,011	10.0	10.9	9.0
35-39	19,680	10,794	8,886	6.2	6.6	5.7
40-44	13,502	7,604	5,898	4.2	4.7	3.8
45-49	8,670	4,771	3,899	2.7	2.9	2.5
50-54	6,456	3,440	3,016	2.0	2.1	1.9
55-59	3,768	1,939	1,829	1.2	1.2	1.2
60-64	2,355	1,141	1,214	0.7	0.7	0.8
65-69	1,499	598	901	0.5	0.4	0.6
70-74	1,298	472	826	0.4	0.3	0.5
75-79	935	333	602	0.3	0.2	0.4
80-84	581	180	401	0.2	0.1	0.3
85+	571	182	389	0.2	0.1	0.3

Source: RPHC 2012, (NISR)

**Table 2.2.6: Distribution of Resident Population (Nyarugenge District)**

Five-year Age Groups	Count			Percentage (%)		
	Both Sexes	Male	Female	Both Sexes	Male	Female
Nyarugenge District	284,561	148,132	136,429	100.0	100.0	100.0
0-4	37,417	18,528	18,889	13.1	12.5	13.8
5-9	30,980	15,560	15,420	10.9	10.5	11.3
10-14	25,849	12,725	13,124	9.1	8.6	9.6
15-19	30,498	14,160	16,338	10.7	9.6	12.0
20-24	38,532	20,203	18,329	13.5	13.6	13.4
25-29	38,160	21,556	16,604	13.4	14.6	12.2
30-34	29,448	17,075	12,373	10.3	11.5	9.1
35-39	16,974	9,407	7,567	6.0	6.4	5.5
40-44	11,756	6,440	5,316	4.1	4.3	3.9
45-49	7,693	4,198	3,495	2.7	2.8	2.6
50-54	6,055	3,204	2,851	2.1	2.2	2.1
55-59	3,980	1,971	2,009	1.4	1.3	1.5
60-64	2,776	1,391	1,385	1.0	0.9	1.0
65-69	1,547	695	852	0.5	0.5	0.6
70-74	1,204	432	772	0.4	0.3	0.6
75-79	735	277	458	0.3	0.2	0.3
80-84	504	182	322	0.2	0.1	0.2
85+	453	128	325	0.2	0.1	0.2

Source: RPHC 2012 (NISR)

### (3) Households

The total number of households in Kigali City was 287,000 in 2012. The average household size was 3.72 in RPHC 2012. The household sizes of Gasabo, Kicukiro, and Nyarugenge were 137,000, 77,000, and 72,000, respectively. The average household sizes range from 3.65 to 3.85 showing similar sizes in all districts in the city.

**Table 2.2.7: Number of Household and Household Size**

Area/Districts	Household	Population	Average Household Size (person/household)
Kigali City	286,664	1,066,731	3.72
Gasabo	137,146	501,109	3.65
Kicukiro	77,238	297,159	3.85
Nyarugenge	72,280	268,463	3.71

Source: RPHC 2012 (NISR)

According to the estimation in EICV4, 2014-2015, the number of households in Kigali City was estimated at 295,000. The average household size was 4.5.

#### (4) Workforce and Employment Structure

The labor-force participation rate for Rwanda was 73.6%. The rate for Kigali City was 68.6%, which was slightly lower than the national figure. The male workers ratio for Kigali City was 76.6%, and the ratio for female workers was 59.8%.

**Table 2.2.8: Labor-force Participation Rate among Resident Population (16 years and above)**

Area/Districts	Total (%)			Urban (%)			Rural (%)		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Rwanda	73.6	75.6	71.7	68.1	75.2	60.9	74.7	75.8	73.9
Kigali City	68.6	76.7	59.8	69	77.4	59.5	67.2	73.9	61.0
Nyarugenge	67.4	75.6	58.4	68.8	76.7	59.6	62.9	71.6	54.4
Gasabo	70.1	78.2	61.3	70	79	59.5	70.4	75.8	65.4
Kicukiro	67.3	75.3	58.7	67.9	75.9	59.3	62	70.5	53.9

Source: RPHC 2012 (NISR)

About two thirds of the total work forces are male. The tendency is about the same in Rwanda and Kigali City.

**Table 2.2.9: Distribution of Number of Workers and Gender Structure by District (Excerpt)**

Area/Districts	Total		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
Total Rwanda	493,302	100.0	314,154	63.7	179,148	36.3
Kigali City	140,352	28.5	87,241	62.2	53,111	37.8
Nyarugenge	52,701	10.7	31,928	60.6	20,773	39.4
Gasabo	57,173	11.6	36,748	64.3	20,425	35.7
Kicukiro	30,478	6.2	18,565	60.9	11,913	39.1

Source: Establishment Census 2014

The unemployment rates in Kigali City are higher than the national average and these rates are higher in Kigali City and in urban areas. Nyarugenge District alone has unemployment rate that is higher than that in rural areas. Likewise, unemployment rates for female are substantially higher than those of their male counterparts, which is an indication of gender disparities in Rwanda.

**Table 2.2.10: Unemployment Rate among Active Population (16 years and above)**

Area/Districts	Total (%)			Urban (%)			Rural (%)		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Rwanda	3.4	2.8	4	7.7	5.1	11.1	2.6	2.2	2.9
Kigali City	9.42	5.94	14.28	10.54	6.47	16.55	5.32	3.76	7.09
Gasabo	8.46	5.14	13.05	10.22	5.91	16.85	4.02	2.84	5.26
Kicukiro	10.78	6.86	16.16	11.07	6.98	16.74	8.15	5.72	11.2
Nyarugenge	9.72	6.42	14.5	10.41	6.81	15.79	7.13	4.85	10.05

Source: RPHC 2012 (NISR)

## (5) Poverty

Reduction of poverty is one of the major policy issues of the Rwanda government as stated in the Second Economic Development and Poverty Reduction Strategy for 2013-2018 (EDPRS II). Vision 2020 states that the target rate is less than 20%. Only in Kigali City was this reduction of poverty rate close to the target rate at 20.7%. In other areas, the poverty level is still high. In all provinces except Northern Province, reduction of poverty rates is noted. It is remarkable that Southern Province shows reduction from 56.5% to 38.4%.

**Table 2.2.11: Poverty Rate**

Unit: Percent

Area/Provinces	2000/01	2005/6	2010/11	2013/14
RWANDA	58.9	56.7	44.9	39.1
<b>Kigali City</b>	<b>22.7</b>	<b>20.8</b>	<b>16.8</b>	<b>20.7</b>
Eastern Province	59.3	52.1	42.6	37.9
Northern Province	64.2	60.5	42.8	46.1
Western Province	62.3	60.4	48.4	45.2
Southern Province	65.5	66.7	56.5	38.4

Source: NISR/EICV4

## (6) Hospitals

The number of health facilities is increasing steadily in Rwanda. The number of health workers in the public sector also increased from 2,471 (2012) to 4,006 (2015)<sup>2</sup>.

**Table 2.2.12: Number of Health Facilities**

Year	2010	2011	2012	2013	2014	2014	2015
National Referral Hospitals	4	4	5	5	8	8	8
Provincial Hospitals					4	4	4
District Hospitals	40	40	41	42	35	35	35
Police Hospital	1	1	1	1	1	1	1
Health Centers	436	442	451	465	478	478	495
Prison Dispensaries	18	13	16	15	15	15	15
Health Posts	45	60	60	252	380	380	406
Private Dispensaries	35	95	114	137	113	113	123
Private Clinics	-	-	60	84	91	91	95
Community-owned Health Facilities	-	-	-	15	15	15	13
VCT <sup>3</sup> Centers	-	-	-	20	21	21	26
Total	579	655	748	1,036	1,161	1,161	1,221

Source: Health Facilities Database, HMIS unit

### 2.2.2 Education

Rwanda has the 6-3-3-4 system of education: primary school; lower secondary school; upper secondary school; technical/vocational education; and tertiary education.

The total number of primary school pupils has been increasing gradually from 2,395,000 in 2012 to 2,546,000 in 2016. The ratio of boys and girls is about the same. Almost all pupils are

<sup>2</sup> Statistical Yearbook 2017, p, 30.

<sup>3</sup> A voluntary counseling and testing center conduct an HIV test.

enrolled in primary education. The completion rates, however, are relatively low with a noted rate of about 70% in 2016.

The total number of students in the secondary schools was 553,000 in 2016. The gross enrollment in 2016 was about 37.2%. The female and male ratios have not been changed since 2012; the number of female students is slightly higher than that of male students.

There are three types of vocational and technical schools, i.e.: Vocational Training Centers; Technical Secondary Schools, and Polytechnics. The total number of students in 2016 was 93,000. For the Vocational Training Centers and Technical Secondary Schools, the male and female ratios are close with a little higher ratio of male students. Male student ratio of about 78% in Polytechnics shows dominance of male in technical education.

About two thirds of the students in the tertiary education in public schools are male. The total number of students was 90,000. Female students have higher share in the private schools with a rate of 51.8% in 2016. It is imperative to note that the number of students per 100,000 inhabitants increased steadily since 2011.

In Kigali City, there are public and private schools.

**Table 2.2.13: Number of Schools in Kigali City**

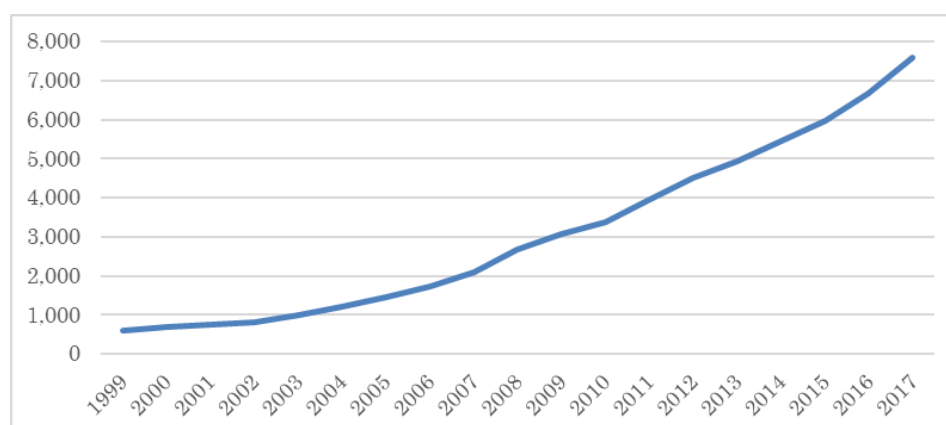
District	Public Schools	Private Schools
Gasabo	73	55
Kicukiro	82	50
Nyarugenge	52	36
Total	207	141

Source: Kigali City Development Strategy (2018-2024)

## 2.2.3 Economic Conditions

### (1) Overall Economic Structure

In 2017, GDP at current market prices was estimated at RWF 7,597 billion.<sup>4</sup> It has been increasing rapidly at a rate of about 12.3% since 2010. In 2017, GDP per capita had reached USD 774 (RWF 643,000). Figures for Regional Gross Domestic Products (RGDPs) were not available.



Source: NISR

**Figure 2.2.2: Gross Domestic Product (1999 – 2017)**

<sup>4</sup> Gross Domestic Product – 2017, March 2017, NISR

**Table 2.2.14: GDP by Economic Sector from 2010 to 2017 in Rwanda**

At current price (in billion RWF)

Activity Description	2010	2011	2012	2013	2014	2015	2016	2017
<b>AGRICULTURE, FORESTRY AND FISHING</b>	<b>949</b>	<b>1,112</b>	<b>1,317</b>	<b>1,424</b>	<b>1,572</b>	<b>1,671</b>	<b>1,956</b>	<b>2,352</b>
Food crops	519	606	740	839	934	992	1,208	1,504
Export crops	79	82	106	83	107	109	129	172
Livestock and livestock products	113	127	143	158	174	195	223	260
Forestry	258	283	312	325	337	354	372	391
Fishing	12	14	16	19	20	22	23	26
<b>INDUSTRY</b>	<b>500</b>	<b>649</b>	<b>746</b>	<b>848</b>	<b>939</b>	<b>1,013</b>	<b>1,092</b>	<b>1,198</b>
Mining and quarrying	45	102	97	124	147	132	137	179
<b>TOTAL MANUFACTURING</b>	<b>208</b>	<b>235</b>	<b>270</b>	<b>291</b>	<b>322</b>	<b>352</b>	<b>388</b>	<b>450</b>
Of which: Food	66	79	87	92	101	104	119	161
Beverages and tobacco	61	66	76	85	95	102	109	112
Textiles, clothing and leather goods	14	17	18	19	20	21	23	28
Wood and paper; printing	10	10	11	13	14	16	18	18
Chemicals, rubber and plastic products	24	29	32	33	32	36	38	45
Non-metallic mineral products	10	12	14	16	18	21	25	29
Metal products, machinery and equipment	9	13	16	14	18	25	30	29
Furniture and other manufacturing	11	16	18	20	22	26	25	29
Electricity	25	29	37	43	47	58	81	88
Water and waste management	22	26	28	30	31	32	37	38
Construction	198	259	313	359	392	440	449	443
<b>SERVICES</b>	<b>1,657</b>	<b>1,849</b>	<b>2,147</b>	<b>2,353</b>	<b>2,578</b>	<b>2,857</b>	<b>3,156</b>	<b>3,524</b>
<b>TRADE and TRANSPORT</b>	<b>407</b>	<b>463</b>	<b>553</b>	<b>593</b>	<b>640</b>	<b>699</b>	<b>761</b>	<b>804</b>
Maintenance and repair of motor vehicles	16	18	20	22	23	24	28	29
Wholesale and retail trade	257	293	348	370	410	450	476	488
Transport services	130	147	182	201	207	225	257	287
<b>OTHER SERVICES</b>	<b>1,256</b>	<b>1,388</b>	<b>1,588</b>	<b>1,760</b>	<b>1,938</b>	<b>2,158</b>	<b>2,394</b>	<b>2,720</b>
Hotels and restaurants	68	73	77	80	96	107	124	138
Information and communication	52	58	73	72	80	92	93	96
Financial services	82	103	132	157	159	175	180	217
Real estate activities	401	422	418	415	452	486	551	608
Professional, scientific and technical activities	119	126	141	153	144	169	190	233
Administrative and support service activities	134	142	160	173	202	241	279	369
Public administration and defense; compulsory social security	137	165	210	238	260	282	329	355
Education	68	85	104	140	154	157	166	169
Human health and social work activities	78	80	102	117	133	137	140	152
Cultural, domestic and other services	153	161	185	214	257	313	342	382
<b>TAXES LESS SUBSIDIES ON PRODUCTS</b>	<b>266</b>	<b>328</b>	<b>301</b>	<b>304</b>	<b>377</b>	<b>427</b>	<b>469</b>	<b>524</b>
<b>GROSS DOMESTIC PRODUCT (GDP)</b>	<b>3,366</b>	<b>3,940</b>	<b>4,506</b>	<b>4,929</b>	<b>5,466</b>	<b>5,968</b>	<b>6,672</b>	<b>7,597</b>

Source: National Institute of Statistics of Rwanda, March 15, 2018

Agriculture is the main economic activity in Rwanda accounting for 31% of GDP. The industry sector shares 16%, and the service sector shares 46% of the total.<sup>5</sup> The share of the service sector declined slightly; on the other hand, the share of the agriculture sector increased since 2010.

**Table 2.2.15: GDP Aggregates per Economic Sector in Rwanda**

Activity Description	2010	2011	2012	2013	2014	2015	2016	2017
<b>AGRICULTURE, FORESTRY AND FISHING</b>	<b>28%</b>	<b>28%</b>	<b>29%</b>	<b>29%</b>	<b>29%</b>	<b>28%</b>	<b>29%</b>	<b>31%</b>
Food crops	15%	15%	16%	17%	17%	17%	18%	20%
Export crops	2%	2%	2%	2%	2%	2%	2%	2%
Livestock and livestock products	3%	3%	3%	3%	3%	3%	3%	3%
Forestry	8%	7%	7%	7%	6%	6%	6%	5%
Fishing	0%	0%	0%	0%	0%	0%	0%	0%
<b>INDUSTRY</b>	<b>15%</b>	<b>17%</b>	<b>17%</b>	<b>17%</b>	<b>17%</b>	<b>17%</b>	<b>16%</b>	<b>16%</b>

<sup>5</sup> Source: National Institute of Statistics of Rwanda, March 15, 2018

Mining and quarrying	1%	3%	2%	3%	3%	2%	2%	2%
<b>TOTAL MANUFACTURING</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>
Of which: Food	2%	2%	2%	2%	2%	2%	2%	2%
Beverages and tobacco	2%	2%	2%	2%	2%	2%	2%	2%
Textiles, clothing and leather goods	0%	0%	0%	0%	0%	0%	0%	0%
Wood and paper; printing	0%	0%	0%	0%	0%	0%	0%	0%
Chemicals, rubber and plastic products	1%	1%	1%	1%	1%	1%	1%	1%
Non-metallic mineral products	0%	0%	0%	0%	0%	0%	0%	0%
Metal products, machinery and equipment	0%	0%	0%	0%	0%	0%	0%	0%
Furniture and other manufacturing	0%	0%	0%	0%	0%	0%	0%	0%
Electricity	1%	1%	1%	1%	1%	1%	1%	1%
Water and waste management	1%	1%	1%	1%	1%	1%	1%	1%
Construction	6%	7%	7%	7%	7%	7%	7%	6%
<b>SERVICES</b>	<b>49%</b>	<b>47%</b>	<b>48%</b>	<b>48%</b>	<b>47%</b>	<b>48%</b>	<b>47%</b>	<b>46%</b>
<b>TRADE AND TRANSPORT</b>	<b>12%</b>	<b>12%</b>	<b>12%</b>	<b>12%</b>	<b>12%</b>	<b>12%</b>	<b>11%</b>	<b>11%</b>
Maintenance and repair of motor vehicles	1%	1%	0%	0%	0%	0%	0%	0%
Wholesale and retail trade	8%	7%	8%	8%	8%	8%	7%	6%
Transport services	4%	4%	4%	4%	4%	4%	4%	4%
<b>OTHER SERVICES</b>	<b>37%</b>	<b>35%</b>	<b>35%</b>	<b>36%</b>	<b>36%</b>	<b>36%</b>	<b>36%</b>	<b>36%</b>
Hotels and restaurants	2%	2%	2%	2%	2%	2%	2%	2%
Information communication	2%	2%	2%	2%	2%	2%	1%	1%
Financial services	2%	3%	3%	3%	3%	3%	3%	3%
Real estate activities	12%	11%	9%	8%	8%	8%	8%	8%
Professional, scientific and technical activities	4%	3%	3%	3%	3%	3%	3%	3%
Administrative and support service activities	4%	4%	4%	4%	4%	4%	4%	5%
Public administration and defense; compulsory social security	4%	4%	5%	5%	5%	5%	5%	5%
Education	2%	2%	2%	3%	3%	3%	3%	2%
Human health and social work activities	2%	2%	2%	2%	2%	2%	2%	2%
Cultural, domestic and other services	5%	4%	4%	4%	5%	5%	5%	5%
<b>TAXES LESS SUBSIDIES ON PRODUCTS</b>	<b>8%</b>	<b>8%</b>	<b>7%</b>	<b>6%</b>	<b>7%</b>	<b>7%</b>	<b>7%</b>	<b>7%</b>
<b>GROSS DOMESTIC PRODUCT (GDP)</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: National Institute of Statistics of Rwanda, March 15, 2018

Among the food crops, tea and coffee are the major exports. The production of coffee increased from 21,802 tons in 2015 to 22,009 tons in 2016. The production of tea increased also from 25,411 tons to 25,628 tons.<sup>6</sup>

In the industry sector, mining and quarrying accounted for 2% of the total GDP. The major mineral exports are cassiterite, coltan and wolframite. The total amount of export in 2015 was USD 149.1 million.

**Table 2.2.16: Mineral Export**

	unit: million USD				
	Cassiterite	Coltan	Wolframite	Other Minerals	General Total
2012	52.9	56.9	26.3	0.3	136.3
2013	61.1	134.6	30.1	0.5	226.2
2014	71.6	104.8	26.2	8.1	210.7
2015	34.3	66.2	17.3	31.3	149.1

Source: RNRA, Geology and Mines Department

Other industrial activities in Rwanda include processing of coffee, tea, bananas, beans, sorghum, potatoes, and other agricultural commodities. Other industrial products include cement, furniture, shoes, plastic goods, textiles, and cigarettes.<sup>7</sup>

<sup>6</sup> Statistical Year Book 2017, p. v

<sup>7</sup> [http://www.commonwealthofnations.org/sectors-rwanda/business/industry\\_and\\_manufacturing/](http://www.commonwealthofnations.org/sectors-rwanda/business/industry_and_manufacturing/), 2018/07



In the service sector in Rwanda, tourism which includes hotels and restaurants and transport services are experiencing growth which is noted by the total number of tourist arrivals. In 2010 alone, tourist arrivals were 666,000. The year 2014 witnessed an increase to 1,300,000 arrivals which implies that in four years, the number had doubled. It is worthwhile to note that the number of tourist arrival from Africa has since increased, while that of East Asia/Pacific experienced decrease in 2014.

**Table 2.2.17: Tourist Arrival (2010, 2014)**

Year	Region	Holiday/ Vacation	Visiting Friends and Relatives (VFR)	Business/ Conference/ Official	Transit	Other Purposes	Total Tourist Arrival
2010	Africa	29,526	183,148	272,617	8,405	53,235	546,931
	America	12,293	6,180	9,709	3,542	1,465	33,189
	East Asia/Pacific	3,068	1,127	4199	1,620	714	10,728
	Europe	18,524	8,532	14,179	9,366	3,651	54,252
	Middle East	353	464	996	914	193	2,920
	South Asia	3,912	1,821	5,439	3,645	3,164	17,981
	Total	67,676	201,272	307,139	27,492	62,422	666,001
2014	Africa	65,747	377,583	364,690	19,184	263027	1,090,231
	America	13,792	6,210	6,817	6,348	1,869	35,036
	East Asia/Pacific	4,131	1,500	4,076	2,063	137	11,907
	Europe	19,285	10,538	12,377	15,028	4,632	61,860
	Middle East	427	587	711	1,112	93	2,930
	South Asia	1,782	1,635	6,479	5,032	2,173	17,101
	UN	49	58	194	163		464
Total	105,213	398,111	395,344	48,930	271,931	1,219,529	

Source: RDB

As the number of tourist arrival increases, the numbers of accommodation facilities have also been increasing. In 2010, the number of accommodation facilities in Rwanda was 220 while in 2016, the number grew to 485. Kigali City has the highest number of accommodation facilities with about half of the total number of accommodation facilities in Rwanda being located in Kigali City.

## (2) Economic Activities

About 21.3% of the enterprises are situated in Kigali City. The percentages for wholesale and retail trade, repair of motor vehicle and motorcycles, and accommodation and food service activities are high. Employment in mining and quarrying was 2,407 in 2011. The number of employees has since increased rapidly to 16,182 in 2014. The percentage increase of the mining and quarrying was over 500% as noted from 2011 to 2014, which is captured in Table 2.2.19.

**Table 2.2.18: Economic Activities of Private Enterprises**

ECONOMIC ACTIVITY	2011	2014	Percentage Change
Total	264,648	355,883	34.5
Agriculture, forestry and fishing	22,653	26,273	16
Mining and quarrying	2,407	16,182	572.3
Manufacturing	34,504	39,581	14.7
Electricity, gas, steam and air conditioning supply	671	1,747	160.4
Water supply, sewage, waste management and remediation activities	944	704	-25.4

Construction	5,639	5,087	-9.8
Whole sale and retail trade; repair of motor vehicles and motorcycles	93,551	120,419	28.7
Transportation and storage	2,926	4,532	54.9
Accommodation and food service activities	59,581	82,040	37.7
Information and communication	1,621	1,824	12.5
Financial and insurance activities	6,343	11,195	81.2
Real estate activities	163	9	-94.5
Professional, scientific and technical activities	2,789	2,861	2.6
Administrative and support services activities	2,999	11,045	268.3
Private formal education	9,261	9,323	0.7
Human health and social work activities	2,736	4,109	50.2
Arts, entertainment, and recreation	511	857	67.7
Other services activities	14,385	17,636	22.6
Not stated	964	459	-52.4

Source: Establishment Census 2014, NISR

### **(3) Foreign Investment**

The Foreign Direct Investment (FDI) inflow of the ICT sector is the highest amounting to USD 113.14 million in 2016, followed by the financial and insurance activities sector and wholesale and retail trade sector with investment amounting to USD 70.31 million and USD 57.37 million, respectively.

**Table 2.2.19: Foreign Direct Investment (FDI) Inflows by Sector**

Unit: USD million

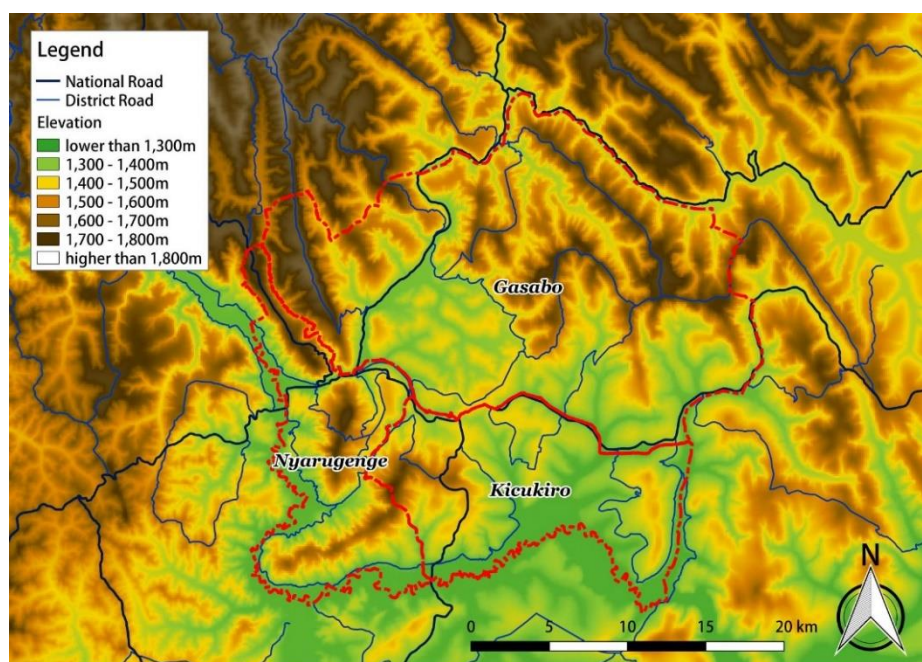
Sectors	2012	2013	2014	2015	2016
Administrative and support service activities	0.33	0.01	0.23	0.00	0.62
Agriculture	10.67	20.52	8.71	17.29	5.53
Construction	1.03	2.41	1.45	22.00	7.37
Education	0.00	1.21	2.64	2.51	0.00
Electricity, gas, steam	0.18	0.34	0.02	76.14	21.89
Financial and insurance activities	22.28	37.95	68.82	57.85	70.31
Human health and social work activities	0.63	0.00	0.00	0.57	1.28
ICT	167.33	20.45	116.15	76.68	113.14
Manufacturing	34.93	63.97	21.21	14.47	41.12
Mining	0.11	99.28	136.18	7.14	6.72
Other service activities	1.93	0.39	0.21	0.34	0.51
Professional, scientific and technical activities	-0.05	0.00	1.97	1.04	0.41
Real estate activities	0.00	0.27	0.00	7.67	11.05
Tourism	1.73	1.96	71.80	66.86	4.40
Transportation and storage	5.78	0.97	-0.06	3.23	0.53
Water supply	0.00	0.00	0.00	0.02	0.00
Wholesale and retail trade	8.08	7.91	29.60	26.03	57.37
<b>TOTAL</b>	<b>254.96</b>	<b>257.64</b>	<b>458.91</b>	<b>379.84</b>	<b>342.25</b>

Source: Foreign Private Capital in Rwanda, 2017, National Bank of Rwanda

## 2.3 Natural Conditions

### 2.3.1 Geography

Kigali City lies in a variable terrain from about 1,300 m to 1,800 m above sea level. Since the northern part of Gasabo District is hilly and highly elevated area, populated area is well spread in low-elevated area in green color in Figure 2.3.1 below. However, wetlands and the Nyabarongo River, which is a part of upper Nile, spread partially in the low-elevated area, and thus the area has risk of flooding.

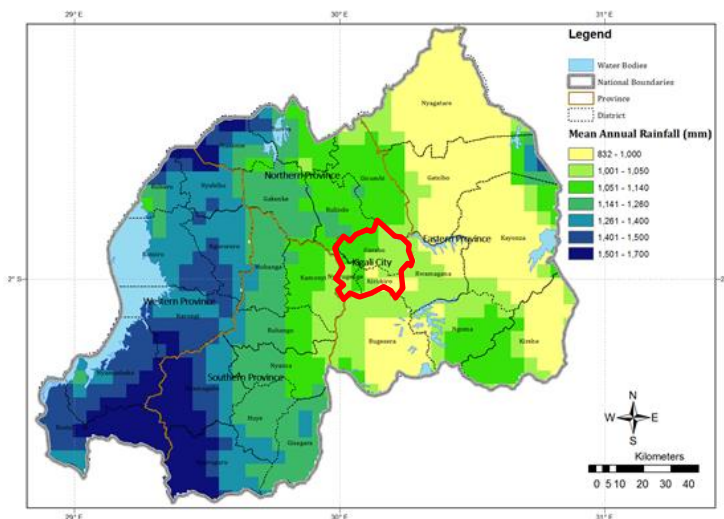


Source: Created by JICA Survey Team using Landsat data

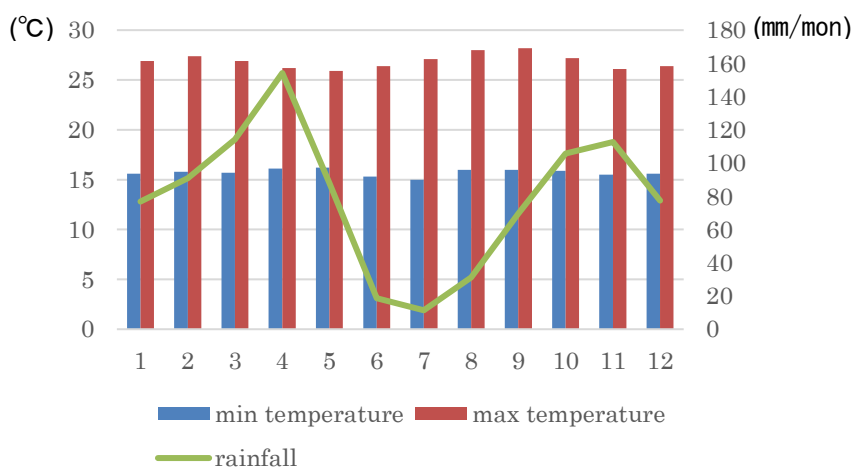
**Figure 2.3.1: Elevation of Kigali City**

### 2.3.2 Climate

Rwanda is located within the equatorial belt and its climate is strictly not of the equatorial rainy type. It has a modified humid climate including rainy forest and savannah types. Kigali is generally of semi-arid type owing to its position in the rainy shadow of the western highlands. Mean annual rainfall of Kigali is 950 mm/year.



Source: Rwanda Meteorology Agency  
**Figure 2.3.2: Mean Annual Rainfall of Rwanda**



Source: World Meteorological Organization  
**Figure 2.3.3: Mean Monthly Rainfall and Temperature of Kigali**

## **Chapter 3: National Level Vision and Related Development Plans**

### **3.1 National Level Visions and Related Plans**

#### **3.1.1 Vision 2020 (Only Description on the Transport Sector)**

In 1998-1999, the Government of Rwanda (GoR) sets the Rwanda Vision 2020 (hereafter referred as “the Vision 2020”), to clearly define the future of the country. To achieve this, the Vision 2020 identifies six interwoven pillars, including:

- Good governance and an efficient state,
- Skilled human capital,
- Vibrant private sector,
- World class physical infrastructure (including transport),
- Modern agriculture and livestock, all geared towards prospering in national, regional, and global markets, and
- Regional and international economic integration.

In 2011, with less than ten years towards the realization of the Vision 2020, the government found it necessary to assess the relevance of the indicators and targets; and ensure that they continue to reflect the ambition and the progress of the country towards attaining its long-term development goals. The revision was mainly based on the following guiding principles:

- Aligning the targets to the level of low- to middle-income countries;
- Harmonizing with the more ambitious Seven Years Government Program (hereafter referred to as “7YGP”<sup>1</sup>) targets;
- Inclusion of indicators and targets for climate change, governance, information and communications technology (ICT), and regional integration; and
- Adjustment of the targets already achieved to be more ambitious.

This report highlights areas which are of benefit to this JICA Study based on the targets set by the Vision 2020 and the revised targets based on the 7YGP for the implementation of the transport sector.

The Vision 2020 indicates that the main challenge which Rwanda is currently facing is high transportation costs due to its landlocked nature, with long distance travel from the ocean ports of Mombasa in Kenya and Dar es Salaam in Tanzania, which in essence causes high transportation costs on both exports and imports. In addition, the country lacks a link to regional

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<sup>1</sup> Seven Years Government Program (7YGP): is the National Strategies for Transformation, which is aligned to the presidential mandate of seven year-term from 2017 to 2024

railway networks, which means that most of the trade Rwanda is engaged in are transported by road transportation. Moreover, poor quality of road infrastructure that links Rwanda to the neighboring countries, leads to inflated prices on domestically-manufactured products, and it also raises the price of raw materials imported for manufacturing.

Although the Vision 2020 recognized the challenges that transportation cost poses, it thus emphasizes on developing alternative lower costs of transport to the sea, notably through a regional rail extension to Isaka, Tanzania, and extension to the Ugandan Railway System. Furthermore, a second airport in Bugesera capable of serving, as a regional hub for the Great Lakes Region, will be developed. However, these programs are focusing only on railway and airport, and no specific targets are set for improvement of road transportation.

### **3.1.2 Seven Years Government Program (7YGP)**

The 7YGP is the National Strategies for Transformation (NST-1) which was presented by the Prime Minister in the Parliament in September 2017 describing the ambitious targets set by the government for seven years (2017-2024)

The 7 Years Government Program was prepared based on the following principles:

- Manifesto of Ruling Party (RPF) for the period of seven years of presidential term;
- Presidential pledges to the citizen during election for the seven year-terms; and
- The last year program to fulfil the EDPRS 2 (2013-2018), three years to complete the Vision 2020, future activities for the proposed Rwanda Vision 2050.

Other international and regional programs such as Sustainable Development Goals (SDGs) 2030, Africa Union Vision 2063, and East Africa Community Vision 2050.

Therefore, the 7YGP presented more emphasis on air transportation, road infrastructure, and other modes of transport (such as railway, waterway port in Lake Kivu, etc.). The 7YGP sets the targets for road infrastructure to ensure smooth mobility in the road transportation by increasing the percentage of road in good condition from the current 59% to 85%. This target was also adopted as new target sets in the revised Vision 2020.

In addition, the 7YGP clearly presented the target of road length to be upgraded in the road network to asphalt standard as 800 km, which shall be completed within the period that stretches to 2024. The targeted roads were presented as follows:

- Ngoma-Bugesera – Nyanza;
- Base-Kirambo – Butaro-Cyanika;
- Huye – Kibeho – Munini;
- Kagitumba - Kayonza – Rusumo;
- Kicukiro-Bugesera International Airport;
- Kigali Ring Road; and
- Kigali new urban roads networks (upgrader) of 350 km.

For the rural road, the 7YGP targeted the construction of feeder roads with a total length of 3.000 km for airport infrastructure, the 7YGP targeted the completion of the first phase of the Bugesera International Airport and upgrading of Kamembe and Gisenyi regional airports.

For the railway line, the 7YGP targeted more collaboration in the region on the realization of the railway extension from Isaka in Tanzania (Central Corridor) and from Kampala in Uganda (Northern Corridor).

For other infrastructure supporting transport, the 7YGP targeted the completion of construction of Kigali Logistics Platform (Masaka), provision of additional cross border markets infrastructure, provision of foreign multi-services centers (to facilitate the local traders), and expansion of Kigali Special Economic Zone (SEZ) to accommodate over 350 enterprises.

Since this JICA study focuses on the transport sector, it is evident that more emphasis has been on the targets set for transport-related projects, wherein JICA can play a role on the intervention on the urban roads development as well as national road network in order to support the Vision 2020 and 7YGP of 2024.

### **3.1.3 Public Transport Policy and Strategy**

The public transport policy and strategies for Rwanda were developed in 2012 with the aim of outlining the current status, strategies, priorities, and action plan for intercity, rural, international, and urban public transport system for Rwanda.

At present, there is no railway network in Rwanda. The land public transport services are solely oriented in road based public transport services. The public transport is mainly provided by private investors who own large buses, medium buses, and minibuses which cater to 84% of the total supply, whereas taxi cabs and motorcycle taxies provide 3% and 13% of the other public transport, respectively. Minibuses, having a seating capacity of 38, are the principle mode of transport for inter-city transportation while mixtures of large- and medium-sized buses are the principle modes of Kigali City public transport.

The transport policy highlights that the conditions of the national paved roads are very good. However, lack of road network continuity and lack of Level of Service (LOS) for national and district roads are existing unpaved road network, which operates at undesirable level of service; the total length of road network being analyzed operates at a LOS E (Unstable flow) to F (Forced or breakdown flow). It is therefore clear that the LOS of the road network of Rwanda is not satisfying. As strategy, the policy indicates that in order to improve mobility, accessibility, and connectivity, the network will be improved in terms of addition of new links and upgrading of existing unpaved roads to paved roads. In addition, the key policy strategies for the development of intercity road passenger services includes:

- Provision of quality bus service as a dedicated service on 11 major corridors linking important cities and nodes within Rwanda;
- Providing a faster and more convenient service that would successfully compete with private cars; and
- Provision of scheduled bus service to provide feeder services in low demand areas.

For the urban transport in the city of Kigali, the public transport policy indicates that the population of Kigali City has been increasing at a phenomenal rate; and the private car ownership has been increasing rapidly accordingly, which would likely to induce more and more congestion and pollution in the city. The general public transport problems related to transport infrastructure are as follows:

- Traffic signals on some of major intersections do not function and cannot meet the current traffic demand;

- Insufficient infrastructure does meet public transport demand;
- Traffic signals do not have any priority signs in case of malfunctioning;
- Deteriorated road surfaces (especially unpaved);
- Lack of proper drainage system (practically on unpaved roads);
- Lack of protection for cyclists and pedestrians (appropriate sidewalk and cycle ways) in the main roads networks;
- Uncoordinated parking facilities; and
- Lack of coordination between different policy making, regulatory, and implementing agencies.

The main problems of public transport operation are shown as follows:

- Congestion in existing bus terminals;
- Punctual operation;
- Insufficient bus bays (bus stops) and parking spaces in the city center;
- Insufficient bus routes in wide areas;
- Absence of integrated ticketing and revenue sharing mechanisms for public transport service under a multi-route and multi-operator environment of Kigali City;
- Lack of standard and coordinated taxi services;
- Lack of coordination between authorities which sees no consultation when roads are reconstructed and new roads developed without any consideration for bus pull-ins, shelters, etc.;
- Lack of well-designed pedestrian crossing facilities giving pedestrians, disabled persons, and cyclists more priority; and
- Lack of bus priority of dedicated bus lanes to give public transport priority.

As a strategy for the solution on public transport problems, the policy proposes the use of an integrated traffic demand and supply management approach. Under an integrated traffic demand and supply management approach, an integrated multi-modal transport development strategy will be adopted. In addition, a business model to run the public transport needs to be developed using Net Cost Route Approach. In such model, efforts shall be made to provide comprehensive bus services under strict schedule in all 19 (15 radial and 4 circular) designed routes.

Additional strategy proposed by the policy is to award the public transport services to the private operators who should form large cooperatives, wherein such cooperatives would then be given operating contracts. However, these contracts would be for a specific defined period and can be renewed thereafter. In recent time, this strategy has been implemented by the Rwanda Utility and Regulatory Authority (RURA) by awarding the operating contract to three major private companies and larger cooperatives as follows:

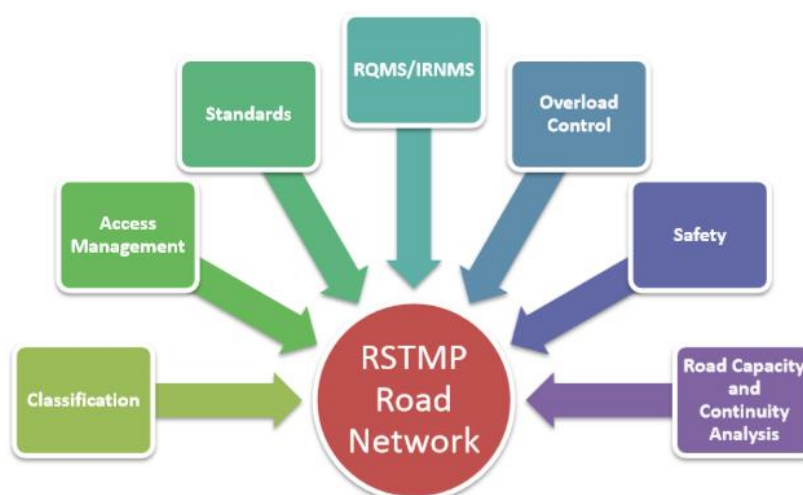


- **Kigali Bus Service** was awarded to operate in Zone I which covers the routes of Remera, Kanombe, Kabeza, Nyarugunga, Rusororo (Kabuga), Masaka, and Ndera sectors. The trunk routes of this public transport zone include the main routes connecting it to the central business district (CBD) or to Nyabugogo Taxi Park.
- **Royal Express Ltd.** was awarded to operate in Zone II which covers the routes of Niboye, Kicukiro (Sonatubes, Center), Gahanga, Gatenga, Gikondo and Kigarama. The trunk routes of this public transport zone include the main routes connecting it to the CBD and to Nyabugogo Taxi Park.
- **Rwanda Federation of Transport Cooperatives (RFTC)** was awarded to operate in Zone III which covers the routes of Kimironko, Kinyinya (Kagugu and Dutchwelle), Gisozi, Kacyiru, New Gakinjoro, Batsinda, Kibagabaga, Kimihurura, Nyarutarama, and the trunk routes of this public transport zone includes the main routes connecting it to the CBD and to the Nyabugogo and Kimironko taxi parks.

### 3.1.4 Strategic Transportation Master Plan for Rwanda

The Rwanda Strategic Transportation Master Plan (RSTMP) was developed in 2012 to solve national level transport issues. It covers a proposal of the institutional structure of transport sector as well as the delivery of transport infrastructure and services. The strategy takes a long-term view on the future transportation system and identifies programs and projects to secure the integrity of the system. The RSTMP deals with the “strategic” layer of the transport system. The strategic transport system envisaged for Rwanda in the RSTMP is aligned with the visions and objectives of the current transport policies of Rwanda (Transport Sector Policy, EDPRS, LUMP, and the Vision 2020)

For the road network, important criteria that relate to the RSTMP Road Network are presented in Figure 3.1.1 below



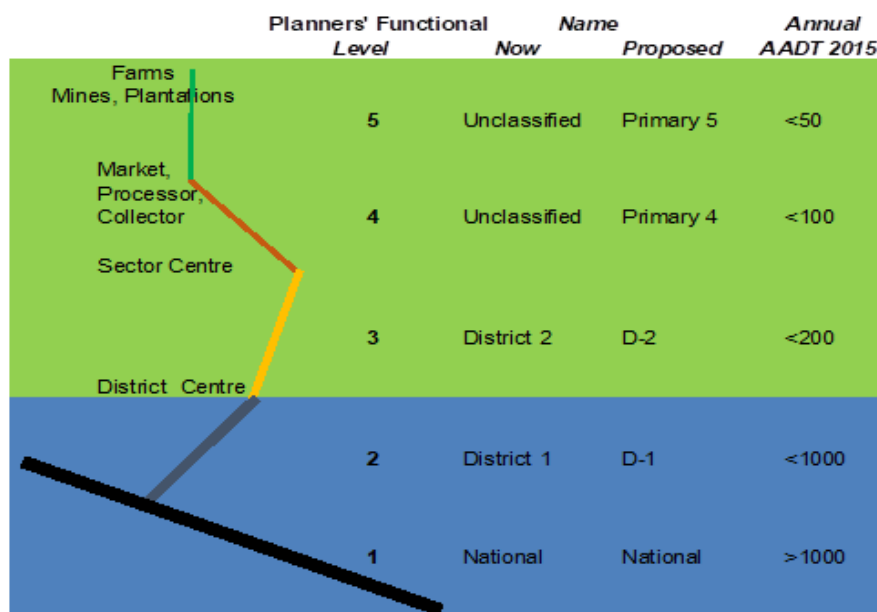
Source: Aurecon, 2012

**Figure 3.1.1: Important Criteria Related to RSTMP for Road Network**

The RSTMP defines classification of the road network as a process by which roads are grouped into classes by the service they provide. Basically, this process is the recognition of trips that involves mobility through a network of roads.

In accordance with the Rwanda Road Act (2012) and the ministerial order establishing the naming of the road networks in Rwanda (2015) the roads are classified into four classes, namely: i) national roads (RN-class), ii) district and city of Kigali roads (RD Category 1), iii) district and city of Kigali roads (RD Category 2), and iv) specific roads. The road classifications are made in accordance to the destination and significance of these public roads; and in addition, there are other classes of roads that have not been proclaimed, namely, rural feeder roads, specific roads, and urban road network.

However, this study has noted that although Road Act does not define the feeder roads and urban roads; nevertheless, the Feeder Road Policy (2017) proposes that the feeder road networks to be classified as Primary Level 4 and Level 5, which links the last sections of the district roads and city of Kigali, i.e.; Level 3 of RD-Category 2. The road network hierarchy as per the Feeder Road Policy is presented in Figure 3.1.2.



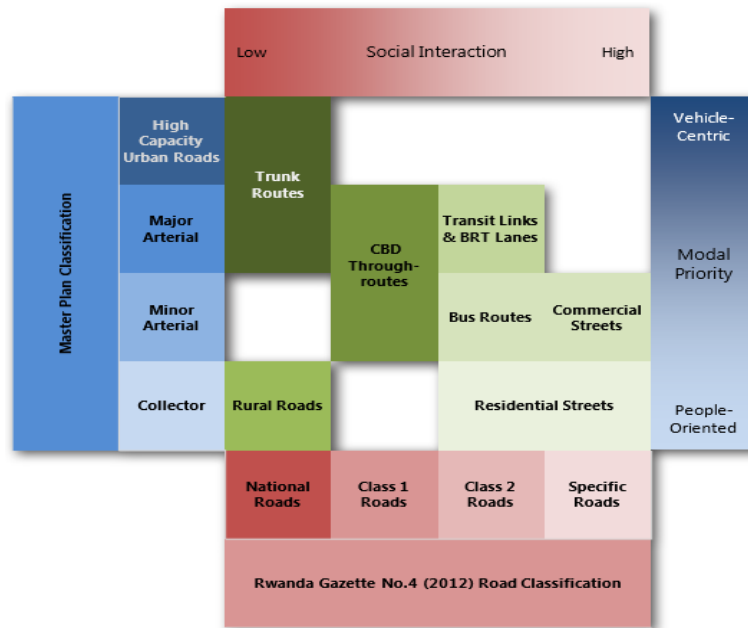
Source: Feeder road policy (2017)

**Figure 3.1.2: Road Network Hierarchy Based on Rwanda Road Act (2012)**

Whereas, the Kigali Transportation Master Plan proposed the hierarchy of urban roads networks into three function classifications namely:

- Major arterial,
- Minor arterial, and
- Local collector.

The major arterial (trunk) corresponds to the national road in the Road Act. While the minor road (CBD) through routes corresponds to Class 1 in the Road Act. The collector (residential streets) corresponds to Class 2 or specific roads.



Source: Kigali Transportation Master Plan (2013)

**Figure 3.1.3: Road Classification Based on Kigali Transportation Master Plan (2013)**

It is evident from this study that the review of the Road Act is imperative in order to define road classification based on the function classification for all types of Rwanda road networks (i.e., inter-regional; inter-provincial; and Kigali and important national nodes)

The RSTMP further indicated that the majority of the classified road network in Rwanda has settlements located in the vicinity of its reserve as well as the following constraints with respect to road operations in Rwanda:

- Poor level of service;
- Reduced road safety; and
- Impaired land use and transport integration, among others.

Following such recommendation, this study has noted the responsible agency. RTDA has installed road reserve demarcation along the road reserve to protect any future encroachment and any road upgrade projects which require land acquisition after the payment of properties.

The RSTMP has also identified that an Integrated Road Network Management System (IRNMS) does exist in the transport industry and the system brings all road management systems together. IRNMS requires a comprehensive understanding of all elements involved in the roadway environment and the users interacting with this environment. This study thus notes that such system has not been established and therefore, recommends for its future implementation with possible support from JICA

The RSTMP highlighted that many countries have promulgated their Road Traffic Acts that stipulate permissible axle load, axle group combinations, and vehicle dimensions. These limits are meant to ensure that roads last for their full design life with normal maintenance expenditures. In Rwanda, the overloading control is aligned with that of the East African Community (EAC) (i.e., harmonize axle load limits and vehicle dimension standards; guide registrations of new vehicles to eliminate variations over time). However, this study has also noted that Rwanda has not commissioned or implemented a country-specific Overload Control

Strategy in order to ensure that the unique OLC situation is prevalent in Rwanda, and thereby, identifies associated requirements which are to be identified and addressed. This is one of the areas where the Rwanda government requires support.

In the road safety, RSTMP indicates that compared with other countries in the region, Rwanda's road-related fatalities are minor; nonetheless, on the national level, the numbers are still high and the issue should be addressed. Motorcycle is the most registered type of vehicles in Rwanda and there is a need for more clarity on the data on the number of registered vehicles in Rwanda. RSTMP also shows very little information on road safety available or able to be disclosed which led to the following conclusions: that Rwanda has no institutional structure for road safety – currently, the Ministry of Infrastructure (MININFRA), police, and RTDA share responsibilities. Moreover, there is no policy/legislation that stipulates roles and responsibilities; notwithstanding that currently this is a grey area. Nonetheless, the Road Traffic and Road Safety (Draft) Act makes provision for the establishment of an advisory National Road Safety Committee. This study also notes that similarly, there is a lack of informative accidents data, therefore, and this is also another area which require support.

### **3.1.5 Transport Sector Strategic Plan for EDPRS2**

The Economic Development and Poverty Reduction Strategy 2 was established for the year 2013-2018 after the successful achievement of EDPRS 1. In the EDPRS 2, one of the thematic areas of priorities is on the economic transportation in the transport sector. The set priority areas on transport sector are indicated on priority 2<sup>nd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> as follows:

- 2<sup>nd</sup> Increase the external connectivity of Rwanda's economy and boosting exports by building a new international airport, expanding RwandAir, and finalizing planning for an appropriate railway connection along the central transport corridor to Tanzania or to Uganda; transforming Rwanda's logistics system and strengthening export promotion.
- 4<sup>th</sup> Transform the economic geography of Rwanda by facilitating urbanization and promoting secondary cities. Six secondary cities will be developed as poles of growth and centers of non-agricultural economic activities.
- 5<sup>th</sup> Pursue a 'green economy' approach to economic transformation. The green economy approach favors the development of sustainable cities and villages.

In EDPRS 2, no specific targets were set for the national and urban road networks. However, in the rural sector development, the EDPRS 2 sets the target to upgrade 2,550 km of district Class 2 feeder roads and 7,000 km of farm to market roads. The program also sets target to connect areas with high agricultural production potential and also, it envisages the utilization of local labor-based approaches such as HIMO (which is stand for Haute Intensité de Main d'Oeuvre, means labor intensive method) for its implementation.

This study also notes that the set targets for the EDPRS 2 in the transport sector were achieved and some projects are still under implementation.

### **3.1.6 Rwanda Vision 2050**

On 16 December 2016 Rwanda launched the Vision 2050 with the theme “the Rwanda We Want” which is about ensuring high standards of living for all Rwandans. The blueprint, which comprises five main pillars envisaged in Vision 2050, is presented as follows:

- Quality of life;
- Modern infrastructure and livelihoods;
- Transformation for prosperity;
- Values for Vision 2050; and
- International cooperation and positioning.

The Vision 2050 comes into light of the final phase of its Vision 2020 where the achievements registered should pave way for further elaborated development program towards a more dignified Rwanda. The Vision 2050 is also aligning Rwanda into other international and regional visions such as Addis Ababa Action Agenda (financing for development) – 2030, Sustainable Development Goals (SDGs) – 2030, Paris Declaration on Climate Change (2030), EAC Vision 2050, and African Union Agenda – 2063

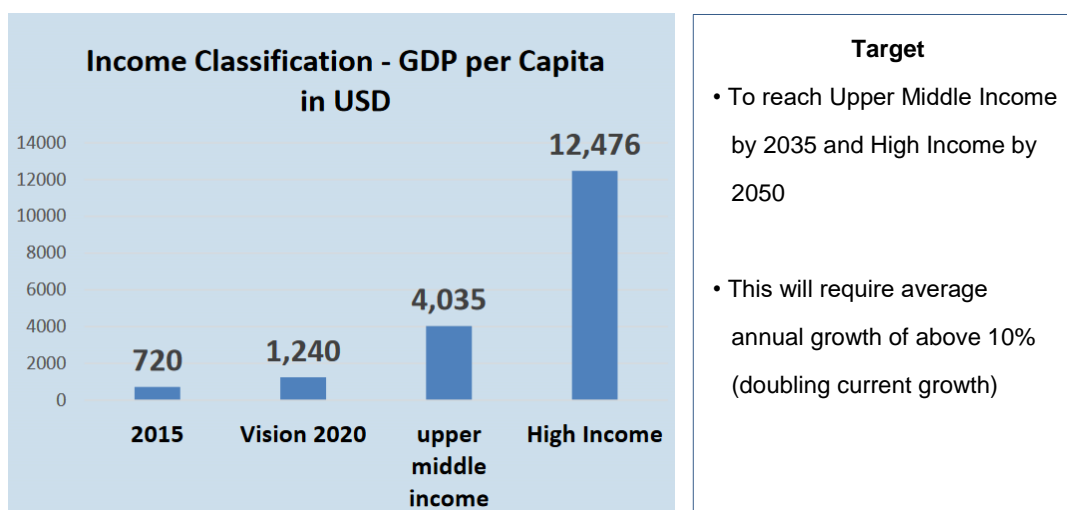
To make Vision 2050 a reality, Rwanda will be driven by high level of commitment and sacrifice drawn from the country’s history and cultural values; a sense of urgency in delivery; thinking big towards implementing bigger, faster, and smarter; strong accountability; and prolonged national security and stability.

In international cooperation, the government will continue to work towards consolidating the strides made in regional integration, strengthening multi-bilateral and bilateral cooperation and positioning the brand “Rwanda”.

Looking at the modern infrastructure and livelihoods, Vision 2050 focuses on the implementation of the following programs:

- Modern and SMART cities (optimal space utilization, connected cities, broadband, and internet of things);
- Green/Eco-friendly cities and neighborhoods; e.g., powered by renewable energy, recycling, etc.;
- SMART towns and rural settlements;
- Modern transport facilities and services (i.e., efficient public transport and reliable infrastructure); and
- Efficient public and private services.

The overall perspective of the income level of Rwanda by 2050 is presented in Figure 3.1.4.



Source: Vision 2050, MINECOFIN

**Figure 3.1.4: Perspective of Income Level of Rwanda by 2050**

It is evident from the study observation that to deliver this Vision 2050, the Rwanda government needs to have collaboration and coordination with international and regional agencies of which, JICA should play a role in the international areas of modern transport that facilitates trade of goods and services for efficient and reliable public transport.

### 3.1.7 National Strategy for Transformation 1 (NST-1)

The National Strategy for Transformation is an amalgamation of the Economic Development and Poverty Reduction Strategy (EDPRS) and 7 Year Government Program (7YGP). It is a new strategy adopted by the GoR to spur national development for the next seven years towards economic growth and improving the well-being of its citizens. The development of an effective transport network at the national and regional levels, the diversification of the modes of transport and improvement in the quality of transport services on major transport corridors will certainly contribute to achieving these objectives. With regard to transport, the NST-1 is aligned with Vision 7YGP; and Vision 2050 aims at increasing external connectivity of Rwanda's economy and boosting exports by building a new international airport, expanding RwandAir destinations, and finalizing planning for an appropriate railway connection along the Central Transport Corridor to Dar es Salaam or Northern Corridor to Uganda; transforming Rwanda's logistics systems; and strengthening export promotion. Therefore NST-1 Priority Area 1 on transport sector focuses on:

Contribution to accelerated sustainable urbanization from 17.3% (2013/14) to 35% by 2024. The Transport Sector Strategic Plan predetermined interventions focus on the following:

- Improve rural and urban transport services through the establishment of scheduled bus routes, construction of urban roads and rural roads rehabilitated, route franchising, as well as operationalization of smart ticketing system;
- Reduce traffic congestion through improvement of junctions, avail dedicated bus lanes, introduction of traffic control system (ITS);
- Avail passenger information system (real time public transport information); and
- Installing public lighting on newly constructed roads.

In the NST-1 Priority Area 4: the focuses are in the:

Promotion of industrialization and attaining a structural shift in the export base to high value goods and services with the aim of growing exports to 17% annually: delivering on this annual target will require developing hard infrastructure for trade competitiveness. The transport sector interventions will focus on:

- Upgrade 440 km national roads, rehabilitate (paved) 453 km national roads, and ensure the riding quality is kept to 97% for paved roads, and four operational weighbridges;
- Maintaining 1,091 km unpaved national roads and keep riding quality at 50%;
- About 57% of DR1 in good condition and 3,085 km of feeder roads;
- Develop 30 km railway transport;
- Develop four ports on Lake Kivu;
- Construct two one-stop border post (OSBP); and
- Develop seven road side stations.

In May 2018, MININFRA prepared the draft Transport Sector Strategic Plan which provided guidance in developing integrated medium transport sector programs for the next seven years in conformity with the current government priorities as provided for in the first National Strategy for Transformation (NST-1). Table 1 shows NST-1 aligned with transport sector strategic plan in the economic transformation.

**Table 3.1.1: NST-1 Alignment with Transport Sector Strategic Plan**

NST-1 Priority Area	NST-1 Outcome	Transport SSP Outcome	Transport SSP Strategic Interventions
<b>1.2:</b> Accelerate Sustainable Urbanization from 17.3% (2013/14) to 35% by 2024	<b>1.2.1</b> Developed and integrated urban and rural settlements  <b>or</b> <b>1.2.2:</b> Increased economic opportunities in urban areas	<b>Transport Outcome 2:</b> Improved public transport services, effective and safe traffic management	<b>Transport ST:</b> Improve rural and urban transport services through the establishment of scheduled bus routes, construction of urban roads and rural roads rehabilitated, route franchising, as well as operationalization of smart ticketing system
			<b>Transport ST:</b> Reduce traffic congestion through improvement of junctions, avail dedicated bus lanes, and introduction of traffic control system (ITS)
			<b>Transport ST:</b> Avail passenger information system (real time public transport information)
<b>1.4:</b> Promote industrialization and attain a structural shift in the export base to high-value goods and services with the aim of growing exports by 17% annually.	<b>1.4.4:</b> Hard infrastructure developed for trade competitiveness	<b>Transport Outcome 1:</b> Improved and sustained quality of road network	<b>Transport ST:</b> Upgrade 440 km national roads, rehabilitate (pave) 453 km national roads, and ensure the riding quality is kept to 97% for paved roads and four operational weighbridges
			<b>Transport ST:</b> Maintain 1,091 km unpaved national roads and keep riding quality at 50%

NST-1 Priority Area	NST-1 Outcome	Transport SSP Outcome	Transport SSP Strategic Interventions
			<b>Transport ST:</b> 57% of DR1 in good condition and 3,085 km of feeder roads
		<b>Transport Outcome 3:</b> Improved regional transport and trade facilitation	<b>Transport ST:</b> Develop 30 km railway transport
			<b>Transport ST:</b> Develop four ports on Lake Kivu
			<b>Transport ST:</b> Construct two OSBP
			<b>Transport ST:</b> Develop seven road side stations

Transport ST: Transport Strategic Transformation

This study also noted that the NST-1 sets transport infrastructure as areas of priority where several actions have been identified in order for the government to achieve the different policy and strategic version such as Vision 2020, Vision 2025, 7YGP, and other international and regional goals. It is evident from these priorities that the government clearly indicated that the collaboration between national and international partners was the key to the success. This study thus postulates that the project identified by this study will shed light for the national and international partners to understand and support the implementation of these activities in line with the government strategic plan.

### 3.1.8 Road Asset Management System (RAMS)

The Rwanda Maintenance Fund (RMF) is in the process of developing Road Asset Management System Master Plan (RAMSMP) (2018) which is a tool to provide the necessary decision support to ensure the cost-effective maintenance of the existing road, and provision of new road infrastructure, making the most efficient possible use of scarce resources. In other means, RAMS is also the instrument by which the RTDA can give account of its performance to the RMF and the Ministry of Infrastructure (MININFRA) on the use of RMF-funded projects in an efficient and effective manner.

Road asset management encompasses all activities executed to provide and maintain a road network. Therefore, there are numerous processes that could be formalised and incorporated into one integrated Road Asset Management System. The following subsystems are considered first to be incorporated into an integrated road asset management system:

- Road Location Referencing System (RLRS);
- Road Proclamation System (RPS);
- Traffic Management System (TMS);
- Pavement Management System (PMS);
- Unsealed Road Management System (URMS);
- Bridge/Structures Management System (BMS);
- Geometric/Capacity Management System (GMS);
- Maintenance Management System (MMS);
- Project Control System (PCS);
- Network Integration Module (NIM); and
- Road Accident/Incident Information System (RAIS)

The aforementioned different subsystems all contribute to identify potential projects, maintenance programs, and therefore, expected expenditures too. In this regard, two different strategies are followed to optimize expenditure using two different objective functions, namely:



- a) Preservation strategy
- b) Economic strategy

The preparation of RAMS is still at the inception phase. It is a long-term program where the critical subsystems, i.e., Core System as well as the Road Location and Reserve Management System, will be available in 18 months. The maximum time (per subsystem) for development and implementation into a fully operational system, with training, must not exceed 24 months. The development of the Bridge Management System and Geometric/Capacity Management System be scheduled to provide results before integrating all needs in the Network Integration Module. Optimized funding requirements and recommended distribution (strategic planning results), as well as provisional tactical planning results will be available after 36 months (3 years). All identified subsystems of the integrated RAMS shall be operational within 5 years

This study has noted that RAMS Master Plan is a very important system that aims to guide all future development and provides structure to establishing a unique visionary and sustainable Road Asset Management System for Rwanda.

### 3.2 Local Government Level Plans

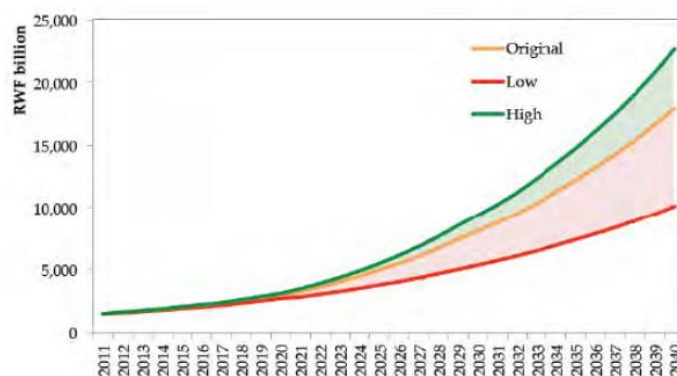
#### 3.2.1 City Master Plan

##### (1) Overview

Kigali City Master Plan was planned in 2013 at the same time that the Transportation Master Plan was also developed. Since both of the two master plans were planned by a Singaporean consultant (Surbana Jurong), they are well harmonized. Based on this City Master Plan, in this clause, the critical indicators are picked up as references.

##### 1) GRDP

In medium scenario, the gross regional domestic product (GRDP) of Kigali City is estimated as a minimum RWF 12.29 trillion to RWF 21.28 trillion in 2040 based on 5.6% of total workforce growth in the next decade.

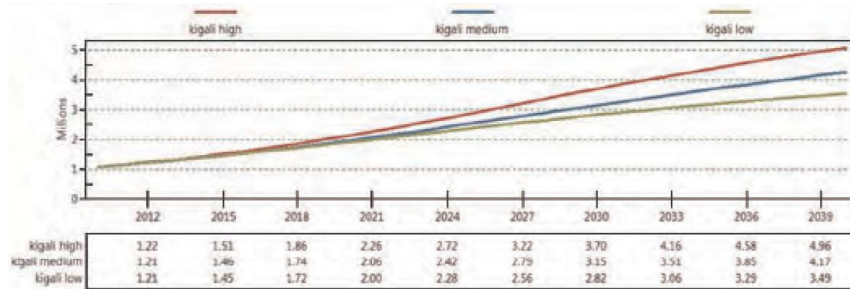


Source: Kigali City Master Plan, 2013

**Figure 3.2.1: Projected Economic Scenario for Kigali City (2011-2040), GRDP**

## 2) Population Projection

Population projection of the existing City Master Plan is projected based on the Third Integrated Household Living Conditions Survey (EICV 3) which was investigated in 2011, and the total population of the Kigali City was 1,059,000. Based on this figure, a population of 2.5 million in 2025 and 4.3 million in 2040 was projected in the medium scenario. The population growth ratio is assumed at 5% until 2025 and 2.5% until 2040. The population growth curve in the City Master Plan is shown below.



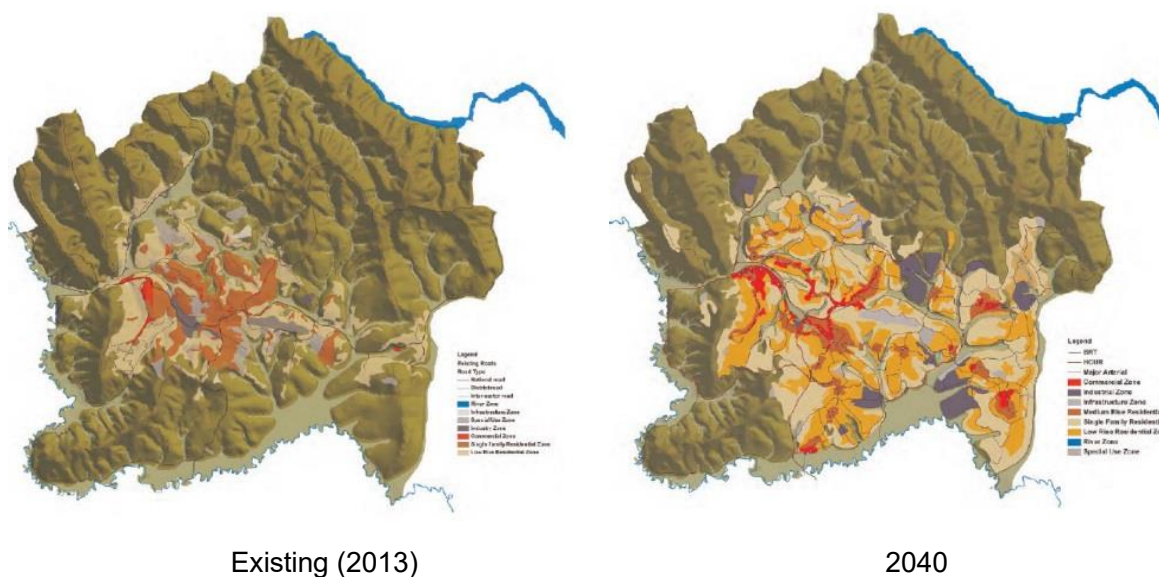
Source: Kigali City Master Plan, 2013

**Figure 3.2.2: Projected Population for Kigali City (2011-2040)**

## 3) Proposed Land Use

In 2013, urbanized area of Kigali City was only 17% of the entire area, while the other 83% was shared by open space or natural area. However, since rapid city growth is expected in order to meet rapid population increase projections for 2040, which will be almost double of the current urbanized area (32.4%) is thus planned as urbanized area in 2040. Majority of land use in the urbanized area is residential where more than 60% is covered.

The two figures below, existing land use and the proposed land use in 2040 illustrate future development direction of the Kigali City. The urbanized area is expanding to the south and southeast. On the other hand, the hilly area in the northern part and wetland remains as undeveloped area.



Source: Kigali City Master Plan, 2013

**Figure 3.2.3: Existing and Proposed Land Use**

## 4) Infrastructure Development

In accordance with the projected population and the proposed land use, demand forecast of utility and infrastructure has been done. In order to meet the future water demand, in addition to the existing water resources such as the Yanze River, Nyabugogo River, and Lake Mugesera, utilization and additional usage of the Nyabugogo River and Mutobo Spring is proposed. However, corresponding to the water demand, developments to the water treatment plant and the sewerage system are also required. Regarding electricity, a demand of 1,210 MW in 2040 is projected, which is almost eight times of the current consumption (154 MW in 2012).

**Table 3.2.1: Summary of Infrastructure Demand Forecast**

Sector	2025	2040
Water supply	369,078 m <sup>3</sup> /d	622,089 m <sup>3</sup> /d
Water treatment	(ultimate design capacity) 74,000 m <sup>3</sup> /d	
Water resource	400,000 m <sup>3</sup> /d	642,000 m <sup>3</sup> /d
Sewerage	295,263 m <sup>3</sup> /d	497,671 m <sup>3</sup> /d
Electricity	601.2 MW	1,210.7 MW

Source: Kigali City Master Plan, 2013

### (2) Challenges, Vision and Goals

#### 1) Challenges

As described above, rapid urbanization due to rapid population increase is expected, and some urban challenges related to this phenomenon are bound to occur in the future. The main urban challenges, which are identified in the City Master Plan, are listed below:

- Sprawled and unplanned development;
- Inadequate infrastructure, utilities, and public transport;
- Lack of affordable and quality homes;
- Encroachment of environmentally sensitive areas; and
- Limited resource management (water and electricity).

#### 2) Vision

Under the City Vision “The Centre of Urban Excellence in Africa”, roles are set in each district such as i) Nyarugenge: “The Financial Hub”, ii) Gasabo: “The Administrative Centre”, and iii) Kicukiro: “The Knowledge Hub”.

#### 3) Goals

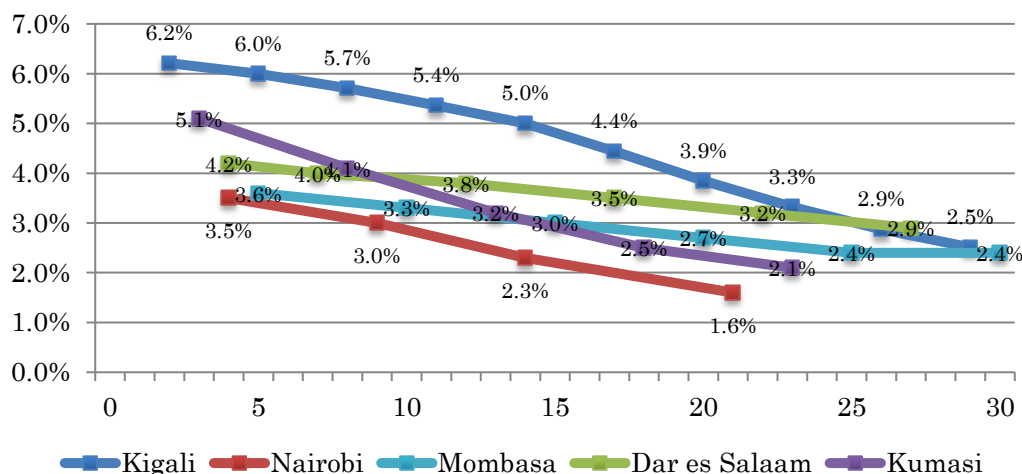
Six goals are targeted as shown below.

- City of character, vibrant economy, and diversity;
- City of green transport;
- City of affordable homes;
- City of enchanting nature and biodiversity;
- City of sustainable resource management; and
- City of endearing character and unique local identity.

### (3) Recommendations based on the Review of the Existing Master Plan

#### 1) Benchmark Study on Population Projection

As mentioned above, rapid urbanization due to rapid population increase is expected, and some urban challenges related this phenomenon are bound to occur in the future. The main urban challenges identified in the City Master Plan are listed below.



Source: JICA Survey Team created based on JICA Data

**Figure 3.2.4: Benchmark Study on Population Growth Ratio**

**Table 3.2.2: Benchmark Study on Population Growth Ratio**

		Kigali* <sup>2</sup> (Rwanda)	Nairobi (Kenya)	Mombasa (Kenya)	Kumasi (Ghana)	Dar es Salaam (Tanzania)
Base year	Year	2010	2009	2010	2003	2010
	Pop.	1.22 mil	3.14 mil	0.96 mil	2.60 mil	2.04 mil
Short-term	Year	2015(+5)	2013(+4)	2015(+5)	2007(+4)	2013(+4)
	Pop.	1.46 mil	3.60 mil	1.15 mil	3.07 mil	2.36 mil
	GR* <sup>1</sup>	6.0 %	3.5 %	3.6 %	4.2 %	5.1 %
Mid-term	Year	2025(+15)	2023(+14)	2025 (+15)	2015(+12)	2023(+14)
	Pop.	2.5 mil	4.68 mil	1.56 mil	4.16 mil	3.37 mil
	GR	5.0 %	2.3 %	3.0 %	3.8 %	3.2 %
Long-term	Year	2040(+30)	2030(+21)	2040 (+30)	2030(+27)	2033(+24)
	Pop.	4.3 mil	5.21 mil	2.26 mil	6.68 mil	4.23 mil
	GR	2.5 %	1.6 %	2.4 %	2.9 %	2.1 %

Note \*<sup>1</sup> GR: Growth Ratio

\*<sup>2</sup> The population projection of Kigali shown in the table is accorded to the medium case scenario.

\* Red letters show the highest figure among the cities.

Source: Kigali City Master Plan 2013, JICA data

#### 2) Confirmation of Planned Migration to/from Kigali City

According to the Kigali City Master Plan 2013, fertility rate is set as 3.5% from 2010 until 2025 and 3.0% in 2040. On the other hand, population growth is 6.0% in 2015, 5.0% in 2025, and 2.5% in 2040.

These figures show that almost the same amount of population in-flow (about 35,000 people) occurs in 2015 and 2025. On the other hand, 21,000 of population spill occurs.

It is considered that the population spill might be considered because of the land limitation of Kigali City. However, it is recommended that scenarios on future migration

to/from Kigali City and fertility rate are reviewed during the Master Plan Updating Project, which is currently under planning.

**Table 3.2.3: Detailed Figures of Benchmark Study on Population Projection**

	2015	2025	2040
Growth Ratio	6.0 %	5.0 %	2.5 %
Fertility Ratio	3.5 %		3.0 %
Gap (Migration)	+2.5 %	+1.5 %	-0.5 %
Migrated Population	+34,000	+36,000	-21,000

Source: Kigali City Master Plan, 2013

### 3) Recommendations on Updating City Master Plan

Based on the review, the following points are recommended:

- Reviewing of the population growth ratio  
In case a high ratio will be adopted in the updated master plan, it is better to clearly describe the reason and calculation method in the report.
- Reviewing of the migration scenario  
Since it seems that population spill occurs in 2040 according to the figures shown in the City Master Plan 2013 Report, the figures and migration scenarios should be reviewed.

## 3.2.2 Updated City Master Plan

### (1) Overview

The City of Kigali (CoK) has started updating the City Master Plan and the Transportation Master Plan which was formed in 2013. The project started from June 2018 for 10 months. The City Master Plan as well as the District Plan shall both be updated. In the updating, “Sustainable City” development is proposed as a development concept, and utility management by utilizing smart technology, such as Area Energy Management System (AEMS), Smart lighting, Smart CCTV etc., is proposed.



Source: Progress Report Meeting of the Master Plan Update

**Figure 3.2.5: City Development Concept “Sustainable City”**

The City Master Plan covers the planning of water supply, sanitation, electricity, storm water, ICT, solid waste management, and infrastructure development plan to meet the future demand of these infrastructure. The project schedule is shown below.

**Table 3.2.4: Work Schedule of City Master Plan Updating**

Activities	2017							2018		
	6	7	8	9	10	11	12	1	2	3
Project Inception										
Visioning and Program Update										
Interim Master Plan Update										
Transport Plan Update										
Final Master Plan Update										
Master Plan Implementation										

Source: Progress Report Meeting of the Master Plan Update

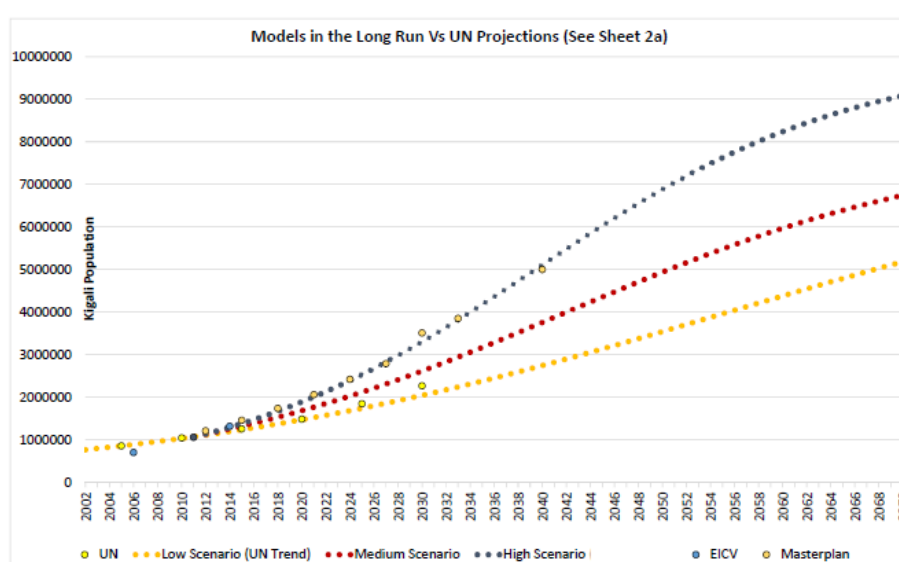
### 1) Population Projection

Population projection was updated based on the latest population data in 2014 (EICV 4). In the medium scenario, although the existing master plan shows a population of 4.3 million in 2040, the updated figure is revised and decreased to 4.00 million in 2042.

**Table 3.2.5: Population Projection**

	Updated MP			Existing MP
	Low (mil)	Medium (mil)	High (mil)	Medium (mil)
2012	1.11	1.13	1.13	1.21 (2012)
2022	1.57	1.85	2.13	2.06 (2021)
2032	2.17	2.83	3.64	3.51 (2033)
2042	2.90	4.00	5.48	4.3 (2040)
2050	3.54	4.93	6.88	-

Source: Progress Report Meeting of the Master Plan Update



Source: Progress Report Meeting of the Master Plan Update

**Figure 3.2.6: Projected Population for Kigali City (2011-2040)**

## **(2) Vision and Goals**

### **1) Vision**

In the updated city master plan, the following three visions are proposed:

- The Center of Urban Excellence in Africa
- Inclusive City of Excellence
- Our Kigali! Kigali Yacu!

### **2) Goals**

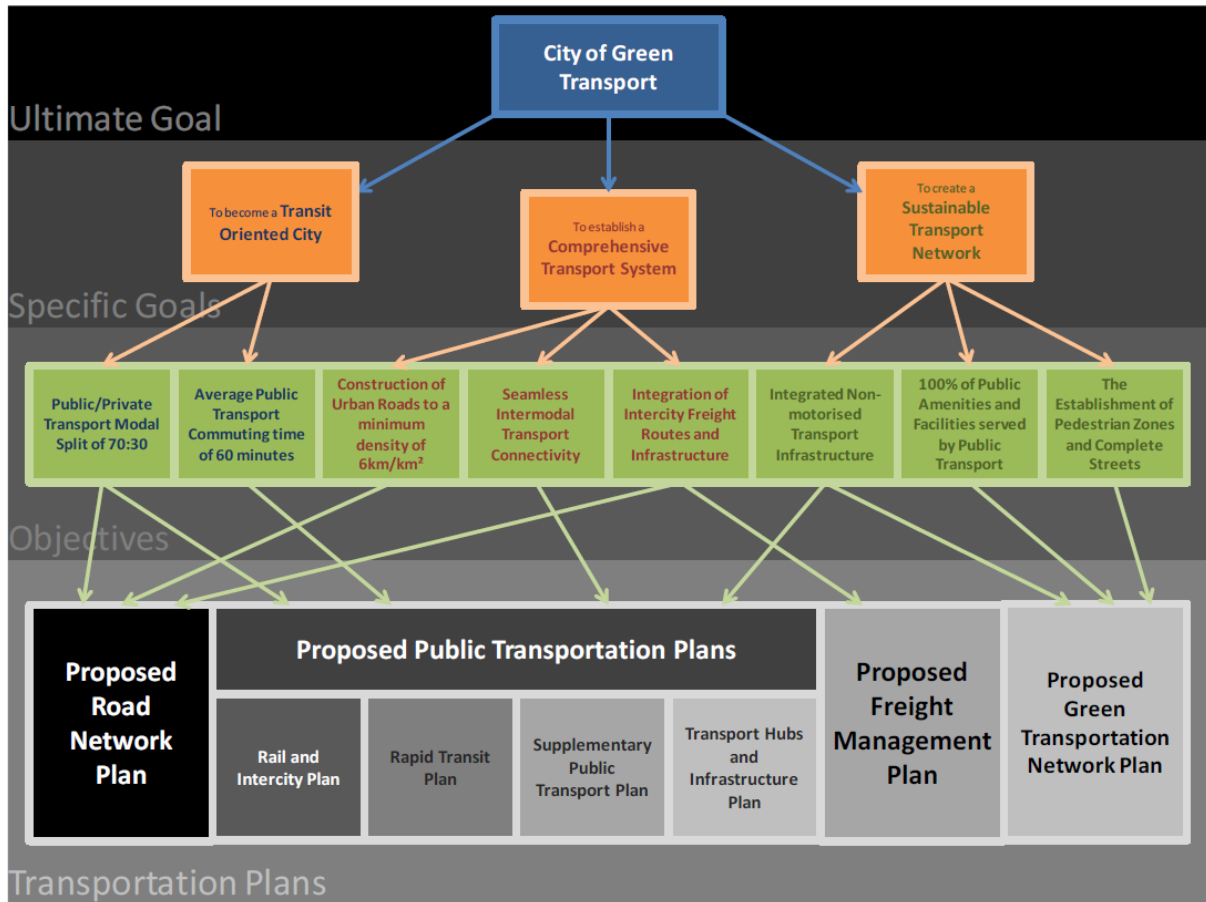
Although five goals were identified in the existing master plan, eight goals are proposed in the updated master plan:

- City of Excellence
- City on the Move
- Efficient City
- Green City
- City at Work
- Creative City
- City for Citizens
- City of Integrated Neighborhoods

## **3.2.3 Transportation Master Plan**

### **(1) Outline of the Transportation Master Plan**

The Kigali City Master Plan indicated that the population of Kigali City is expected to increase by 4 to 5 million by 2040. The Transportation Master Plan was formulated to ensure the future transport requirement in consideration of city growth. The “City of Green Transport”, which was set as one of the six critical goals in the City Master Plan, is set as the ultimate goal in this Transportation Master Plan. Based on the challenges and opportunities that were identified from the review of the current traffic situation in Kigali City, three specific goals are set under the ultimate goal: i) to become a Transit Oriented City, ii) to establish a Comprehensive Strategic Road Network, and iii) to create a Sustainable Transport Network. The target year of this master plan is 2040. Four transportation plans, which are the Road Network Plan, the Public Transportation Plans (which consists of four related plans), the Freight Management Plan, and the Green Transport Network Plan, as well as the institutional set-up and the traffic management and policy were set out in this master plan. Based on these, necessary interventions in short-mid-long term periods were also proposed.



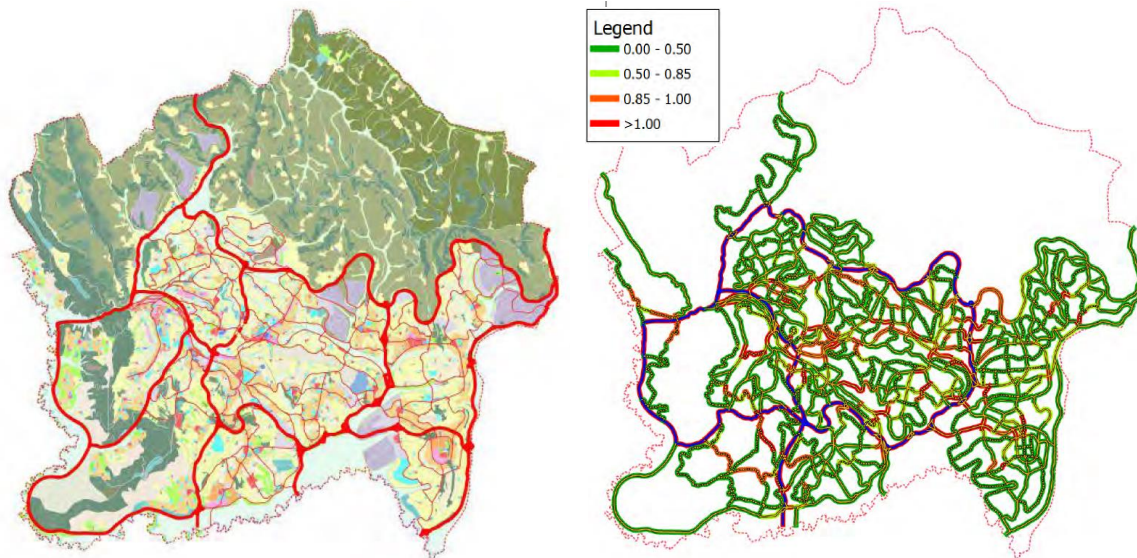
Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.7: Goals and Objectives of the Transportation Master Plan**

## (2) Future Framework and Traffic Demand

Although the future socio-economic framework is not shown in this master plan, it is assumed that the result shown in the City Master Plan was utilized. The traffic demand analysis was conducted using VISUM, which is a software for traffic analysis, and the alignment and class for future the road network was thus proposed based on the analysis result. The vehicle capacity ratio at morning peak time against the proposed road network is shown in this master plan; however, the value of future traffic demand, such as traffic volume and travel speed, is not presented in the report. The assessment of impact and the effect of the proposed interventions is also not introduced in the report.





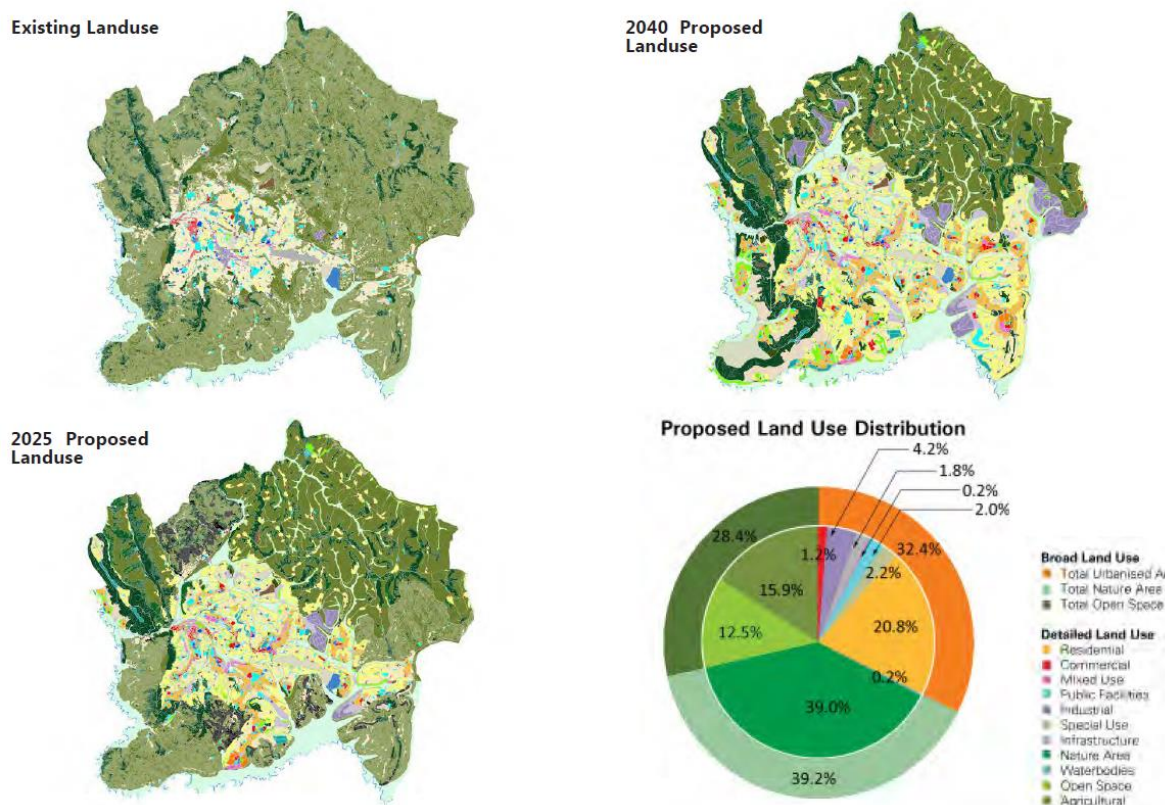
Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.8: Proposed Future Road Network (Left) and Road Network Capacity (Right)**

### (3) Proposed Land Use Plan

The land use plan for 2025 and 2040 is indicated in this master plan based on the City Master Plan. The socio-economic study projected the city's population to be between 4 to 5 million by 2040 and it is proposed that the urban area within the city is expanded by two and a half folds to meet the future population and economic growth. Three areas are defined, which are the City Center, the Fringe Area, and the Sub-urban Area, and each density distribution (urban center: 30,000 persons/km<sup>2</sup>, fringe: 22,000 persons/km<sup>2</sup>, sub-urban: 18,000 persons/km<sup>2</sup>), and the future land use plan is presented based on the area and distribution mentioned above.

The main development plan of each area is (a) to expand and strengthen the City Center by allowing high density commercial and vibrant mixed-use developments, (b) to introduce regional level commercial area and redevelop existing dense unplanned settlements into medium-rise residential zone in the Fringe Area, and (c) to introduce regional level commercial areas and develop a medium-rise residential township and a light industrial area in the Sub-urban Area.



Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.9: Evolution of Land Use from Existing 2012 to 2040**

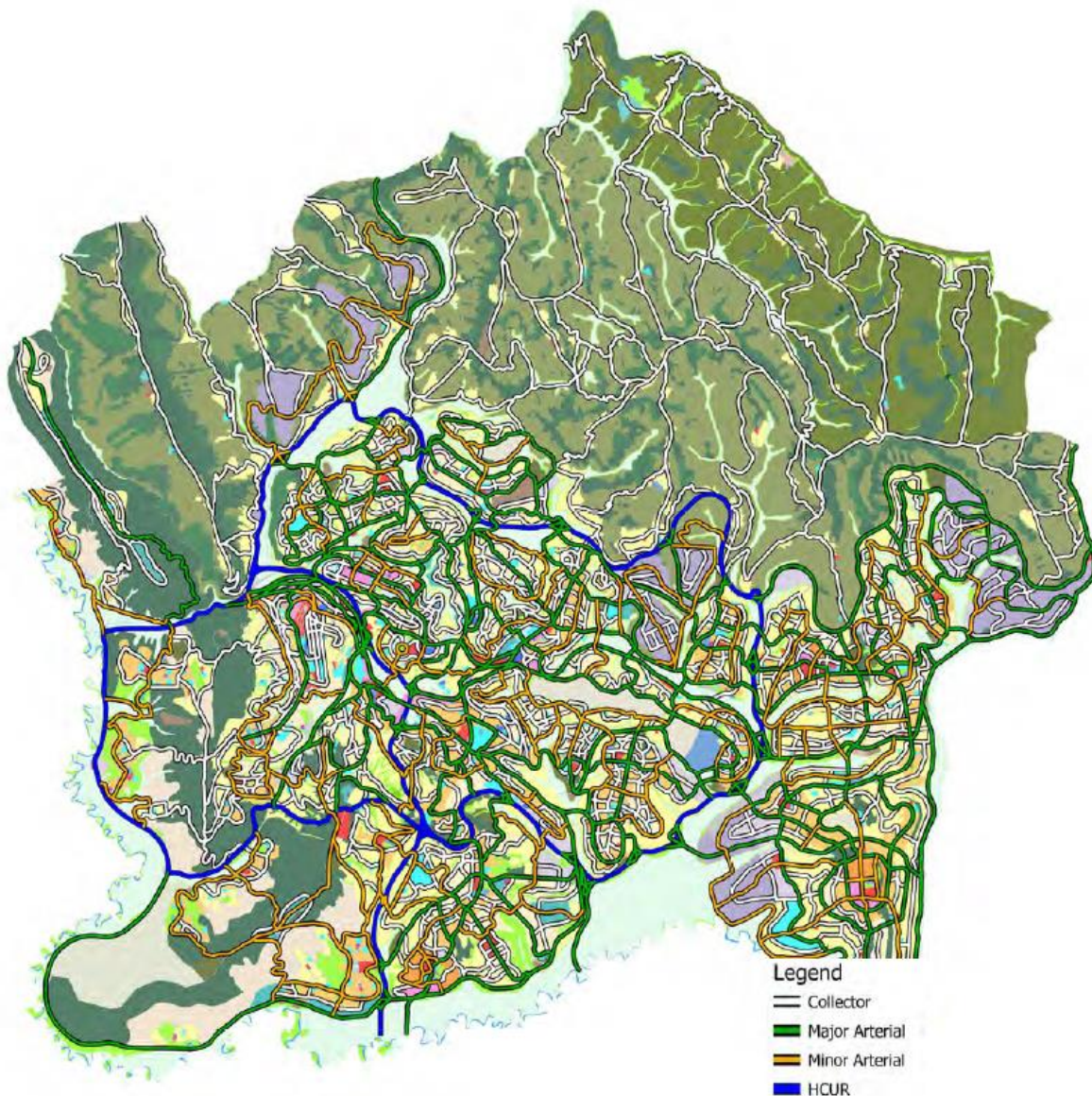
#### (4) Proposed Four Transport Related Plans

The four transport-related plans are presented in this transportation master plan. The outline of each plan is shown below. Transit Oriented Development (TOD) centering on the introduction and operation of a bus rapid transit (BRT) is proposed.

##### 1) Road Network Plan

The future road network in Kigali City is proposed based on the proposed land use plan and traffic modeling. The proposed road network is shown in Figure 3.2.10. The following six principles were set for the development of the road network plan:

- Connect and provide access to and between communities, centers of activity, and neighborhoods of all types, as well as recreational and cultural facilities;
- Form a grid-like pattern of continuous thoroughfares except as precluded by topographic barriers;
- Confirm with and follow natural topographic features and avoid adverse impacts to natural resource areas;
- Meet spacing and connectivity criteria;
- Have thoroughfares interconnected with specified distances between intersections to provide choices of routes to reduce travel distances; to promote use of transit, bicycles, and walking; and to efficiently accommodate utility needs; and
- Re-use existing road alignments to minimize impact on existing properties.

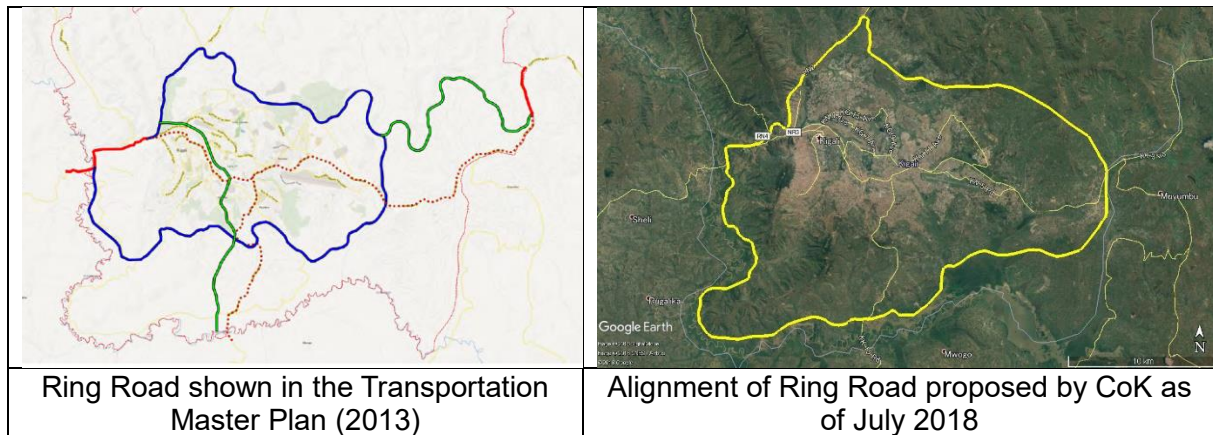


Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.10: Proposed Road Network**

Based on the discussion with related organizations, the future road network includes the ring road which becomes a detour route for through traffic, public transport network, and coverage of road. According to the master plan, although most of the major arterial routes are congested due to overcapacity at the morning peak hours, it is pointed out that the introduction of intelligent transport systems may be the solution for this situation. Regarding the coverage of road, it is shown that 87% of built-up areas are accessible from any point of the arterial road within 500 m distance (ten-minute walk). The necessity of design guidelines for access road design in the local zone and the detailed design guideline for standardized road design are also presented in this master plan.

The alignment of the ring road is updated as of July 2018. According to the interview conducted in CoK, Mota Engil is considering a final alignment based on the alignment and topography data proposed by the city. The alignment is proposed to be wider than the original one.



Source: Kigali City Transportation Master Plan (2013), Collected Data from CoK

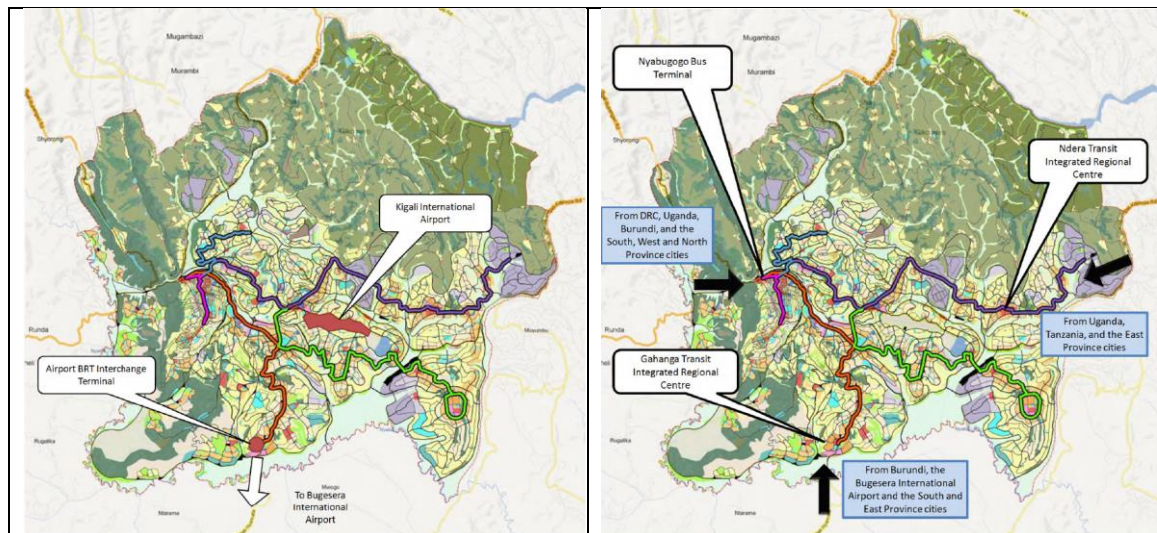
**Figure 3.2.11: Alignment of Ring Road**

## 2) Public Transportation Plan

The Public Transportation Plan consists of four individual plans: (a) Rail and Intercity Transportation Plan, (b) Rapid Transit Plan, (c) Supplementary Public Transport Plan, and (d) Transport Hubs and Infrastructure Plan.

### a) Rail and Intercity Transportation Plan

This plan is for the transit between city and international travel and mentions the efficiency of freight transport brought by the introduction of railway and connection improvement between New Bugesera International Airport (BIA) and the CBD area in Kigali City. There is a railway plan of the East African Rail Corridor with links from Dar es Salaam to Rwanda, and the railway station has already been built at DP World Kigali Logistics Center in Gitaraga. This master plan proposes to connect the railway station and BRT station. The development of three public transport terminals is also proposed to establish a connection between New Bugesera International Airport and the CBD by BRT and to improve intercity and international connections as one of the improvements in public transport service.

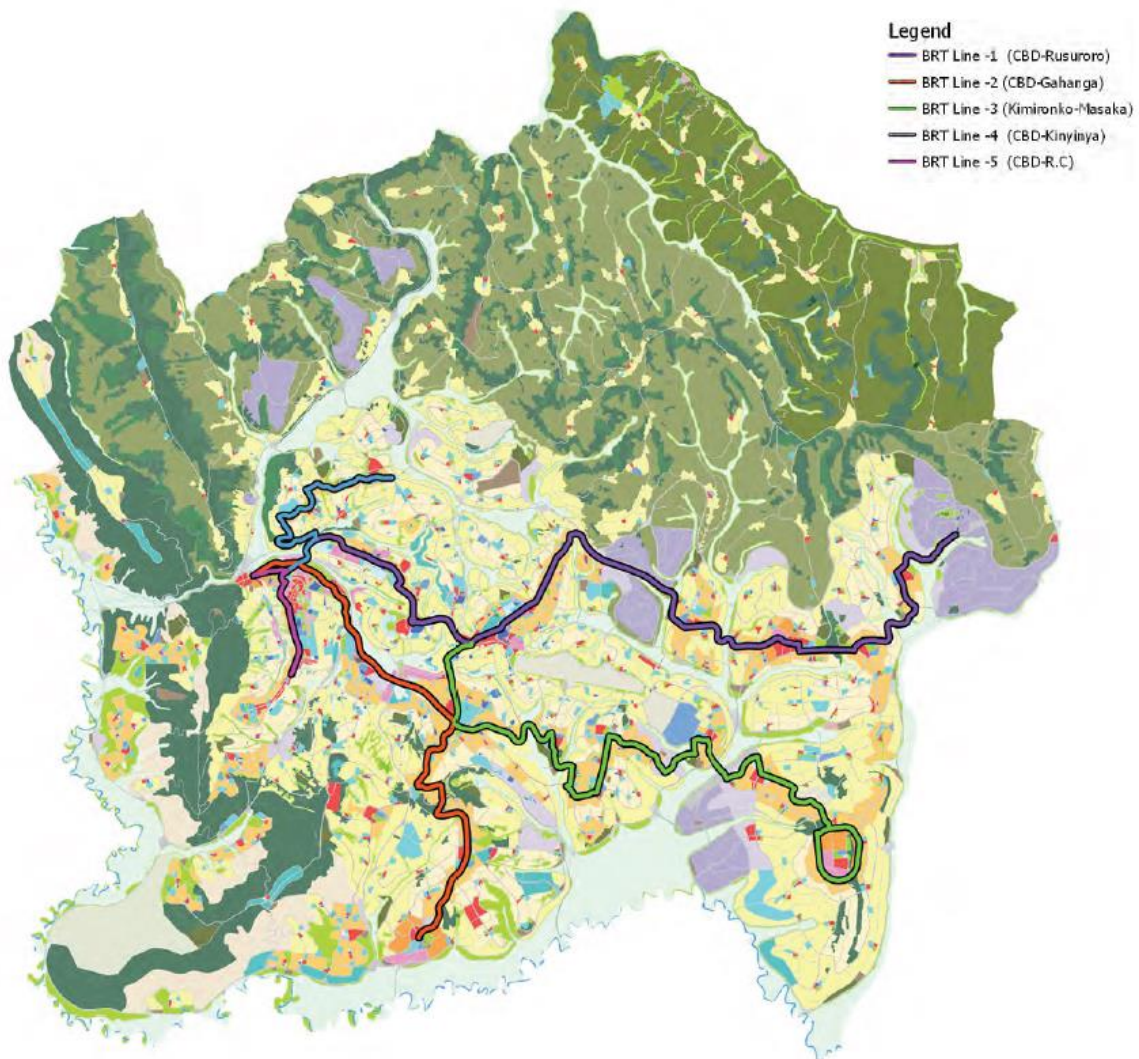


Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.12: Air Transit Connectivity (Left) and Public Transit Connectivity (Right)**

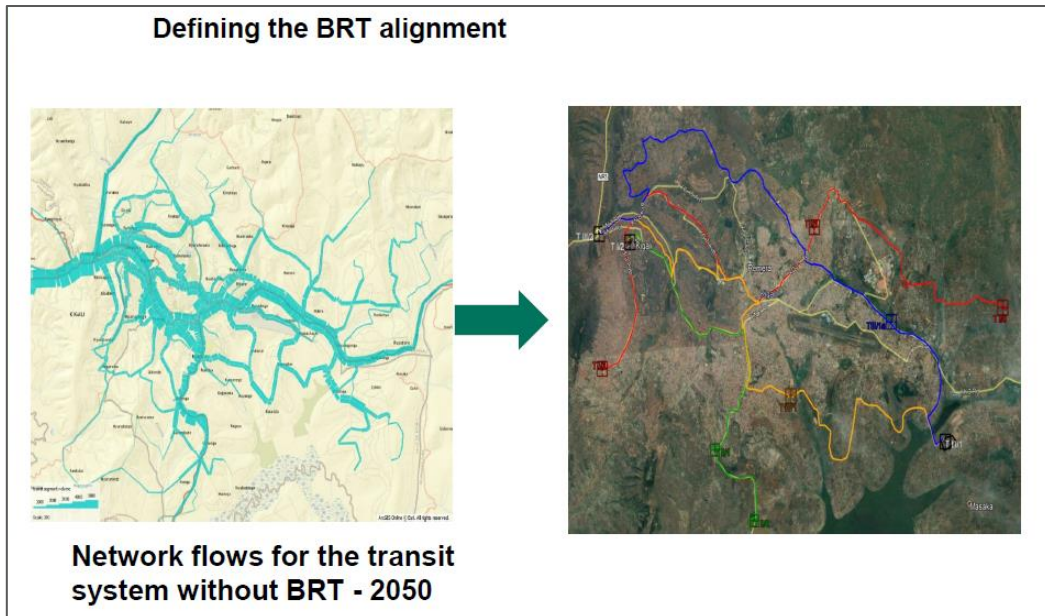
b) Rapid Transit Plan

The development of a 92-km long BRT network, which consists of five lines, is proposed for the year 2040. These BRT lines will be connected between the CBDs of Rusuroro, Gahanga, Kimironko, Masaka, and Kinyinya, and the longest line spans 30 km. Three (BRT Line-1, BRT Line-2, and BRT Line-3) of them serve the trunk line of BRT, and the remaining two lines (BRT Line-4 and BRT Line-5) serve the CBD area. It is presented in the master plan that 73% of the city area would be accessible to the nearest BRT station with a maximum of 30 minutes of walking. The master plan also recommends introducing a BRT from short to middle term, and it also mentions that the mototaxi should be phased out and that the feeder bus service should be provided for the BRT lines. In addition to this, it is mentioned that it is desirable to consider introducing light rail transit (LRT)/mass rapid transit (MRT) in the future. However, it is concluded that a feasibility study is needed for the implementation of the LRT and MRT. As of 2018, a feasibility study on the BRT was conducted by the CoK. According to the feasibility study, BRT lines are updated based on the public transport demand. The master plan mentions that the introduction of park-and-ride facilities is a necessity project for promoting public transport use, and it presents the development of parking facilities in consideration of connections between car, BRT, and commercial facilities.



Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.13: Proposed BRT Routes in the Master Plan**

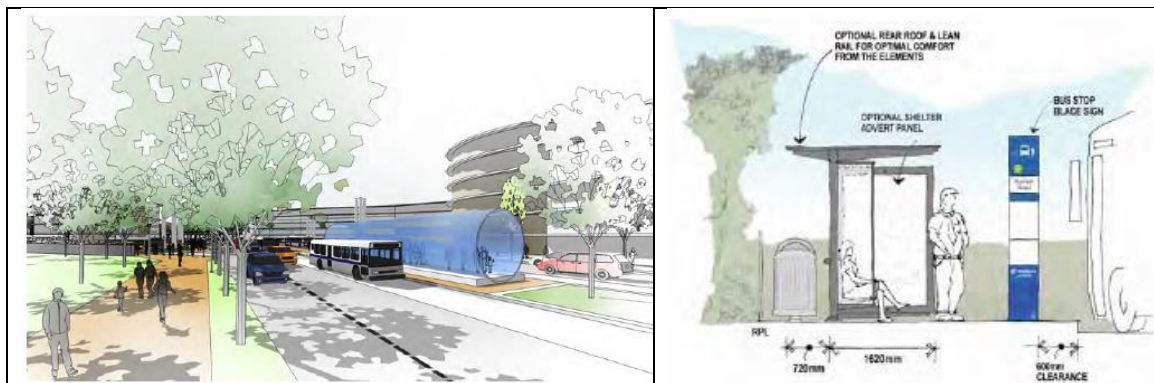


Source: Material for BRT Workshop

**Figure 3.2.14: Public Transport Demand and BRT Network in Feasibility Study**

c) Supplementary Public Transport Plan

This plan presents some images for planning and design of bus stops and related facilities, such as signage.

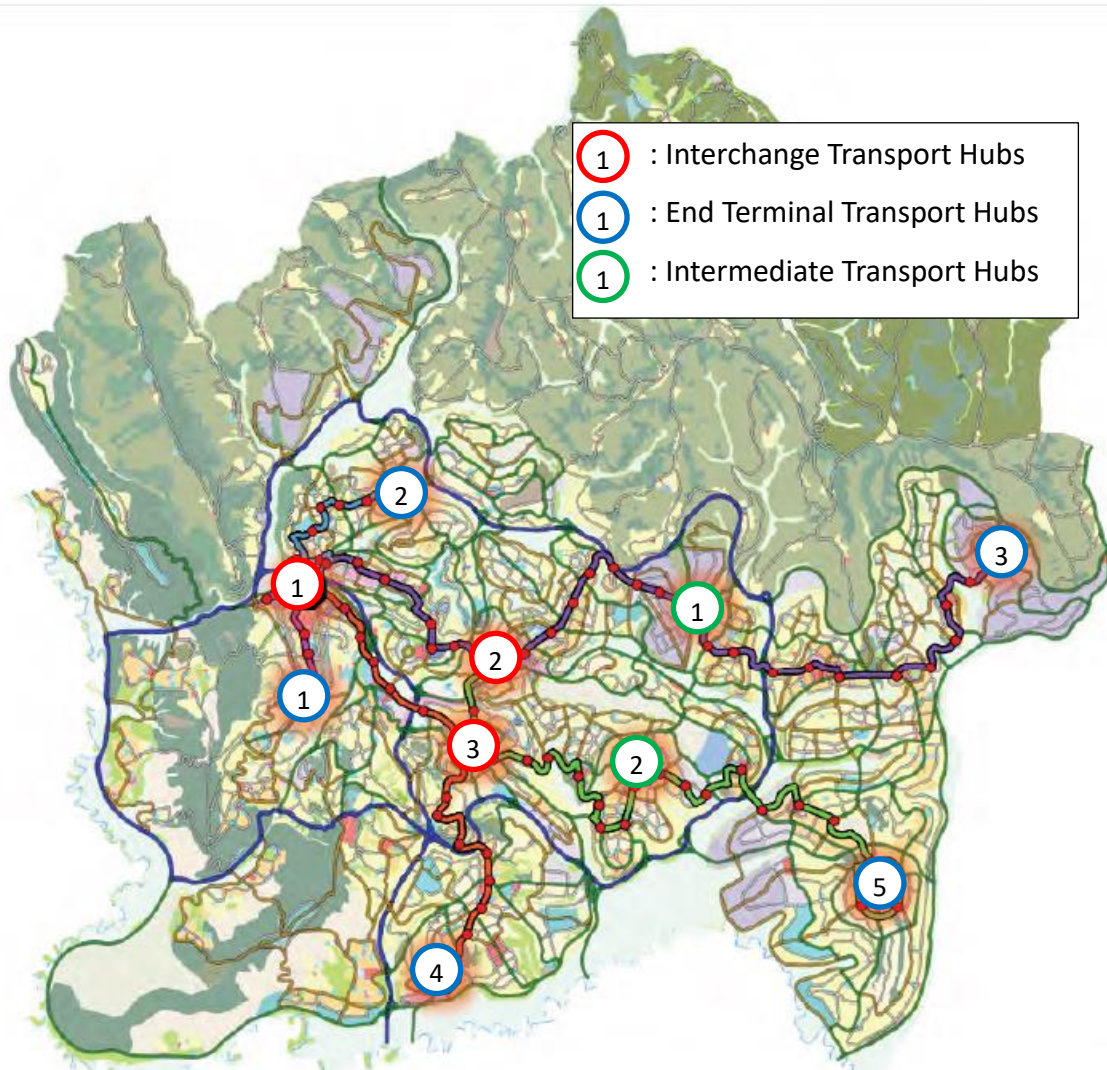


Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.15: Image of Integration of NMT and Public Transport (Left), Example Component of Bus Stops (Right)**

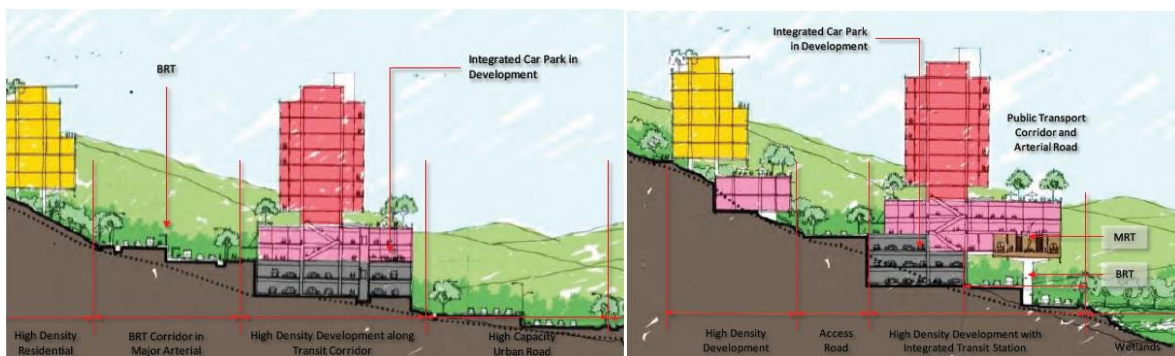
d) Transport Hubs and Infrastructure Plan

This plan proposes potential locations of transport hubs based on the land use plan. Also, interchange transport hubs, end terminal transport hubs, and intermediate transport hubs are specified in these potential locations. These hubs are located at the interchanges of different BRT lines and at the end point of each BRT station. Three interchange transport hubs function as connection points between other transportation modes and commercial areas. Five end terminal transport hubs function as interconnection points between several public transport terminals or as park-and-ride terminals. Two intermediate transport hubs, which are located in the Ndera free trade zone and in the south area of Ndera free trade zone, function as connection points of industrial and commercial areas. The master plan also presents the conceptual image of the transport hub facility.



Source: Modified by JICA Survey Team based on the Kigali City Transportation Master Plan, 2013

**Figure 3.2.16: Proposed Location of Transportation Hubs and Each Function**



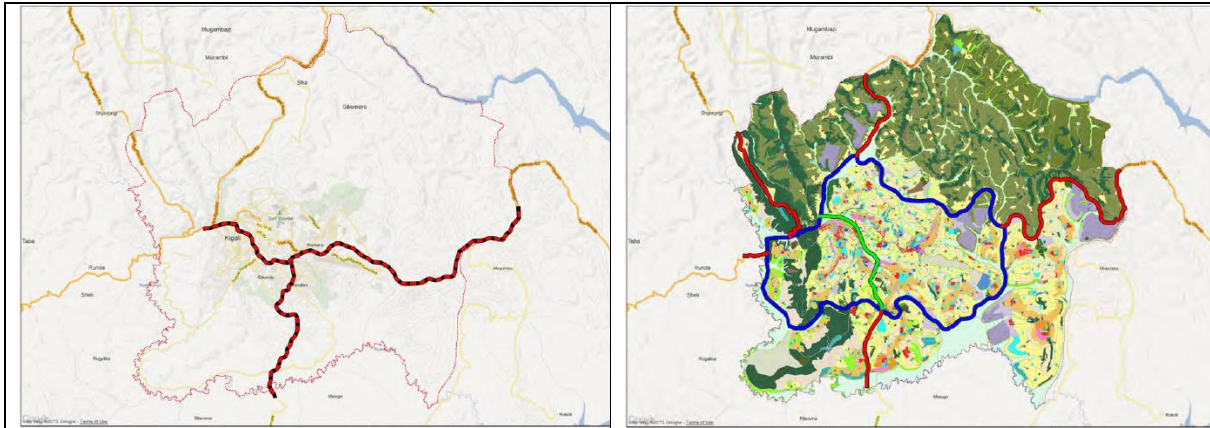
Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.17: Proposed Development along Transit Stations (Right: Including MRT)**

### 3) Freight Management Plan

There are five access routes in Kigali City. Each route passes through the center of the city, and it has been one of the causes of high concentration of freight and passenger

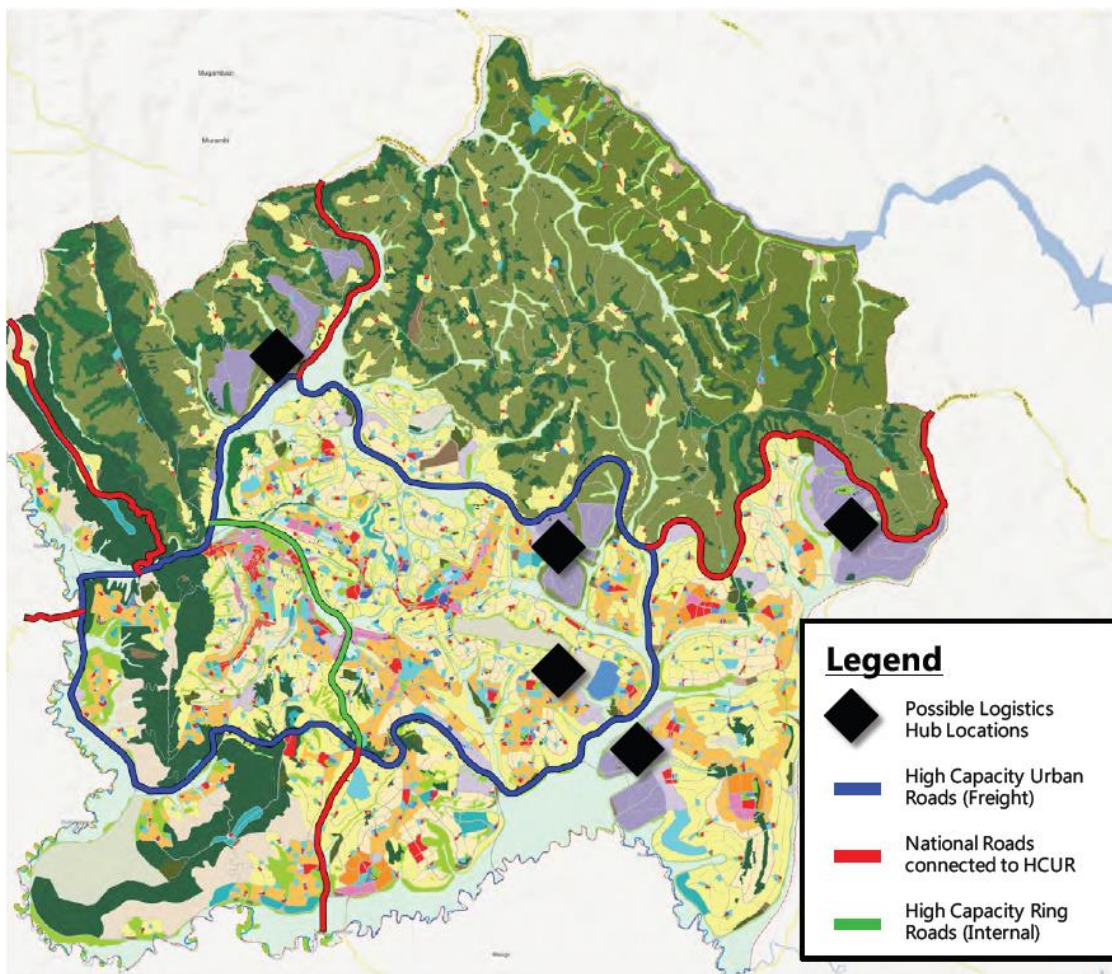
traffic in the main road. The development of the ring road and the high capacity urban road (HCUR) is proposed as a solution. The master plan shows that mitigating traffic concentration of freight traffic by detour routes and the decrease of road maintenance cost by avoiding traffic concentration are expected from the development of the ring road and the HCUR.



Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.18: Existing Freight Route (Left) and Proposed Freight Route in 2040 (Right)**

In addition to this, five logistic hubs are proposed based on the HCUR network.



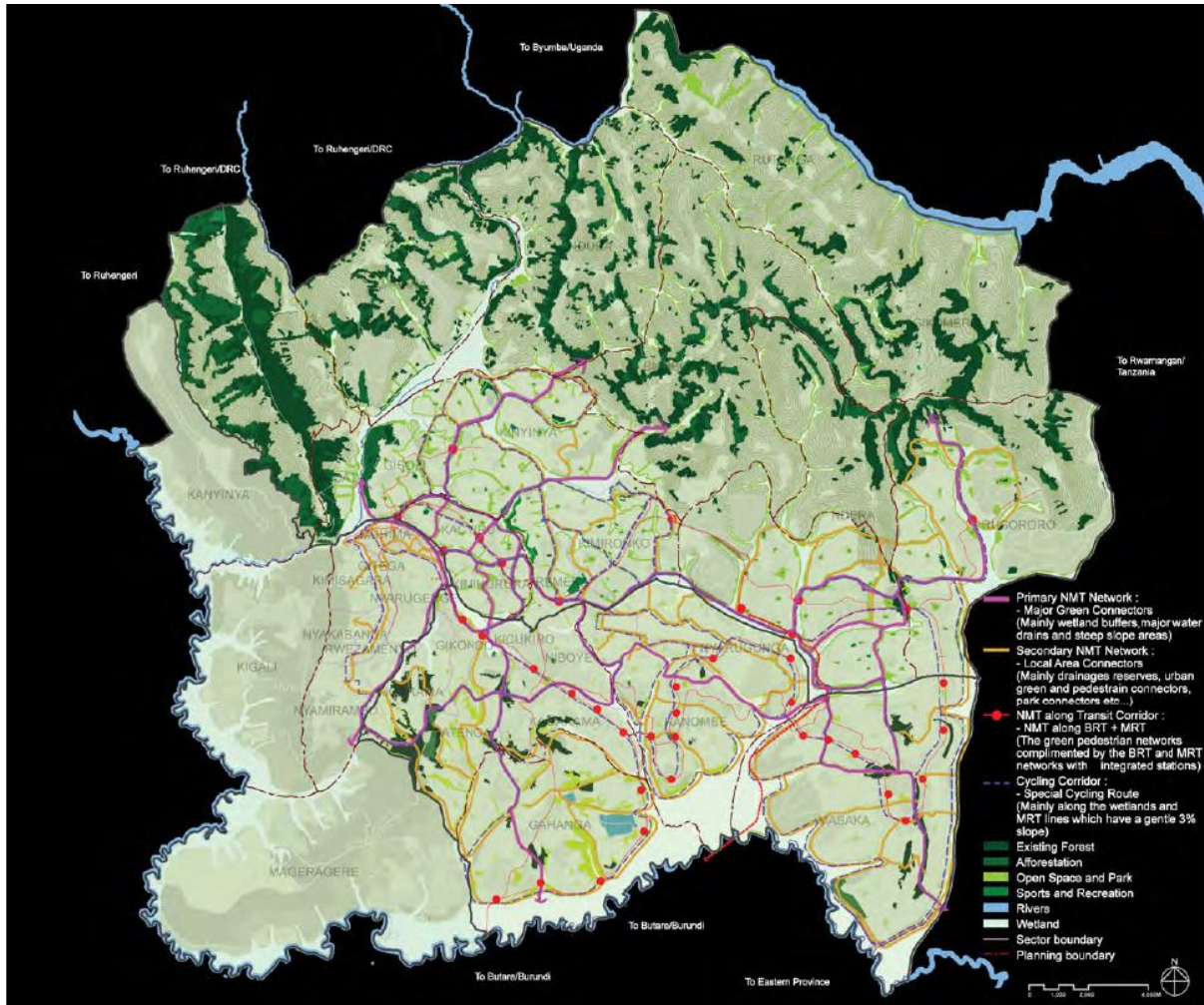
Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.19: Possible Location for Logistics Hubs**



#### 4) Green Transport Network Plan

The plan presents environment-friendly road development and improvement measures for NMT users, such as pedestrians and bicycle users. The master plan also presents the desirable road structure for pedestrianization of the Nyarugenge Market.



Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.20: Proposed Green Transportation Network Plan**

## (5) Proposed Projects

This master plan proposes the following projects as catalyst projects. Transport-related projects mainly include the development of the BRT line and transport hub facilities.

	Short Term (2017)	Medium Term (2025)	Long Term (2040)
<b>EMPLOYMENT</b>	<ul style="list-style-type: none"> <li>Development of Kigali CBD-Phase 1</li> <li>Development of Gahanga Sports Hub</li> <li>Development of Airport Boulevard</li> <li>Kigali SEZ - Phase 2</li> <li>Light Industrial Estate at Gahanga</li> </ul>	<ul style="list-style-type: none"> <li>New CBD Core Development</li> <li>Nyamirambo Fringe Centre</li> <li>Gahanga Regional Centre - Phase 1 (Expo and Business Park)</li> <li>Kicukiro Fringe Centre</li> <li>Kinyinya Fringe Centre</li> <li>Kigali SEZ - Phase 3</li> <li>Gikondo Regeneration (Mixed-Use)</li> <li>Kimironko Redevelopment</li> </ul>	<ul style="list-style-type: none"> <li>Gahanga Regional Centre Subsequent Phase</li> <li>Kimironko Stadium Redevelopment</li> <li>Ndera Regional Centre</li> <li>Masaka Regional Centre</li> <li>Rusororo Industrial Estate</li> <li>Masaka Industrial Estate</li> </ul>
<b>HOUSING</b>	<ul style="list-style-type: none"> <li>Development of affordable housing at Akuminigo and Rugarama</li> <li>Upgradation of unplanned neighborhood at Kimironko</li> <li>Development of Affordable Housing at Kinyinya (OZ Subarea)</li> <li>Upgradation of unplanned neighborhood at Kicukiro</li> <li>Redevelopment of unplanned area in Kimisagara and Gitega</li> <li>RSSB affordable Housing Development</li> </ul>	<ul style="list-style-type: none"> <li>Incremental Housing in unplanned neighborhood at Kimironko</li> <li>Development of Affordable Housing at Kinyinya - Phase 1</li> <li>Incremental Housing in unplanned neighborhood at Kicukiro</li> <li>Development of Affordable Housing at Gahanga- Phase 1</li> <li>Development of Affordable Housing at Ndera</li> </ul>	<ul style="list-style-type: none"> <li>Redevelopment of unplanned neighborhood at Kimironko</li> <li>Redevelopment of unplanned neighborhood at Kicukiro</li> <li>Development of Affordable Housing at Masaka</li> <li>Development of Affordable Housing at Gahanga- Phase 2</li> </ul>
<b>INFRASTRUCTURE</b>	<ul style="list-style-type: none"> <li>Nyabugogo Transport Hub</li> <li>Reservation for BRT Corridor</li> <li>Development of STP in Gitikinyoni and Gikondo</li> <li>Development of Landfill in Nyarugenge</li> </ul>	<ul style="list-style-type: none"> <li>Nyamirambo - Nyabugogo - Ndera BRT (Line 1)</li> <li>Nyabugogo- Gahanga BRT Line (Line2)</li> </ul>	<ul style="list-style-type: none"> <li>Extension of BRT Line 1 to Rusororo Industrial Estate</li> <li>Nyabugogo - Kinyinya BRT Line (Line 3)</li> <li>Kicukiro - Masaka BRT Line (Line 4)</li> <li>New MRT Lines</li> </ul>
<b>RECREATION AND TOURISM</b>	<ul style="list-style-type: none"> <li>Nyarugenge Heritage Village</li> <li>Lake Muhazi Development - Phase 1</li> <li>Pottery Village</li> <li>Kigali Cultural Village</li> </ul>	<ul style="list-style-type: none"> <li>Kigali CBD Wetland Park and Kimicanga Entertainment District - Phase 1</li> <li>Agro Tourism Valley</li> <li>Wetland Biodiversity Park - Phase 1</li> </ul>	<ul style="list-style-type: none"> <li>Lake Muhazi Adventure Theme Park</li> <li>Kigali CBD Wetland Park - Phase 2</li> <li>Wetland Biodiversity ParkPhase 2</li> <li>Flower Valley</li> </ul>

Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.21: Catalyst Development Projects**

The following measures are proposed to support the above catalyst projects:

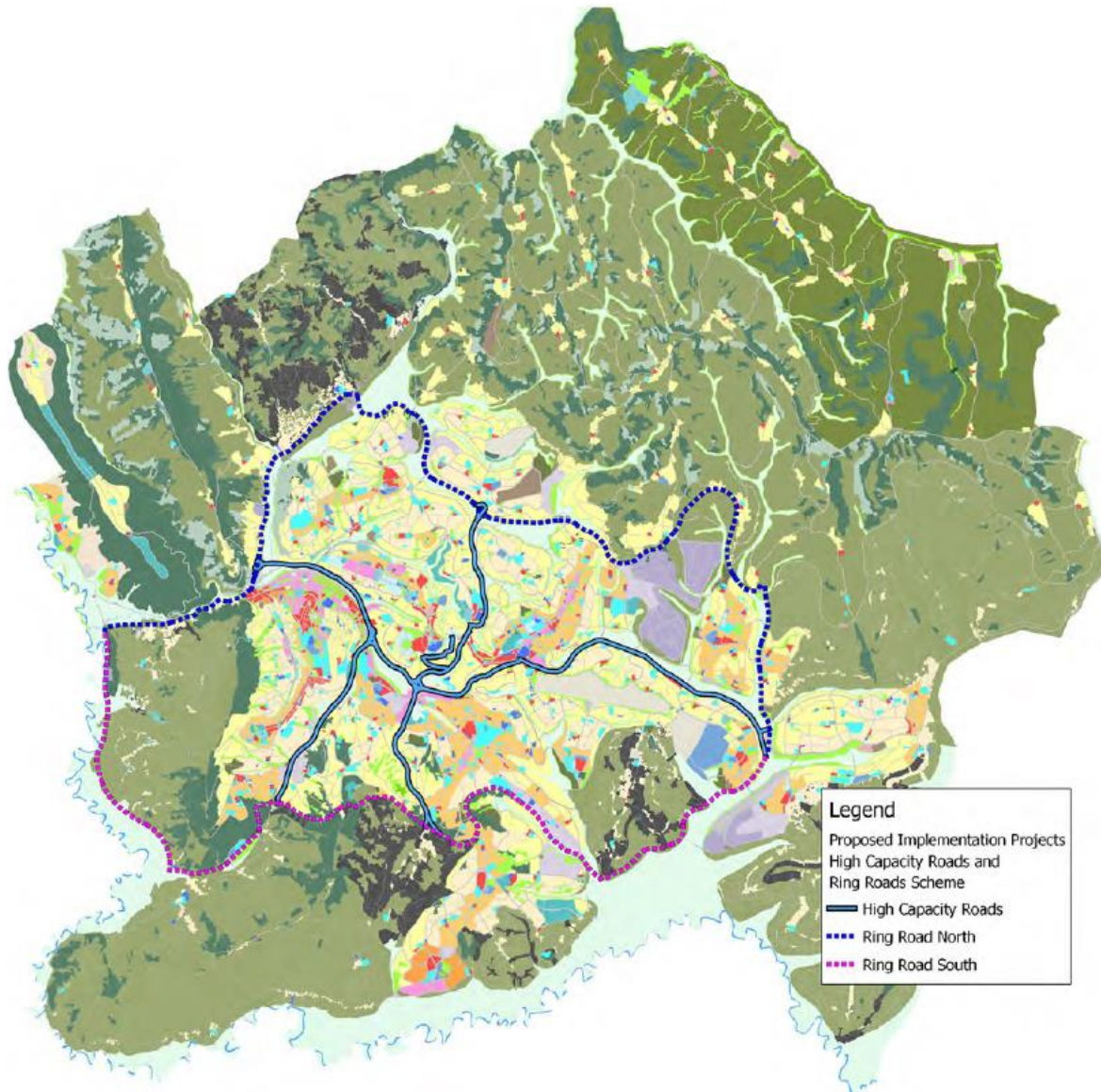
### 1) Construction of Key Road and Mass Transit Infrastructure

As development projects in the short and middle term, the implementation of the following new roads or road improvement projects are proposed:

- Kimironko Regeneration: 3 km + 2.5 km street improvement
- Gikondo Regeneration: 2 km of street improvement
- Gahanga Integrated Township: 21 km of new roads
- Ndera Integrated Township: 22 km of new roads

In addition to the above projects, the following key roads and mass transit infrastructure projects are proposed:

- Ring Road (North): 36.7 km, 6-lane dual carriageway
- Ring Road (South): 33.2 km, 6-lane dual carriageway
- High Capacity Urban Roads: 45.8 km, 6-lane dual carriageway

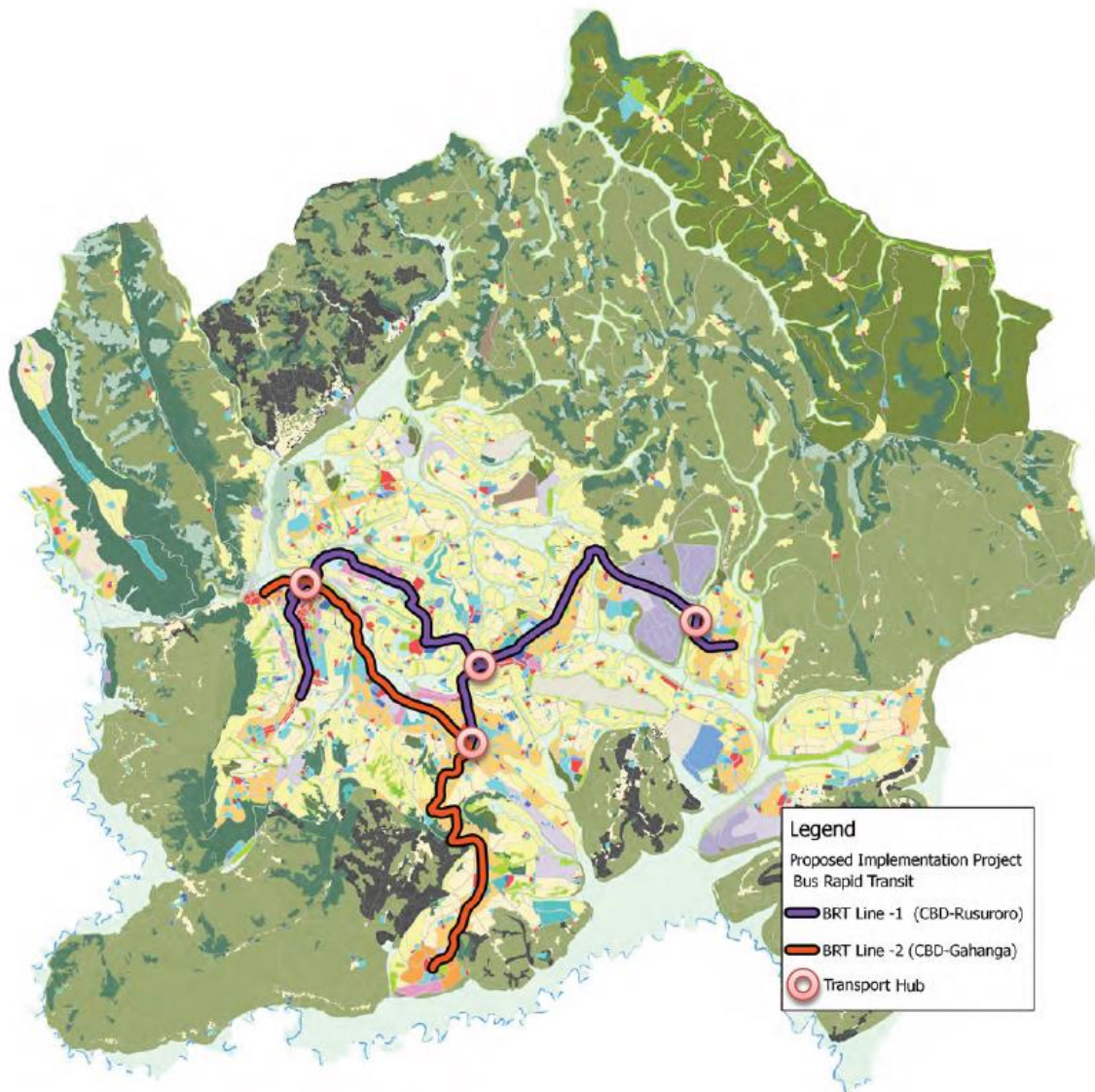


Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.22: Proposed Implementation Project - High Capacity Urban Roads and Ring Roads Scheme**

## 2) Implementation Study of Bus Rapid Transit Lines and Transport Hub Infrastructure

The implementation study of BRT Lines 1 and 2, which is a planned introduction from short to middle term, are proposed. Removal of on-road parking along BRT routes, development of public parking facility, and development of four transport hubs are also proposed. The master plan mentioned that these proposed BRT lines have the potential to be implemented as a public-private partnership (PPP) project. The development of transport hubs is proposed to be done by PPP scheme or as a public project.

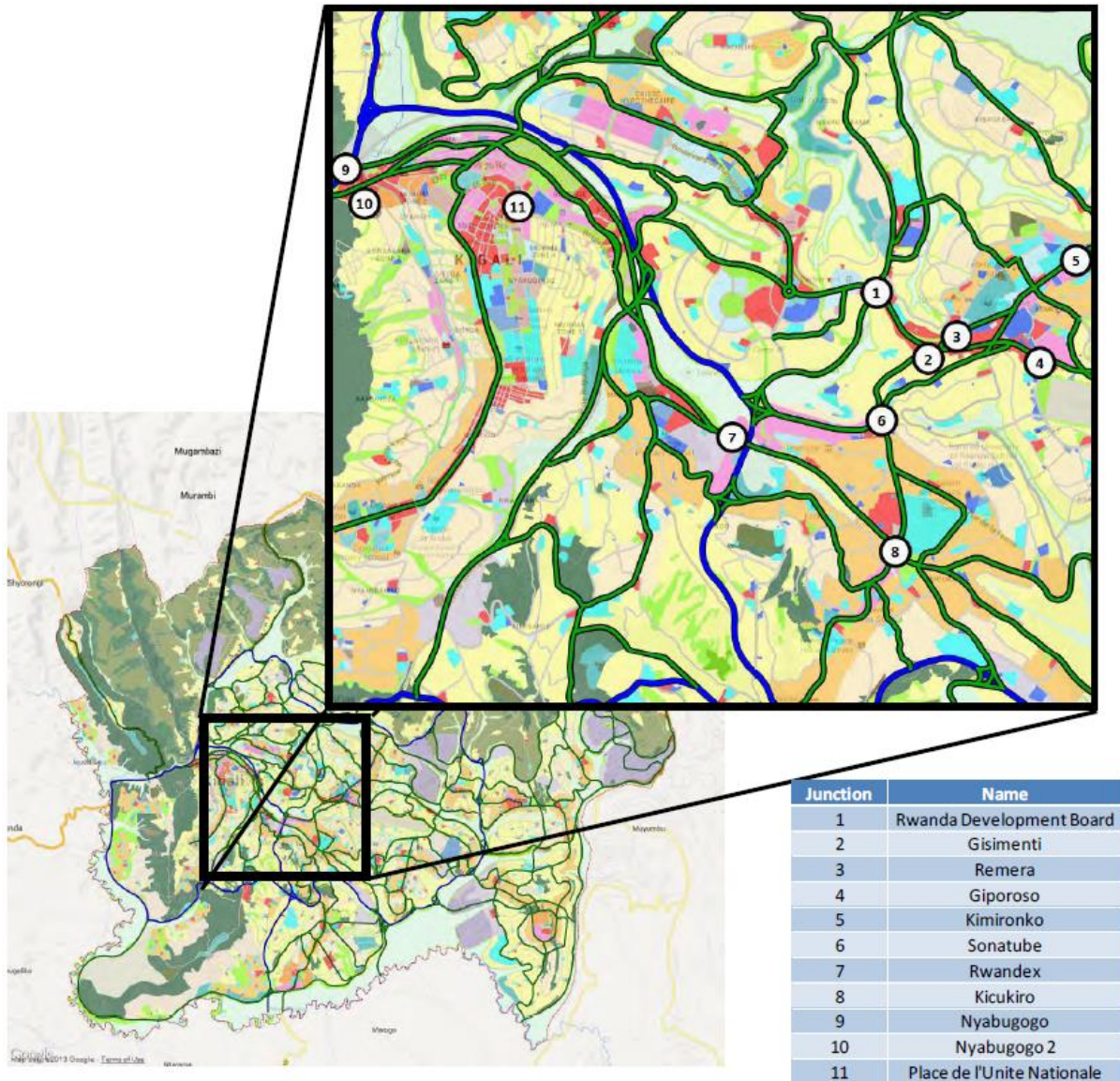


Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.23: Proposed Implementation Project – Bus Rapid Transit Scheme**

### 3) Junction Improvement and Development Program

Eleven intersection improvement projects in Kigali City are proposed in this master plan. These projects are proposed for ensuring road capacity, which was set in developing the future road network plan. In addition, utilization of ITS, the introduction of a traffic control center and the installation of a signal control system are proposed, but there are no concrete proposals.

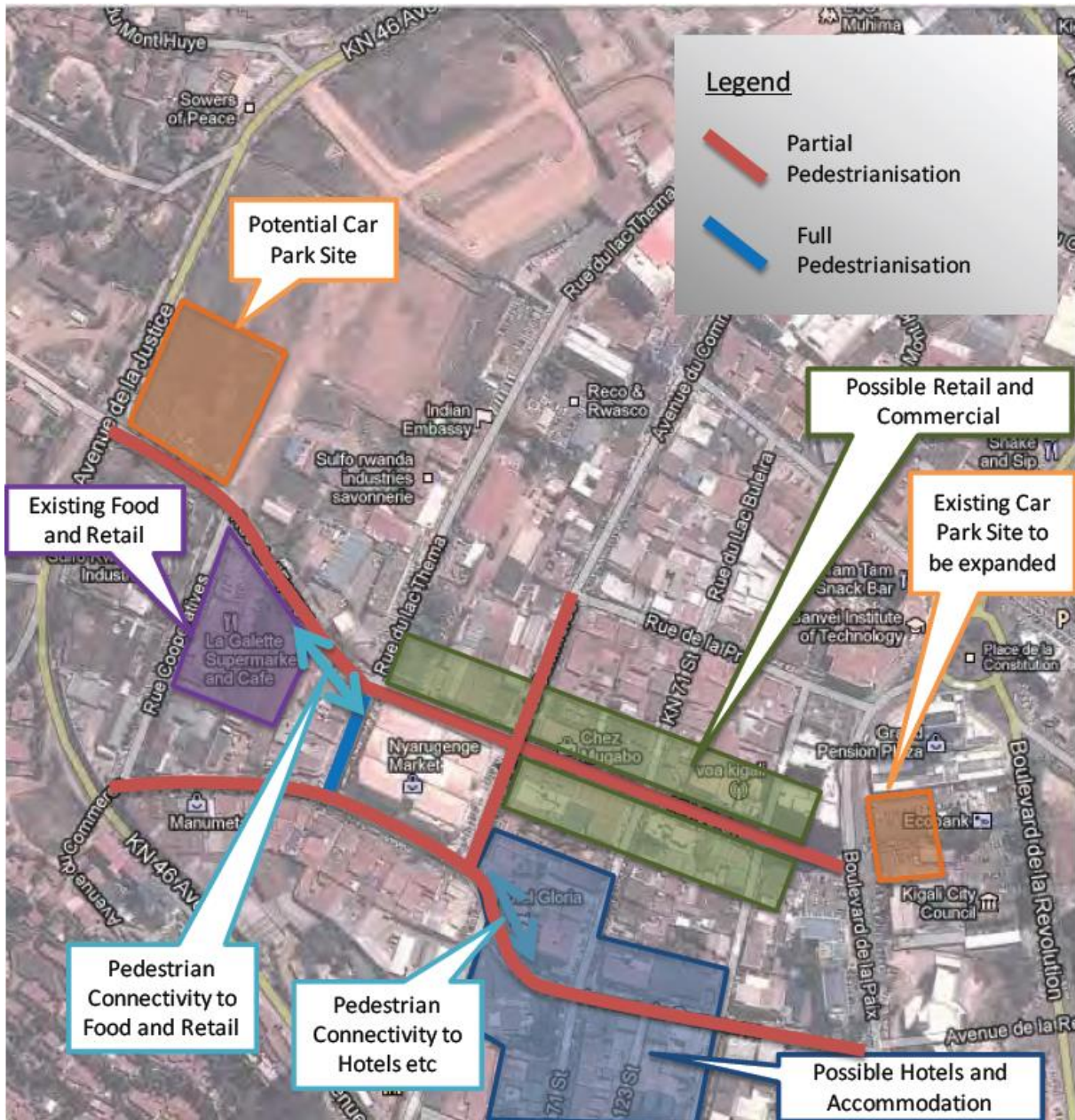


Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.24: Location for Junctions Earmarked for Improvement**

### 4) Pedestrianization

Pedestrianization of Nyarugenge Market, which is presented in the Green Transport Network Plan, is proposed. The potential pedestrianization routes and locations of potential car park sites are identified.



Source: Kigali City Transportation Master Plan, 2013

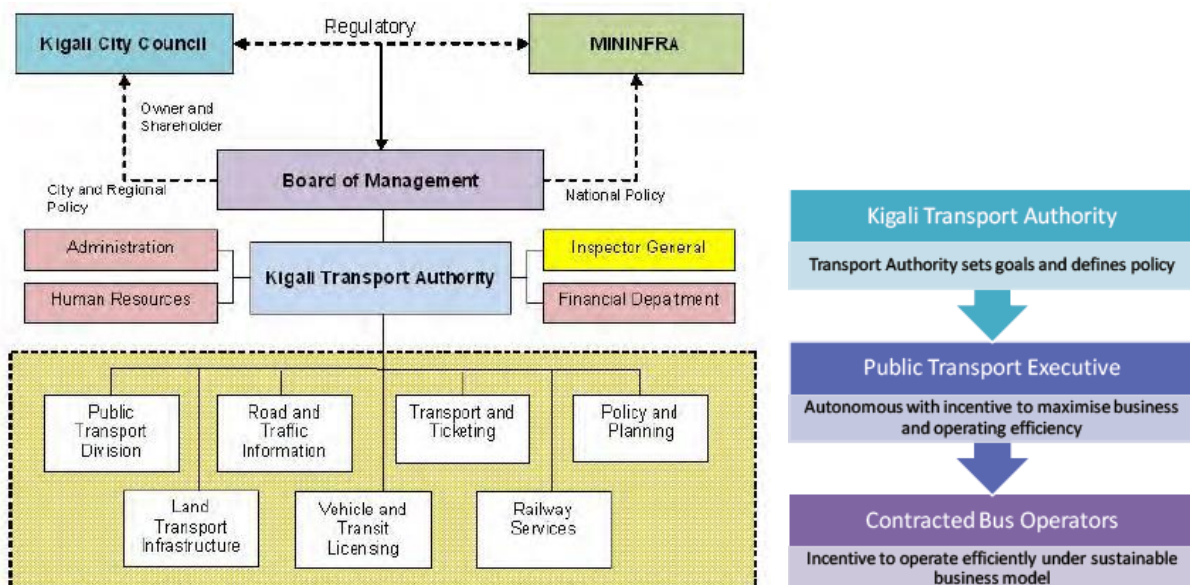
**Figure 3.2.25: Example Schematic for Pedestrianization of Nyarugenge Market**

## 5) Reorganization of the Public Transport Institutions and Management

The establishment of Kigali Transport Authority (KTA) as a unique transport institution is proposed in this master plan. The main role of KTA is proposed as follows:

- Formulate regional transportation policy;
- Formulate integrated transportation planning, including road network development, railway (MRT) development, traffic management, and public transportation system management;
- Implement integrated transportation planning and programs;
- Issue licenses and control public transportation with bus route license, public transport business license, bus terminal development permission, and so on;
- Manage vehicle registration operation and taxation;
- Manage on-street parking operation;
- Provide public transport services, such as trunk bus, minibuses, railway, MRT, and BRT; and
- Carry out traffic management measures, such as road pricing, park-and-ride, and park-and-bus-ride

In establishing a new organization, it takes time to ensure human resources and legislation. The master plan proposes that the Kigali City Transport Planning Committee, which consists of the members of transport related agencies, are established as the first phase, and KTA is established officially after the transition period. The master plan also proposes the establishment of a Public Transport Executive, which is autonomous with incentive to maximize business, under the KTA structure. The basic roles are to manage and enforce bus operator contracts.



Source: Kigali City Transportation Master Plan, 2013

**Figure 3.2.26: Organization Structure of KTA (Left) and Conceptual Framework of BRT Management and Operation (Right)**

### 3.2.4 Kigali City Development Strategy

The Kigali City Development Strategy (CDS) was finalized as of May 2018 by CoK.

#### (1) Vision, Mission and Goals

##### 1) Vision

The vision of CoK is to become “The Centre of Urban Excellence in Africa”.

##### 2) Mission

The mission of CoK is 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”.

##### 3) Goals

Six goals are targeted as shown below.

- City of character, vibrant economy, and diversity;
- City of green transport;
- City of affordable homes;
- City of enchanting nature and biodiversity;
- City of sustainable resource management; and
- City of endearing character and unique local identity

#### (2) Pillars and the Costing

In the CDS, five pillars are identified in each sector. In addition, the budget to achieve those pillars are estimated at a total of RWF 444.6 billion. The details are shown below.

**Table 3.2.6: Pillars and Costing of Kigali City Development Strategy**

Sector	Pillar	Budget Estimate
Economic Transformation	1) Create 1.5 million (over 214,000 annually) decent and productive jobs for economic development	RWF 423,945,774,099
	2) Accelerate sustainable urbanization from 17.3% (2013/14) to 35% by 2024	
	3) Promote industrialization and attain a structural shift in the export base to high-value goods and services with the aim of growing exports by 17% annually	
	4) Sustainable management of natural resources and environment to transition Rwanda towards a carbon neutral economy	
	5) Sustainable management of natural resources and environment to transition Rwanda towards a carbon neutral economy	
Social Transformation	1) Enhancing graduation from extreme poverty and promoting resilience	RWF 2,572,553,976
	2) Eradicating malnutrition	
	3) Enhancing demographic dividend through ensuring access to quality health for all	
	4) Enhancing demographic dividend through ensuring access to quality education	



	5) Moving towards a modern Rwandan household	
Transformational Governance	1) Reinforce Rwandan culture and values as a foundation for peace and unity	RWF 2,544,115,968
	2) Ensure safety and security of citizens and property	
	3) Strengthen diplomatic and international cooperation to accelerate Rwanda and Africa's development	
	4) Strengthen justice, law, and order	
	5) Strengthen capacity, service delivery, and accountability of public institutions	

Source: Kigali City Development Strategy, City of Kigali

In order to achieve sectoral target, some prioritized programs are planned. Infrastructure-related programs are listed below.

## 1) Economic Transformation

[Prioritized Program 1]

- Improved road networks and public transportation (construction of junctions, develop dedicated bus lanes, and develop the rapid bus terminal corridors)

[Strategy]

- Secure land for the development of the BRT corridor
- Construct six interchanges road junctions
- Create and market dedicated bus lanes especially within the city
- Establish and implement a framework to engage with the private sector
- Reserve a few seats in each bus for pregnant women, women with babies, and elderly people

[Prioritized Program 2]

- Promotion of urbanization and group settlements through establishing land banks

[Strategy]

- Secure land for the development of the affordable housing and both commercial development including public parks
- Engage with different stakeholders to ensure industrial and commercial sites are developed and integrated with and connected to the city
- Improve greening initiatives
- Reduce informal settlements
- Develop and implement an innovative whole land bank activation framework
- Implement the land bank projects and programs

[Prioritized Program 3]

- Improving key city infrastructure of asphalt and stone networks, sewage systems, solid waste treatment plant, and smart solutions in transportation

[Strategy]

- Construct 44.706 km of asphalt roads and rehabilitate the existing ones, integrating smart solutions
- Create dedicated bus lanes on expanded roads
- Construct pedestrian bridges
- Construct sidewalks on existing and new roads
- Improve traffic safety (signage, drainage covering, road markings, and reflectors)
- Implement the centralized sewage system feasibility study
- Build shelters at every bus station and stop to accommodate commuters, especially pregnant women, women with infants, people with disability, elderly, etc., while waiting for a bus

[Prioritized program 4]

- Development of the Kigali Water Front

[Strategy]

- Support and deliver events, festivals, and markets partnering with the private sector
- Develop and implement a program of city improvements supporting the major retail, commercial, and hospitality precincts and small businesses
- Develop and implement local retail and industrial precinct plans
- Promote and increase urban tourism promotion
- Promote smart city solutions through the development of Intelligent Transport System (ITS) within the project
- Create an enriched visitor experience culture
- Engage and continue to work with the tourism sector
- Further define the role of CoK in destination marketing and visitor information services

[Prioritized program 5]

- Urban management

[Strategy]

- Develop and implement a transport strategy
- Enhance transport connections with CoK
- Identify and implement infrastructure improvements to enhance road safety
- Plan and implement the parking strategy for the city dwellers, visitors, and working population
- Identify and implement measures to support the use of public transport
- Implement the principal bicycle network

- Review network operation of smart city streets and adopt a network operating plan
- Provide a wide range of quality places where the community can enjoy urban activities and events
- Develop, manage, and maintain the city's urban spaces and infrastructure
- Develop an inner-city wayfinding system
- Strengthen open space connectivity through acquisitions and other opportunities
- Implement the City of Kigali Master Plan, including preventive measures

[Prioritized program 6]

- Environment and natural resources

[Strategy]

- Increased male and female resilience to climate change
- Strong environmental stewardship
- A highly valued natural and cultural open space network with the greening concept
- Leadership in environmental performance with the efficient use of natural resources
- Develop a climate change disclosure plan
- Develop and implement a hazard strategy
- Develop and promote the greening concept
- Develop, implement, and review the high-risk zone management plans
- Prepare and implement master drainage plans
- Regulate and manage potentially polluting activities, protect, and improve the environment
- Develop and implement a new solid waste management and treatment plants strategy

## **2) Social Transformation**

[Prioritized program 1]

- A delinquency-free city

[Strategy]

- Deliver and support recreation, education, social and healthy living programs, and activities in the city facilities
- Support effective utilization of city facilities, infrastructure, and open spaces
- Develop a recreation and facilities strategy
- Build capacity and resilience to prepare the community for emergency situations

- Consider vulnerable members of the community, like poor men and women and people with disability, when responding to an emergency and in community recovery planning
- Protect and improve public and environmental health outcomes
- Implement the affordable housing framework especially for the disadvantaged and people with disabilities
- Engage and support the community to address safety and social issues

### **3.2.5 Smart City-Related Plans**

#### **(1) Overview**

The Rwanda government is locomoting the Smart Kigali Initiative. The Smart Rwanda Master Plan (SRMP) was published in 2015 to support the implementation. In the SRMP, Kigali City is planned to be a smart city by 2020, and the road map was shown. In 2017, Smart Africa, whose secretariat is allocated in Kigali and chaired by the Rwandan President Paul Kagame, was published to accelerate smart city development in African countries. In the same year, SRMP was updated and this concept shall be reflected in the City Master Plan and other city development-related plans.

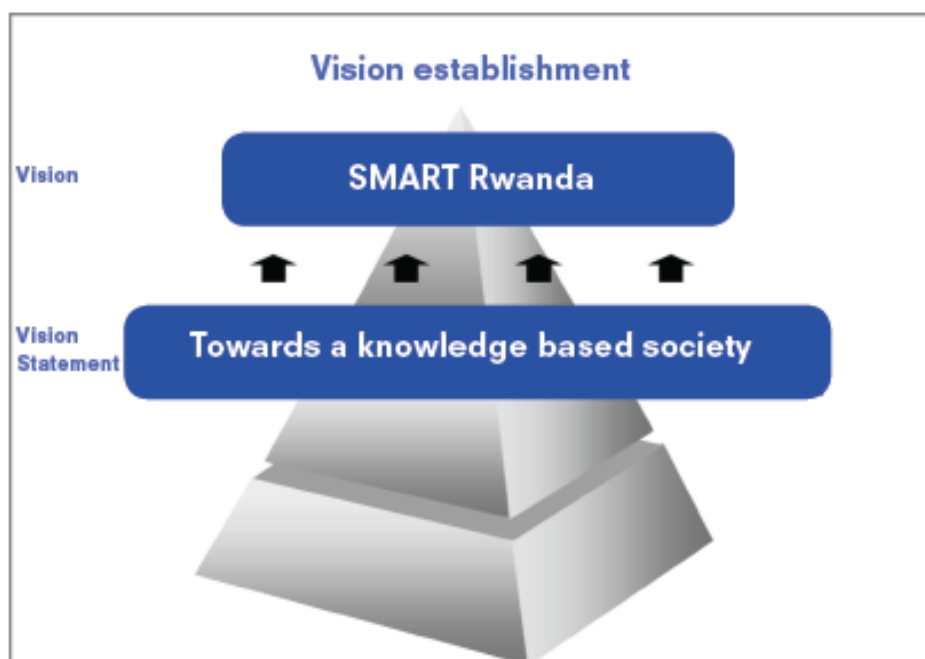
#### **(2) Vision and Roadmap of Each Plans**

##### **1) Smart Rwanda Master Plan (SRMP)**

###### **(I) Vision**

The statement of SRMP is to develop “Towards a Knowledge-Based Society” in order to implement effective and efficient utilization of information and communication technologies. The knowledge-based society secures and accumulates knowledge competency as the driver of productivity and economic growth. This vision targets:

- Service > 60% contribution of gross domestic product (GDP)
- Poverty reduction < 30%
- Literacy rate > 80%
- Achieve sustainable GDP growth of 10% pa
- Off-farm jobs create more than 2 million
- Life expectancy > 66 years



Source: Smart Rwanda Master Plan

**Figure 3.2.27: Vision of Smart Rwanda Master Plan**

## (II) Road Map

In order to develop and expand ICT industry in Rwanda, cultivating of young engineers and ensuring of labors for related industry are aimed. To implement this, the following four goals are raised up:

### **Goal 1: Cultivate New Local ICT Enterprises**

- 100 innovation studios in primary and high schools
- 200 supported new projects from universities and colleges
- 100 start-up companies with market capitalization of USD 50 m
- USD 250 million in new venture funds to support tech entrepreneurs created

### **Goal 2: Grow Existing Indigenous ICT Companies**

- Reducing costs
- Improving service delivery
- Creating new revenue streams

### **Goal 3: Transform Non-ICT Business with Technology**

- 500,000 farmers trained and tracked for ICT impact on business
- 500,000 businesses using ICT in their business
- 1,000,000 new ICT and ICT enabled jobs

### **Goal 4: Export and Foreign Direct Investment Expansion**

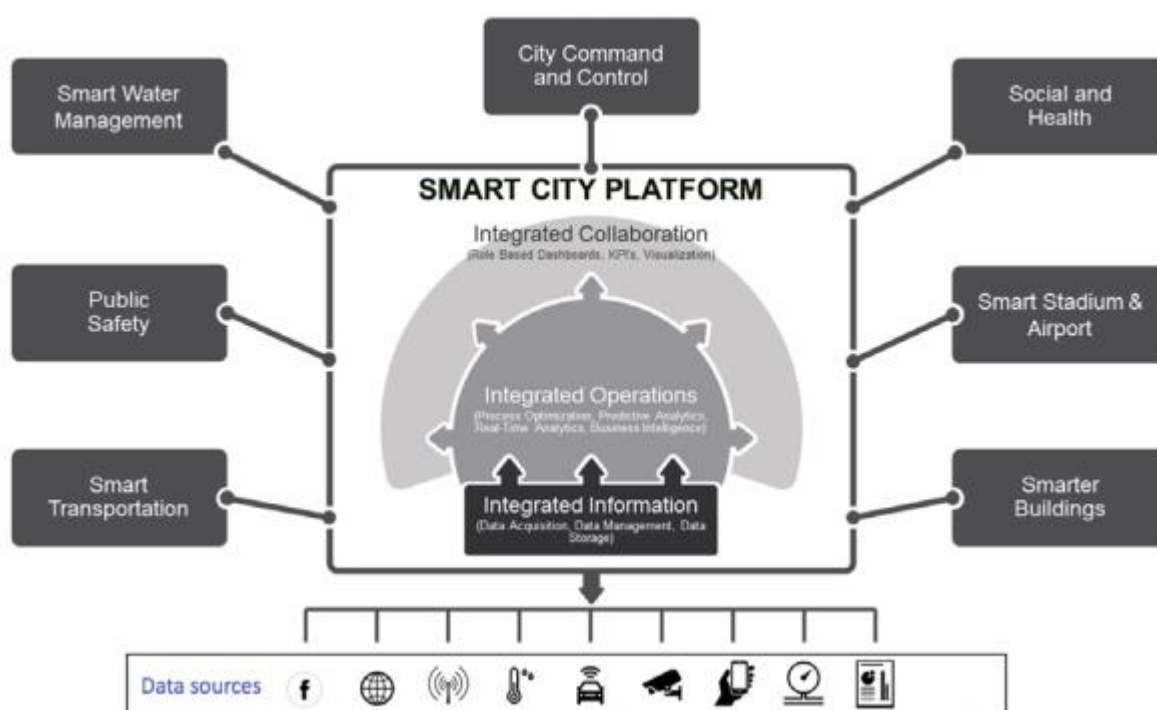
- USD 100 m new export revenue

- 50 exporting companies
- USD 1 billion in operational foreign direct investments
- 100,000 export jobs

## 2) Smart Sustainable Cities: A Blueprint for Africa/Smart Africa

### (I) Vision

In order to ensure sustainable economic growth, cultivating of smart industry is proposed in this smart city development concept. As a development vision, i) smart citizen (connectivity through smart device, big data analysis, etc.), ii) 3I's of smart city (instrumented, interconnected, and intelligent), and iii) 3R's of smart city (recycle, reuse, and reduce) are raised. Based on this smart city development vision, the following smart city platform is proposed:



Source: The Smart Cities Blueprint 2017

**Figure 3.2.28: A Smart City Platform**

### (II) Road Map

Smart Cities Blueprint recommends the following ten steps for planning smart cities to develop pilot projects and capacity building to implement smart city development:

- Step 1: Study the city
- Step 2: Create a smart city steering team
- Step 3: Identify the main challenges
- Step 4: Collect data
- Step 5: Create a strategic action plan

- Step 6: Build a dynamic urban management map
- Step 7: Implement pilot projects
- Step 8: Monitor and evaluate the pilot projects
- Step 9: Provide capacity building of stakeholders
- Step 10: Apply dynamic management and coordination processes

### **3) Smart City Rwanda Master Plan Version 2.0**

#### **(I) Vision**

The Rwandan smart city is planned to achieve i) inclusive data-led management and planning, ii) efficient community-based infrastructure and services, iii) localized and shared innovation, and iv) economic development for leaders and citizens.

#### **(II) Road Map**

The figure below shows the action plan for the Rwandan smart city. This master plan requests to develop urban planning by utilizing smart data and develop smart policies and regulations as these areas relate to urban development in Kigali City. As an example of data-led urban planning, i) integrated GIS management platform, ii) cross-ministry project management, and iii) multi-stakeholder safer cities program are targeted.

PILLARS	BUILDING BLOCKS	INITIATIVES	
<b>1</b> Smart governance and planning	<b>A</b> Data-led urban planning and management	<b>1</b> Integrated, GIS-based urban management platforms	
		<b>2</b> Cross-ministry financial and project management platform	
		<b>3</b> Multi-stakeholder safer cities programme	
	<b>B</b> Smart policies and regulations	<b>4</b> Dynamic data-supported urban master planning	
		<b>5</b> Enabling environments for urban technology testing	
	<b>C</b> Public engagement and open data	<b>6</b> Data strategies including open data, privacy and cybersecurity	
		<b>7</b> Accessible internet zones in strategic and residential areas	
		<b>8</b> Digital citizen engagement tools accessible to all	
		<b>9</b> Urban Data accessible to all	
<b>2</b> Smart and efficient services and utilities	<b>D</b> Shared local infrastructure	<b>10</b> Digitally monitor and manage utility networks	
		<b>11</b> Explore smart micro grids based on the prosumer model	
	<b>E</b> Efficient, demand based services	<b>12</b> Regulatory frameworks for virtual power plants and other demand-based management solutions	
		<b>13</b> Smart data-led 'door-to door' mobility solutions	
		<b>14</b> Digital service points for rural settlements	
		<b>15</b> Smart urban agriculture projects	
	<b>F</b> Sustainable and resilient resource management	<b>16</b> Sensor-based environmental data	
		<b>17</b> Green and smart building labs	
		<b>18</b> Smart, sustainable and shared neighbourhood pilot projects	
	<b>G</b> Education, innovation and digital literacy	<b>19</b> Innovation in education, from primary school to higher education	
		<b>20</b> ICT skills training in education, for local authorities and the general public	
		<b>21</b> National fund to encourage challenge-based innovation	
		<b>22</b> Innovation teams in ministries and local authorities	
	<b>3</b> Localized innovation for social and economic development	<b>H</b> Localized and challenge-based financial opportunities	<b>23</b> Promote local digital business platforms
			<b>24</b> Create collaborative community co-working and digital excellence centers
<b>25</b> Establish collaborative urban innovation acceleration labs with academy, community and industry			
<b>I</b> Digital transformation of financial services	<b>26</b> Introduce personalized e-finance platforms for all life-time services		
	<b>27</b> Electronic due-diligence and business loan systems for SMEs		

Source: Rwanda Smart City Master Plan

**Figure 3.2.29: Action Plan for Rwandan Smart City**



### 3.3 Related Ongoing/Planned Projects

#### 3.3.1 Project List

As of the total, 22 transport-related development projects and five major urban development projects are currently ongoing/planned in and around Kigali. The outline is summarized in the table below.

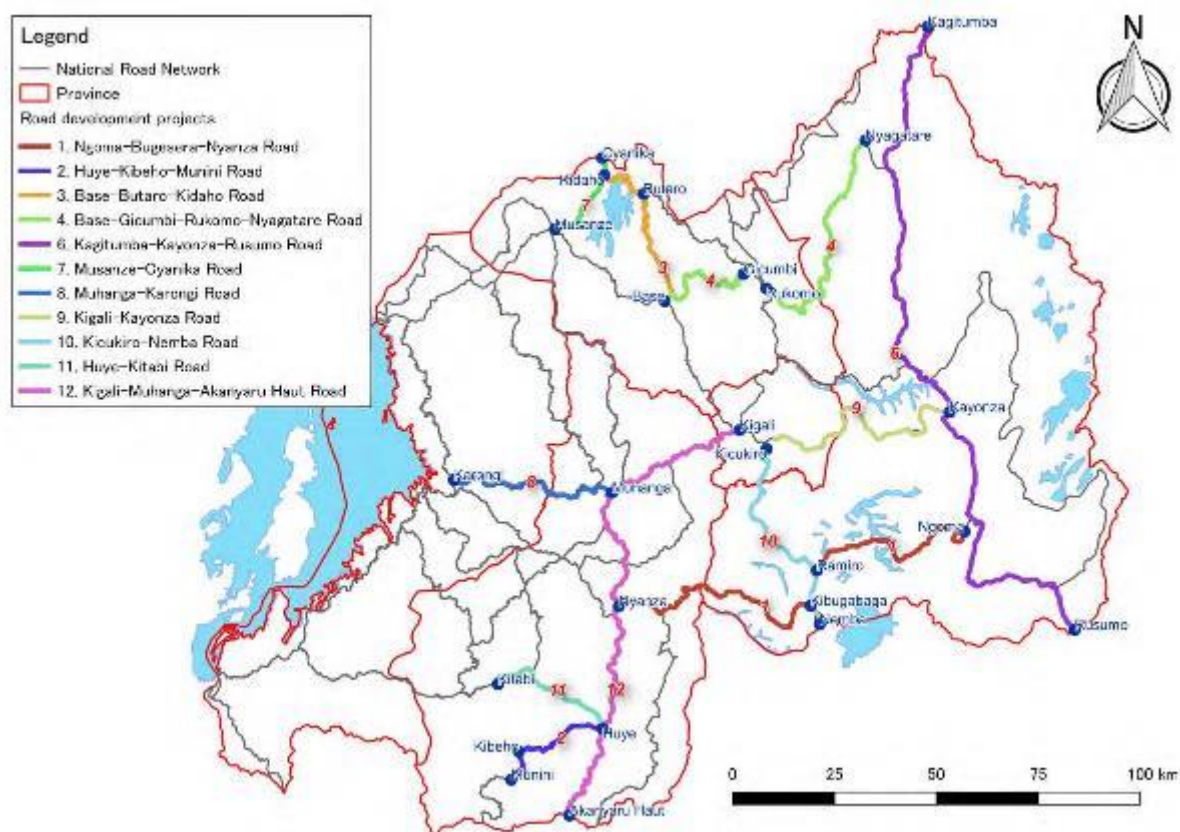
**Table 3.3.1: Project List for Ongoing/Planned Projects in and around Kigali**

No.	Project Name	Length/Area	Executing Agency	Fund	Status
<b>National Roads Project List to be implemented during 2018/19 – 2023/24 in Rwanda</b>					
1	Upgrading (440 km of unpaved national roads to paved)				
1)	Ngoma-Bugesera-Nyanza Road	123 km	MININFRA, RTDA	WB & JICA	DD & CS
2)	Huye-Kibeho-Munini Road	66 km	MININFRA, RTDA	RMF	On-going
3)	Base-Butaro-Kidaho Road	68 km	MININFRA, RTDA	India Government	On-going
4)	Base-Gicumbi (40 km) Rukomo-Nyagatare (73 km) Road	113 km	MININFRA, RTDA	AfDB	On-going
5)	Kigali-Ring Road	80 km	MININFRA, RTDA, CoK	Mota Engil	Under Feasibility Study
2	Rehabilitation (453 km of paved national roads)				
1)	Kagitumba-Kayonza-Rusumo Road	209 km	MININFRA, RTDA	AfDB & JICA	On-going
2)	Musanze-Cyanika Road	32 km	MININFRA, RTDA	Not funded yet	Study is available
3)	Muhanga-Karongi Road	60 km	MININFRA, RTDA	GoR	No detail
4)	Kigali – Kayonza Road	74 km	MININFRA, RTDA	Not funded yet	Study is available
5)	Kicukiro – Nemba Road	61 km	MININFRA, RTDA	Exim Bank & GoR	No detail
6)	Huye-Kitabi Road	53 km	MININFRA, RTDA	BADEA & Kuwait & OPEC	On-going
7)	Kigali-Muhanga-Akanyaru Haut Road	157 km	MININFRA, RTDA	Not funded yet	Study is available
<b>Other Transport-related Projects</b>					
1	Kigali-Ring Road (Upgrading from unpaved national roads to paved)	80 km	MININFRA, CoK, RTDA	Mota Engil	Under Feasibility Study
2	Kigali – Kayonza Road (Rehabilitation of paved national road)	74 km	MININFRA, RTDA	Not funded yet	Study is available
3	Kigali-Muhanga-Akanyaru Haut Road (Rehabilitation of paved national road)	157 km	MININFRA, RTDA	Not funded yet	Study is available
4	Expressway Kigali – BIA				
1)	Sonatube-Akagera Bridge	13.8 km	CoK, RTDA	EXIM Bank	Study is available

No.	Project Name	Length/Area	Executing Agency	Fund	Status
2)	Akagera Bridge-BIA	No detail	No detail	GoR and Mota Engil	Conceptual design is done
5	Nyabugogo - Jabana & Nyacyonga – Mukoto Road	46 km	MININFRA, RTDA	Not funded yet	Study is available
6	Urban Roads in CoK				
1)	Rehabilitation of Asphalt Roads	21.08km	CoK	Not funded yet	Planning
2)	Construction of Asphalt Roads	120km	CoK	Not funded yet	Planning
3)	Upgrading Project (Widening)	60km	CoK	Not funded yet	Planning
4)	Upgrading Project (Widening)	54.56km	CoK	Exim Bank	On-going
7	7 Intersection Improvement Project	-	CoK	Not funded yet	Under feasibility study
8	Standard Gauge Railway (SGR) Project				
1)	Kampala-Kigali	148km	RTDA	Not funded yet	Preliminary design completed
2)	Isaka-Kigali	150km	RTDA	Not funded yet	Draft Design completed, Design is under modify
9	Dedicated Bus Lanes (DBL)	22 km/CoK	CoK	Not yet	No status
10	BRT	2025-2030 13.6 km 2030-2040 17.3 km 2040-50 42.24 km /CoK	CoK	Not yet	FS
11	Road Asset Management System (RAMS)	No detail	No detail	No detail	No detail
12	MRT	Not yet	Not yet	Not yet	No status
13	Nyabugogo-Jabana	10 km	MININFRA, RTDA	Not yet	No detail
14	Kigali-Kayonza	75 km	MININFRA, RTDA	Not yet	No detail
15	Kigali-Muhanga-Akanyaru Lot 1	45 km	MININFRA, RTDA	Not yet	No detail
<b>Urban Development Projects in Kigali</b>					
1	Bugesera International Airport Development Project	Bugesera district	No detail	No detail	No detail
2	Kigali SEZ Phase 2 & 3	178 ha/200 ha	MINICOM/RDB	Prime Economic Zone	CS/P
3	Kicukiro SME SEZ	43.2 ha	MINICOM	-	DD
4	Kigali Logistics Platform	9.7 ha	MINICOM	DP World	CS
5	Affordable Housing Development Projects in Kigali	Total 11,829 units	Rwanda Housing Development Authority (RHD)	CoK & Privates	DD/CS

Note: Status: P (Planning stage), FS (Feasibility Study stage), BD (Basic Design stage), DD (Detailed Design stage), CS (Construction Supervision)

Source: JICA Survey Team



Source: JICA Survey Team

**Figure 3.3.1: On-going/Planning National Roads Project**

### 3.3.2 Details of Each Project

#### (1) Kigali Ring Road Project

Kigali City comprises three of the most densely populated districts in Rwanda: Gasabo, Nyarugenge, and Kicukiro. Most of the traffic, including heavy vehicles, is concentrated in the main routes of Kigali City. Moreover, there is traffic congestion that is caused by transit traffic from Tanzania, Uganda, Burundi, and Congo crossing through CoK. Hence, the RTDA now considers providing a detour route which can be used by these transit vehicles.

This project is stated as the priority action project in the transport sector 2018/19-2023/24 in the National Strategy for Transformation (NST-1) and Kigali City Development Strategy 2018-2024.

RTDA carried out the feasibility study of the project with SABA Engineering (an Ethiopian private company) in 2015/2016. In the feasibility study, based on the traffic survey and forecast, which was carried out in the feasibility study, the estimated average annual daily traffic (AADT) of the project road in 2020 was 7,099, and was estimated to be 18,080 and 46,261 in 2030 and 2040, respectively. The alignment design was carried out based on the RTDA Road Design Manual and the design speed is varied from 50 to 120 km/h according to the terrain conditions (urban, steep, mountain, rolling, flat). The proposed lane width is 3.75 m and the uniformed carriageway with four lanes was proposed with various median widths (dual-carriageway).

Thereafter, the alignment was modified to pass outside the special economic zone (SEZ) area of CoK, and the feasibility study is currently being updated by Mote-Engil (a Portuguese private company) and is planned to be completed by the end of 2018.

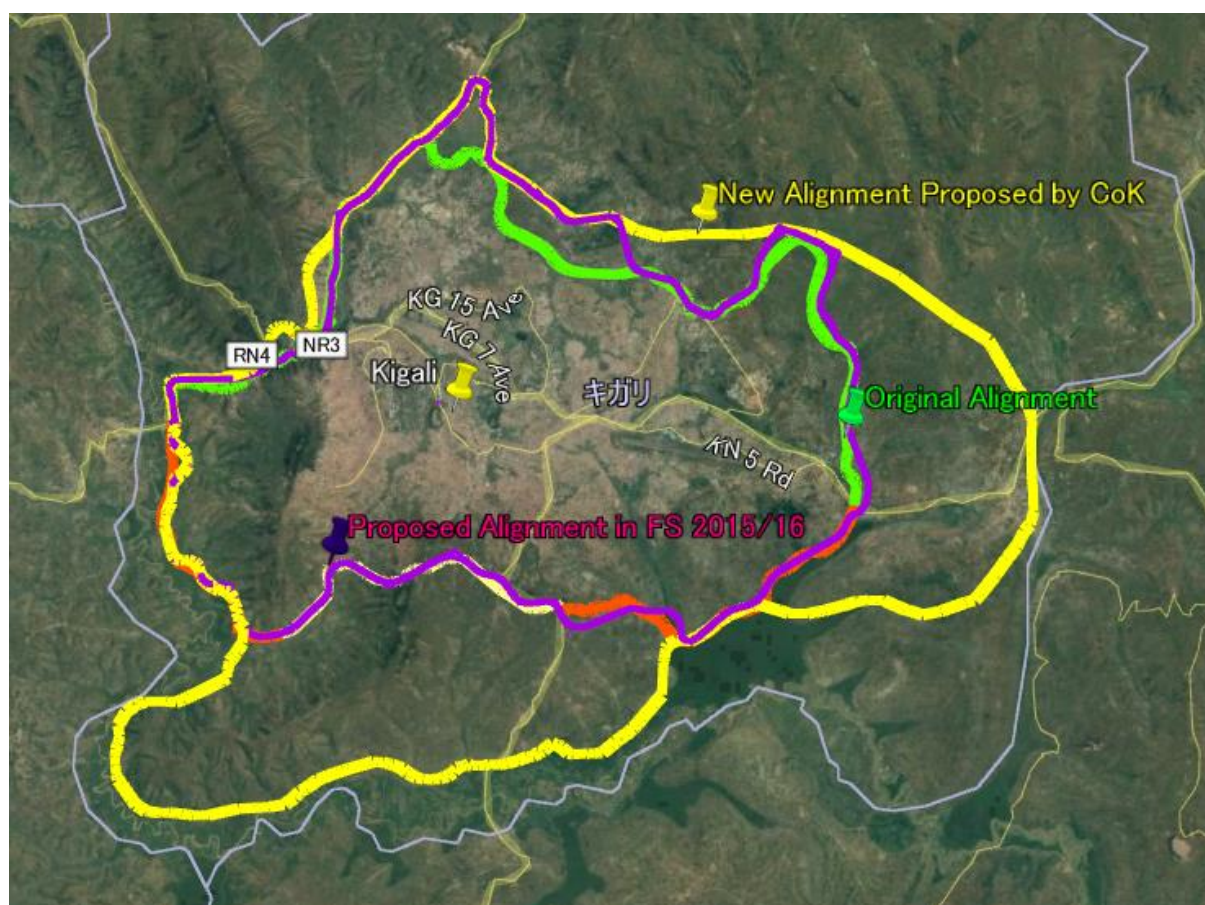
The toll system is also studied in the feasibility study. Mota-Engil has indicated interest in financing the project, although the financing is predicated based on the result of the feasibility study.

**Table 3.3.2: Project Outline of Kigali Ring Road Project**

Sector	Transport
Executing agency	CoK, RTDA
Relevant Ministry	MININFRA
Outline	<ul style="list-style-type: none"> <li>● Length: 80 km</li> <li>● Width: four lanes (3.75 m @ 4)</li> <li>● Expected output: Mitigation of traffic congestion in the City of Kigali and smoother logistic flow as a bypass in the city.</li> </ul>
Location	Kigali province of three districts of Gasabo, Kicukiro, and Nyarugenge
Project cost	No information*
Fund	Mota-Engil is interested in funding
Current status	Feasibility study (updated)
Schedule	Updated feasibility study is planned to be completed by the end of 2018. The completion of the construction works will be in 2023/2024.

Note: \* To be updated.

Source: JICA Survey Team



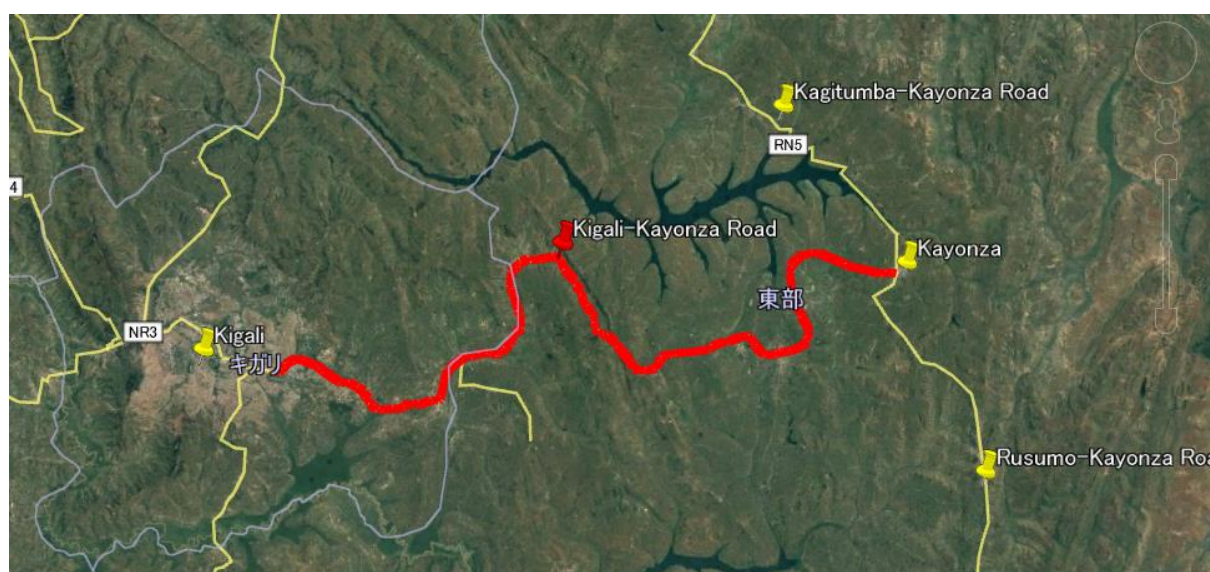
Source: JICA Survey Team

**Figure 3.3.2: Alignment of Kigali Ring Road Project**

## (2) Kigali-Kayonza Road Rehabilitation Project

The Kigali-Kayonza Road has been initiated within the framework of the implementation of the regional infrastructures development strategy and is located in the eastern province and crosses three districts, namely Kayonza, Kicukiro, and Rwamagana.

The Kigali-Kayonza Road is the main link conveying cargo from both Dar es Salaam Port at the Central Corridor and the Mombasa Port at the Northern Corridor to CoK. The Kigali-Kayonza Road is a continuation of the Rusumo-Kayonza Road, which is now rehabilitated under the co-financing scheme of JICA and African Development Bank (AfDB) from Rusumo One Stop Border Post (OSBP) (with Tanzania), which is funded by JICA toward CoK and also a continuation of Kagitumba-Kayonza Road, which is rehabilitated by financing of the African Development Bank (AfDB) from Kagitumba OSBP (with Uganda) toward CoK.



Source: JICA Survey Team

**Figure 3.3.3: Alignment of Kigali-Kayonza Road**

This project is stated as the priority action in the transport sector 2018/19-2023/24 in NST-1.

The project proposes the road to be widened from 6 m single-carriageway (2-lane) to dual-carriageway (4-lane), an asphalt concrete pavement, and 2 m width sidewalk on the segment Cyamutzing-Rugende while the remaining part will be upgraded to the EAC road standards (7 m width carriageway with 1.5 m width shoulders on both sides).

The existing pavement of this road is in good condition, and the whole section is a single carriageway with 2-lane. Traffic is mostly caused by heavy vehicles, and there is no climbing lane. Outside of the city boundary, there is a parking space for heavy vehicles since they are prohibited to enter the city during day time.



Two Lanes, Good Condition of Pavement



Heavy Vehicle Parking Space

Source: JICA Survey Team

**Figure 3.3.4: Photos of Existing Condition of Kigali-Kayonza Road**

**Table 3.3.3: Project Outline of Kigali-Kayonza Road Rehabilitation Project**

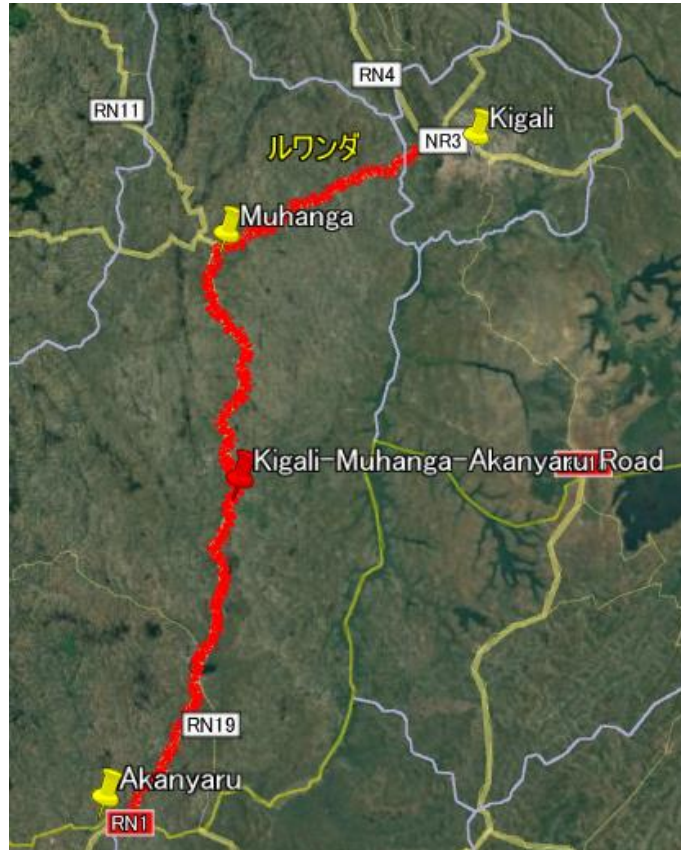
Sector	Transport
Executing agency	RTDA
Relevant ministry	MININFRA
Outline	<ul style="list-style-type: none"> <li>● Length: 75 km</li> <li>● Expected output: Smooth logistic flow and regional integration</li> </ul>
Location	Kigali city (Cyamutzing Intersection) to Kayonza
Project cost	USD 86.5 million
Fund	Fund mobilizing
Current status	Study is available
Schedule	Completion (proposed): 2025

Source: JICA Survey Team

### (3) Rehabilitation and Upgrading of Kigali-Muhanga-Akanyaru Road

This road section is a continuation of the Central and Northern Corridor through CoK. It is the main link used by the transit cargo to connect Kigali with Bukavu and Kamanyola in Congo, and Bujumbura in Burundi. This road being the Program for Infrastructure Development in Arica (PIDA) considered road assists in improving the access to integrate regional and cross-border infrastructure networks.

This road is a 2-lane paved trunk road with steep and winding mountainous alignment. The pavement is in good condition in the Nyabugogo-Muhanga section. The photos of the existing conditions of this road are presented below.



Source: JICA Survey Team

**Figure 3.3.5: Alignment of Kigali-Muhanga-Akanyaru Road**



Existing Condition (2-lane and shoulders with no sidewalk), Pavement is in Good Condition



Existing Bridge on Nyabarongo River (2-lane)

Source: JICA Survey Team

**Figure 3.3.6: Photos of Existing Condition of Kigali-Muhanga Section**

The carriageway of the road will be widened from 6 m to 7 m with asphalt concrete surface (with a dual carriageway from the exit of Kigali to around 155 km) with 1.5 m to 2 m walkways for rural and urban environments, respectively.

Upgrading of the road will contribute to the improvement of the quality of key international and domestic road corridors to reduce travel time from CoK to the southern province towards Burundian border, transit time for tradable goods and improve regional connectivity, as well as the riding quality and mobility and lastly allow the harmonization of road standards with the other EAC countries.

**Table 3.3.4: Project Outline of Rehabilitation and Upgrading of Kigali-Muhanga-Akanyaru Road**

Sector	Transport
Executing agency	RTDA
Relevant ministry	MININFRA
Outline	<ul style="list-style-type: none"> <li>● Length: 157 km (Kigali-Muhanga: 45 km, Muhanga-Akanyaru: 112 km)</li> <li>● Expected output: Regional integration</li> </ul>
Location	From Kigali City to Muhanga to Akanyaru
Project cost	USD 225.7 million
Fund	Fund mobilizing
Current status	Study is available
Schedule	Lot 1: Kigali-Muhanga (45 km): 2019-2022 Lot 2: Muhanga-Akanyaru (112 km): 2025-2029

Source: JICA Survey Team

#### **(4) Expressway Kigali-Bugesera International Airport (BIA)**

In 2009, a plan for the construction of the new Bugesera International Airport (BIA) was approved by the MININFRA according to the increase of the demand of the existing Kigali International Airport (KIA). BIA is located in Bugesera District, which is around 25 km south of Kigali. According to the government's plan, BIA will be an air traffic hub in Central Africa with a projected capacity of over three million passengers per year in 2030.

In 2015, MININFRA established the Aviation Travel and Logistics Holding Ltd (ATL), which is a company that merges all air transport, logistics, and tourism services and products in Rwanda. ATL is comprised of five subsidiaries: RwandAir (the national airline), Airports Company Rwanda Ltd-ACR (the airport management company to emerge from the ongoing reform of Rwanda Civil Aviation Authority-RCAA), Akagera Aviation Ltd (the general aviation and training company), Rwanda Tours & Events Ltd.-RTE (as the flagship of the tourism sector), and Rwanda Links Logistics Ltd-RLL (a new cargo and freight handling company).

Since 2015, ATL has partnered with Mota-Engil and has promoted the Bugesera Airport Development Project as Bugesera Airport Company (BAC). ATL and Mota-Engil invested 25% and 75%, respectively.

BIA is now under construction by BAC and will be completed by October of 2019. BIA will start to operate in September 2020, after the commissioning period of the operation. BAC will have 25 years of concessionaire, which was already contracted. After the opening of BIA, the current passenger services of KIA will be transferred to the BIA, and the KIA will be operated only for government, military, private jet, humanitarian, and diversion.

The Expressway Kigali-BIA comprises two sections: the first section is from Sonatubes Intersection to a crossing of Akagera River (Akagera Bridge), and the second section is from Akagera Bridge to BIA.

The first section is a part of rehabilitation of National Road (NR5) Kicukiro-Nemba which is listed in NST-1. This section will be upgraded from 2-lane to 4-lane (dual-carriageway) and will be financed by China Export-Import Bank (Exim Bank). The president of China has signed on the agreement of construction of this section on 23 July 2018 in Rwanda. In this section, the new bridge construction parallel to the existing Akagera Bridge (see photo) is included.





Existing Condition of NR5 (2-lane)

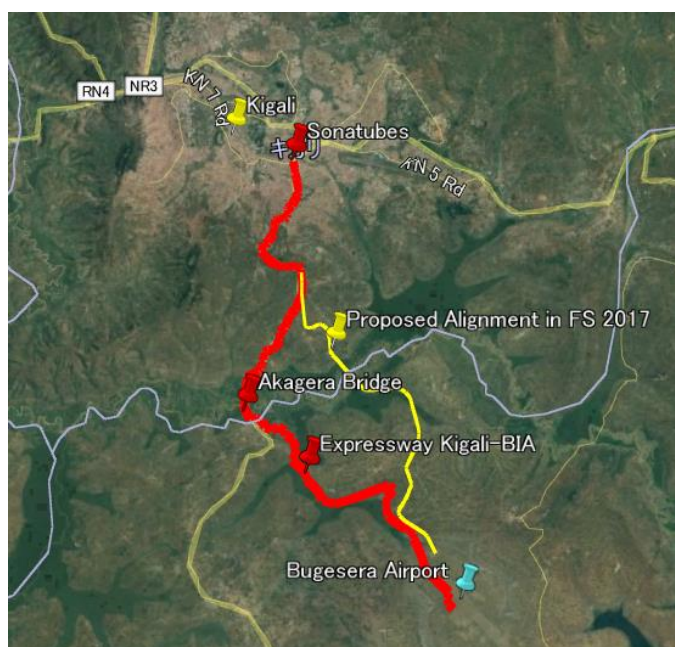


Existing Akagera Bridge (2-lane)

Source: JICA Survey Team

**Figure 3.3.7: Photos of Existing Condition of NR5 and Existing Akagera Bridge**

As for the second section, the conceptual design is already completed and the detailed design is being carried out by Mota-Engil. The alignment is modified from the proposal alignment in the feasibility study, which was carried out by SPEA Engineering in 2017. Because it was required to construct a new river crossing bridge for the proposed alignment in FS 2017, the beginning point of the second section was set after Akagera Bridge considering the reduction of the project cost for their portion. The alignment was designed in a way such as to dodge the swamp area. It will be constructed as 2-lane for the first phase, and it will be widened to 4-lane depending on the future demand. In the FS in 2017, a toll gate system was once studied, but a non-toll policy was directed by the government side during the latest study by Mota Engil.



Source: JICA Survey Team

**Figure 3.3.8: Alignment of Expressway Kigali-BIA**

The section from the Akagera Bridge (BIA of the expressway is a part of BIA development project and BAC) will be constructed, and after completion, the expressway will be handed over to RTDA. The construction cost of this section is estimated as USD 80 million within the USD 500 million for BIA development total project cost. The Expressway Kigali-BIA will be completed by around January 2020.

**Table 3.3.5: Project Outline of Expressway Kigali-BIA**

Sector	Transport
Executing agency	CoK, RTDA
Relevant ministry	MININFRA
Outline	<ul style="list-style-type: none"> <li>● Length: Sonatubes-Akagera Bridge: 13.8 km, Akagera Bridge-BIA</li> <li>● Width: Sonatubes-Akagera Bridge: 4-lane, Akagera Bridge-BIA: 2-lane</li> <li>● Expected output: Mitigation of traffic congestion inside of Kigali City, strengthen of the connection of Kigali City and Bugesera District and provision of access to BIA</li> </ul>
Location	Kigali City and Bugesera District (BIA)
Project cost	Sonatubes-Akagera Bridge: No information* AKagera Bridge-BIA: USD 80 million
Fund	Sonatube-Akagera Bridge Section (including New Akagera Bridge Construction): Exim Bank Akagera Bridge-BIA Section: Mota-Engil and GoR (ATL)
Current status	Study is available for Sonatube-Akagera Bridge Section Detailed Engineering Design is carried out for Akagera Bridge-BIA section.
Schedule	Complete by March 2020

Note: \* To be updated.

Source: JICA Survey Team

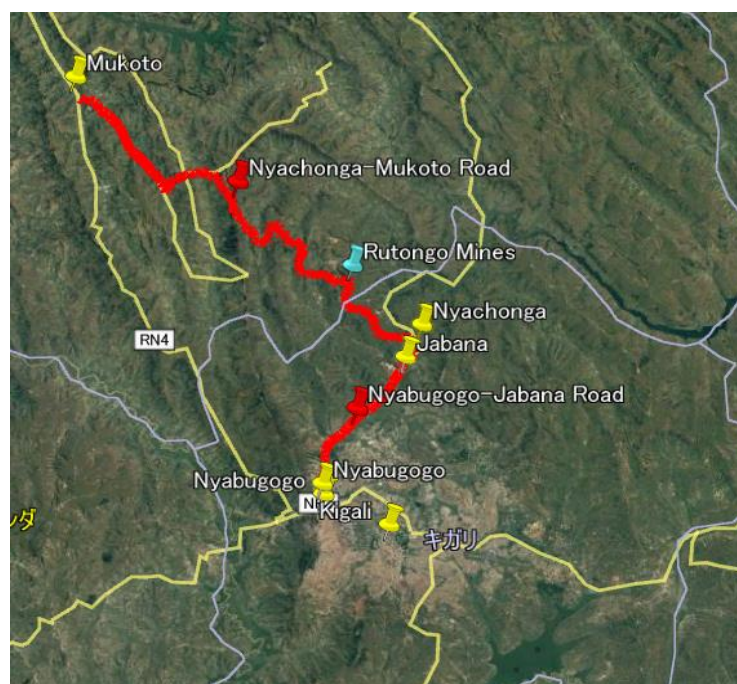
### (5) Multilane Divided Highway Nyabugogo-Jabana and Nyacyonga-Mukoto Upgrading Road Project

The Nyabugogo-Jabana and Nyacyonga-Mukoto roads have a total length of 46 km (10 km and 36 km, respectively).

The Nyabugogo-Jabana Road starts in 700 m from Nyabugogo Bridge on the Kigali-Gatuna main trunk road (National Road NR3) ending at the junction with DR52 in Gasabo District at Nyacyonga.

It is located in one district of CoK and passes through urban and suburban areas and forms part of the National Roads network (RN3), and is of great importance for the Kigali urban area.

The existing road Nyabugogo-Jabana Section has 2-lane without walkways. It is a paved trunk road. Photos of the existing conditions are shown below.



Source: JICA Survey Team

**Figure 3.3.9: Alignment of Nyabugogo-Jabana and Nyacyonga-Mukoto Road**



Existing Condition (2-lane)



Existing Bridge on Murongozi River (2-lane)

Source: JICA Survey Team

**Figure 3.3.10: Photos of Existing Condition of Nyabugogo-Jabana Road**

The Nyacyonga-Mukoto Road (36 km) starts from the junction of Kigali-Gatuna (RN 3) with DR 52 and ends at the junction of Kigali - Musanze Road (NR 2) with DR 48 in Rulindo District.

The GoR decided to improve all main road networks including rural roads to reduce travel time and cost of transport. It is in this context that upgrading the Nyabugogo-Jabana and Nyacyonga-Mukoto roads will have a very strong positive impact by contributing to large economic savings due to the increase in capacity and visible traffic diversion to reduce congestion.

This project also contributes to the access to a tin mining area of Rutongo (shown in Figure 3.3.9) and mobility improvement in the Northern Corridor.

**Table 3.3.6: Project Outline of Multilane Divided Highway Nyabugogo-Jabana and Nyacyonga-Mukoto Upgrading Road Project**

Sector	Transport
Executing agency	RTDA
Relevant ministry	MININFRA
Outline	<ul style="list-style-type: none"> <li>● Length: 46 km (Nyabugogo-Jabana: 10 km, Nyacyonga-Mukoto: 36 km)</li> <li>● Expected output: Access to mining area of Rutongo and mobility improvement in the Northern Corridor</li> </ul>
Location	Gasabo District / Nyabugogo – Jabana, Nyacyonga - Mukoto
Project cost	USD 69 million (USD 32 million for Nyacyonga-Mukoto Segment)
Fund	Fund mobilizing
Current status	Study is available
Schedule	2019-2022

Source: JICA Survey Team

## (6) Upgrading and Rehabilitation of Urban Roads in the City of Kigali

The Kigali Urban Road Upgrading Project (54.56 km) is now carried out by a Chinese contractor, China Road and Bridge Corporation (CRBC), under the supervision of HYCOGEC since February 2017. The project is financed by China Export-Import Bank (Exim Bank). It includes the widening of urban roads to 4-lane (dual-carriageway) and the construction of new roads.



Nyabugogo Bridge under Construction



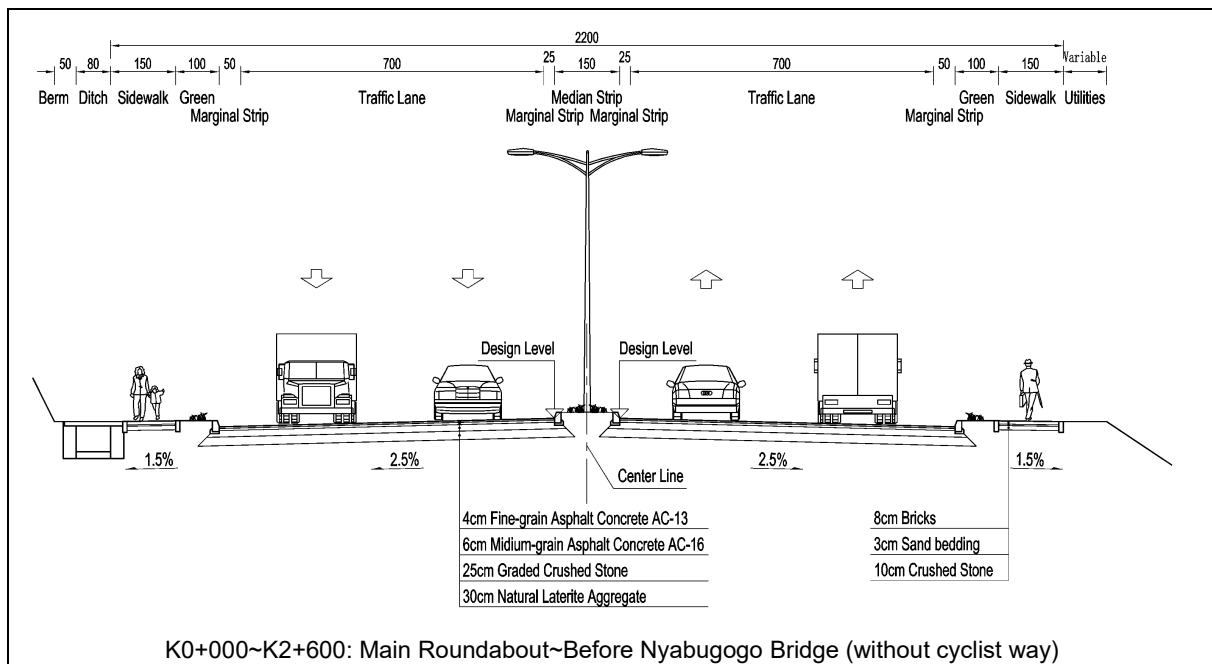
On-going widening to 4-lane at KN3 Road

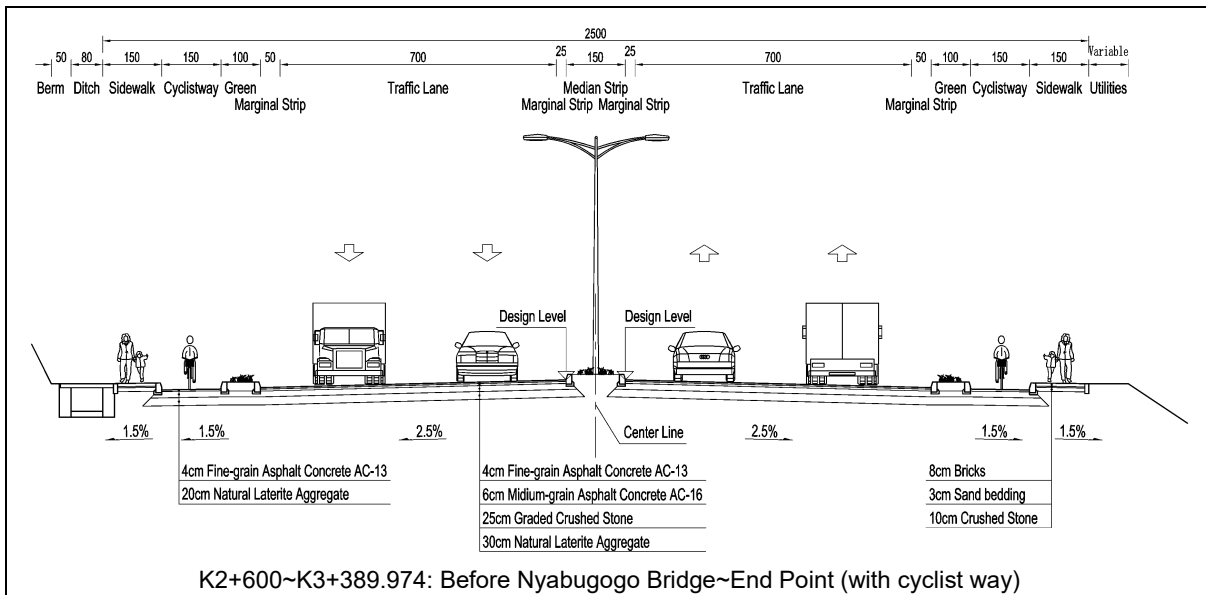
Source: JICA Survey Team

**Figure 3.3.11: On-going Kigali Urban Roads Upgrading Project**

This project will enhance the road capacity in the urban areas, especially in and around Nyabugogo area which is one of the most congested areas in the city.

According to the existing drawings of the detailed design for the on-going “Road Main Roundabout – Gatsata” (prepared by CRBC, 2017.10), the route, subgrade, pavement, and structures are designed as urban arterial road with a design speed 60 km/h, in accordance with Chinese codes (JTG, CJJ) and laws and regulations in Rwanda. The typical cross sections are shown below.

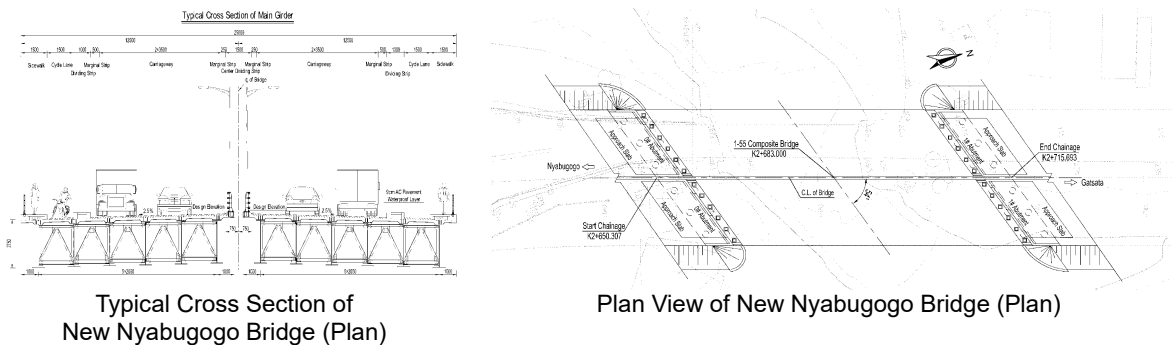




Source: Kigali Urban Road Upgrading Project (54.56 km) Road Roundabout - Gatsata Detailed Design CRBC 2017.10

**Figure 3.3.12: Typical Cross Sections of Road Main Roundabout - Gatsata**

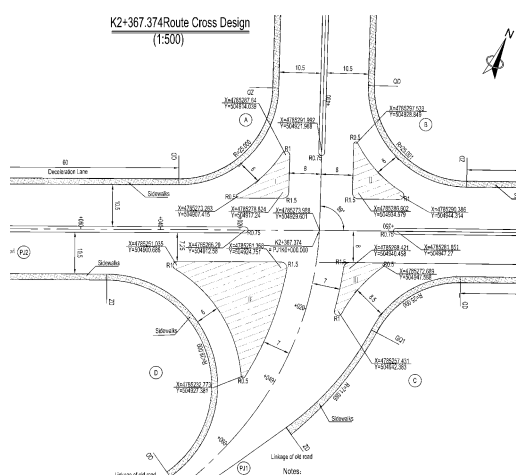
In this route of the project, the replacement of Nyabugogo Bridge across Nyabugogo River is included and is now under construction as shown in Figure 3.3.11 above. The New Nyabugogo Bridge is designed as a steel-concrete composite bridge with a single span of 55 m. The typical cross-section and the plan view are shown below.



Source: Kigali Urban Road Upgrading Project (54.56 km) Road Roundabout - Gatsata Detailed Design CRBC 2017.10

**Figure 3.3.13: Typical Cross Sections and Plan View of New Nyabugogo Bridge**

The Nyabugogo Intersection was also designed as shown in Figure 3.3.14, and the current situation at Nyabugogo Intersection is also shown.



Detailed Design of Nyabugogo Intersection (Plan)



Current Situation of Nyabugogo Intersection: Under Construction

Source: Kigali Urban Road Upgrading Project (54.56 km) Road Roundabout - Gatsata Detailed Design CRBC 2017.10, Photo: JICA Survey Team

**Figure 3.3.14: Detailed Design and Current Situation of Nyabugogo Intersection**

CoK is now planning the “21.08 km of asphalt roads rehabilitation”, “120 km of asphalt roads construction”, and “60 km of urban roads upgrading project” as part of the Kigali City Development Strategy 2018-2024.

The proposed road lists of 21.08 km of asphalt roads rehabilitation and 120 km of asphalt roads construction are shown in Table 3.3.7 and Table 3.3.8, respectively.

**Table 3.3.7: Roads List of 21.08 km of Asphalt Roads Rehabilitation**

Section of the Roads (Roads' Name)	Length (km)
Rehabilitation of City Center Roads	5.96
Kiyovu Roads Network	2.05
Kinamba-Gisozi-Nyarutarama-Kibagabaga Roads (KG14Ave-KG12Ave-KG19Ave)	12.79

Source: City of Kigali

**Table 3.3.8: Roads List of 120 km of Asphalt Roads Construction**

Section of the Roads (Roads' Name)	Length (km)
Gakiro-Kagugu	4.525
Kimironko-Zindiro	3.214
Bibare-Adventist Church	1.239
Kagarama	2.682
Quartier Niboye	4.386
Kumunyinya-Elcastro	1.283
Nyanza Landfill&Memorial Site	1.338
Unilak-Rwandex	1.509
Agatare-Rugarama	4.081
Around Grace Hotel	0.561
Road Behind Kimisagara Market	0.624
GISOZI	0.740
GACULIRO	6.238
KIMIRONKO	7.641
MIGINA	3.125
GIKONDO	2.180
KAGARAMA	4.574
NIBOYE	3.521
MUHIMA	1.528
Nyabisindu-Kibagabaga	0.9

Nyabisindu-Nyarutarama	0.6
Remera Sports View-Nyarutarama	1.33
Masaka-Rusheshe	9.75
Kamutwa-Kinamba (1)	1.6
Kamutwa-Kinamba (2)	1.1
Kacyiru Hospital-Utexirwa	0.6
Birembo-Kami	4.3
Presidential Palace Museum-Nyarugunga Sector	1.1
Muhima roads	1.82
Sonatubes-Kabeza	3
Alpha Palace-Sonatube	1.95
Sonatubes-Sahara	2.2
Gikondo-Gatenga-Nyanza Taxi Park	3.25
Gaposho village roads	1.5
Rusororo roads	6.1
Rwahama-Kimironko Market-Zindiro	3.1
Controle Technique-Kimironko Sector-Zindiro	2.5
Kiyovu-Muhima (Yamaha-Ubumwe)	1.5
Karama-Nyamirambo	4.5
Public Library	1.5
Karuruma-Bweramvura	9.11
Gatenga-Nyanza Taxi Park	2.61

Source: City of Kigali

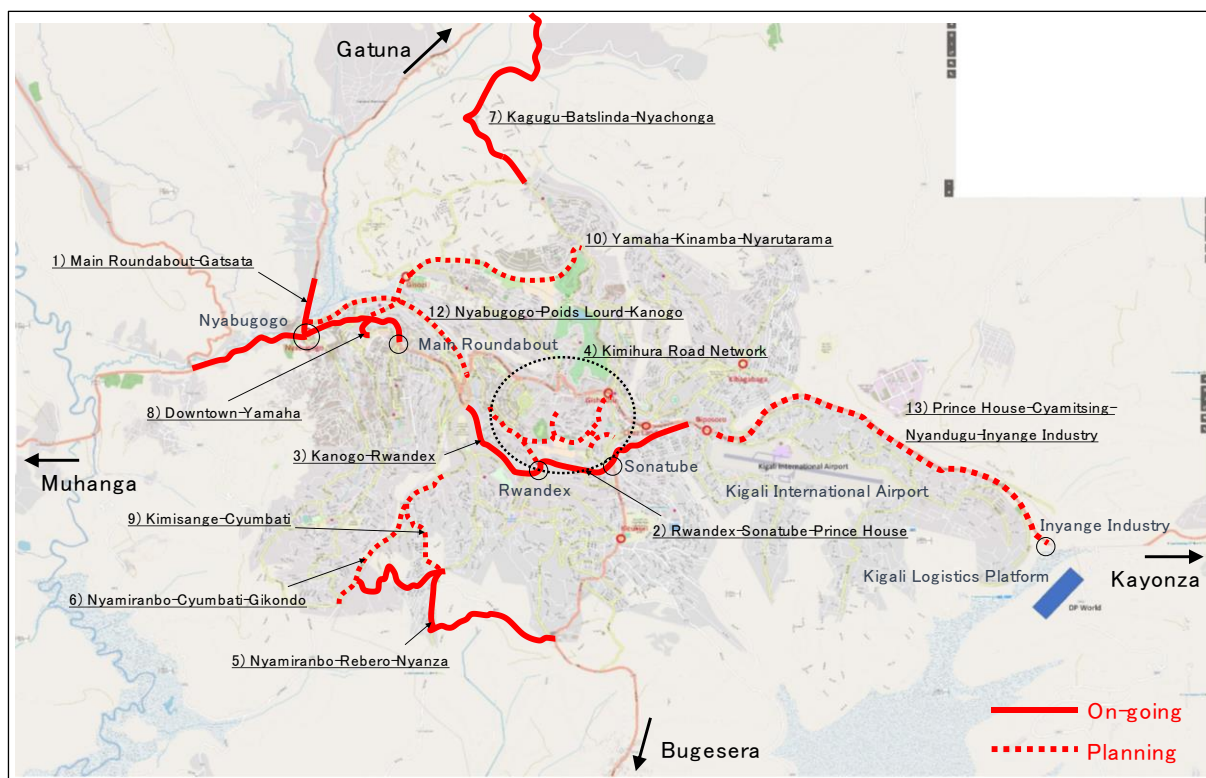
The road list and the locations of planning and on-going road upgrading project is shown below. The 23.86 km of remaining roads of on-going upgrading project (54.56 km) will be included in the 60 km of urban roads upgrading project.

**Table 3.3.9: Roads List of Urban Roads Upgrading Project in the City of Kigali**

Section of the Roads (Roads' Name)	Length (km)	Status
<b>On-going Urban Roads Upgrading Project (54.56 km)</b>		
1) Main Roundabout-Gatsata: Including Nyabugogo Bridge Construction	3.465	On-Going
2) Rwandex-Sonatubes-Prince House	*	Completed
3) Kanogo-Rwandex (KN3)	*	On-Going
4) Kimihura Road Network	*	Planning
5) Nyamiranbo-Rebero-Nyanza	*	On-Going
6) Nyamirambo-Cyumbati-Gikondo	*	Planning
7) Kagugu-Batsinda-Nyacyonga	*	On-Going
8) Down Town-Yamaha	*	On-Going
9) Kimisange-Cyumbati	*	Planning
<b>Planning Urban Roads Upgrading Project (60 km)</b>		
10) Yamaha-Kinamba-Nyarutarama (KG15): 2-Lane to 4-Lane	10.67	Planning
11) Two (2) Bridges in Kinamba: Replacement	-	Planning
12) Nyabugogo-Poids Lourds-Kanogo (KN7): 2-Lane to 4-Lane	5.0	Planning
13) Prince House-Cyamutsing-Nyandungu-Inyange Industry (RN3): 2-Lane to 4-Lane	10.0	Planning
14) Mulindi-Rusororo-Kabuga: Earth to Asphalt Road	10.3	Planning
15) 54.56 km Remaining Roads (4),6),9)	23.858	Planning

Note:\* To be updated.

Source: City of Kigali



Source: JICA Survey Team

**Figure 3.3.15: Location Map of Urban Roads Upgrading Project**

**Table 3.3.10: Project Outline of Upgrading and Rehabilitation of Urban Roads in the City of Kigali**

Sector	Transport
Executing agency	City of Kigali, RTDA
Relevant ministry	MININFRA, MINALOC, CoK
Outline	● Expected output: Enhancement of the road traffic capacity in the urban areas of Kigali
Location	Kigali City (Upgrading Project: Shown in Figure 3.3.15)
Project cost	1) 21.08 km of Asphalt Roads Rehabilitation: No information* 2) 120 km of Asphalt Roads Construction: RWF 66 billion 3) 60 km of Urban Roads Upgrading Project: RWF 100 billion 4) 54.56 km of Urban Roads Upgrading Project (on-going): RWF 65 billion
Fund	1)~3) Fund mobilizing 4) Exim Bank
Current status	1)~3) is under planning and studied, some of 4) is on-going.
Schedule	Complete by 2023/24

Note: \* To be updated.

Source: JICA Survey Team

## (7) 7 Intersections Improvement

RTDA studied the improvement of the existing seven intersections in Kigali with the consultant Aronis-Drettas-Karlaftis in 2016. The seven intersections are 1) Nyabugogo, 2) Kicukiro, 3) Kibagabaga, 4) Gishushu, 5) Chez Lando, 6) Giporoso, and 7) Gisozi. All these intersections are on the main arterial roads in Kigali. The locations of these intersections are shown below.









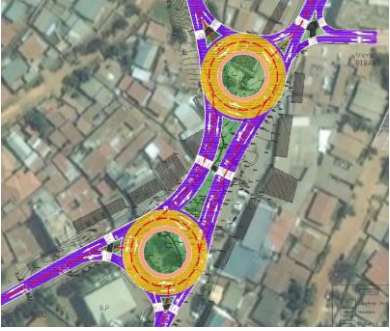




Source: JICA Survey Team





**Figure 3.3.16: Location of Seven Intersections**

In the study, these intersections are studied based on traffic data and proposed to be improved in accordance with the draft final Rwanda Design Manuals as shown below.

**Table 3.3.11: Summary of the Detail Design for Urban Intersections (Proposed Improvement)**

Intersection	Existing Layout and Identified Issues	Proposed Improvement Plan
1) Nyabugogo		*Studied in the separate study of Nyabugogo-Jabana Road and it is not obtained yet.
2) Kicukiro	 <ul style="list-style-type: none"> <li>- Three-leg intersection</li> <li>- Proper channelization and extra turning lanes are missing</li> </ul>	 <ul style="list-style-type: none"> <li>- Double lane roundabout</li> <li>- Additional improvement of neighboring three-leg intersection</li> </ul>



<p>3) Kibagabaga</p>	<ul style="list-style-type: none"> <li>- AADT of Main Road: 9,000~11,000</li> </ul>  <ul style="list-style-type: none"> <li>- Double three-leg intersection</li> <li>- Proximity of the junctions and the angle of intersection</li> <li>- Absence of turning movement lanes</li> <li>- AADT of Main Road: 5,000~8,000</li> </ul>	 <ul style="list-style-type: none"> <li>- Two independent roundabouts and connected bean-shaped system</li> <li>- Additional upgrade of the neighboring road network</li> </ul>
<p>4) Gishushu</p>	 <ul style="list-style-type: none"> <li>- Four-leg intersection where a four-lane main road meets a secondary 2-lane road</li> <li>- Separation of movements is not always clear</li> <li>- Traffic during peak hour is very high</li> <li>- AADT of Main Road: 18,000~23,000</li> </ul>	 <ul style="list-style-type: none"> <li>- Additional lanes with signal optimization</li> <li>- Signal optimization settings for AM Peak and PM Peak was proposed</li> </ul>
<p>5) Chez Lando</p>	 <ul style="list-style-type: none"> <li>- Four-leg 2-lane roundabout</li> <li>- Vehicle running on the north leg face conflicts with vehicles entering or exiting the T-junction up north.</li> <li>- AADT of Main Road: 22,000~23,000</li> </ul>	 <ul style="list-style-type: none"> <li>- Introduction of a median on the north leg</li> <li>- Introduction of channelized right turns for the northbound and westbound direction</li> <li>- Additional upgrade of the neighboring network</li> </ul>







<p>6) Giporoso</p>		
<p>7) Gisozi</p>		
<ul style="list-style-type: none"> <li>- Four-leg intersection where a 4-lane main road meets a secondary 2-lane road</li> <li>- Poor channelization of the movements</li> <li>- AADT of Main Road: 19,000</li> </ul>	<ul style="list-style-type: none"> <li>- Roundabout</li> </ul>	
<ul style="list-style-type: none"> <li>- Two major T-junctions which are close to each other</li> <li>- Inadequate channelization of movements and angle of intersection cause problems in the traffic flow</li> <li>- The approach's capacity is reduced by the presence of the bus station</li> <li>- AADT of Main Road: 11,000~14,000</li> </ul>	<ul style="list-style-type: none"> <li>- Two intersections will feature only one-way link with semi-roundabout system at the south-west.</li> <li>- Relocation of bus station to a place further away from the intersection</li> <li>- Double entry grade separation</li> </ul>	







Source: Detail Design Report for Urban Intersections, December 2016

The existing conditions of these intersections are shown below. According to the plan of BRT project, the intersections of 4) Gishushu, 5) Chez Lando, and 6) Giporoso will be affected by the BRT lanes. The elevated MRT is depicted to pass through the intersections 2) Kicukiro, 3) Kibagabaga, 4) Gishushu, 5) Chez Lando, and 7) Gisozi according to the proposed City Master Plan.

**Table 3.3.12: Existing Condition of Major Intersections**

Intersection	Photo of Existing Condition and Comments	
<p>1) Nyabugogo</p>		
	<ul style="list-style-type: none"> <li>- It is now under construction through the Urban Road Upgrading Project (54.56 km), but it was still unpaved as of June 2018.</li> </ul>	

	<ul style="list-style-type: none"> <li>- The detailed design of this intersection is shown in Figure 3.3.14.</li> <li>- The main bus terminal is adjacent, and pedestrian random crossing is outstanding.</li> <li>- According to CoK, few pedestrian bridges will be planned to be installed in the future (no studies yet).</li> </ul>
<p>2) Kicukiro</p>	<div style="display: flex; justify-content: space-around;">   </div> <ul style="list-style-type: none"> <li>- No traffic light is installed.</li> <li>- Traffic from North (straight) and traffic from South to West (left turning) are intercepting each other.</li> <li>- Monitoring camera is installed.</li> <li>- Main road (NR5) will be upgraded from 2-lane to 4-lane by the National Roads (Kicukiro-Nemba) Rehabilitation Project (Expressway Kigali - BIA: Sonatubes - Akagera Bridges Section).</li> </ul>
<p>3) Kibagabaga</p>	<div style="display: flex; justify-content: space-around;">   </div> <ul style="list-style-type: none"> <li>- No lane marking and no channelization causes traffic interception.</li> <li>- Even non-peak hour the traffic is in conflict with the junctions close each other.</li> <li>- Corkscrew through motorcycle and vehicles leaving the adjacent parking worsen the traffic congestion.</li> <li>- Shops and buildings are adjacent to the intersections.</li> </ul>
<p>4) Gishushu</p>	<div style="display: flex; justify-content: space-around;">   </div> <ul style="list-style-type: none"> <li>- Traffic lights are installed, but traffic police control the traffic in the peak hour.</li> <li>- Traffic from West to North (left turning) is prone long queues.</li> <li>- The south leg has a steep slope and poor visibility.</li> </ul>

5) Chez Lando		
<ul style="list-style-type: none"> <li>- There are no lane markings for several lanes in the roundabout.</li> <li>- Traffic goes out from inside lane intercepts the traffic flow.</li> <li>- Traffic interception occurs in the T-junction in the north.</li> </ul>		
6) Giporoso		
<ul style="list-style-type: none"> <li>- Traffic lights are installed, but traffic police control the traffic in the peak hour.</li> </ul>		
7) Gisozi		
<ul style="list-style-type: none"> <li>- Two close T-junctions and no lane markings complicate the traffic flow.</li> <li>- The main road (KG15) will be upgraded from 2-lane to 4-lane in the Urban Road Upgrading Project (60 km).</li> </ul>		

Source: JICA Survey Team

**Table 3.3.13: Project Outline of Seven Intersections Improvement**

Sector	Transport
Executing agency	CoK, RTDA
Relevant ministry	MININFRA
Outline	<ul style="list-style-type: none"> <li>● Name of Intersections: Nyabugogo, Gisozi, Gishushu, Chez Lando, Kicukiro, Giporoso, Kibagabaga</li> <li>● Expected output: Increase in the capacity of the intersections and mitigation of traffic congestion in CoK</li> </ul>
Location	City of Kigali
Project cost	No information*
Fund	Fund mobilizing
Current status	Under study
Schedule	Complete by 2023/24

Note: \* To be updated.

Source: JICA Survey Team

## (8) Standard Gauge Railways

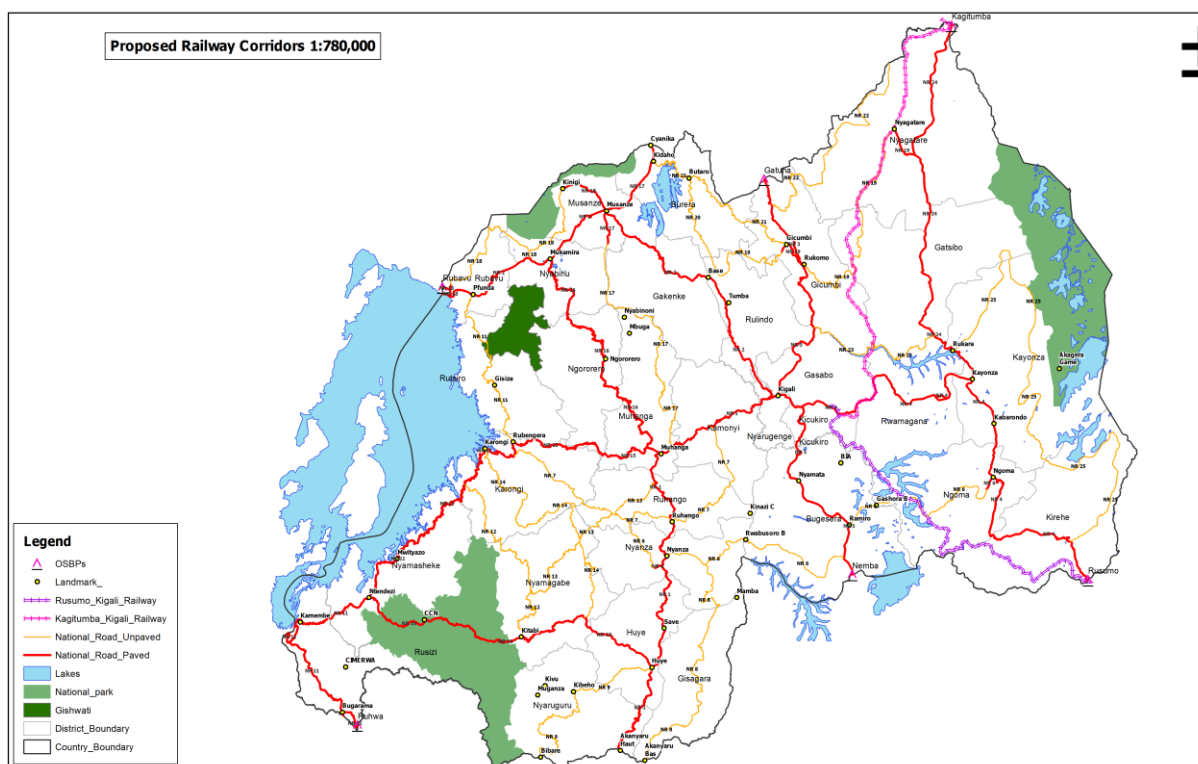
Standard Gauge Railways (SGR) are planned in the railway transport system as one of the solutions to boost socio-economic development, welfare of Rwandans, as well as cutting down of the transport costs. At present, two major rail transport corridors connecting the country to the Indian Ocean are planned, with the Northern Corridor running from Mombasa-Nairobi-Kampala to Kigali, and the Central Corridor linking Kigali with Dar es Salaam. This railway project will be the first railway transport system in Rwanda. The proposed railway in Rwanda will be a single-ballasted standard gauge system with maximum speed of 120 km/h for passenger and 80 km/h for freight.

### 1) Kampala-Kigali SGR (Northern Corridor)

The preliminary engineering design was carried out and completed by Gauff Consultants. The section length in Rwanda is approximately 148 km, and the cost is estimated at about USD 1,820 million. According to RTDA, the construction of the section inside Rwanda will be started after the completion of the section between Kampala and Mombasa.

### 2) Isaka-Kigali SGR (Central Corridor)

The preliminary engineering design was carried out by the Canadian Pacific Consulting Services (CPCS), and it has been reviewed and updated. The alignment has been modified and will be based on the design speed of 160 km/h. The length inside Rwanda is approximately 150 km, and the cost is estimated at about USD 1,200 million. According to RTDA, the commencement of construction of the section inside of Rwanda has been targeted in this year.



Source: RTDA

Figure 3.3.17: Location Map of Standard Gauge Railways Project (Preliminary)

**Table 3.3.14: Project Outline of Standard Gauge Railways**

Sector	Transport
Executing agency	RTDA
Relevant ministry	MININFRA
Outline	<ul style="list-style-type: none"> <li>● Length: Kampala-Kigali: 148 km,</li> <li>● Length: Isaka-Kigali: 150 km</li> <li>● Expected output: Smoother logistic flow, efficient and low-cost transport system and regional integration</li> </ul>
Location	From Kampala (Uganda) to Kigali for Northern Corridor, and from Isaka (Tanzania) to Kigali for Central Corridor.
Project cost	Kampala-Kigali: USD 1,820 million Isaka-Kigali: USD 1,200 million
Fund	Fund mobilizing
Current status	Kampala-Kigali: Preliminary Design is completed. Isaka-Kigali: Under study (Draft design based on design speed 120 km/h is done and the alignment is modified.)
Schedule	Kampala-Kigali: No Information Isaka-Kigali: Commencement in 2018 (Target)

Source: JICA Survey Team

### (9) Expansion of Kigali Special Economic Zone (Phase 2 and 3)

The Kigali Special Economic Zone (SEZ) is the first SEZ in Kigali which was set up by merging the former Kigali Free Trade Zone and the Kigali Industrial Park. Phase 1 of the SEZ covers 98 ha with 97 lots, and operations started in 2012. As of 2018, 75% of the lands are operational. The Prime Economic Zone (PEZ) owns lands and functions as developer/operator. The PEZ has investments from the Rwandan insurance companies, banks, and government; however, the share of the government is minor.

Phase 2 covers 178 ha of land and is under construction. In addition to those two phases, Phase 3 is currently being planned.

**Table 3.3.15: Project Outline of Kigali SEZ**

Sector	Industrial development
Executing agency	PEZ
Relevant ministry	RDB, MINICOM
Outline	<ul style="list-style-type: none"> <li>● Phase 2: 178 ha, Phase 3: approx. 200 ha</li> <li>● Infrastructure; <ul style="list-style-type: none"> <li>-Internal road: developed</li> <li>-Utility: Water supply (water tank capacity is 2,500 m<sup>3</sup>), wastewater treatment (plant capacity is 500 m<sup>3</sup>/d), power supply, and fire station</li> </ul> </li> <li>● Industry: mainly light industry, Innovation City Park (ICT), and shopping mall are partially planned in phase 2</li> <li>● Land leasing price: 43,000 RWF/m<sup>2</sup> (=50 USD/m<sup>2</sup>) for 99 years</li> <li>● Employment: 5,000-6,000 people</li> </ul>
Location	Kigali City
Project cost	-
Fund	Private
Current status	Phase 2: Under construction, Phase 3: Planning
Schedule	-

Source: JICA Survey Team



Source: JICA Survey Team

**Figure 3.3.18: Kigali SEZ (left: main road of Phase-1, right: under construction of Phase 2)**

### (10) Kicukiro SME SEZ

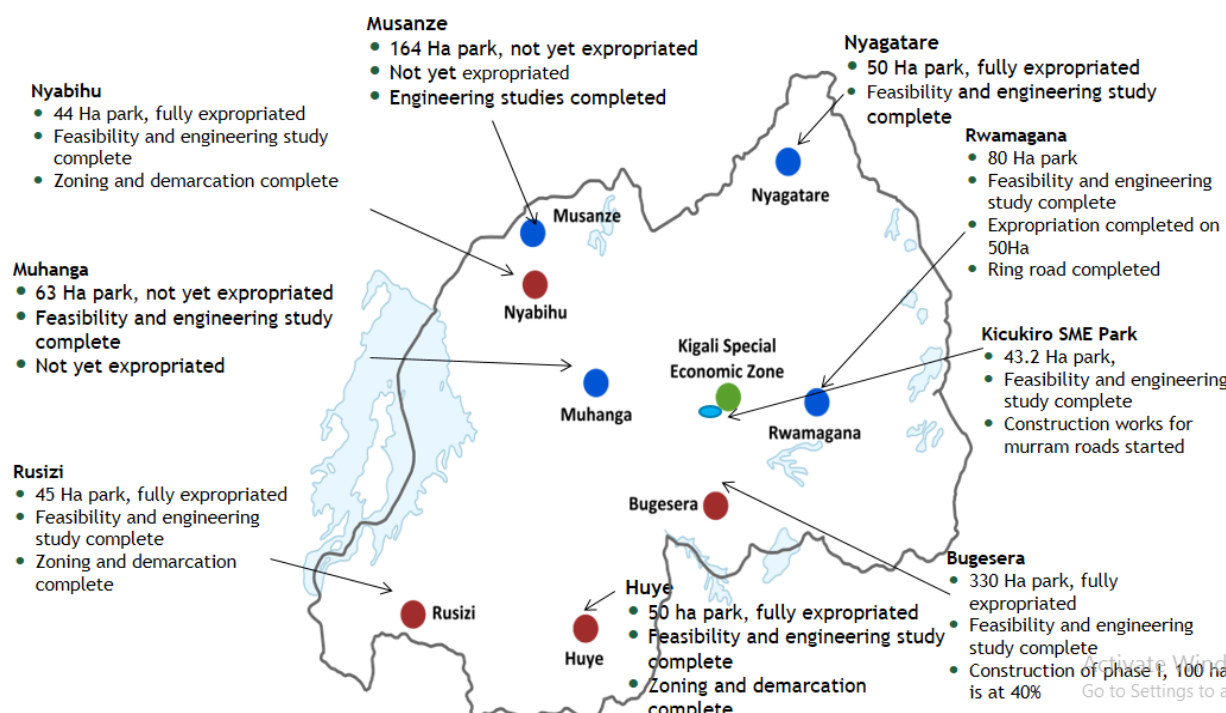
In addition to the existing Kigali SEZ, nine more SEZs (a total of 869 ha of development) are planned to be developed in Rwanda by MININFRA. Kicukiro SME Park is one of them and is planned inside Kigali City. The SEZ is well-placed to cater to the needs of the densely populated area of Kigali City as well as other parts of Rwanda. The park is located close to Kigali International Airport, which enhances its export potential. The park is closer to the skilled population of Kigali and can be utilized as IT/ITES and financial services hub. Currently, the park is fully-booked with industries, and almost 70% of it is operational.

**Table 3.3.16: Project Outline of Kicukiro SME SEZ**

Sector	Industrial Development
Executing agency	MINICOM
Relevant ministry	-
Outline	<ul style="list-style-type: none"> <li>● 43.2 ha</li> <li>● Expected industry: metal, wood, agro-processing, chemical, paper, and textile</li> <li>● Current investor: 12 in metal, palm oil, spirits, and wood</li> </ul>
Location	Kicukiro District
Project cost	Ongoing
Fund	MINICOM
Current status	Under construction
Schedule	Construction work of murram roads started

Source: JICA Survey Team





Source: MINICOM

Figure 3.3.19: Location Map Planned SEZs

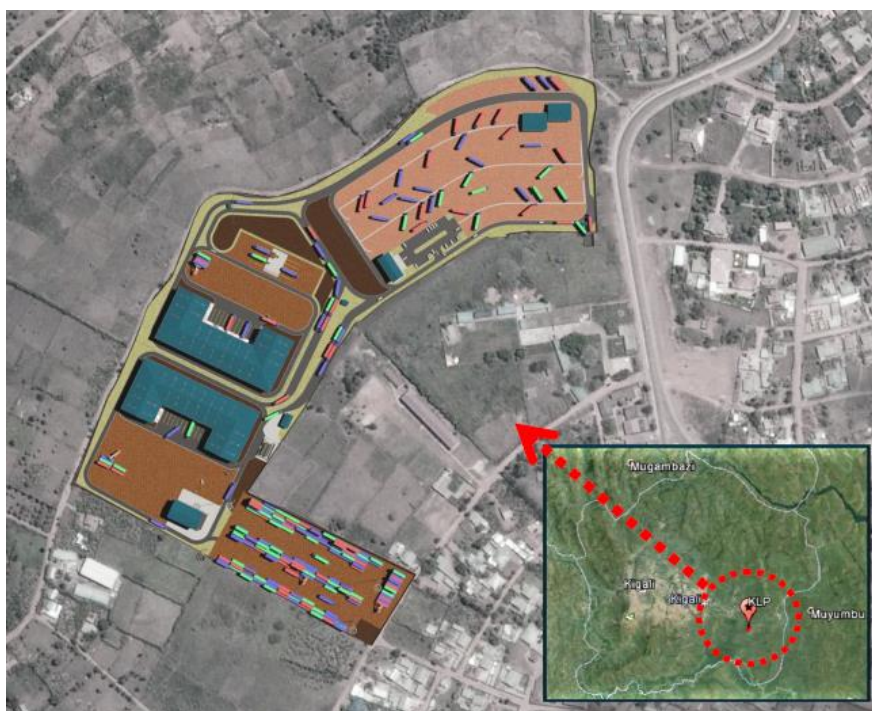
## (11) Kigali Logistics Platform

The Kigali Logistics Platform is a logistics park development project implemented by a Dubai-based company (Dubai Ports World: DP World). DP world has already obtained a commission to develop, construct, operate, and maintain this Kigali Logistics Platform. Since the area is roughly 10 ha, it has a future plan of expanding railway terminal to the area, and a total 50 ha is already reserved. The development area is made up of three parts: i) warehouse area, ii) container depo, and iii) truck parking. The Kigali Logistics Platform handles cargos from both the Port of Mombasa in Kenya and the Port of Dar es Salaam in Tanzania.

Table 3.3.17: Project Outline of Kigali Logistic Platform

Sector	Industrial development
Executing agency	DP World
Relevant ministry	MINICOM
Outline	<ul style="list-style-type: none"> <li>9.7 ha as initial phase</li> <li>0.29 ha is ensured as future development</li> <li>Land use: container yard, warehouse and track parking</li> </ul>
Location	Masaka in Kigali City
Project cost	-
Fund	Private
Current status	Under construction
Schedule	Two years are estimated for engineering and construction

Source: JICA Survey Team



Source: DP World

**Figure 3.3.20: Location of Kigali Logistics Platform**

## (12) Affordable Housing Development

In Rwanda, Rwanda Housing Authority (RHA) is a public institution under the MININFRA which started its operation in December 2010. The main missions of this authority are to organize the construction of industries and to spur economic development and poverty reduction. In accordance with this mission, RHA implements affordable housing development projects in Rwanda. In Kigali City, a total of 11,829 housing units of affordable housings are planned to be provided. The brief outline of the projects including its status is summarized below.

**Table 3.3.18: Project Outline of Affordable Housing Development in Kigali**

Sector	Housing Development
Executing agency	RHA
Relevant ministry	-
Outline	● As total 11,829 housing units (details are shown in the next table)
Location	Kigali City
Project cost	-
Fund	GoR
Current status	DD/CS
Schedule	Depends on the project

Source: JICA Survey Team

**Table 3.3.19: Project Component of Affordable Housing Development in Kigali**

Project Location (Stakeholder)	Plot Size (ha)	Housing Unit	Current Status
Kinyinya Low Cost Housing (URUKUMBUZI Company)	45	1,000	<ul style="list-style-type: none"> <li>● 250 single houses of 3-BHK have been completed</li> </ul>
RUGARAMA (City of Kigali)	58.5	2,743	<ul style="list-style-type: none"> <li>● Designs completed</li> <li>● Looking for a developers/partners to carry out affordable housing construction works</li> </ul>
KABUGA Affordable Housing Project (Abadahigwa Kuntego)	2	86	<ul style="list-style-type: none"> <li>● 32 houses were completed</li> <li>● Basic infrastructures have been provided to the site</li> <li>● More 54 affordable houses are to be built and completed in 2019</li> </ul>
NDERA Affordable Housing Project (Morrocan Investors)	22	2,000	<ul style="list-style-type: none"> <li>● Designs completed</li> <li>● Construction works of 2,000 affordable houses to start in September 2018</li> </ul>
BUSANZA Affordable Housing Project (GCI)	27	2,000	<ul style="list-style-type: none"> <li>● Designs completed</li> <li>● Construction works of 780 Affordable houses expected to start in July 2018</li> </ul>
KINYINYA Affordable Housing Project (IFC+RSSB)	-	2,000	<ul style="list-style-type: none"> <li>● Designs and feasibility study completed,</li> <li>● Construction of Factory for pre-fabricated materials that will be used to construct 2,000 affordable houses is ongoing</li> </ul>
Gasogi Affordable Housing Project (RSSB+HORIZON)	-	2,000	<ul style="list-style-type: none"> <li>● Designs completed, construction works to start in January 2019</li> </ul>
		<b>11,829</b>	

Source: RHA

## Chapter 4: Responsible Organization and Related Laws/Regulations

### 4.1 Responsible Organizations

#### 4.1.1 Ministry of Infrastructure (MININFRA)

The Ministry of Infrastructure was initially established in 1962 as the Ministry for Technical Businesses. In 1965, the Ministry of Public Services also included energy and water. In 1999, it included transport and communication under the name of the Ministry of Public Service, Transport and Communication (MINITRACO). On 15 November 2002, MINITRACO was changed to establish the Ministry of Infrastructure (MININFRA).<sup>1</sup>

MININFRA has the following missions and purposes:

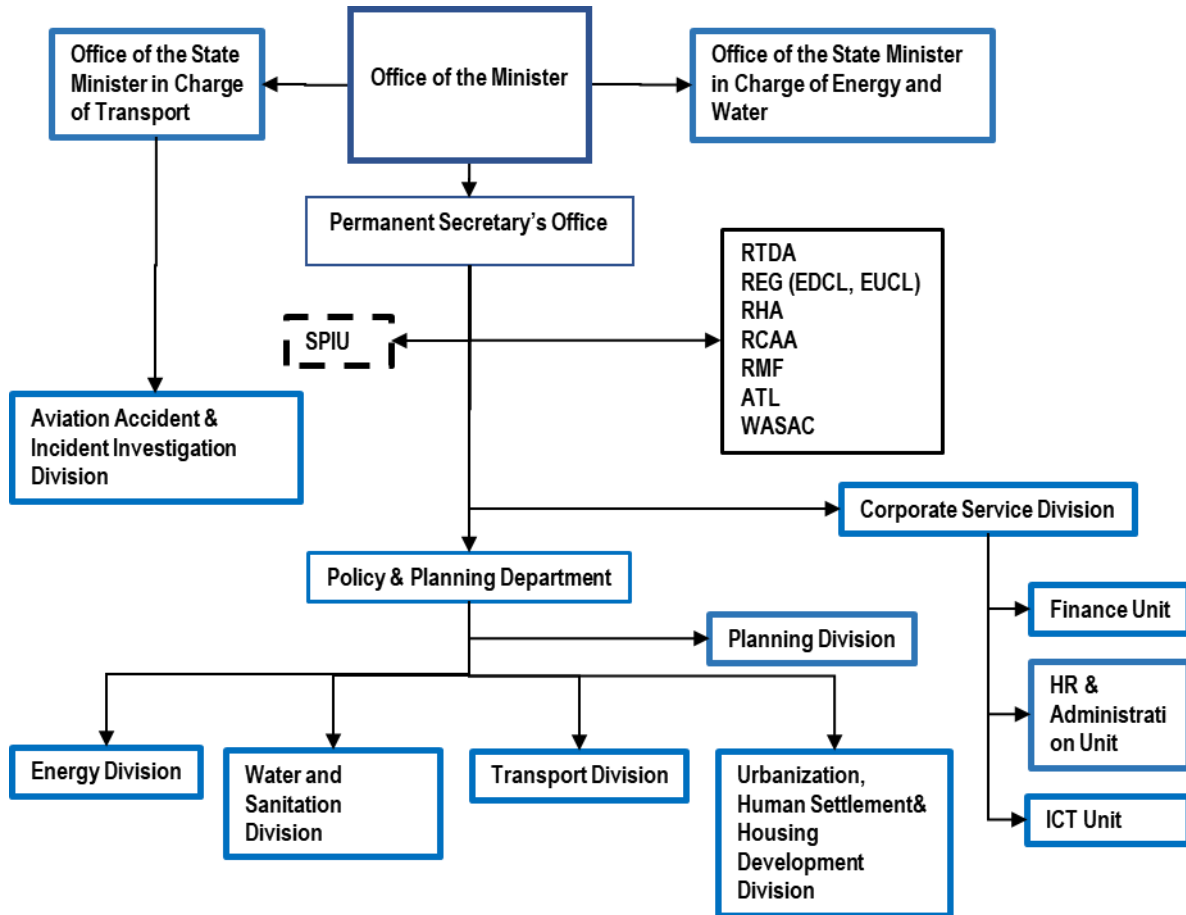
- To initiate programs to develop, rehabilitate, and maintain an efficient and integrated national transport infrastructure network, including roads, bridges, airports, railways, and water transportation, which will contribute towards economic development and regional integration;
- To initiate, develop, and maintain sustainable power generation facilities to supply clean, cost-effective, and uninterrupted energy for the country and the region;
- To initiate, develop, and facilitate urban development programs with a view to providing affordable shelter with due regard to adequate water and sanitation facilities for the population and promote grouped settlement (*Imidugudu*);
- To initiate programs aimed at increasing access to affordable energy, water, and sanitation, and transport infrastructure and related services for the population;
- To ensure that the development of policies and strategies concerning national infrastructure is in line with regional integration and harmonization policies with the EAC;
- To supervise the implementation of quality standards and norms, cost effectiveness, response to environmental sustainability, safety and cross-cutting issues in infrastructure development;
- To supervise activities meant to elaborate, monitor, and assess the implementation of national policies and programs on matters relating to habitat, urbanism, transport, energy, water, and sanitation;
- To support and supervise infrastructure development programs under the decentralized structures of respective subsectors as per the District Development Programs in each district;
- To orient and supervise the functioning and management of public institutions, agencies, and companies under the Ministry of Infrastructure including existing agencies such as Road Maintenance Fund (RMF), Rwanda Civil Aviation Authority (RCAA), Rwanda Energy Group (REG) (Energy Development Company Ltd. (EDCL)

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<sup>1</sup> <http://www.mininfra.gov.rw/index.php?id=24>

and Energy Utility Company Ltd (EUCL)), Water and Sanitation Corporation Ltd (WASAC), Rwanda Transport Development Agency (RTDA), Rwanda Housing Authority (RHA), RwandAir, and other agencies to be formed under its subsectors; and

- To facilitate, promote, and engage the private sector to invest in infrastructure.



Sources: MININFRA

Figure 4.1.1: Organization Structure of MININFRA<sup>2</sup>

There are 86 persons working in MININFRA. Other than the Minister, there are also State Minister in-charge of Transport and State Minister in-charge of Energy and Water who are under the Permanent Secretary. There is the Policy and Planning Department consisting of four technical divisions structured as follows: Energy Division; Water and Sanitation; Transport; and Urbanization, Human Settlement and Housing. The Corporate Service Division is an administration division that includes the Information and Communications Technology (ICT) Unit which supervises the computer network and the website of MININFRA. There is no independent organization unit or person in-charge of railways or inland water transport.

Among many functions, “policy making” and “project monitoring” are the major functions. Based on the national policies such as the Second Economic Development and Poverty Reduction Strategy for 2013-2018 (EDPRS-2) and now, the National Strategies for Transformation (NST 1), projects are selected; budgets are allocated; and progresses are

<sup>2</sup> The institutions indicated with black borders are institutions outside of MININFRA. The contents of the SPIU changes depending on projects; therefore, the figure is indicated with a broken line. The person in-charge is stationed in RTDA at present.

monitored. Coordinating with donor agencies is also an important task. The implementation bodies of MININFRA are: RTDA, REG (EDCL, EUCL), RHA, RCAA, RMF, Aviation Travel and Logistics Holding Ltd (ATL), and WASAC with Single Project Implementation Unit (SPIU).

**Table 4.1.1: Staffing of MININFRA**

Organization Unit	Position	No
Office of the Minister	Minister	1
	Advisor to the Minister	2
	Investment Liaison Specialist	1
	Administrative Assistant	1
	Internal Auditor	1
Office of the State Minister in-charge of Transport	Minister of State	1
	Advisor to the Minister of State	1
	Administrative Assistant	1
Office of the State Minister in-charge of Energy and Water	Minister of State	1
	Advisor to the Minister	1
	Administrative Assistant	1
Permanent Secretary's Office	Permanent Secretary	1
	Legal Advisor	2
	Administrative Assistant	1
	Public Relation and Communication Officer	2
	Administrative Liaison Officer	1
Aviation Accident and Incident Investigation Division	Division Manager	1
	Air Traffic Management and Communication Navigation Surveillance Investigation Analyst	1
	Air Worthiness Investigation Specialist	1
	Flight Operations Investigation Specialist	1
Policy Planning Department	Head of Department	1
	Environmental Specialist	1
	Administrative Assistant	1
Planning Division	Division Manager	1
	Planning Specialist	1
	M&E(Monitoring & Evaluation) Specialist	4
	GIS and Remote Sensing Specialist	1
	Sector and External Link Specialist	2
Energy Division	Division Manager	1
	Power Systems Planner Senior Engineer	1
	Power Transmission and Distribution Senior Engineer	1
	Renewable Energy Senior Engineer	1
	Fossil Energy Senior Engineer	1
	Energy Efficiency Senior Engineer	1
Water and Sanitation Division	Division Manager	1
	Urban Water Supply Senior Engineer	1
	Rural Water Supply Senior Engineer	1
	Sanitation Senior Engineer	1
	Water and Sanitation Economist	1
Transport Division	Division Manager	1
	Transport Planning Principal Engineer	1
	Public Transport Senior Engineer	1
	Transport Economist	1
	Freight Transport and Logistics Senior Engineer	1
	Safety and Licensing Compliance Senior Engineer	1
	Road Asset Management Senior Engineer	1
	Air Transport Senior Engineer	1
	Fleet Management Senior Engineer	1
Fleet Registration and Management Officer	1	
Urbanization, Human Settlement and Housing Development Division	Division Manager	1
	Housing Development and Building Safety Senior Engineer	1
	Affordable and Social Housing Senior Engineer	1
	Physical Planning Senior Engineer	1

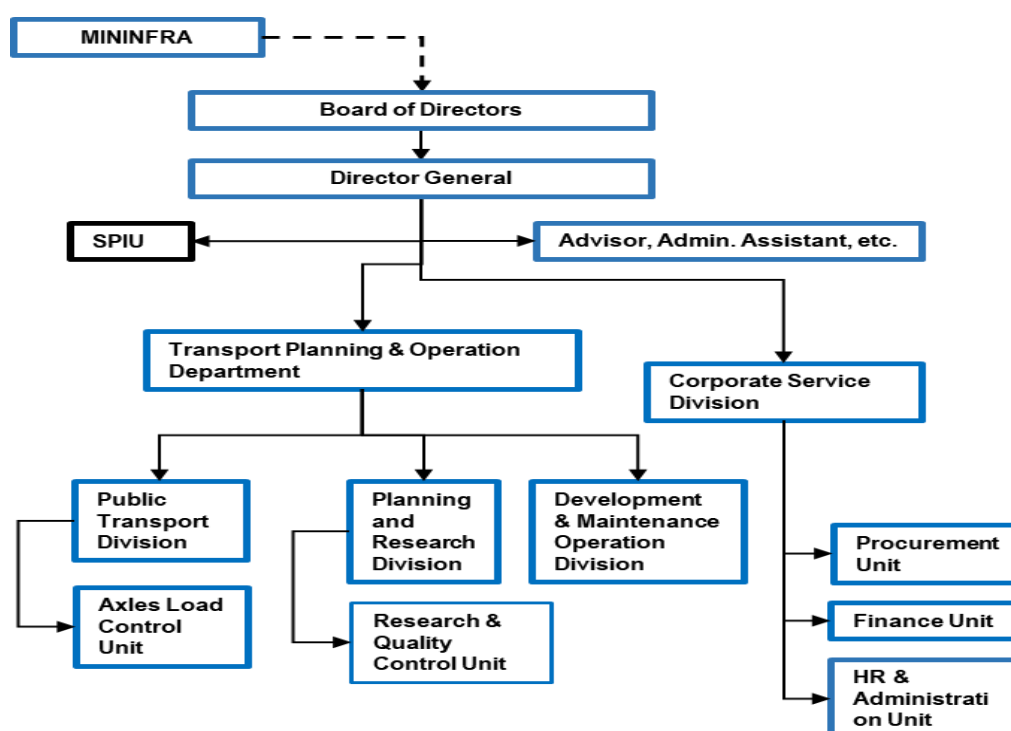
	Urbanization and Housing Economist	1
	Social Development Planning Specialist	1
	Urbanization Liaison and Monitoring Specialist	1
	Physical Planning Auditor Specialist	1
	Urban and Rural Settlement Senior Engineer	1
Corporate Service Division	Division Manager	1
	Procurement Officer	2
Finance Unit	Director	1
	Secretariat to the Unit	1
	Accountant	2
	Budget Officer	1
HR and Administration	Director	1
	Human Resource Officer	1
	Logistics Officer	1
	Customer Care Officer	1
	Documentation and Archives	1
	Head of Central Secretariat	1
	Secretary in Central	1
	Secretariat	2
ICT Unit	Director	1
	Network and System Administrator	1
	Database and Application Administrator	1
	Information Management Specialist	1
		86

Sources: MININFRA

#### 4.1.2 Rwanda Transport Development Authority (RTDA)

The Rwanda Transport Development Authority (RTDA) was created in 2010 as an implementing body in the transport sector by an organic Law No. 29/2014 of 14/08/2014 modifying and completing Law No. 02/2010 of 20/01/2010.<sup>3</sup> The major functions of RTDA are<sup>4</sup>:

- a) Develop, coordinate, and monitor transport development projects;
- b) Coordinate and monitor maintenance projects;
- c) Safeguard environment protection while implementing transport;
- d) Development activities; and
- e) Research in transport development.



Sources: RTDA<sup>5</sup>

Figure 4.1.2: Organization Structure of RTDA<sup>6</sup>

The Transport Planning and Operation Department is placed under the Director General. Under Transport Planning and Operation Department, there are three divisions, i.e.: Public Transport; Planning and Research; and Development and Maintenance Operation Division. Excluding drivers, there are 50 employees in RTDA.

<sup>3</sup>(2017). Annual Report 2016-2017. R. T. D. Agency. Kigali, Rwanda.

<sup>4</sup> Ibid.

<sup>5</sup>

[http://www.rtda.gov.rw/fileadmin/templates/documents/RTDA\\_Organizational\\_Structure\\_Official\\_Gazette\\_no\\_Special\\_Bis\\_of\\_28.02.2015.pdf](http://www.rtda.gov.rw/fileadmin/templates/documents/RTDA_Organizational_Structure_Official_Gazette_no_Special_Bis_of_28.02.2015.pdf)

<sup>6</sup> The contents of the Single Project Implementation Unit change; therefore, the rectangle in the figure is indicated in black. The person in-charge is stationed in RTDA; therefore, the solid line is used.



**Table 4.1.2: Staffing of RTDA**

Organization Unit	Position	No
Director General	Director General	1
Advisor, Admin. Assistant, etc.	Advisor	1
	Administrative Assistant	1
	Public Relations and Communication Officer	1
	Internal Auditor	1
	M&E Specialist	1
	Legal Affairs Officer	1
	Administrative Liaison Officer	1
Transport Planning and Operations Department	Head of Department	1
	Administrative Assistant	1
Public Transport Division	Division Manager	1
	Integrated Public Transport Senior Engineer	1
	Traffic Management Specialist	1
	Transport Networking and Planning Senior Engineer	2
Axles Load Control Unit	Director of Unit	1
	Axle Load Control Engineer	2
Planning and Research Division	Division Manager	1
	Road Design and Construction Senior Engineer	1
	Railway and Cable Car Development Senior Engineer	1
	Inland and Waterways Development Senior Engineer	1
	Environment Specialist	1
	Transport Economy Specialist	1
	Social Scientist Specialist	1
Research and Quality Control Unit	Director of Unit	1
	Quality Assurance Senior Engineer	1
	Quality Control Technicians	2
Development and Maintenance Operation Division	Division Manager	1
	Maintenance Programming Senior Engineer	2
	Maintenance/Asset Management Senior Engineer	1
	Direct Support, M&E and Training Senior Engineer	1
	Inspection and Emergency Management Senior Engineer	1
Corporate Services	Division Manager	1
Procurement Unit	Director	1
	Procurement Officer	1
Finance Unit	Director	1
	Accountant	1
	Budget Officer	1
	Secretary	1
HR and Administration Unit	Director	1
	HR Officer	1
	Logistics Officer	1
	Database and Application Administrator	1
	Network and System Administrator	1
	Documentation and Archives Officer	1
	Head of Central Secretariat	1
	Secretary in Central Secretariat	1
	Driver	4
Total		54

Source: RTDA

The SPIU consists of the staff shown in Table 4.1.3.

**Table 4.1.3: Members of the Single Project Implementation Unit**

Position	Number
Feeder Roads Program Manager	1
Feeder Roads Specialists	4
M&E(Monitoring & Evaluation) Specialist	1
Social Safeguard Specialist	3
Environmental Safeguard Specialist	2
Procurement Specialist	1
Contract Management Specialist	1
GIS and Mapping Specialist	1
Financial Specialist	1
Accountant	1
CDO (LCAs)	1
Technical Advisor	1
Technical Advisor / Procurement- Contract Administration	1

Source: RTDA

RTDA has road location data, road condition data, traffic data, and bridge data. The road data has the national roads (paved and unpaved), district roads class 1, feeder roads, starting and end points, and land marks.<sup>7</sup> The road condition data are acquired once a year. Traffic counts are manually conducted on national roads and district roads. The bridge data are organized in spreadsheet. Project data and information are organized using Excel. An annual report was prepared for the year 2016/2017, but the previous versions were not available.

### **4.1.3 City of Kigali (CoK)**

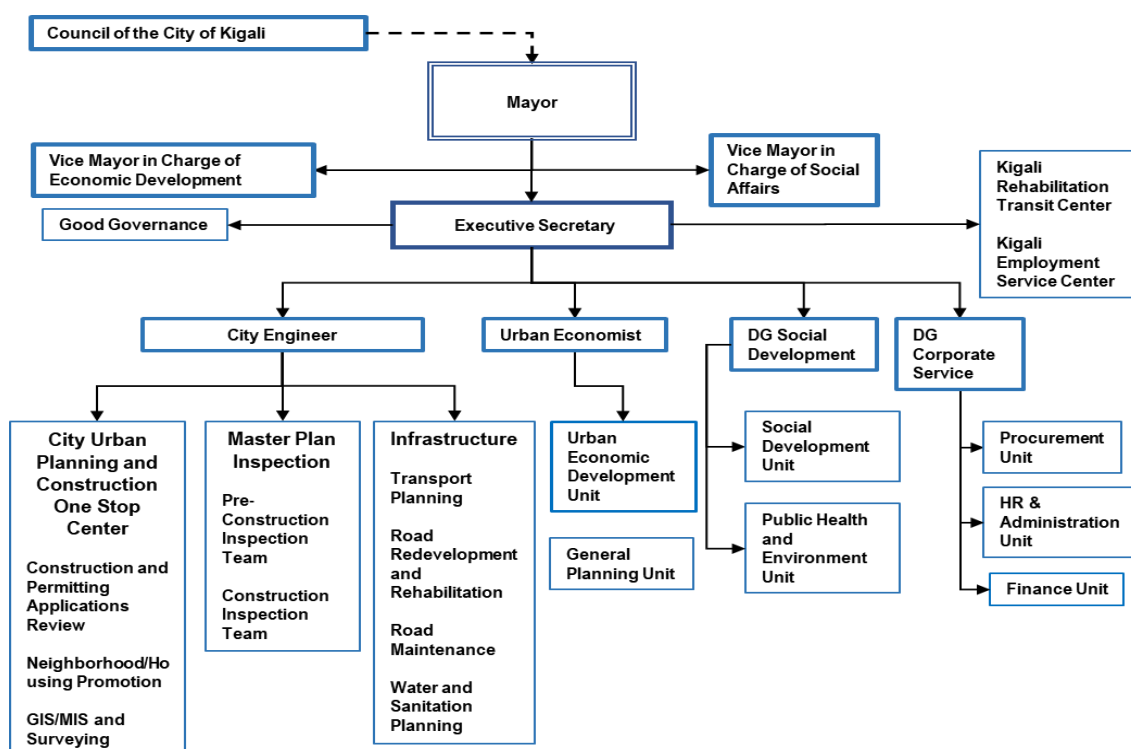
The decision-making body is the Council of CoK. The Mayor of CoK has the highest position in the executive branch. Under the Mayor, there is an Executive Secretary. Under the Executive Secretary, the City Engineer, Urban Economist, DG Social Development and DG Corporate Services are assigned.

There are 135 employees in CoK. Excluding the number of drivers and on-transfer, the total number becomes 129. In a city with a population of over one million, the number of city employees is very low. In May 2018, the positions of Executive Secretary, City Engineer, DG Corporate Service and Waste Management and Environment Officer under the Water and Sanitation Planning in the Infrastructure Unit were vacant.

The City Urban Planning and Construction One Stop Center has the function of issuing construction permit and application review. It has the Geographic Information System (GIS) Unit that has road network data and land parcel data. The Master Plan Inspection Division conducts urban control operations. The Infrastructure Division has four units: Transport Planning; Road Redevelopment and Rehabilitation; Road Maintenance; and Waste and Sanitation Planning. Infrastructure Division has the largest number of employees as it manages the allocation of funds for maintaining roads and road facilities.

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<sup>7</sup> RAMSMP Version 3-0, p20.



Sources: Human Resource Unit, CoK, Edited by the JICA Study Team

**Figure 4.1.3: Organization Structure of the City of Kigali**

**Table 4.1.4: Number of City Employees by Section**

Organization Name	Section Name	No
Executive Committee		7
Executive Secretary		2
Good Governance Unit		3
Kigali City Council		5
Subtotal		17
Urban Economist Directorate	Planning Unit	5
	Urban Economic Development Unit	7
Subtotal		12
DG Social Development	Social Development Directorate	1
	Social Development Unit	5
	Public Health and Environment Unit	5
Subtotal		11
DG Corporate Service	Corporate Services	1
	Finance	6
	Human Resource and Administration Unit	17
	Procurement Unit	4
Subtotal		28
Kigali Employment Service Center		6
City Engineer General Directorate	Infrastructure Unit	15
	City Urban Planning and Construction One Stop Center	30
Subtotal		45
	Driver or on-transfer	16
Total		135

Note: The number of City Urban Planning and Construction One Stop Center includes the Master Plan Inspection since there was no distinction in the list of human resources.

#### 4.1.4 Road Maintenance Fund (RMF)

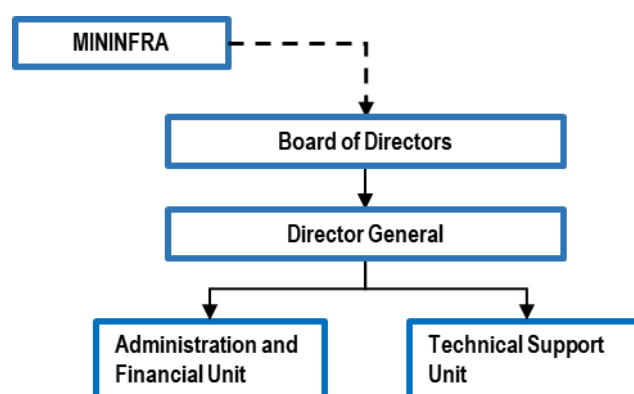
##### (1) Introduction

The Road Maintenance Fund (RMF) is a public institution established by Law No. 49/2013 of 28/06/2013 and Law No. 12bis/2014 of 19/05/2014 modifying and completing Law No. 49/2013.<sup>8</sup>

RMF is responsible for funds for the maintenance of the national, district, and Kigali City roads. The funds are distributed to RTDA, 30 districts, and CoK. The road maintenance has five categories, namely: 1) reconstruction works; 2) rehabilitation works; 3) periodic maintenance; 4) routine maintenance; and 5) emergency maintenance. The reconstruction and rehabilitation works are considered and covered by the development budget of MININFRA while the other three, i.e., periodic maintenance, routine maintenance, and emergency maintenance, are covered by the recurrent budget of RMF. The sources of RMF are as follows:<sup>9</sup>

- a) State budget allocation;
- b) State or partners' subsidies;
- c) Funds from activities performed by RMF;
- d) Proceeds from its property;
- e) Road user charge levied on gas, oil, and petrol;
- f) Road toll levied on foreign registered vehicles;
- g) Compensation for damages caused to the national road network;
- h) Loans to RMF approved by the Minister in-charge of Finance;
- i) Donation and bequests; and
- j) Property formerly owned by FER (RMF).

The structure of RMF consists of the Board of Directors, Director General, Administration and Financial Unit, and Technical Support Unit.



Source: Road Maintenance Fund

**Figure 4.1.4: Organization Structure of RMF**

The total number of employees is 13 as shown in Table 4.1.5.

<sup>8</sup> RMF Annual Progress Report Period: 1<sup>st</sup> July 2015-30<sup>th</sup> June 2016, p.3.

<sup>9</sup> Ibid. p.5.

**Table 4.1.5: Organization Structure of RMF**

Unit	Post	No
	Director General	1
	Administrative Assistant	1
	Internal Auditor	1
	Procurement Officer	1
	Legal Affairs	1
Administration and Financial Unit	Director	1
	Accountant	2
	ICT Officer	1
	HR Officer	1
Technical Support Unit	Director	1
	District Roads M&E Engineer	1
	National Road M&E Engineer	1

Source: Road Maintenance Fund

RMF issues the annual reports that include the budget for the fiscal year and achievement. The total budget for the year 2015/2016 was RWF 33 billion. The execution was about RWF 39 billion achieving the budget execution rate of 116.87%.<sup>10</sup>

## 1) Operation Framework

RMF is a public institution established in 1998 to ensure collection and funding for the maintenance of road networks in Rwanda.

RMF carries out payment for road maintenance activities, monitoring, and technical as well as financial audits. RMF ensures funding of road maintenance on the basis of an annual program of activities prepared by RTDA, CoK, and the district authorities.

The responsible authorities for the maintenance of classified road are shown below.

**Table 4.1.6: Responsible Authorities for Classified Road**

Classified Roads	Responsible Authorities
National Roads (NR)	Rwanda Transport Development Agency (RTDA)
District Roads (DR)	Individual Executive Committee of 30 districts
CoK Roads	CoK Council

Source: RMF Annual Report

## 2) Road Sector Financing

In usual circumstances, RMF finances emergency works, routine maintenance (comprising routine and recurrent maintenance), and periodic maintenance. Rehabilitation works and reconstruction works are financed by the development budget of MININFRA.

The distribution scheme between the development and recurrent budgets is shown below.

<sup>10</sup> Ibid. p.12.

Maintenance categories	Budget allocation
Reconstruction works	Development Budget
Rehabilitation works	
Periodic Maintenance	MININFRA
Routine maintenance	
Emergency Maintenance	
	RMF
	Recurrent Budget

Source: RMF Annual Progress Report Period: 1 July 2016 – 30 June 2017

Figure 4.1.5: Distribution Scheme between Development and Recurrent Budgets

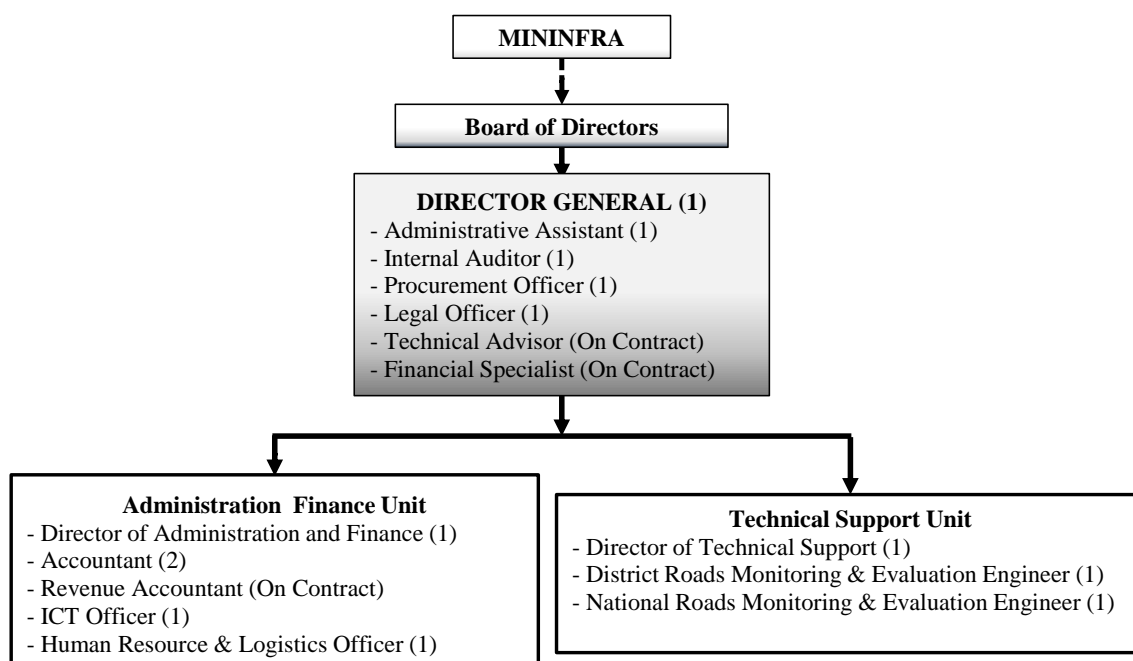
### 3) RMF Financial Resources

The current revenues of RMF are derived from petrol and diesel levy, which is about 72% of the revenues, while the road toll (based on COMESA regulations) is charged on foreign heavy vehicles (28% of fund revenues).

Revenues from fuel levy and road toll levied on foreign registered vehicles are collected by the Rwanda Revenue Authority (RRA) and transferred into the RMF account held in the Central Bank of Rwanda (BNR).

### 4) Organizational Structure

RMF is administered by a Board of Directors and is headed by a Director General being the secretary of the Board of Directors.



Source: RMF Annual Progress Report Period: 1 July 2016 – 30 June 2017

Figure 4.1.6: RMF Organizational Structure

## (2) Achievement of RMF

The planned budget and disbursed amount on each fiscal year since 2012/13 are shown in Table 4.1.7 below.

**Table 4.1.7: RMF Achievement of Each Fiscal Year**

Year	Planned Budget (RWF)	Disbursed Amount	
		City of Kigali Project (RWF)	Total Amount (All Projects) (RWF)
2012/13	-	9,023,668,464	<b>18,829,861,844</b>
2013/14	26,700,000,000	6,812,886,141	<b>24,777,554,519</b>
2014/15	31,996,000,000	12,191,914,076	<b>32,111,743,977</b>
2015/16	33,000,035,000	11,431,927,674	<b>38,567,821,013</b>
2016/17	39,370,406,205	16,464,987,416	<b>42,324,278,744</b>
2017/18	43,000,000,000	-	-

Source: RMF Annual Progress Report

### 4.1.5 Rwanda Development Board (RDB)

The Rwanda Development Board is a gateway to invest in Rwanda. RDB is organized into three thematic functions, i.e.: crosscutting departments; strategy and support; and economic clusters. Under each functional organization, the organizational units are subdivided further.

**Table 4.1.8: Organization Structure of RDB**

Crosscutting Departments	Economic Clusters	Strategy and Support
<ul style="list-style-type: none"> <li>• Investment Promotion</li> <li>• Office of Registrar General</li> <li>• Strategic Investment</li> <li>• Special Economic Zone and Export Department</li> <li>• Competitiveness and Business Communication</li> </ul>	<ul style="list-style-type: none"> <li>• ICT Business Development</li> <li>• Tourism and Conservations</li> </ul>	<ul style="list-style-type: none"> <li>• Administration</li> <li>• Finance</li> <li>• Planning</li> <li>• Procurement</li> <li>• IT Operation</li> </ul>

Source: RDB

The investment opportunities listed are in the areas of: energy; manufacturing; infrastructure; mining; ICT; real estate and construction; tourism; agriculture; financial services; health; and education. The one-stop center provides registration information and assistance in business registration, environmental impact assessment (EIA) registration, and visa.

### 4.1.6 Rwanda National Police (RNP)<sup>11</sup>

There are 15 departments in Rwanda National Police, namely: Department of Command and Coordination; Department of Information Technology and Cybercrime Investigations; Department of Crime Intelligence; Department of Human Resource Management and Development; Department of Peace Support Operations; Department of Operations and Public Order; Department of Community Policing; Department of Inspectorate of Police Services and Ethics; Department of Public Relations and Media; Department of Private Security Service Providers; Department of Training, Research and Development; Department of Finance; Department of Police Logistics; Department of Traffic Police and Road Safety; and Department of Counter-terrorism.

<sup>11</sup> <https://www.police.gov.rw/home/> 2018/07

Among them, the Department of Traffic Police and Road Safety has been working for traffic control operations in CoK. Traffic accident data and information are available since 2013. The Department of Command and Coordination monitors images from closed-circuit television (CCTVs) installed mainly at intersections. Currently, there are about 190 CCTVs in operation.

#### **4.1.7 Rwanda Utility and Regulatory Authority (RURA)**

The Rwanda Utility and Regulatory Authority (RURA) was created by the Prime Minister's Order No. 89/03 of 11/09/2014. The purpose of the authority is to determine the modalities of which ministries in-charge of regulated sectors shall coordinate their activities with RURA, in the implementation of their respective mandate.<sup>12</sup>

RURA covers the sectors of ICT; radiation protection; energy; water and sanitation; transport; consumer affairs; and media center. Among these, the division for the transport sector issues licenses for passenger transport companies and cooperatives of public bus, motorcycles, car rentals, and taxicabs.

**Table 4.1.9: Number of Licensed Passenger Transport Company**

Category of Licensee	Q3 2017	Q4 2017	Q1 2018
Public bus and mini bus companies and cooperatives	46	46	48
Motorcycle companies and cooperatives	147	147	147
Car rental companies	29	29	27
Taxicab companies and cooperatives	55	55	50

Source: RURA database, RURA, Transport Statistics Report, as of March 2018

The number of fleets is managed using the database of RURA.

**Table 4.1.10: Number of Fleets of Licensed Company**

Category of Licensee	Q3 2017	Q4 2017	Q1 2018
Public bus and mini bus companies and cooperatives	3,691	3,617	3,648
Motorcycle companies and cooperatives	31,050	31,242	32,230
Car rental companies	481	470	531
Taxicab companies and cooperatives	1,257	1,313	1,298

Source: RURA database, RURA, Transport Statistics Report, as of March 2018

There are 89 driving schools nationwide. The operation is licensed also by RURA. It licenses the waterway transport operators. There are 294 operators mainly concentrated in Kivu with 213 operators.

#### **4.1.8 Rwanda ICT Chamber**

The ICT Chamber is the youngest member of the Private Sector Federation (PSF). More specifically, the Rwanda ICT Chamber brings together ICT associations, businesses, groups, and individuals into a community where they can share ideas on how to promote and develop Rwanda ICT and ICT-enabled Industries.<sup>13</sup>

It has the mission of "Making Rwanda the Leading ICT-Driven Society" and the vision "To be the leader in influencing the transformation of the economy and culture through ICT. These are:

- a) Creating career paths through skills development, especially among the youth;

<sup>12</sup> Official Gazette No. 38 of 22/09/2014, p.14.

<sup>13</sup> <http://www.ict.rw/about.html>, 2018/06/04



- b) Stimulating entrepreneurship and competitiveness;
- c) Driving and protecting investments and innovation;
- d) Promoting export of ICT products and services; and
- e) Becoming the arbitrator of the ICT sector.

Among the 170 major members, some are listed on the website of ICT Chamber.

**Table 4.1.11: Members of ICT Chamber**

Type	Company Name	Link
ICT Solutions Associations	Dimension Data	<a href="https://www.dimensiondata.com/en/">https://www.dimensiondata.com/en/</a>
The iHills (Young ICT Entrepreneur)	ArtSoft Ltd.	<a href="https://rwandaguide.info/place-details/aurasoft-ltd">https://rwandaguide.info/place-details/aurasoft-ltd</a>
The iHills (Young ICT Entrepreneur)	Techware Solutions Rwanda Ltd.	<a href="http://rw.wowcity.com/kigali/gpid/110551741342887508470/techware-solutions-rwanda-ltd.htm">http://rw.wowcity.com/kigali/gpid/110551741342887508470/techware-solutions-rwanda-ltd.htm</a>
Telecoms and ISPS Association	Artel	<a href="http://africa.airtel.com/wps/wcm/connect/africarevamp/Rwanda/Home/">http://africa.airtel.com/wps/wcm/connect/africarevamp/Rwanda/Home/</a>
Telecoms and ISPS Association	Tigo	
Telecoms and ISPS Association	Altech Stream Rwanda	
Telecoms and ISPS Association	ISPA	<a href="http://www.ispa.rw/">http://www.ispa.rw/</a>
Telecoms and ISPS Association	Airtel Rwanda	
Telecoms and ISPS Association	MTN Rwanda	
Software Development Association	iLogics	
Software Development Association	Ishyiga Software	<a href="http://www.ishyiga.net/">http://www.ishyiga.net/</a>
Software Development Association	AXIS	<a href="http://www.rwanda-rwanda.com/software-rwanda-rwanda.html#.WxTexkjRCUk">http://www.rwanda-rwanda.com/software-rwanda-rwanda.html#.WxTexkjRCUk</a>
Software Development Association	Craft Silicon	<a href="https://www.craftsilicon.com/">https://www.craftsilicon.com/</a>

ISPS: internet service providers  
Source: ICT Chamber Web Site

### 4.1.9 RFTC and RITCO

The Rwanda Federation of Transport Cooperatives (RFTC) was established in 2013. Its former entity was Association of Transport Companies (ATRACO), a commuter transportation association established in 1996. After the genocide, individual drivers and bus owners established the association, and afterwards established a cooperative. RFTC was formed with 12 cooperatives and four unions in 2013. It is one of the three large bus companies operating in Kigali. The other two bus companies are Royal Bus Company and Kigali Bus Service (KBS). Since RFTC was a bus operation company, other activities were limited by the corporate law. Thus, RFTC established a holding company called JALI Holdings. Three subsidiary companies were created, namely: JALI Transport Company, JALI Real Estate, and JALI Microfinance.

JALI Transport Company is the execution unit that runs the bus operation of RFTC. JALI Transport Company employs 542 drivers and is managed by 40 administration staff. Large-sized buses with a capacity of 71 persons (sitting and standing seats combined) operate in the area of zones 3 and 4 in Kigali. There are 20 large buses, 181 mid-sized buses with a capacity of 29 persons, and 13 small to mid-sized buses with a capacity of 18 persons operating in the city in 30 routes.

JALI Transport has a hierarchical managing structure. Under the Managing Director, there are zone inspectors. Under the zone inspectors, there are route supervisors. A route supervisor generally manages 20 to 34 buses depending on the routes.

JALI Real Estate Company invests in bus parks and 80% of the bus parks of Rwanda are under the possession of JALI Real Estate Company.

Every quarter, the Kigali Steering Committee discusses policies of public transportation, regulation, operation needs, service, etc. The committee is chaired by the Minister in-charge of Transport and members are from RURA, MININFRA, CoK, districts (mayors), public transport operating companies, traffic police, and cashless service provider.

The challenges of transportation in Kigali from the viewpoint of the private company are: (1) development of bus exclusive lanes; (2) pavement (upgrade); and (3) traffic congestion management. Especially, traffic congestion seriously affects the operators running at a slow speed where buses consume more fuel. The slow-speed operation reduces profitability at the same time loses comfort for the passengers. The slow-speed operation damages the gears and engines. At the same time, because of the spatial distribution of facilities such as schools and commercial establishments, the peak-hour operation tends to be in one direction that forces the buses to operate almost empty on the other direction during the same period.

The bus company is operating using ICT. It started with cashless service, WiFi, and installation of speed governors. On-demand arrangement of dispatches would be the future ICT application.

Rwanda Interlink Transport Company Limited (RITCO) is a public-private owned transporter servicing the urban and rural areas. The former public transport service entity was the *Office National des Transports en commune* (ONATRACOM). The public institution was experiencing operational debt. In June 2013, MININFRA proposed a joint venture company with RFTC. JALI Transportation acquired 48% of stocks, and became the operator of RITCO.

#### 4.1.10 Issues on Organizations

The JICA Survey Team conducted a Working Group (WG) meeting on 28 May 2018, and invited members from MININFRA, RTDA, CoK, RURA, and RNP. In the WG meeting, discussions were held based on the issues presented with regard to urban transport sector in CoK. CoK conducted a SWOT analysis while developing the Kigali City Development Strategy (2018-2024). The opinions therein vary. The Public Transport Policy and Strategy for Rwanda was developed in October 2012, which summarized the transport sector issues in CoK as it focuses on public transport in the city.

**Table 4.1.12: Issues of the Transport Sector in CoK**

Category	Issues
Transport Infrastructure	Intersection traffic signals are not working in accordance with traffic demand; Insufficient infrastructure to meet public transport demand; Traffic signals do not have any priority signs in case of malfunctioning; Deteriorated road surfaces (especially unpaved); Lack of proper drainage system (practically on unpaved roads); Lack of protection for cyclists and pedestrians (appropriate sidewalk and cycle ways); Uncoordinated parking facilities; and Lack of coordination among different policy making, regulatory, and implementing agencies.
Planning and Management and Land Use Pattern	Lack of traffic and transport engineering; Lack of basic data; Absence of appropriate road hierarchy and classification; Absence of appropriate road infrastructure development and maintenance management system; Lack of proper transport planning and design; and Increase of pollution level.
Main Problems for Public Transport Operation	Congestion in the existing bus terminals No timetable operation; No appropriated layout of routes; Insufficient bus bays (bus stops) and parking spaces at the center; Inefficient and unconventional mini buses;

	<p>Insufficient bus routes;  Absence of integrated ticketing and revenue sharing mechanisms for public transport service under a multi-route and multi-operator environment of Kigali City;  Lack of standard and coordinated taxi services;  Rapid population growth and traffic increase but inadequate bus service;  Lack of coordination among authorities, which sees no consultation when roads are re-constructed and new roads developed without any consideration for bus pull-ins, shelters, etc.;  With unrestricted allocation of new licenses for mini buses, the city is now congested with buses parking everywhere and anywhere creating great problems;  The presence of “private” unlicensed buses operating without any structure and no policy on bus routes from the authorities;  Lack of central planning or standardization used in the road and supplementary infrastructure which has detrimental impact on transport vehicles and the efficient operating of traffic within the city;  Lack of well-designed pedestrian crossing facilities giving pedestrians and public transport more priority; and  Lack of bus priority on dedicated bus lanes to give public transport priority.</p>
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Source: Public Transport Policy and Strategy for Rwanda, MININFRA, October 2012

To cope with the issues summarized in the table above, the Road Asset Management System (RAMS) was proposed and is currently in the process to be implemented. How the project will be financed is still under discussion. Currently, it is planned that a team of IT and transportation planners will be selected to develop the system, but how to finance the operation and maintenance of the system and its subsystems is not yet clearly stated. Especially, the cost of road maintenance data acquisition is expected to be high when feeder roads will also be incorporated.

### **1) RAMS Data and Information Share to the City of Kigali**

The CoK and Rwanda National Police (RNP) already have systems. The city has a geographic information system (GIS) on roads. RNP monitors road activities using CCTVs. The proposed systems and subsystems of RAMS on traffic management system and road safety management system will require close coordination with CoK and RNP.

### **2) MININFRA**

In RAMS, one new division and one new unit are proposed to RTDA. The Road Asset Management Division consists of the Division Manager (1); Road Location Reference and Road Reserve Management System (RLRMS) Senior Engineer (2); Traffic Management System (TMS) Senior Engineer (1); Pavement Management System (PMS) and Unsealed Road Management System (URMS) Senior Engineer (5); Assessment Senior Technician (1); and Junior Technicians (3). While the Information Technology Unit consists of the Network and System Administrator; Database and Application Specialist; System Support Specialist; and GIS Specialist.<sup>14</sup>

Technical Support Unit is proposed for RMF, under the RAMS scheme,<sup>15</sup> composing of the Director, District Roads Monitoring and Evaluation (M&E) Senior Engineer; National Roads M&E Senior Engineer; and two Project Control Senior Engineers.

In MININFRA, with or without RAMS introduction, there shall be a dedicated unit for railways and inland water transport. To facilitate the drafting of legal documents, there

<sup>14</sup> Road Asset Management System Master Plan (RAMSMP) Version 3-0, Figure 12.

<sup>15</sup> Ibid. Figure 14.

shall be an additional legal expert who has knowledge in transportation planning, development, and management in the Infrastructure Division.

A financial analysis shall be conducted for RAMS. Especially since RAMS Master Plan does not specify in-house or outsourcing for data acquisition on road surface condition survey, cost-effective operation will have to be planned for the management activities not to become financial burden in the future.

### **3) City of Kigali**

Under the Infrastructure Directorate, there are three units, i.e.: Transport Planning; Road Development and Rehabilitation; and Road Maintenance. The Water and Sanitation Planning Unit and Public Health and Environment Unit under the DG Social Development have similar functions; therefore, the Water and Sanitation Planning Unit under the Infrastructure Directorate is recommended to be transferred and merged with the Public Health and Environment Unit.

The three units under the Infrastructure Directorate, namely: Transport Planning; Road Development and Rehabilitation; and Road Maintenance, shall have independent managers to ease the workloads of the Director of Infrastructure Division.

There are only two full-time employees in the ICT Unit. The role of the ICT Unit becomes more significant when the smart city concept will be implemented. Additional full-time employees with knowledge and skills of database and system administration will be needed.

## **4.2 Related Laws and Regulations**

### **4.2.1 Rwandan Constitution 2003 (Rev. 2015)**

Article 34 states right for private ownership of land and other rights related to land.

### **4.2.2 Land Law**

#### **Organic Law No. 08/2005 of 14/07/2005 Determining the Use and Management of Land in Rwanda**

Article 3 of the law stipulates that the state has the right to expropriation due to public interest, settlement and general land management through procedures provided by the law and prior to appropriate compensation.

### **4.2.3 Law Governing Road in Rwanda**

#### **Law No. 55/2011 of 14/12/2011 Governing Roads in Rwanda**

Article 1 states the purpose of the law: "This law regulates the road network in Rwanda and determines its reserves, classification, and management." Article 3 defines road classification. All public roads are classified into: national roads; district, and CoK roads in urban areas- Class One; district and CoK roads in other urban areas-Class 2; and specific roads. Article 6 defines that all management and maintenance of the national roads are under the jurisdiction of RTDA. Article 8 states that district roads and CoK roads are under the jurisdictions of districts and CoK, respectively. Maintenance works are funded by RMF, and development is funded by the government. Articles 15 and 16 define the width of the roads.

#### **4.2.4 Land Use Planning Law**

##### **Law No. 24/2012 of 15/06/2012 Relating to the Planning of Land Use and Development in Rwanda**

The law governs the planning of land use and development in Rwanda. Article 5 states that a Presidential Order shall determine the land use and development master plan in Rwanda to guide the enforcement of land use planning at the national level. It mandates all the districts to prepare specific master plan based on the district development plan.

#### **4.2.5 Law Governing Urban Planning**

##### **Law No. 10/2012 of 02/05/2012 Governing Urban Planning and Building in Rwanda**

It is a law applicable to urban areas, i.e.: cities, municipalities, and agglomeration with a population of 10,000 or over with an area of at least 20 square kilometers, and other areas such as economic zones or any other densely occupied areas. The law defines the master plan, local plan, local land development, specific land development plans, and land subdivision plans. It also rules construction, rehabilitation, and demolition activities. Article 56 states the power of the government, CoK, and district to create land reserves for the purpose of land development in the public. This law is the legal basis of the permits such as building permits, occupancy permits, and demolition permits.

#### **4.2.6 Expropriation**

##### **Law No. 32/2015 of 11/06/2015 Relating to Expropriation in the Public Interest**

Article 1 Purpose of this law states that the law determines the procedures relating to expropriation for public interest. The law gives power to the government to order expropriation for public interest. Article 5 gives the list of activities. Among the 22 types of projects of public nature, roads and railway lines are stated first in the list. The districts, CoK, and the central government are the entities that determine expropriation.

#### **4.2.7 Environmental Impact Assessment (EIA)**

##### **Annex I to Ministerial Order No. 001/2018 of 25/04/2018 Determining the List of Works, Activities and Projects Subject to an Environmental Impact Assessment**

REMA has prepared the EIA Guidelines for Road Construction. Section 3.3.2 sets the EIA requirements on roads based on sizes (width and length) by new construction, rehabilitation, and upgrading. Section 3.3.3 defines road categories. The five categories of road projects are: a) new construction; b) reconstruction and/or upgrading; c) improvements; d) rehabilitation; and e) maintenance.

##### **(1) RDB Role in EIA<sup>16</sup>**

The Department of Investment and the Division of Investment Promotion of RDB coordinate the EIA process and issue the environmental clearance certificates of the project, as well as validate the EIA project studies. Article 67 as stipulated in the Environmental Organic Law No. 04/2005 of 08/04/2005 clarifies the different steps to obtain the EIA certificate.<sup>17</sup>

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<sup>16</sup> Environmental and Social Impact Assessment (ESIA) for the Upgrading Project of Ngoma-Nyanza Road, Rwanda Transport Development Agency (RTDA), p.21

<sup>17</sup> Environmental and Social Impact Assessment (ESIA) for the Upgrading Project of Ngoma-Nyanza Road,

## **(2) EIA Procedure in Rwanda**

An EIA process in Rwanda includes the following five steps: (1) project application and registration, (2) screening, scoping, and terms of reference, (3) EIA study and report, (4) submission of an EIA report, and finally (5) decision making.

Screening enables the categorization of projects according to their impact level (IL) as follows:

- Category 1 (Impact level IL1): Full EIA is not required. RDB advises on the appropriate environmental management measures (plan). The exercise may take 14 days from the day of receipt of the project brief (days may be less or more depending on the nature of the project);
- Category 2 (Impact level IL2): The proposed projects under this category are screened to determine whether or not a full EIA is needed. In this connection, RDB provides the developer with clear indication of the additional information required. Once this information is received, RDB will determine whether or not a full EIA of the project is needed.
- Category 3 (Impact level 3): Full EIA is required.

In the guidelines prepared by REMA, the EIA requirements are defined as follows:<sup>18</sup>

A detailed EIA study is required if the road project considered in its entirety meets any of the following criteria:

- a) In case of new construction (new alignment):
  - All main highways and national roads; and
  - All roads longer than 5 km and the road reserve is greater than 15 m.
  
- b) In case of rehabilitation, upgrading, or other improvement:
  - Upgrading of roads to provide four or more lanes (continuous section of 10 km or more);
  - The road reserve is greater than 15 m and the length of the road project is greater than 30 km; and
  - The road reserve is less than 15 m and the length of the road project is greater than 60 km.
  
- c) For all types of road projects:
  - The road project or temporary infrastructure affects partly or completely more than 100 households;
  - The road project or temporary infrastructure crosses a river with a distance of 300 m (or less) inside the floodplain;

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Rwanda Transport Development Agency (RTDA), p.21

<sup>18</sup> Sector Guidelines for Environmental Impact Assessment (EIA) for Roads Development Projects in Rwanda, REMA. p.16

- The road project or temporary infrastructure is located along an existing river bank at a distance of less than 30 m and with a total length of more than 100 m;
- The road project or temporary infrastructure is located 10 km from or within the national parks, conservation areas, or forest reserves; and
- The road project crosses a sensitive area.

Also, for non-major impact projects, the Initial Environmental Examination is required<sup>19</sup>:

For a project which:

- Is unlikely to involve setting up temporary infrastructure within the existing road reserve;
- Is unlikely to require any resettlement (within or outside of the road reserve);
- Is unlikely to affect any sensitive areas, e.g., a habitat of rare or threatened species;
- Is unlikely to require a new borrow pit or other facilities (e.g., site camps); and
- Is unlikely to create any important induced development.

Other institutions involved in the EIA processes are summarized as follows:

**Table 4.2.1: Key Institutions in EIA for Road Development Projects in Rwanda**

Institution/ Agency	Key Interests and Responsibilities
1 Ministry of Infrastructure (MININFRA)	Formulating policies, laws, and standards for roads development in the country. Is also responsible for national roads, highways and bridges and overseeing local roads development.
2 Road Maintenance Fund ( <i>Font d' Entretien Routier</i> : FER))	Mobilizing financing and technical resources for regular maintenance of highways and other national roads. Ensuring that road infrastructures are maintained to the required standards through proper procurement. The Rwanda Transport Board (RTB) oversees the implementation of the transport policy, including management of roads; initiating public investment in transport services like licensing of public transport service providers such as in rail, water and air transport.
4 Ministry of Natural Resources (MINIRENA)	Formulating policies, laws and standards for land administration and land use planning; environmental protection and natural resources utilization. In road development, major responsibilities include the determination of compensation and provision of land for resettlement of displaced people.
5 Ministry of Local Government (MINALOC)	National policies and laws on decentralization and local governance; supervising local government authorities who are responsible for district, local, and community roads.
6 Rwanda Environmental Management Authority (REMA)	National authority responsible for environmental regulations and standards setting and overseeing the implementation of EIA guidelines. REMA will also be responsible for mobilizing, educating, and sensitizing stakeholders to follow or participate in the implementation of the EIA guidelines.
7 Ministry of Commerce, Trade, Industry, Cooperatives and Tourism (MINICOM)	Policies and laws relating to licensing of commercial and industrial activities including premises.
8 City Council of Kigali	Responsible for design and implementation of all urban infrastructures in the city, including inter-district roads; Providing and enforcing guidelines for construction work within the city of Kigali.

<sup>19</sup> Ibid. p.20.

9 District Local Governments	Districts are responsible for planning and execution of road construction and maintenance within the district.
10 Rwanda Bureau of Standards (RBS)	Imposition of regulations and standards on public utilities associated with housing/ building i.e., water, electricity, and telecommunications. This includes the quality of service provision including tariff setting.
11 National Land Centre (NLC)	Land registration and land use planning throughout the country. Compensation and resettlement will depend on legal ownership.
12 Electrogaz	National agency responsible for provision of water and electricity utilities. In road development, Electrogaz' major stake in roads

Source: REMA, Sector Specific EIA Guidelines for Road Construction Project

## **4.2.8 Public Private Partnership (PPP) Laws**

### **The Law on Investment Promotion and Facilitation (Law No. 06/2015 of 28/03/2015 Relating to Investment Promotion and Facilitation)**

The Law on Investment Promotion and Facilitation was enacted in March 2015 to promote and facilitate investment in Rwanda.<sup>20</sup> In the law, a foreign investor is defined as a) a natural person who is not a citizen of Rwanda or of a member state of the East African Community (EAC) or the Common Market for Eastern and Southern Africa (COMESA); b) a business company or a partnership not registered in Rwanda or a member state of the East African Community or COMESA; c) a business company or a partnership registered in Rwanda whose foreign capital from countries other than East African Community (EAC) or COMESA member states is at least fifty-one percent (51%) of the invested capital.

Foreign investors' rights such as protection of investor's capital and assets are clearly stated and protected as well as their intellectual property rights.

### **PPP Law: Law No. 14/2016 of 02/05/2016 Governing Public Private Partnerships**

The PPP Law was officially published at the end of May 2016. The conventional procurement process was designed only for the private sector. With the PPP Law, the government is a partner in investment projects and can receive value for money unlike under conventional procurement framework.

Article 6 of the law states the roles of public institutions in PPP. The Steering Committee is composed of the Minister in-charge of Finance Economic Planning; the Minister in-charge of Infrastructure; the Chief Executive Office of Rwanda Development Board; and the Head of the Contracting Authority depending on the PPP project under study. The Steering Committee has the responsibility to approve and oversee those PPP projects. The responsibility of the Contracting Authority is stated in Article 9. The Contracting Authority identifies PPP project and conducts feasibility studies. During implementation, the Contracting Authority needs to provide the Steering Committee the monthly and annual progress reports on project implementation.

## **4.2.9 Speed Governor**

### **Presidential Order No. 25/01 of 25/02/2015 Modifying and Complementing Presidential Decree No. 85/01 of 02/09/2002**

#### **Regulating General Traffic Police and Road Traffic as Modified and Complemented to Date**

Articles 29 and 30 of the order limit the speed of a public or goods transport vehicle at sixty kilometers per hour (60 km/h). All public or goods transport vehicles must be equipped with

<sup>20</sup> Chapter One, Article 1: Purpose of this law



speed governors, and a qualified agent may stop any public or goods transport vehicle for the verification of installation and proper functioning of a speed governor.

#### **4.2.10 Technical Standards and Guidelines**

RTDA prepared the draft bridge and road design manuals in 2014. The composition of the manuals is as follows:

- Bridge Design Manual
- Road Geometric Design Manual
- Road Pavement Design Manual
- Drainage Design Manual
- Standard Specifications for Road and Bridge Works

The Bridge Design Manual was drafted based on the American Association of State Highway and Transportation Officials (AASHTO) and the Road Geometric Design was drafted in consideration of the East African Community (EAC) recommendations.

These manuals are still draft versions. AASHTO is referred to for the structure design.

#### **4.2.11 Issues on Laws and Regulations**

##### **(1) Technical Standards/Guidelines**

RTDA prepared the draft bridge and road design manuals in 2014 considering the harmonization with EAC standards. However, these are still draft versions, and AASHTO is more referred since RTDA manuals are not really used.

It is obvious that the standards have to be prepared considering the specific geographical condition and situation of Kigali City. The reasons why the RTDA manuals have not been used and not finalized. The standards shall be clarified and it is important to prepare the main standards to be used in Rwanda by Rwandan Engineers.

##### **(2) Prioritization of the Solutions with a Rational Approach**

There are various issues related to transportation in CoK. Tackling all the issues at the same time is not possible and not recommended. Although there are already proposed projects in NST 1 related to situations in CoK, projects are listed in the Kigali City Development Strategy (2018-2014). Considering these proposed projects, effectiveness of these projects needs to be considered.

Immediate action to be taken is to tackle the situation of the six congested intersections. There are two approaches to this situation. One is physical improvement and the other is operational improvement. The physical approach to improve the intersections requires various administrative procedures and costs that may include relocation of residents and landowners. On the other hand, the operational approach, which is to improve the operation of signals at the intersections, would require less costs and time. It would be an effective approach that could result in short-term improvement. The Smart City Concept is an institutional arrangement to make operational improvement to the various administrative functionalities of CoK. The initial functional improvement could be targeted to the transport sector—namely, the traffic signal operation improvement.

Vision 2050 sets the prospective incomes to USD 4,035 by 2035 and USD 12,476 by 2050. As stated, gross domestic product (GDP) per capita in 2017 was USD 774. The target for 2020, in Vision 2020 is USD 1,240. While the government draws an enthusiastic economic growth scenario, the International Monetary Fund (IMF) projects GDP per capita for the year 2020 at USD 908, and for the year 2023, it would be USD 1,110.<sup>21</sup> Without drastic economic and institutional structural reform with substantial foreign direct investment (FDI) and financial and technical assistance from donors, the targets set in Vision 2050 would be difficult to achieve. Investment in modern and smart cities and high investment in human capital stated in Vision 2050 will be significant directions. Transforming the capital city of Kigali as a smart city will become one of the first steps of the national policies toward 2050.

There is a transport master plan entitled the Kigali Transport Master Plan (update of Version 2013). The general direction is to follow the master plan under the condition that the master plan was prepared based on the survey data and rational projection studies. Since this Data Collection Survey on Urban Transport in Kigali City (the JICA Survey) includes traffic surveys, the results shall be reflected in the general directions of the Kigali Transport Master Plan.

### **(3) Information Collection and Sharing Among Stakeholders**

RAMS documents stated RTDA, RMF, and MININFRA as the major beneficiaries of the system. Others such as RNP and CoK shall be considered as users of the system or subsystems. The City Control Center Concept at the city level and RAMS at the national level shall be coordinated so as not to duplicate information collection work. Since some of the road maintenance works such as cleaning of ditches have been conducted at the local level (sector or cell) as in *Umuganda*<sup>22</sup>, such activities will have to be integrated to the road maintenance system.

### **(4) Overloading Trucks**

As in the speed governor that limits the speed of public or goods transport vehicles, installation of a vehicle-mount-digital-axle-load indicator/sensor<sup>23</sup> shall become mandatory for all goods transport vehicles.

The ordinary axle load scale needs operational costs and installation costs. A vehicle mount system will become less costly to the government.

### **(5) Bus Park Management**

Domination or monopoly situation in bus park management was reported. RFTC's subsidiary company, JALI Real Estate, owns 80% of the bus parks in Rwanda controlling the fees of using the bus parks, which could lead to unhealthy competition among different bus operators. Since these bus parks are public in nature, management shall be regulated by the government or guidelines shall be prepared.

### **(6) On-demand Dispatch of Taxi**

As the number of tourist arrivals increases, more taxi operations will be demanded. With the locator system of smart phones, a taxi shall be dispatched to the location of potential passengers. Similar on-demand system shall be developed for motor taxis also. All the

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<sup>21</sup> <http://www.imf.org/external/datamapper/NGDPDPC@WEO/OEMDC/ADVEC/WEOWORLD/RWA>

<sup>22</sup> Umuganda is a practice that takes root from Rwandan culture of self-help and cooperation. c.f. <http://www.rgb.rw/home-grown-solutions/rwandas-hgs-good-practices/umuganda/>

<sup>23</sup> An example of the system: <http://www.airtecaustralia.com.au/truck-scales/truck-scales-digital-gauges/axl302-axle-load-gauge/>

systems shall be cashless for passengers' convenience. An online performance evaluation or customer satisfaction system shall be introduced so that a rider or driver with low skills and services will be eliminated. Technology is available but institutional design and consensus building will become necessary.